

TOTAL DOSE RADIATION TEST REPORT

Part Type : MT48LC16M8A2

SDRAM 4 Mb x 8 x 4 banks

Package : TSOP - 54

Manufacturer: Micron Technology Inc.

Report Reference : ESA_QCA0421T_C

Issue : 01

Date : November 10 2004

ESA Call of order Number 12, Estec / Contract n° 13528/99/NL/MV

European Space Agency Contract Report

The work described in this report was done under ESA contract.
Responsibility for the contents resides in the author or organization that prepared it

ESA Technical Officer: Reno HARBOE SORENSEN

Hirex reference :	HRX/TID/0241	Issue : 01	Date :	November 10 2004
Written by :	S.PATRY	Technician		
Approved by :	O. PERROTIN	Study Manager		
Authorised by :	J.F. PASCAL	Technical Manager		

HIREX Engineering	Total Dose Test Report		Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.

TOTAL DOSE RADIATION TEST REPORT

on

Micron Technology Inc. MT48LC16M8A2 SDRAM 4 Mb x 8 x 4 banks

TABLE OF CONTENTS

1	Abstract	4
2	Introduction	5
3	Applicable and Reference Documents	5
3.1	APPLICABLE DOCUMENTS	5
3.2	REFERENCE DOCUMENTS	5
4	Test Samples	5
5	Experimental Conditions	6
5.1	RADIATION SOURCE DOSE RATE AND ANNEALING	6
5.2	BIAS DURING DOSE EXPOSURES AND MEASUREMENTS CONDITIONS	6
5.2.1	Bias conditions	6
5.2.2	Electrical Measurements	8
6	Test Results	11
7	Conclusion	11
List of figures:		
	Figure 1 : Bias Conditions during Irradiation Exposures and Annealing	7
	Figure 2 : test program principle	8
List of Tables		
	Table 1: Measured electrical parameters	9
List of Appendices		
	Appendix 1 : Test Results Including Tables and Graphs	12

HIREX Engineering	Total Dose Test Report		Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.

1 Abstract

Under ESA Call of order Number 12, Estec / Contract n° 13528/99/NL/MV covering "Radiation Evaluation of COTS Semiconductor Components", the radiation sensitivity to Total Ionizing Dose (TID) of three different SDRAM was evaluated. Results from these evaluations, are reported in individual TID reports. Below summary table lists manufacturer and evaluated types, and gives references to the various reports issued.

Manufacturer	Part Number	Description	TID Report
Elpida Memory Inc.	EDS2508APTA	SDRAM 8Mb x 8 x 4 , 133MHz	ESA_QCA0419T_C
Samsung	K4S510432B	SDRAM 32Mb x 4 x 4 , 133MHz	ESA_QCA0420T_C
Micron Technology Inc.	MT48LC16M8A2	SDRAM 4 Mb x 8 x 4 banks	ESA_QCA0421T_C

HIREX Engineering	Total Dose Test Report		Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.

2 Introduction

A total dose radiation evaluation test of the Micron Technology Inc. MT48LC16M8A2 SDRAM 4 Mb x 8 x 4 banks has been performed with an accumulated dose of about 100 Krad(Si) ,at a dose rate of 200 rad(Si)/hour in response to ESA contract: Call of order Number 12, Estec / Contract n° 13528/99/NL/MV.

The purpose of this test was to evaluate total dose withstanding of this component, to investigate its suitability for being used in space applications and to evaluate auto-refresh and self-refresh modes of bias operation. This test was conducted on samples procured by ESA/ESTEC TEC-QCA.

Test has been performed in accordance with Hirex Engineering Proposal reference: HRX/PRO/0289 Issue 1.

A complete set of electrical measurements together with graphical representation of measured parameters with respect to total dose received, are provided for all samples.

3 Applicable and Reference Documents

3.1 Applicable Documents

- Hirex proposal: HRX/PRO/0289 Issue 1.
- Micron Technology Inc. : MT48LC16M8A2 datasheet dated February 2003.
- ESA/SCC Basic Specification N° 22900 Issue 4 – Total dose steady-State Irradiation Test Method.

3.2 Reference Documents

- NA

4 Test Samples

10 samples of the MT48LC16M8A2 device were tested (10 + 1 control sample). Parts have been biased according to the allocation table below.

Serial number	Allocation
40 Ref	Control
41	Auto refresh mode
42	Auto refresh mode
43	Auto refresh mode
44	Auto refresh mode
45	Auto refresh mode
46	Self refresh mode
47	Self refresh mode
48	Self refresh mode
49	Self refresh mode
50	Self refresh mode

Identification of the MT48LC16M8A2 is given below:

Part Number:	MT48LC16M8A2	Mask Set:	NA
Project:	-	Diffusion Lot:	NA
Lot Number:	-	Marking:	0020 2-2 MT 48LC16M8A2 TG -8E B FBQ3
Date Code:	0020		

HIREX Engineering	Total Dose Test Report		Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.

5 Experimental Conditions

5.1 Radiation Source Dose Rate and Annealing

The dose exposures were performed at CERT-ONERA. In this irradiation facility, a Cobalt 60 source is used with the possibility to vary the dose rate by simply adjusting the distance to the source.

The irradiation conditions used for this test are provided in the following table:

Irradiation Steps krads	Dose rate krads/h	Annealing steps hours	Temperature °C
0			25
10	0.2		25
20	0.2		25
30	0.2		25
50	0.2		25
70	0.2		25
100	0.2		25
		24	25
		168	100

5.2 Bias during Dose Exposures and Measurements conditions

5.2.1 Bias conditions

During exposures dedicated test boards were used mounted on a special board-holder made for irradiation. The test boards allowed two biasing conditions of the devices in accordance with electrical circuits provided in Figure 1.

These conditions correspond to functioning of the components in self refresh and auto refresh mode.

In order to set the devices in these modes, an emulation board was used.

This emulation board was interfaced to the bias board at each exposure step and ensured programming of irradiated samples in the proper mode, thanks to the use of CPLD devices.

To ensure functioning of samples in auto-refresh mode, one emulation board per device is maintained connected to the bias board during exposure. Each emulation board being protected by lead during exposure.

To ensure functioning of samples in self-refresh mode, the emulation board configures each SDRAM, then it is removed and samples are autonomous.

During annealing steps, the same stress conditions were applied at 25°C and 100°C temperatures.

HIREX Engineering	Total Dose Test Report		Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.

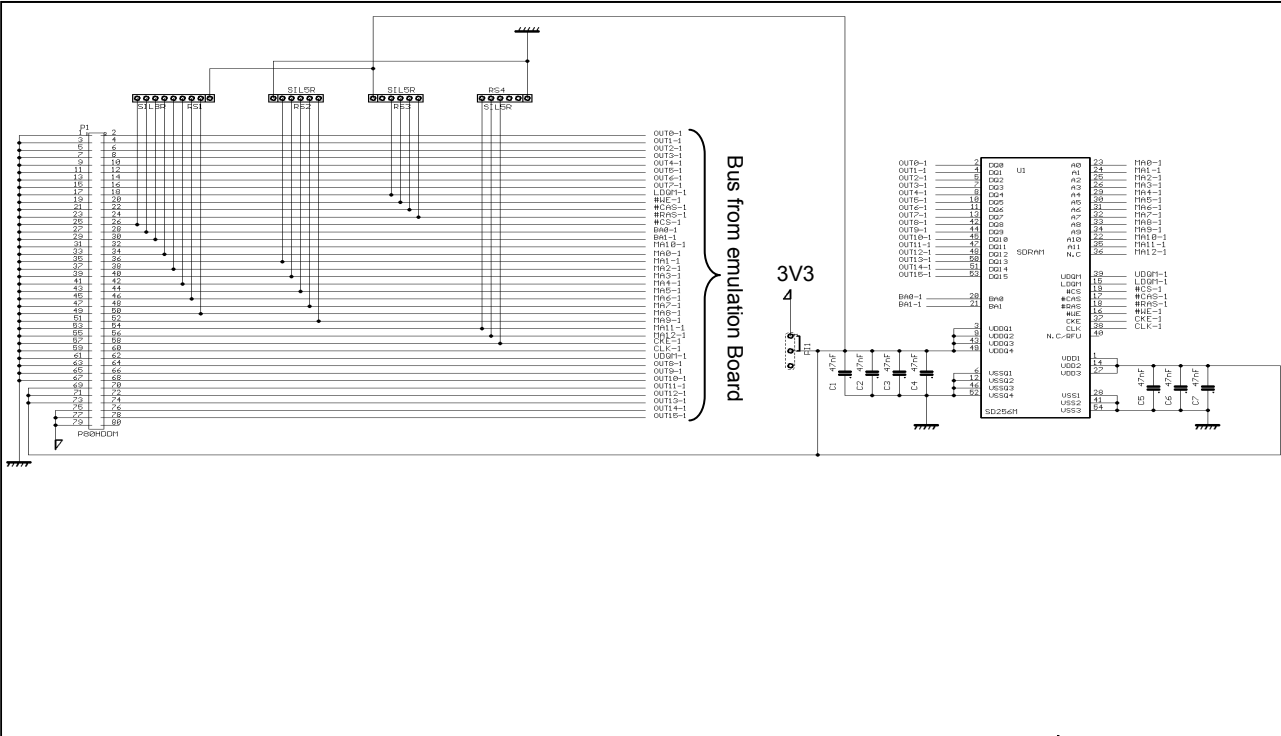


Figure 1 : Bias Conditions (Bias board) during Irradiation Exposures and Annealing

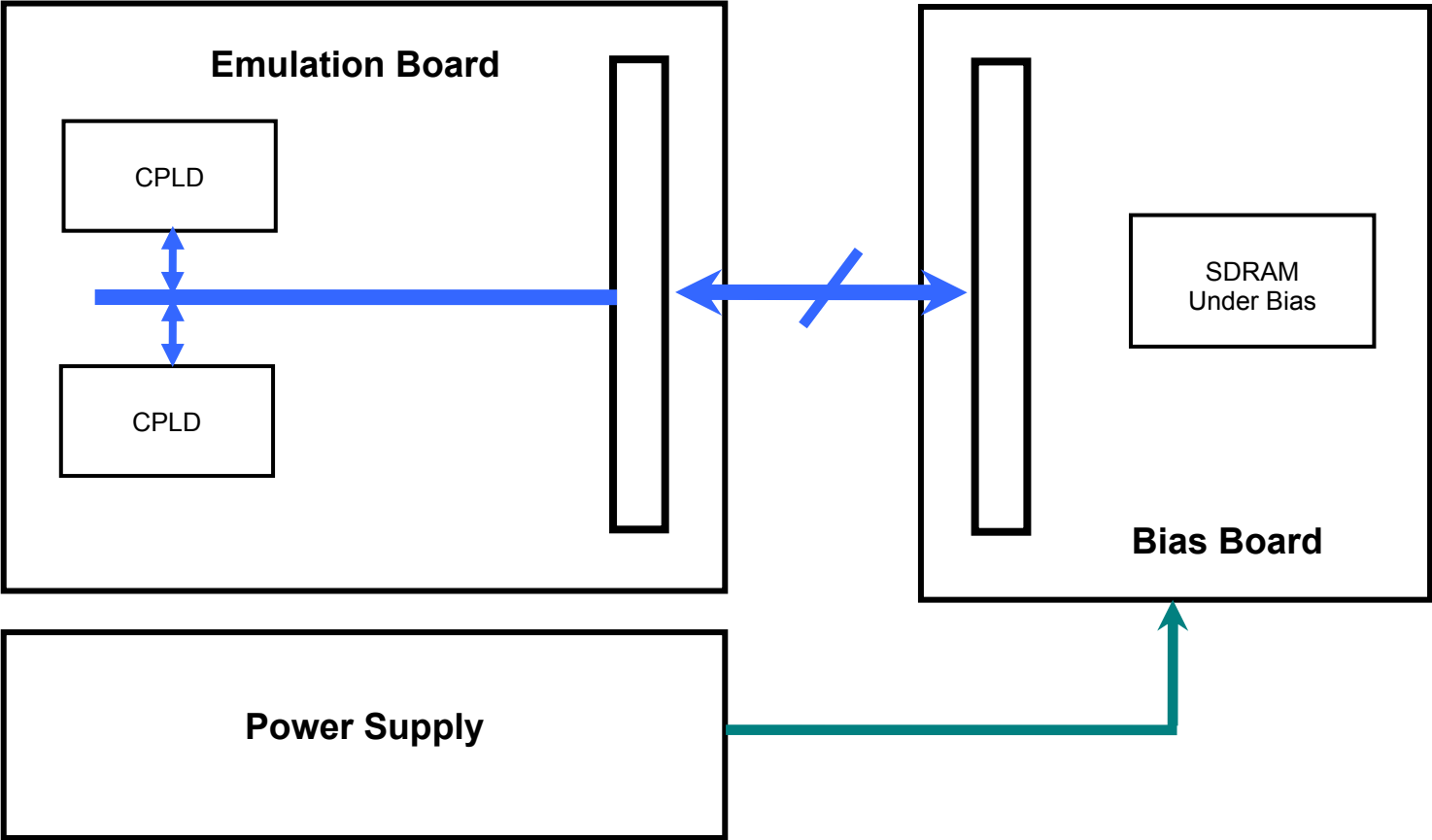


Figure 2 : Bias Conditions principle during Irradiation Exposures and Annealing

HIREX Engineering	Total Dose Test Report		Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.

5.2.2 Electrical Measurements

Electrical parameters test program principle for MT48LC16M8A2 is provided in Figure 3.

The test Setup for this SDRAM includes an IMS ATS Test Station, a SUN workstation, and a dedicated test fixture board.

A special memory test module was used for algorithmic address generation. An ATS data card is used to control the ATS memory test card that generates all required addresses for the memory under test. Other ATS data cards are used for the transfer of data and control signals between the ATS test station and the DUT.

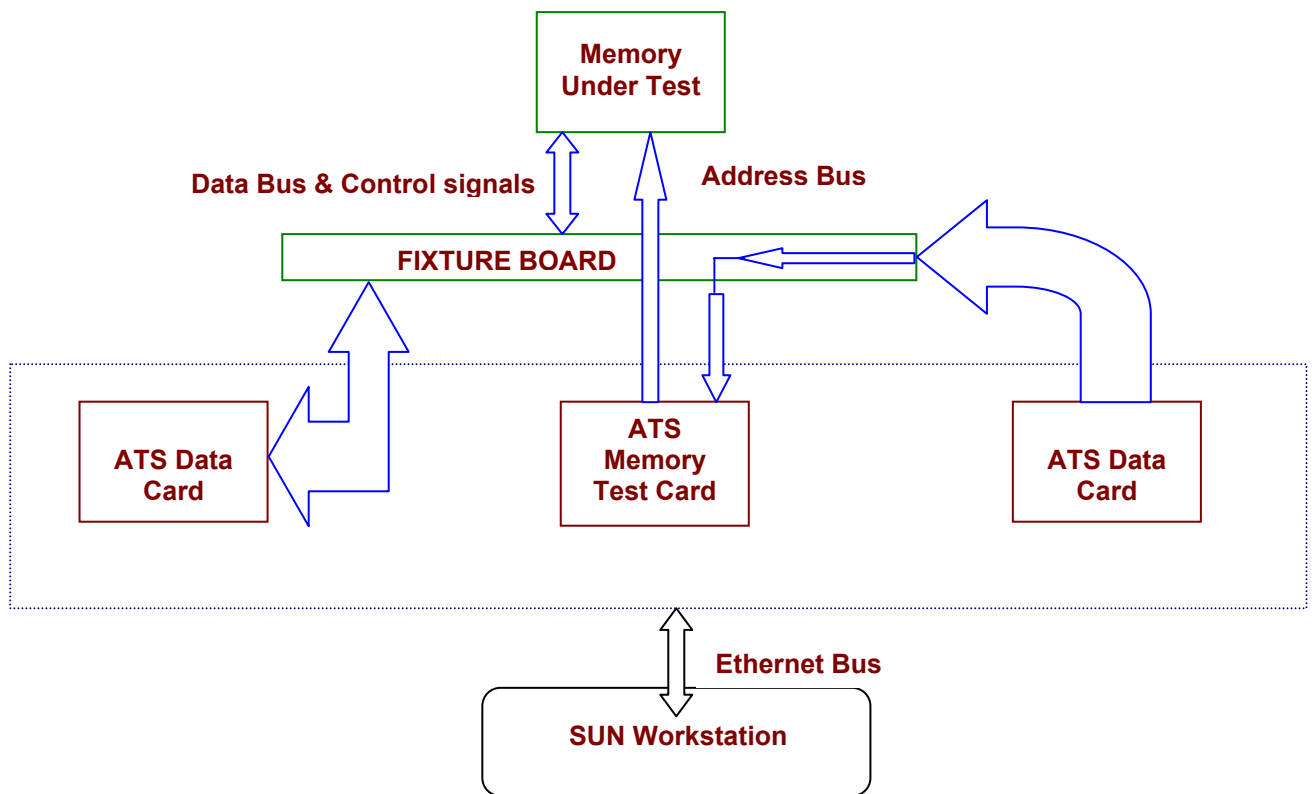


Figure 3 : test program principle

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.	

Electrical parameters test conditions and limits used for performing this test are given in the following table.

Table 1: Measured electrical parameters

5.2.2.1 Tests DC

Parameters tested					
Parameter	Symbol	Test conditions (Note 1)	Min.	Max.	Unit
Input High Voltage : Logic 1	V_{IH}	guaranteed during functional test	2	3.6	V
Input Low Voltage : Logic 0	V_{IL}	guaranteed during functional test	-0.3	0.8	V
Operating Current : Active Mode	I_{DD1}	Burst = 2, Read/Write, $t_{RC} = t_{RCMin} = 66ns$	-	140	mA
Standby Current : Active Mode	I_{DD3}	CKE = /CS = High, All banks active, No accesses in progress	-	40	mA
Operating Current : Burst Mode	I_{DD4}	Continuous Burst, Read/Write, All banks active	-	140	mA
Auto Refresh Current	I_{DD5}	CKE = /CS = High, $t_{RFC} = t_{RFCMin} = 66ns$	-	270	mA
Auto Refresh Current	I_{DD6}	CKE = /CS = High, $T_{RFC} = 15.625\mu s$	-	3	mA
Self Refresh Current	I_{DD7}	CKE = 0.2V	-	2	mA
Output High Voltage : Logic 1	V_{OH}	$I_{OH} = -4mA$	2.4	-	V
Output Low Voltage : Logic 0	V_{OL}	$I_{OL} = 4mA$	-	0.4	V
Input High Leakage Current	I_{IH}	-	-5	5	uA
Input Low Leakage Current	I_{IL}	-	-5	5	uA

Note1 : Vdd = VddQ = 3.3V. $V_{IL} = 0V$ et $V_{IH} = 3.3V$.

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.	

5.2.2.2 Tests AC

Parameters tested					
Parameter	Symbol	Test conditions (Note 2)	Min.	Max.	Unit
Access Time from a positive edge of CLK	$t_{AC(3)}$	CAS Latency = 3	-	6	ns
Access Time from a positive edge of CLK	$t_{AC(2)}$	CAS Latency = 2	-	6	ns
Address Hold Time	t_{AH}		-	1	ns
Address Setup Time	t_{AS}		-	2	ns
CS*, RAS*, CAS*, WE*, DQM Hold Time	t_{CMH}		-	1	ns
CS*, RAS*, CAS*, WE*, DQM Setup Time	t_{CMS}		-	2	ns
Data In Hold Time	t_{DH}		-	1	ns
Data In Setup Time	t_{DS}		-	2	ns
Data Out Hold Time	t_{OH}		3	-	ns
Active to Active Command Period	t_{RC}		-	70	ns
Precharge Command Period	t_{RP}		-	20	ns
Active to Read Delay	t_{RCD}		-	20	ns
Active Bank "A" to Active Bank "B"	t_{RRD}		-	20	ns
Write Recovery Time	t_{WR}		-	1CLK + 7	ns

Note 2 : $V_{IL} = 0V$ et $V_{IH} = 3V$. $I_{OH} = -2mA$, $I_{OL} = 2mA$

Table 1: Measured electrical parameters (continued)

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.	

6 Test Results

Test results including tables and graphics are provided in Appendix 1 for each measured parameter.

The parameters trc, twr, trcd, trp, trrd represent values measured within the limit of the tester. The actual values are lower or equal to the values indicated.

7 Conclusion

A Total Ionizing Dose evaluation test was carried out by Hirex Engineering under ESA contract on the Micron Technology Inc. MT48LC16M8A2 SDRAM 4 Mb x 8 x 4 banks in TSOP - 54 package.

10 samples plus one control sample were used during testing. They were exposed to radiation using a dose rate of 200 rad(Si)/hour at room temperature.

Generally this device exhibited a fairly good resistance to total dose induced effects.

However, it should be noted that samples biased in self-refresh mode had a different behaviour than samples biased in auto-refresh mode.

Samples biased in self refresh mode :

Functionally failed after 98 KRad(Si) of dose exposure. Samples have recovered after the last annealing step.

Parameters Idd1, Idd3, Idd4, Idd5, Idd6, Idd7, lozL, lozH, liL (on pins CLK, CKE, /CS), liH (on pins CLK, CKE, /CS) failed specification limits after 98 KRad(Si) of dose exposure. All these parameters have recovered after the last annealing step.

It should be noted that there are missing results at 98 KRad(Si) and 24h annealing step for AC parameters, VoH and VoL due to the loss of functionality.

Samples biased in auto refresh mode :

Samples passed specification limits for all parameters and remained functional all along testing.

It should be mentioned a small drift on VoH parameter, after 98 KRad(Si) exposure, which completely recovered after annealing step.

All other parameters remained within specification limits all along testing.

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.	

Appendix 1 : Test Results Including Tables and Graphs

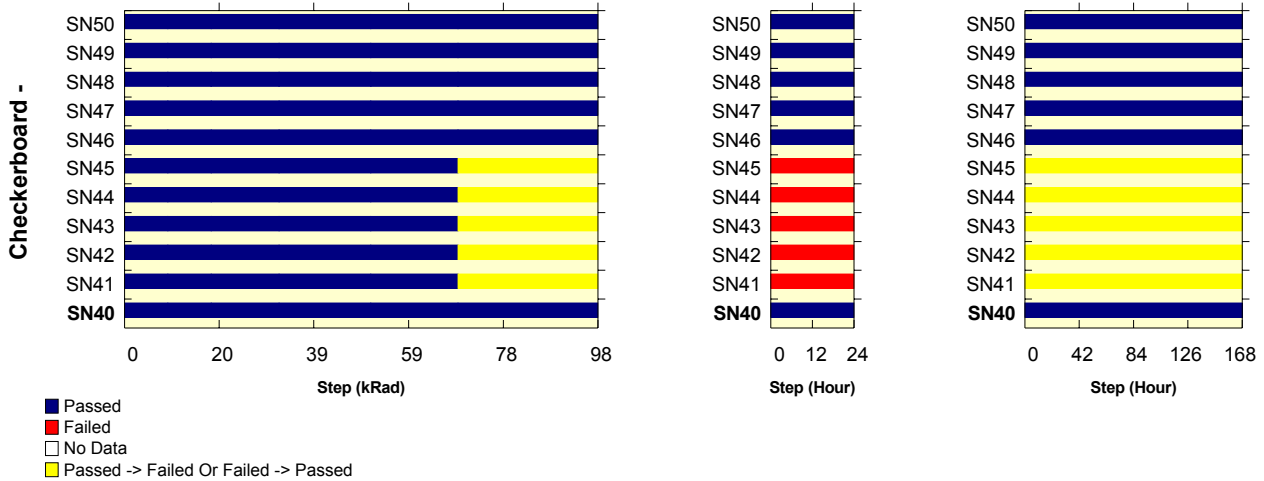
HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.	

Test conditions : Tid

Parameter : Functional : Checkerboard

Unit :

No spec limit specified.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	PASSED	PASSED	PASSED	PASSED	PASSED	PASSED	PASSED
SN41	PASSED	PASSED	PASSED	PASSED	PASSED	PASSED	FAILED
SN42	PASSED	PASSED	PASSED	PASSED	PASSED	PASSED	FAILED
SN43	PASSED	PASSED	PASSED	PASSED	PASSED	PASSED	FAILED
SN44	PASSED	PASSED	PASSED	PASSED	PASSED	PASSED	FAILED
SN45	PASSED	PASSED	PASSED	PASSED	PASSED	PASSED	FAILED
SN46	PASSED	PASSED	PASSED	PASSED	PASSED	PASSED	PASSED
SN47	PASSED	PASSED	PASSED	PASSED	PASSED	PASSED	PASSED
SN48	PASSED	PASSED	PASSED	PASSED	PASSED	PASSED	PASSED
SN49	PASSED	PASSED	PASSED	PASSED	PASSED	PASSED	PASSED
SN50	PASSED	PASSED	PASSED	PASSED	PASSED	PASSED	PASSED

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	PASSED	PASSED
SN41	FAILED	FAILED
SN42	FAILED	FAILED
SN43	FAILED	FAILED
SN44	FAILED	FAILED
SN45	FAILED	FAILED
SN46	PASSED	PASSED
SN47	PASSED	PASSED
SN48	PASSED	PASSED
SN49	PASSED	PASSED
SN50	PASSED	PASSED

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	PASSED	PASSED
SN41	FAILED	PASSED
SN42	FAILED	PASSED
SN43	FAILED	PASSED
SN44	FAILED	PASSED
SN45	FAILED	PASSED
SN46	PASSED	PASSED
SN47	PASSED	PASSED
SN48	PASSED	PASSED
SN49	PASSED	PASSED
SN50	PASSED	PASSED

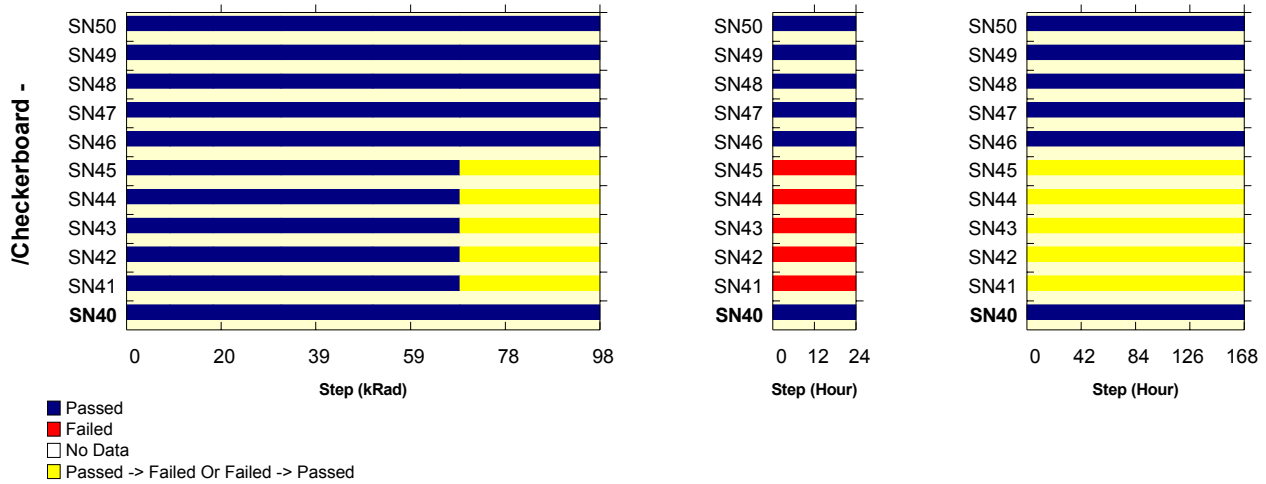
HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.	

Test conditions : Tid

Parameter : Functional : /Checkerboard

Unit :

No spec limit specified.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	PASSED	PASSED	PASSED	PASSED	PASSED	PASSED	PASSED
SN41	PASSED	PASSED	PASSED	PASSED	PASSED	PASSED	FAILED
SN42	PASSED	PASSED	PASSED	PASSED	PASSED	PASSED	FAILED
SN43	PASSED	PASSED	PASSED	PASSED	PASSED	PASSED	FAILED
SN44	PASSED	PASSED	PASSED	PASSED	PASSED	PASSED	FAILED
SN45	PASSED	PASSED	PASSED	PASSED	PASSED	PASSED	FAILED
SN46	PASSED	PASSED	PASSED	PASSED	PASSED	PASSED	PASSED
SN47	PASSED	PASSED	PASSED	PASSED	PASSED	PASSED	PASSED
SN48	PASSED	PASSED	PASSED	PASSED	PASSED	PASSED	PASSED
SN49	PASSED	PASSED	PASSED	PASSED	PASSED	PASSED	PASSED
SN50	PASSED	PASSED	PASSED	PASSED	PASSED	PASSED	PASSED

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	PASSED	PASSED
SN41	FAILED	FAILED
SN42	FAILED	FAILED
SN43	FAILED	FAILED
SN44	FAILED	FAILED
SN45	FAILED	FAILED
SN46	PASSED	PASSED
SN47	PASSED	PASSED
SN48	PASSED	PASSED
SN49	PASSED	PASSED
SN50	PASSED	PASSED

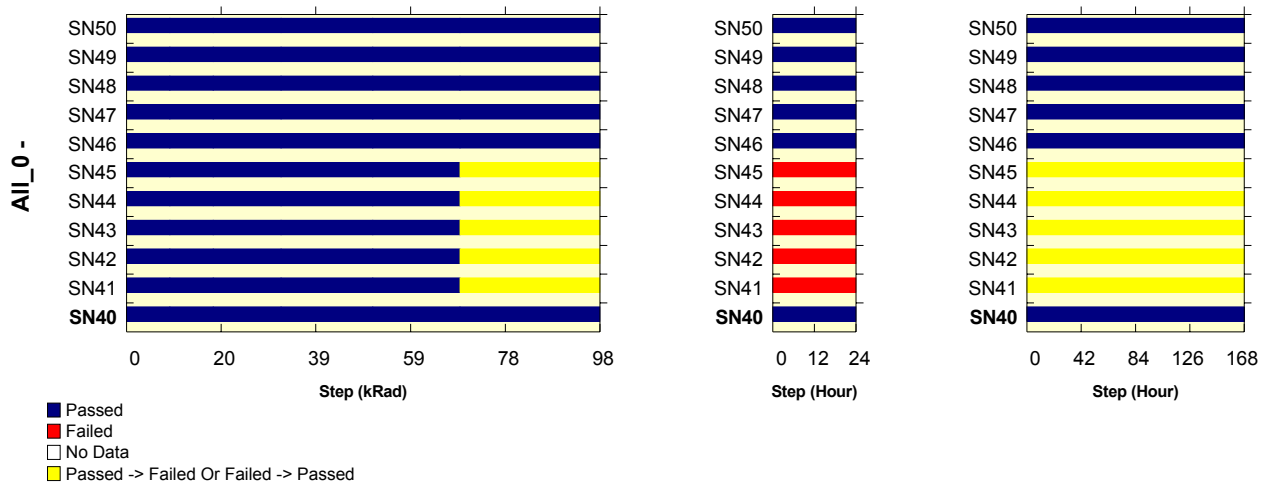
Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	PASSED	PASSED
SN41	FAILED	PASSED
SN42	FAILED	PASSED
SN43	FAILED	PASSED
SN44	FAILED	PASSED
SN45	FAILED	PASSED
SN46	PASSED	PASSED
SN47	PASSED	PASSED
SN48	PASSED	PASSED
SN49	PASSED	PASSED
SN50	PASSED	PASSED

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.	

Test conditions : Tid
Parameter : Functional : All_0

Unit :
No spec limit specified.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	PASSED	PASSED	PASSED	PASSED	PASSED	PASSED	PASSED
SN41	PASSED	PASSED	PASSED	PASSED	PASSED	PASSED	FAILED
SN42	PASSED	PASSED	PASSED	PASSED	PASSED	PASSED	FAILED
SN43	PASSED	PASSED	PASSED	PASSED	PASSED	PASSED	FAILED
SN44	PASSED	PASSED	PASSED	PASSED	PASSED	PASSED	FAILED
SN45	PASSED	PASSED	PASSED	PASSED	PASSED	PASSED	FAILED
SN46	PASSED	PASSED	PASSED	PASSED	PASSED	PASSED	PASSED
SN47	PASSED	PASSED	PASSED	PASSED	PASSED	PASSED	PASSED
SN48	PASSED	PASSED	PASSED	PASSED	PASSED	PASSED	PASSED
SN49	PASSED	PASSED	PASSED	PASSED	PASSED	PASSED	PASSED
SN50	PASSED	PASSED	PASSED	PASSED	PASSED	PASSED	PASSED

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	PASSED	PASSED
SN41	FAILED	FAILED
SN42	FAILED	FAILED
SN43	FAILED	FAILED
SN44	FAILED	FAILED
SN45	FAILED	FAILED
SN46	PASSED	PASSED
SN47	PASSED	PASSED
SN48	PASSED	PASSED
SN49	PASSED	PASSED
SN50	PASSED	PASSED

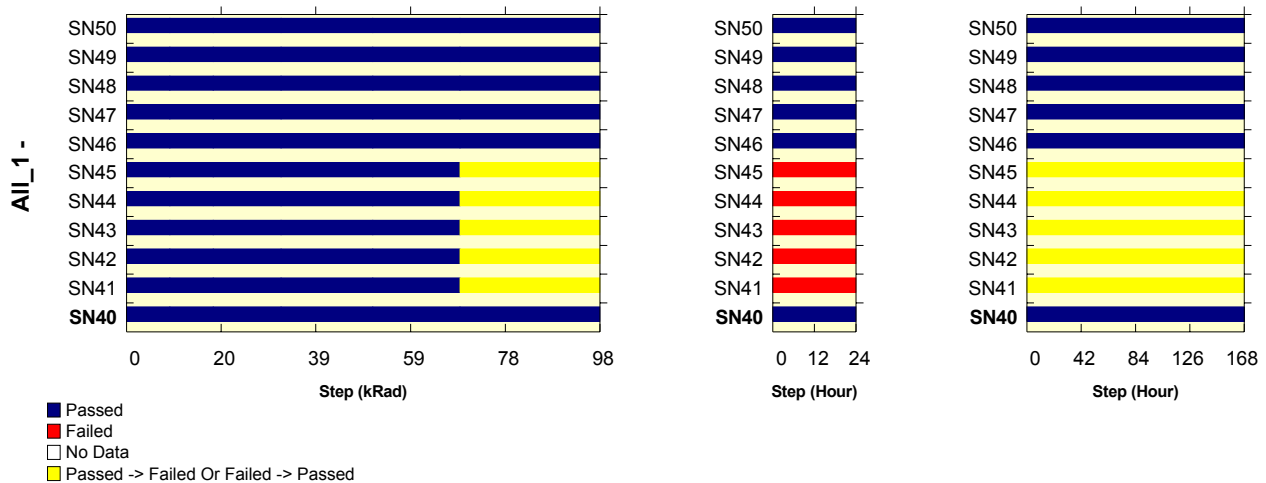
Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	PASSED	PASSED
SN41	FAILED	PASSED
SN42	FAILED	PASSED
SN43	FAILED	PASSED
SN44	FAILED	PASSED
SN45	FAILED	PASSED
SN46	PASSED	PASSED
SN47	PASSED	PASSED
SN48	PASSED	PASSED
SN49	PASSED	PASSED
SN50	PASSED	PASSED

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.	

Test conditions : Tid
Parameter : Functional : All_1

Unit :
No spec limit specified.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	PASSED	PASSED	PASSED	PASSED	PASSED	PASSED	PASSED
SN41	PASSED	PASSED	PASSED	PASSED	PASSED	PASSED	FAILED
SN42	PASSED	PASSED	PASSED	PASSED	PASSED	PASSED	FAILED
SN43	PASSED	PASSED	PASSED	PASSED	PASSED	PASSED	FAILED
SN44	PASSED	PASSED	PASSED	PASSED	PASSED	PASSED	FAILED
SN45	PASSED	PASSED	PASSED	PASSED	PASSED	PASSED	FAILED
SN46	PASSED	PASSED	PASSED	PASSED	PASSED	PASSED	PASSED
SN47	PASSED	PASSED	PASSED	PASSED	PASSED	PASSED	PASSED
SN48	PASSED	PASSED	PASSED	PASSED	PASSED	PASSED	PASSED
SN49	PASSED	PASSED	PASSED	PASSED	PASSED	PASSED	PASSED
SN50	PASSED	PASSED	PASSED	PASSED	PASSED	PASSED	PASSED

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	PASSED	PASSED
SN41	FAILED	FAILED
SN42	FAILED	FAILED
SN43	FAILED	FAILED
SN44	FAILED	FAILED
SN45	FAILED	FAILED
SN46	PASSED	PASSED
SN47	PASSED	PASSED
SN48	PASSED	PASSED
SN49	PASSED	PASSED
SN50	PASSED	PASSED

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	PASSED	PASSED
SN41	FAILED	PASSED
SN42	FAILED	PASSED
SN43	FAILED	PASSED
SN44	FAILED	PASSED
SN45	FAILED	PASSED
SN46	PASSED	PASSED
SN47	PASSED	PASSED
SN48	PASSED	PASSED
SN49	PASSED	PASSED
SN50	PASSED	PASSED

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.	

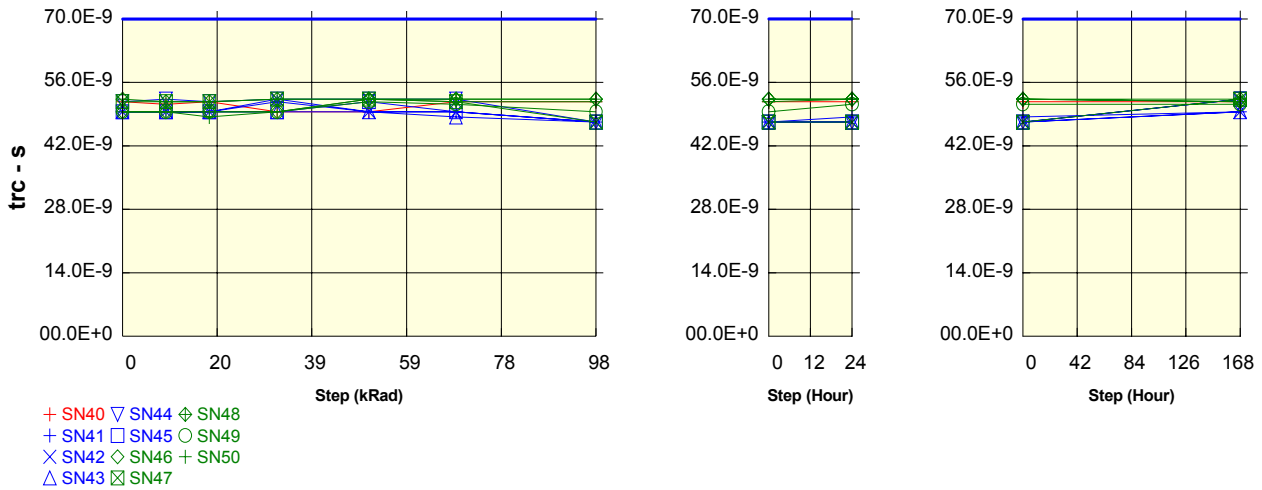
Test conditions : Tid

Parameter : Active to Active Command Period : trc

Unit : s

Spec Limit Max : 70.0E-9

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	51.8E-9	51.2E-9	51.8E-9	49.5E-9	49.5E-9	51.8E-9	51.8E-9
SN41	49.5E-9	49.5E-9	49.5E-9	51.8E-9	49.5E-9	49.5E-9	47.3E-9
SN42	49.5E-9	49.5E-9	49.5E-9	52.3E-9	49.5E-9	49.5E-9	47.3E-9
SN43	49.5E-9	49.5E-9	49.5E-9	49.5E-9	49.5E-9	48.4E-9	47.3E-9
SN44	51.8E-9	52.3E-9	51.8E-9	52.3E-9	52.3E-9	52.3E-9	47.3E-9
SN45	49.5E-9	49.5E-9	49.5E-9	49.5E-9	51.8E-9	49.5E-9	47.3E-9
SN46	49.5E-9	49.5E-9	49.5E-9	49.5E-9	52.3E-9	52.3E-9	52.3E-9
SN47	51.8E-9	51.8E-9	51.8E-9	52.3E-9	52.3E-9	51.8E-9	47.3E-9
SN48	52.3E-9	51.8E-9	51.8E-9	52.3E-9	52.3E-9	52.3E-9	52.3E-9
SN49	49.5E-9	49.5E-9	49.5E-9	49.5E-9	51.8E-9	51.2E-9	49.5E-9
SN50	49.5E-9	49.5E-9	48.4E-9	49.5E-9	52.3E-9	51.8E-9	51.8E-9
Statistics							
Min	49.5E-9	49.5E-9	48.4E-9	49.5E-9	49.5E-9	48.4E-9	47.3E-9
Max	52.3E-9	52.3E-9	51.8E-9	52.3E-9	52.3E-9	52.3E-9	52.3E-9
Mean	50.2E-9	50.2E-9	50.1E-9	50.8E-9	51.4E-9	50.9E-9	48.9E-9
Sigma	11.9E-10	11.9E-10	12.1E-10	14.3E-10	13.0E-10	14.8E-10	23.1E-10

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	51.8E-9	51.8E-9
SN41	47.3E-9	48.4E-9
SN42	47.3E-9	47.3E-9
SN43	47.3E-9	47.3E-9
SN44	47.3E-9	47.3E-9
SN45	47.3E-9	47.3E-9
SN46	52.3E-9	52.3E-9
SN47	47.3E-9	47.3E-9
SN48	52.3E-9	52.3E-9
SN49	49.5E-9	51.2E-9
SN50	51.8E-9	52.3E-9
Statistics		
Min	47.3E-9	47.3E-9
Max	52.3E-9	52.3E-9
Mean	48.9E-9	49.3E-9
Sigma	23.1E-10	24.2E-10

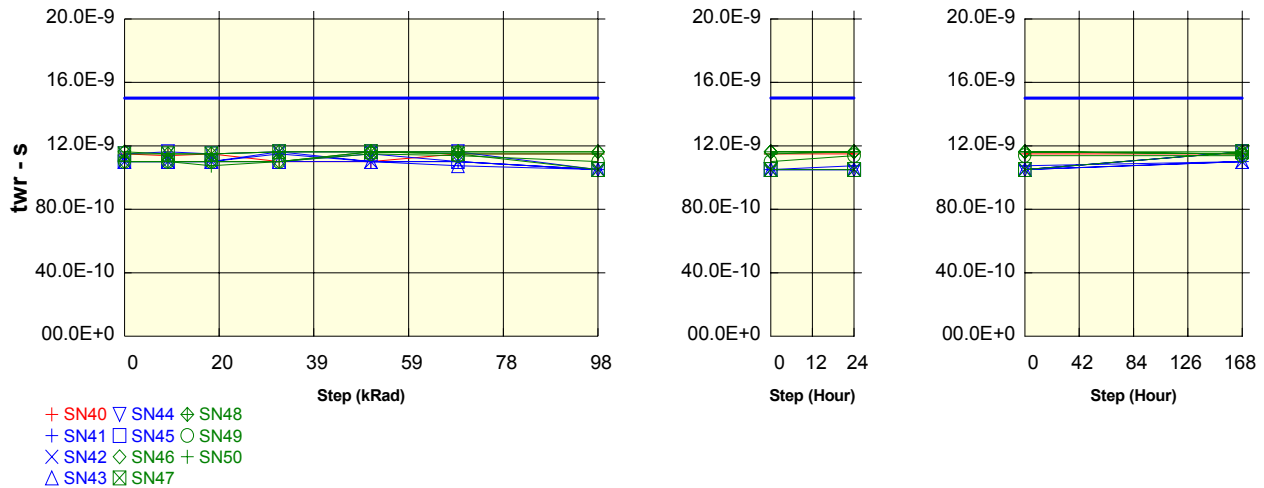
Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	51.8E-9	51.8E-9
SN41	48.4E-9	49.5E-9
SN42	47.3E-9	49.5E-9
SN43	47.3E-9	49.5E-9
SN44	47.3E-9	52.3E-9
SN45	47.3E-9	52.3E-9
SN46	52.3E-9	51.8E-9
SN47	47.3E-9	52.3E-9
SN48	52.3E-9	52.3E-9
SN49	51.2E-9	51.2E-9
SN50	52.3E-9	51.8E-9
Statistics		
Min	47.3E-9	49.5E-9
Max	52.3E-9	52.3E-9
Mean	49.3E-9	51.2E-9
Sigma	24.2E-10	12.6E-10

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.	

Test conditions : Tid
Parameter : Write Recovery Time : twr

Unit : s
Spec Limit Max : 15.0E-9
Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	11.5E-9	11.4E-9	11.5E-9	11.0E-9	11.0E-9	11.5E-9	11.5E-9
SN41	11.0E-9	11.0E-9	11.0E-9	11.5E-9	11.0E-9	11.0E-9	10.5E-9
SN42	11.0E-9	11.0E-9	11.0E-9	11.6E-9	11.0E-9	11.0E-9	10.5E-9
SN43	11.0E-9	11.0E-9	11.0E-9	11.0E-9	11.0E-9	10.8E-9	10.5E-9
SN44	11.5E-9	11.6E-9	11.5E-9	11.6E-9	11.6E-9	11.6E-9	10.5E-9
SN45	11.0E-9	11.0E-9	11.0E-9	11.0E-9	11.5E-9	11.0E-9	10.5E-9
SN46	11.0E-9	11.0E-9	11.0E-9	11.0E-9	11.6E-9	11.6E-9	11.6E-9
SN47	11.5E-9	11.5E-9	11.5E-9	11.6E-9	11.6E-9	11.5E-9	10.5E-9
SN48	11.6E-9	11.5E-9	11.5E-9	11.6E-9	11.6E-9	11.6E-9	11.6E-9
SN49	11.0E-9	11.0E-9	11.0E-9	11.0E-9	11.5E-9	11.4E-9	11.0E-9
SN50	11.0E-9	11.0E-9	10.8E-9	11.0E-9	11.6E-9	11.5E-9	11.5E-9
Statistics							
Min	11.0E-9	11.0E-9	10.8E-9	11.0E-9	11.0E-9	10.8E-9	10.5E-9
Max	11.6E-9	11.6E-9	11.5E-9	11.6E-9	11.6E-9	11.6E-9	11.6E-9
Mean	11.2E-9	11.2E-9	11.1E-9	11.3E-9	11.4E-9	11.3E-9	10.9E-9
Sigma	26.5E-11	26.5E-11	27.0E-11	32.1E-11	29.1E-11	33.1E-11	51.5E-11

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	11.5E-9	11.5E-9
SN41	10.5E-9	10.8E-9
SN42	10.5E-9	10.5E-9
SN43	10.5E-9	10.5E-9
SN44	10.5E-9	10.5E-9
SN45	10.5E-9	10.5E-9
SN46	11.6E-9	11.6E-9
SN47	10.5E-9	10.5E-9
SN48	11.6E-9	11.6E-9
SN49	11.0E-9	11.4E-9
SN50	11.5E-9	11.6E-9
Statistics		
Min	10.5E-9	10.5E-9
Max	11.6E-9	11.6E-9
Mean	10.9E-9	11.0E-9
Sigma	51.5E-11	54.0E-11

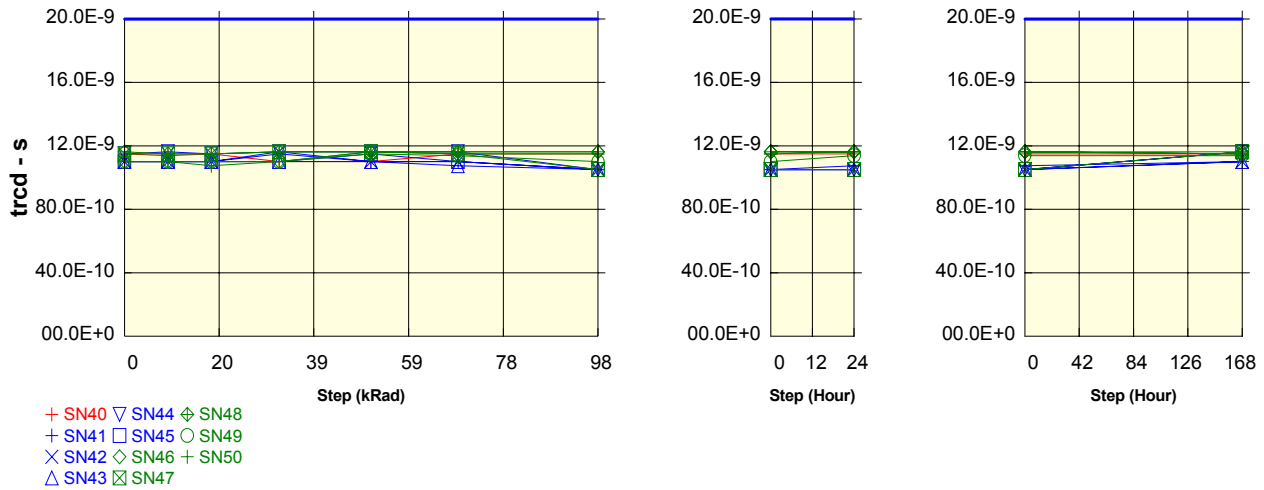
Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	11.5E-9	11.5E-9
SN41	10.8E-9	11.0E-9
SN42	10.5E-9	11.0E-9
SN43	10.5E-9	11.0E-9
SN44	10.5E-9	11.6E-9
SN45	10.5E-9	11.6E-9
SN46	11.6E-9	11.5E-9
SN47	10.5E-9	11.6E-9
SN48	11.6E-9	11.6E-9
SN49	11.4E-9	11.4E-9
SN50	11.6E-9	11.5E-9
Statistics		
Min	10.5E-9	11.0E-9
Max	11.6E-9	11.6E-9
Mean	11.0E-9	11.4E-9
Sigma	54.0E-11	28.1E-11

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.	

Test conditions : Tid
Parameter : Active to Read Delay : trcd

Unit : s
Spec Limit Max : 20.0E-9
Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	11.5E-9	11.4E-9	11.5E-9	11.0E-9	11.0E-9	11.5E-9	11.5E-9
SN41	11.0E-9	11.0E-9	11.0E-9	11.5E-9	11.0E-9	11.0E-9	10.5E-9
SN42	11.0E-9	11.0E-9	11.0E-9	11.6E-9	11.0E-9	11.0E-9	10.5E-9
SN43	11.0E-9	11.0E-9	11.0E-9	11.0E-9	11.0E-9	10.8E-9	10.5E-9
SN44	11.5E-9	11.6E-9	11.5E-9	11.6E-9	11.6E-9	11.6E-9	10.5E-9
SN45	11.0E-9	11.0E-9	11.0E-9	11.0E-9	11.5E-9	11.0E-9	10.5E-9
SN46	11.0E-9	11.0E-9	11.0E-9	11.0E-9	11.6E-9	11.6E-9	11.6E-9
SN47	11.5E-9	11.5E-9	11.5E-9	11.6E-9	11.6E-9	11.5E-9	10.5E-9
SN48	11.6E-9	11.5E-9	11.5E-9	11.6E-9	11.6E-9	11.6E-9	11.6E-9
SN49	11.0E-9	11.0E-9	11.0E-9	11.0E-9	11.5E-9	11.4E-9	11.0E-9
SN50	11.0E-9	11.0E-9	10.8E-9	11.0E-9	11.6E-9	11.5E-9	11.5E-9
Statistics							
Min	11.0E-9	11.0E-9	10.8E-9	11.0E-9	11.0E-9	10.8E-9	10.5E-9
Max	11.6E-9	11.6E-9	11.5E-9	11.6E-9	11.6E-9	11.6E-9	11.6E-9
Mean	11.2E-9	11.2E-9	11.1E-9	11.3E-9	11.4E-9	11.3E-9	10.9E-9
Sigma	26.5E-11	26.5E-11	27.0E-11	32.1E-11	29.1E-11	33.1E-11	51.5E-11

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	11.5E-9	11.5E-9
SN41	10.5E-9	10.8E-9
SN42	10.5E-9	10.5E-9
SN43	10.5E-9	10.5E-9
SN44	10.5E-9	10.5E-9
SN45	10.5E-9	10.5E-9
SN46	11.6E-9	11.6E-9
SN47	10.5E-9	10.5E-9
SN48	11.6E-9	11.6E-9
SN49	11.0E-9	11.4E-9
SN50	11.5E-9	11.6E-9
Statistics		
Min	10.5E-9	10.5E-9
Max	11.6E-9	11.6E-9
Mean	10.9E-9	11.0E-9
Sigma	51.5E-11	54.0E-11

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	11.5E-9	11.5E-9
SN41	10.8E-9	11.0E-9
SN42	10.5E-9	11.0E-9
SN43	10.5E-9	11.0E-9
SN44	10.5E-9	11.6E-9
SN45	10.5E-9	11.6E-9
SN46	11.6E-9	11.5E-9
SN47	10.5E-9	11.6E-9
SN48	11.6E-9	11.6E-9
SN49	11.4E-9	11.4E-9
SN50	11.6E-9	11.5E-9
Statistics		
Min	10.5E-9	11.0E-9
Max	11.6E-9	11.6E-9
Mean	11.0E-9	11.4E-9
Sigma	54.0E-11	28.1E-11

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.	

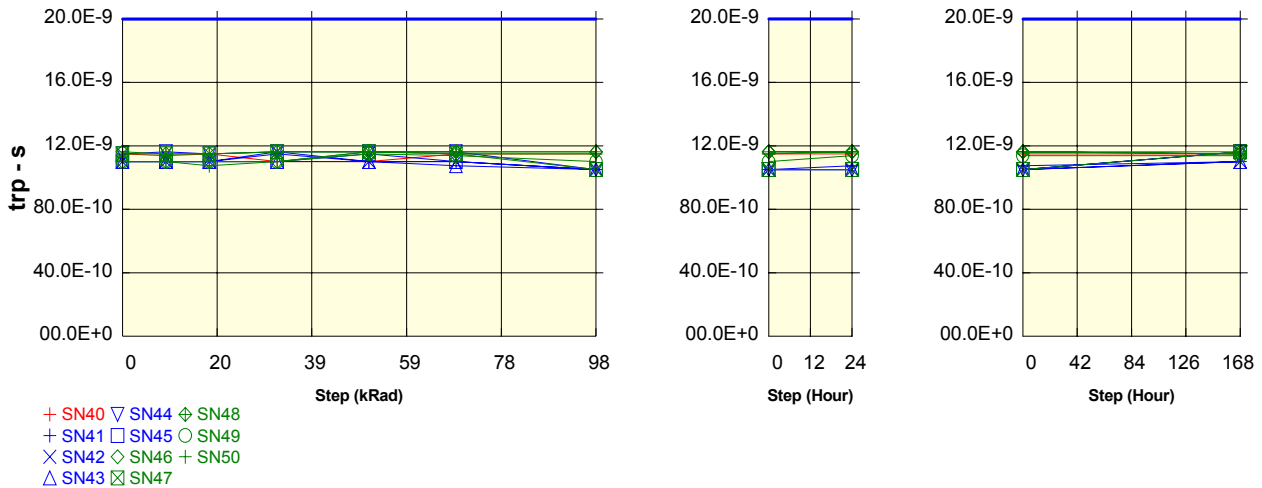
Test conditions : Tid

Parameter : Precharge Command Period : trp

Unit : s

Spec Limit Max : 20.0E-9

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	11.5E-9	11.4E-9	11.5E-9	11.0E-9	11.0E-9	11.5E-9	11.5E-9
SN41	11.0E-9	11.0E-9	11.0E-9	11.5E-9	11.0E-9	11.0E-9	10.5E-9
SN42	11.0E-9	11.0E-9	11.0E-9	11.6E-9	11.0E-9	11.0E-9	10.5E-9
SN43	11.0E-9	11.0E-9	11.0E-9	11.0E-9	11.0E-9	10.8E-9	10.5E-9
SN44	11.5E-9	11.6E-9	11.5E-9	11.6E-9	11.6E-9	11.6E-9	10.5E-9
SN45	11.0E-9	11.0E-9	11.0E-9	11.0E-9	11.5E-9	11.0E-9	10.5E-9
SN46	11.0E-9	11.0E-9	11.0E-9	11.0E-9	11.6E-9	11.6E-9	11.6E-9
SN47	11.5E-9	11.5E-9	11.5E-9	11.6E-9	11.6E-9	11.5E-9	10.5E-9
SN48	11.6E-9	11.5E-9	11.5E-9	11.6E-9	11.6E-9	11.6E-9	11.6E-9
SN49	11.0E-9	11.0E-9	11.0E-9	11.0E-9	11.5E-9	11.4E-9	11.0E-9
SN50	11.0E-9	11.0E-9	10.8E-9	11.0E-9	11.6E-9	11.5E-9	11.5E-9
Statistics							
Min	11.0E-9	11.0E-9	10.8E-9	11.0E-9	11.0E-9	10.8E-9	10.5E-9
Max	11.6E-9	11.6E-9	11.5E-9	11.6E-9	11.6E-9	11.6E-9	11.6E-9
Mean	11.2E-9	11.2E-9	11.1E-9	11.3E-9	11.4E-9	11.3E-9	10.9E-9
Sigma	26.5E-11	26.5E-11	27.0E-11	32.1E-11	29.1E-11	33.1E-11	51.5E-11

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	11.5E-9	11.5E-9
SN41	10.5E-9	10.8E-9
SN42	10.5E-9	10.5E-9
SN43	10.5E-9	10.5E-9
SN44	10.5E-9	10.5E-9
SN45	10.5E-9	10.5E-9
SN46	11.6E-9	11.6E-9
SN47	10.5E-9	10.5E-9
SN48	11.6E-9	11.6E-9
SN49	11.0E-9	11.4E-9
SN50	11.5E-9	11.6E-9
Statistics		
Min	10.5E-9	10.5E-9
Max	11.6E-9	11.6E-9
Mean	10.9E-9	11.0E-9
Sigma	51.5E-11	54.0E-11

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	11.5E-9	11.5E-9
SN41	10.8E-9	11.0E-9
SN42	10.5E-9	11.0E-9
SN43	10.5E-9	11.0E-9
SN44	10.5E-9	11.6E-9
SN45	10.5E-9	11.6E-9
SN46	11.6E-9	11.5E-9
SN47	10.5E-9	11.6E-9
SN48	11.6E-9	11.6E-9
SN49	11.4E-9	11.4E-9
SN50	11.6E-9	11.5E-9
Statistics		
Min	10.5E-9	11.0E-9
Max	11.6E-9	11.6E-9
Mean	11.0E-9	11.4E-9
Sigma	54.0E-11	28.1E-11

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.	

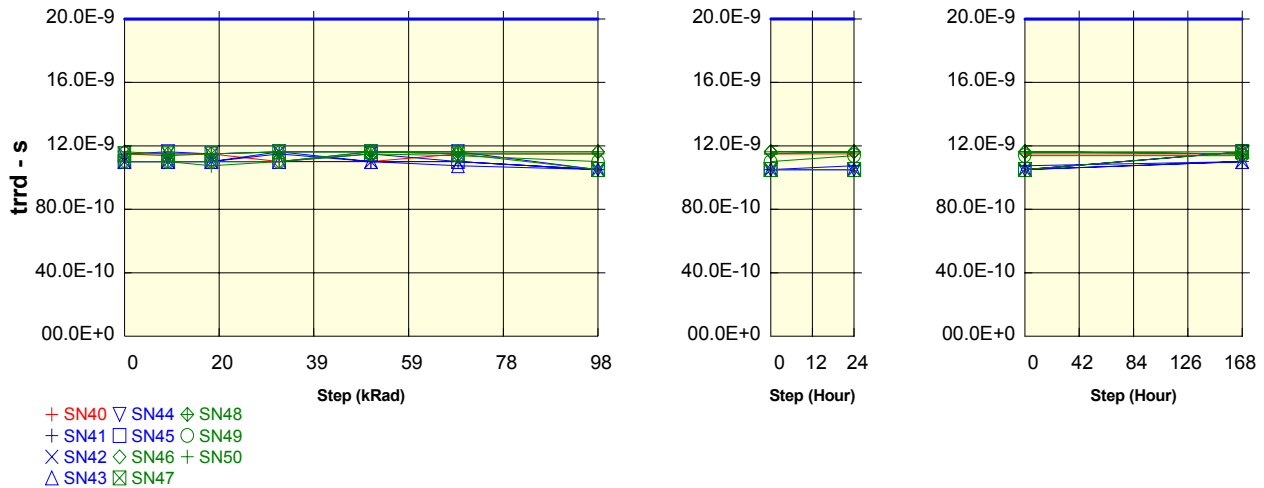
Test conditions : Tid

Parameter : Active Bank "A" to Active Bank "B" command : trrd

Unit : s

Spec Limit Max : 20.0E-9

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	11.5E-9	11.4E-9	11.5E-9	11.0E-9	11.0E-9	11.5E-9	11.5E-9
SN41	11.0E-9	11.0E-9	11.0E-9	11.5E-9	11.0E-9	11.0E-9	10.5E-9
SN42	11.0E-9	11.0E-9	11.0E-9	11.6E-9	11.0E-9	11.0E-9	10.5E-9
SN43	11.0E-9	11.0E-9	11.0E-9	11.0E-9	11.0E-9	10.8E-9	10.5E-9
SN44	11.5E-9	11.6E-9	11.5E-9	11.6E-9	11.6E-9	11.6E-9	10.5E-9
SN45	11.0E-9	11.0E-9	11.0E-9	11.0E-9	11.5E-9	11.0E-9	10.5E-9
SN46	11.0E-9	11.0E-9	11.0E-9	11.0E-9	11.6E-9	11.6E-9	11.6E-9
SN47	11.5E-9	11.5E-9	11.5E-9	11.6E-9	11.6E-9	11.5E-9	10.5E-9
SN48	11.6E-9	11.5E-9	11.5E-9	11.6E-9	11.6E-9	11.6E-9	11.6E-9
SN49	11.0E-9	11.0E-9	11.0E-9	11.0E-9	11.5E-9	11.4E-9	11.0E-9
SN50	11.0E-9	11.0E-9	10.8E-9	11.0E-9	11.6E-9	11.5E-9	11.5E-9
Statistics							
Min	11.0E-9	11.0E-9	10.8E-9	11.0E-9	11.0E-9	10.8E-9	10.5E-9
Max	11.6E-9	11.6E-9	11.5E-9	11.6E-9	11.6E-9	11.6E-9	11.6E-9
Mean	11.2E-9	11.2E-9	11.1E-9	11.3E-9	11.4E-9	11.3E-9	10.9E-9
Sigma	26.5E-11	26.5E-11	27.0E-11	32.1E-11	29.1E-11	33.1E-11	51.5E-11

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	11.5E-9	11.5E-9
SN41	10.5E-9	10.8E-9
SN42	10.5E-9	10.5E-9
SN43	10.5E-9	10.5E-9
SN44	10.5E-9	10.5E-9
SN45	10.5E-9	10.5E-9
SN46	11.6E-9	11.6E-9
SN47	10.5E-9	10.5E-9
SN48	11.6E-9	11.6E-9
SN49	11.0E-9	11.4E-9
SN50	11.5E-9	11.6E-9
Statistics		
Min	10.5E-9	10.5E-9
Max	11.6E-9	11.6E-9
Mean	10.9E-9	11.0E-9
Sigma	51.5E-11	54.0E-11

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	11.5E-9	11.5E-9
SN41	10.8E-9	11.0E-9
SN42	10.5E-9	11.0E-9
SN43	10.5E-9	11.0E-9
SN44	10.5E-9	11.6E-9
SN45	10.5E-9	11.6E-9
SN46	11.6E-9	11.5E-9
SN47	10.5E-9	11.6E-9
SN48	11.6E-9	11.6E-9
SN49	11.4E-9	11.4E-9
SN50	11.6E-9	11.5E-9
Statistics		
Min	10.5E-9	11.0E-9
Max	11.6E-9	11.6E-9
Mean	11.0E-9	11.4E-9
Sigma	54.0E-11	28.1E-11

HIREX Engineering	Total Dose Test Report		Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.

Test conditions : Tid

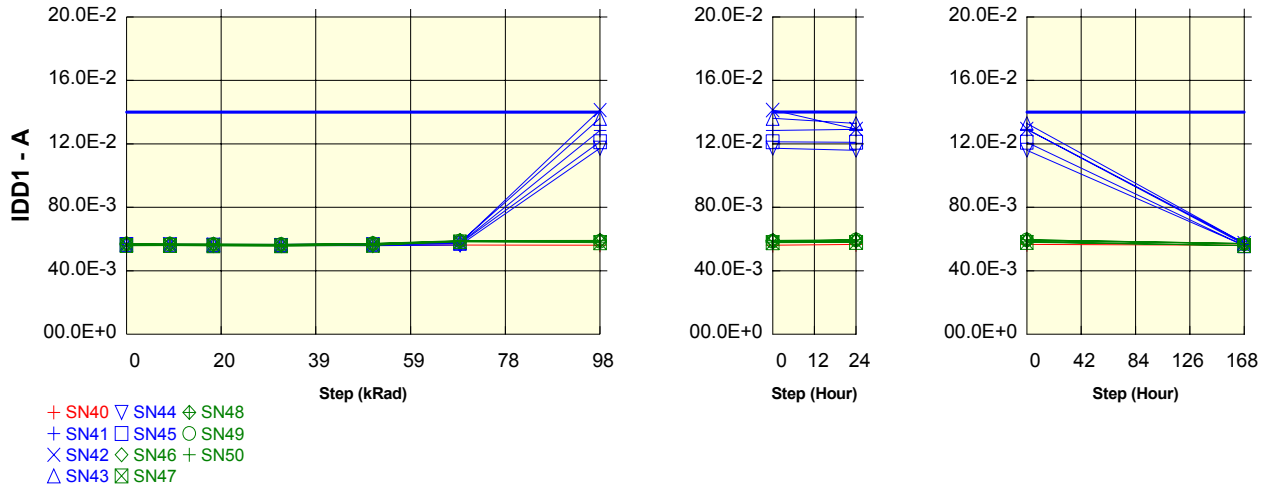
Parameter : Operating Current : Active Mode : IDD1

Burst length = 2. tRC = tRCMin . IO = 0 mA

Unit : A

Spec Limit Max : 14.0E-2

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	56.2E-3	56.2E-3	56.0E-3	56.0E-3	56.0E-3	56.2E-3	56.1E-3
SN41	56.3E-3	56.3E-3	56.2E-3	56.2E-3	56.5E-3	57.2E-3	12.8E-2
SN42	56.7E-3	56.7E-3	56.4E-3	56.3E-3	56.8E-3	57.5E-3	14.1E-2
SN43	56.8E-3	56.8E-3	56.6E-3	56.6E-3	57.1E-3	57.9E-3	13.6E-2
SN44	56.6E-3	56.3E-3	56.1E-3	55.9E-3	55.8E-3	56.2E-3	11.7E-2
SN45	56.3E-3	56.3E-3	56.1E-3	55.9E-3	56.4E-3	57.3E-3	12.1E-2
SN46	56.6E-3	56.7E-3	56.5E-3	56.3E-3	56.2E-3	58.9E-3	58.5E-3
SN47	56.0E-3	55.9E-3	55.7E-3	55.7E-3	56.1E-3	58.3E-3	57.7E-3
SN48	57.2E-3	56.9E-3	56.8E-3	56.5E-3	57.2E-3	59.1E-3	59.2E-3
SN49	56.7E-3	56.8E-3	56.7E-3	56.5E-3	57.1E-3	58.8E-3	58.6E-3
SN50	55.8E-3	55.9E-3	55.7E-3	55.6E-3	56.4E-3	58.6E-3	58.1E-3
Statistics							
Min	55.8E-3	55.9E-3	55.7E-3	55.6E-3	55.8E-3	56.2E-3	57.7E-3
Max	57.2E-3	56.9E-3	56.8E-3	56.6E-3	57.2E-3	59.1E-3	14.1E-2
Mean	56.5E-3	56.5E-3	56.3E-3	56.2E-3	56.6E-3	58.0E-3	93.6E-3
Sigma	40.6E-5	35.5E-5	38.4E-5	36.8E-5	46.6E-5	91.4E-5	37.7E-3

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	56.1E-3	56.6E-3
SN41	12.8E-2	12.9E-2
SN42	14.1E-2	12.9E-2
SN43	13.6E-2	13.3E-2
SN44	11.7E-2	11.6E-2
SN45	12.1E-2	12.1E-2
SN46	58.5E-3	58.8E-3
SN47	57.7E-3	57.9E-3
SN48	59.2E-3	59.5E-3
SN49	58.6E-3	59.4E-3
SN50	58.1E-3	58.2E-3
Statistics		
Min	57.7E-3	57.9E-3
Max	14.1E-2	13.3E-2
Mean	93.6E-3	92.2E-3
Sigma	37.7E-3	35.5E-3

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	56.6E-3	56.1E-3
SN41	12.9E-2	56.7E-3
SN42	12.9E-2	57.4E-3
SN43	13.3E-2	57.4E-3
SN44	11.6E-2	56.0E-3
SN45	12.1E-2	55.7E-3
SN46	58.8E-3	56.9E-3
SN47	57.9E-3	55.9E-3
SN48	59.5E-3	57.2E-3
SN49	59.4E-3	57.1E-3
SN50	58.2E-3	55.8E-3
Statistics		
Min	57.9E-3	55.7E-3
Max	13.3E-2	57.4E-3
Mean	92.2E-3	56.6E-3
Sigma	35.5E-3	68.0E-5

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.	

Test conditions : Tid

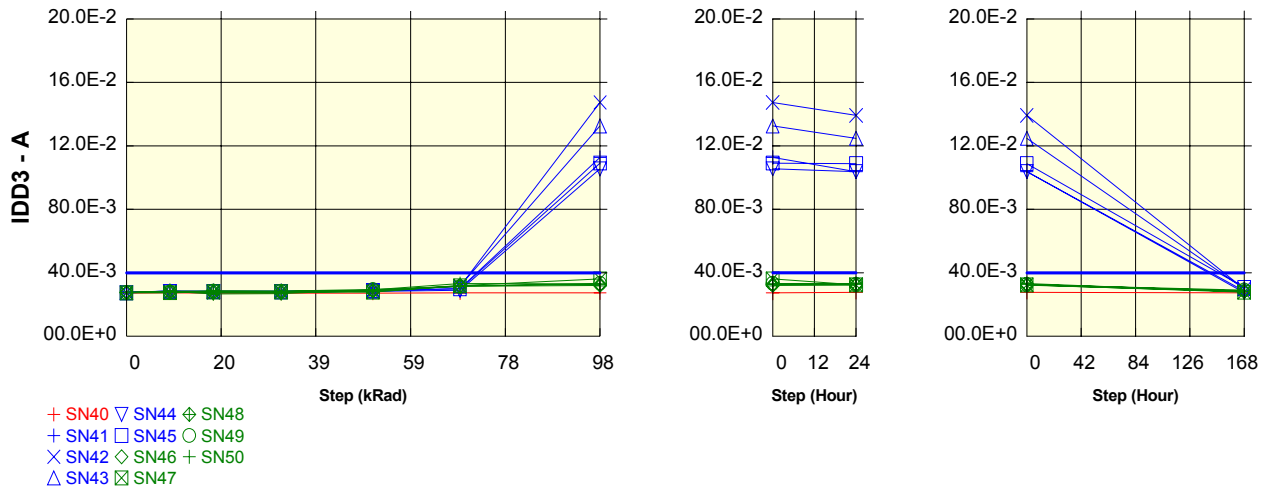
Parameter : Standby Current : Active Mode : IDD3

CKE = /CS = VIH (min). tCC = 10ns. Input signals are changed one time during 20ns

Unit : A

Spec Limit Max : 40.0E-3

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	27.2E-3	27.3E-3	27.2E-3	27.2E-3	27.2E-3	27.4E-3	27.2E-3
SN41	27.6E-3	28.4E-3	27.4E-3	27.6E-3	28.4E-3	30.1E-3	11.3E-2
SN42	27.6E-3	27.6E-3	27.5E-3	28.2E-3	28.9E-3	31.4E-3	14.7E-2
SN43	27.7E-3	28.5E-3	28.4E-3	28.4E-3	28.4E-3	31.7E-3	13.3E-2
SN44	27.4E-3	28.2E-3	28.0E-3	27.9E-3	28.3E-3	28.9E-3	10.6E-2
SN45	27.4E-3	28.2E-3	28.0E-3	28.0E-3	28.8E-3	30.0E-3	10.9E-2
SN46	27.6E-3	27.6E-3	27.5E-3	27.5E-3	28.5E-3	31.6E-3	32.0E-3
SN47	27.4E-3	27.4E-3	28.0E-3	28.0E-3	27.9E-3	31.8E-3	36.1E-3
SN48	27.6E-3	28.5E-3	28.4E-3	28.3E-3	28.7E-3	31.9E-3	32.6E-3
SN49	27.6E-3	27.7E-3	28.4E-3	28.4E-3	29.4E-3	31.3E-3	33.4E-3
SN50	27.4E-3	28.3E-3	26.7E-3	26.8E-3	29.3E-3	33.2E-3	33.0E-3
Statistics							
Min	27.4E-3	27.4E-3	26.7E-3	26.8E-3	27.9E-3	28.9E-3	32.0E-3
Max	27.7E-3	28.5E-3	28.4E-3	28.4E-3	29.4E-3	33.2E-3	14.7E-2
Mean	27.5E-3	28.0E-3	27.8E-3	27.9E-3	28.7E-3	31.2E-3	77.4E-3
Sigma	11.9E-5	41.0E-5	56.0E-5	50.4E-5	47.3E-5	12.2E-4	47.9E-3

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	27.2E-3	27.7E-3
SN41	11.3E-2	10.4E-2
SN42	14.7E-2	13.9E-2
SN43	13.3E-2	12.5E-2
SN44	10.6E-2	10.4E-2
SN45	10.9E-2	10.9E-2
SN46	32.0E-3	32.3E-3
SN47	36.1E-3	32.3E-3
SN48	32.6E-3	32.7E-3
SN49	33.4E-3	32.5E-3
SN50	33.0E-3	33.1E-3
Statistics		
Min	32.0E-3	32.3E-3
Max	14.7E-2	13.9E-2
Mean	77.4E-3	74.3E-3
Sigma	47.9E-3	45.2E-3

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	27.7E-3	27.3E-3
SN41	10.4E-2	28.4E-3
SN42	13.9E-2	29.8E-3
SN43	12.5E-2	29.9E-3
SN44	10.4E-2	27.5E-3
SN45	10.9E-2	30.8E-3
SN46	32.3E-3	28.2E-3
SN47	32.3E-3	27.8E-3
SN48	32.7E-3	28.4E-3
SN49	32.5E-3	29.2E-3
SN50	33.1E-3	28.0E-3
Statistics		
Min	32.3E-3	27.5E-3
Max	13.9E-2	30.8E-3
Mean	74.3E-3	28.8E-3
Sigma	45.2E-3	10.7E-4

HIREX Engineering	Total Dose Test Report		Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.

Test conditions : Tid

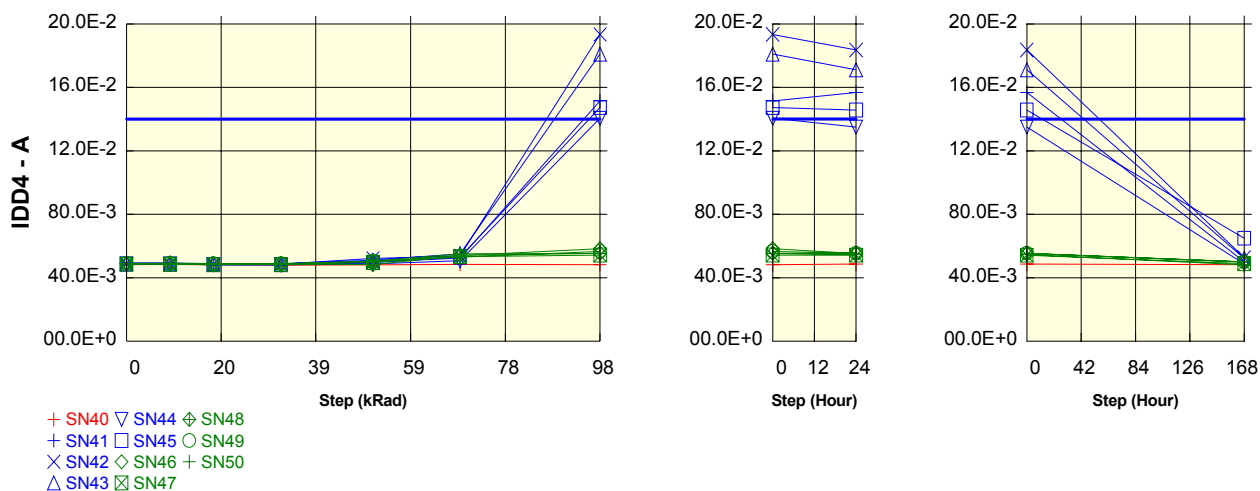
Parameter : Operating Current : Burst Mode : IDD4

IO = 0 mA. Page Burst. 4 banks active. tCCD = 2CLKs

Unit : A

Spec Limit Max : 14.0E-2

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	48.4E-3	48.4E-3	48.1E-3	48.0E-3	48.1E-3	48.4E-3	48.2E-3
SN41	49.1E-3	49.1E-3	48.9E-3	48.9E-3	50.1E-3	52.3E-3	15.1E-2
SN42	48.9E-3	48.9E-3	48.6E-3	48.6E-3	52.1E-3	53.8E-3	19.3E-2
SN43	49.3E-3	49.2E-3	49.0E-3	48.6E-3	51.0E-3	55.2E-3	18.1E-2
SN44	48.6E-3	48.6E-3	48.3E-3	48.2E-3	48.9E-3	50.7E-3	14.0E-2
SN45	48.7E-3	48.6E-3	48.3E-3	48.3E-3	49.6E-3	53.0E-3	14.7E-2
SN46	49.0E-3	49.0E-3	48.7E-3	48.7E-3	48.3E-3	54.1E-3	58.3E-3
SN47	48.6E-3	48.5E-3	48.3E-3	48.2E-3	49.7E-3	53.4E-3	54.3E-3
SN48	48.9E-3	49.0E-3	48.8E-3	48.8E-3	50.2E-3	54.1E-3	55.4E-3
SN49	49.1E-3	49.2E-3	48.9E-3	49.0E-3	50.4E-3	53.0E-3	56.5E-3
SN50	48.6E-3	48.6E-3	48.4E-3	48.5E-3	50.5E-3	55.1E-3	55.2E-3
Statistics							
Min	48.6E-3	48.5E-3	48.3E-3	48.2E-3	48.3E-3	50.7E-3	54.3E-3
Max	49.3E-3	49.2E-3	49.0E-3	49.0E-3	52.1E-3	55.2E-3	19.3E-2
Mean	48.9E-3	48.9E-3	48.6E-3	48.6E-3	50.1E-3	53.5E-3	10.9E-2
Sigma	24.6E-5	25.9E-5	28.2E-5	28.6E-5	10.8E-4	13.2E-4	58.3E-3

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	48.2E-3	48.7E-3
SN41	15.1E-2	15.7E-2
SN42	19.3E-2	18.4E-2
SN43	18.1E-2	17.1E-2
SN44	14.0E-2	13.5E-2
SN45	14.7E-2	14.6E-2
SN46	58.3E-3	55.2E-3
SN47	54.3E-3	54.2E-3
SN48	55.4E-3	55.4E-3
SN49	56.5E-3	55.4E-3
SN50	55.2E-3	54.6E-3
Statistics		
Min	54.3E-3	54.2E-3
Max	19.3E-2	18.4E-2
Mean	10.9E-2	10.7E-2
Sigma	58.3E-3	56.0E-3

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	48.7E-3	48.3E-3
SN41	15.7E-2	50.1E-3
SN42	18.4E-2	52.7E-3
SN43	17.1E-2	52.2E-3
SN44	13.5E-2	48.7E-3
SN45	14.6E-2	64.9E-3
SN46	55.2E-3	49.9E-3
SN47	54.2E-3	49.0E-3
SN48	55.4E-3	50.0E-3
SN49	55.4E-3	50.1E-3
SN50	54.6E-3	48.1E-3
Statistics		
Min	54.2E-3	48.1E-3
Max	18.4E-2	64.9E-3
Mean	10.7E-2	51.6E-3
Sigma	56.0E-3	49.1E-4

HIREX Engineering	Total Dose Test Report		Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.

Test conditions : Tid

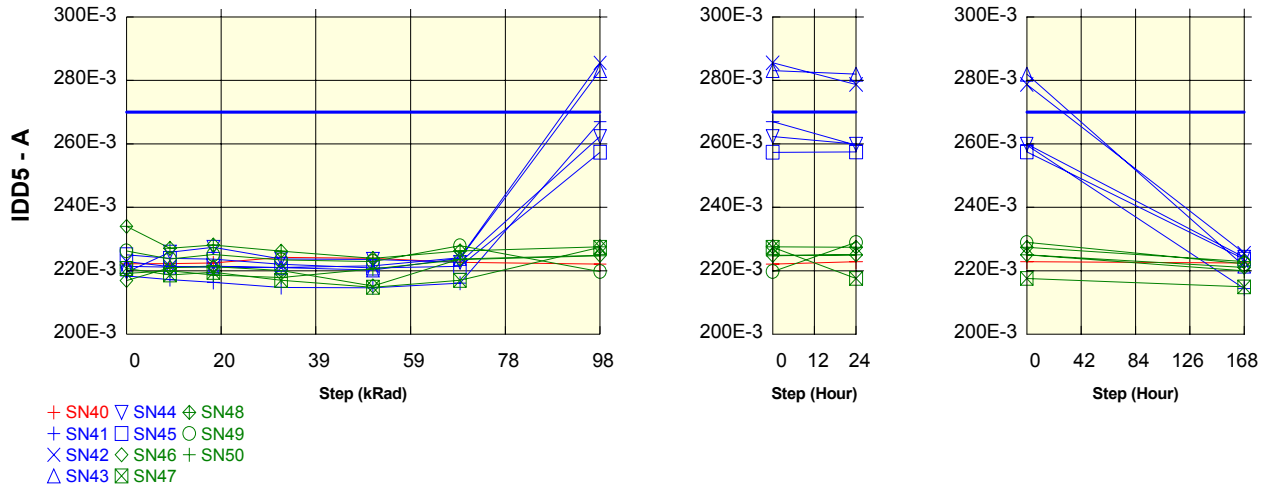
Parameter : Auto Refresh Current : IDD5

CKE = /CS = High. tRC = tRCMin

Unit : A

Spec Limit Max : 270E-3

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	222E-3	222E-3	222E-3	224E-3	224E-3	223E-3	222E-3
SN41	218E-3	217E-3	216E-3	215E-3	215E-3	216E-3	267E-3
SN42	223E-3	221E-3	221E-3	221E-3	222E-3	224E-3	286E-3
SN43	221E-3	221E-3	221E-3	221E-3	220E-3	224E-3	283E-3
SN44	220E-3	226E-3	227E-3	224E-3	224E-3	223E-3	262E-3
SN45	225E-3	224E-3	224E-3	222E-3	221E-3	221E-3	257E-3
SN46	217E-3	221E-3	221E-3	220E-3	215E-3	224E-3	225E-3
SN47	221E-3	219E-3	219E-3	217E-3	215E-3	217E-3	227E-3
SN48	234E-3	227E-3	228E-3	226E-3	224E-3	226E-3	228E-3
SN49	226E-3	224E-3	225E-3	223E-3	223E-3	228E-3	220E-3
SN50	219E-3	220E-3	219E-3	218E-3	221E-3	223E-3	225E-3
Statistics							
Min	217E-3	217E-3	216E-3	215E-3	215E-3	216E-3	220E-3
Max	234E-3	227E-3	228E-3	226E-3	224E-3	228E-3	286E-3
Mean	222E-3	222E-3	222E-3	221E-3	220E-3	223E-3	248E-3
Sigma	500E-5	311E-5	379E-5	345E-5	365E-5	369E-5	258E-4

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	222E-3	223E-3
SN41	267E-3	260E-3
SN42	286E-3	279E-3
SN43	283E-3	282E-3
SN44	262E-3	260E-3
SN45	257E-3	258E-3
SN46	225E-3	225E-3
SN47	227E-3	218E-3
SN48	228E-3	227E-3
SN49	220E-3	229E-3
SN50	225E-3	225E-3
Statistics		
Min	220E-3	218E-3
Max	286E-3	282E-3
Mean	248E-3	246E-3
Sigma	258E-4	240E-4

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	223E-3	222E-3
SN41	260E-3	214E-3
SN42	279E-3	226E-3
SN43	282E-3	221E-3
SN44	260E-3	224E-3
SN45	258E-3	224E-3
SN46	225E-3	221E-3
SN47	218E-3	215E-3
SN48	227E-3	223E-3
SN49	229E-3	222E-3
SN50	225E-3	220E-3
Statistics		
Min	218E-3	214E-3
Max	282E-3	226E-3
Mean	246E-3	221E-3
Sigma	240E-4	372E-5

HIREX Engineering	Total Dose Test Report		Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.

Test conditions : Tid

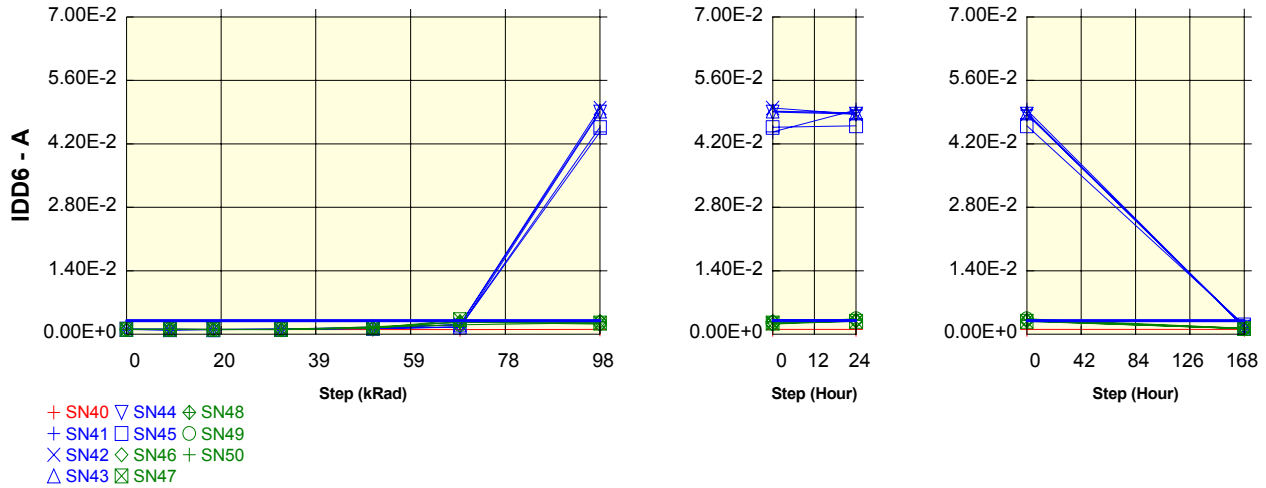
Parameter : Auto Refresh Current : IDD6

CKE = /CS = High. TRC = 15.625µs

Unit : A

Spec Limit Max : 3.00E-3

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	1.05E-3	1.11E-3	1.05E-3	1.03E-3	1.04E-3	1.03E-3	1.07E-3
SN41	1.10E-3	1.08E-3	1.07E-3	1.10E-3	1.36E-3	1.66E-3	4.46E-2
SN42	1.07E-3	8.80E-4	1.02E-3	1.04E-3	1.39E-3	2.19E-3	4.99E-2
SN43	1.08E-3	1.15E-3	1.05E-3	1.11E-3	1.57E-3	2.05E-3	4.92E-2
SN44	1.13E-3	1.10E-3	1.10E-3	1.15E-3	1.30E-3	1.53E-3	4.90E-2
SN45	1.06E-3	1.00E-3	1.00E-3	1.07E-3	1.28E-3	1.60E-3	4.56E-2
SN46	1.05E-3	1.08E-3	1.09E-3	1.01E-3	1.49E-3	2.65E-3	2.24E-3
SN47	1.09E-3	1.08E-3	1.07E-3	1.08E-3	1.38E-3	3.21E-3	2.46E-3
SN48	1.08E-3	1.03E-3	1.05E-3	1.02E-3	1.34E-3	2.82E-3	2.77E-3
SN49	1.08E-3	1.06E-3	1.01E-3	1.09E-3	1.48E-3	2.11E-3	2.51E-3
SN50	1.10E-3	1.07E-3	1.03E-3	1.07E-3	1.68E-3	2.61E-3	2.49E-3
Statistics							
Min	1.05E-3	8.80E-4	1.00E-3	1.01E-3	1.28E-3	1.53E-3	2.24E-3
Max	1.13E-3	1.15E-3	1.10E-3	1.15E-3	1.68E-3	3.21E-3	4.99E-2
Mean	1.08E-3	1.05E-3	1.05E-3	1.07E-3	1.43E-3	2.24E-3	2.51E-2
Sigma	2.23E-5	7.20E-5	3.28E-5	4.27E-5	1.27E-4	5.65E-4	2.39E-2

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	1.07E-3	1.08E-3
SN41	4.46E-2	4.95E-2
SN42	4.99E-2	4.85E-2
SN43	4.92E-2	4.88E-2
SN44	4.90E-2	4.85E-2
SN45	4.56E-2	4.60E-2
SN46	2.24E-3	2.89E-3
SN47	2.46E-3	2.84E-3
SN48	2.77E-3	3.16E-3
SN49	2.51E-3	3.43E-3
SN50	2.49E-3	3.11E-3
Statistics		
Min	2.24E-3	2.84E-3
Max	4.99E-2	4.95E-2
Mean	2.51E-2	2.57E-2
Sigma	2.39E-2	2.38E-2

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	1.08E-3	1.08E-3
SN41	4.95E-2	1.47E-3
SN42	4.85E-2	1.77E-3
SN43	4.88E-2	1.61E-3
SN44	4.85E-2	1.53E-3
SN45	4.60E-2	2.07E-3
SN46	2.89E-3	1.21E-3
SN47	2.84E-3	1.23E-3
SN48	3.16E-3	1.31E-3
SN49	3.43E-3	1.32E-3
SN50	3.11E-3	1.22E-3
Statistics		
Min	2.84E-3	1.21E-3
Max	4.95E-2	2.07E-3
Mean	2.57E-2	1.47E-3
Sigma	2.38E-2	2.81E-4

HIREX Engineering	Total Dose Test Report		Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.

Test conditions : Tid

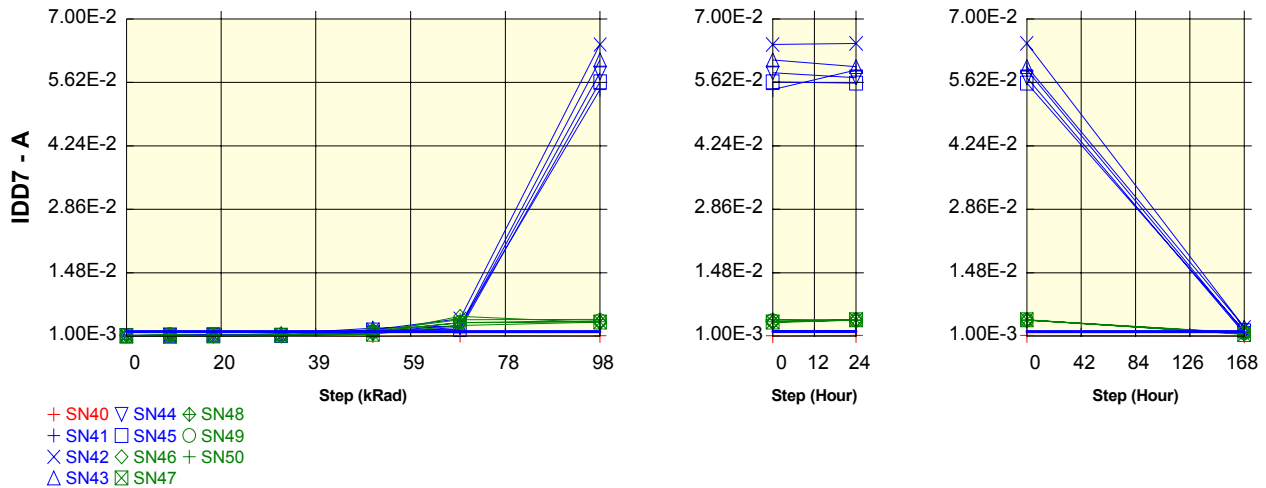
Parameter : Self Refresh Current : IDD7

CKE = 0.2V

Unit : A

Spec Limit Max : 2.00E-3

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	1.13E-3	1.19E-3	1.04E-3	1.16E-3	1.07E-3	1.16E-3	1.13E-3
SN41	1.08E-3	1.06E-3	1.27E-3	1.18E-3	2.00E-3	3.31E-3	5.46E-2
SN42	1.11E-3	1.10E-3	1.26E-3	1.23E-3	2.41E-3	4.83E-3	6.44E-2
SN43	1.13E-3	1.27E-3	1.25E-3	1.55E-3	2.74E-3	3.25E-3	6.11E-2
SN44	1.20E-3	1.23E-3	1.31E-3	1.19E-3	1.76E-3	2.91E-3	5.82E-2
SN45	1.12E-3	1.24E-3	1.25E-3	1.16E-3	2.33E-3	2.46E-3	5.63E-2
SN46	1.13E-3	1.26E-3	1.11E-3	1.09E-3	1.54E-3	5.30E-3	3.95E-3
SN47	1.12E-3	1.02E-3	1.04E-3	1.25E-3	1.45E-3	3.33E-3	4.07E-3
SN48	1.23E-3	1.24E-3	1.07E-3	1.10E-3	1.98E-3	3.93E-3	4.17E-3
SN49	1.12E-3	1.36E-3	1.16E-3	1.30E-3	2.04E-3	3.99E-3	4.39E-3
SN50	1.09E-3	1.07E-3	1.25E-3	1.35E-3	2.19E-3	4.58E-3	4.64E-3
Statistics							
Min	1.08E-3	1.02E-3	1.04E-3	1.09E-3	1.45E-3	2.46E-3	3.95E-3
Max	1.23E-3	1.36E-3	1.31E-3	1.55E-3	2.74E-3	5.30E-3	6.44E-2
Mean	1.13E-3	1.18E-3	1.20E-3	1.24E-3	2.04E-3	3.79E-3	3.16E-2
Sigma	4.42E-5	1.14E-4	9.61E-5	1.36E-4	3.95E-4	9.05E-4	2.89E-2

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	1.13E-3	1.17E-3
SN41	5.46E-2	5.89E-2
SN42	6.44E-2	6.47E-2
SN43	6.11E-2	5.96E-2
SN44	5.82E-2	5.72E-2
SN45	5.63E-2	5.60E-2
SN46	3.95E-3	4.55E-3
SN47	4.07E-3	4.59E-3
SN48	4.17E-3	4.50E-3
SN49	4.39E-3	4.51E-3
SN50	4.64E-3	4.51E-3
Statistics		
Min	3.95E-3	4.50E-3
Max	6.44E-2	6.47E-2
Mean	3.16E-2	3.19E-2
Sigma	2.89E-2	2.89E-2

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	1.17E-3	1.13E-3
SN41	5.89E-2	1.92E-3
SN42	6.47E-2	2.89E-3
SN43	5.96E-2	2.95E-3
SN44	5.72E-2	1.62E-3
SN45	5.60E-2	2.17E-3
SN46	4.55E-3	1.50E-3
SN47	4.59E-3	1.40E-3
SN48	4.50E-3	1.64E-3
SN49	4.51E-3	1.72E-3
SN50	4.51E-3	1.65E-3
Statistics		
Min	4.50E-3	1.40E-3
Max	6.47E-2	2.95E-3
Mean	3.19E-2	1.95E-3
Sigma	2.89E-2	5.56E-4

HIREX Engineering	Total Dose Test Report		Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.

Test conditions : Tid

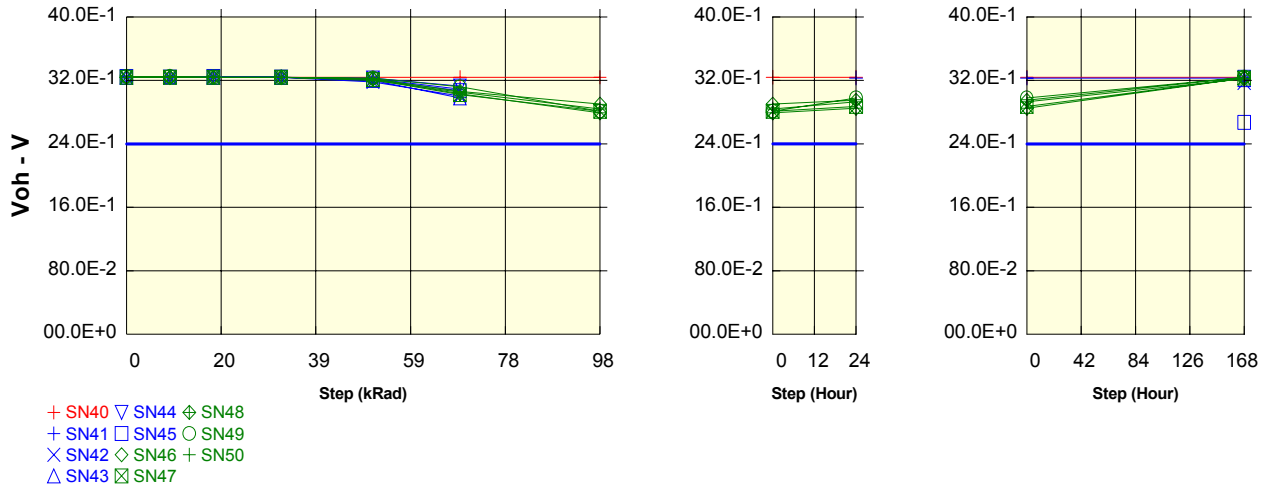
Parameter : Output High Voltage : Logic 1 : VohDQ07

IOH = -4mA

Unit : V

Spec Limit Min : 24.0E-1

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	32.4E-1	32.4E-1	32.4E-1	32.4E-1	32.4E-1	32.4E-1	32.4E-1
SN41	32.5E-1	32.4E-1	32.5E-1	32.4E-1	32.2E-1	30.9E-1	
SN42	32.4E-1	32.4E-1	32.5E-1	32.4E-1	31.8E-1	30.0E-1	
SN43	32.4E-1	32.5E-1	32.4E-1	32.4E-1	32.0E-1	29.8E-1	
SN44	32.5E-1	32.4E-1	32.5E-1	32.4E-1	32.3E-1	31.3E-1	
SN45	32.4E-1	32.4E-1	32.4E-1	32.4E-1	32.1E-1	30.7E-1	
SN46	32.4E-1	32.4E-1	32.4E-1	32.4E-1	32.2E-1	30.6E-1	29.0E-1
SN47	32.4E-1	32.4E-1	32.4E-1	32.4E-1	32.1E-1	30.2E-1	28.1E-1
SN48	32.4E-1	32.4E-1	32.4E-1	32.4E-1	32.2E-1	30.3E-1	27.9E-1
SN49	32.5E-1	32.5E-1	32.4E-1	32.4E-1	32.3E-1	31.2E-1	28.1E-1
SN50	32.4E-1	32.5E-1	32.4E-1	32.4E-1	32.0E-1	30.5E-1	28.4E-1
Statistics							
Min	32.4E-1	32.4E-1	32.4E-1	32.4E-1	31.8E-1	29.8E-1	00.0E+0
Max	32.5E-1	32.5E-1	32.5E-1	32.4E-1	32.3E-1	31.3E-1	29.0E-1
Mean	32.4E-1	32.4E-1	32.4E-1	32.4E-1	32.1E-1	30.6E-1	14.2E-1
Sigma	48.3E-4	48.3E-4	48.3E-4	56.2E-9	15.5E-3	49.3E-3	14.9E-1

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	32.4E-1	32.4E-1
SN41		32.3E-1
SN42		
SN43		
SN44		
SN45		
SN46	29.0E-1	29.5E-1
SN47	28.1E-1	28.7E-1
SN48	27.9E-1	28.5E-1
SN49	28.1E-1	29.8E-1
SN50	28.4E-1	29.3E-1
Statistics		
Min	00.0E+0	00.0E+0
Max	29.0E-1	32.3E-1
Mean	14.2E-1	17.8E-1
Sigma	14.9E-1	15.4E-1

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	32.4E-1	32.4E-1
SN41	32.3E-1	32.3E-1
SN42		31.7E-1
SN43		32.1E-1
SN44		32.4E-1
SN45		26.7E-1
SN46	29.5E-1	32.4E-1
SN47	28.7E-1	32.3E-1
SN48	28.5E-1	32.3E-1
SN49	29.8E-1	32.4E-1
SN50	29.3E-1	32.2E-1
Statistics		
Min	00.0E+0	26.7E-1
Max	32.3E-1	32.4E-1
Mean	17.8E-1	31.7E-1
Sigma	15.4E-1	17.6E-2

HIREX Engineering	Total Dose Test Report		Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.

Test conditions : Tid

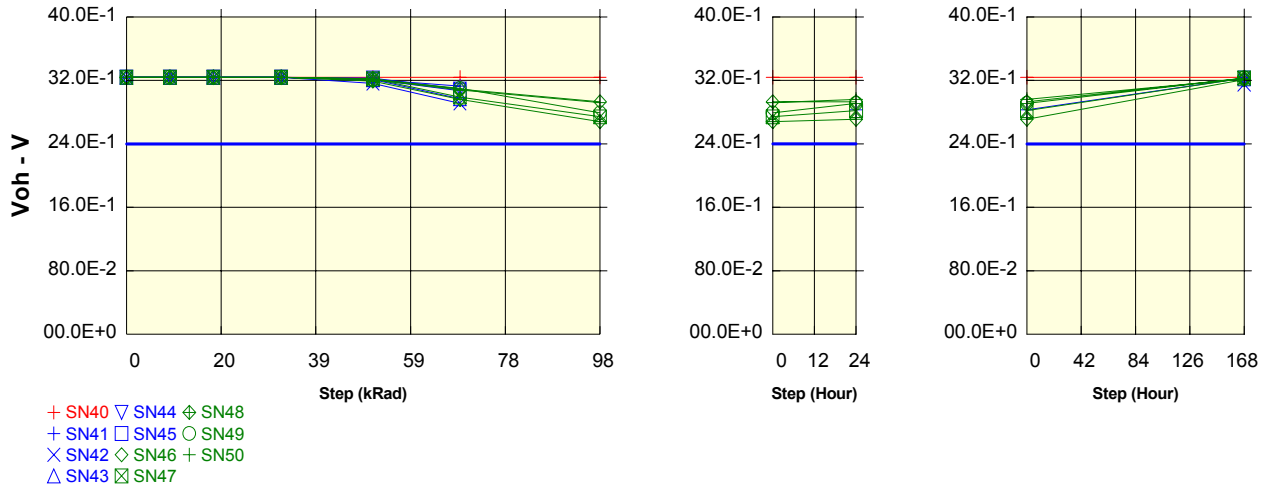
Parameter : Output High Voltage : Logic 1 : VohDQ06

IOH = -4mA

Unit : V

Spec Limit Min : 24.0E-1

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	32.4E-1	32.4E-1	32.4E-1	32.4E-1	32.4E-1	32.4E-1	32.4E-1
SN41	32.4E-1	32.4E-1	32.4E-1	32.4E-1	32.1E-1	31.3E-1	
SN42	32.4E-1	32.4E-1	32.4E-1	32.4E-1	31.6E-1	29.1E-1	
SN43	32.4E-1	32.4E-1	32.4E-1	32.4E-1	32.1E-1	29.7E-1	
SN44	32.4E-1	32.4E-1	32.4E-1	32.4E-1	32.3E-1	30.9E-1	
SN45	32.4E-1	32.4E-1	32.4E-1	32.4E-1	32.1E-1	30.7E-1	
SN46	32.4E-1	32.4E-1	32.4E-1	32.4E-1	32.2E-1	30.9E-1	29.3E-1
SN47	32.4E-1	32.4E-1	32.4E-1	32.4E-1	32.2E-1	29.9E-1	27.4E-1
SN48	32.4E-1	32.4E-1	32.4E-1	32.4E-1	31.9E-1	29.6E-1	26.8E-1
SN49	32.4E-1	32.4E-1	32.4E-1	32.4E-1	32.1E-1	31.0E-1	27.9E-1
SN50	32.4E-1	32.4E-1	32.4E-1	32.4E-1	32.1E-1	30.8E-1	29.2E-1
Statistics							
Min	32.4E-1	32.4E-1	32.4E-1	32.4E-1	31.6E-1	29.1E-1	00.0E+0
Max	32.4E-1	32.4E-1	32.4E-1	32.4E-1	32.3E-1	31.3E-1	29.3E-1
Mean	32.4E-1	32.4E-1	32.4E-1	32.4E-1	32.1E-1	30.4E-1	14.1E-1
Sigma	56.2E-9	56.2E-9	56.2E-9	56.2E-9	19.5E-3	74.5E-3	14.8E-1

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	32.4E-1	32.4E-1
SN41		28.3E-1
SN42		
SN43		
SN44		
SN45		
SN46	29.3E-1	29.3E-1
SN47	27.4E-1	28.2E-1
SN48	26.8E-1	27.1E-1
SN49	27.9E-1	29.1E-1
SN50	29.2E-1	29.6E-1
Statistics		
Min	00.0E+0	00.0E+0
Max	29.3E-1	29.6E-1
Mean	14.1E-1	17.2E-1
Sigma	14.8E-1	14.8E-1

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	32.4E-1	32.4E-1
SN41	28.3E-1	32.3E-1
SN42		31.5E-1
SN43		32.2E-1
SN44		32.3E-1
SN45		
SN46	29.3E-1	32.3E-1
SN47	28.2E-1	32.3E-1
SN48	27.1E-1	32.1E-1
SN49	29.1E-1	32.3E-1
SN50	29.6E-1	32.2E-1
Statistics		
Min	00.0E+0	00.0E+0
Max	29.6E-1	32.3E-1
Mean	17.2E-1	29.0E-1
Sigma	14.8E-1	10.2E-1

HIREX Engineering	Total Dose Test Report		Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.

Test conditions : Tid

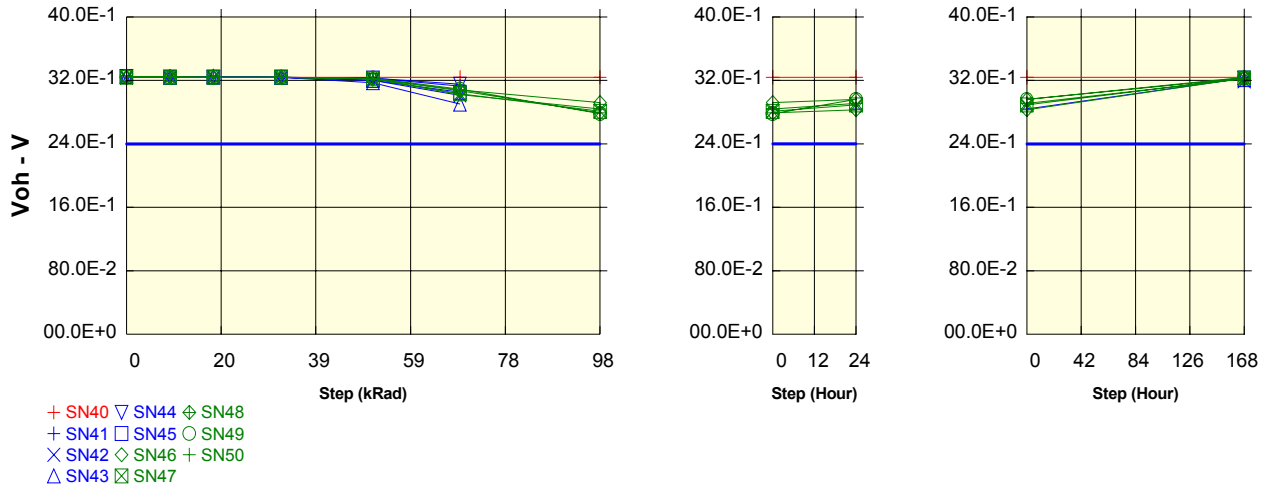
Parameter : Output High Voltage : Logic 1 : VohDQ05

IOH = -4mA

Unit : V

Spec Limit Min : 24.0E-1

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	32.4E-1	32.4E-1	32.4E-1	32.4E-1	32.4E-1	32.4E-1	32.4E-1
SN41	32.4E-1	32.5E-1	32.4E-1	32.4E-1	32.3E-1	31.3E-1	
SN42	32.4E-1	32.4E-1	32.4E-1	32.4E-1	32.0E-1	30.1E-1	
SN43	32.5E-1	32.4E-1	32.5E-1	32.4E-1	31.7E-1	29.0E-1	
SN44	32.5E-1	32.4E-1	32.4E-1	32.4E-1	32.3E-1	31.5E-1	
SN45	32.5E-1	32.4E-1	32.4E-1	32.4E-1	32.0E-1	30.5E-1	
SN46	32.4E-1	32.4E-1	32.4E-1	32.4E-1	32.2E-1	30.8E-1	29.2E-1
SN47	32.4E-1	32.4E-1	32.4E-1	32.4E-1	32.2E-1	30.3E-1	28.1E-1
SN48	32.4E-1	32.5E-1	32.4E-1	32.4E-1	32.2E-1	30.7E-1	27.9E-1
SN49	32.5E-1	32.4E-1	32.4E-1	32.4E-1	32.3E-1	30.9E-1	27.8E-1
SN50	32.4E-1	32.4E-1	32.4E-1	32.4E-1	32.2E-1	30.2E-1	28.4E-1
Statistics							
Min	32.4E-1	32.4E-1	32.4E-1	32.4E-1	31.7E-1	29.0E-1	00.0E+0
Max	32.5E-1	32.5E-1	32.5E-1	32.4E-1	32.3E-1	31.5E-1	29.2E-1
Mean	32.4E-1	32.4E-1	32.4E-1	32.4E-1	32.1E-1	30.5E-1	14.1E-1
Sigma	51.6E-4	42.2E-4	31.6E-4	56.2E-9	19.0E-3	70.4E-3	14.9E-1

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	32.4E-1	32.4E-1
SN41		28.4E-1
SN42		
SN43		
SN44		
SN45		
SN46	29.2E-1	29.6E-1
SN47	28.1E-1	28.9E-1
SN48	27.9E-1	28.3E-1
SN49	27.8E-1	29.6E-1
SN50	28.4E-1	29.1E-1
Statistics		
Min	00.0E+0	00.0E+0
Max	29.2E-1	29.6E-1
Mean	14.1E-1	17.4E-1
Sigma	14.9E-1	15.0E-1

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	32.4E-1	32.4E-1
SN41	28.4E-1	32.3E-1
SN42		31.9E-1
SN43		32.1E-1
SN44		32.3E-1
SN45		
SN46	29.6E-1	32.4E-1
SN47	28.9E-1	32.3E-1
SN48	28.3E-1	32.3E-1
SN49	29.6E-1	32.3E-1
SN50	29.1E-1	32.2E-1
Statistics		
Min	00.0E+0	00.0E+0
Max	29.6E-1	32.4E-1
Mean	17.4E-1	29.0E-1
Sigma	15.0E-1	10.2E-1

HIREX Engineering	Total Dose Test Report		Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.

Test conditions : Tid

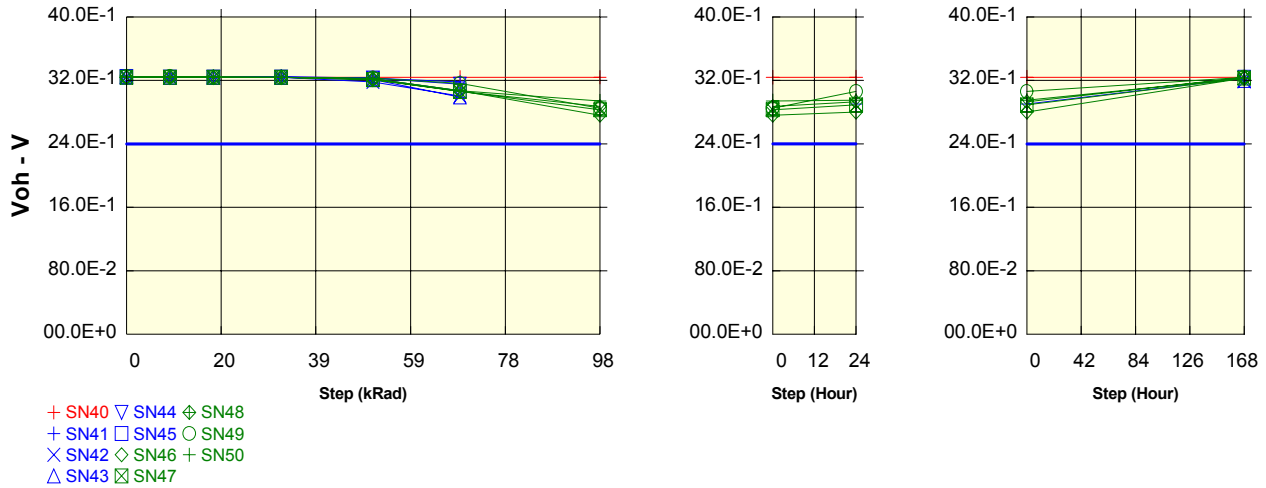
Parameter : Output High Voltage : Logic 1 : VohDQ04

IOH = -4mA

Unit : V

Spec Limit Min : 24.0E-1

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	32.4E-1	32.4E-1	32.4E-1	32.4E-1	32.4E-1	32.4E-1	32.4E-1
SN41	32.5E-1	32.5E-1	32.4E-1	32.5E-1	32.3E-1	31.8E-1	
SN42	32.5E-1	32.4E-1	32.4E-1	32.4E-1	31.8E-1	30.0E-1	
SN43	32.5E-1	32.4E-1	32.4E-1	32.4E-1	32.1E-1	29.9E-1	
SN44	32.5E-1	32.4E-1	32.4E-1	32.4E-1	32.3E-1	31.5E-1	
SN45	32.4E-1	32.4E-1	32.4E-1	32.4E-1	32.2E-1	30.7E-1	
SN46	32.4E-1	32.4E-1	32.4E-1	32.4E-1	32.1E-1	30.6E-1	28.7E-1
SN47	32.4E-1	32.4E-1	32.4E-1	32.4E-1	32.1E-1	30.6E-1	28.3E-1
SN48	32.4E-1	32.5E-1	32.4E-1	32.4E-1	32.2E-1	30.7E-1	27.6E-1
SN49	32.5E-1	32.5E-1	32.4E-1	32.4E-1	32.3E-1	31.6E-1	28.5E-1
SN50	32.5E-1	32.5E-1	32.5E-1	32.4E-1	32.2E-1	30.7E-1	29.4E-1
Statistics							
Min	32.4E-1	32.4E-1	32.4E-1	32.4E-1	31.8E-1	29.9E-1	00.0E+0
Max	32.5E-1	32.5E-1	32.5E-1	32.5E-1	32.3E-1	31.8E-1	29.4E-1
Mean	32.5E-1	32.4E-1	32.4E-1	32.4E-1	32.2E-1	30.8E-1	14.3E-1
Sigma	51.6E-4	51.6E-4	31.6E-4	31.6E-4	15.1E-3	64.0E-3	15.0E-1

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	32.4E-1	32.4E-1
SN41		29.0E-1
SN42		
SN43		
SN44		
SN45		
SN46	28.7E-1	29.3E-1
SN47	28.3E-1	28.9E-1
SN48	27.6E-1	28.0E-1
SN49	28.5E-1	30.6E-1
SN50	29.4E-1	29.5E-1
Statistics		
Min	00.0E+0	00.0E+0
Max	29.4E-1	30.6E-1
Mean	14.3E-1	17.5E-1
Sigma	15.0E-1	15.1E-1

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	32.4E-1	32.4E-1
SN41	29.0E-1	32.3E-1
SN42		31.9E-1
SN43		32.0E-1
SN44		32.4E-1
SN45		
SN46	29.3E-1	32.4E-1
SN47	28.9E-1	32.3E-1
SN48	28.0E-1	32.3E-1
SN49	30.6E-1	32.4E-1
SN50	29.5E-1	32.3E-1
Statistics		
Min	00.0E+0	00.0E+0
Max	30.6E-1	32.4E-1
Mean	17.5E-1	29.0E-1
Sigma	15.1E-1	10.2E-1

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.	

Test conditions : Tid

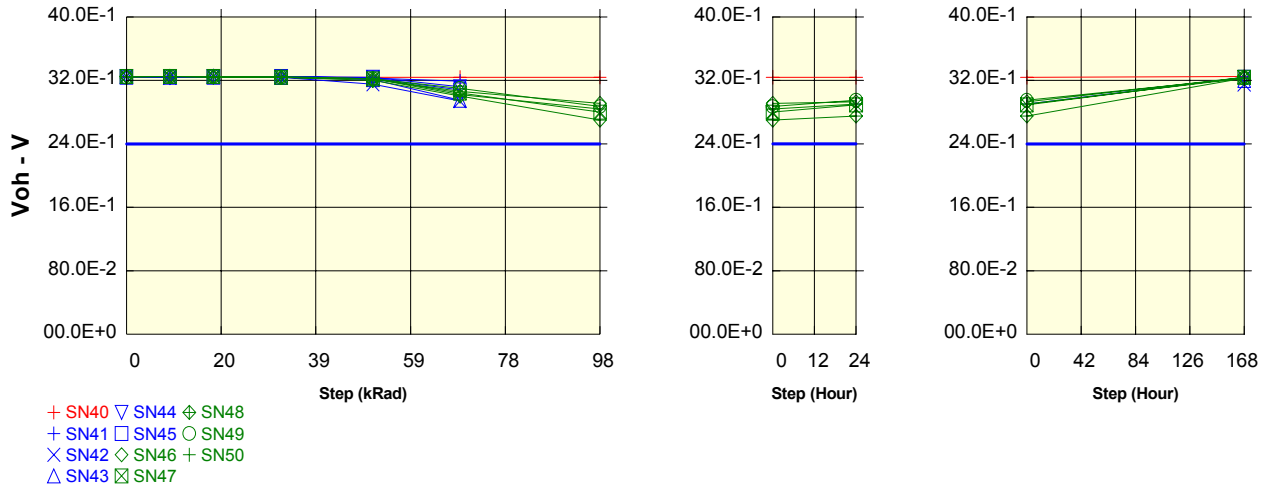
Parameter : Output High Voltage : Logic 1 : VohDQ03

IOH = -4mA

Unit : V

Spec Limit Min : 24.0E-1

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	32.4E-1	32.4E-1	32.4E-1	32.4E-1	32.4E-1	32.4E-1	32.4E-1
SN41	32.5E-1	32.5E-1	32.5E-1	32.5E-1	32.3E-1	31.9E-1	
SN42	32.5E-1	32.4E-1	32.5E-1	32.4E-1	31.5E-1	29.4E-1	
SN43	32.5E-1	32.4E-1	32.5E-1	32.4E-1	32.1E-1	29.5E-1	
SN44	32.5E-1	32.4E-1	32.5E-1	32.5E-1	32.4E-1	31.2E-1	
SN45	32.4E-1	32.5E-1	32.4E-1	32.4E-1	32.3E-1	30.8E-1	
SN46	32.5E-1	32.5E-1	32.4E-1	32.4E-1	32.2E-1	30.6E-1	29.1E-1
SN47	32.5E-1	32.5E-1	32.5E-1	32.4E-1	32.2E-1	30.4E-1	28.0E-1
SN48	32.5E-1	32.5E-1	32.5E-1	32.4E-1	32.0E-1	30.0E-1	27.0E-1
SN49	32.4E-1	32.5E-1	32.5E-1	32.4E-1	32.2E-1	31.0E-1	28.7E-1
SN50	32.5E-1	32.5E-1	32.4E-1	32.5E-1	32.2E-1	30.2E-1	28.4E-1
Statistics							
Min	32.4E-1	32.4E-1	32.4E-1	32.4E-1	31.5E-1	29.4E-1	00.0E+0
Max	32.5E-1	32.5E-1	32.5E-1	32.5E-1	32.4E-1	31.9E-1	29.1E-1
Mean	32.5E-1	32.5E-1	32.5E-1	32.4E-1	32.1E-1	30.5E-1	14.1E-1
Sigma	42.2E-4	48.3E-4	48.3E-4	48.3E-4	25.0E-3	77.2E-3	14.9E-1

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	32.4E-1	32.4E-1
SN41		29.0E-1
SN42		
SN43		
SN44		
SN45		
SN46	29.1E-1	29.3E-1
SN47	28.0E-1	28.9E-1
SN48	27.0E-1	27.5E-1
SN49	28.7E-1	29.5E-1
SN50	28.4E-1	29.0E-1
Statistics		
Min	00.0E+0	00.0E+0
Max	29.1E-1	29.5E-1
Mean	14.1E-1	17.3E-1
Sigma	14.9E-1	14.9E-1

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	32.4E-1	32.5E-1
SN41	29.0E-1	32.4E-1
SN42		31.5E-1
SN43		32.0E-1
SN44		32.4E-1
SN45		
SN46	29.3E-1	32.4E-1
SN47	28.9E-1	32.4E-1
SN48	27.5E-1	32.3E-1
SN49	29.5E-1	32.3E-1
SN50	29.0E-1	32.3E-1
Statistics		
Min	00.0E+0	00.0E+0
Max	29.5E-1	32.4E-1
Mean	17.3E-1	29.0E-1
Sigma	14.9E-1	10.2E-1

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.	

Test conditions : Tid

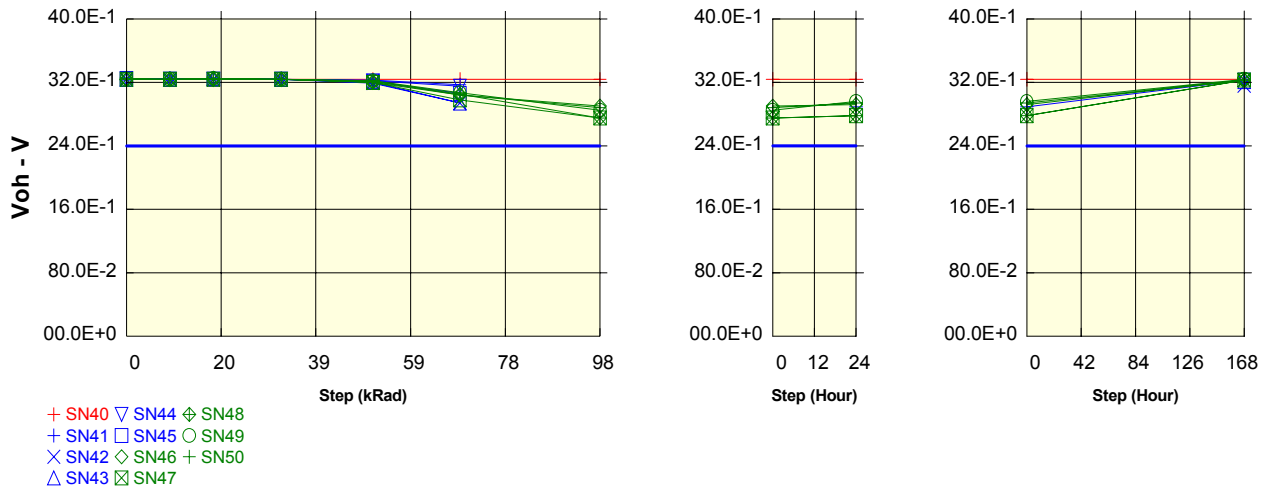
Parameter : Output High Voltage : Logic 1 : VohDQ02

IOH = -4mA

Unit : V

Spec Limit Min : 24.0E-1

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	32.4E-1	32.4E-1	32.4E-1	32.4E-1	32.4E-1	32.4E-1	32.4E-1
SN41	32.5E-1	32.5E-1	32.4E-1	32.4E-1	32.3E-1	31.7E-1	
SN42	32.4E-1	32.4E-1	32.4E-1	32.4E-1	31.9E-1	29.4E-1	
SN43	32.4E-1	32.4E-1	32.5E-1	32.4E-1	32.0E-1	29.4E-1	
SN44	32.5E-1	32.4E-1	32.4E-1	32.4E-1	32.2E-1	31.5E-1	
SN45	32.4E-1	32.4E-1	32.4E-1	32.4E-1	32.1E-1	30.6E-1	
SN46	32.4E-1	32.4E-1	32.4E-1	32.4E-1	32.0E-1	30.4E-1	29.0E-1
SN47	32.4E-1	32.4E-1	32.4E-1	32.4E-1	32.0E-1	29.8E-1	27.5E-1
SN48	32.4E-1	32.4E-1	32.5E-1	32.4E-1	32.1E-1	30.5E-1	27.5E-1
SN49	32.4E-1	32.4E-1	32.5E-1	32.4E-1	32.2E-1	30.7E-1	28.5E-1
SN50	32.5E-1	32.4E-1	32.5E-1	32.4E-1	32.2E-1	30.4E-1	28.8E-1
Statistics							
Min	32.4E-1	32.4E-1	32.4E-1	32.4E-1	31.9E-1	29.4E-1	00.0E+0
Max	32.5E-1	32.5E-1	32.5E-1	32.4E-1	32.3E-1	31.7E-1	29.0E-1
Mean	32.4E-1	32.4E-1	32.4E-1	32.4E-1	32.1E-1	30.4E-1	14.1E-1
Sigma	48.3E-4	31.6E-4	51.6E-4	56.2E-9	12.5E-3	77.3E-3	14.9E-1

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	32.4E-1	32.4E-1
SN41		28.9E-1
SN42		
SN43		
SN44		
SN45		
SN46	29.0E-1	29.2E-1
SN47	27.5E-1	27.8E-1
SN48	27.5E-1	27.8E-1
SN49	28.5E-1	29.6E-1
SN50	28.8E-1	29.4E-1
Statistics		
Min	00.0E+0	00.0E+0
Max	29.0E-1	29.6E-1
Mean	14.1E-1	17.3E-1
Sigma	14.9E-1	14.9E-1

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	32.4E-1	32.4E-1
SN41	28.9E-1	32.3E-1
SN42		31.6E-1
SN43		32.1E-1
SN44		32.3E-1
SN45		
SN46	29.2E-1	32.3E-1
SN47	27.8E-1	32.3E-1
SN48	27.8E-1	32.3E-1
SN49	29.6E-1	32.4E-1
SN50	29.4E-1	32.3E-1
Statistics		
Min	00.0E+0	00.0E+0
Max	29.6E-1	32.4E-1
Mean	17.3E-1	29.0E-1
Sigma	14.9E-1	10.2E-1

HIREX Engineering	Total Dose Test Report		Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.

Test conditions : Tid

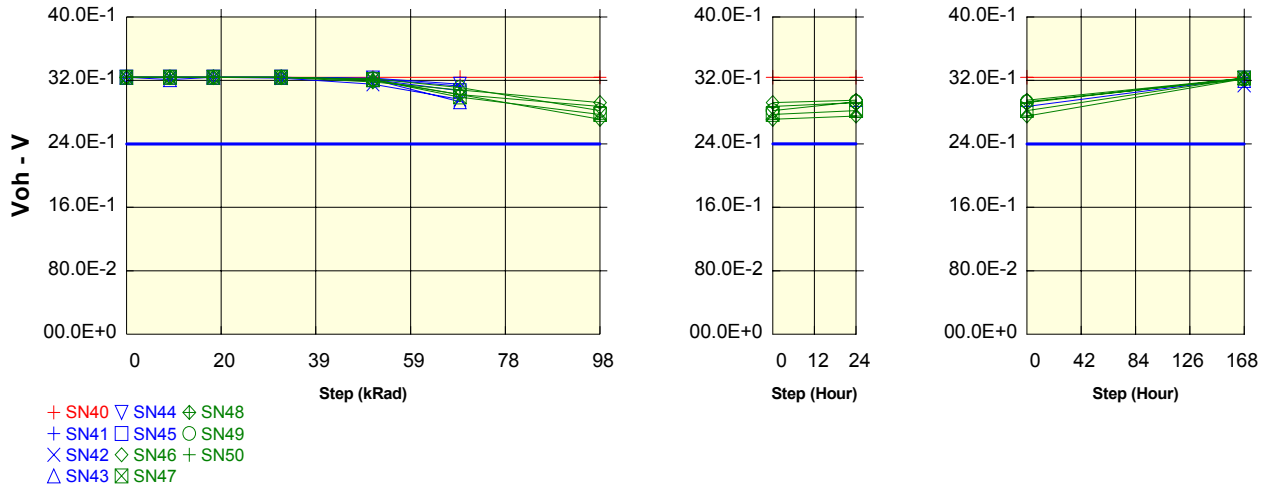
Parameter : Output High Voltage : Logic 1 : VohDQ01

IOH = -4mA

Unit : V

Spec Limit Min : 24.0E-1

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	32.4E-1	32.4E-1	32.4E-1	32.4E-1	32.4E-1	32.4E-1	32.4E-1
SN41	32.4E-1	32.4E-1	32.4E-1	32.4E-1	32.2E-1	31.3E-1	
SN42	32.4E-1	32.4E-1	32.4E-1	32.3E-1	31.5E-1	29.6E-1	
SN43	32.4E-1	32.1E-1	32.4E-1	32.4E-1	32.1E-1	29.3E-1	
SN44	32.4E-1	32.4E-1	32.4E-1	32.4E-1	32.3E-1	31.5E-1	
SN45	32.4E-1	32.4E-1	32.4E-1	32.4E-1	32.1E-1	30.7E-1	
SN46	32.4E-1	32.4E-1	32.4E-1	32.4E-1	31.8E-1	30.8E-1	29.2E-1
SN47	32.4E-1	32.4E-1	32.4E-1	32.4E-1	32.1E-1	29.9E-1	27.7E-1
SN48	32.4E-1	32.4E-1	32.4E-1	32.4E-1	32.0E-1	30.2E-1	27.1E-1
SN49	32.4E-1	32.4E-1	32.4E-1	32.4E-1	32.2E-1	31.1E-1	28.2E-1
SN50	32.4E-1	32.4E-1	32.4E-1	32.4E-1	32.1E-1	30.2E-1	28.7E-1
Statistics							
Min	32.4E-1	32.1E-1	32.4E-1	32.3E-1	31.5E-1	29.3E-1	00.0E+0
Max	32.4E-1	32.4E-1	32.4E-1	32.4E-1	32.3E-1	31.5E-1	29.2E-1
Mean	32.4E-1	32.4E-1	32.4E-1	32.4E-1	32.0E-1	30.5E-1	14.1E-1
Sigma	56.2E-9	94.9E-4	56.2E-9	31.6E-4	23.2E-3	73.8E-3	14.9E-1

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	32.4E-1	32.4E-1
SN41		28.7E-1
SN42		
SN43		
SN44		
SN45		
SN46	29.2E-1	29.5E-1
SN47	27.7E-1	28.2E-1
SN48	27.1E-1	27.5E-1
SN49	28.2E-1	29.3E-1
SN50	28.7E-1	29.2E-1
Statistics		
Min	00.0E+0	00.0E+0
Max	29.2E-1	29.5E-1
Mean	14.1E-1	17.2E-1
Sigma	14.9E-1	14.8E-1

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	32.4E-1	32.4E-1
SN41	28.7E-1	32.3E-1
SN42		31.4E-1
SN43		32.0E-1
SN44		32.3E-1
SN45		
SN46	29.5E-1	32.3E-1
SN47	28.2E-1	32.3E-1
SN48	27.5E-1	32.2E-1
SN49	29.3E-1	32.2E-1
SN50	29.2E-1	32.3E-1
Statistics		
Min	00.0E+0	00.0E+0
Max	29.5E-1	32.3E-1
Mean	17.2E-1	28.9E-1
Sigma	14.8E-1	10.2E-1

HIREX Engineering	Total Dose Test Report		Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.

Test conditions : Tid

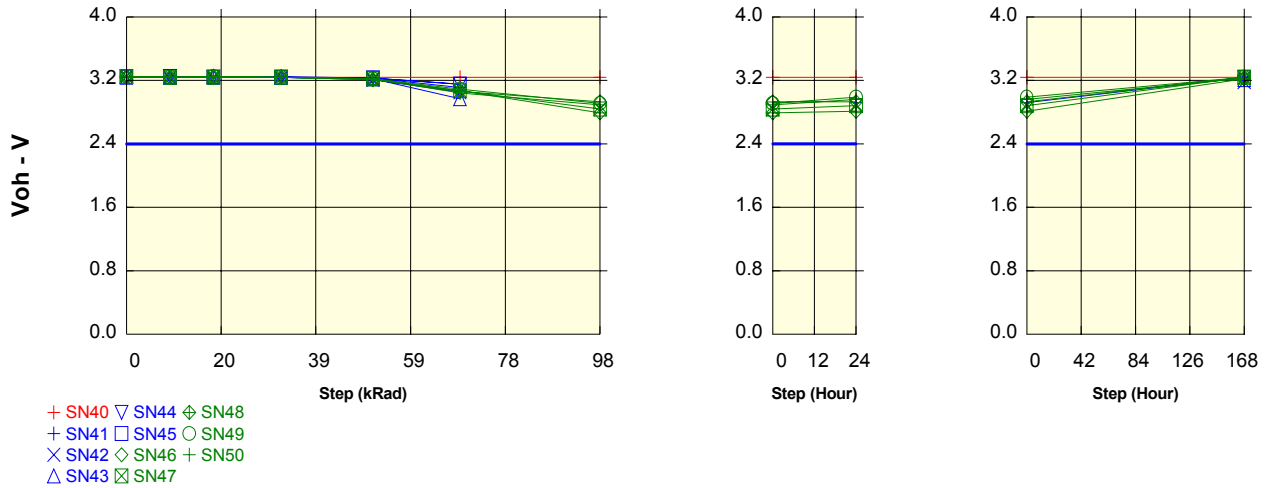
Parameter : Output High Voltage : Logic 1 : VohDQ00

IOH = -4mA

Unit : V

Spec Limit Min : 2.4

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	3.24	3.24	3.24	3.24	3.24	3.24	3.24
SN41	3.25	3.24	3.25	3.25	3.23	3.11	
SN42	3.25	3.24	3.24	3.24	3.21	3.05	
SN43	3.25	3.24	3.25	3.24	3.22	2.97	
SN44	3.25	3.25	3.24	3.24	3.23	3.15	
SN45	3.24	3.25	3.24	3.24	3.23	3.15	
SN46	3.24	3.24	3.24	3.24	3.21	3.06	2.93
SN47	3.25	3.24	3.24	3.24	3.22	3.07	2.84
SN48	3.25	3.24	3.25	3.24	3.21	3.07	2.79
SN49	3.25	3.24	3.25	3.24	3.22	3.09	2.91
SN50	3.25	3.24	3.24	3.24	3.22	3.04	2.89
Statistics							
Min	3.24	3.24	3.24	3.24	3.21	2.97	0.0
Max	3.25	3.25	3.25	3.25	3.23	3.15	2.93
Mean	3.248	3.242	3.244	3.241	3.22	3.076	1.436
Sigma	0.004	0.004	0.005	0.003	0.008	0.054	1.514

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	3.24	3.24
SN41		2.92
SN42		
SN43		
SN44		
SN45		
SN46	2.93	2.93
SN47	2.84	2.88
SN48	2.79	2.81
SN49	2.91	2.99
SN50	2.89	2.96
Statistics		
Min	0.0	0.0
Max	2.93	2.99
Mean	1.436	1.749
Sigma	1.514	1.506

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	3.24	3.24
SN41	2.92	3.24
SN42		3.18
SN43		3.21
SN44		3.24
SN45		
SN46	2.93	3.24
SN47	2.88	3.24
SN48	2.81	3.22
SN49	2.99	3.24
SN50	2.96	3.23
Statistics		
Min	0.0	0.0
Max	2.99	3.24
Mean	1.749	2.904
Sigma	1.506	1.021

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.	

Test conditions : Tid

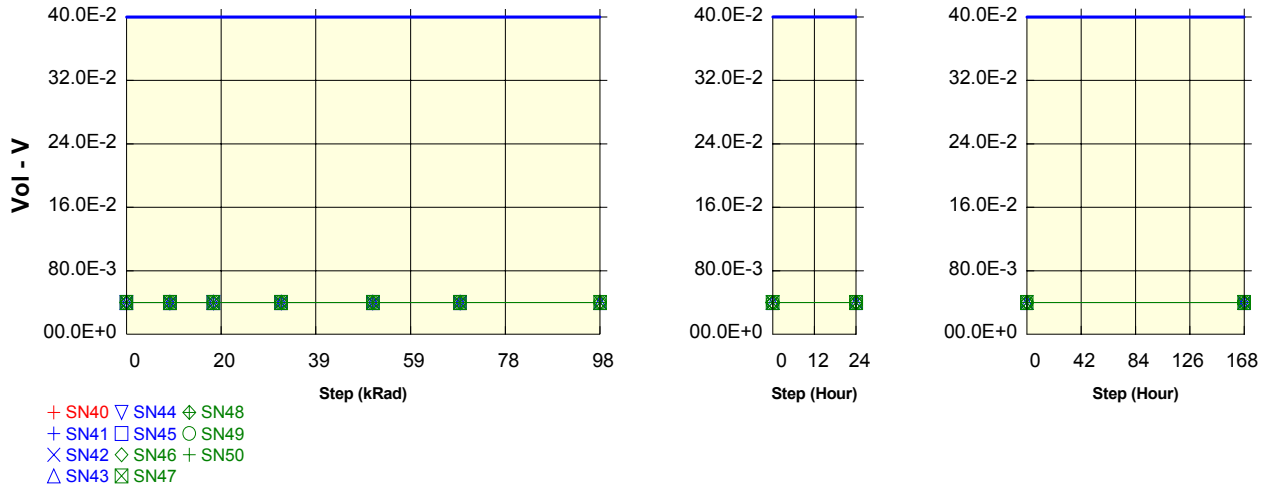
Parameter : Output High Voltage : Logic 0 : VoIDQ07

IOL = 4mA

Unit : V

Spec Limit Max : 40.0E-2

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3
SN41	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3
SN42	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3
SN43	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3
SN44	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3
SN45	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3
SN46	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3
SN47	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3
SN48	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3
SN49	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3
SN50	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3
Statistics							
Min	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	00.0E+0
Max	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3
Mean	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	28.0E-3
Sigma	10.8E-10	10.8E-10	10.8E-10	10.8E-10	10.8E-10	10.8E-10	19.3E-3

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	40.0E-3	40.0E-3
SN41		40.0E-3
SN42	40.0E-3	40.0E-3
SN43	40.0E-3	40.0E-3
SN44		
SN45		
SN46	40.0E-3	40.0E-3
SN47	40.0E-3	40.0E-3
SN48	40.0E-3	40.0E-3
SN49	40.0E-3	40.0E-3
SN50	40.0E-3	40.0E-3
Statistics		
Min	00.0E+0	00.0E+0
Max	40.0E-3	40.0E-3
Mean	28.0E-3	32.0E-3
Sigma	19.3E-3	16.9E-3

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	40.0E-3	40.0E-3
SN41	40.0E-3	40.0E-3
SN42	40.0E-3	40.0E-3
SN43	40.0E-3	40.0E-3
SN44		40.0E-3
SN45		
SN46	40.0E-3	40.0E-3
SN47	40.0E-3	40.0E-3
SN48	40.0E-3	40.0E-3
SN49	40.0E-3	40.0E-3
SN50	40.0E-3	40.0E-3
Statistics		
Min	00.0E+0	00.0E+0
Max	40.0E-3	40.0E-3
Mean	32.0E-3	36.0E-3
Sigma	16.9E-3	12.6E-3

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.	

Test conditions : Tid

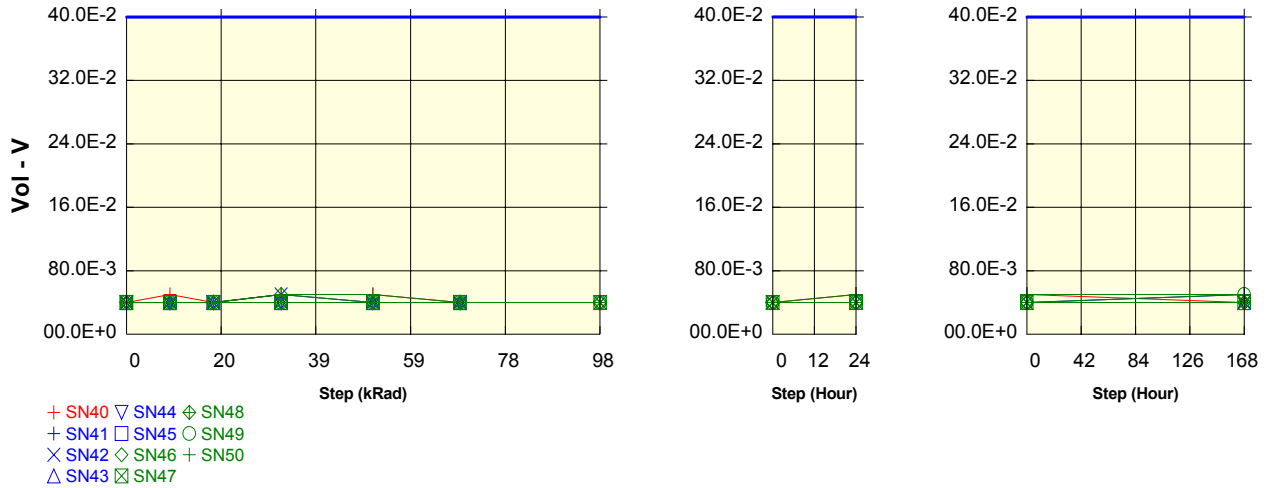
Parameter : Output High Voltage : Logic 0 : VoIDQ06

IOL = 4mA

Unit : V

Spec Limit Max : 40.0E-2

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	40.0E-3	50.0E-3	40.0E-3	50.0E-3	50.0E-3	40.0E-3	40.0E-3
SN41	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	
SN42	40.0E-3	40.0E-3	40.0E-3	50.0E-3	40.0E-3	40.0E-3	40.0E-3
SN43	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	
SN44	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	
SN45	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	
SN46	40.0E-3	40.0E-3	40.0E-3	50.0E-3	40.0E-3	40.0E-3	40.0E-3
SN47	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3
SN48	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3
SN49	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3
SN50	40.0E-3	40.0E-3	40.0E-3	50.0E-3	50.0E-3	40.0E-3	40.0E-3
Statistics							
Min	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	00.0E+0
Max	40.0E-3	40.0E-3	40.0E-3	50.0E-3	50.0E-3	40.0E-3	40.0E-3
Mean	40.0E-3	40.0E-3	40.0E-3	43.0E-3	41.0E-3	40.0E-3	24.0E-3
Sigma	10.8E-10	10.8E-10	10.8E-10	48.3E-4	31.6E-4	10.8E-10	20.7E-3

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	40.0E-3	50.0E-3
SN41		40.0E-3
SN42	40.0E-3	40.0E-3
SN43		
SN44		
SN45		
SN46	40.0E-3	40.0E-3
SN47	40.0E-3	40.0E-3
SN48	40.0E-3	40.0E-3
SN49	40.0E-3	40.0E-3
SN50	40.0E-3	50.0E-3
Statistics		
Min	00.0E+0	00.0E+0
Max	40.0E-3	50.0E-3
Mean	24.0E-3	29.0E-3
Sigma	20.7E-3	20.2E-3

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	50.0E-3	40.0E-3
SN41	40.0E-3	50.0E-3
SN42	40.0E-3	40.0E-3
SN43		40.0E-3
SN44		40.0E-3
SN45		
SN46	40.0E-3	40.0E-3
SN47	40.0E-3	40.0E-3
SN48	40.0E-3	40.0E-3
SN49	40.0E-3	50.0E-3
SN50	50.0E-3	50.0E-3
Statistics		
Min	00.0E+0	00.0E+0
Max	50.0E-3	50.0E-3
Mean	29.0E-3	39.0E-3
Sigma	20.2E-3	14.5E-3

HIREX Engineering	Total Dose Test Report		Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.

Test conditions : Tid

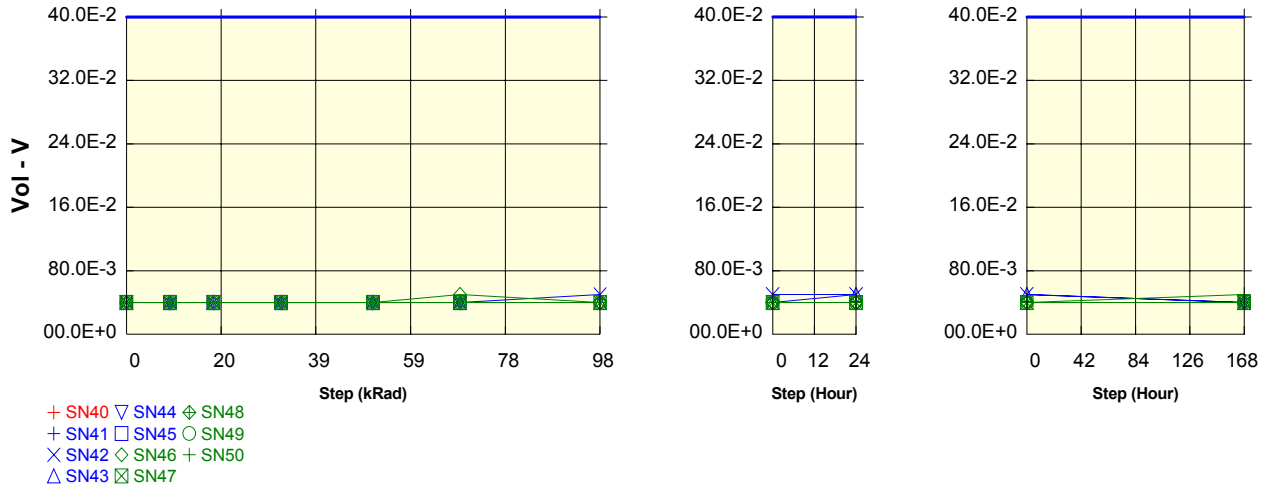
Parameter : Output High Voltage : Logic 0 : VoIDQ05

IOL = 4mA

Unit : V

Spec Limit Max : 40.0E-2

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3
SN41	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3
SN42	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	50.0E-3
SN43	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3
SN44	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3
SN45	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3
SN46	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	50.0E-3	40.0E-3
SN47	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3
SN48	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3
SN49	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3
SN50	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3
Statistics							
Min	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	00.0E+0
Max	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	50.0E-3	50.0E-3
Mean	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	41.0E-3	29.0E-3
Sigma	10.8E-10	10.8E-10	10.8E-10	10.8E-10	10.8E-10	31.6E-4	20.2E-3

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	40.0E-3	40.0E-3
SN41		40.0E-3
SN42	50.0E-3	50.0E-3
SN43	40.0E-3	50.0E-3
SN44		
SN45		
SN46	40.0E-3	40.0E-3
SN47	40.0E-3	40.0E-3
SN48	40.0E-3	40.0E-3
SN49	40.0E-3	40.0E-3
SN50	40.0E-3	40.0E-3
Statistics		
Min	00.0E+0	00.0E+0
Max	50.0E-3	50.0E-3
Mean	29.0E-3	34.0E-3
Sigma	20.2E-3	18.4E-3

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	40.0E-3	40.0E-3
SN41	40.0E-3	40.0E-3
SN42	50.0E-3	40.0E-3
SN43	50.0E-3	40.0E-3
SN44		40.0E-3
SN45		
SN46	40.0E-3	40.0E-3
SN47	40.0E-3	40.0E-3
SN48	40.0E-3	40.0E-3
SN49	40.0E-3	40.0E-3
SN50	40.0E-3	50.0E-3
Statistics		
Min	00.0E+0	00.0E+0
Max	50.0E-3	50.0E-3
Mean	34.0E-3	37.0E-3
Sigma	18.4E-3	13.4E-3

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.	

Test conditions : Tid

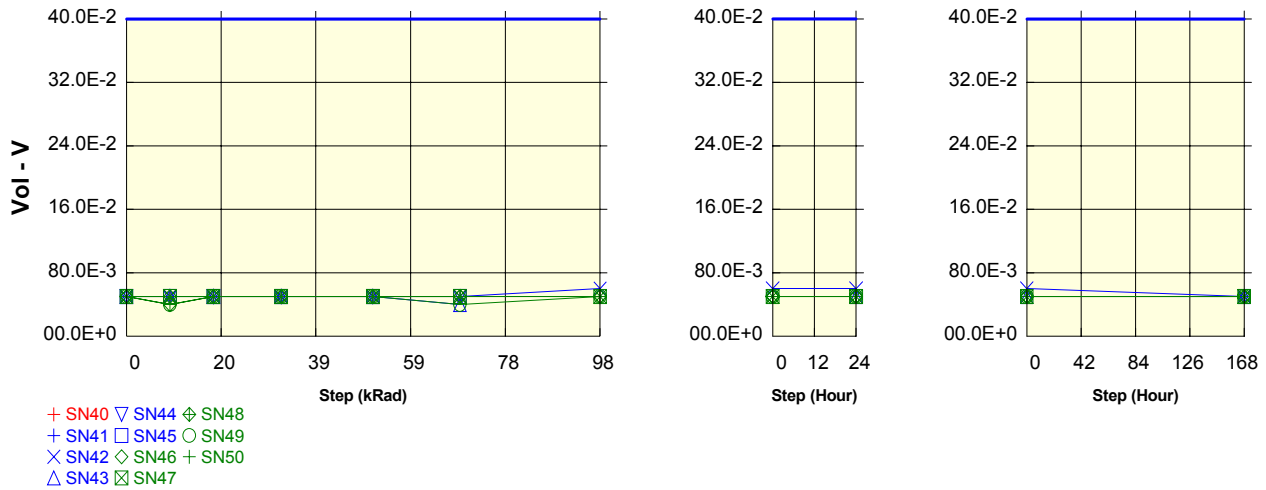
Parameter : Output High Voltage : Logic 0 : VoIDQ04

IOL = 4mA

Unit : V

Spec Limit Max : 40.0E-2

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	50.0E-3	50.0E-3	50.0E-3	50.0E-3	50.0E-3	50.0E-3	50.0E-3
SN41	50.0E-3	50.0E-3	50.0E-3	50.0E-3	50.0E-3	50.0E-3	
SN42	50.0E-3	50.0E-3	50.0E-3	50.0E-3	50.0E-3	50.0E-3	60.0E-3
SN43	50.0E-3	50.0E-3	50.0E-3	50.0E-3	50.0E-3	40.0E-3	
SN44	50.0E-3	50.0E-3	50.0E-3	50.0E-3	50.0E-3	50.0E-3	50.0E-3
SN45	50.0E-3	50.0E-3	50.0E-3	50.0E-3	50.0E-3	50.0E-3	50.0E-3
SN46	50.0E-3	50.0E-3	50.0E-3	50.0E-3	50.0E-3	50.0E-3	50.0E-3
SN47	50.0E-3	50.0E-3	50.0E-3	50.0E-3	50.0E-3	50.0E-3	50.0E-3
SN48	50.0E-3	40.0E-3	50.0E-3	50.0E-3	50.0E-3	50.0E-3	50.0E-3
SN49	50.0E-3	40.0E-3	50.0E-3	50.0E-3	50.0E-3	40.0E-3	50.0E-3
SN50	50.0E-3	50.0E-3	50.0E-3	50.0E-3	50.0E-3	50.0E-3	50.0E-3
Statistics							
Min	50.0E-3	40.0E-3	50.0E-3	50.0E-3	50.0E-3	40.0E-3	00.0E+0
Max	50.0E-3	50.0E-3	50.0E-3	50.0E-3	50.0E-3	50.0E-3	60.0E-3
Mean	50.0E-3	48.0E-3	50.0E-3	50.0E-3	50.0E-3	48.0E-3	31.0E-3
Sigma	12.4E-10	42.2E-4	12.4E-10	12.4E-10	12.4E-10	42.2E-4	26.9E-3

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	50.0E-3	50.0E-3
SN41		50.0E-3
SN42	60.0E-3	60.0E-3
SN43		50.0E-3
SN44		
SN45		
SN46	50.0E-3	50.0E-3
SN47	50.0E-3	50.0E-3
SN48	50.0E-3	50.0E-3
SN49	50.0E-3	50.0E-3
SN50	50.0E-3	50.0E-3
Statistics		
Min	00.0E+0	00.0E+0
Max	60.0E-3	60.0E-3
Mean	31.0E-3	41.0E-3
Sigma	26.9E-3	21.8E-3

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	50.0E-3	50.0E-3
SN41	50.0E-3	50.0E-3
SN42	60.0E-3	50.0E-3
SN43	50.0E-3	50.0E-3
SN44		50.0E-3
SN45		
SN46	50.0E-3	50.0E-3
SN47	50.0E-3	50.0E-3
SN48	50.0E-3	50.0E-3
SN49	50.0E-3	50.0E-3
SN50	50.0E-3	50.0E-3
Statistics		
Min	00.0E+0	00.0E+0
Max	60.0E-3	50.0E-3
Mean	41.0E-3	45.0E-3
Sigma	21.8E-3	15.8E-3

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.	

Test conditions : Tid

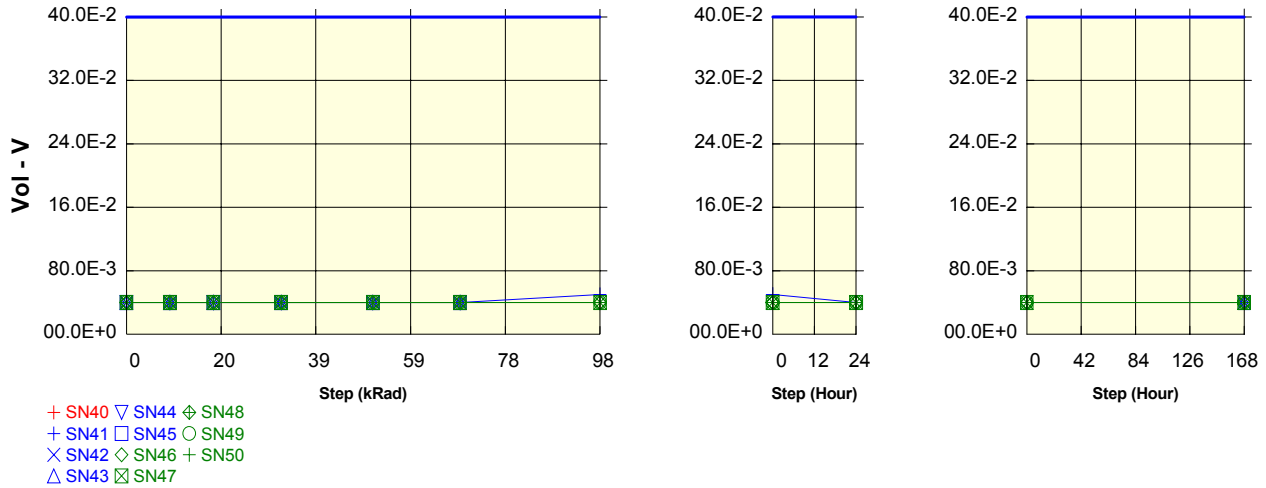
Parameter : Output High Voltage : Logic 0 : VoIDQ03

IOL = 4mA

Unit : V

Spec Limit Max : 40.0E-2

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3
SN41	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	50.0E-3
SN42	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	
SN43	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	
SN44	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	
SN45	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	
SN46	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3
SN47	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3
SN48	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3
SN49	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3
SN50	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3
Statistics							
Min	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	00.0E+0
Max	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	50.0E-3
Mean	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	25.0E-3
Sigma	10.8E-10	10.8E-10	10.8E-10	10.8E-10	10.8E-10	10.8E-10	21.7E-3

Test TST002 : Annealing 24H

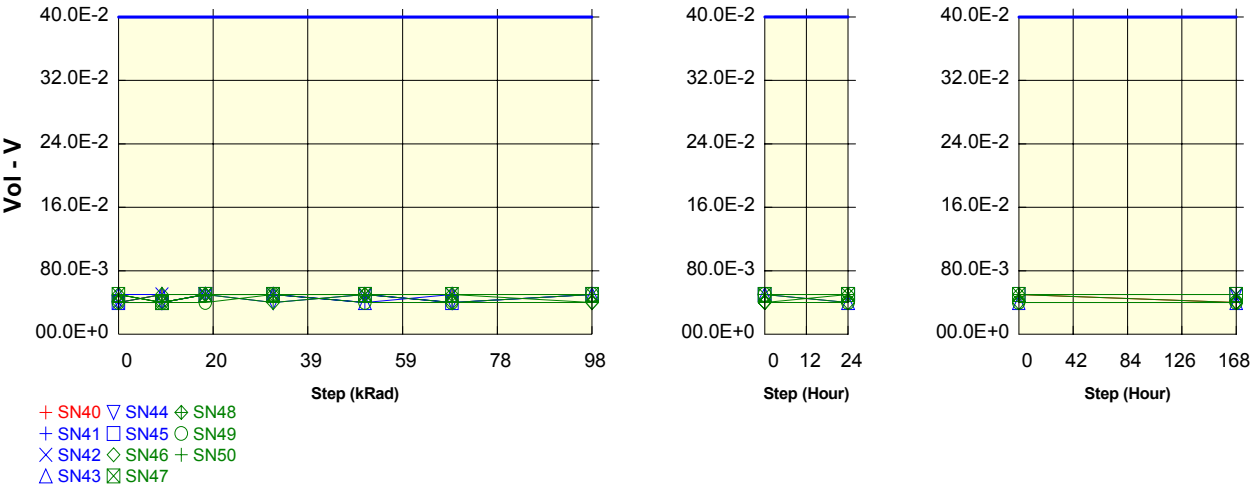
	0 Hour	24 Hour
SN40	40.0E-3	40.0E-3
SN41	50.0E-3	40.0E-3
SN42		
SN43		
SN44		
SN45		
SN46	40.0E-3	40.0E-3
SN47	40.0E-3	40.0E-3
SN48	40.0E-3	40.0E-3
SN49	40.0E-3	40.0E-3
SN50	40.0E-3	40.0E-3
Statistics		
Min	00.0E+0	00.0E+0
Max	50.0E-3	40.0E-3
Mean	25.0E-3	24.0E-3
Sigma	21.7E-3	20.7E-3

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	40.0E-3	40.0E-3
SN41	40.0E-3	40.0E-3
SN42		40.0E-3
SN43		40.0E-3
SN44		40.0E-3
SN45		
SN46	40.0E-3	40.0E-3
SN47	40.0E-3	40.0E-3
SN48	40.0E-3	40.0E-3
SN49	40.0E-3	40.0E-3
SN50	40.0E-3	40.0E-3
Statistics		
Min	00.0E+0	00.0E+0
Max	40.0E-3	40.0E-3
Mean	24.0E-3	36.0E-3
Sigma	20.7E-3	12.6E-3

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.	

Test conditions : Tid
Parameter : Output High Voltage : Logic 0 : VoIDQ02
IOL = 4mA
 Unit : V
 Spec Limit Max : 40.0E-2
 Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	40.0E-3	50.0E-3	50.0E-3	50.0E-3	50.0E-3	50.0E-3	50.0E-3
SN41	40.0E-3	40.0E-3	50.0E-3	50.0E-3	40.0E-3	40.0E-3	50.0E-3
SN42	40.0E-3	50.0E-3	50.0E-3	50.0E-3	50.0E-3	50.0E-3	
SN43	50.0E-3	50.0E-3	50.0E-3	50.0E-3	40.0E-3	50.0E-3	50.0E-3
SN44	40.0E-3	40.0E-3	50.0E-3	40.0E-3	50.0E-3	40.0E-3	
SN45	40.0E-3	40.0E-3	50.0E-3	50.0E-3	50.0E-3	50.0E-3	50.0E-3
SN46	50.0E-3	40.0E-3	50.0E-3	50.0E-3	50.0E-3	50.0E-3	40.0E-3
SN47	50.0E-3	40.0E-3	50.0E-3	50.0E-3	50.0E-3	50.0E-3	50.0E-3
SN48	40.0E-3	50.0E-3	50.0E-3	40.0E-3	50.0E-3	40.0E-3	40.0E-3
SN49	40.0E-3	40.0E-3	40.0E-3	50.0E-3	40.0E-3	40.0E-3	50.0E-3
SN50	50.0E-3	40.0E-3	50.0E-3	50.0E-3	50.0E-3	50.0E-3	50.0E-3
Statistics							
Min	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	00.0E+0
Max	50.0E-3	50.0E-3	50.0E-3	50.0E-3	50.0E-3	50.0E-3	50.0E-3
Mean	44.0E-3	43.0E-3	49.0E-3	48.0E-3	47.0E-3	45.0E-3	38.0E-3
Sigma	51.6E-4	48.3E-4	31.6E-4	42.2E-4	48.3E-4	52.7E-4	20.4E-3

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	50.0E-3	50.0E-3
SN41	50.0E-3	50.0E-3
SN42		
SN43	50.0E-3	40.0E-3
SN44		
SN45	50.0E-3	50.0E-3
SN46	40.0E-3	40.0E-3
SN47	50.0E-3	50.0E-3
SN48	40.0E-3	50.0E-3
SN49	50.0E-3	40.0E-3
SN50	50.0E-3	50.0E-3
Statistics		
Min	00.0E+0	00.0E+0
Max	50.0E-3	50.0E-3
Mean	38.0E-3	37.0E-3
Sigma	20.4E-3	20.0E-3

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	50.0E-3	40.0E-3
SN41	50.0E-3	50.0E-3
SN42		50.0E-3
SN43	40.0E-3	40.0E-3
SN44		50.0E-3
SN45	50.0E-3	50.0E-3
SN46	40.0E-3	40.0E-3
SN47	50.0E-3	50.0E-3
SN48	50.0E-3	40.0E-3
SN49	40.0E-3	40.0E-3
SN50	50.0E-3	50.0E-3
Statistics		
Min	00.0E+0	40.0E-3
Max	50.0E-3	50.0E-3
Mean	37.0E-3	46.0E-3
Sigma	20.0E-3	51.6E-4

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.	

Test conditions : Tid

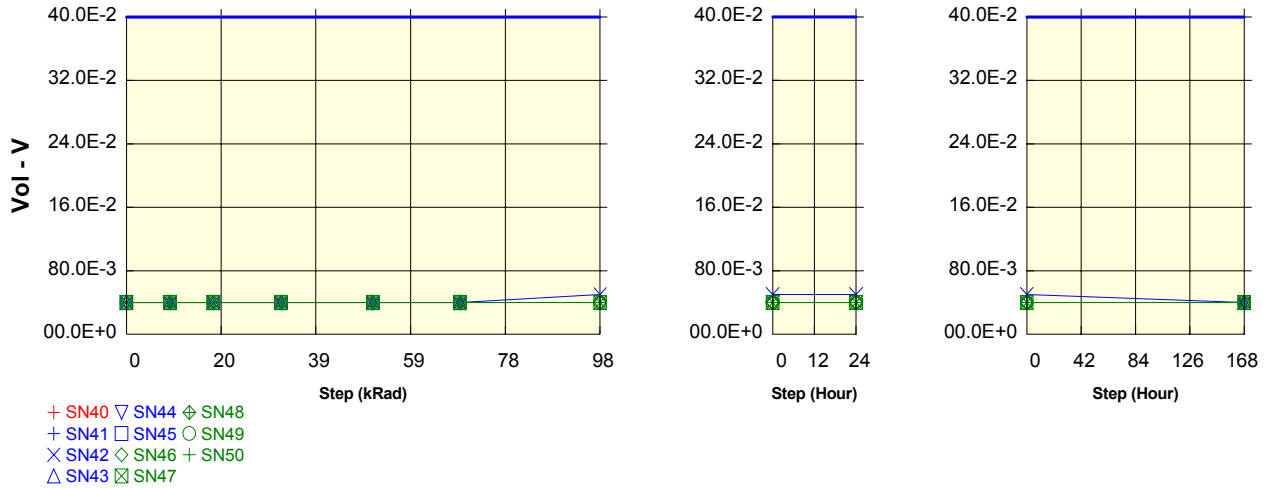
Parameter : Output High Voltage : Logic 0 : VoIDQ01

IOL = 4mA

Unit : V

Spec Limit Max : 40.0E-2

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3
SN41	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3
SN42	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	50.0E-3
SN43	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	
SN44	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	
SN45	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	
SN46	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3
SN47	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3
SN48	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3
SN49	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3
SN50	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3
Statistics							
Min	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	00.0E+0
Max	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	50.0E-3
Mean	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	29.0E-3
Sigma	10.8E-10	10.8E-10	10.8E-10	10.8E-10	10.8E-10	10.8E-10	20.2E-3

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	40.0E-3	40.0E-3
SN41	40.0E-3	40.0E-3
SN42	50.0E-3	50.0E-3
SN43		
SN44		
SN45		
SN46	40.0E-3	40.0E-3
SN47	40.0E-3	40.0E-3
SN48	40.0E-3	40.0E-3
SN49	40.0E-3	40.0E-3
SN50	40.0E-3	40.0E-3
Statistics		
Min	00.0E+0	00.0E+0
Max	50.0E-3	50.0E-3
Mean	29.0E-3	29.0E-3
Sigma	20.2E-3	20.2E-3

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	40.0E-3	40.0E-3
SN41	40.0E-3	40.0E-3
SN42	50.0E-3	40.0E-3
SN43		40.0E-3
SN44		40.0E-3
SN45		
SN46	40.0E-3	40.0E-3
SN47	40.0E-3	40.0E-3
SN48	40.0E-3	40.0E-3
SN49	40.0E-3	40.0E-3
SN50	40.0E-3	40.0E-3
Statistics		
Min	00.0E+0	00.0E+0
Max	50.0E-3	40.0E-3
Mean	29.0E-3	36.0E-3
Sigma	20.2E-3	12.6E-3

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.	

Test conditions : Tid

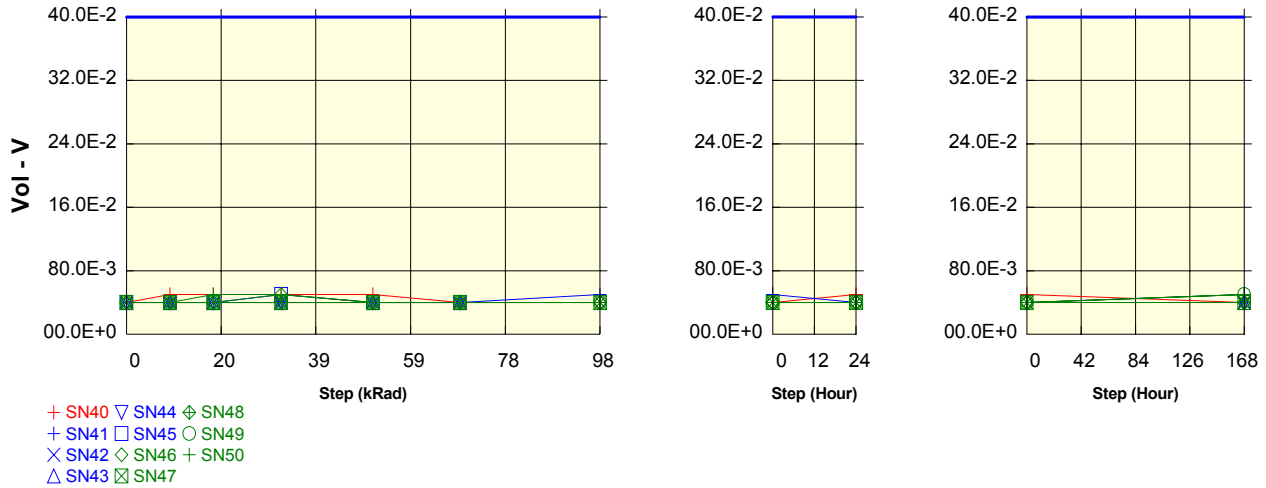
Parameter : Output High Voltage : Logic 0 : VoIDQ00

IOL = 4mA

Unit : V

Spec Limit Max : 40.0E-2

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	40.0E-3	50.0E-3	50.0E-3	50.0E-3	50.0E-3	40.0E-3	40.0E-3
SN41	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	50.0E-3
SN42	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	
SN43	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	
SN44	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	
SN45	40.0E-3	40.0E-3	40.0E-3	50.0E-3	40.0E-3	40.0E-3	
SN46	40.0E-3	40.0E-3	40.0E-3	50.0E-3	40.0E-3	40.0E-3	40.0E-3
SN47	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3
SN48	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3
SN49	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3
SN50	40.0E-3	40.0E-3	50.0E-3	50.0E-3	40.0E-3	40.0E-3	40.0E-3
Statistics							
Min	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	40.0E-3	00.0E+0
Max	40.0E-3	40.0E-3	50.0E-3	50.0E-3	40.0E-3	40.0E-3	50.0E-3
Mean	40.0E-3	40.0E-3	41.0E-3	43.0E-3	40.0E-3	40.0E-3	25.0E-3
Sigma	10.8E-10	10.8E-10	31.6E-4	48.3E-4	10.8E-10	10.8E-10	21.7E-3

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	40.0E-3	50.0E-3
SN41	50.0E-3	40.0E-3
SN42		
SN43		
SN44		
SN45		
SN46	40.0E-3	40.0E-3
SN47	40.0E-3	40.0E-3
SN48	40.0E-3	40.0E-3
SN49	40.0E-3	40.0E-3
SN50	40.0E-3	40.0E-3
Statistics		
Min	00.0E+0	00.0E+0
Max	50.0E-3	40.0E-3
Mean	25.0E-3	24.0E-3
Sigma	21.7E-3	20.7E-3

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	50.0E-3	40.0E-3
SN41	40.0E-3	50.0E-3
SN42		40.0E-3
SN43		40.0E-3
SN44		40.0E-3
SN45		
SN46	40.0E-3	40.0E-3
SN47	40.0E-3	40.0E-3
SN48	40.0E-3	40.0E-3
SN49	40.0E-3	50.0E-3
SN50	40.0E-3	50.0E-3
Statistics		
Min	00.0E+0	00.0E+0
Max	40.0E-3	50.0E-3
Mean	24.0E-3	39.0E-3
Sigma	20.7E-3	14.5E-3

HIREX Engineering	Total Dose Test Report		Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.

Test conditions : Tid

Parameter : Input Low Leakage Current : I_{oI}IDQ07

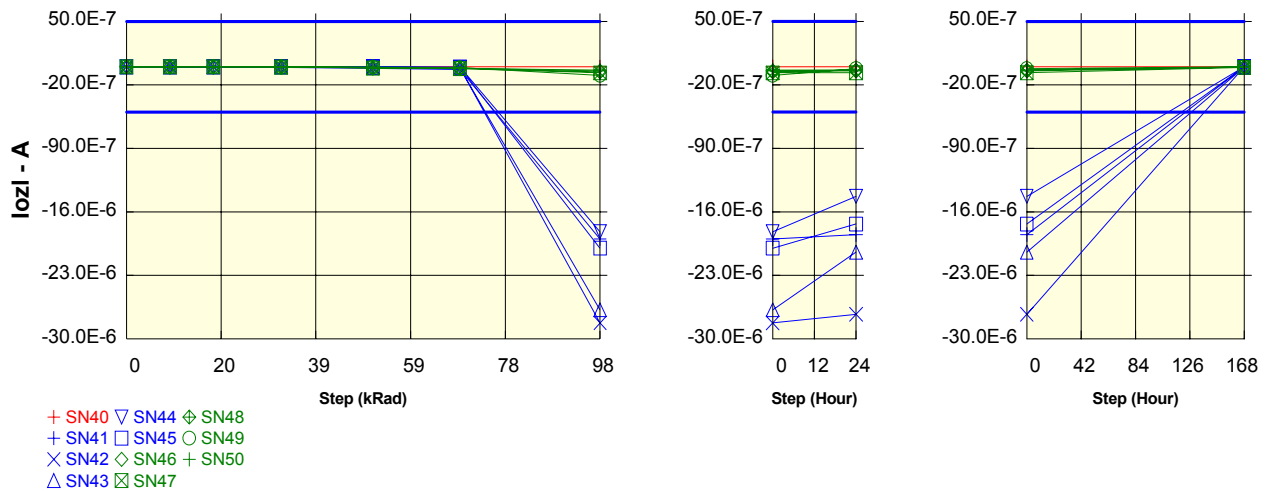
-

Unit : A

Spec Limit Min : -50.0E-7

Spec Limit Max : 50.0E-7

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	-45.0E-11	-20.0E-11	-25.0E-11	-35.0E-11	-25.0E-11	-20.0E-11	-25.0E-11
SN41	-60.0E-11	-13.5E-10	-81.5E-10	-52.7E-9	-18.6E-8	-28.1E-8	-19.0E-6
SN42	-25.0E-11	-30.0E-11	-90.0E-11	-11.9E-9	-75.1E-9	-15.8E-8	-28.3E-6
SN43	-30.0E-11	-30.0E-11	-12.0E-10	-12.9E-9	-81.4E-9	-18.9E-8	-26.8E-6
SN44	-30.0E-11	-25.0E-11	-35.0E-11	-27.5E-10	-17.4E-9	-40.9E-9	-18.2E-6
SN45	-30.0E-11	-25.0E-11	-65.0E-11	-57.5E-10	-41.3E-9	-98.0E-9	-20.0E-6
SN46	-30.0E-11	-25.0E-11	-12.5E-10	-13.6E-9	-13.4E-8	-15.4E-8	-58.3E-8
SN47	-45.0E-11	-55.0E-11	-31.0E-10	-30.9E-9	-14.1E-8	-20.9E-8	-67.6E-8
SN48	-30.0E-11	-20.0E-11	-12.5E-10	-12.5E-9	-63.9E-9	-18.9E-8	-45.1E-8
SN49	-30.0E-11	-25.0E-11	-85.0E-11	-78.5E-10	-42.6E-9	-95.5E-9	-96.0E-8
SN50	-30.0E-11	-30.0E-11	-90.0E-11	-12.2E-9	-87.3E-9	-16.8E-8	-37.2E-8
Statistics							
Min	-60.0E-11	-13.5E-10	-81.5E-10	-52.7E-9	-18.7E-8	-28.1E-8	-28.3E-6
Max	-25.0E-11	-20.0E-11	-35.0E-11	-27.5E-10	-17.4E-9	-40.9E-9	-37.2E-8
Mean	-34.0E-11	-40.0E-11	-18.6E-10	-16.3E-9	-87.0E-9	-15.8E-8	-11.5E-6
Sigma	10.5E-11	34.7E-11	23.3E-10	14.8E-9	52.3E-9	67.5E-9	11.9E-6

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	-25.0E-11	-25.0E-11
SN41	-19.0E-6	-18.5E-6
SN42	-28.3E-6	-27.3E-6
SN43	-26.8E-6	-20.5E-6
SN44	-18.2E-6	-14.3E-6
SN45	-20.0E-6	-17.4E-6
SN46	-58.3E-8	-36.8E-8
SN47	-67.6E-8	-67.1E-8
SN48	-45.1E-8	-46.5E-8
SN49	-96.0E-8	-21.9E-8
SN50	-37.2E-8	-34.5E-8
Statistics		
Min	-28.3E-6	-27.3E-6
Max	-37.2E-8	-21.9E-8
Mean	-11.5E-6	-10.0E-6
Sigma	11.9E-6	10.6E-6

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	-25.0E-11	-25.0E-11
SN41	-18.5E-6	-13.0E-9
SN42	-27.3E-6	-14.7E-9
SN43	-20.5E-6	-26.0E-9
SN44	-14.3E-6	-17.2E-9
SN45	-17.4E-6	-19.8E-9
SN46	-36.8E-8	-34.0E-9
SN47	-67.1E-8	-78.9E-9
SN48	-46.5E-8	-34.2E-9
SN49	-21.9E-8	-17.5E-9
SN50	-34.5E-8	-35.9E-9
Statistics		
Min	-27.3E-6	-78.9E-9
Max	-21.9E-8	-13.0E-9
Mean	-10.0E-6	-29.1E-9
Sigma	10.6E-6	19.5E-9

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.	

Test conditions : Tid

Parameter : Input Low Leakage Current : IozIDQ06

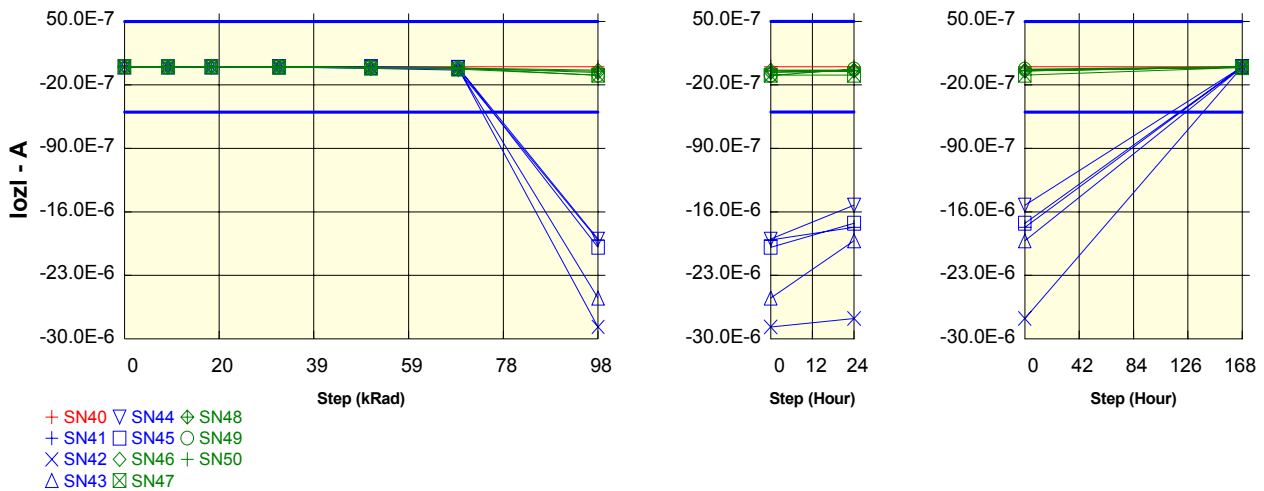
-

Unit : A

Spec Limit Min : -50.0E-7

Spec Limit Max : 50.0E-7

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	-30.0E-11	-10.0E-11	-15.0E-11	-35.0E-11	-25.0E-11	-15.0E-11	-25.0E-11
SN41	-55.0E-11	-11.5E-10	-78.5E-10	-50.2E-9	-18.3E-8	-36.9E-8	-19.1E-6
SN42	-25.0E-11	-25.0E-11	-10.5E-10	-14.4E-9	-78.6E-9	-14.9E-8	-28.7E-6
SN43	-25.0E-11	-25.0E-11	-18.0E-10	-14.9E-9	-99.5E-9	-18.6E-8	-25.5E-6
SN44	-25.0E-11	-25.0E-11	-55.0E-11	-36.5E-10	-25.3E-9	-65.4E-9	-19.0E-6
SN45	-20.0E-11	-25.0E-11	-90.0E-11	-53.5E-10	-41.9E-9	-88.7E-9	-19.9E-6
SN46	-25.0E-11	-25.0E-11	-14.5E-10	-14.8E-9	-14.9E-8	-14.0E-8	-64.8E-8
SN47	-35.0E-11	-60.0E-11	-31.0E-10	-31.1E-9	-15.1E-8	-26.0E-8	-93.1E-8
SN48	-25.0E-11	-30.0E-11	-13.0E-10	-13.8E-9	-59.2E-9	-14.7E-8	-36.7E-8
SN49	-25.0E-11	-30.0E-11	-10.0E-10	-10.1E-9	-54.7E-9	-15.8E-8	-93.6E-8
SN50	-30.0E-11	-35.0E-11	-12.5E-10	-10.4E-9	-73.7E-9	-19.5E-8	-50.0E-8
Statistics							
Min	-55.0E-11	-11.5E-10	-78.5E-10	-50.2E-9	-18.4E-8	-36.9E-8	-28.7E-6
Max	-20.0E-11	-25.0E-11	-55.0E-11	-36.5E-10	-25.3E-9	-65.4E-9	-36.7E-8
Mean	-29.0E-11	-39.5E-11	-20.3E-10	-16.9E-9	-91.7E-9	-17.6E-8	-11.6E-6
Sigma	99.4E-12	28.6E-11	21.6E-10	13.8E-9	52.9E-9	86.8E-9	11.8E-6

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	-25.0E-11	-15.0E-11
SN41	-19.1E-6	-17.7E-6
SN42	-28.7E-6	-27.8E-6
SN43	-25.5E-6	-19.2E-6
SN44	-19.0E-6	-15.3E-6
SN45	-19.9E-6	-17.3E-6
SN46	-64.8E-8	-46.3E-8
SN47	-93.1E-8	-92.9E-8
SN48	-36.7E-8	-37.8E-8
SN49	-93.6E-8	-26.8E-8
SN50	-50.0E-8	-47.8E-8
Statistics		
Min	-28.7E-6	-27.8E-6
Max	-36.7E-8	-26.9E-8
Mean	-11.6E-6	-99.7E-7
Sigma	11.8E-6	10.5E-6

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	-15.0E-11	-30.0E-11
SN41	-17.7E-6	-17.0E-9
SN42	-27.8E-6	-12.1E-9
SN43	-19.2E-6	-23.9E-9
SN44	-15.3E-6	-95.0E-10
SN45	-17.3E-6	-12.3E-9
SN46	-46.3E-8	-38.2E-9
SN47	-92.9E-8	-82.7E-9
SN48	-37.8E-8	-36.8E-9
SN49	-26.8E-8	-21.2E-9
SN50	-47.8E-8	-40.1E-9
Statistics		
Min	-27.8E-6	-82.7E-9
Max	-26.9E-8	-95.0E-10
Mean	-99.7E-7	-29.4E-9
Sigma	10.5E-6	21.9E-9

HIREX Engineering	Total Dose Test Report		Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.

Test conditions : Tid

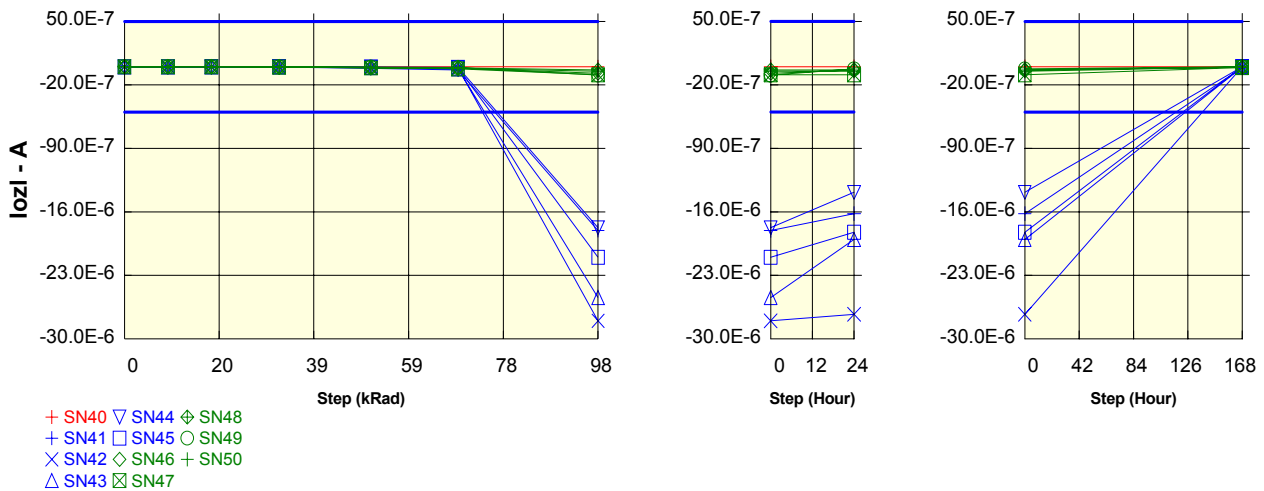
Parameter : Input Low Leakage Current : IolIDQ05

Unit : A

Spec Limit Min : -50.0E-7

Spec Limit Max : 50.0E-7

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	-30.0E-11	-15.0E-11	-20.0E-11	-20.0E-11	-20.0E-11	-15.0E-11	-15.0E-11
SN41	-40.0E-11	-95.0E-11	-61.5E-10	-44.3E-9	-18.4E-8	-34.7E-8	-18.1E-6
SN42	-25.0E-11	-20.0E-11	-16.5E-10	-18.3E-9	-88.7E-9	-16.4E-8	-28.0E-6
SN43	-20.0E-11	-25.0E-11	-12.5E-10	-18.2E-9	-10.1E-8	-23.3E-8	-25.5E-6
SN44	-25.0E-11	-20.0E-11	-75.0E-11	-78.5E-10	-29.7E-9	-59.4E-9	-17.8E-6
SN45	-20.0E-11	-20.0E-11	-60.0E-11	-57.0E-10	-54.2E-9	-13.9E-8	-21.0E-6
SN46	-20.0E-11	-25.0E-11	-13.5E-10	-27.6E-9	-12.9E-8	-16.2E-8	-71.4E-8
SN47	-30.0E-11	-60.0E-11	-39.0E-10	-29.1E-9	-13.5E-8	-24.0E-8	-89.7E-8
SN48	-25.0E-11	-25.0E-11	-10.0E-10	-10.3E-9	-51.4E-9	-12.9E-8	-35.3E-8
SN49	-20.0E-11	-20.0E-11	-85.0E-11	-84.0E-10	-39.4E-9	-94.6E-9	-91.4E-8
SN50	-25.0E-11	-25.0E-11	-14.0E-10	-15.5E-9	-75.8E-9	-16.6E-8	-49.4E-8
Statistics							
Min	-40.0E-11	-95.0E-11	-61.5E-10	-44.4E-9	-18.4E-8	-34.7E-8	-28.0E-6
Max	-20.0E-11	-20.0E-11	-60.0E-11	-57.0E-10	-29.7E-9	-59.4E-9	-35.4E-8
Mean	-25.0E-11	-33.5E-11	-18.9E-10	-18.5E-9	-89.0E-9	-17.3E-8	-11.4E-6
Sigma	62.4E-12	24.7E-11	17.6E-10	12.1E-9	49.2E-9	82.0E-9	11.7E-6

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	-15.0E-11	-20.0E-11
SN41	-18.1E-6	-16.2E-6
SN42	-28.0E-6	-27.3E-6
SN43	-25.5E-6	-19.1E-6
SN44	-17.8E-6	-13.9E-6
SN45	-21.0E-6	-18.3E-6
SN46	-71.4E-8	-34.5E-8
SN47	-89.7E-8	-88.7E-8
SN48	-35.3E-8	-36.1E-8
SN49	-91.4E-8	-23.7E-8
SN50	-49.4E-8	-48.6E-8
Statistics		
Min	-28.0E-6	-27.3E-6
Max	-35.4E-8	-23.7E-8
Mean	-11.4E-6	-97.0E-7
Sigma	11.7E-6	10.3E-6

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	-20.0E-11	-15.0E-11
SN41	-16.2E-6	-97.5E-9
SN42	-27.3E-6	-14.9E-9
SN43	-19.1E-6	-33.2E-9
SN44	-13.9E-6	-11.7E-9
SN45	-18.3E-6	-17.0E-9
SN46	-34.5E-8	-29.5E-9
SN47	-88.7E-8	-96.5E-9
SN48	-36.1E-8	-25.2E-9
SN49	-23.7E-8	-18.2E-9
SN50	-48.6E-8	-42.4E-9
Statistics		
Min	-27.3E-6	-97.5E-9
Max	-23.7E-8	-11.8E-9
Mean	-97.0E-7	-38.6E-9
Sigma	10.3E-6	32.1E-9

HIREX Engineering	Total Dose Test Report		Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.

Test conditions : Tid

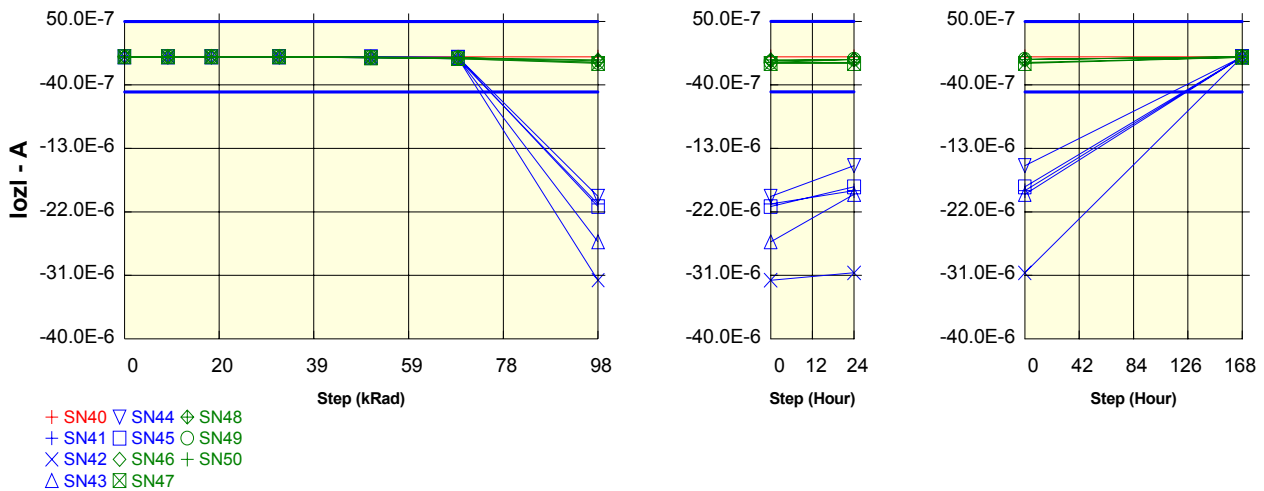
Parameter : Input Low Leakage Current : I_{ozIDQ04}

Unit : A

Spec Limit Min : -50.0E-7

Spec Limit Max : 50.0E-7

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	-30.0E-11	-10.0E-11	-20.0E-11	-25.0E-11	-20.0E-11	-35.0E-11	-15.0E-11
SN41	-55.0E-11	-12.0E-10	-49.0E-10	-40.6E-9	-16.3E-8	-31.4E-8	-20.9E-6
SN42	-25.0E-11	-30.0E-11	-23.0E-10	-25.3E-9	-12.8E-8	-24.4E-8	-31.7E-6
SN43	-25.0E-11	-25.0E-11	-80.0E-11	-13.2E-9	-82.3E-9	-22.7E-8	-26.3E-6
SN44	-25.0E-11	-30.0E-11	-65.0E-11	-49.5E-10	-36.3E-9	-78.1E-9	-19.8E-6
SN45	-25.0E-11	-20.0E-11	-13.5E-10	-11.7E-9	-58.7E-9	-12.1E-8	-21.3E-6
SN46	-25.0E-11	-25.0E-11	-12.0E-10	-18.5E-9	-14.3E-8	-16.1E-8	-61.5E-8
SN47	-40.0E-11	-55.0E-11	-32.5E-10	-26.6E-9	-14.9E-8	-28.9E-8	-96.0E-8
SN48	-25.0E-11	-25.0E-11	-10.0E-10	-12.6E-9	-66.1E-9	-16.4E-8	-43.4E-8
SN49	-25.0E-11	-35.0E-11	-19.5E-10	-14.3E-9	-90.1E-9	-13.5E-8	-83.2E-8
SN50	-25.0E-11	-45.0E-11	-33.5E-10	-28.9E-9	-12.5E-8	-29.1E-8	-82.4E-8
Statistics							
Min	-55.0E-11	-12.0E-10	-49.0E-10	-40.7E-9	-16.4E-8	-31.4E-8	-31.7E-6
Max	-25.0E-11	-20.0E-11	-65.0E-11	-49.5E-10	-36.3E-9	-78.2E-9	-43.4E-8
Mean	-29.5E-11	-41.0E-11	-20.8E-10	-19.7E-9	-10.4E-8	-20.3E-8	-12.4E-6
Sigma	10.1E-11	29.7E-11	13.8E-10	10.6E-9	43.2E-9	81.6E-9	12.7E-6

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	-15.0E-11	-15.0E-11
SN41	-20.9E-6	-19.0E-6
SN42	-31.7E-6	-30.7E-6
SN43	-26.3E-6	-19.5E-6
SN44	-19.8E-6	-15.5E-6
SN45	-21.3E-6	-18.5E-6
SN46	-61.5E-8	-36.2E-8
SN47	-96.0E-8	-96.0E-8
SN48	-43.4E-8	-43.2E-8
SN49	-83.2E-8	-36.1E-8
SN50	-82.4E-8	-80.5E-8
Statistics		
Min	-31.7E-6	-30.7E-6
Max	-43.4E-8	-36.1E-8
Mean	-12.4E-6	-10.6E-6
Sigma	12.7E-6	11.2E-6

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	-15.0E-11	-30.0E-11
SN41	-19.0E-6	-19.0E-9
SN42	-30.7E-6	-17.6E-9
SN43	-19.5E-6	-22.4E-9
SN44	-15.5E-6	-11.6E-9
SN45	-18.5E-6	-22.6E-9
SN46	-36.2E-8	-25.1E-9
SN47	-96.0E-8	-89.0E-9
SN48	-43.2E-8	-27.5E-9
SN49	-36.1E-8	-25.3E-9
SN50	-80.5E-8	-96.0E-9
Statistics		
Min	-30.7E-6	-96.0E-9
Max	-36.1E-8	-11.6E-9
Mean	-10.6E-6	-35.6E-9
Sigma	11.2E-6	30.4E-9

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.	

Test conditions : Tid

Parameter : Input Low Leakage Current : lozIDQ03

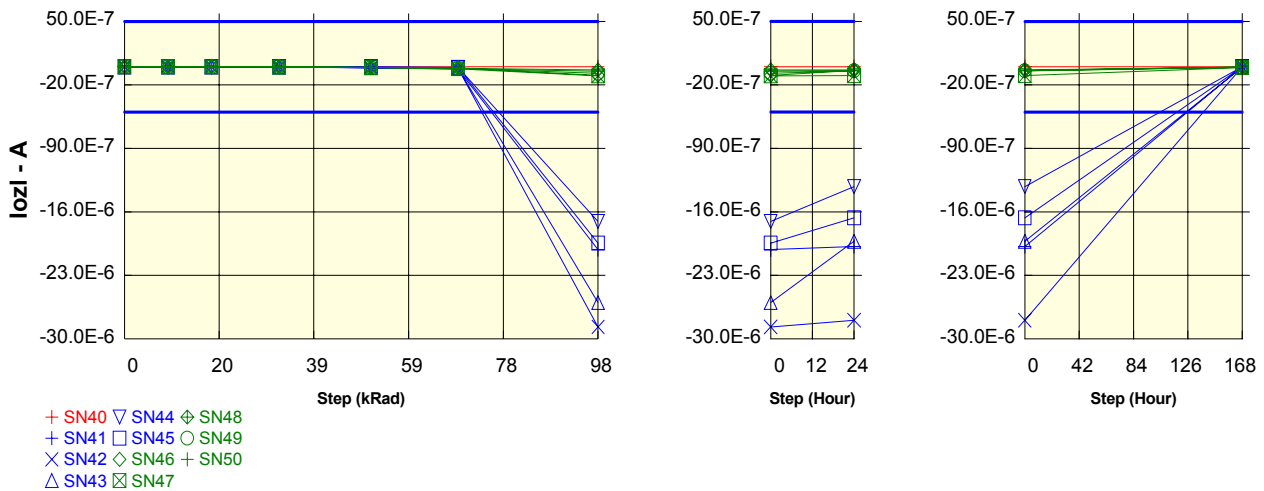
-

Unit : A

Spec Limit Min : -50.0E-7

Spec Limit Max : 50.0E-7

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	-20.0E-11	-15.0E-11	-20.0E-11	-30.0E-11	-20.0E-11	-20.0E-11	-20.0E-11
SN41	-40.0E-11	-75.0E-11	-41.5E-10	-28.3E-9	-12.7E-8	-26.0E-8	-20.2E-6
SN42	-20.0E-11	-25.0E-11	-17.5E-10	-21.9E-9	-13.1E-8	-16.9E-8	-28.7E-6
SN43	-25.0E-11	-30.0E-11	-10.5E-10	-16.5E-9	-87.1E-9	-17.5E-8	-26.0E-6
SN44	-25.0E-11	-20.0E-11	-65.0E-11	-61.5E-10	-31.9E-9	-67.1E-9	-17.1E-6
SN45	-25.0E-11	-15.0E-11	-50.0E-11	-47.0E-10	-34.4E-9	-10.0E-8	-19.5E-6
SN46	-20.0E-11	-25.0E-11	-12.0E-10	-12.8E-9	-10.1E-8	-12.8E-8	-93.8E-8
SN47	-35.0E-11	-60.0E-11	-32.5E-10	-28.9E-9	-10.4E-8	-22.3E-8	-10.1E-7
SN48	-25.0E-11	-25.0E-11	-10.0E-10	-92.5E-10	-73.6E-9	-17.4E-8	-35.1E-8
SN49	-25.0E-11	-25.0E-11	-12.5E-10	-11.2E-9	-79.3E-9	-16.7E-8	-71.3E-8
SN50	-30.0E-11	-30.0E-11	-14.5E-10	-15.0E-9	-95.3E-9	-20.8E-8	-48.6E-8
Statistics							
Min	-40.0E-11	-75.0E-11	-41.5E-10	-28.9E-9	-13.1E-8	-26.1E-8	-28.7E-6
Max	-20.0E-11	-15.0E-11	-50.0E-11	-47.0E-10	-32.0E-9	-67.1E-9	-35.1E-8
Mean	-27.0E-11	-33.0E-11	-16.3E-10	-15.5E-9	-86.4E-9	-16.7E-8	-11.5E-6
Sigma	63.2E-12	19.0E-11	11.7E-10	85.3E-10	33.5E-9	57.4E-9	11.8E-6

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	-20.0E-11	-20.0E-11
SN41	-20.2E-6	-19.8E-6
SN42	-28.7E-6	-28.0E-6
SN43	-26.0E-6	-19.3E-6
SN44	-17.1E-6	-13.2E-6
SN45	-19.5E-6	-16.7E-6
SN46	-93.8E-8	-39.3E-8
SN47	-10.1E-7	-98.0E-8
SN48	-35.1E-8	-35.5E-8
SN49	-71.3E-8	-44.1E-8
SN50	-48.6E-8	-47.5E-8
Statistics		
Min	-28.7E-6	-28.0E-6
Max	-35.1E-8	-35.5E-8
Mean	-11.5E-6	-99.5E-7
Sigma	11.8E-6	10.6E-6

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	-20.0E-11	-15.0E-11
SN41	-19.8E-6	-16.8E-9
SN42	-28.0E-6	-12.7E-9
SN43	-19.3E-6	-23.7E-9
SN44	-13.2E-6	-70.0E-10
SN45	-16.7E-6	-12.5E-9
SN46	-39.3E-8	-39.9E-9
SN47	-98.0E-8	-87.0E-9
SN48	-35.5E-8	-26.5E-9
SN49	-44.1E-8	-39.2E-9
SN50	-47.5E-8	-53.2E-9
Statistics		
Min	-28.0E-6	-87.0E-9
Max	-35.5E-8	-70.0E-10
Mean	-99.5E-7	-31.8E-9
Sigma	10.6E-6	24.3E-9

HIREX Engineering	Total Dose Test Report		Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.

Test conditions : Tid

Parameter : Input Low Leakage Current : I_{oI}IDQ02

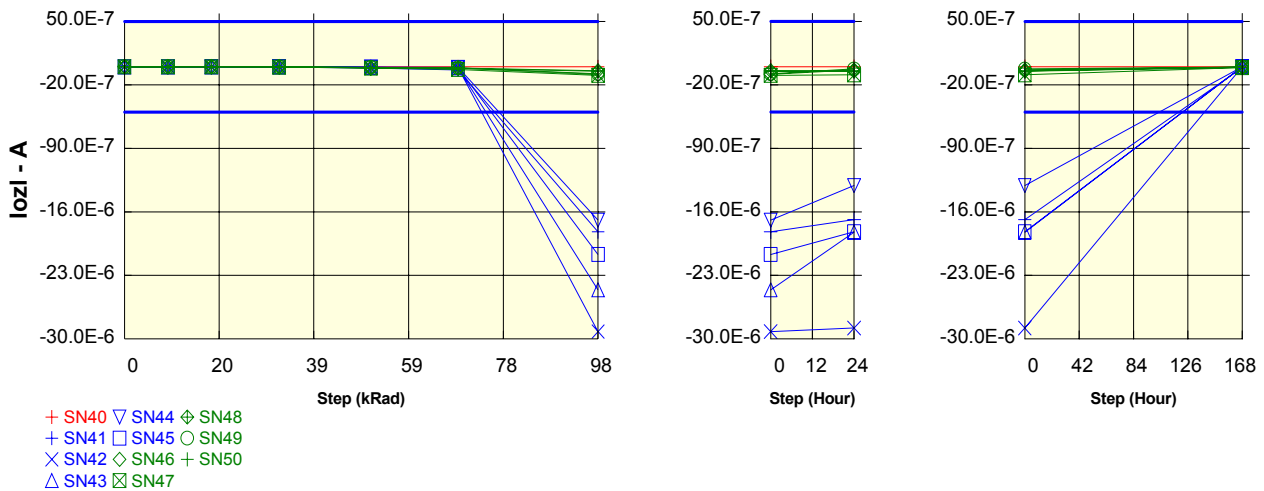
-

Unit : A

Spec Limit Min : -50.0E-7

Spec Limit Max : 50.0E-7

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	-25.0E-11	-50.0E-12	-20.0E-11	-20.0E-11	-20.0E-11	-20.0E-11	-20.0E-11
SN41	-40.0E-11	-75.0E-11	-30.5E-10	-24.7E-9	-15.4E-8	-36.3E-8	-18.2E-6
SN42	-25.0E-11	-25.0E-11	-80.0E-11	-97.5E-10	-68.3E-9	-10.4E-8	-29.2E-6
SN43	-25.0E-11	-25.0E-11	-80.0E-11	-10.2E-9	-63.9E-9	-13.5E-8	-24.6E-6
SN44	-20.0E-11	-20.0E-11	-70.0E-11	-55.5E-10	-30.5E-9	-59.3E-9	-16.9E-6
SN45	-15.0E-11	-15.0E-11	-60.0E-11	-74.5E-10	-56.4E-9	-10.9E-8	-20.7E-6
SN46	-15.0E-11	-20.0E-11	-10.5E-10	-17.4E-9	-15.7E-8	-14.1E-8	-82.8E-8
SN47	-25.0E-11	-55.0E-11	-30.5E-10	-35.3E-9	-15.4E-8	-30.2E-8	-93.6E-8
SN48	-20.0E-11	-30.0E-11	-18.0E-10	-12.7E-9	-82.4E-9	-16.1E-8	-43.4E-8
SN49	-25.0E-11	-30.0E-11	-10.5E-10	-98.0E-10	-52.9E-9	-11.0E-8	-77.3E-8
SN50	-25.0E-11	-35.0E-11	-15.0E-10	-15.7E-9	-10.3E-8	-19.1E-8	-49.7E-8
Statistics							
Min	-40.0E-11	-75.0E-11	-30.5E-10	-35.4E-9	-15.7E-8	-36.3E-8	-29.2E-6
Max	-15.0E-11	-15.0E-11	-60.0E-11	-55.5E-10	-30.5E-9	-59.3E-9	-43.4E-8
Mean	-23.5E-11	-33.0E-11	-14.4E-10	-14.9E-9	-92.1E-9	-16.7E-8	-11.3E-6
Sigma	70.9E-12	18.4E-11	92.5E-11	90.9E-10	47.1E-9	95.0E-9	11.7E-6

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	-20.0E-11	-15.0E-11
SN41	-18.2E-6	-16.9E-6
SN42	-29.2E-6	-28.8E-6
SN43	-24.6E-6	-18.3E-6
SN44	-16.9E-6	-13.1E-6
SN45	-20.7E-6	-18.2E-6
SN46	-82.8E-8	-34.2E-8
SN47	-93.6E-8	-90.3E-8
SN48	-43.4E-8	-45.2E-8
SN49	-77.3E-8	-24.9E-8
SN50	-49.7E-8	-50.1E-8
Statistics		
Min	-29.2E-6	-28.8E-6
Max	-43.4E-8	-24.9E-8
Mean	-11.3E-6	-97.6E-7
Sigma	11.7E-6	10.5E-6

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	-15.0E-11	-15.0E-11
SN41	-16.9E-6	-84.5E-9
SN42	-28.8E-6	-13.4E-9
SN43	-18.3E-6	-16.4E-9
SN44	-13.1E-6	-76.5E-10
SN45	-18.2E-6	-21.8E-9
SN46	-34.2E-8	-37.2E-9
SN47	-90.3E-8	-97.0E-9
SN48	-45.2E-8	-44.5E-9
SN49	-24.9E-8	-25.1E-9
SN50	-50.1E-8	-55.6E-9
Statistics		
Min	-28.8E-6	-97.0E-9
Max	-24.9E-8	-76.5E-10
Mean	-97.6E-7	-40.3E-9
Sigma	10.5E-6	30.5E-9

HIREX Engineering	Total Dose Test Report		Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.

Test conditions : Tid

Parameter : Input Low Leakage Current : IozIDQ01

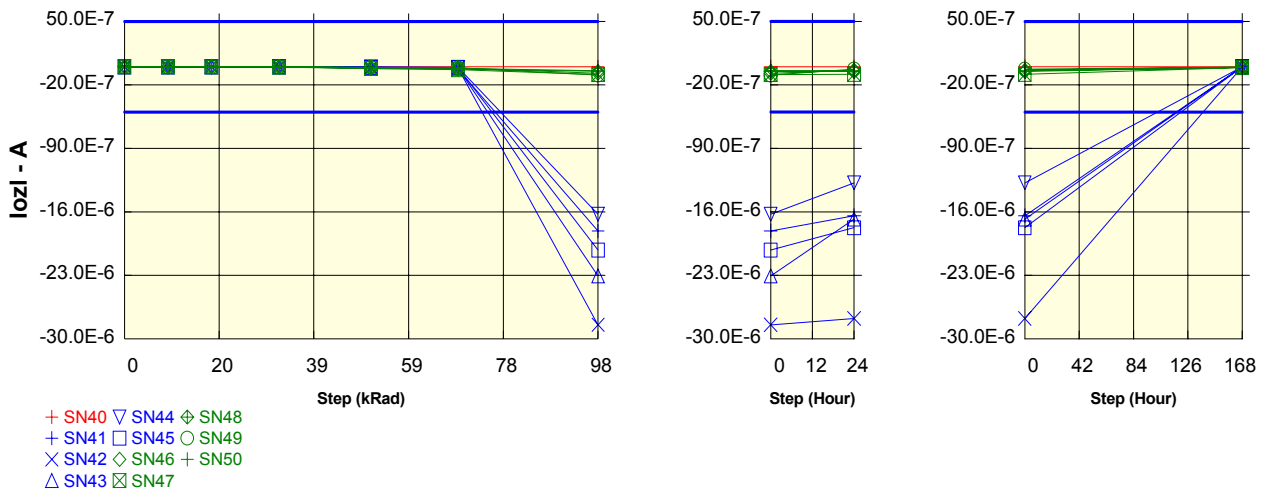
-

Unit : A

Spec Limit Min : -50.0E-7

Spec Limit Max : 50.0E-7

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	-20.0E-11	-15.0E-11	-15.0E-11	-25.0E-11	-15.0E-11	-15.0E-11	-20.0E-11
SN41	-45.0E-11	-12.0E-10	-73.5E-10	-45.2E-9	-16.1E-8	-27.3E-8	-18.1E-6
SN42	-20.0E-11	-25.0E-11	-13.5E-10	-16.6E-9	-10.9E-8	-14.0E-8	-28.5E-6
SN43	-25.0E-11	-25.0E-11	-12.0E-10	-24.9E-9	-86.4E-9	-15.8E-8	-23.1E-6
SN44	-20.0E-11	-20.0E-11	-50.0E-11	-36.5E-10	-20.9E-9	-59.7E-9	-16.3E-6
SN45	-20.0E-11	-25.0E-11	-70.0E-11	-58.5E-10	-56.0E-9	-12.1E-8	-20.2E-6
SN46	-25.0E-11	-25.0E-11	-95.0E-11	-10.7E-9	-18.2E-8	-13.2E-8	-71.4E-8
SN47	-35.0E-11	-60.0E-11	-36.0E-10	-36.8E-9	-19.5E-8	-32.7E-8	-86.6E-8
SN48	-20.0E-11	-30.0E-11	-14.0E-10	-17.3E-9	-95.0E-9	-26.0E-8	-50.4E-8
SN49	-20.0E-11	-30.0E-11	-28.0E-10	-16.4E-9	-57.6E-9	-11.2E-8	-92.8E-8
SN50	-30.0E-11	-40.0E-11	-19.5E-10	-19.8E-9	-80.5E-9	-16.8E-8	-44.8E-8
Statistics							
Min	-45.0E-11	-12.0E-10	-73.5E-10	-45.2E-9	-19.5E-8	-32.7E-8	-28.5E-6
Max	-20.0E-11	-20.0E-11	-50.0E-11	-36.5E-10	-20.9E-9	-59.8E-9	-44.8E-8
Mean	-26.0E-11	-40.0E-11	-21.8E-10	-19.7E-9	-10.4E-8	-17.5E-8	-11.0E-6
Sigma	84.3E-12	30.4E-11	20.5E-10	13.0E-9	57.5E-9	83.7E-9	11.3E-6

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	-20.0E-11	-15.0E-11
SN41	-18.1E-6	-16.4E-6
SN42	-28.5E-6	-27.8E-6
SN43	-23.1E-6	-16.8E-6
SN44	-16.3E-6	-12.8E-6
SN45	-20.2E-6	-17.8E-6
SN46	-71.4E-8	-37.7E-8
SN47	-86.6E-8	-84.7E-8
SN48	-50.4E-8	-53.1E-8
SN49	-92.8E-8	-26.0E-8
SN50	-44.8E-8	-44.3E-8
Statistics		
Min	-28.5E-6	-27.8E-6
Max	-44.8E-8	-26.0E-8
Mean	-11.0E-6	-94.0E-7
Sigma	11.3E-6	10.1E-6

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	-15.0E-11	-10.0E-11
SN41	-16.4E-6	-17.0E-9
SN42	-27.8E-6	-12.9E-9
SN43	-16.8E-6	-16.4E-9
SN44	-12.8E-6	-49.5E-10
SN45	-17.8E-6	-15.3E-9
SN46	-37.7E-8	-30.5E-9
SN47	-84.7E-8	-89.4E-9
SN48	-53.1E-8	-52.2E-9
SN49	-26.0E-8	-23.3E-9
SN50	-44.3E-8	-64.8E-9
Statistics		
Min	-27.8E-6	-89.4E-9
Max	-26.0E-8	-49.5E-10
Mean	-94.0E-7	-32.7E-9
Sigma	10.1E-6	27.3E-9

HIREX Engineering	Total Dose Test Report		Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.

Test conditions : Tid

Parameter : Input Low Leakage Current : I_{ol}IDQ00

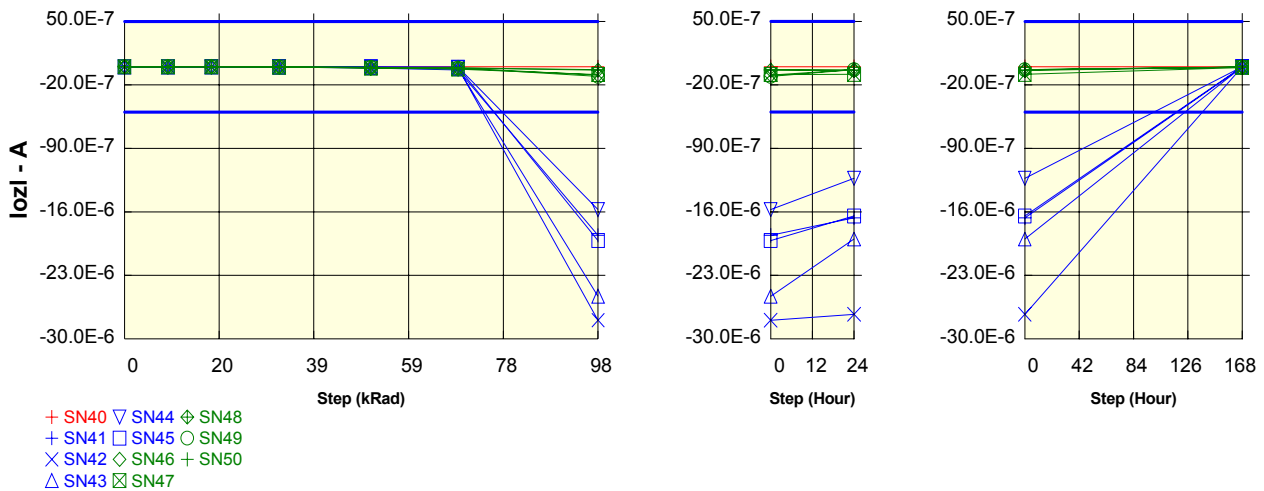
-

Unit : A

Spec Limit Min : -50.0E-7

Spec Limit Max : 50.0E-7

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	-25.0E-11	-10.0E-11	-20.0E-11	-25.0E-11	-20.0E-11	-20.0E-11	-20.0E-11
SN41	-45.0E-11	-16.5E-10	-65.0E-10	-38.7E-9	-16.3E-8	-35.3E-8	-18.6E-6
SN42	-15.0E-11	-25.0E-11	-85.0E-11	-12.0E-9	-71.7E-9	-12.3E-8	-28.0E-6
SN43	-25.0E-11	-25.0E-11	-20.0E-10	-28.8E-9	-90.3E-9	-19.4E-8	-25.3E-6
SN44	-20.0E-11	-20.0E-11	-45.0E-11	-37.5E-10	-27.6E-9	-50.8E-9	-15.8E-6
SN45	-20.0E-11	-10.0E-11	-35.0E-11	-23.5E-10	-26.0E-9	-71.0E-9	-19.2E-6
SN46	-20.0E-11	-10.0E-11	-85.0E-11	-11.6E-9	-14.3E-8	-14.3E-8	-91.3E-8
SN47	-25.0E-11	-60.0E-11	-32.5E-10	-29.0E-9	-15.0E-8	-26.1E-8	-85.2E-8
SN48	-25.0E-11	-25.0E-11	-11.0E-10	-12.4E-9	-65.6E-9	-15.8E-8	-38.4E-8
SN49	-20.0E-11	-20.0E-11	-13.5E-10	-22.6E-9	-71.7E-9	-14.8E-8	-10.6E-7
SN50	-20.0E-11	-20.0E-11	-13.0E-10	-11.5E-9	-69.2E-9	-13.5E-8	-33.2E-8
Statistics							
Min	-45.0E-11	-16.5E-10	-65.0E-10	-38.7E-9	-16.3E-8	-35.4E-8	-28.0E-6
Max	-15.0E-11	-10.0E-11	-35.0E-11	-23.5E-10	-26.1E-9	-50.8E-9	-33.2E-8
Mean	-23.5E-11	-38.0E-11	-18.0E-10	-17.3E-9	-87.8E-9	-16.4E-8	-11.0E-6
Sigma	81.8E-12	46.7E-11	18.5E-10	11.9E-9	48.7E-9	88.8E-9	11.4E-6

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	-20.0E-11	-20.0E-11
SN41	-18.6E-6	-16.7E-6
SN42	-28.0E-6	-27.3E-6
SN43	-25.3E-6	-19.0E-6
SN44	-15.8E-6	-12.3E-6
SN45	-19.2E-6	-16.5E-6
SN46	-91.3E-8	-31.2E-8
SN47	-85.2E-8	-83.2E-8
SN48	-38.4E-8	-39.6E-8
SN49	-10.6E-7	-32.1E-8
SN50	-33.2E-8	-33.9E-8
Statistics		
Min	-28.0E-6	-27.3E-6
Max	-33.2E-8	-31.2E-8
Mean	-11.0E-6	-93.9E-7
Sigma	11.4E-6	10.1E-6

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	-20.0E-11	-10.0E-11
SN41	-16.7E-6	-35.5E-9
SN42	-27.3E-6	-12.6E-9
SN43	-19.0E-6	-18.6E-9
SN44	-12.3E-6	-78.5E-10
SN45	-16.5E-6	-11.9E-9
SN46	-31.2E-8	-26.5E-9
SN47	-83.2E-8	-81.2E-9
SN48	-39.6E-8	-33.9E-9
SN49	-32.1E-8	-34.2E-9
SN50	-33.9E-8	-29.2E-9
Statistics		
Min	-27.3E-6	-81.3E-9
Max	-31.2E-8	-78.5E-10
Mean	-93.9E-7	-29.1E-9
Sigma	10.1E-6	20.9E-9

HIREX Engineering	Total Dose Test Report		Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.

Test conditions : Tid

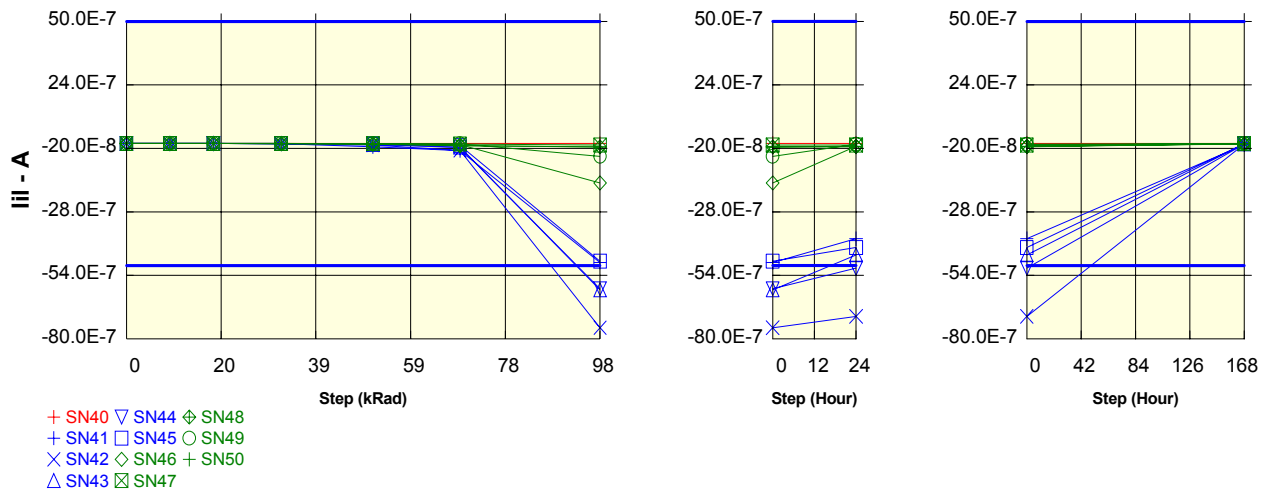
Parameter : Input Low Leakage Current : I_{IL}CLK

Unit : A

Spec Limit Min : -50.0E-7

Spec Limit Max : 50.0E-7

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	-10.0E-11	-10.0E-11	-10.0E-11	-10.0E-11	-10.0E-11	-15.0E-11	-10.0E-11
SN41	00.0E+0	-10.0E-11	-25.0E-11	-13.6E-9	-14.2E-8	-29.9E-8	-48.7E-7
SN42	-10.0E-11	-20.0E-11	-45.0E-11	-55.0E-10	-63.1E-9	-28.5E-8	-75.5E-7
SN43	-50.0E-12	-10.0E-11	-25.0E-11	-44.0E-10	-41.6E-9	-14.5E-8	-60.0E-7
SN44	-10.0E-11	-10.0E-11	-20.0E-11	-50.0E-10	-30.0E-9	-17.2E-8	-59.5E-7
SN45	-10.0E-11	-50.0E-12	-10.0E-11	-45.0E-11	-18.2E-9	-84.0E-9	-48.2E-7
SN46	-15.0E-11	-50.0E-12	-45.0E-11	-72.5E-10	-90.5E-10	-51.4E-9	-16.2E-7
SN47	-50.0E-12	-10.0E-11	-10.0E-11	-10.0E-10	-93.0E-10	-18.8E-9	-65.4E-9
SN48	-10.0E-11	-15.0E-11	-25.0E-11	-66.0E-10	-32.5E-9	-90.6E-9	-13.7E-8
SN49	-50.0E-12	-10.0E-11	-10.0E-11	-60.0E-11	-47.0E-10	-78.5E-10	-53.1E-8
SN50	-10.0E-11	-50.0E-12	-20.0E-11	-19.0E-10	-25.0E-9	-83.8E-9	-14.8E-8
Statistics							
Min	-15.0E-11	-20.0E-11	-45.0E-11	-13.7E-9	-14.2E-8	-30.0E-8	-75.5E-7
Max	00.0E+0	-50.0E-12	-10.0E-11	-45.0E-11	-47.0E-10	-78.5E-10	-65.5E-9
Mean	-80.0E-12	-10.0E-11	-23.5E-11	-46.4E-10	-37.5E-9	-12.4E-8	-31.7E-7
Sigma	42.2E-12	47.1E-12	12.9E-11	40.5E-10	40.5E-9	10.2E-8	29.4E-7

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	-10.0E-11	-15.0E-11
SN41	-48.7E-7	-39.0E-7
SN42	-75.5E-7	-70.8E-7
SN43	-60.0E-7	-45.6E-7
SN44	-59.5E-7	-51.0E-7
SN45	-48.2E-7	-42.6E-7
SN46	-16.2E-7	-11.2E-8
SN47	-65.4E-9	-63.1E-9
SN48	-13.7E-8	-11.5E-8
SN49	-53.1E-8	-29.4E-9
SN50	-14.8E-8	-14.0E-8
Statistics		
Min	-75.5E-7	-70.8E-7
Max	-65.5E-9	-29.4E-9
Mean	-31.7E-7	-25.4E-7
Sigma	29.4E-7	27.1E-7

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	-15.0E-11	-50.0E-12
SN41	-39.0E-7	-46.7E-9
SN42	-70.8E-7	-23.3E-9
SN43	-45.6E-7	-56.0E-10
SN44	-51.0E-7	-17.2E-9
SN45	-42.6E-7	-10.6E-9
SN46	-11.2E-8	-15.1E-9
SN47	-63.1E-9	-67.0E-10
SN48	-11.5E-8	-53.0E-10
SN49	-29.4E-9	-90.0E-11
SN50	-14.0E-8	-11.1E-9
Statistics		
Min	-70.8E-7	-46.8E-9
Max	-29.4E-9	-90.0E-11
Mean	-25.4E-7	-14.3E-9
Sigma	27.1E-7	13.2E-9

HIREX Engineering	Total Dose Test Report		Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.

Test conditions : Tid

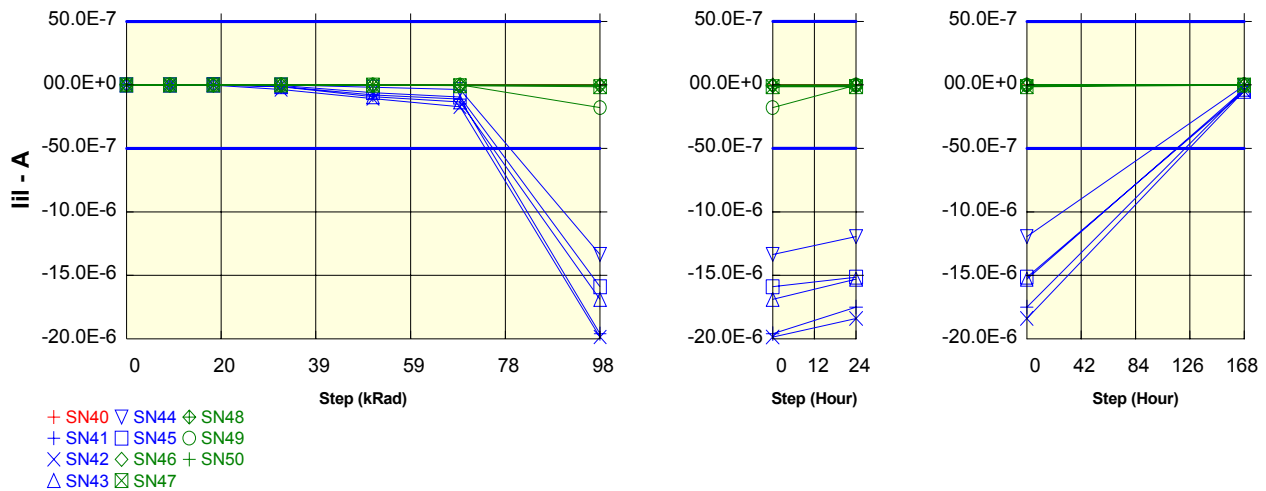
Parameter : Input Low Leakage Current : I_{IL}CKE

Unit : A

Spec Limit Min : -50.0E-7

Spec Limit Max : 50.0E-7

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	-50.0E-12	-50.0E-12	-50.0E-12	-10.0E-11	-50.0E-12	-10.0E-11	-50.0E-12
SN41	-10.0E-11	-10.0E-11	-54.5E-10	-12.6E-8	-78.4E-8	-11.3E-7	-19.6E-6
SN42	-10.0E-11	-20.0E-11	-11.6E-9	-37.5E-8	-10.8E-7	-17.3E-7	-19.9E-6
SN43	-50.0E-12	-50.0E-12	-80.5E-10	-13.8E-8	-93.4E-8	-13.4E-7	-16.9E-6
SN44	-50.0E-12	-10.0E-11	-15.0E-11	-74.5E-10	-18.3E-8	-35.9E-8	-13.4E-6
SN45	-50.0E-12	-10.0E-11	-48.0E-10	-46.8E-9	-61.5E-8	-96.0E-8	-15.9E-6
SN46	-10.0E-11	-50.0E-12	-10.0E-11	-55.0E-11	-13.2E-9	-24.5E-10	-94.5E-10
SN47	-10.0E-11	-30.0E-11	-10.5E-10	-41.5E-10	-13.5E-9	-55.8E-9	-13.5E-8
SN48	-50.0E-12	-50.0E-12	-30.0E-11	-26.0E-10	-10.6E-9	-47.2E-9	-87.2E-9
SN49	-50.0E-12	-50.0E-12	-10.0E-11	-20.5E-10	-10.5E-9	-83.5E-10	-17.9E-7
SN50	-15.0E-11	-50.0E-12	-10.0E-11	-75.0E-11	-72.5E-10	-21.3E-9	-53.7E-9
Statistics							
Min	-15.0E-11	-30.0E-11	-11.6E-9	-37.5E-8	-10.8E-7	-17.3E-7	-19.9E-6
Max	-50.0E-12	-50.0E-12	-10.0E-11	-55.0E-11	-72.5E-10	-24.5E-10	-94.5E-10
Mean	-80.0E-12	-10.5E-11	-31.7E-10	-70.2E-9	-36.5E-8	-56.4E-8	-87.7E-7
Sigma	35.0E-12	83.2E-12	41.1E-10	11.9E-8	43.8E-8	65.8E-8	90.0E-7

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	-50.0E-12	-10.0E-11
SN41	-19.9E-6	-17.5E-6
SN42	-19.6E-6	-18.4E-6
SN43	-16.9E-6	-15.3E-6
SN44	-13.4E-6	-12.0E-6
SN45	-15.9E-6	-15.2E-6
SN46	-94.5E-10	-72.0E-10
SN47	-13.5E-8	-13.9E-8
SN48	-87.2E-9	-85.1E-9
SN49	-17.9E-7	-25.7E-9
SN50	-53.7E-9	-49.3E-9
Statistics		
Min	-19.9E-6	-18.4E-6
Max	-94.5E-10	-72.0E-10
Mean	-87.7E-7	-78.6E-7
Sigma	90.0E-7	83.9E-7

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	-10.0E-11	-50.0E-12
SN41	-17.5E-6	-31.8E-8
SN42	-18.4E-6	-46.1E-8
SN43	-15.3E-6	-34.2E-8
SN44	-12.0E-6	-49.9E-9
SN45	-15.2E-6	-50.1E-8
SN46	-72.0E-10	-40.0E-11
SN47	-13.9E-8	-15.5E-9
SN48	-85.1E-9	-63.5E-10
SN49	-25.7E-9	-25.0E-10
SN50	-49.3E-9	-27.0E-10
Statistics		
Min	-18.4E-6	-50.2E-8
Max	-72.0E-10	-40.0E-11
Mean	-78.6E-7	-17.0E-8
Sigma	83.9E-7	21.0E-8

HIREX Engineering	Total Dose Test Report		Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.

Test conditions : Tid

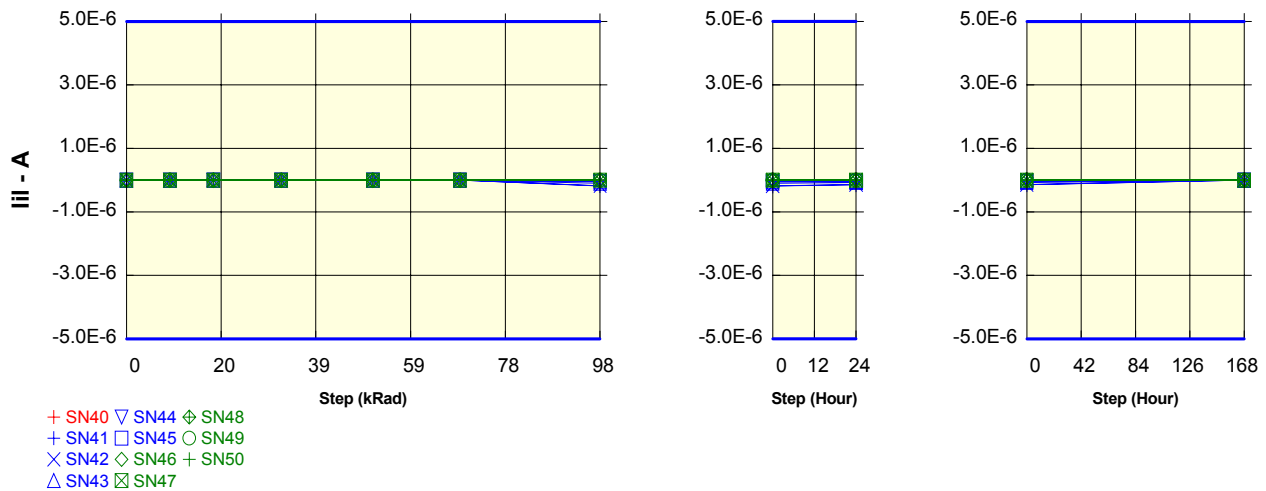
Parameter : Input Low Leakage Current : I_{il}/RAS

Unit : A

Spec Limit Min : -5.0E-6

Spec Limit Max : 5.0E-6

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	-1.5E-10	0.0E+0	0.0E+0	-1.5E-10	-1.0E-10	-1.0E-10	-5.0E-11
SN41	-5.0E-11	-5.0E-11	-5.0E-11	-1.0E-10	-1.0E-10	0.0E+0	-1.9E-7
SN42	-1.0E-10	-1.0E-10	-5.0E-11	-1.0E-10	-1.0E-10	-5.0E-11	-1.8E-7
SN43	-1.0E-10	-5.0E-11	0.0E+0	-1.5E-10	0.0E+0	-1.0E-10	-9.8E-8
SN44	-1.0E-10	-1.0E-10	0.0E+0	-1.0E-10	-5.0E-11	0.0E+0	-4.6E-8
SN45	-5.0E-11	-1.0E-10	-5.0E-11	-1.0E-10	0.0E+0	-1.0E-10	-4.9E-8
SN46	-1.5E-10	-5.0E-11	-5.0E-11	-5.0E-11	-5.0E-11	-5.0E-11	-5.0E-11
SN47	-1.0E-10	-1.5E-10	-5.0E-11	-5.0E-11	-1.0E-10	-5.0E-11	-5.0E-11
SN48	-5.0E-11	-5.0E-11	-5.0E-11	-5.0E-11	-1.0E-10	-5.0E-11	-1.0E-10
SN49	-5.0E-11	-5.0E-11	-1.0E-10	-1.0E-10	0.0E+0	-1.0E-10	0.0E+0
SN50	-5.0E-11	-1.0E-10	-5.0E-11	-5.0E-11	-5.0E-11	-5.0E-11	-5.0E-11
Statistics							
Min	-1.5E-10	-1.5E-10	-1.0E-10	-1.5E-10	-1.0E-10	-1.0E-10	-1.9E-7
Max	-5.0E-11	-5.0E-11	0.0E+0	-5.0E-11	0.0E+0	0.0E+0	0.0E+0
Mean	-8.0E-11	-8.0E-11	-4.5E-11	-8.5E-11	-5.5E-11	-5.5E-11	-5.6E-8
Sigma	3.5E-11	3.5E-11	2.8E-11	3.4E-11	4.4E-11	3.7E-11	7.5E-8

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	-5.0E-11	-1.0E-10
SN41	-1.9E-7	-1.5E-7
SN42	-1.8E-7	-1.4E-7
SN43	-9.8E-8	-7.4E-8
SN44	-4.6E-8	-3.6E-8
SN45	-4.9E-8	-4.5E-8
SN46	-5.0E-11	-1.0E-10
SN47	-5.0E-11	-1.5E-10
SN48	-1.0E-10	-1.5E-10
SN49	0.0E+0	-5.0E-11
SN50	-5.0E-11	-5.0E-11
Statistics		
Min	-1.9E-7	-1.5E-7
Max	0.0E+0	-5.0E-11
Mean	-5.6E-8	-4.5E-8
Sigma	7.5E-8	5.9E-8

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	-1.0E-10	-1.0E-10
SN41	-1.5E-7	-5.0E-11
SN42	-1.4E-7	-5.0E-11
SN43	-7.4E-8	-5.0E-11
SN44	-3.6E-8	-1.5E-10
SN45	-4.5E-8	-5.0E-11
SN46	-1.0E-10	-1.0E-10
SN47	-1.5E-10	-5.0E-11
SN48	-1.5E-10	-1.0E-10
SN49	-5.0E-11	-1.0E-10
SN50	-5.0E-11	-5.0E-11
Statistics		
Min	-1.5E-7	-1.5E-10
Max	-5.0E-11	-5.0E-11
Mean	-4.5E-8	-7.5E-11
Sigma	5.9E-8	3.5E-11

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.	

Test conditions : Tid

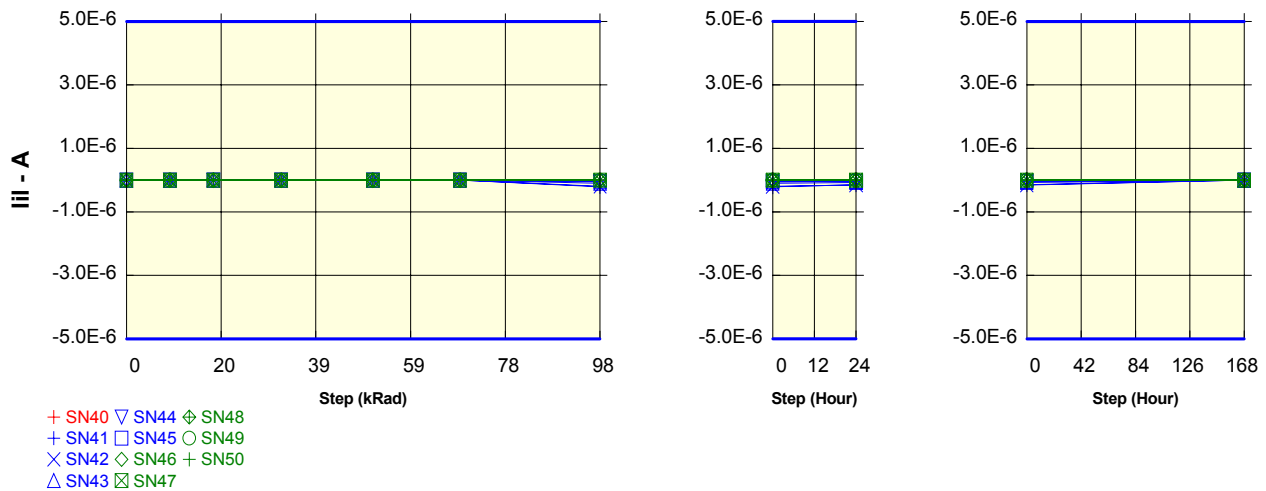
Parameter : Input Low Leakage Current : I_{il}/CAS

Unit : A

Spec Limit Min : -5.0E-6

Spec Limit Max : 5.0E-6

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	-5.0E-11	-5.0E-11	-5.0E-11	-1.5E-10	-5.0E-11	-1.0E-10	-1.0E-10
SN41	0.0E+0	-5.0E-11	-5.0E-11	-5.0E-11	-5.0E-11	0.0E+0	-2.1E-7
SN42	-1.5E-10	-1.0E-10	-5.0E-11	-1.0E-10	0.0E+0	-5.0E-11	-2.0E-7
SN43	-1.0E-10	-5.0E-11	-1.0E-10	-5.0E-11	-5.0E-11	-1.0E-10	-1.0E-7
SN44	-1.5E-10	-1.5E-10	-5.0E-11	-1.0E-10	-5.0E-11	0.0E+0	-4.5E-8
SN45	-2.5E-10	-1.0E-10	0.0E+0	-1.5E-10	-5.0E-11	-5.0E-11	-4.7E-8
SN46	-2.0E-10	-5.0E-11	-5.0E-11	-1.0E-10	-5.0E-11	-5.0E-11	-5.0E-11
SN47	-2.0E-10	-1.0E-10	-5.0E-11	-5.0E-11	-5.0E-11	-5.0E-11	-5.0E-11
SN48	-1.0E-10	-5.0E-11	-5.0E-11	-5.0E-11	-5.0E-11	-5.0E-11	-1.0E-10
SN49	-1.0E-10	-1.0E-10	-5.0E-11	-1.0E-10	0.0E+0	-1.0E-10	-5.0E-11
SN50	-1.0E-10	-5.0E-11	-5.0E-11	-5.0E-11	-5.0E-11	-5.0E-11	-5.0E-11
Statistics							
Min	-2.5E-10	-1.5E-10	-1.0E-10	-1.5E-10	-5.0E-11	-1.0E-10	-2.1E-7
Max	0.0E+0	-5.0E-11	0.0E+0	-5.0E-11	0.0E+0	0.0E+0	-5.0E-11
Mean	-1.4E-10	-8.0E-11	-5.0E-11	-8.0E-11	-4.0E-11	-5.0E-11	-6.1E-8
Sigma	7.1E-11	3.5E-11	2.4E-11	3.5E-11	2.1E-11	3.3E-11	8.3E-8

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	-1.0E-10	-1.0E-10
SN41	-2.1E-7	-1.5E-7
SN42	-2.0E-7	-1.6E-7
SN43	-1.0E-7	-7.3E-8
SN44	-4.5E-8	-3.6E-8
SN45	-4.7E-8	-4.2E-8
SN46	-5.0E-11	-5.0E-11
SN47	-5.0E-11	-5.0E-11
SN48	-1.0E-10	-5.0E-11
SN49	-5.0E-11	-5.0E-11
SN50	-5.0E-11	-1.0E-10
Statistics		
Min	-2.1E-7	-1.6E-7
Max	-5.0E-11	-5.0E-11
Mean	-6.1E-8	-4.6E-8
Sigma	8.3E-8	6.2E-8

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	-1.0E-10	-5.0E-11
SN41	-1.5E-7	-5.0E-11
SN42	-1.6E-7	0.0E+0
SN43	-7.3E-8	-5.0E-11
SN44	-3.6E-8	-5.0E-11
SN45	-4.2E-8	-5.0E-11
SN46	-5.0E-11	-5.0E-11
SN47	-5.0E-11	-5.0E-11
SN48	-5.0E-11	-5.0E-11
SN49	-5.0E-11	-1.0E-10
SN50	-1.0E-10	0.0E+0
Statistics		
Min	-1.6E-7	-1.0E-10
Max	-5.0E-11	0.0E+0
Mean	-4.6E-8	-4.5E-11
Sigma	6.2E-8	2.8E-11

HIREX Engineering	Total Dose Test Report		Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.

Test conditions : Tid

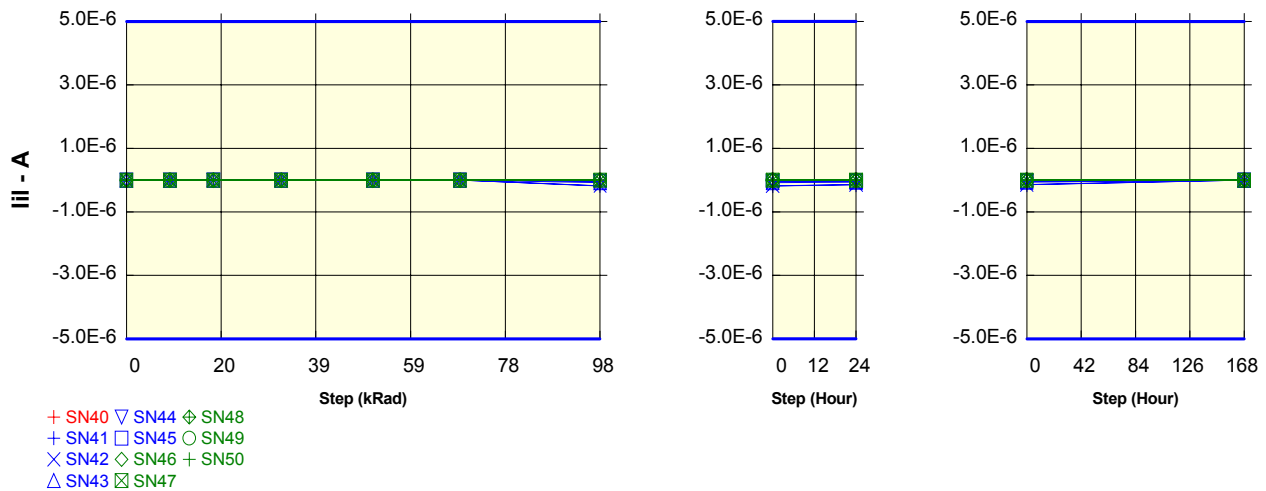
Parameter : Input Low Leakage Current : I_{il}/WE

Unit : A

Spec Limit Min : -5.0E-6

Spec Limit Max : 5.0E-6

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	-1.5E-10	-5.0E-11	-5.0E-11	-1.0E-10	-5.0E-11	-1.0E-10	-1.5E-10
SN41	-1.5E-10	-5.0E-11	-5.0E-11	-1.5E-10	-5.0E-11	-5.0E-11	-1.8E-7
SN42	-1.5E-10	-1.5E-10	0.0E+0	-1.5E-10	-5.0E-11	-1.0E-10	-1.8E-7
SN43	-5.0E-11	-1.0E-10	0.0E+0	-1.5E-10	-5.0E-11	-1.0E-10	-8.4E-8
SN44	-1.0E-10	-2.0E-10	-5.0E-11	-1.0E-10	-5.0E-11	-1.0E-10	-3.0E-8
SN45	0.0E+0	-1.0E-10	0.0E+0	-1.0E-10	-5.0E-11	-1.0E-10	-3.6E-8
SN46	-1.0E-10	-1.0E-10	0.0E+0	-5.0E-11	-1.0E-10	-1.0E-10	-1.0E-10
SN47	-1.0E-10	-1.0E-10	-5.0E-11	-1.0E-10	0.0E+0	0.0E+0	-5.0E-11
SN48	0.0E+0	-1.5E-10	-5.0E-11	-1.0E-10	-5.0E-11	-1.0E-10	-1.5E-10
SN49	-5.0E-11	-1.5E-10	-5.0E-11	-1.0E-10	-5.0E-11	-1.0E-10	-1.0E-10
SN50	-5.0E-11	-1.0E-10	-5.0E-11	-5.0E-11	-1.0E-10	0.0E+0	-5.0E-11
Statistics							
Min	-1.5E-10	-2.0E-10	-5.0E-11	-1.5E-10	-1.0E-10	-1.0E-10	-1.8E-7
Max	0.0E+0	-5.0E-11	0.0E+0	-5.0E-11	0.0E+0	0.0E+0	-5.0E-11
Mean	-7.5E-11	-1.2E-10	-3.0E-11	-1.1E-10	-5.5E-11	-7.5E-11	-5.1E-8
Sigma	5.4E-11	4.2E-11	2.6E-11	3.7E-11	2.8E-11	4.2E-11	7.3E-8

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	-1.5E-10	-5.0E-11
SN41	-1.8E-7	-1.5E-7
SN42	-1.8E-7	-1.4E-7
SN43	-8.4E-8	-6.2E-8
SN44	-3.0E-8	-2.3E-8
SN45	-3.6E-8	-3.3E-8
SN46	-1.0E-10	-1.0E-10
SN47	-5.0E-11	-5.0E-11
SN48	-1.5E-10	-1.0E-10
SN49	-1.0E-10	-5.0E-11
SN50	-5.0E-11	-1.0E-10
Statistics		
Min	-1.8E-7	-1.5E-7
Max	-5.0E-11	-5.0E-11
Mean	-5.1E-8	-4.1E-8
Sigma	7.3E-8	5.8E-8

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	-5.0E-11	-1.5E-10
SN41	-1.5E-7	-2.5E-10
SN42	-1.4E-7	-2.5E-10
SN43	-6.2E-8	-1.5E-10
SN44	-2.3E-8	-1.5E-10
SN45	-3.3E-8	-1.5E-10
SN46	-1.0E-10	-1.0E-10
SN47	-5.0E-11	-1.5E-10
SN48	-1.0E-10	-1.5E-10
SN49	-5.0E-11	-1.0E-10
SN50	-1.0E-10	-1.0E-10
Statistics		
Min	-1.5E-7	-2.5E-10
Max	-5.0E-11	-1.0E-10
Mean	-4.1E-8	-1.6E-10
Sigma	5.8E-8	5.5E-11

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.	

Test conditions : Tid

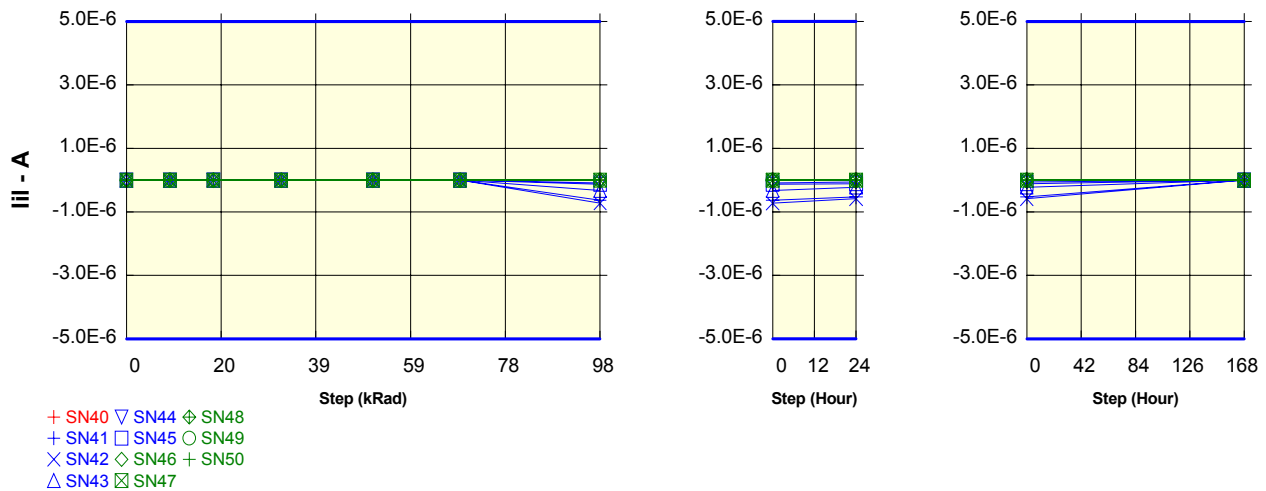
Parameter : Input Low Leakage Current : I_{IL}BA1

Unit : A

Spec Limit Min : -5.0E-6

Spec Limit Max : 5.0E-6

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	0.0E+0	-5.0E-11	0.0E+0	-1.0E-10	0.0E+0	-5.0E-11	-1.0E-10
SN41	-5.0E-11	0.0E+0	0.0E+0	-5.0E-11	-5.0E-11	-5.0E-11	-6.4E-7
SN42	0.0E+0	-1.5E-10	-5.0E-11	-1.0E-10	-5.0E-11	-5.0E-11	-7.3E-7
SN43	-5.0E-11	0.0E+0	-5.0E-11	-5.0E-11	0.0E+0	-5.0E-11	-3.2E-7
SN44	-1.0E-10	-1.0E-10	-5.0E-11	-1.0E-10	0.0E+0	-5.0E-11	-8.6E-8
SN45	-1.0E-10	-5.0E-11	0.0E+0	-1.0E-10	0.0E+0	-5.0E-11	-1.3E-7
SN46	-1.0E-10	-5.0E-11	-5.0E-11	-1.0E-10	-5.0E-11	-5.0E-11	-5.0E-11
SN47	-2.0E-10	-1.0E-10	-5.0E-11	-5.0E-11	-5.0E-11	-5.0E-11	-5.0E-11
SN48	-1.0E-10	-5.0E-11	-5.0E-11	-1.0E-10	-5.0E-11	-5.0E-11	-1.0E-10
SN49	-1.5E-10	-5.0E-11	0.0E+0	-5.0E-11	0.0E+0	-5.0E-11	-5.0E-11
SN50	-5.0E-11	-5.0E-11	-5.0E-11	-5.0E-11	0.0E+0	-1.0E-10	-5.0E-11
Statistics							
Min	-2.0E-10	-1.5E-10	-5.0E-11	-1.0E-10	-5.0E-11	-1.0E-10	-7.3E-7
Max	0.0E+0	0.0E+0	0.0E+0	-5.0E-11	0.0E+0	-5.0E-11	-5.0E-11
Mean	-9.0E-11	-6.0E-11	-3.5E-11	-7.5E-11	-2.5E-11	-5.5E-11	-1.9E-7
Sigma	5.7E-11	4.6E-11	2.4E-11	2.6E-11	2.6E-11	1.6E-11	2.8E-7

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	-1.0E-10	-5.0E-11
SN41	-6.4E-7	-5.3E-7
SN42	-7.3E-7	-5.9E-7
SN43	-3.2E-7	-2.2E-7
SN44	-8.6E-8	-6.1E-8
SN45	-1.3E-7	-1.1E-7
SN46	-5.0E-11	-5.0E-11
SN47	-5.0E-11	-5.0E-11
SN48	-1.0E-10	-5.0E-11
SN49	-5.0E-11	-1.0E-10
SN50	-5.0E-11	-5.0E-11
Statistics		
Min	-7.3E-7	-5.9E-7
Max	-5.0E-11	-5.0E-11
Mean	-1.9E-7	-1.5E-7
Sigma	2.8E-7	2.3E-7

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	-5.0E-11	-5.0E-11
SN41	-5.3E-7	-5.0E-11
SN42	-5.9E-7	0.0E+0
SN43	-2.2E-7	0.0E+0
SN44	-6.1E-8	-5.0E-11
SN45	-1.1E-7	0.0E+0
SN46	-5.0E-11	-1.0E-10
SN47	-5.0E-11	-5.0E-11
SN48	-5.0E-11	-5.0E-11
SN49	-1.0E-10	-5.0E-11
SN50	-5.0E-11	-5.0E-11
Statistics		
Min	-5.9E-7	-1.0E-10
Max	-5.0E-11	0.0E+0
Mean	-1.5E-7	-4.0E-11
Sigma	2.3E-7	3.2E-11

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.	

Test conditions : Tid

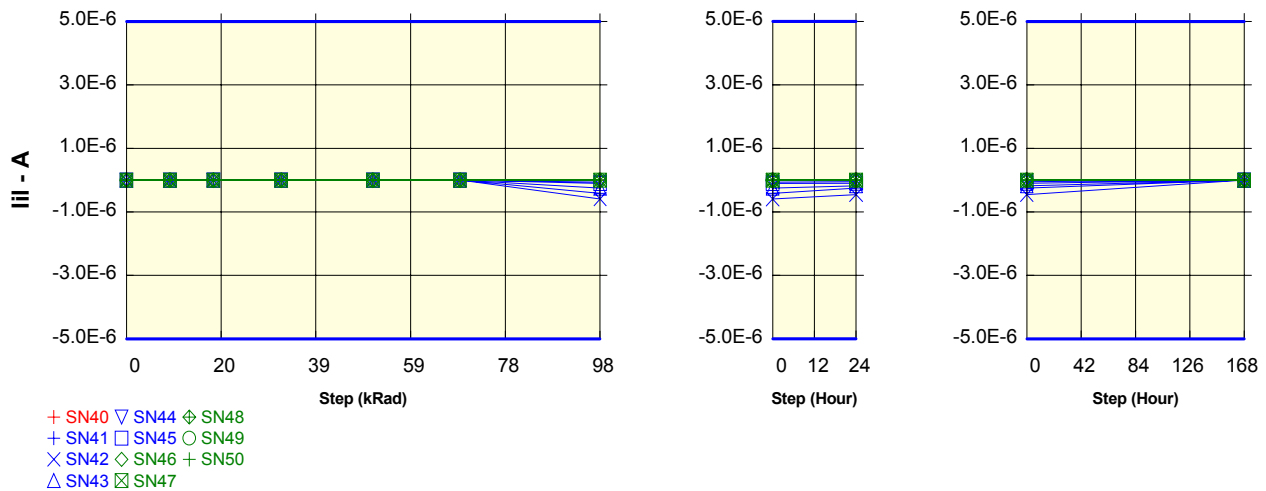
Parameter : Input Low Leakage Current : IilBA0

Unit : A

Spec Limit Min : -5.0E-6

Spec Limit Max : 5.0E-6

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	-1.0E-10	-1.0E-10	0.0E+0	-1.5E-10	-5.0E-11	-1.5E-10	0.0E+0
SN41	-5.0E-11	0.0E+0	-5.0E-11	-1.5E-10	0.0E+0	-5.0E-11	-4.1E-7
SN42	-1.0E-10	-1.5E-10	-5.0E-11	-1.0E-10	-1.0E-10	-1.5E-10	-5.9E-7
SN43	-1.0E-10	-1.0E-10	-5.0E-11	-1.5E-10	0.0E+0	-1.0E-10	-2.5E-7
SN44	0.0E+0	-1.0E-10	-5.0E-11	-1.5E-10	-5.0E-11	-1.5E-10	-6.3E-8
SN45	-1.0E-10	-5.0E-11	0.0E+0	-1.0E-10	-5.0E-11	-1.0E-10	-1.0E-7
SN46	-5.0E-11	-5.0E-11	-5.0E-11	-1.0E-10	-5.0E-11	-5.0E-11	-5.0E-11
SN47	-1.0E-10	-5.0E-11	-5.0E-11	-1.5E-10	0.0E+0	-5.0E-11	-5.0E-11
SN48	-1.0E-10	-1.0E-10	-1.0E-10	-1.0E-10	-5.0E-11	-1.0E-10	0.0E+0
SN49	0.0E+0	-1.0E-10	-5.0E-11	-1.5E-10	-5.0E-11	-5.0E-11	-1.0E-10
SN50	-1.5E-10	-1.0E-10	0.0E+0	-1.0E-10	-5.0E-11	0.0E+0	-5.0E-11
Statistics							
Min	-1.5E-10	-1.5E-10	-1.0E-10	-1.5E-10	-1.0E-10	-1.5E-10	-5.9E-7
Max	0.0E+0	0.0E+0	0.0E+0	-1.0E-10	0.0E+0	0.0E+0	0.0E+0
Mean	-7.5E-11	-8.0E-11	-4.5E-11	-1.3E-10	-4.0E-11	-8.0E-11	-1.4E-7
Sigma	4.9E-11	4.2E-11	2.8E-11	2.6E-11	3.2E-11	4.8E-11	2.1E-7

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	0.0E+0	-1.0E-10
SN41	-4.1E-7	-2.6E-7
SN42	-5.9E-7	-4.6E-7
SN43	-2.5E-7	-1.8E-7
SN44	-6.3E-8	-4.6E-8
SN45	-1.0E-7	-9.5E-8
SN46	-5.0E-11	-1.0E-10
SN47	-5.0E-11	-1.5E-10
SN48	0.0E+0	-1.0E-10
SN49	-1.0E-10	-5.0E-11
SN50	-5.0E-11	-1.0E-10
Statistics		
Min	-5.9E-7	-4.6E-7
Max	0.0E+0	-5.0E-11
Mean	-1.4E-7	-1.0E-7
Sigma	2.1E-7	1.5E-7

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	-1.0E-10	-5.0E-11
SN41	-2.6E-7	-5.0E-11
SN42	-4.6E-7	-1.0E-10
SN43	-1.8E-7	-5.0E-11
SN44	-4.6E-8	-5.0E-11
SN45	-9.5E-8	-5.0E-11
SN46	-1.0E-10	-5.0E-11
SN47	-1.5E-10	0.0E+0
SN48	-1.0E-10	-5.0E-11
SN49	-5.0E-11	-5.0E-11
SN50	-1.0E-10	0.0E+0
Statistics		
Min	-4.6E-7	-1.0E-10
Max	-5.0E-11	0.0E+0
Mean	-1.0E-7	-4.5E-11
Sigma	1.5E-7	2.8E-11

HIREX Engineering	Total Dose Test Report		Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.

Test conditions : Tid

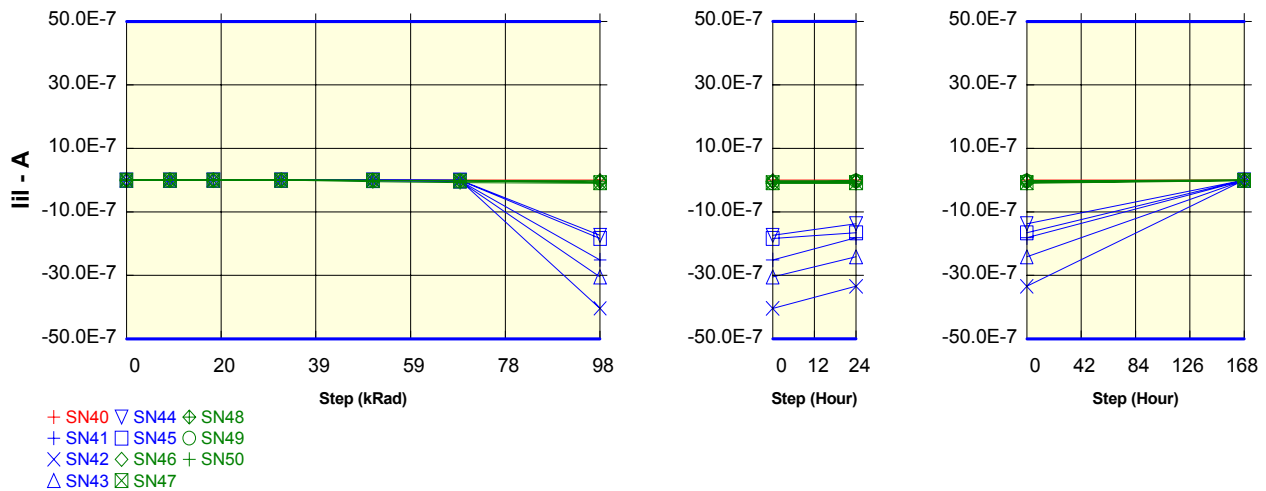
Parameter : Input Low Leakage Current : I_{IL}DQM_H

Unit : A

Spec Limit Min : -50.0E-7

Spec Limit Max : 50.0E-7

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	-10.0E-11	-50.0E-12	-50.0E-12	-10.0E-11	-50.0E-12	-10.0E-11	-10.0E-11
SN41	-10.0E-11	-15.0E-11	-35.0E-11	-23.0E-10	-13.0E-9	-22.2E-9	-25.1E-7
SN42	-50.0E-12	-15.0E-11	-10.0E-11	-65.0E-11	-13.5E-10	-45.5E-10	-40.4E-7
SN43	-50.0E-12	-10.0E-11	-15.0E-11	-16.5E-10	-18.7E-9	-34.7E-9	-30.5E-7
SN44	-50.0E-12	-50.0E-12	-50.0E-12	-35.0E-11	-85.0E-11	-29.0E-10	-17.4E-7
SN45	-10.0E-11	-10.0E-11	-50.0E-12	-20.0E-11	-21.5E-10	-54.5E-10	-18.4E-7
SN46	-10.0E-11	-50.0E-12	-10.0E-11	-65.0E-11	-10.7E-9	-93.0E-10	-19.2E-9
SN47	-10.0E-11	-50.0E-12	-25.0E-11	-16.5E-10	-11.1E-9	-24.2E-9	-78.7E-9
SN48	-50.0E-12	-50.0E-12	-10.0E-11	-40.0E-11	-10.1E-9	-20.0E-9	-48.6E-9
SN49	-10.0E-11	-50.0E-12	-15.0E-11	-16.5E-10	-11.4E-9	-23.4E-9	-81.1E-9
SN50	-50.0E-12	-50.0E-12	-20.0E-11	-33.5E-10	-50.3E-9	-81.7E-9	-96.5E-9
Statistics							
Min	-10.0E-11	-15.0E-11	-35.0E-11	-33.5E-10	-50.3E-9	-81.7E-9	-40.4E-7
Max	-50.0E-12	-50.0E-12	-50.0E-12	-20.0E-11	-85.0E-11	-29.0E-10	-19.2E-9
Mean	-75.0E-12	-80.0E-12	-15.0E-11	-12.9E-10	-13.0E-9	-22.8E-9	-13.5E-7
Sigma	26.4E-12	42.2E-12	94.3E-12	10.2E-10	14.3E-9	23.2E-9	15.0E-7

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	-10.0E-11	-50.0E-12
SN41	-25.1E-7	-18.1E-7
SN42	-40.4E-7	-33.5E-7
SN43	-30.5E-7	-24.2E-7
SN44	-17.4E-7	-13.7E-7
SN45	-18.4E-7	-16.6E-7
SN46	-19.2E-9	-17.5E-9
SN47	-78.7E-9	-80.2E-9
SN48	-48.6E-9	-46.2E-9
SN49	-81.1E-9	-24.5E-9
SN50	-96.5E-9	-10.1E-8
Statistics		
Min	-40.4E-7	-33.5E-7
Max	-19.2E-9	-17.5E-9
Mean	-13.5E-7	-10.9E-7
Sigma	15.0E-7	12.1E-7

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	-50.0E-12	-50.0E-12
SN41	-18.1E-7	-48.0E-10
SN42	-33.5E-7	-85.0E-11
SN43	-24.2E-7	-49.0E-10
SN44	-13.7E-7	-45.0E-11
SN45	-16.6E-7	-50.0E-11
SN46	-17.5E-9	-11.5E-10
SN47	-80.2E-9	-52.0E-10
SN48	-46.2E-9	-58.5E-10
SN49	-24.5E-9	-10.0E-10
SN50	-10.1E-8	-13.9E-9
Statistics		
Min	-33.5E-7	-13.9E-9
Max	-17.5E-9	-45.0E-11
Mean	-10.9E-7	-38.6E-10
Sigma	12.1E-7	41.6E-10

HIREX Engineering	Total Dose Test Report		Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.

Test conditions : Tid

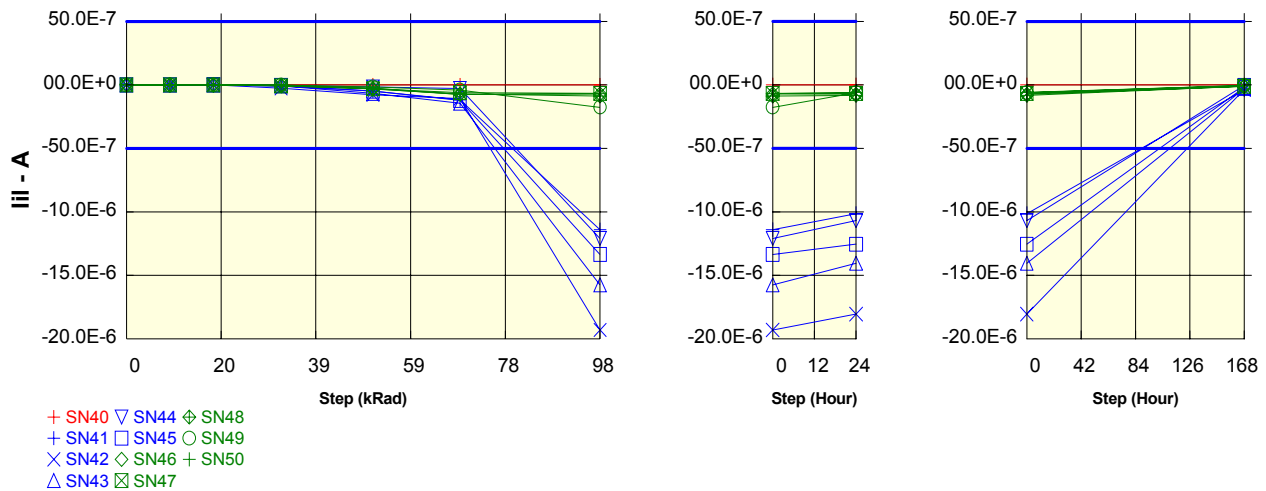
Parameter : Input Low Leakage Current : I_{il}/CS

Unit : A

Spec Limit Min : -50.0E-7

Spec Limit Max : 50.0E-7

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	-50.0E-12	-50.0E-12	-50.0E-12	-15.0E-11	00.0E+0	-10.0E-11	-50.0E-12
SN41	-15.0E-11	-60.0E-11	-98.0E-10	-89.3E-9	-48.9E-8	-11.9E-7	-11.4E-6
SN42	-10.0E-11	-50.0E-12	-68.5E-10	-26.5E-8	-77.3E-8	-10.9E-7	-19.3E-6
SN43	-50.0E-12	-10.0E-11	-75.0E-11	-82.0E-9	-67.9E-8	-14.4E-7	-15.8E-6
SN44	-15.0E-11	-10.0E-11	-21.5E-10	-44.4E-9	-16.9E-8	-28.7E-8	-12.1E-6
SN45	-20.0E-11	-50.0E-12	-95.0E-11	-33.7E-9	-48.6E-8	-12.2E-7	-13.4E-6
SN46	-20.0E-11	-10.0E-11	-10.5E-10	-65.0E-9	-30.6E-8	-74.3E-8	-71.6E-8
SN47	-20.0E-11	-15.0E-11	-58.0E-10	-76.7E-9	-30.4E-8	-61.0E-8	-66.8E-8
SN48	-15.0E-11	-10.0E-11	-45.0E-11	-29.4E-9	-32.2E-8	-71.2E-8	-87.1E-8
SN49	-15.0E-11	00.0E+0	-11.5E-10	-27.5E-9	-17.1E-8	-41.4E-8	-17.6E-7
SN50	-10.0E-11	-10.0E-11	-25.0E-11	-40.5E-10	-23.8E-8	-76.1E-8	-68.3E-8
Statistics							
Min	-20.0E-11	-60.0E-11	-98.0E-10	-26.5E-8	-77.3E-8	-14.4E-7	-19.3E-6
Max	-50.0E-12	00.0E+0	-25.0E-11	-40.5E-10	-16.9E-8	-28.7E-8	-66.8E-8
Mean	-14.5E-11	-13.5E-11	-29.2E-10	-71.7E-9	-39.4E-8	-84.5E-8	-76.6E-7
Sigma	49.7E-12	16.8E-11	33.4E-10	73.1E-9	20.8E-8	37.2E-8	74.1E-7

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	-50.0E-12	-10.0E-11
SN41	-11.4E-6	-10.2E-6
SN42	-19.3E-6	-18.1E-6
SN43	-15.8E-6	-14.1E-6
SN44	-12.1E-6	-10.7E-6
SN45	-13.4E-6	-12.6E-6
SN46	-71.6E-8	-73.2E-8
SN47	-66.8E-8	-67.3E-8
SN48	-87.1E-8	-82.4E-8
SN49	-17.6E-7	-61.2E-8
SN50	-68.3E-8	-58.3E-8
Statistics		
Min	-19.3E-6	-18.1E-6
Max	-66.8E-8	-58.4E-8
Mean	-76.6E-7	-68.9E-7
Sigma	74.1E-7	68.8E-7

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	-10.0E-11	-50.0E-12
SN41	-10.2E-6	-39.6E-8
SN42	-18.1E-6	-37.6E-8
SN43	-14.1E-6	-27.8E-8
SN44	-10.7E-6	-37.7E-9
SN45	-12.6E-6	-20.0E-8
SN46	-73.2E-8	-11.8E-8
SN47	-67.3E-8	-98.0E-9
SN48	-82.4E-8	-99.5E-9
SN49	-61.2E-8	-42.1E-9
SN50	-58.3E-8	-46.7E-9
Statistics		
Min	-18.1E-6	-39.6E-8
Max	-58.4E-8	-37.7E-9
Mean	-68.9E-7	-16.9E-8
Sigma	68.8E-7	13.7E-8

HIREX Engineering	Total Dose Test Report		Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.

Test conditions : Tid

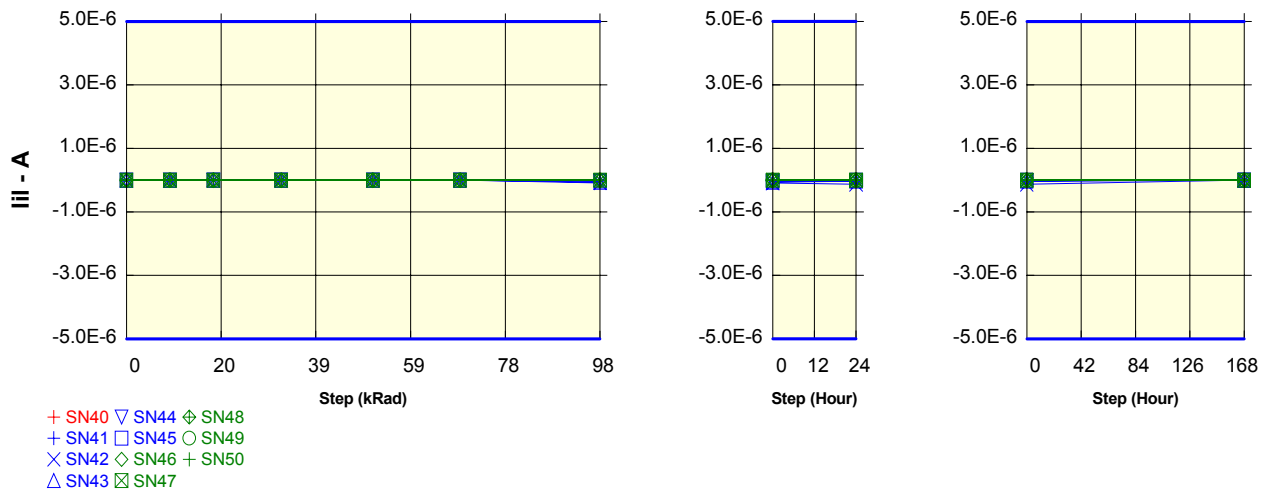
Parameter : Input Low Leakage Current : IilA11

Unit : A

Spec Limit Min : -5.0E-6

Spec Limit Max : 5.0E-6

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	-2.0E-10	-1.5E-10	-1.0E-10	-2.0E-10	-1.5E-10	-1.5E-10	-1.5E-10
SN41	-2.0E-10	-1.5E-10	-1.0E-10	-1.0E-10	-1.0E-10	-1.5E-10	-1.9E-8
SN42	-2.0E-10	-1.0E-10	-1.0E-10	-2.0E-10	-2.0E-10	-1.5E-10	-9.3E-8
SN43	-1.5E-10	-1.5E-10	-1.0E-10	-1.5E-10	-1.0E-10	-1.0E-10	-6.5E-8
SN44	-1.0E-10	-1.0E-10	-5.0E-11	-1.0E-10	-1.5E-10	-1.0E-10	-2.4E-8
SN45	-1.0E-10	-2.0E-10	-1.0E-10	-1.5E-10	-1.0E-10	-1.0E-10	-2.9E-8
SN46	-1.5E-10	-1.5E-10	-5.0E-11	-1.5E-10	-2.0E-10	-1.0E-10	-1.0E-10
SN47	-1.5E-10	-1.5E-10	-1.5E-10	-1.5E-10	-1.5E-10	-1.0E-10	-1.0E-10
SN48	-1.5E-10	-1.0E-10	-1.5E-10	-1.5E-10	-5.0E-11	-1.0E-10	-1.5E-10
SN49	-1.0E-10	-1.0E-10	-5.0E-11	-1.5E-10	-5.0E-11	-1.5E-10	-1.0E-10
SN50	-2.0E-10	-1.5E-10	-1.5E-10	-2.0E-10	-1.0E-10	-1.0E-10	-1.5E-10
Statistics							
Min	-2.0E-10	-2.0E-10	-1.5E-10	-2.0E-10	-2.0E-10	-1.5E-10	-9.3E-8
Max	-1.0E-10	-1.0E-10	-5.0E-11	-1.0E-10	-5.0E-11	-1.0E-10	-1.0E-10
Mean	-1.5E-10	-1.4E-10	-1.0E-10	-1.5E-10	-1.2E-10	-1.2E-10	-2.3E-8
Sigma	4.1E-11	3.4E-11	4.1E-11	3.3E-11	5.4E-11	2.4E-11	3.2E-8

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	-1.5E-10	-1.5E-10
SN41	-1.9E-8	-2.1E-8
SN42	-9.3E-8	-1.3E-7
SN43	-6.5E-8	-3.5E-8
SN44	-2.4E-8	-1.9E-8
SN45	-2.9E-8	-1.5E-10
SN46	-1.0E-10	-1.5E-10
SN47	-1.0E-10	-1.0E-10
SN48	-1.5E-10	-1.0E-10
SN49	-1.0E-10	-1.0E-10
SN50	-1.5E-10	-1.5E-10
Statistics		
Min	-9.3E-8	-1.3E-7
Max	-1.0E-10	-1.0E-10
Mean	-2.3E-8	-2.1E-8
Sigma	3.2E-8	4.1E-8

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	-1.5E-10	-1.0E-10
SN41	-2.1E-8	-1.5E-10
SN42	-1.3E-7	-1.0E-10
SN43	-3.5E-8	-1.0E-10
SN44	-1.9E-8	-1.5E-10
SN45	-1.5E-10	-1.5E-10
SN46	-1.5E-10	-1.0E-10
SN47	-1.0E-10	-1.0E-10
SN48	-1.0E-10	-1.0E-10
SN49	-1.0E-10	-1.0E-10
SN50	-1.5E-10	-1.0E-10
Statistics		
Min	-1.3E-7	-1.5E-10
Max	-1.0E-10	-1.0E-10
Mean	-2.1E-8	-1.2E-10
Sigma	4.1E-8	2.4E-11

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.	

Test conditions : Tid

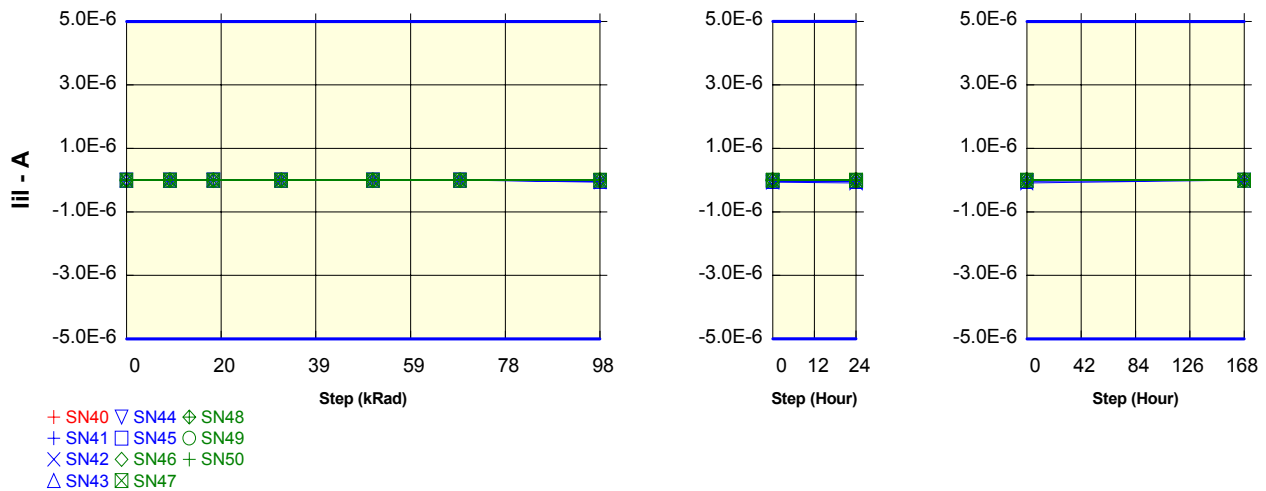
Parameter : Input Low Leakage Current : IilA10

Unit : A

Spec Limit Min : -5.0E-6

Spec Limit Max : 5.0E-6

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	-1.0E-10	-1.0E-10	-1.0E-10	-2.0E-10	-1.0E-10	-1.5E-10	-1.5E-10
SN41	-1.5E-10	-1.5E-10	-1.5E-10	-1.5E-10	-1.0E-10	-1.0E-10	-2.0E-8
SN42	-2.0E-10	-1.5E-10	-5.0E-11	-1.0E-10	-1.0E-10	-5.0E-11	-6.8E-8
SN43	-1.5E-10	-5.0E-11	-1.5E-10	-1.5E-10	-1.5E-10	-1.5E-10	-4.3E-8
SN44	-1.5E-10	-1.0E-10	-1.0E-10	-1.5E-10	-1.0E-10	-5.0E-11	-1.6E-8
SN45	-1.0E-10	-5.0E-11	-1.0E-10	-1.5E-10	-1.0E-10	-1.0E-10	-2.6E-8
SN46	-1.5E-10	-1.5E-10	-1.5E-10	-1.5E-10	-1.0E-10	-1.0E-10	-1.5E-10
SN47	-1.0E-10	-5.0E-11	-1.0E-10	-1.5E-10	-5.0E-11	-5.0E-11	-5.0E-11
SN48	-1.5E-10	-5.0E-11	-1.0E-10	-1.5E-10	-2.0E-10	-1.0E-10	-1.0E-10
SN49	-1.5E-10	-1.0E-10	-1.0E-10	-1.5E-10	-1.0E-10	-1.5E-10	-1.0E-10
SN50	-1.0E-10	-5.0E-11	-5.0E-11	-1.5E-10	-1.0E-10	-5.0E-11	-1.0E-10
Statistics							
Min	-2.0E-10	-1.5E-10	-1.5E-10	-1.5E-10	-2.0E-10	-1.5E-10	-6.8E-8
Max	-1.0E-10	-5.0E-11	-5.0E-11	-1.0E-10	-5.0E-11	-5.0E-11	-5.0E-11
Mean	-1.4E-10	-9.0E-11	-1.1E-10	-1.5E-10	-1.1E-10	-9.0E-11	-1.7E-8
Sigma	3.2E-11	4.6E-11	3.7E-11	1.6E-11	3.9E-11	3.9E-11	2.3E-8

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	-1.5E-10	-1.5E-10
SN41	-2.0E-8	-1.0E-10
SN42	-6.8E-8	-8.9E-8
SN43	-4.3E-8	-3.1E-8
SN44	-1.6E-8	-1.4E-8
SN45	-2.6E-8	-2.1E-8
SN46	-1.5E-10	-1.5E-10
SN47	-5.0E-11	-1.5E-10
SN48	-1.0E-10	-1.5E-10
SN49	-1.0E-10	-1.0E-10
SN50	-1.0E-10	-1.5E-10
Statistics		
Min	-6.8E-8	-8.9E-8
Max	-5.0E-11	-1.0E-10
Mean	-1.7E-8	-1.6E-8
Sigma	2.3E-8	2.8E-8

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	-1.5E-10	-5.0E-11
SN41	-1.0E-10	-5.0E-11
SN42	-8.9E-8	-1.5E-10
SN43	-3.1E-8	-1.0E-10
SN44	-1.4E-8	-5.0E-11
SN45	-2.1E-8	
SN46	-1.5E-10	-1.0E-10
SN47	-1.5E-10	-5.0E-11
SN48	-1.5E-10	-1.0E-10
SN49	-1.0E-10	-1.0E-10
SN50	-1.5E-10	-5.0E-11
Statistics		
Min	-8.9E-8	-1.5E-10
Max	-1.0E-10	0.0E+0
Mean	-1.6E-8	-7.5E-11
Sigma	2.8E-8	4.2E-11

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.	

Test conditions : Tid

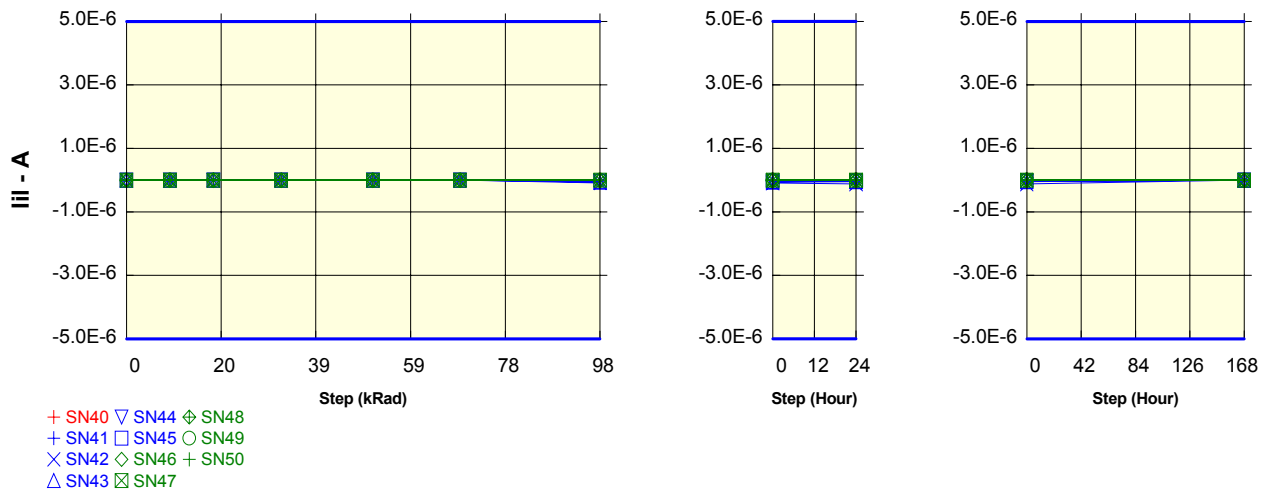
Parameter : Input Low Leakage Current : IilA09

Unit : A

Spec Limit Min : -5.0E-6

Spec Limit Max : 5.0E-6

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	-1.0E-10	-5.0E-11	-1.0E-10	-1.5E-10	-5.0E-11	-1.5E-10	-1.5E-10
SN41	-1.0E-10	-1.5E-10	-5.0E-11	-1.5E-10	-5.0E-11	-1.0E-10	-2.6E-8
SN42	-1.0E-10	-1.0E-10	-1.0E-10	-1.0E-10	-1.0E-10	-1.5E-10	-8.8E-8
SN43	-5.0E-11	-5.0E-11	-1.0E-10	-1.0E-10	-1.0E-10	-1.0E-10	-6.3E-8
SN44	-1.5E-10	-1.0E-10	-5.0E-11	-1.5E-10	-1.0E-10	-1.0E-10	-2.6E-8
SN45	-1.0E-10	-5.0E-11	0.0E+0	-1.0E-10	-1.0E-10	-1.0E-10	-4.2E-8
SN46	-1.5E-10	-1.5E-10	-1.0E-10	-1.5E-10	-5.0E-11	-1.0E-10	-1.0E-10
SN47	-1.5E-10	-5.0E-11	-5.0E-11	-1.5E-10	-1.0E-10	-1.0E-10	-1.0E-10
SN48	-1.0E-10	-5.0E-11	-5.0E-11	-1.0E-10	-1.0E-10	-1.0E-10	-1.0E-10
SN49	-1.0E-10	-1.0E-10	-5.0E-11	-1.5E-10	-1.0E-10	-5.0E-11	-1.5E-10
SN50	-1.0E-10	-5.0E-11	-1.0E-10	-1.0E-10	-5.0E-11	-1.0E-10	-1.0E-10
Statistics							
Min	-1.5E-10	-1.5E-10	-1.0E-10	-1.5E-10	-1.0E-10	-1.5E-10	-8.8E-8
Max	-5.0E-11	-5.0E-11	0.0E+0	-1.0E-10	-5.0E-11	-5.0E-11	-1.0E-10
Mean	-1.1E-10	-8.5E-11	-6.5E-11	-1.3E-10	-8.5E-11	-1.0E-10	-2.5E-8
Sigma	3.2E-11	4.1E-11	3.4E-11	2.6E-11	2.4E-11	2.4E-11	3.1E-8

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	-1.5E-10	-1.0E-10
SN41	-2.6E-8	-2.5E-10
SN42	-8.8E-8	-1.3E-7
SN43	-6.3E-8	-5.2E-8
SN44	-2.6E-8	-2.2E-8
SN45	-4.2E-8	-3.4E-8
SN46	-1.0E-10	-1.0E-10
SN47	-1.0E-10	-1.0E-10
SN48	-1.0E-10	-1.0E-10
SN49	-1.5E-10	-1.0E-10
SN50	-1.0E-10	-1.5E-10
Statistics		
Min	-8.8E-8	-1.3E-7
Max	-1.0E-10	-1.0E-10
Mean	-2.5E-8	-2.3E-8
Sigma	3.1E-8	4.0E-8

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	-1.0E-10	-1.5E-10
SN41	-2.5E-10	-1.5E-11
SN42	-1.3E-7	-5.0E-11
SN43	-5.2E-8	-1.0E-10
SN44	-2.2E-8	-1.0E-10
SN45	-3.4E-8	-1.5E-10
SN46	-1.0E-10	-1.0E-10
SN47	-1.0E-10	-1.0E-10
SN48	-1.0E-10	-5.0E-11
SN49	-1.0E-10	-1.0E-10
SN50	-1.5E-10	-5.0E-11
Statistics		
Min	-1.3E-7	-1.5E-10
Max	-1.0E-10	-5.0E-11
Mean	-2.3E-8	-9.5E-11
Sigma	4.0E-8	3.7E-11

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.	

Test conditions : Tid

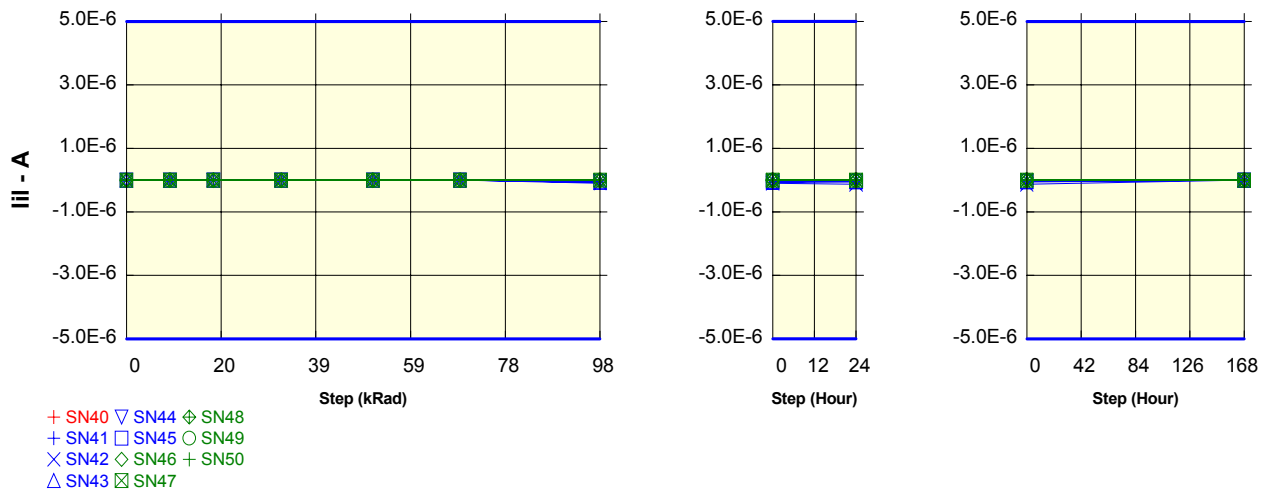
Parameter : Input Low Leakage Current : IilA08

Unit : A

Spec Limit Min : -5.0E-6

Spec Limit Max : 5.0E-6

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	-3.0E-10	-2.5E-10	-2.0E-10	-2.5E-10	-2.0E-10	-3.5E-10	-1.5E-10
SN41	-3.0E-10	-2.5E-10	-1.5E-10	-2.0E-10	-2.0E-10	-2.0E-10	-7.5E-8
SN42	-3.0E-10	-2.0E-10	-2.0E-10	-2.5E-10	-2.0E-10	-3.5E-10	-9.5E-8
SN43	-2.5E-10	-2.0E-10	-2.0E-10	-2.5E-10	-2.0E-10	-2.5E-10	-7.0E-8
SN44	-2.5E-10	-2.0E-10	-2.0E-10	-2.5E-10	-2.0E-10	-2.5E-10	-3.1E-8
SN45	-2.0E-10	-2.0E-10	-1.5E-10	-2.0E-10	-2.0E-10	-3.0E-10	-4.6E-8
SN46	-3.5E-10	-2.0E-10	-2.0E-10	-2.0E-10	-2.0E-10	-2.5E-10	-1.0E-10
SN47	-3.0E-10	-2.0E-10	-1.0E-10	-2.0E-10	-2.0E-10	-2.0E-10	-1.5E-10
SN48	-2.0E-10	-2.5E-10	-1.5E-10	-2.0E-10	-2.0E-10	-3.0E-10	-1.5E-10
SN49	-2.0E-10	-2.0E-10	-2.0E-10	-2.0E-10	-2.0E-10	-3.0E-10	-1.5E-10
SN50	-3.0E-10	-2.0E-10	-2.0E-10	-2.5E-10	-2.0E-10	-2.0E-10	-2.0E-10
Statistics							
Min	-3.5E-10	-2.5E-10	-2.0E-10	-2.5E-10	-2.0E-10	-3.5E-10	-9.5E-8
Max	-2.0E-10	-2.0E-10	-1.0E-10	-2.0E-10	-2.0E-10	-2.0E-10	-1.0E-10
Mean	-2.7E-10	-2.1E-10	-1.8E-10	-2.2E-10	-2.0E-10	-2.6E-10	-3.2E-8
Sigma	5.3E-11	2.1E-11	3.5E-11	2.6E-11	3.3E-18	5.2E-11	3.7E-8

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	-1.5E-10	-1.5E-10
SN41	-7.5E-8	-1.0E-10
SN42	-9.5E-8	-1.3E-7
SN43	-7.0E-8	-5.7E-8
SN44	-3.1E-8	-2.7E-8
SN45	-4.6E-8	-3.9E-8
SN46	-1.0E-10	-1.0E-10
SN47	-1.5E-10	-2.0E-10
SN48	-1.5E-10	-1.5E-10
SN49	-1.5E-10	-1.5E-10
SN50	-2.0E-10	-1.0E-10
Statistics		
Min	-9.5E-8	-1.3E-7
Max	-1.0E-10	-1.0E-10
Mean	-3.2E-8	-2.6E-8
Sigma	3.7E-8	4.3E-8

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	-1.5E-10	-1.5E-10
SN41	-1.0E-10	-1.5E-10
SN42	-1.3E-7	-1.5E-10
SN43	-5.7E-8	-1.5E-10
SN44	-2.7E-8	-1.5E-10
SN45	-3.9E-8	-2.0E-10
SN46	-1.0E-10	-1.5E-10
SN47	-2.0E-10	-1.5E-10
SN48	-1.5E-10	-1.5E-10
SN49	-1.5E-10	-1.5E-10
SN50	-1.0E-10	-1.5E-10
Statistics		
Min	-1.3E-7	-2.0E-10
Max	-1.0E-10	-1.5E-10
Mean	-2.6E-8	-1.6E-10
Sigma	4.3E-8	1.6E-11

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.	

Test conditions : Tid

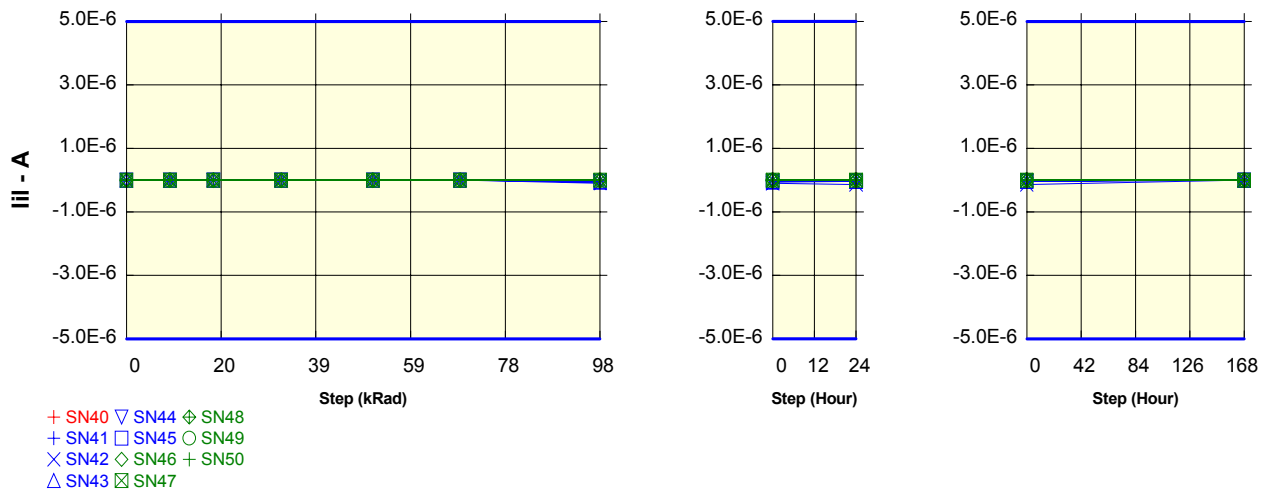
Parameter : Input Low Leakage Current : I_{IL}A07

Unit : A

Spec Limit Min : -5.0E-6

Spec Limit Max : 5.0E-6

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	-1.5E-10	-1.0E-10	-1.5E-10	-1.5E-10	-1.5E-10	-2.5E-10	-2.0E-10
SN41	-1.5E-10	-1.0E-10	-1.5E-10	-1.5E-10	-1.5E-10	-2.0E-10	-2.4E-8
SN42	-1.5E-10	-1.5E-10	-1.0E-10	-2.0E-10	-1.5E-10	-1.5E-10	-9.8E-8
SN43	-1.5E-10	-1.0E-10	-5.0E-11	-1.0E-10	-1.5E-10	-1.5E-10	-6.7E-8
SN44	-1.0E-10	-1.0E-10	-1.0E-10	-1.0E-10	-1.0E-10	-1.5E-10	-2.9E-8
SN45	-1.5E-10	-1.0E-10	-1.0E-10	-1.0E-10	-1.0E-10	-1.5E-10	-4.1E-8
SN46	-1.5E-10	-1.0E-10	-1.5E-10	-1.5E-10	-1.5E-10	-1.5E-10	-1.0E-10
SN47	-1.0E-10	-1.0E-10	-1.5E-10	-1.0E-10	-1.5E-10	-1.5E-10	-1.5E-10
SN48	-2.0E-10	-1.0E-10	-1.0E-10	-1.5E-10	-1.5E-10	-1.5E-10	-1.5E-10
SN49	-1.0E-10	-1.5E-10	-1.5E-10	-2.0E-10	-1.5E-10	-1.5E-10	-1.0E-10
SN50	-1.5E-10	-1.5E-10	-1.5E-10	-2.0E-10	-1.0E-10	-1.0E-10	-1.0E-10
Statistics							
Min	-2.0E-10	-1.5E-10	-1.5E-10	-2.0E-10	-1.5E-10	-2.0E-10	-9.8E-8
Max	-1.0E-10	-1.0E-10	-5.0E-11	-1.0E-10	-1.0E-10	-1.0E-10	-1.0E-10
Mean	-1.4E-10	-1.2E-10	-1.2E-10	-1.5E-10	-1.4E-10	-1.5E-10	-2.6E-8
Sigma	3.2E-11	2.4E-11	3.5E-11	4.4E-11	2.4E-11	2.4E-11	3.4E-8

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	-2.0E-10	-1.0E-10
SN41	-2.4E-8	-1.0E-10
SN42	-9.8E-8	-1.3E-7
SN43	-6.7E-8	-3.9E-8
SN44	-2.9E-8	-2.5E-8
SN45	-4.1E-8	-3.3E-8
SN46	-1.0E-10	-1.5E-10
SN47	-1.5E-10	-1.5E-10
SN48	-1.5E-10	-1.0E-10
SN49	-1.0E-10	-1.0E-10
SN50	-1.0E-10	-1.0E-10
Statistics		
Min	-9.8E-8	-1.3E-7
Max	-1.0E-10	-1.0E-10
Mean	-2.6E-8	-2.3E-8
Sigma	3.4E-8	4.2E-8

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	-1.0E-10	-5.0E-11
SN41	-1.0E-10	-1.0E-10
SN42	-1.3E-7	-1.5E-10
SN43	-3.9E-8	-1.0E-10
SN44	-2.5E-8	-1.0E-10
SN45	-3.3E-8	-1.5E-10
SN46	-1.5E-10	-1.0E-10
SN47	-1.5E-10	-1.0E-10
SN48	-1.0E-10	-1.0E-10
SN49	-1.0E-10	-1.5E-10
SN50	-1.0E-10	-5.0E-11
Statistics		
Min	-1.3E-7	-1.5E-10
Max	-1.0E-10	-5.0E-11
Mean	-2.3E-8	-1.1E-10
Sigma	4.2E-8	3.2E-11

HIREX Engineering	Total Dose Test Report		Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.

Test conditions : Tid

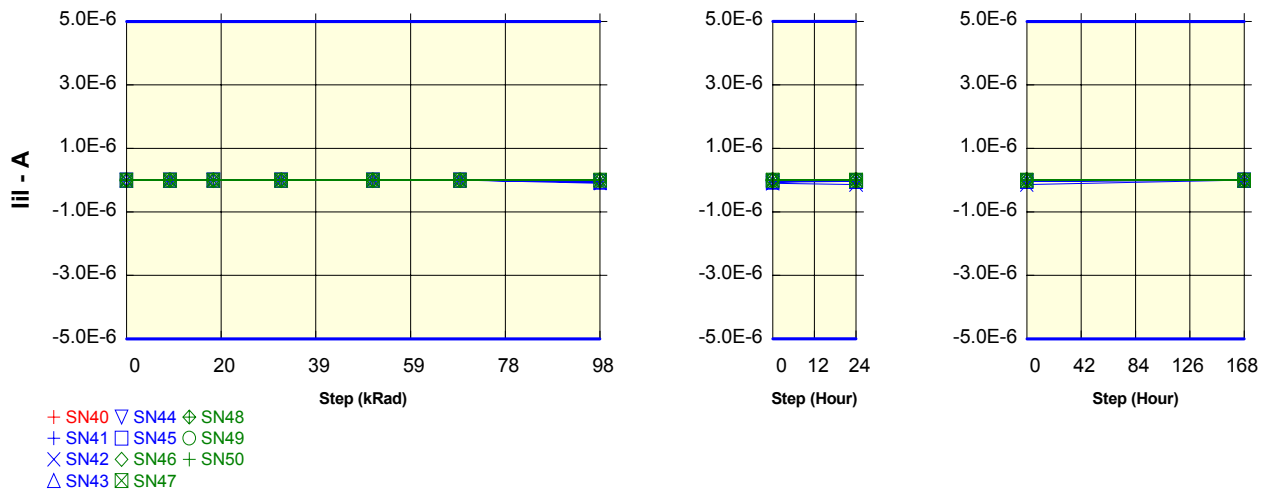
Parameter : Input Low Leakage Current : IilA06

Unit : A

Spec Limit Min : -5.0E-6

Spec Limit Max : 5.0E-6

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	-2.5E-10	-1.5E-10	-1.5E-10	-2.5E-10	-2.5E-10	-3.0E-10	-1.5E-10
SN41	-3.0E-10	-2.0E-10	-1.0E-10	-2.0E-10	-2.0E-10	-2.0E-10	-6.5E-8
SN42	-2.5E-10	-2.5E-10	-1.5E-10	-2.5E-10	-2.0E-10	-3.5E-10	-1.0E-7
SN43	-2.0E-10	-2.0E-10	-1.0E-10	-2.5E-10	-2.0E-10	-2.5E-10	-6.9E-8
SN44	-2.5E-10	-2.5E-10	-1.5E-10	-2.5E-10	-2.0E-10	-2.5E-10	-2.3E-8
SN45	-2.5E-10	-2.0E-10	-1.0E-10	-2.5E-10	-2.0E-10	-3.0E-10	-3.9E-8
SN46	-4.0E-10	-2.5E-10	-1.5E-10	-1.5E-10	-2.5E-10	-3.0E-10	-1.0E-10
SN47	-2.5E-10	-2.0E-10	-2.0E-10	-2.5E-10	-2.0E-10	-2.0E-10	-1.5E-10
SN48	-2.5E-10	-2.5E-10	-2.0E-10	-2.5E-10	-2.0E-10	-3.5E-10	-2.0E-10
SN49	-2.0E-10	-2.5E-10	-2.0E-10	-2.5E-10	-1.5E-10	-3.5E-10	-1.5E-10
SN50	-3.5E-10	-2.5E-10	-1.5E-10	-2.5E-10	-2.0E-10	-1.5E-10	-1.5E-10
Statistics							
Min	-4.0E-10	-2.5E-10	-2.0E-10	-2.5E-10	-2.5E-10	-3.5E-10	-1.0E-7
Max	-2.0E-10	-2.0E-10	-1.0E-10	-1.5E-10	-1.5E-10	-1.5E-10	-1.0E-10
Mean	-2.7E-10	-2.3E-10	-1.5E-10	-2.4E-10	-2.0E-10	-2.7E-10	-3.0E-8
Sigma	6.3E-11	2.6E-11	4.1E-11	3.4E-11	2.4E-11	7.1E-11	3.7E-8

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	-1.5E-10	-1.5E-10
SN41	-6.5E-8	-2.0E-10
SN42	-1.0E-7	-1.4E-7
SN43	-6.9E-8	-4.0E-8
SN44	-2.3E-8	-1.6E-8
SN45	-3.9E-8	-3.1E-8
SN46	-1.0E-10	-1.5E-10
SN47	-1.5E-10	-2.0E-10
SN48	-2.0E-10	-1.5E-10
SN49	-1.5E-10	-1.5E-10
SN50	-1.5E-10	-1.5E-10
Statistics		
Min	-1.0E-7	-1.4E-7
Max	-1.0E-10	-1.5E-10
Mean	-3.0E-8	-2.3E-8
Sigma	3.7E-8	4.3E-8

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	-1.5E-10	-1.0E-10
SN41	-2.0E-10	-1.5E-10
SN42	-1.4E-7	-1.0E-10
SN43	-4.0E-8	-1.0E-10
SN44	-1.6E-8	-1.5E-10
SN45	-3.1E-8	-1.5E-10
SN46	-1.5E-10	-1.5E-10
SN47	-2.0E-10	-1.5E-10
SN48	-1.5E-10	-1.0E-10
SN49	-1.5E-10	-1.5E-10
SN50	-1.5E-10	-1.5E-10
Statistics		
Min	-1.4E-7	-1.5E-10
Max	-1.5E-10	-1.0E-10
Mean	-2.3E-8	-1.4E-10
Sigma	4.3E-8	2.4E-11

HIREX Engineering	Total Dose Test Report		Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.

Test conditions : Tid

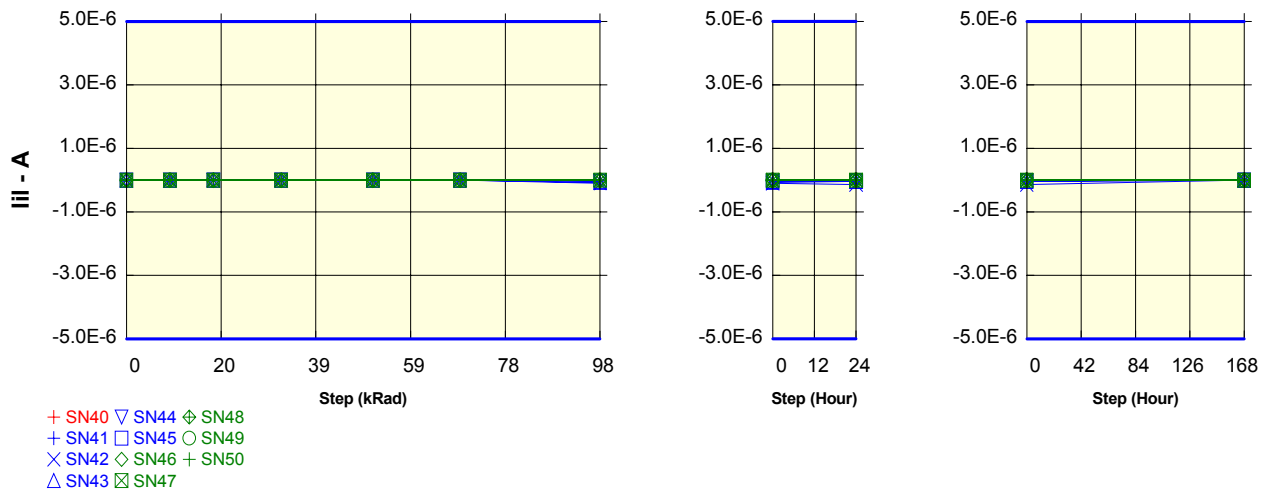
Parameter : Input Low Leakage Current : I_{il}A05

Unit : A

Spec Limit Min : -5.0E-6

Spec Limit Max : 5.0E-6

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	-3.5E-10	-2.0E-10	-2.0E-10	-2.0E-10	-2.0E-10	-2.5E-10	-1.5E-10
SN41	-3.0E-10	-2.5E-10	-1.5E-10	-2.0E-10	-2.0E-10	-2.5E-10	-2.0E-8
SN42	-2.5E-10	-3.0E-10	-1.0E-10	-2.5E-10	-2.0E-10	-3.5E-10	-9.8E-8
SN43	-3.0E-10	-2.5E-10	-1.0E-10	-2.5E-10	-2.5E-10	-2.5E-10	-7.0E-8
SN44	-3.0E-10	-2.5E-10	-2.0E-10	-2.0E-10	-2.5E-10	-3.0E-10	-2.1E-8
SN45	-2.5E-10	-2.0E-10	-1.5E-10	-2.0E-10	-2.0E-10	-3.0E-10	-4.0E-8
SN46	-4.0E-10	-2.5E-10	-2.0E-10	-2.5E-10	-2.0E-10	-3.0E-10	-1.0E-10
SN47	-2.5E-10	-2.5E-10	-2.0E-10	-2.5E-10	-2.0E-10	-2.5E-10	-1.5E-10
SN48	-2.5E-10	-2.0E-10	-2.5E-10	-2.5E-10	-2.0E-10	-2.5E-10	-1.0E-10
SN49	-2.5E-10	-2.0E-10	-2.0E-10	-2.5E-10	-2.5E-10	-3.0E-10	-1.5E-10
SN50	-3.5E-10	-2.5E-10	-1.5E-10	-2.0E-10	-2.0E-10	-2.0E-10	-1.0E-10
Statistics							
Min	-4.0E-10	-3.0E-10	-2.5E-10	-2.5E-10	-2.5E-10	-3.5E-10	-9.8E-8
Max	-2.5E-10	-2.0E-10	-1.0E-10	-2.0E-10	-2.0E-10	-2.0E-10	-1.0E-10
Mean	-2.9E-10	-2.4E-10	-1.7E-10	-2.3E-10	-2.2E-10	-2.8E-10	-2.5E-8
Sigma	5.2E-11	3.2E-11	4.8E-11	2.6E-11	2.4E-11	4.2E-11	3.5E-8

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	-1.5E-10	-1.0E-10
SN41	-2.0E-8	-1.5E-10
SN42	-9.8E-8	-1.4E-7
SN43	-7.0E-8	-3.9E-8
SN44	-2.1E-8	-1.7E-8
SN45	-4.0E-8	-3.2E-8
SN46	-1.0E-10	-5.0E-11
SN47	-1.5E-10	-1.5E-10
SN48	-1.0E-10	-1.5E-10
SN49	-1.5E-10	-1.0E-10
SN50	-1.0E-10	-5.0E-11
Statistics		
Min	-9.8E-8	-1.4E-7
Max	-1.0E-10	-5.0E-11
Mean	-2.5E-8	-2.3E-8
Sigma	3.5E-8	4.3E-8

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	-1.0E-10	-1.5E-10
SN41	-1.5E-10	-1.5E-10
SN42	-1.4E-7	-1.5E-10
SN43	-3.9E-8	-1.0E-10
SN44	-1.7E-8	-1.0E-10
SN45	-3.2E-8	-1.0E-10
SN46	-5.0E-11	-1.5E-10
SN47	-1.5E-10	-1.5E-10
SN48	-1.5E-10	-1.0E-10
SN49	-1.0E-10	-1.5E-10
SN50	-5.0E-11	-1.5E-10
Statistics		
Min	-1.4E-7	-1.5E-10
Max	-5.0E-11	-1.0E-10
Mean	-2.3E-8	-1.3E-10
Sigma	4.3E-8	2.6E-11

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.	

Test conditions : Tid

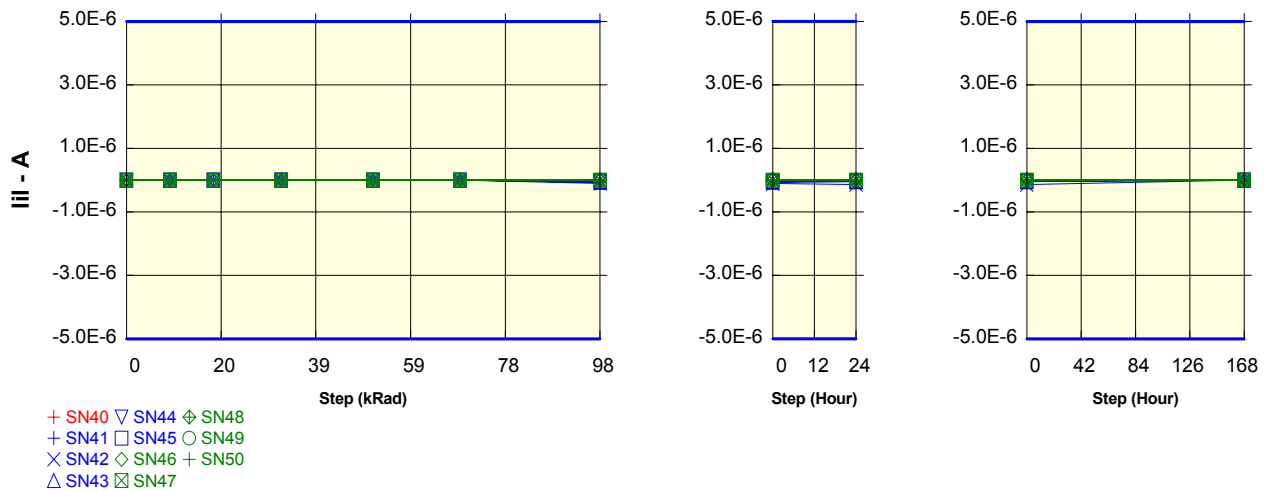
Parameter : Input Low Leakage Current : IilA04

Unit : A

Spec Limit Min : -5.0E-6

Spec Limit Max : 5.0E-6

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	-1.0E-10	-1.0E-10	-2.0E-10	-2.0E-10	-1.5E-10	-2.5E-10	-1.0E-10
SN41	-1.5E-10	-1.5E-10	-1.0E-10	-1.5E-10	-1.5E-10	-1.5E-10	-6.2E-8
SN42	-1.5E-10	-1.5E-10	-5.0E-11	-1.5E-10	-1.0E-10	-2.0E-10	-1.0E-7
SN43	-1.5E-10	-1.0E-10	-1.0E-10	-1.0E-10	-1.0E-10	-2.0E-10	-7.2E-8
SN44	-2.0E-10	-1.5E-10	-1.0E-10	-1.5E-10	-2.0E-10	-1.5E-10	-2.6E-8
SN45	-1.5E-10	-1.5E-10	-1.5E-10	-2.0E-10	-1.5E-10	-1.0E-10	-4.0E-8
SN46	-1.5E-10	-5.0E-11	-1.0E-10	-1.5E-10	-1.5E-10	-1.0E-10	-1.0E-10
SN47	-2.0E-10	-2.0E-10	-1.5E-10	-1.5E-10	-1.0E-10	-1.5E-10	-1.0E-10
SN48	-1.5E-10	-1.5E-10	-1.5E-10	-2.0E-10	-2.0E-10	-2.5E-10	-1.5E-10
SN49	-1.5E-10	-1.0E-10	-5.0E-11	-2.0E-10	-2.0E-10	-1.5E-10	-1.0E-10
SN50	-2.0E-10	-1.5E-10	-1.5E-10	-1.5E-10	-1.5E-10	-1.5E-10	-1.0E-10
Statistics							
Min	-2.0E-10	-2.0E-10	-1.5E-10	-2.0E-10	-2.0E-10	-2.5E-10	-1.0E-7
Max	-1.5E-10	-5.0E-11	-5.0E-11	-1.0E-10	-1.0E-10	-1.0E-10	-1.0E-10
Mean	-1.7E-10	-1.4E-10	-1.1E-10	-1.6E-10	-1.5E-10	-1.6E-10	-3.0E-8
Sigma	2.4E-11	4.1E-11	3.9E-11	3.2E-11	4.1E-11	4.6E-11	3.8E-8

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	-1.0E-10	-1.0E-10
SN41	-6.2E-8	-1.0E-10
SN42	-1.0E-7	-1.4E-7
SN43	-7.2E-8	-5.2E-8
SN44	-2.6E-8	-2.1E-8
SN45	-4.0E-8	-3.3E-8
SN46	-1.0E-10	-1.5E-10
SN47	-1.0E-10	-1.5E-10
SN48	-1.5E-10	-1.0E-10
SN49	-1.0E-10	-1.5E-10
SN50	-1.0E-10	-1.0E-10
Statistics		
Min	-1.0E-7	-1.4E-7
Max	-1.0E-10	-1.0E-10
Mean	-3.0E-8	-2.5E-8
Sigma	3.8E-8	4.4E-8

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	-1.0E-10	-1.0E-10
SN41	-1.0E-10	-1.0E-10
SN42	-1.4E-7	-1.5E-10
SN43	-5.2E-8	-1.5E-10
SN44	-2.1E-8	-1.5E-10
SN45	-3.3E-8	-1.0E-10
SN46	-1.5E-10	-1.5E-10
SN47	-1.5E-10	-1.0E-10
SN48	-1.0E-10	-1.5E-10
SN49	-1.5E-10	-1.0E-10
SN50	-1.0E-10	-1.5E-10
Statistics		
Min	-1.4E-7	-1.5E-10
Max	-1.0E-10	-1.0E-10
Mean	-2.5E-8	-1.3E-10
Sigma	4.4E-8	2.6E-11

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.	

Test conditions : Tid

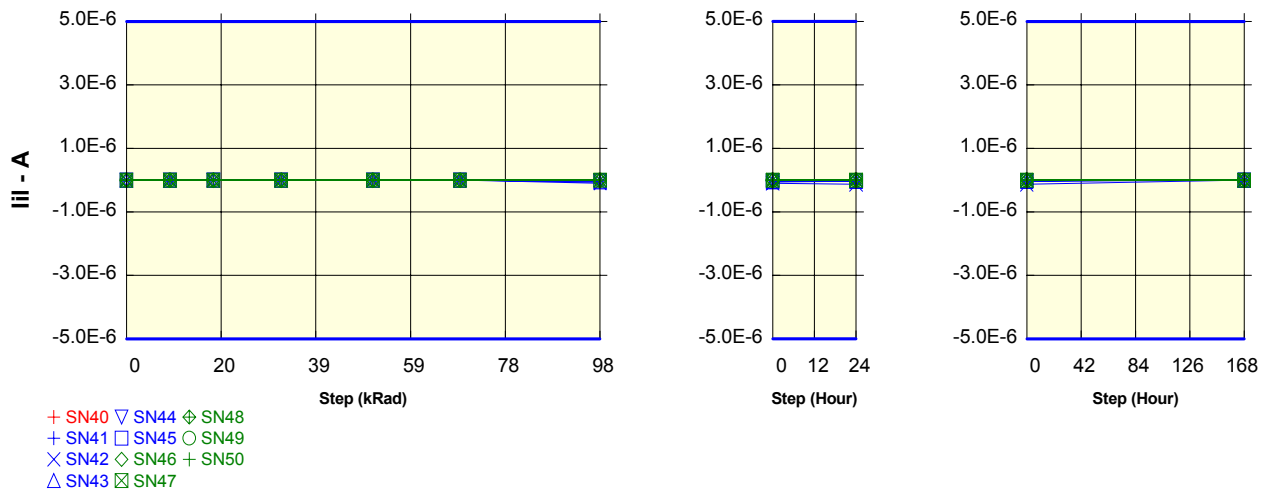
Parameter : Input Low Leakage Current : IilA03

Unit : A

Spec Limit Min : -5.0E-6

Spec Limit Max : 5.0E-6

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	-1.5E-10	-1.5E-10	-1.0E-10	-2.5E-10	-1.5E-10	-1.0E-10	-1.0E-10
SN41	-1.5E-10	-1.0E-10	-1.0E-10	-1.5E-10	-1.5E-10	-1.5E-10	-1.7E-8
SN42	-2.0E-10	-2.0E-10	-5.0E-11	-2.0E-10	-1.0E-10	-1.5E-10	-9.6E-8
SN43	-1.5E-10	-1.0E-10	-1.0E-10	-1.5E-10	-1.5E-10	-1.5E-10	-6.0E-8
SN44	-1.5E-10	-1.0E-10	-1.5E-10	-1.0E-10	-2.0E-10	-1.5E-10	-1.9E-8
SN45	-1.0E-10	-1.5E-10	-1.5E-10	-1.5E-10	-1.0E-10	-1.5E-10	-3.1E-8
SN46	-2.5E-10	-1.0E-10	-1.0E-10	-2.0E-10	-1.0E-10	-1.5E-10	-1.0E-10
SN47	-1.5E-10	-2.0E-10	-1.0E-10	-1.5E-10	-1.0E-10	-1.5E-10	-1.5E-10
SN48	-2.0E-10	-5.0E-11	-5.0E-11	-1.5E-10	-1.5E-10	-1.0E-10	-1.0E-10
SN49	-1.5E-10	-1.0E-10	-1.5E-10	-1.5E-10	-2.0E-10	-1.0E-10	-5.0E-11
SN50	-2.0E-10	-5.0E-11	-1.0E-10	-1.5E-10	-5.0E-11	-1.5E-10	-1.0E-10
Statistics							
Min	-2.5E-10	-2.0E-10	-1.5E-10	-2.0E-10	-2.0E-10	-1.5E-10	-9.6E-8
Max	-1.0E-10	-5.0E-11	-5.0E-11	-1.0E-10	-5.0E-11	-1.0E-10	-5.0E-11
Mean	-1.7E-10	-1.2E-10	-1.1E-10	-1.6E-10	-1.3E-10	-1.4E-10	-2.2E-8
Sigma	4.2E-11	5.3E-11	3.7E-11	2.8E-11	4.8E-11	2.1E-11	3.2E-8

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	-1.0E-10	-1.5E-10
SN41	-1.7E-8	-1.5E-10
SN42	-9.6E-8	-1.3E-7
SN43	-6.0E-8	-3.2E-8
SN44	-1.9E-8	-1.5E-8
SN45	-3.1E-8	-2.3E-8
SN46	-1.0E-10	-1.5E-10
SN47	-1.5E-10	-1.0E-10
SN48	-1.0E-10	-1.5E-10
SN49	-5.0E-11	-1.5E-10
SN50	-1.0E-10	-5.0E-11
Statistics		
Min	-9.6E-8	-1.3E-7
Max	-5.0E-11	-5.0E-11
Mean	-2.2E-8	-2.0E-8
Sigma	3.2E-8	4.2E-8

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	-1.5E-10	-5.0E-11
SN41	-1.5E-10	-1.0E-10
SN42	-1.3E-7	-1.5E-10
SN43	-3.2E-8	-1.5E-10
SN44	-1.5E-8	-5.0E-11
SN45	-2.3E-8	-1.5E-10
SN46	-1.5E-10	-1.0E-10
SN47	-1.0E-10	-1.0E-10
SN48	-1.5E-10	-1.0E-10
SN49	-1.5E-10	-1.0E-10
SN50	-5.0E-11	-1.5E-10
Statistics		
Min	-1.3E-7	-1.5E-10
Max	-5.0E-11	-5.0E-11
Mean	-2.0E-8	-1.2E-10
Sigma	4.2E-8	3.4E-11

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.	

Test conditions : Tid

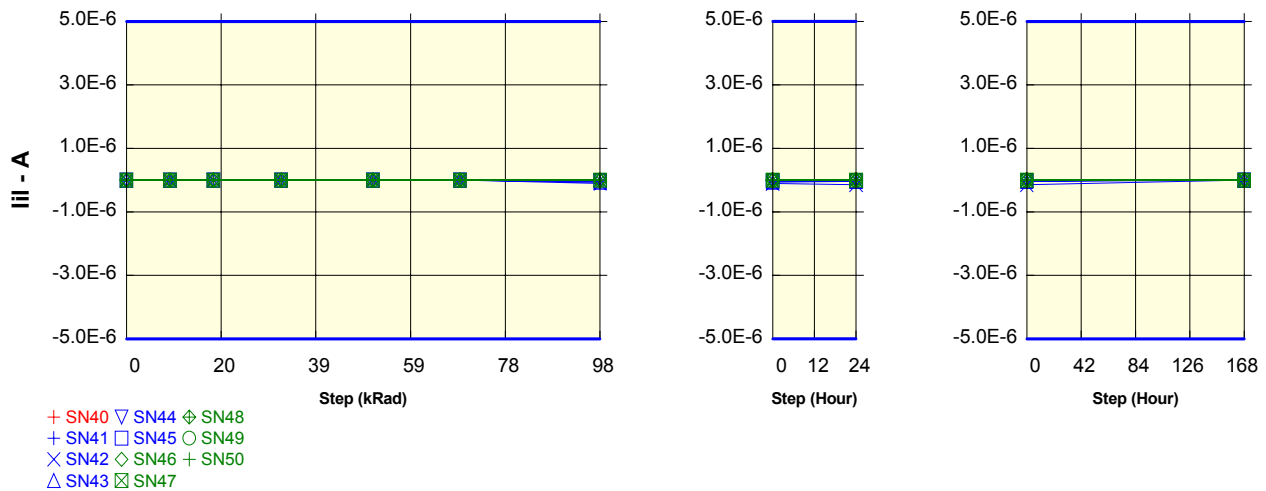
Parameter : Input Low Leakage Current : IilA02

Unit : A

Spec Limit Min : -5.0E-6

Spec Limit Max : 5.0E-6

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	-2.0E-10	-1.5E-10	-1.0E-10	-2.0E-10	-1.0E-10	-2.5E-10	-1.0E-10
SN41	-2.5E-10	-1.5E-10	-5.0E-11	-1.5E-10	-1.5E-10	-1.5E-10	-2.2E-8
SN42	-2.0E-10	-1.5E-10	-1.0E-10	-1.5E-10	-1.0E-10	-2.5E-10	-1.1E-7
SN43	-1.0E-10	-1.0E-10	-1.0E-10	-1.5E-10	-1.0E-10	-2.0E-10	-6.5E-8
SN44	-2.0E-10	-1.0E-10	-1.5E-10	-1.0E-10	-1.0E-10	-2.0E-10	-1.8E-8
SN45	-2.0E-10	-1.5E-10	-1.5E-10	-2.0E-10	-1.0E-10	-2.0E-10	-3.2E-8
SN46	-2.0E-10	-1.0E-10	-1.5E-10	-2.0E-10	-1.5E-10	-2.0E-10	-1.0E-10
SN47	-2.0E-10	-1.5E-10	-1.5E-10	-1.5E-10	-1.5E-10	-1.5E-10	-1.0E-10
SN48	-1.5E-10	-1.0E-10	-1.5E-10	-1.5E-10	-1.5E-10	-2.5E-10	-1.0E-10
SN49	-1.0E-10	-1.5E-10	-1.5E-10	-1.0E-10	-1.0E-10	-2.0E-10	-1.5E-10
SN50	-2.0E-10	-1.0E-10	-1.0E-10	-1.5E-10	-1.5E-10	-1.5E-10	-1.0E-10
Statistics							
Min	-2.5E-10	-1.5E-10	-1.5E-10	-2.0E-10	-1.5E-10	-2.5E-10	-1.1E-7
Max	-1.0E-10	-1.0E-10	-5.0E-11	-1.0E-10	-1.0E-10	-1.5E-10	-1.0E-10
Mean	-1.8E-10	-1.3E-10	-1.3E-10	-1.5E-10	-1.3E-10	-2.0E-10	-2.5E-8
Sigma	4.8E-11	2.6E-11	3.5E-11	3.3E-11	2.6E-11	3.7E-11	3.6E-8

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	-1.0E-10	-1.5E-10
SN41	-2.2E-8	-1.5E-10
SN42	-1.1E-7	-1.4E-7
SN43	-6.5E-8	-3.7E-8
SN44	-1.8E-8	-1.4E-8
SN45	-3.2E-8	-2.4E-8
SN46	-1.0E-10	-1.0E-10
SN47	-1.0E-10	-1.5E-10
SN48	-1.0E-10	-1.0E-10
SN49	-1.5E-10	-1.5E-10
SN50	-1.0E-10	-1.5E-10
Statistics		
Min	-1.1E-7	-1.4E-7
Max	-1.0E-10	-1.0E-10
Mean	-2.5E-8	-2.2E-8
Sigma	3.6E-8	4.5E-8

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	-1.5E-10	-1.0E-10
SN41	-1.5E-10	-5.0E-11
SN42	-1.4E-7	-1.5E-10
SN43	-3.7E-8	-1.5E-10
SN44	-1.4E-8	-1.0E-10
SN45	-2.4E-8	-1.0E-10
SN46	-1.0E-10	-5.0E-11
SN47	-1.5E-10	-1.0E-10
SN48	-1.0E-10	-5.0E-11
SN49	-1.5E-10	-5.0E-11
SN50	-1.5E-10	-1.0E-10
Statistics		
Min	-1.4E-7	-1.5E-10
Max	-1.0E-10	-5.0E-11
Mean	-2.2E-8	-9.0E-11
Sigma	4.5E-8	3.9E-11

HIREX Engineering	Total Dose Test Report		Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.

Test conditions : Tid

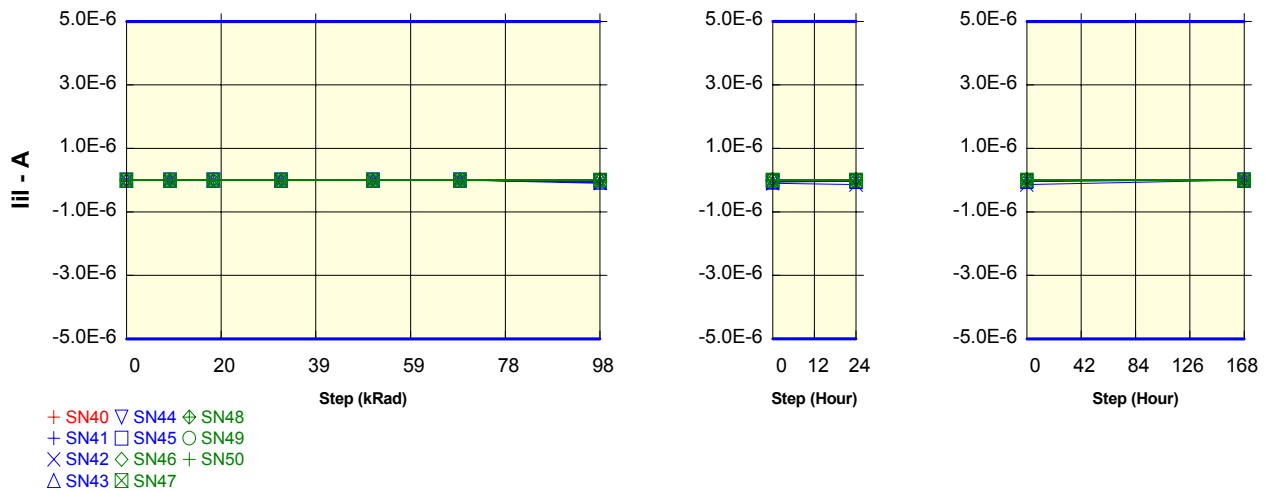
Parameter : Input Low Leakage Current : IilA01

Unit : A

Spec Limit Min : -5.0E-6

Spec Limit Max : 5.0E-6

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	-3.0E-10	-2.0E-10	-2.0E-10	-3.0E-10	-2.0E-10	-2.5E-10	-1.5E-10
SN41	-2.5E-10	-2.0E-10	-2.0E-10	-3.0E-10	-2.5E-10	-2.0E-10	-2.0E-8
SN42	-2.5E-10	-2.0E-10	-1.0E-10	-3.0E-10	-2.5E-10	-3.0E-10	-1.0E-7
SN43	-2.0E-10	-2.0E-10	-2.5E-10	-2.5E-10	-2.0E-10	-2.5E-10	-6.5E-8
SN44	-2.5E-10	-2.5E-10	-1.5E-10	-1.5E-10	-2.0E-10	-2.0E-10	-2.4E-8
SN45	-2.0E-10	-2.0E-10	-1.5E-10	-2.5E-10	-2.5E-10	-2.0E-10	-3.2E-8
SN46	-3.5E-10	-2.0E-10	-1.0E-10	-2.0E-10	-2.5E-10	-1.5E-10	-1.0E-10
SN47	-2.5E-10	-2.5E-10	-2.0E-10	-2.0E-10	-2.5E-10	-2.0E-10	-2.0E-10
SN48	-2.5E-10	-2.0E-10	-1.5E-10	-2.5E-10	-2.5E-10	-2.5E-10	-1.5E-10
SN49	-2.5E-10	-2.5E-10	-2.5E-10	-2.0E-10	-1.5E-10	-2.5E-10	-1.5E-10
SN50	-3.0E-10	-2.5E-10	-1.5E-10	-2.5E-10	-2.5E-10	-1.5E-10	-1.0E-10
Statistics							
Min	-3.5E-10	-2.5E-10	-2.5E-10	-3.0E-10	-2.5E-10	-3.0E-10	-1.0E-7
Max	-2.0E-10	-2.0E-10	-1.0E-10	-1.5E-10	-1.5E-10	-1.5E-10	-1.0E-10
Mean	-2.6E-10	-2.2E-10	-1.7E-10	-2.4E-10	-2.3E-10	-2.2E-10	-2.4E-8
Sigma	4.4E-11	2.6E-11	5.4E-11	4.7E-11	3.5E-11	4.7E-11	3.4E-8

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	-1.5E-10	-1.0E-10
SN41	-2.0E-8	-1.5E-10
SN42	-1.0E-7	-1.4E-7
SN43	-6.5E-8	-3.3E-8
SN44	-2.4E-8	-2.0E-8
SN45	-3.2E-8	-2.4E-8
SN46	-1.0E-10	-1.5E-10
SN47	-2.0E-10	-1.5E-10
SN48	-1.5E-10	-1.5E-10
SN49	-1.5E-10	-1.0E-10
SN50	-1.0E-10	-1.0E-10
Statistics		
Min	-1.0E-7	-1.4E-7
Max	-1.0E-10	-1.0E-10
Mean	-2.4E-8	-2.1E-8
Sigma	3.4E-8	4.2E-8

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	-1.0E-10	-1.0E-10
SN41	-1.5E-10	-1.5E-10
SN42	-1.4E-7	-1.5E-10
SN43	-3.3E-8	-2.0E-10
SN44	-2.0E-8	-1.0E-10
SN45	-2.4E-8	-1.5E-10
SN46	-1.5E-10	-1.0E-10
SN47	-1.5E-10	-1.0E-10
SN48	-1.5E-10	-1.0E-10
SN49	-1.0E-10	-1.5E-10
SN50	-1.0E-10	-1.5E-10
Statistics		
Min	-1.4E-7	-2.0E-10
Max	-1.0E-10	-1.0E-10
Mean	-2.1E-8	-1.4E-10
Sigma	4.2E-8	3.4E-11

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.	

Test conditions : Tid

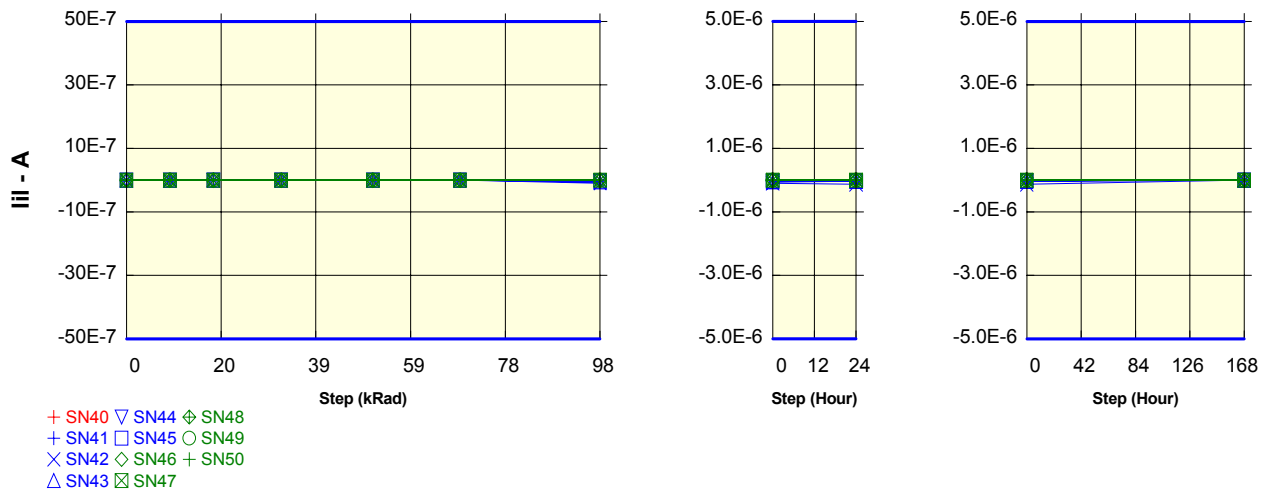
Parameter : Input Low Leakage Current : IilA00

Unit : A

Spec Limit Min : -50E-7

Spec Limit Max : 50E-7

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	-10E-11	-10E-11	-50E-12	-15E-11	-10E-11	-10E-11	-50E-12
SN41	-50E-12	-10E-11	-50E-12	-15E-11	-15E-11	00E+0	-25E-9
SN42	-10E-11	-15E-11	-50E-12	-15E-11	-50E-12	-15E-11	-99E-9
SN43	-50E-12	-50E-12	-10E-11	-10E-11	00E+0	-50E-12	-62E-9
SN44	-15E-11	-15E-11	00E+0	-10E-11	-50E-12	-10E-11	-24E-9
SN45	-15E-11	-10E-11	-10E-11	-50E-12	-50E-12	-10E-11	-35E-9
SN46	-20E-11	-15E-11	-10E-11	-10E-11	-10E-11	-50E-12	-10E-11
SN47	-25E-11	-50E-12	00E+0	-50E-12	-10E-11	-50E-12	-50E-12
SN48	-15E-11	-10E-11	-10E-11	-10E-11	-50E-12	-50E-12	-50E-12
SN49	-20E-11	00E+0	-50E-12	-10E-11	-10E-11	-50E-12	-50E-12
SN50	-15E-11	-10E-11	-10E-11	-15E-11	-10E-11	-50E-12	-50E-12
Statistics							
Min	-25E-11	-15E-11	-10E-11	-15E-11	-15E-11	-15E-11	-99E-9
Max	-50E-12	00E+0	00E+0	-50E-12	00E+0	00E+0	-50E-12
Mean	-15E-11	-95E-12	-65E-12	-11E-11	-75E-12	-65E-12	-25E-9
Sigma	64E-12	50E-12	41E-12	37E-12	42E-12	41E-12	33E-9

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	-5.0E-11	-1.0E-10
SN41	-2.5E-8	-5.0E-11
SN42	-9.9E-8	-1.3E-7
SN43	-6.2E-8	-3.5E-8
SN44	-2.4E-8	-1.9E-8
SN45	-3.5E-8	-2.9E-8
SN46	-1.0E-10	-5.0E-11
SN47	-5.0E-11	-1.5E-10
SN48	-5.0E-11	-1.0E-10
SN49	-5.0E-11	-1.0E-10
SN50	-5.0E-11	-1.0E-10
Statistics		
Min	-9.9E-8	-1.3E-7
Max	-5.0E-11	-5.0E-11
Mean	-2.5E-8	-2.2E-8
Sigma	3.3E-8	4.2E-8

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	-1.0E-10	-5.0E-11
SN41	-5.0E-11	-1.0E-10
SN42	-1.3E-7	-1.0E-10
SN43	-3.5E-8	-1.0E-10
SN44	-1.9E-8	-5.0E-11
SN45	-2.9E-8	-5.0E-11
SN46	-5.0E-11	-1.0E-10
SN47	-1.5E-10	-5.0E-11
SN48	-1.0E-10	-5.0E-11
SN49	-1.0E-10	-5.0E-11
SN50	-1.0E-10	-5.0E-11
Statistics		
Min	-1.3E-7	-1.0E-10
Max	-5.0E-11	-5.0E-11
Mean	-2.2E-8	-7.0E-11
Sigma	4.2E-8	2.6E-11

HIREX Engineering	Total Dose Test Report		Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.

Test conditions : Tid

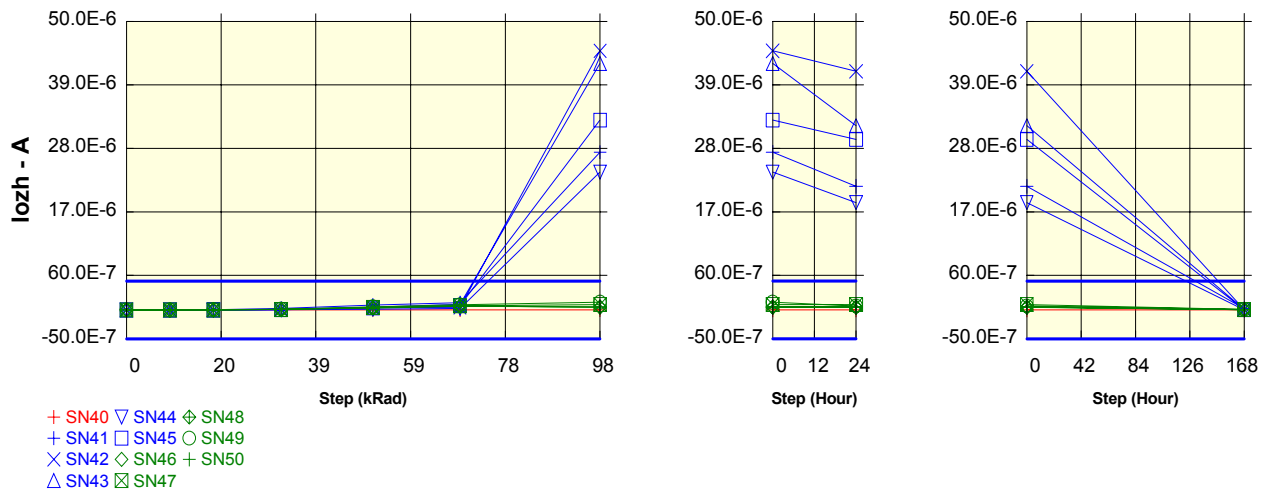
Parameter : Input High Leakage Current : lozhDQ07

Unit : A

Spec Limit Min : -50.0E-7

Spec Limit Max : 50.0E-7

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	50.0E-11	25.0E-11	35.0E-11	45.0E-11	35.0E-11	35.0E-11	30.0E-11
SN41	95.0E-11	73.0E-10	41.8E-9	27.4E-8	85.4E-8	12.6E-7	27.4E-6
SN42	50.0E-11	60.0E-11	40.5E-10	68.7E-9	37.0E-8	45.6E-8	44.9E-6
SN43	50.0E-11	80.0E-11	90.0E-10	92.4E-9	48.8E-8	97.5E-8	42.7E-6
SN44	45.0E-11	12.0E-10	61.0E-10	45.0E-9	13.8E-8	27.2E-8	23.9E-6
SN45	60.0E-11	70.0E-11	55.0E-10	50.1E-9	35.2E-8	76.4E-8	32.9E-6
SN46	40.0E-11	16.5E-10	11.0E-9	10.6E-8	42.5E-8	74.5E-8	46.4E-8
SN47	55.0E-11	26.5E-10	14.4E-9	11.4E-8	43.8E-8	73.5E-8	95.5E-8
SN48	50.0E-11	85.0E-11	64.0E-10	80.5E-9	32.5E-8	63.6E-8	53.0E-8
SN49	70.0E-11	48.5E-10	50.8E-9	16.1E-8	54.1E-8	91.7E-8	13.4E-7
SN50	50.0E-11	95.0E-11	66.5E-10	77.9E-9	39.8E-8	69.8E-8	48.7E-8
Statistics							
Min	40.0E-11	60.0E-11	40.5E-10	45.0E-9	13.8E-8	27.2E-8	46.4E-8
Max	95.0E-11	73.0E-10	50.9E-9	27.4E-8	85.4E-8	12.6E-7	44.9E-6
Mean	56.5E-11	21.6E-10	15.6E-9	10.7E-8	43.3E-8	74.6E-8	17.6E-6
Sigma	15.8E-11	22.3E-10	16.6E-9	67.5E-9	18.3E-8	27.3E-8	18.7E-6

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	30.0E-11	35.0E-11
SN41	27.4E-6	21.4E-6
SN42	44.9E-6	41.4E-6
SN43	42.7E-6	32.0E-6
SN44	23.9E-6	18.6E-6
SN45	32.9E-6	29.6E-6
SN46	46.4E-8	44.9E-8
SN47	95.5E-8	93.1E-8
SN48	53.0E-8	54.3E-8
SN49	13.4E-7	69.9E-8
SN50	48.7E-8	48.9E-8
Statistics		
Min	46.4E-8	44.9E-8
Max	44.9E-6	41.4E-6
Mean	17.6E-6	14.6E-6
Sigma	18.7E-6	15.9E-6

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	35.0E-11	35.0E-11
SN41	21.4E-6	23.3E-8
SN42	41.4E-6	46.4E-9
SN43	32.0E-6	76.7E-9
SN44	18.6E-6	24.0E-9
SN45	29.6E-6	69.8E-9
SN46	44.9E-8	48.1E-9
SN47	93.1E-8	97.0E-9
SN48	54.3E-8	48.9E-9
SN49	69.9E-8	88.7E-9
SN50	48.9E-8	53.3E-9
Statistics		
Min	44.9E-8	24.0E-9
Max	41.4E-6	23.3E-8
Mean	14.6E-6	78.6E-9
Sigma	15.9E-6	58.5E-9

HIREX Engineering	Total Dose Test Report		Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.

Test conditions : Tid

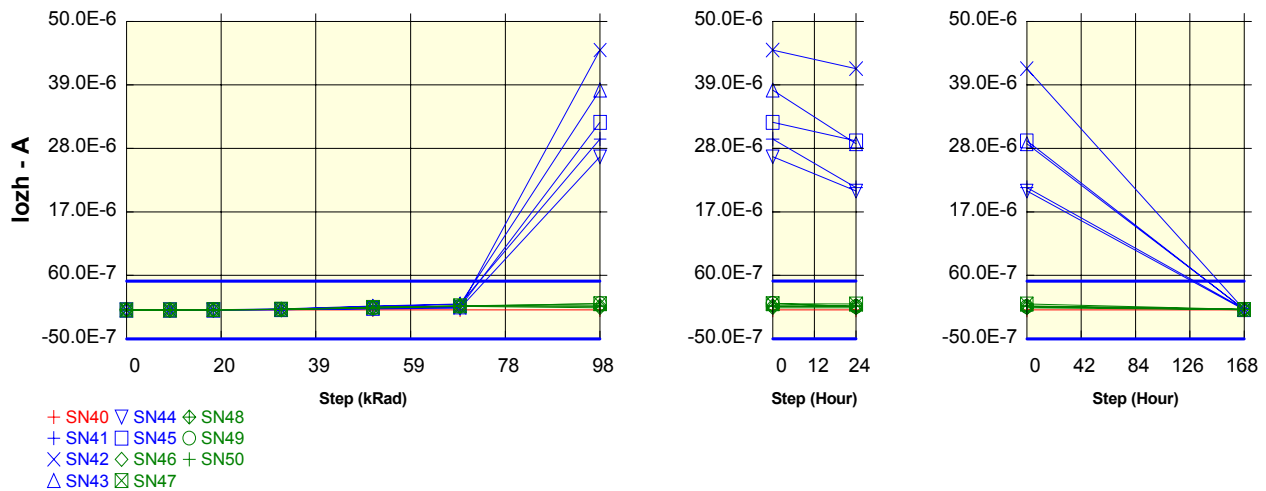
Parameter : Input High Leakage Current : IozhDQ06

Unit : A

Spec Limit Min : -50.0E-7

Spec Limit Max : 50.0E-7

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	40.0E-11	30.0E-11	25.0E-11	40.0E-11	30.0E-11	40.0E-11	30.0E-11
SN41	70.0E-11	56.5E-10	31.0E-9	18.9E-8	70.0E-8	10.4E-7	29.6E-6
SN42	50.0E-11	11.5E-10	83.0E-10	82.6E-9	36.0E-8	41.6E-8	45.1E-6
SN43	45.0E-11	11.0E-10	69.0E-10	12.2E-8	60.2E-8	10.1E-7	38.1E-6
SN44	40.0E-11	85.0E-11	48.0E-10	38.2E-9	18.1E-8	34.0E-8	26.6E-6
SN45	45.0E-11	75.0E-11	42.0E-10	55.3E-9	27.7E-8	52.5E-8	32.5E-6
SN46	40.0E-11	14.5E-10	97.5E-10	89.4E-9	46.4E-8	61.8E-8	38.5E-8
SN47	65.0E-11	86.0E-10	36.1E-9	14.7E-8	47.9E-8	73.8E-8	10.9E-7
SN48	50.0E-11	17.0E-10	12.9E-9	99.0E-9	39.5E-8	65.8E-8	71.0E-8
SN49	45.0E-11	12.0E-10	97.5E-10	87.9E-9	32.8E-8	65.3E-8	11.4E-7
SN50	40.0E-11	14.5E-10	11.3E-9	98.5E-9	38.8E-8	70.2E-8	63.1E-8
Statistics							
Min	40.0E-11	75.0E-11	42.0E-10	38.2E-9	18.1E-8	34.0E-8	38.5E-8
Max	70.0E-11	86.0E-10	36.2E-9	18.9E-8	70.0E-8	10.4E-7	45.1E-6
Mean	49.0E-11	23.9E-10	13.5E-9	10.1E-8	41.7E-8	67.0E-8	17.6E-6
Sigma	10.5E-11	26.1E-10	11.0E-9	43.3E-9	15.2E-8	22.5E-8	18.4E-6

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	30.0E-11	35.0E-11
SN41	29.6E-6	21.2E-6
SN42	45.1E-6	41.8E-6
SN43	38.1E-6	28.8E-6
SN44	26.6E-6	20.6E-6
SN45	32.5E-6	29.3E-6
SN46	38.5E-8	37.7E-8
SN47	10.9E-7	10.4E-7
SN48	71.0E-8	72.3E-8
SN49	11.4E-7	59.4E-8
SN50	63.1E-8	60.7E-8
Statistics		
Min	38.5E-8	37.7E-8
Max	45.1E-6	41.8E-6
Mean	17.6E-6	14.5E-6
Sigma	18.4E-6	15.7E-6

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	35.0E-11	45.0E-11
SN41	21.2E-6	17.1E-8
SN42	41.8E-6	38.4E-9
SN43	28.8E-6	87.9E-9
SN44	20.6E-6	39.6E-9
SN45	29.3E-6	58.0E-9
SN46	37.7E-8	51.1E-9
SN47	10.4E-7	11.8E-8
SN48	72.3E-8	86.3E-9
SN49	59.4E-8	52.8E-9
SN50	60.7E-8	77.6E-9
Statistics		
Min	37.7E-8	38.4E-9
Max	41.8E-6	17.1E-8
Mean	14.5E-6	78.0E-9
Sigma	15.7E-6	41.0E-9

HIREX Engineering	Total Dose Test Report		Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.

Test conditions : Tid

Parameter : Input High Leakage Current : IozhDQ05

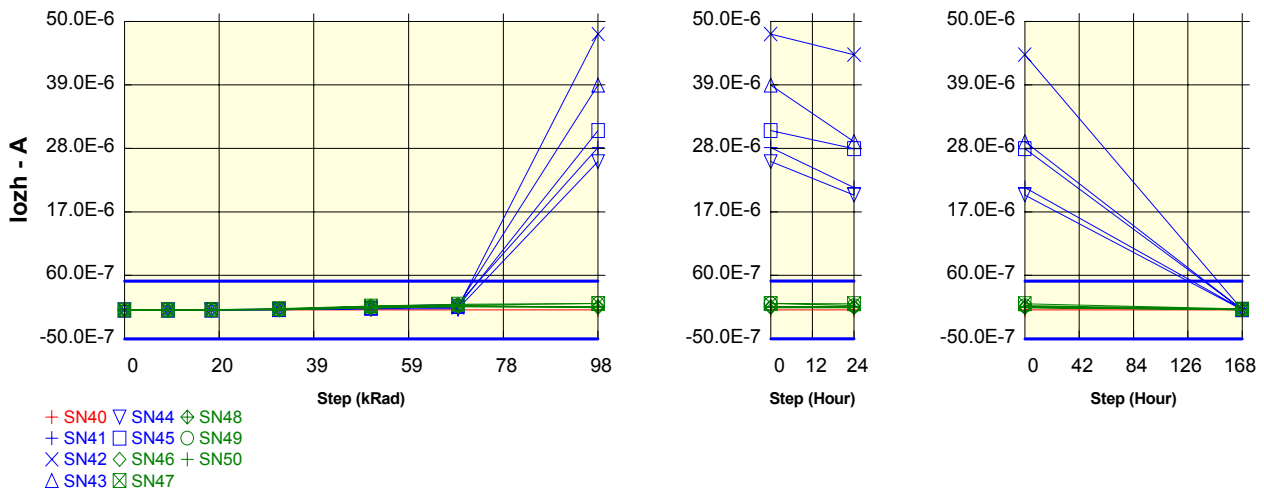
-

Unit : A

Spec Limit Min : -50.0E-7

Spec Limit Max : 50.0E-7

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	35.0E-11	15.0E-11	20.0E-11	40.0E-11	25.0E-11	20.0E-11	25.0E-11
SN41	70.0E-11	52.0E-10	30.9E-9	18.6E-8	60.2E-8	99.5E-8	28.2E-6
SN42	45.0E-11	80.0E-11	66.0E-10	88.3E-9	43.5E-8	44.2E-8	47.8E-6
SN43	45.0E-11	10.0E-10	71.0E-10	85.6E-9	42.0E-8	82.1E-8	39.0E-6
SN44	30.0E-11	75.0E-11	50.0E-10	33.1E-9	17.1E-8	24.6E-8	25.7E-6
SN45	35.0E-11	60.0E-11	59.0E-10	50.0E-9	27.1E-8	58.9E-8	31.1E-6
SN46	40.0E-11	20.0E-10	13.2E-9	15.0E-8	65.4E-8	79.3E-8	43.2E-8
SN47	75.0E-11	57.5E-10	35.0E-9	22.1E-8	67.2E-8	98.5E-8	11.4E-7
SN48	45.0E-11	70.0E-11	63.5E-10	74.8E-9	35.0E-8	62.4E-8	59.1E-8
SN49	45.0E-11	11.0E-10	12.6E-9	10.7E-8	54.1E-8	82.0E-8	11.1E-7
SN50	35.0E-11	11.0E-10	10.2E-9	70.9E-9	30.4E-8	55.1E-8	42.9E-8
Statistics							
Min	30.0E-11	60.0E-11	50.0E-10	33.2E-9	17.1E-8	24.6E-8	42.9E-8
Max	75.0E-11	57.5E-10	35.0E-9	22.1E-8	67.2E-8	99.5E-8	47.8E-6
Mean	46.5E-11	19.0E-10	13.3E-9	10.7E-8	44.2E-8	68.6E-8	17.5E-6
Sigma	14.7E-11	19.3E-10	10.8E-9	60.5E-9	17.1E-8	24.0E-8	18.7E-6

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	25.0E-11	20.0E-11
SN41	28.2E-6	21.2E-6
SN42	47.8E-6	44.3E-6
SN43	39.0E-6	29.2E-6
SN44	25.7E-6	19.9E-6
SN45	31.1E-6	28.0E-6
SN46	43.2E-8	39.7E-8
SN47	11.4E-7	11.0E-7
SN48	59.1E-8	57.9E-8
SN49	11.1E-7	75.0E-8
SN50	42.9E-8	42.7E-8
Statistics		
Min	42.9E-8	39.7E-8
Max	47.8E-6	44.3E-6
Mean	17.5E-6	14.6E-6
Sigma	18.7E-6	16.0E-6

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	20.0E-11	25.0E-11
SN41	21.2E-6	13.9E-8
SN42	44.3E-6	51.6E-9
SN43	29.2E-6	66.3E-9
SN44	19.9E-6	30.6E-9
SN45	28.0E-6	57.2E-9
SN46	39.7E-8	46.1E-9
SN47	11.0E-7	16.8E-8
SN48	57.9E-8	57.0E-9
SN49	75.0E-8	89.4E-9
SN50	42.7E-8	58.9E-9
Statistics		
Min	39.7E-8	30.6E-9
Max	44.3E-6	16.8E-8
Mean	14.6E-6	76.4E-9
Sigma	16.0E-6	43.8E-9

HIREX Engineering	Total Dose Test Report		Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.

Test conditions : Tid

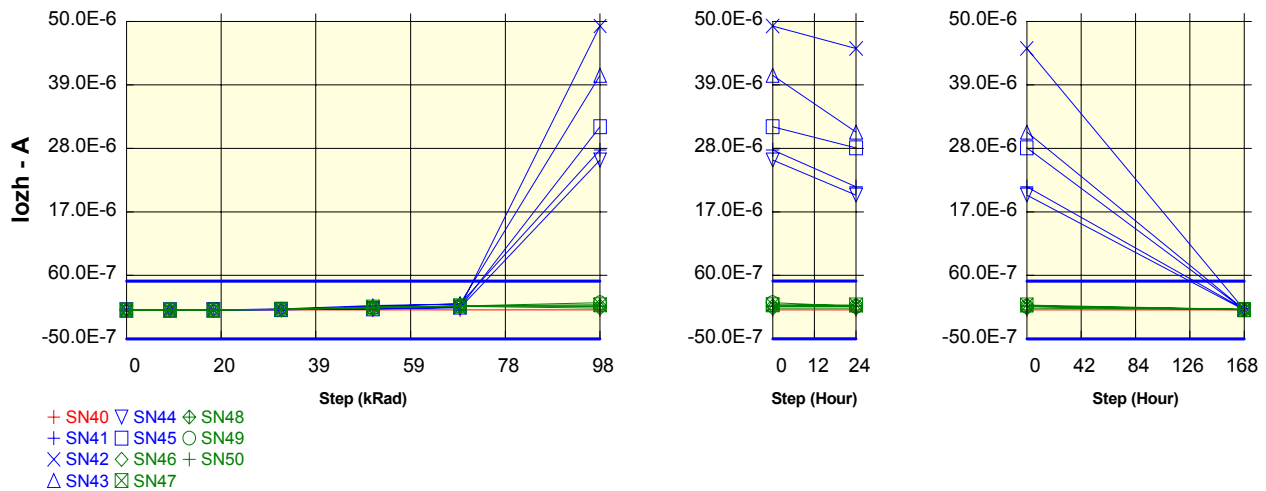
Parameter : Input High Leakage Current : lozhDQ04

Unit : A

Spec Limit Min : -50.0E-7

Spec Limit Max : 50.0E-7

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	50.0E-11	30.0E-11	25.0E-11	45.0E-11	35.0E-11	55.0E-11	25.0E-11
SN41	80.0E-11	43.0E-10	27.6E-9	19.8E-8	76.8E-8	10.4E-7	27.8E-6
SN42	45.0E-11	80.0E-11	70.0E-10	86.9E-9	42.8E-8	46.3E-8	49.2E-6
SN43	50.0E-11	12.0E-10	94.5E-10	11.3E-8	60.3E-8	10.7E-7	40.7E-6
SN44	40.0E-11	90.0E-11	49.0E-10	45.5E-9	19.9E-8	36.8E-8	26.0E-6
SN45	40.0E-11	50.0E-11	47.0E-10	38.9E-9	20.1E-8	51.1E-8	31.8E-6
SN46	45.0E-11	95.0E-11	73.5E-10	85.2E-9	48.5E-8	62.5E-8	30.2E-8
SN47	55.0E-11	35.0E-10	30.4E-9	13.3E-8	49.5E-8	73.8E-8	88.6E-8
SN48	40.0E-11	15.0E-10	11.0E-9	82.2E-9	35.0E-8	71.3E-8	73.4E-8
SN49	65.0E-11	32.5E-10	21.1E-9	11.0E-8	35.8E-8	67.1E-8	12.7E-7
SN50	50.0E-11	12.0E-10	90.5E-10	81.3E-9	35.2E-8	68.8E-8	60.4E-8
Statistics							
Min	40.0E-11	50.0E-11	47.0E-10	38.9E-9	19.9E-8	36.8E-8	30.2E-8
Max	80.0E-11	43.0E-10	30.5E-9	19.8E-8	76.8E-8	10.7E-7	49.2E-6
Mean	51.0E-11	18.1E-10	13.3E-9	97.3E-9	42.4E-8	68.8E-8	17.9E-6
Sigma	12.9E-11	13.4E-10	95.2E-10	45.5E-9	17.5E-8	22.5E-8	19.2E-6

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	25.0E-11	30.0E-11
SN41	27.8E-6	21.3E-6
SN42	49.2E-6	45.3E-6
SN43	40.7E-6	30.8E-6
SN44	26.0E-6	19.9E-6
SN45	31.8E-6	28.1E-6
SN46	30.2E-8	30.1E-8
SN47	88.6E-8	87.1E-8
SN48	73.4E-8	74.6E-8
SN49	12.7E-7	64.1E-8
SN50	60.4E-8	59.5E-8
Statistics		
Min	30.2E-8	30.1E-8
Max	49.2E-6	45.3E-6
Mean	17.9E-6	14.9E-6
Sigma	19.2E-6	16.5E-6

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	30.0E-11	40.0E-11
SN41	21.3E-6	13.3E-8
SN42	45.3E-6	47.8E-9
SN43	30.8E-6	70.4E-9
SN44	19.9E-6	30.0E-9
SN45	28.1E-6	49.2E-9
SN46	30.1E-8	38.8E-9
SN47	87.1E-8	92.9E-9
SN48	74.6E-8	82.8E-9
SN49	64.1E-8	80.5E-9
SN50	59.5E-8	68.5E-9
Statistics		
Min	30.1E-8	30.1E-9
Max	45.3E-6	13.3E-8
Mean	14.9E-6	69.4E-9
Sigma	16.5E-6	30.3E-9

HIREX Engineering	Total Dose Test Report		Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.

Test conditions : Tid

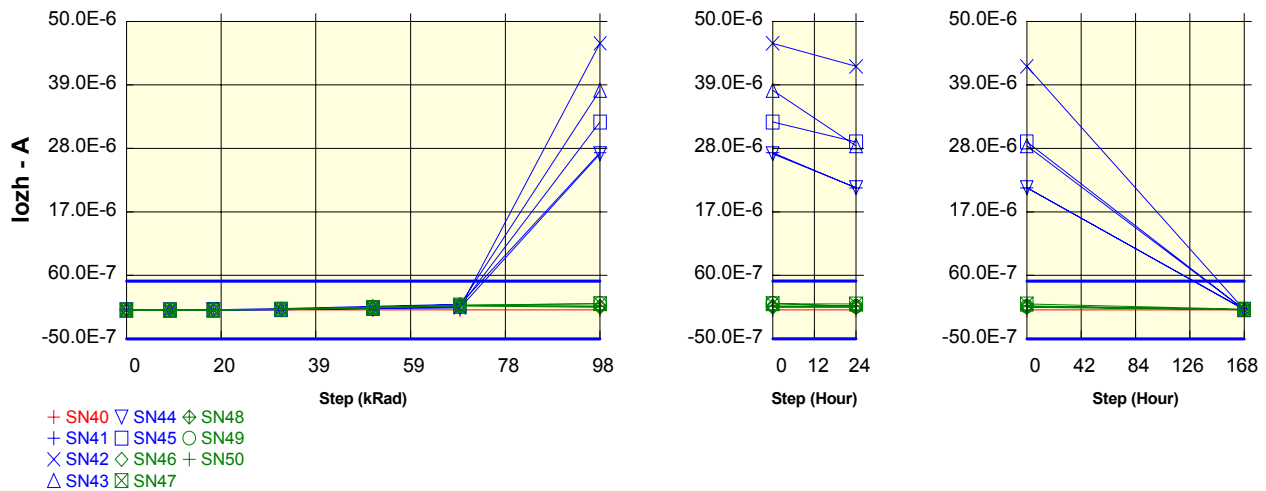
Parameter : Input High Leakage Current : lozhDQ03

Unit : A

Spec Limit Min : -50.0E-7

Spec Limit Max : 50.0E-7

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	25.0E-11	30.0E-11	20.0E-11	30.0E-11	40.0E-11	30.0E-11	25.0E-11
SN41	75.0E-11	69.0E-10	30.8E-9	22.4E-8	61.4E-8	97.0E-8	27.3E-6
SN42	35.0E-11	60.0E-11	67.0E-10	76.7E-9	33.9E-8	40.4E-8	46.2E-6
SN43	40.0E-11	75.0E-11	86.0E-10	10.1E-8	49.3E-8	89.7E-8	38.1E-6
SN44	30.0E-11	10.0E-10	74.5E-10	51.2E-9	22.5E-8	38.7E-8	27.1E-6
SN45	40.0E-11	45.0E-11	40.5E-10	45.9E-9	27.8E-8	62.8E-8	32.6E-6
SN46	35.0E-11	10.0E-10	66.0E-10	88.9E-9	46.0E-8	73.5E-8	46.4E-8
SN47	55.0E-11	40.0E-10	30.6E-9	14.3E-8	47.0E-8	85.1E-8	10.7E-7
SN48	40.0E-11	90.0E-11	81.0E-10	81.0E-9	38.6E-8	77.5E-8	68.7E-8
SN49	50.0E-11	15.5E-10	11.2E-9	89.9E-9	47.1E-8	76.5E-8	11.3E-7
SN50	45.0E-11	10.0E-10	92.0E-10	77.4E-9	36.2E-8	76.3E-8	56.9E-8
Statistics							
Min	30.0E-11	45.0E-11	40.5E-10	45.9E-9	22.5E-8	38.7E-8	46.4E-8
Max	75.0E-11	69.0E-10	30.9E-9	22.4E-8	61.4E-8	97.0E-8	46.2E-6
Mean	44.5E-11	18.2E-10	12.3E-9	97.8E-9	41.0E-8	71.7E-8	17.5E-6
Sigma	13.0E-11	20.5E-10	98.7E-10	51.7E-9	11.5E-8	19.4E-8	18.4E-6

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	25.0E-11	30.0E-11
SN41	27.3E-6	21.2E-6
SN42	46.2E-6	42.2E-6
SN43	38.1E-6	28.5E-6
SN44	27.1E-6	21.2E-6
SN45	32.6E-6	29.1E-6
SN46	46.4E-8	44.8E-8
SN47	10.7E-7	10.5E-7
SN48	68.7E-8	70.8E-8
SN49	11.3E-7	61.5E-8
SN50	56.9E-8	58.9E-8
Statistics		
Min	46.4E-8	44.8E-8
Max	46.2E-6	42.2E-6
Mean	17.5E-6	14.6E-6
Sigma	18.4E-6	15.7E-6

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	30.0E-11	25.0E-11
SN41	21.2E-6	15.6E-8
SN42	42.2E-6	43.1E-9
SN43	28.5E-6	62.8E-9
SN44	21.2E-6	40.0E-9
SN45	29.1E-6	58.5E-9
SN46	44.8E-8	43.1E-9
SN47	10.5E-7	15.2E-8
SN48	70.8E-8	66.3E-9
SN49	61.5E-8	65.4E-9
SN50	58.9E-8	68.2E-9
Statistics		
Min	44.8E-8	40.0E-9
Max	42.2E-6	15.6E-8
Mean	14.6E-6	75.5E-9
Sigma	15.7E-6	42.6E-9

HIREX Engineering	Total Dose Test Report		Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.

Test conditions : Tid

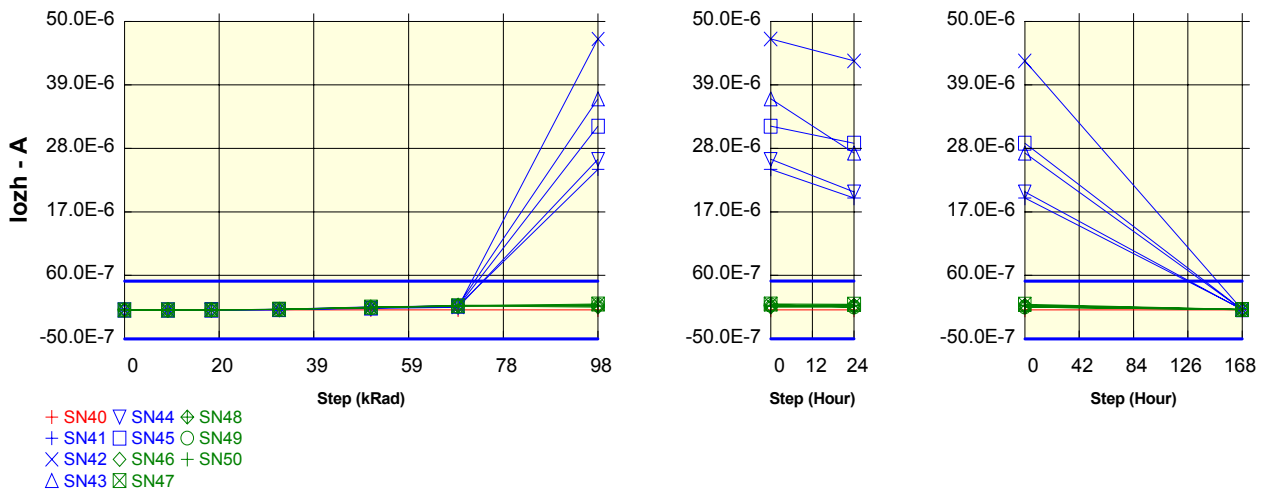
Parameter : Input High Leakage Current : I_{ozh}DQ02

Unit : A

Spec Limit Min : -50.0E-7

Spec Limit Max : 50.0E-7

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	50.0E-11	40.0E-11	30.0E-11	50.0E-11	40.0E-11	40.0E-11	20.0E-11
SN41	80.0E-11	63.5E-10	27.9E-9	16.4E-8	52.4E-8	73.8E-8	24.4E-6
SN42	50.0E-11	80.0E-11	52.0E-10	86.2E-9	40.4E-8	50.5E-8	47.0E-6
SN43	50.0E-11	70.0E-11	59.5E-10	71.6E-9	37.6E-8	76.1E-8	36.6E-6
SN44	45.0E-11	85.0E-11	61.0E-10	56.2E-9	26.7E-8	44.9E-8	26.1E-6
SN45	50.0E-11	75.0E-11	72.5E-10	68.1E-9	34.6E-8	62.8E-8	31.9E-6
SN46	60.0E-11	18.5E-10	17.4E-9	10.6E-8	48.4E-8	71.3E-8	51.4E-8
SN47	55.0E-11	35.0E-10	28.0E-9	15.5E-8	49.5E-8	70.8E-8	10.3E-7
SN48	45.0E-11	11.5E-10	84.5E-10	88.2E-9	42.0E-8	81.6E-8	81.0E-8
SN49	55.0E-11	16.0E-10	96.0E-10	87.1E-9	35.3E-8	62.9E-8	91.9E-8
SN50	60.0E-11	10.0E-10	88.5E-10	84.2E-9	41.5E-8	73.4E-8	65.6E-8
Statistics							
Min	45.0E-11	70.0E-11	52.0E-10	56.3E-9	26.7E-8	44.9E-8	51.4E-8
Max	80.0E-11	63.5E-10	28.0E-9	16.4E-8	52.4E-8	81.6E-8	47.0E-6
Mean	55.0E-11	18.6E-10	12.5E-9	96.7E-9	40.8E-8	66.8E-8	17.0E-6
Sigma	10.3E-11	17.9E-10	88.4E-10	35.8E-9	77.9E-9	11.6E-8	18.1E-6

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	20.0E-11	25.0E-11
SN41	24.4E-6	19.4E-6
SN42	47.0E-6	43.2E-6
SN43	36.6E-6	27.2E-6
SN44	26.1E-6	20.5E-6
SN45	31.9E-6	28.9E-6
SN46	51.4E-8	49.6E-8
SN47	10.3E-7	10.0E-7
SN48	81.0E-8	81.2E-8
SN49	91.9E-8	49.7E-8
SN50	65.6E-8	67.0E-8
Statistics		
Min	51.4E-8	49.6E-8
Max	47.0E-6	43.2E-6
Mean	17.0E-6	14.3E-6
Sigma	18.1E-6	15.6E-6

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	25.0E-11	25.0E-11
SN41	19.4E-6	14.8E-8
SN42	43.2E-6	48.6E-9
SN43	27.2E-6	57.0E-9
SN44	20.5E-6	37.0E-9
SN45	28.9E-6	63.5E-9
SN46	49.6E-8	70.6E-9
SN47	10.0E-7	11.2E-8
SN48	81.2E-8	80.1E-9
SN49	49.7E-8	59.7E-9
SN50	67.0E-8	83.6E-9
Statistics		
Min	49.6E-8	37.0E-9
Max	43.2E-6	14.8E-8
Mean	14.3E-6	76.0E-9
Sigma	15.6E-6	32.6E-9

HIREX Engineering	Total Dose Test Report		Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.

Test conditions : Tid

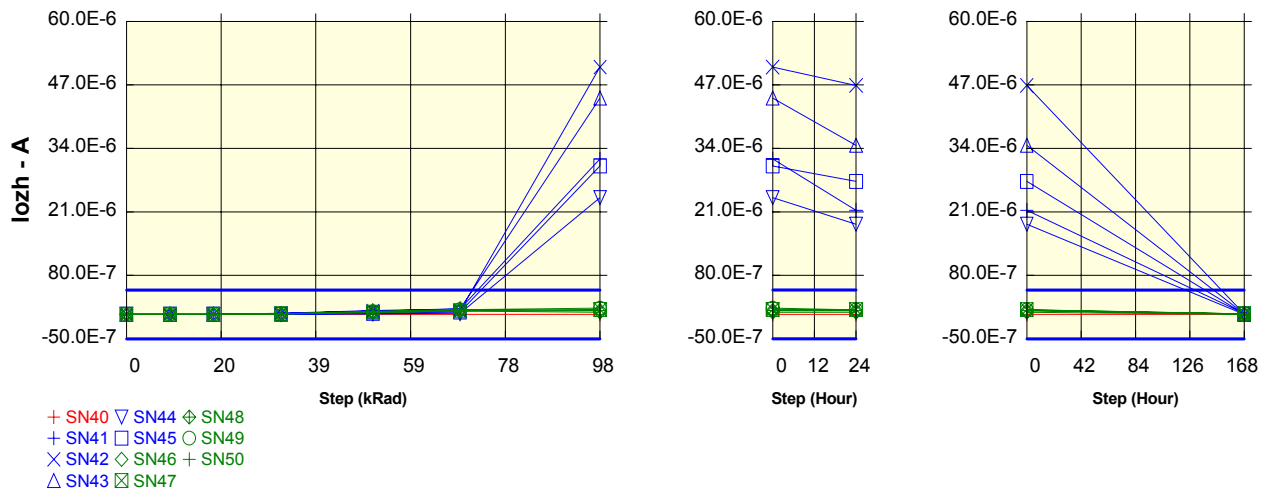
Parameter : Input High Leakage Current : IozhDQ01

Unit : A

Spec Limit Min : -50.0E-7

Spec Limit Max : 50.0E-7

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	40.0E-11	30.0E-11	30.0E-11	40.0E-11	25.0E-11	35.0E-11	25.0E-11
SN41	80.0E-11	63.0E-10	34.0E-9	23.5E-8	79.4E-8	11.5E-7	31.9E-6
SN42	45.0E-11	14.0E-10	16.1E-9	15.9E-8	72.7E-8	70.4E-8	50.7E-6
SN43	40.0E-11	18.5E-10	16.2E-9	15.5E-8	66.3E-8	11.4E-7	44.3E-6
SN44	40.0E-11	70.0E-11	30.5E-10	30.4E-9	13.9E-8	24.5E-8	23.9E-6
SN45	40.0E-11	70.0E-11	78.5E-10	41.1E-9	23.9E-8	49.4E-8	30.4E-6
SN46	45.0E-11	90.0E-11	77.5E-10	10.4E-8	43.1E-8	72.1E-8	44.2E-8
SN47	70.0E-11	32.5E-10	23.3E-9	12.5E-8	44.3E-8	75.9E-8	10.2E-7
SN48	50.0E-11	13.0E-10	11.5E-9	13.8E-8	59.5E-8	99.0E-8	81.5E-8
SN49	55.0E-11	36.0E-10	25.3E-9	14.9E-8	57.5E-8	98.5E-8	12.9E-7
SN50	50.0E-11	14.0E-10	11.6E-9	11.6E-8	35.6E-8	73.0E-8	74.7E-8
Statistics							
Min	40.0E-11	70.0E-11	30.5E-10	30.5E-9	13.9E-8	24.5E-8	44.2E-8
Max	80.0E-11	63.0E-10	34.0E-9	23.5E-8	79.4E-8	11.5E-7	50.7E-6
Mean	51.5E-11	21.4E-10	15.7E-9	12.5E-8	49.6E-8	79.1E-8	18.5E-6
Sigma	13.6E-11	17.7E-10	94.4E-10	59.0E-9	21.3E-8	28.5E-8	20.0E-6

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	25.0E-11	25.0E-11
SN41	31.9E-6	21.3E-6
SN42	50.7E-6	46.9E-6
SN43	44.3E-6	34.7E-6
SN44	23.9E-6	18.5E-6
SN45	30.4E-6	27.3E-6
SN46	44.2E-8	42.3E-8
SN47	10.2E-7	99.5E-8
SN48	81.5E-8	83.1E-8
SN49	12.9E-7	92.2E-8
SN50	74.7E-8	76.0E-8
Statistics		
Min	44.2E-8	42.3E-8
Max	50.7E-6	46.9E-6
Mean	18.5E-6	15.2E-6
Sigma	20.0E-6	17.0E-6

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	25.0E-11	20.0E-11
SN41	21.3E-6	18.9E-8
SN42	46.9E-6	68.1E-9
SN43	34.7E-6	11.1E-8
SN44	18.5E-6	23.4E-9
SN45	27.3E-6	58.0E-9
SN46	42.3E-8	41.1E-9
SN47	99.5E-8	13.0E-8
SN48	83.1E-8	11.6E-8
SN49	92.2E-8	13.1E-8
SN50	76.0E-8	89.5E-9
Statistics		
Min	42.3E-8	23.4E-9
Max	46.9E-6	18.9E-8
Mean	15.2E-6	95.6E-9
Sigma	17.0E-6	49.5E-9

HIREX Engineering	Total Dose Test Report		Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.

Test conditions : Tid

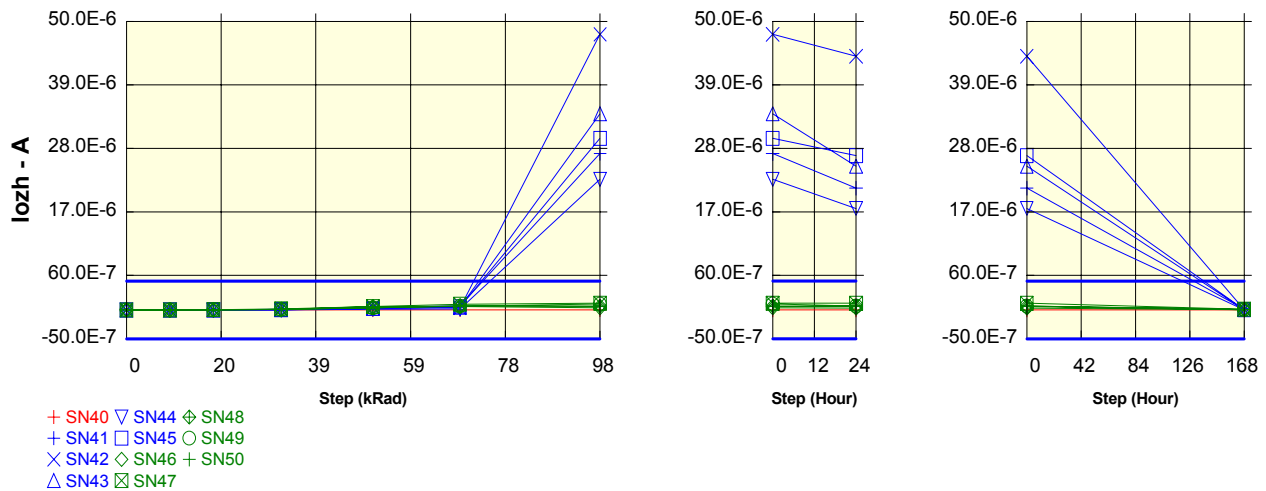
Parameter : Input High Leakage Current : IozhDQ00

Unit : A

Spec Limit Min : -50.0E-7

Spec Limit Max : 50.0E-7

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	30.0E-11	20.0E-11	25.0E-11	25.0E-11	20.0E-11	30.0E-11	30.0E-11
SN41	65.0E-11	62.0E-10	27.1E-9	14.3E-8	48.9E-8	70.9E-8	27.1E-6
SN42	30.0E-11	80.0E-11	66.0E-10	84.2E-9	35.2E-8	37.3E-8	47.8E-6
SN43	40.0E-11	55.0E-11	47.0E-10	59.3E-9	25.6E-8	49.6E-8	34.0E-6
SN44	30.0E-11	70.0E-11	39.0E-10	25.8E-9	12.3E-8	18.9E-8	22.7E-6
SN45	20.0E-11	50.0E-11	35.0E-10	29.2E-9	25.7E-8	52.8E-8	29.8E-6
SN46	35.0E-11	10.0E-10	94.5E-10	98.0E-9	57.3E-8	59.2E-8	34.5E-8
SN47	50.0E-11	48.5E-10	37.3E-9	20.5E-8	58.5E-8	98.0E-8	11.7E-7
SN48	30.0E-11	30.0E-10	14.7E-9	90.9E-9	38.1E-8	73.5E-8	70.0E-8
SN49	40.0E-11	16.0E-10	11.2E-9	92.2E-9	37.0E-8	64.8E-8	10.6E-7
SN50	35.0E-11	11.5E-10	93.0E-10	82.9E-9	36.6E-8	69.8E-8	60.7E-8
Statistics							
Min	20.0E-11	50.0E-11	35.0E-10	25.9E-9	12.3E-8	18.9E-8	34.5E-8
Max	65.0E-11	62.0E-10	37.4E-9	20.5E-8	58.5E-8	98.0E-8	47.8E-6
Mean	37.5E-11	20.4E-10	12.8E-9	91.0E-9	37.5E-8	59.5E-8	16.5E-6
Sigma	12.5E-11	20.0E-10	11.1E-9	52.6E-9	14.5E-8	21.7E-8	17.8E-6

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	30.0E-11	30.0E-11
SN41	27.1E-6	21.1E-6
SN42	47.8E-6	44.0E-6
SN43	34.0E-6	24.9E-6
SN44	22.7E-6	17.6E-6
SN45	29.8E-6	26.8E-6
SN46	34.5E-8	33.7E-8
SN47	11.7E-7	11.6E-7
SN48	70.0E-8	69.9E-8
SN49	10.6E-7	66.2E-8
SN50	60.7E-8	59.6E-8
Statistics		
Min	34.5E-8	33.7E-8
Max	47.8E-6	44.0E-6
Mean	16.5E-6	13.8E-6
Sigma	17.8E-6	15.4E-6

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	30.0E-11	20.0E-11
SN41	21.1E-6	16.1E-8
SN42	44.0E-6	45.8E-9
SN43	24.9E-6	41.9E-9
SN44	17.6E-6	26.7E-9
SN45	26.8E-6	50.9E-9
SN46	33.7E-8	45.4E-9
SN47	11.6E-7	15.9E-8
SN48	69.9E-8	90.4E-9
SN49	66.2E-8	71.8E-9
SN50	59.6E-8	72.9E-9
Statistics		
Min	33.7E-8	26.7E-9
Max	44.0E-6	16.1E-8
Mean	13.8E-6	76.5E-9
Sigma	15.4E-6	47.5E-9

HIREX Engineering	Total Dose Test Report		Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.

Test conditions : Tid

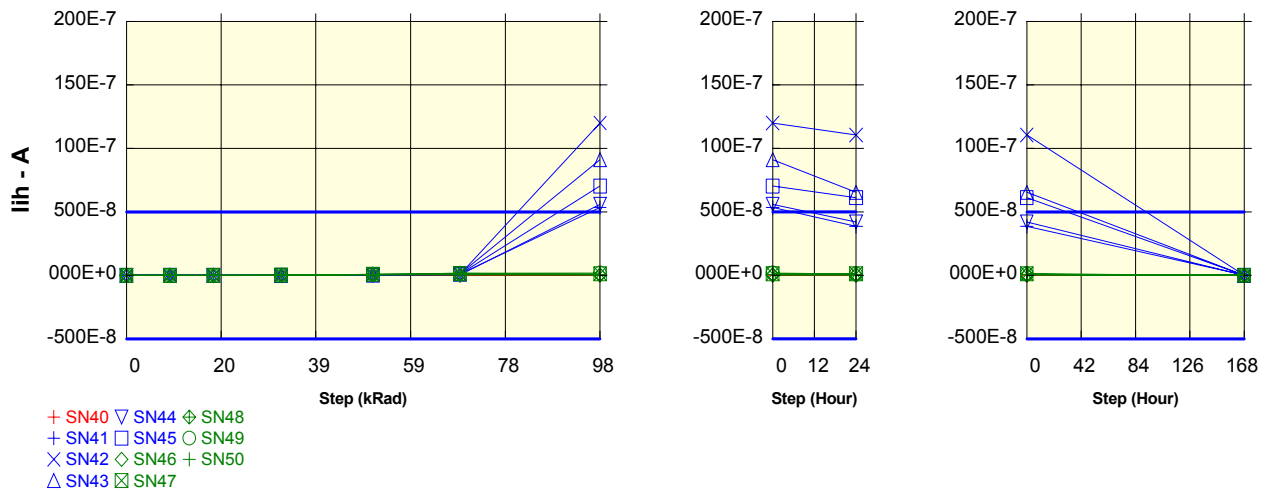
Parameter : Input High Leakage Current : IihCLK

Unit : A

Spec Limit Min : -500E-8

Spec Limit Max : 500E-8

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	150E-12	100E-12	250E-12	200E-12	200E-12	150E-12	150E-12
SN41	300E-12	400E-12	900E-12	153E-10	590E-10	102E-9	534E-8
SN42	250E-12	200E-12	400E-12	515E-11	466E-10	804E-10	120E-7
SN43	200E-12	200E-12	450E-12	460E-11	308E-10	119E-9	911E-8
SN44	200E-12	150E-12	300E-12	160E-11	146E-10	464E-10	559E-8
SN45	250E-12	200E-12	350E-12	265E-11	319E-10	980E-10	704E-8
SN46	200E-12	300E-12	400E-12	320E-11	754E-10	437E-10	235E-10
SN47	200E-12	400E-12	200E-11	172E-10	776E-10	146E-9	119E-9
SN48	200E-12	250E-12	400E-12	535E-11	258E-10	527E-10	523E-10
SN49	200E-12	200E-12	850E-12	118E-10	781E-10	155E-9	185E-9
SN50	150E-12	300E-12	120E-11	184E-10	693E-10	158E-9	692E-10
Statistics							
Min	150E-12	150E-12	300E-12	160E-11	146E-10	437E-10	235E-10
Max	300E-12	400E-12	200E-11	185E-10	781E-10	158E-9	120E-7
Mean	215E-12	260E-12	725E-12	853E-11	509E-10	100E-9	395E-8
Sigma	412E-13	876E-13	539E-12	648E-11	240E-10	441E-10	447E-8

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	150E-12	150E-12
SN41	534E-8	386E-8
SN42	120E-7	111E-7
SN43	911E-8	654E-8
SN44	559E-8	422E-8
SN45	704E-8	612E-8
SN46	235E-10	223E-10
SN47	119E-9	116E-9
SN48	523E-10	564E-10
SN49	185E-9	105E-9
SN50	692E-10	727E-10
Statistics		
Min	235E-10	224E-10
Max	120E-7	111E-7
Mean	395E-8	322E-8
Sigma	447E-8	382E-8

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	150E-12	200E-12
SN41	386E-8	110E-10
SN42	111E-7	465E-11
SN43	654E-8	690E-11
SN44	422E-8	315E-11
SN45	612E-8	790E-11
SN46	223E-10	190E-11
SN47	116E-9	960E-11
SN48	564E-10	570E-11
SN49	105E-9	705E-11
SN50	727E-10	480E-11
Statistics		
Min	224E-10	190E-11
Max	111E-7	111E-10
Mean	322E-8	627E-11
Sigma	382E-8	282E-11

HIREX Engineering	Total Dose Test Report		Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.

Test conditions : Tid

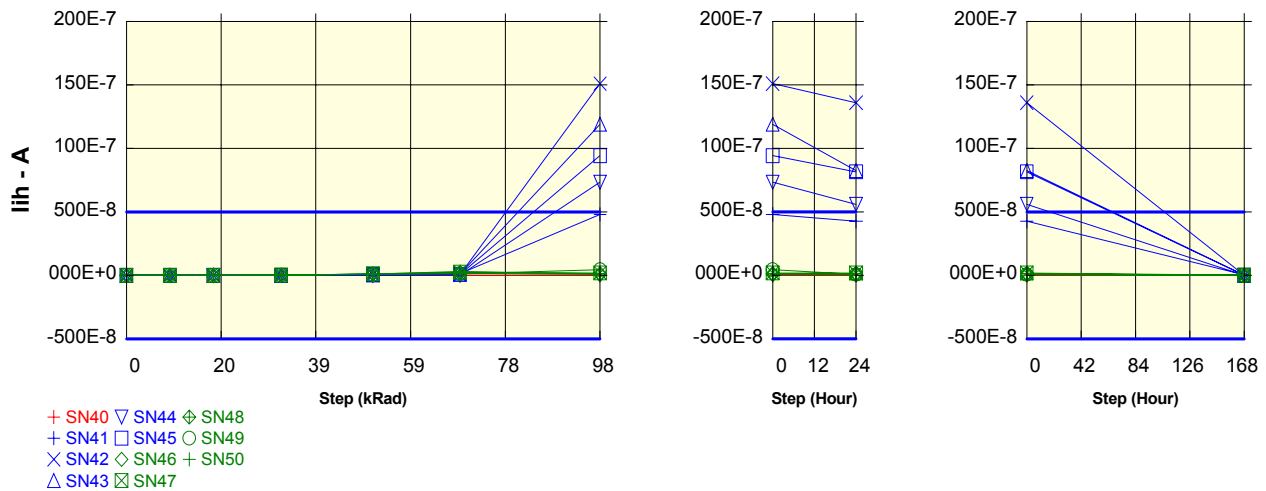
Parameter : Input High Leakage Current : lihCKE

Unit : A

Spec Limit Min : -500E-8

Spec Limit Max : 500E-8

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	150E-12	150E-12	100E-12	200E-12	150E-12	200E-12	200E-12
SN41	150E-12	300E-12	900E-12	935E-11	517E-10	147E-9	479E-8
SN42	150E-12	150E-12	500E-12	470E-11	347E-10	577E-10	151E-7
SN43	150E-12	200E-12	450E-12	520E-11	366E-10	950E-10	119E-7
SN44	150E-12	200E-12	200E-12	120E-11	670E-11	187E-10	735E-8
SN45	200E-12	200E-12	300E-12	570E-11	674E-10	773E-10	944E-8
SN46	150E-12	250E-12	800E-12	790E-11	112E-9	153E-9	519E-10
SN47	150E-12	300E-12	190E-11	187E-10	114E-9	238E-9	192E-9
SN48	200E-12	200E-12	115E-11	129E-10	105E-9	195E-9	141E-9
SN49	150E-12	250E-12	600E-12	875E-11	533E-10	115E-9	445E-9
SN50	150E-12	150E-12	950E-12	137E-10	990E-10	298E-9	123E-9
Statistics							
Min	150E-12	150E-12	200E-12	120E-11	670E-11	187E-10	519E-10
Max	200E-12	300E-12	190E-11	187E-10	114E-9	298E-9	151E-7
Mean	160E-12	220E-12	775E-12	881E-11	679E-10	139E-9	495E-8
Sigma	211E-13	537E-13	497E-12	513E-11	375E-10	856E-10	568E-8

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	200E-12	200E-12
SN41	479E-8	426E-8
SN42	151E-7	136E-7
SN43	119E-7	826E-8
SN44	735E-8	559E-8
SN45	944E-8	816E-8
SN46	519E-10	495E-10
SN47	192E-9	188E-9
SN48	141E-9	146E-9
SN49	445E-9	721E-10
SN50	123E-9	123E-9
Statistics		
Min	519E-10	495E-10
Max	151E-7	136E-7
Mean	495E-8	404E-8
Sigma	568E-8	478E-8

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	200E-12	100E-12
SN41	426E-8	384E-10
SN42	136E-7	700E-11
SN43	826E-8	121E-10
SN44	559E-8	300E-11
SN45	816E-8	915E-11
SN46	495E-10	365E-11
SN47	188E-9	152E-10
SN48	146E-9	895E-11
SN49	721E-10	515E-11
SN50	123E-9	840E-11
Statistics		
Min	495E-10	300E-11
Max	136E-7	384E-10
Mean	404E-8	111E-10
Sigma	478E-8	103E-10

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.	

Test conditions : Tid

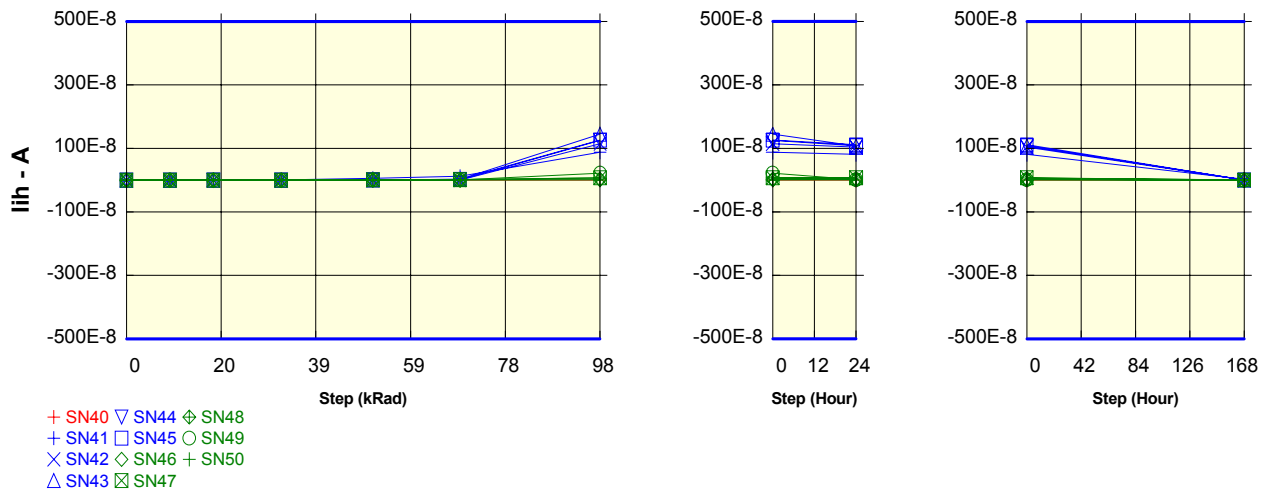
Parameter : Input High Leakage Current : lih/RAS

Unit : A

Spec Limit Min : -500E-8

Spec Limit Max : 500E-8

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	200E-12	200E-12	150E-12	250E-12	200E-12	200E-12	150E-12
SN41	150E-12	400E-12	850E-12	600E-11	555E-10	126E-9	881E-9
SN42	150E-12	200E-12	200E-12	200E-12	950E-12	215E-11	115E-8
SN43	200E-12	200E-12	150E-12	240E-11	101E-10	269E-10	145E-8
SN44	250E-12	200E-12	300E-12	850E-12	440E-11	121E-10	126E-8
SN45	200E-12	200E-12	600E-12	220E-11	855E-11	282E-10	126E-8
SN46	200E-12	200E-12	300E-12	150E-11	885E-11	152E-10	294E-10
SN47	150E-12	200E-12	200E-12	115E-11	900E-11	180E-10	720E-10
SN48	150E-12	150E-12	350E-12	100E-11	200E-11	220E-11	465E-11
SN49	100E-12	200E-12	200E-12	600E-12	345E-11	860E-11	222E-9
SN50	250E-12	200E-12	300E-12	160E-11	435E-11	154E-10	710E-10
Statistics							
Min	100E-12	150E-12	150E-12	200E-12	950E-12	215E-11	465E-11
Max	250E-12	400E-12	850E-12	600E-11	555E-10	126E-9	145E-8
Mean	180E-12	215E-12	345E-12	175E-11	107E-10	254E-10	639E-9
Sigma	483E-13	669E-13	218E-12	164E-11	161E-10	363E-10	608E-9

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	150E-12	150E-12
SN41	881E-9	810E-9
SN42	115E-8	104E-8
SN43	145E-8	107E-8
SN44	126E-8	109E-8
SN45	126E-8	111E-8
SN46	294E-10	296E-10
SN47	720E-10	708E-10
SN48	465E-11	615E-11
SN49	222E-9	149E-10
SN50	710E-10	686E-10
Statistics		
Min	465E-11	615E-11
Max	145E-8	111E-8
Mean	639E-9	530E-9
Sigma	608E-9	526E-9

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	150E-12	200E-12
SN41	810E-9	245E-10
SN42	104E-8	350E-12
SN43	107E-8	675E-11
SN44	109E-8	320E-11
SN45	111E-8	360E-11
SN46	296E-10	145E-11
SN47	708E-10	460E-11
SN48	615E-11	850E-12
SN49	149E-10	120E-11
SN50	686E-10	485E-11
Statistics		
Min	615E-11	350E-12
Max	111E-8	245E-10
Mean	530E-9	513E-11
Sigma	526E-9	709E-11

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.	

Test conditions : Tid

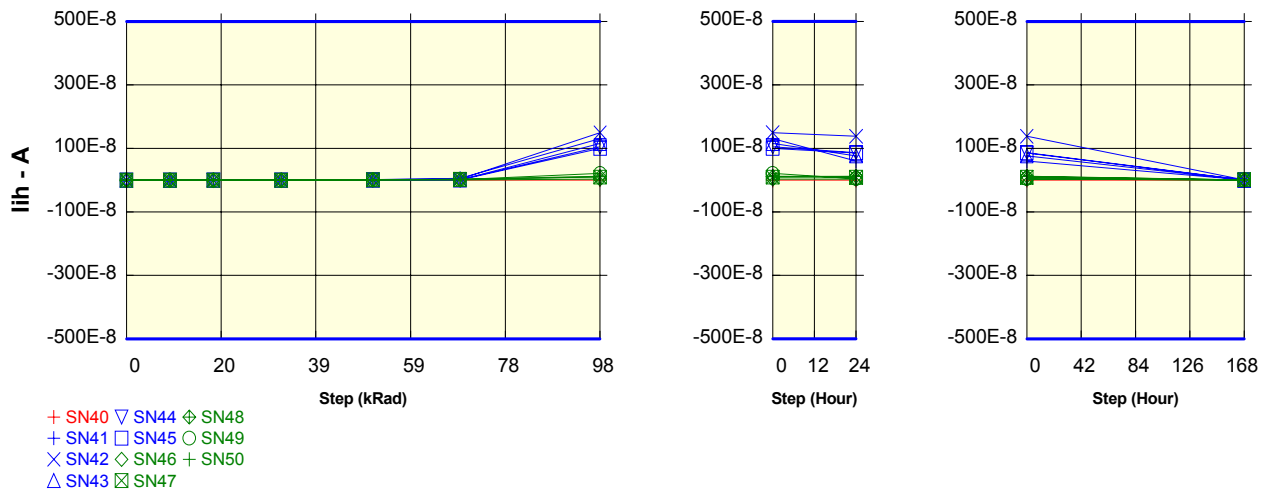
Parameter : Input High Leakage Current : lih/CAS

Unit : A

Spec Limit Min : -500E-8

Spec Limit Max : 500E-8

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	200E-12	150E-12	150E-12	150E-12	200E-12	200E-12	150E-12
SN41	250E-12	300E-12	600E-12	580E-11	181E-10	562E-10	131E-8
SN42	200E-12	200E-12	200E-12	600E-12	174E-10	361E-10	150E-8
SN43	250E-12	200E-12	200E-12	400E-12	250E-11	840E-11	116E-8
SN44	250E-12	200E-12	350E-12	110E-11	570E-11	137E-10	105E-8
SN45	300E-12	250E-12	150E-12	500E-12	335E-11	700E-11	100E-8
SN46	250E-12	200E-12	200E-12	105E-11	675E-11	745E-11	300E-10
SN47	400E-12	250E-12	350E-12	210E-11	710E-11	245E-10	935E-10
SN48	300E-12	200E-12	200E-12	165E-11	129E-10	164E-10	108E-9
SN49	200E-12	200E-12	250E-12	850E-12	400E-11	166E-10	211E-9
SN50	200E-12	200E-12	350E-12	370E-11	199E-10	281E-10	120E-9
Statistics							
Min	200E-12	200E-12	150E-12	400E-12	250E-11	700E-11	300E-10
Max	400E-12	300E-12	600E-12	580E-11	199E-10	563E-10	150E-8
Mean	260E-12	220E-12	285E-12	178E-11	977E-11	214E-10	657E-9
Sigma	615E-13	350E-13	133E-12	172E-11	666E-11	155E-10	591E-9

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	150E-12	150E-12
SN41	131E-8	603E-9
SN42	150E-8	138E-8
SN43	116E-8	768E-9
SN44	105E-8	866E-9
SN45	100E-8	858E-9
SN46	300E-10	307E-10
SN47	935E-10	877E-10
SN48	108E-9	120E-9
SN49	211E-9	443E-10
SN50	120E-9	110E-9
Statistics		
Min	300E-10	307E-10
Max	150E-8	138E-8
Mean	657E-9	487E-9
Sigma	591E-9	473E-9

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	150E-12	200E-12
SN41	603E-9	418E-11
SN42	138E-8	445E-11
SN43	768E-9	100E-11
SN44	866E-9	880E-11
SN45	858E-9	220E-11
SN46	307E-10	185E-11
SN47	877E-10	118E-10
SN48	120E-9	850E-11
SN49	443E-10	380E-11
SN50	110E-9	107E-10
Statistics		
Min	307E-10	100E-11
Max	138E-8	118E-10
Mean	487E-9	573E-11
Sigma	473E-9	389E-11

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.	

Test conditions : Tid

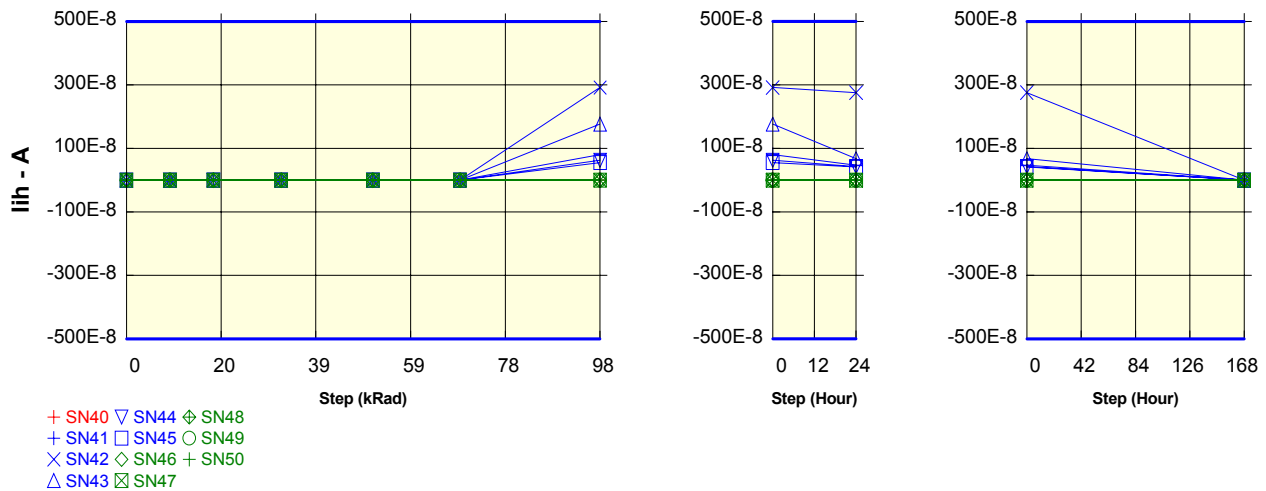
Parameter : Input High Leakage Current : lih/WE

Unit : A

Spec Limit Min : -500E-8

Spec Limit Max : 500E-8

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	250E-12	200E-12	200E-12	150E-12	200E-12	250E-12	250E-12
SN41	150E-12	150E-12	150E-12	300E-12	200E-12	200E-12	806E-9
SN42	200E-12	350E-12	150E-12	150E-12	150E-12	200E-12	292E-8
SN43	250E-12	200E-12	150E-12	250E-12	150E-12	200E-12	177E-8
SN44	150E-12	300E-12	200E-12	200E-12	200E-12	200E-12	625E-9
SN45	200E-12	250E-12	200E-12	200E-12	150E-12	200E-12	556E-9
SN46	150E-12	200E-12	150E-12	200E-12	150E-12	100E-12	150E-12
SN47	150E-12	300E-12	150E-12	250E-12	100E-12	150E-12	200E-12
SN48	250E-12	200E-12	200E-12	200E-12	200E-12	200E-12	150E-12
SN49	150E-12	200E-12	150E-12	150E-12	150E-12	200E-12	150E-12
SN50	250E-12	250E-12	200E-12	200E-12	200E-12	150E-12	250E-12
Statistics							
Min	150E-12	150E-12	150E-12	150E-12	100E-12	100E-12	150E-12
Max	250E-12	350E-12	200E-12	300E-12	200E-12	200E-12	292E-8
Mean	190E-12	240E-12	170E-12	210E-12	165E-12	180E-12	667E-9
Sigma	459E-13	615E-13	258E-13	459E-13	337E-13	350E-13	973E-9

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	250E-12	150E-12
SN41	806E-9	470E-9
SN42	292E-8	276E-8
SN43	177E-8	672E-9
SN44	625E-9	420E-9
SN45	556E-9	415E-9
SN46	150E-12	150E-12
SN47	200E-12	250E-12
SN48	150E-12	200E-12
SN49	150E-12	200E-12
SN50	250E-12	200E-12
Statistics		
Min	150E-12	150E-12
Max	292E-8	276E-8
Mean	667E-9	473E-9
Sigma	973E-9	841E-9

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	150E-12	150E-12
SN41	470E-9	250E-12
SN42	276E-8	250E-12
SN43	672E-9	200E-12
SN44	420E-9	200E-12
SN45	415E-9	200E-12
SN46	150E-12	200E-12
SN47	250E-12	300E-12
SN48	200E-12	150E-12
SN49	200E-12	150E-12
SN50	200E-12	250E-12
Statistics		
Min	150E-12	150E-12
Max	276E-8	300E-12
Mean	473E-9	215E-12
Sigma	841E-9	474E-13

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.	

Test conditions : Tid

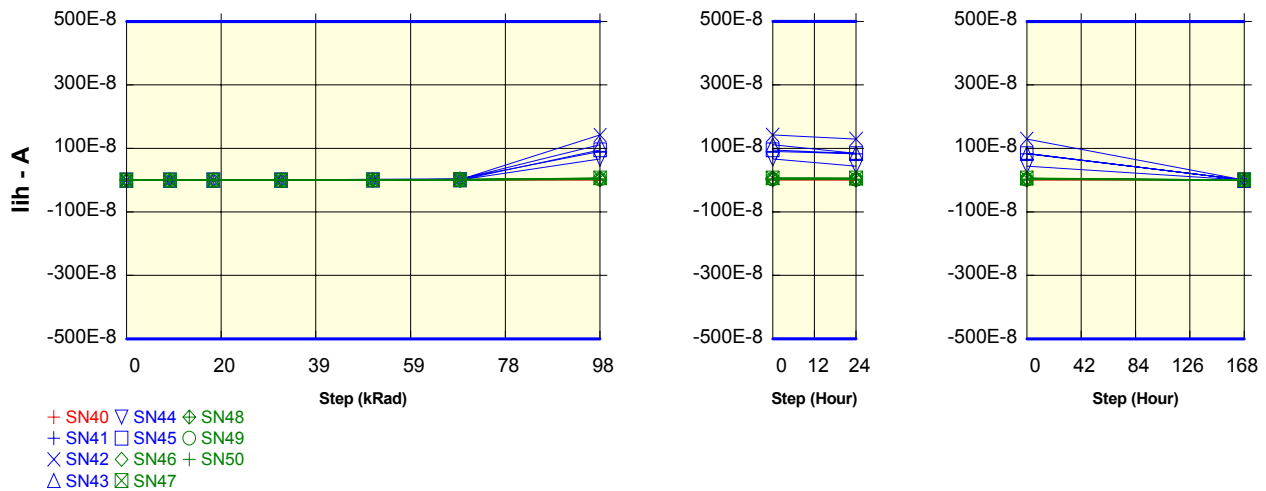
Parameter : Input High Leakage Current : I_{IH}BA1

Unit : A

Spec Limit Min : -500E-8

Spec Limit Max : 500E-8

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	150E-12	200E-12	150E-12	200E-12	500E-13	150E-12	200E-12
SN41	200E-12	200E-12	550E-12	108E-10	215E-10	445E-10	900E-9
SN42	200E-12	300E-12	200E-12	650E-12	101E-10	171E-10	142E-8
SN43	150E-12	200E-12	200E-12	150E-11	114E-10	226E-10	112E-8
SN44	250E-12	200E-12	200E-12	450E-12	200E-11	755E-11	667E-9
SN45	200E-12	200E-12	150E-12	350E-12	340E-11	830E-11	955E-9
SN46	200E-12	250E-12	350E-12	135E-11	360E-11	325E-10	607E-10
SN47	250E-12	150E-12	250E-12	900E-12	375E-11	137E-10	695E-10
SN48	200E-12	200E-12	150E-12	250E-12	850E-12	175E-11	200E-10
SN49	200E-12	200E-12	200E-12	700E-12	175E-11	360E-11	333E-10
SN50	250E-12	150E-12	200E-12	850E-12	415E-11	665E-11	392E-10
Statistics							
Min	150E-12	150E-12	150E-12	250E-12	850E-12	175E-11	201E-10
Max	250E-12	300E-12	550E-12	108E-10	215E-10	445E-10	142E-8
Mean	210E-12	205E-12	245E-12	178E-11	625E-11	158E-10	528E-9
Sigma	316E-13	438E-13	121E-12	319E-11	638E-11	138E-10	543E-9

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	200E-12	150E-12
SN41	900E-9	828E-9
SN42	142E-8	130E-8
SN43	112E-8	844E-9
SN44	667E-9	439E-9
SN45	955E-9	834E-9
SN46	607E-10	571E-10
SN47	695E-10	666E-10
SN48	200E-10	176E-10
SN49	333E-10	207E-10
SN50	392E-10	361E-10
Statistics		
Min	201E-10	176E-10
Max	142E-8	130E-8
Mean	528E-9	444E-9
Sigma	543E-9	472E-9

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	150E-12	500E-13
SN41	828E-9	440E-11
SN42	130E-8	400E-12
SN43	844E-9	550E-12
SN44	439E-9	350E-12
SN45	834E-9	450E-12
SN46	571E-10	885E-11
SN47	666E-10	555E-11
SN48	176E-10	850E-12
SN49	207E-10	130E-11
SN50	361E-10	260E-11
Statistics		
Min	176E-10	350E-12
Max	130E-8	885E-11
Mean	444E-9	253E-11
Sigma	472E-9	288E-11

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.	

Test conditions : Tid

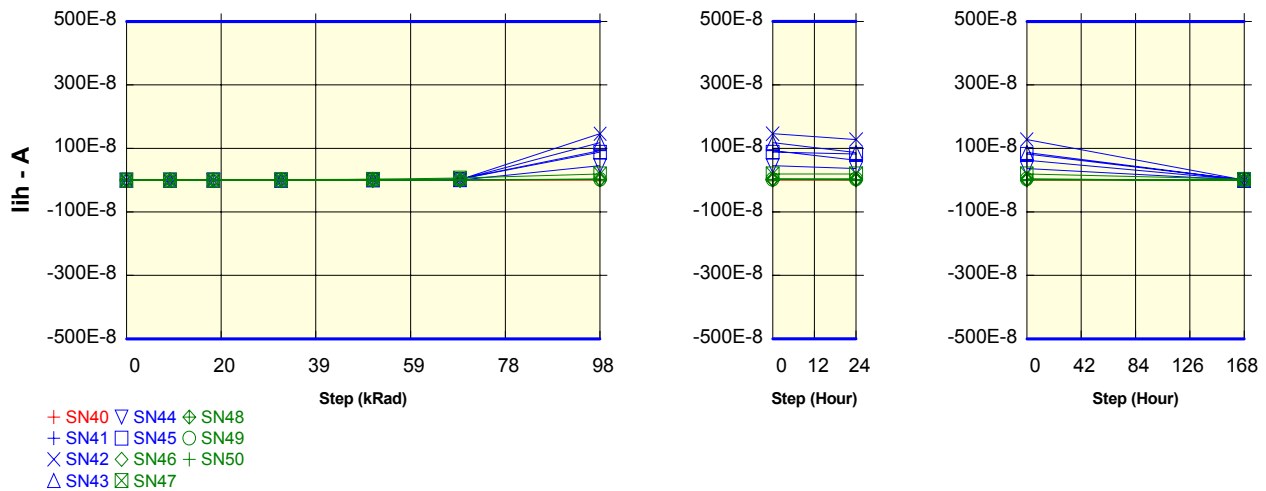
Parameter : Input High Leakage Current : IihBA0

Unit : A

Spec Limit Min : -500E-8

Spec Limit Max : 500E-8

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	150E-12	150E-12	200E-12	150E-12	150E-12	200E-12	200E-12
SN41	150E-12	200E-12	500E-12	420E-11	142E-10	356E-10	930E-9
SN42	150E-12	100E-12	250E-12	200E-11	850E-11	125E-10	147E-8
SN43	200E-12	150E-12	200E-12	170E-11	665E-11	194E-10	118E-8
SN44	150E-12	200E-12	150E-12	200E-12	800E-12	215E-11	458E-9
SN45	200E-12	200E-12	200E-12	205E-11	121E-10	290E-10	883E-9
SN46	150E-12	200E-12	200E-12	750E-12	279E-10	585E-11	330E-10
SN47	200E-12	400E-12	140E-11	125E-10	284E-10	627E-10	195E-9
SN48	250E-12	150E-12	250E-12	450E-12	115E-11	200E-11	130E-10
SN49	200E-12	200E-12	300E-12	150E-11	102E-10	203E-10	256E-10
SN50	200E-12	150E-12	150E-12	600E-12	185E-11	440E-11	218E-10
Statistics							
Min	150E-12	100E-12	150E-12	200E-12	800E-12	200E-11	130E-10
Max	250E-12	400E-12	140E-11	125E-10	285E-10	627E-10	147E-8
Mean	185E-12	195E-12	360E-12	259E-11	112E-10	194E-10	520E-9
Sigma	337E-13	798E-13	379E-12	365E-11	101E-10	191E-10	550E-9

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	200E-12	200E-12
SN41	930E-9	624E-9
SN42	147E-8	128E-8
SN43	118E-8	867E-9
SN44	458E-9	365E-9
SN45	883E-9	818E-9
SN46	330E-10	314E-10
SN47	195E-9	199E-9
SN48	130E-10	121E-10
SN49	256E-10	315E-10
SN50	218E-10	183E-10
Statistics		
Min	130E-10	121E-10
Max	147E-8	128E-8
Mean	520E-9	424E-9
Sigma	550E-9	450E-9

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	200E-12	100E-12
SN41	624E-9	170E-11
SN42	128E-8	350E-12
SN43	867E-9	195E-11
SN44	365E-9	150E-12
SN45	818E-9	200E-11
SN46	314E-10	215E-11
SN47	199E-9	290E-10
SN48	121E-10	650E-12
SN49	315E-10	380E-11
SN50	183E-10	100E-11
Statistics		
Min	121E-10	150E-12
Max	128E-8	290E-10
Mean	424E-9	428E-11
Sigma	450E-9	875E-11

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.	

Test conditions : Tid

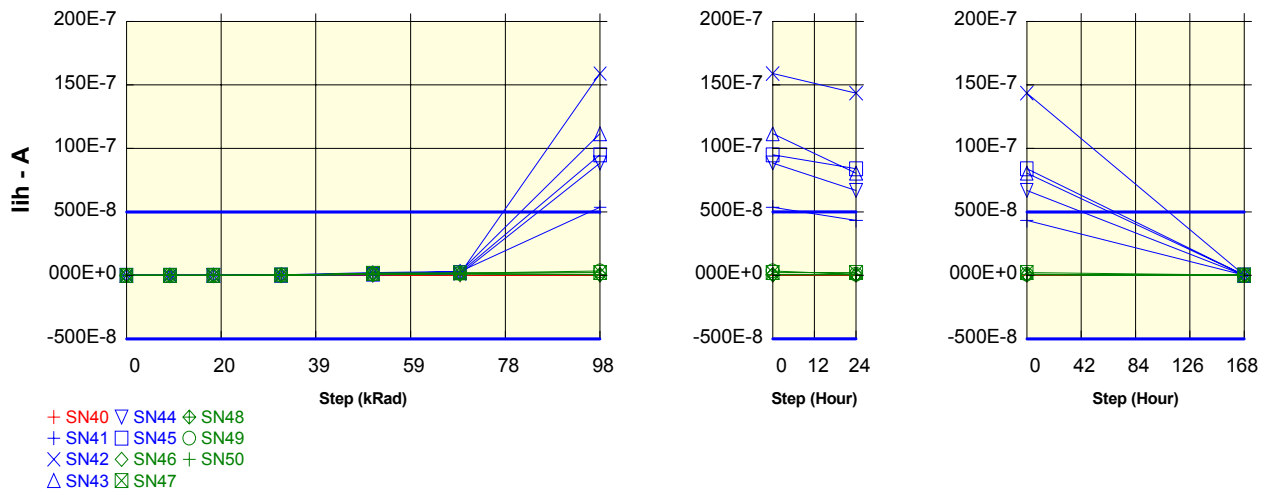
Parameter : Input High Leakage Current : lihDQMH

Unit : A

Spec Limit Min : -500E-8

Spec Limit Max : 500E-8

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	250E-12	150E-12	200E-12	250E-12	200E-12	150E-12	200E-12
SN41	150E-12	500E-12	360E-11	311E-10	216E-9	311E-9	536E-8
SN42	200E-12	250E-12	650E-12	186E-10	121E-9	136E-9	159E-7
SN43	150E-12	250E-12	750E-12	163E-10	140E-9	293E-9	112E-7
SN44	200E-12	200E-12	450E-12	475E-11	481E-10	980E-10	885E-8
SN45	300E-12	150E-12	850E-12	145E-10	105E-9	228E-9	950E-8
SN46	150E-12	250E-12	700E-12	750E-11	155E-9	141E-9	466E-10
SN47	200E-12	600E-12	445E-11	295E-10	156E-9	208E-9	224E-9
SN48	150E-12	200E-12	400E-12	111E-10	733E-10	106E-9	671E-10
SN49	250E-12	250E-12	110E-11	126E-10	766E-10	159E-9	352E-9
SN50	200E-12	200E-12	650E-12	180E-10	845E-10	121E-9	677E-10
Statistics							
Min	150E-12	150E-12	400E-12	475E-11	481E-10	980E-10	467E-10
Max	300E-12	600E-12	445E-11	311E-10	216E-9	311E-9	159E-7
Mean	195E-12	285E-12	136E-11	164E-10	117E-9	180E-9	515E-8
Sigma	497E-13	145E-12	143E-11	852E-11	503E-10	764E-10	586E-8

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	200E-12	150E-12
SN41	536E-8	434E-8
SN42	159E-7	144E-7
SN43	112E-7	806E-8
SN44	885E-8	668E-8
SN45	950E-8	840E-8
SN46	466E-10	444E-10
SN47	224E-9	227E-9
SN48	671E-10	658E-10
SN49	352E-9	840E-10
SN50	677E-10	737E-10
Statistics		
Min	467E-10	444E-10
Max	159E-7	144E-7
Mean	515E-8	423E-8
Sigma	586E-8	501E-8

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	150E-12	150E-12
SN41	434E-8	301E-10
SN42	144E-7	125E-10
SN43	806E-8	182E-10
SN44	668E-8	760E-11
SN45	840E-8	140E-10
SN46	444E-10	365E-11
SN47	227E-9	138E-10
SN48	658E-10	430E-11
SN49	840E-10	805E-11
SN50	737E-10	800E-11
Statistics		
Min	444E-10	365E-11
Max	144E-7	301E-10
Mean	423E-8	120E-10
Sigma	501E-8	784E-11

HIREX Engineering	Total Dose Test Report		Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.

Test conditions : Tid

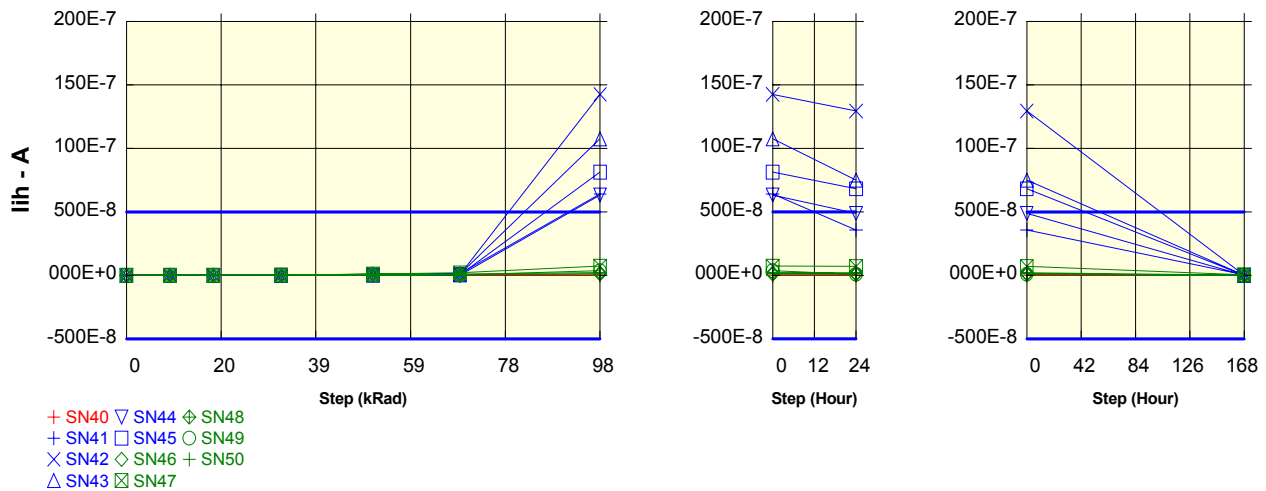
Parameter : Input High Leakage Current : Iih/CS

Unit : A

Spec Limit Min : -500E-8

Spec Limit Max : 500E-8

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	200E-12	200E-12	200E-12	200E-12	200E-12	150E-12	200E-12
SN41	200E-12	300E-12	100E-11	995E-11	564E-10	137E-9	641E-8
SN42	200E-12	250E-12	550E-12	550E-11	445E-10	645E-10	143E-7
SN43	200E-12	200E-12	800E-12	400E-11	350E-10	980E-10	108E-7
SN44	200E-12	300E-12	300E-12	140E-11	860E-11	208E-10	633E-8
SN45	250E-12	250E-12	300E-12	260E-11	207E-10	484E-10	814E-8
SN46	300E-12	150E-12	450E-12	370E-11	980E-10	504E-10	120E-9
SN47	400E-12	350E-12	160E-11	152E-10	101E-9	194E-9	722E-9
SN48	200E-12	200E-12	300E-12	250E-11	172E-10	467E-10	130E-9
SN49	200E-12	250E-12	250E-12	225E-11	128E-10	383E-10	374E-9
SN50	150E-12	300E-12	600E-12	575E-11	396E-10	102E-9	219E-9
Statistics							
Min	150E-12	150E-12	250E-12	140E-11	860E-11	208E-10	120E-9
Max	400E-12	350E-12	160E-11	152E-10	101E-9	194E-9	143E-7
Mean	230E-12	255E-12	615E-12	528E-11	433E-10	799E-10	474E-8
Sigma	715E-13	599E-13	424E-12	425E-11	331E-10	530E-10	518E-8

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	200E-12	200E-12
SN41	641E-8	358E-8
SN42	143E-7	130E-7
SN43	108E-7	751E-8
SN44	633E-8	488E-8
SN45	814E-8	682E-8
SN46	120E-9	107E-9
SN47	722E-9	702E-9
SN48	130E-9	131E-9
SN49	374E-9	794E-10
SN50	219E-9	202E-9
Statistics		
Min	120E-9	794E-10
Max	143E-7	130E-7
Mean	474E-8	370E-8
Sigma	518E-8	436E-8

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	200E-12	150E-12
SN41	358E-8	340E-10
SN42	130E-7	102E-10
SN43	751E-8	820E-11
SN44	488E-8	265E-11
SN45	682E-8	910E-11
SN46	107E-9	850E-11
SN47	702E-9	405E-10
SN48	131E-9	665E-11
SN49	794E-10	350E-11
SN50	202E-9	129E-10
Statistics		
Min	794E-10	265E-11
Max	130E-7	405E-10
Mean	370E-8	136E-10
Sigma	436E-8	129E-10

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.	

Test conditions : Tid

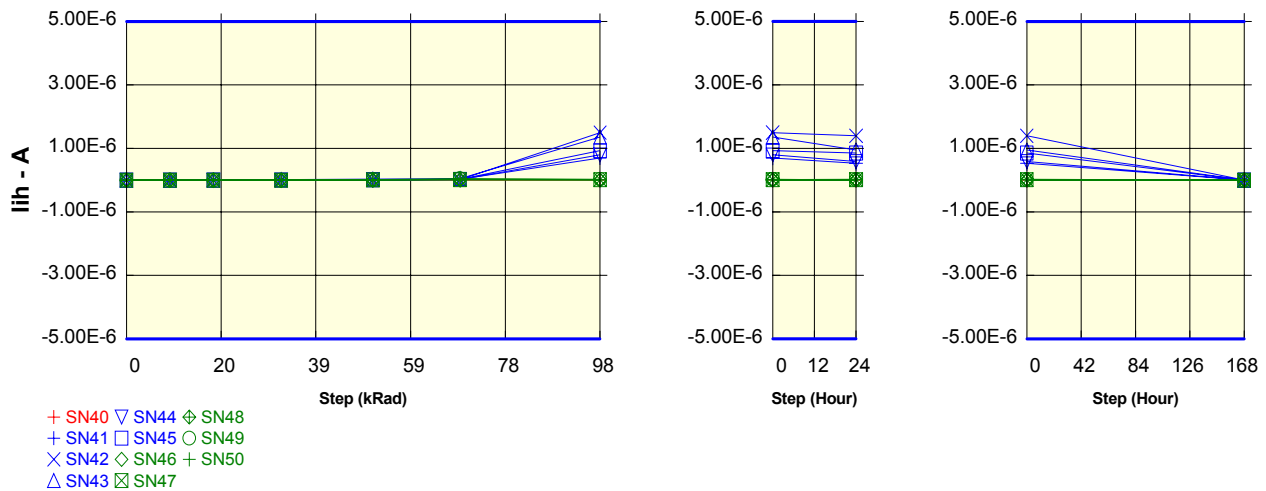
Parameter : Input High Leakage Current : lihA11

Unit : A

Spec Limit Min : -5.00E-6

Spec Limit Max : 5.00E-6

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	8.00E-10	3.50E-10	2.00E-10	3.50E-10	3.00E-10	2.00E-10	2.00E-10
SN41	7.00E-10	6.00E-10	8.00E-10	3.85E-9	1.19E-8	2.61E-8	6.97E-7
SN42	8.00E-10	5.00E-10	2.50E-10	1.00E-9	7.60E-9	1.63E-8	1.50E-6
SN43	6.00E-10	4.00E-10	4.00E-10	1.46E-8	3.53E-8	4.60E-8	1.36E-6
SN44	5.50E-10	4.50E-10	2.00E-10	9.00E-10	9.95E-9	1.49E-8	7.93E-7
SN45	6.50E-10	4.00E-10	3.00E-10	1.30E-9	6.60E-9	2.82E-8	9.28E-7
SN46	6.50E-10	4.00E-10	3.00E-10	1.40E-9	5.65E-9	1.59E-8	8.85E-9
SN47	4.00E-10	4.00E-10	3.50E-10	9.00E-10	6.00E-9	1.44E-8	1.53E-8
SN48	3.50E-10	3.00E-10	2.50E-10	3.00E-10	2.75E-9	6.05E-9	3.50E-9
SN49	5.00E-10	4.00E-10	3.00E-10	3.05E-9	1.30E-8	4.96E-8	2.77E-8
SN50	6.00E-10	3.50E-10	6.00E-10	4.25E-9	3.00E-10	2.97E-8	2.00E-8
Statistics							
Min	3.50E-10	3.00E-10	2.00E-10	3.00E-10	3.00E-10	6.05E-9	3.50E-9
Max	8.00E-10	6.00E-10	8.00E-10	1.46E-8	3.53E-8	4.96E-8	1.50E-6
Mean	5.80E-10	4.20E-10	3.75E-10	3.16E-9	9.91E-9	2.47E-8	5.34E-7
Sigma	1.36E-10	8.23E-11	1.86E-10	4.24E-9	9.73E-9	1.42E-8	5.96E-7

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	2.00E-10	2.00E-10
SN41	6.97E-7	5.29E-7
SN42	1.50E-6	1.40E-6
SN43	1.36E-6	9.50E-7
SN44	7.93E-7	5.88E-7
SN45	9.28E-7	8.54E-7
SN46	8.85E-9	9.60E-9
SN47	1.53E-8	1.53E-8
SN48	3.50E-9	3.80E-9
SN49	2.77E-8	1.15E-8
SN50	2.00E-8	2.29E-8
Statistics		
Min	3.50E-9	3.80E-9
Max	1.50E-6	1.40E-6
Mean	5.34E-7	4.38E-7
Sigma	5.96E-7	5.04E-7

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	2.00E-10	1.50E-10
SN41	5.29E-7	3.25E-9
SN42	1.40E-6	1.60E-9
SN43	9.50E-7	2.05E-9
SN44	5.88E-7	1.60E-9
SN45	8.54E-7	1.95E-9
SN46	9.60E-9	1.00E-9
SN47	1.53E-8	1.90E-9
SN48	3.80E-9	3.50E-10
SN49	1.15E-8	7.00E-10
SN50	2.29E-8	2.30E-9
Statistics		
Min	3.80E-9	3.50E-10
Max	1.40E-6	3.25E-9
Mean	4.38E-7	1.67E-9
Sigma	5.04E-7	8.37E-10

HIREX Engineering	Total Dose Test Report		Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.

Test conditions : Tid

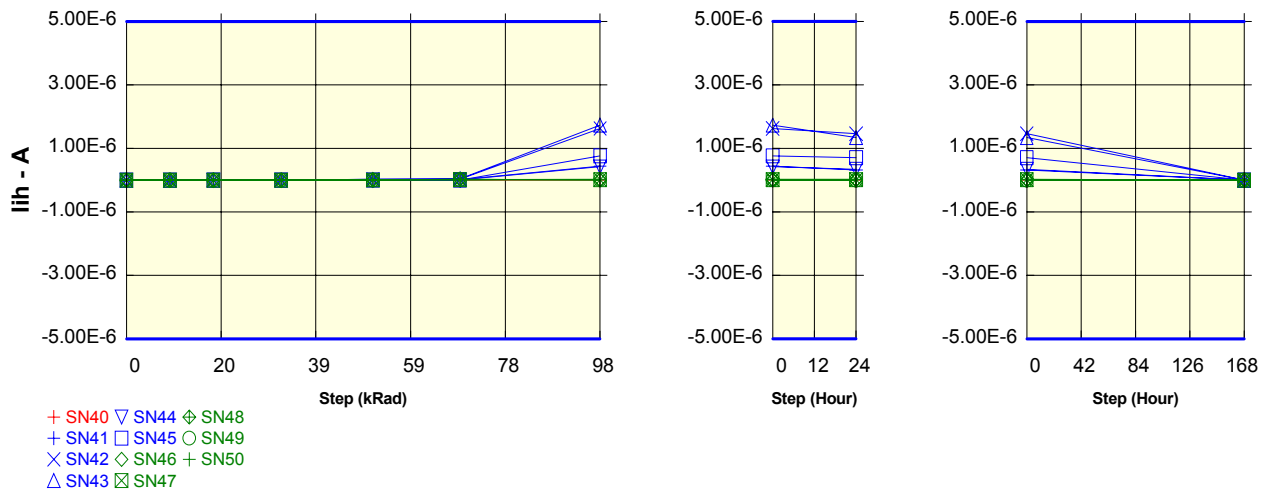
Parameter : Input High Leakage Current : IihA10

Unit : A

Spec Limit Min : -5.00E-6

Spec Limit Max : 5.00E-6

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	2.00E-10	2.50E-10	2.00E-10	2.00E-10	1.50E-10	1.50E-10	2.50E-10
SN41	3.00E-10	2.00E-10	4.00E-10	1.70E-9	4.35E-9	1.61E-8	4.36E-7
SN42	3.00E-10	1.50E-10	4.00E-10	4.00E-9	2.42E-8	2.86E-8	1.63E-6
SN43	2.00E-10	2.00E-10	2.50E-10	2.90E-9	2.09E-8	4.14E-8	1.74E-6
SN44	2.00E-10	1.50E-10	2.00E-10	5.00E-10	2.20E-9	5.45E-9	4.19E-7
SN45	1.50E-10	2.00E-10	1.50E-10	2.50E-10	1.50E-9	2.00E-9	7.68E-7
SN46	2.00E-10	2.00E-10	3.50E-10	1.00E-9	4.60E-9	2.27E-8	8.10E-9
SN47	2.00E-10	2.00E-10	3.50E-10	1.15E-9	4.45E-9	1.56E-8	1.34E-8
SN48	2.50E-10	2.00E-10	2.00E-10	1.90E-9	1.22E-8	2.80E-8	8.05E-9
SN49	3.00E-10	2.00E-10	2.00E-10	3.50E-10	1.60E-9	3.60E-9	1.68E-8
SN50	2.50E-10	2.00E-10	4.00E-10	1.05E-9	6.95E-9	1.83E-8	2.69E-8
Statistics							
Min	1.50E-10	1.50E-10	1.50E-10	2.50E-10	1.50E-9	2.00E-9	8.05E-9
Max	3.00E-10	2.00E-10	4.00E-10	4.00E-9	2.42E-8	4.14E-8	1.74E-6
Mean	2.35E-10	1.90E-10	2.90E-10	1.48E-9	8.29E-9	1.82E-8	5.06E-7
Sigma	5.30E-11	2.11E-11	9.94E-11	1.20E-9	8.17E-9	1.25E-8	6.71E-7

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	2.50E-10	2.00E-10
SN41	4.36E-7	3.19E-7
SN42	1.63E-6	1.47E-6
SN43	1.74E-6	1.34E-6
SN44	4.19E-7	3.39E-7
SN45	7.68E-7	7.11E-7
SN46	8.10E-9	7.60E-9
SN47	1.34E-8	1.38E-8
SN48	8.05E-9	7.70E-9
SN49	1.68E-8	1.50E-9
SN50	2.69E-8	2.64E-8
Statistics		
Min	8.05E-9	1.50E-9
Max	1.74E-6	1.47E-6
Mean	5.06E-7	4.23E-7
Sigma	6.71E-7	5.65E-7

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	2.00E-10	2.00E-10
SN41	3.19E-7	1.15E-9
SN42	1.47E-6	1.60E-9
SN43	1.34E-6	1.45E-9
SN44	3.39E-7	4.50E-10
SN45	7.11E-7	0.00E+0
SN46	7.60E-9	5.00E-10
SN47	1.38E-8	1.45E-9
SN48	7.70E-9	6.00E-10
SN49	1.50E-9	2.50E-10
SN50	2.64E-8	3.25E-9
Statistics		
Min	1.50E-9	0.00E+0
Max	1.47E-6	3.25E-9
Mean	4.23E-7	1.07E-9
Sigma	5.65E-7	9.47E-10

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.	

Test conditions : Tid

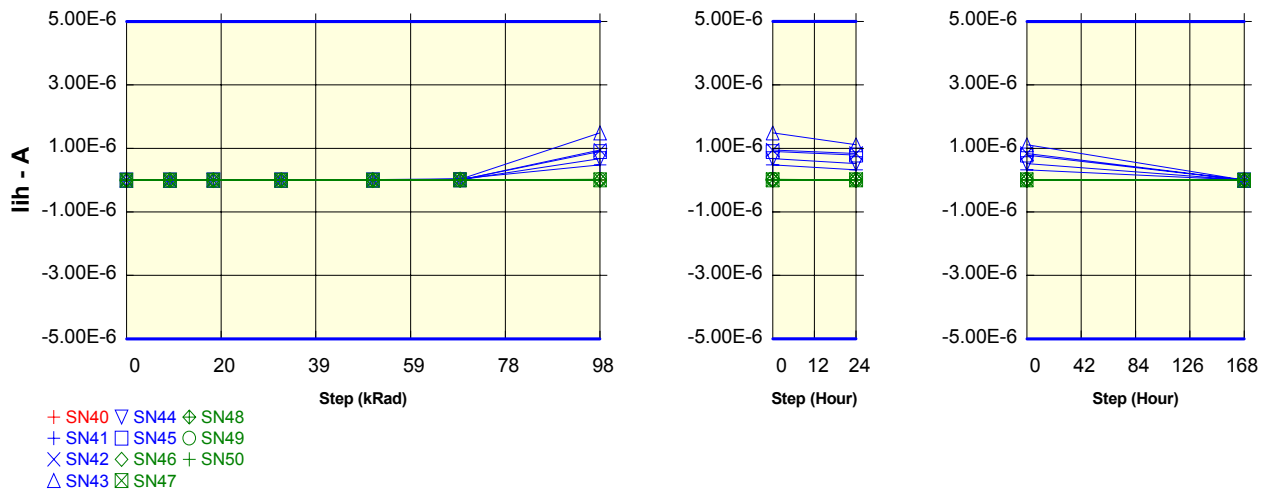
Parameter : Input High Leakage Current : IihA09

Unit : A

Spec Limit Min : -5.00E-6

Spec Limit Max : 5.00E-6

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	2.00E-10	2.00E-10	2.00E-10	1.50E-10	3.00E-10	2.50E-10	2.50E-10
SN41	2.00E-10	2.50E-10	4.50E-10	3.00E-9	1.80E-8	4.30E-8	4.80E-7
SN42	2.50E-10	1.50E-10	1.50E-10	7.00E-10	2.60E-9	3.55E-9	9.48E-7
SN43	2.00E-10	2.00E-10	2.00E-10	1.00E-9	6.80E-9	2.13E-8	1.49E-6
SN44	2.00E-10	2.00E-10	2.00E-10	6.50E-10	3.30E-9	4.20E-9	6.72E-7
SN45	2.00E-10	2.00E-10	2.00E-10	4.50E-10	3.00E-9	8.15E-9	8.99E-7
SN46	2.50E-10	1.50E-10	2.00E-10	2.50E-10	3.05E-9	1.40E-9	7.00E-10
SN47	3.00E-10	3.00E-10	2.50E-10	9.50E-10	3.15E-9	7.05E-9	7.35E-9
SN48	3.00E-10	1.50E-10	2.50E-10	9.00E-10	4.40E-9	6.95E-9	5.30E-9
SN49	2.00E-10	2.00E-10	2.50E-10	5.00E-10	2.55E-9	1.13E-8	2.58E-8
SN50	2.00E-10	1.50E-10	4.50E-10	2.30E-9	1.57E-8	1.08E-8	8.40E-9
Statistics							
Min	2.00E-10	1.50E-10	1.50E-10	2.50E-10	2.55E-9	1.40E-9	7.00E-10
Max	3.00E-10	3.00E-10	4.50E-10	3.00E-9	1.80E-8	4.30E-8	1.49E-6
Mean	2.30E-10	1.95E-10	2.60E-10	1.07E-9	6.26E-9	1.18E-8	4.54E-7
Sigma	4.22E-11	4.97E-11	1.05E-10	8.81E-10	5.74E-9	1.23E-8	5.32E-7

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	2.50E-10	2.00E-10
SN41	4.80E-7	3.26E-7
SN42	9.48E-7	8.39E-7
SN43	1.49E-6	1.12E-6
SN44	6.72E-7	5.24E-7
SN45	8.99E-7	7.87E-7
SN46	7.00E-10	7.00E-10
SN47	7.35E-9	5.95E-9
SN48	5.30E-9	4.85E-9
SN49	2.58E-8	6.15E-9
SN50	8.40E-9	8.60E-9
Statistics		
Min	7.00E-10	7.00E-10
Max	1.49E-6	1.12E-6
Mean	4.54E-7	3.62E-7
Sigma	5.32E-7	4.27E-7

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	2.00E-10	2.00E-10
SN41	3.26E-7	3.25E-9
SN42	8.39E-7	8.00E-10
SN43	1.12E-6	1.10E-9
SN44	5.24E-7	5.00E-10
SN45	7.87E-7	6.00E-10
SN46	7.00E-10	3.00E-10
SN47	5.95E-9	3.50E-10
SN48	4.85E-9	5.50E-10
SN49	6.15E-9	1.15E-9
SN50	8.60E-9	1.50E-9
Statistics		
Min	7.00E-10	3.00E-10
Max	1.12E-6	3.25E-9
Mean	3.62E-7	1.01E-9
Sigma	4.27E-7	8.76E-10

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.	

Test conditions : Tid

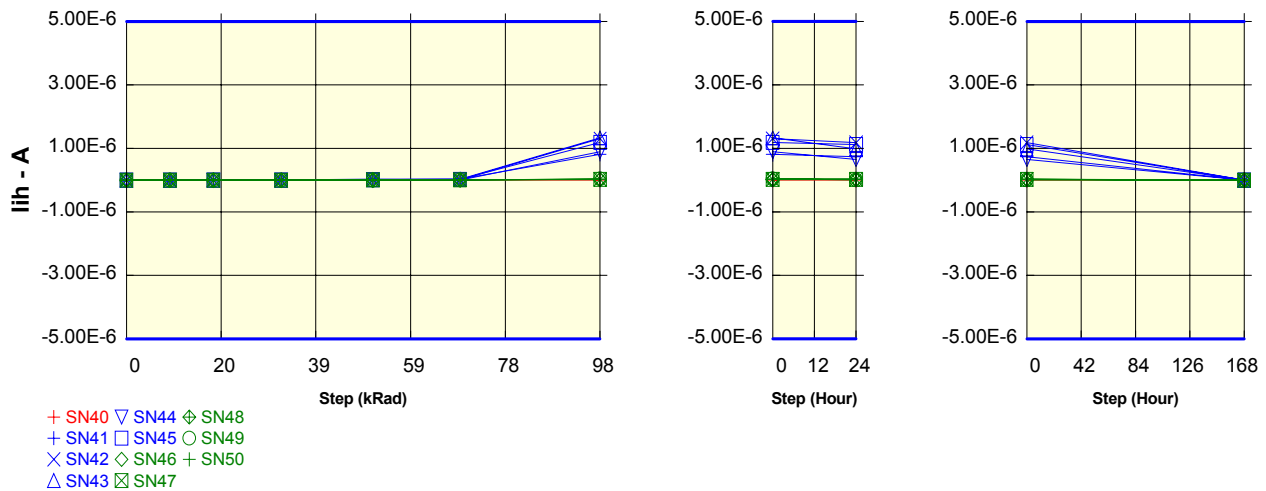
Parameter : Input High Leakage Current : IihA08

Unit : A

Spec Limit Min : -5.00E-6

Spec Limit Max : 5.00E-6

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	6.50E-10	4.00E-10	5.00E-10	5.00E-10	4.50E-10	6.00E-10	3.00E-10
SN41	6.50E-10	6.00E-10	6.00E-10	5.45E-9	3.16E-8	3.19E-8	8.14E-7
SN42	7.00E-10	5.50E-10	4.00E-10	1.35E-9	9.60E-9	7.95E-9	1.31E-6
SN43	6.00E-10	6.00E-10	5.00E-10	2.10E-9	1.25E-8	2.19E-8	1.33E-6
SN44	6.00E-10	5.00E-10	4.00E-10	7.00E-10	1.40E-9	3.65E-9	8.92E-7
SN45	5.00E-10	5.00E-10	7.00E-10	3.20E-9	1.34E-8	2.81E-8	1.19E-6
SN46	9.00E-10	4.00E-10	4.50E-10	5.50E-10	5.20E-9	4.50E-9	1.61E-8
SN47	5.50E-10	5.00E-10	4.50E-10	9.50E-10	5.45E-9	8.25E-9	2.44E-8
SN48	5.50E-10	4.50E-10	4.50E-10	6.50E-10	2.75E-9	8.25E-9	2.29E-8
SN49	5.00E-10	6.00E-10	4.50E-10	7.00E-10	1.65E-9	3.95E-9	4.11E-8
SN50	7.50E-10	5.00E-10	4.50E-10	8.50E-10	2.05E-9	5.85E-9	3.20E-8
Statistics							
Min	5.00E-10	4.00E-10	4.00E-10	5.50E-10	1.40E-9	3.65E-9	1.62E-8
Max	9.00E-10	6.00E-10	7.00E-10	5.45E-9	3.16E-8	3.19E-8	1.33E-6
Mean	6.30E-10	5.20E-10	4.85E-10	1.65E-9	8.56E-9	1.24E-8	5.66E-7
Sigma	1.25E-10	6.75E-11	9.44E-11	1.57E-9	9.23E-9	1.07E-8	5.90E-7

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	3.00E-10	2.00E-10
SN41	8.14E-7	7.43E-7
SN42	1.31E-6	1.18E-6
SN43	1.33E-6	9.85E-7
SN44	8.92E-7	6.51E-7
SN45	1.19E-6	1.12E-6
SN46	1.61E-8	1.29E-8
SN47	2.44E-8	2.25E-8
SN48	2.29E-8	2.26E-8
SN49	4.11E-8	5.60E-9
SN50	3.20E-8	3.09E-8
Statistics		
Min	1.62E-8	5.60E-9
Max	1.33E-6	1.18E-6
Mean	5.66E-7	4.77E-7
Sigma	5.90E-7	5.07E-7

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	2.00E-10	2.50E-10
SN41	7.43E-7	4.00E-9
SN42	1.18E-6	1.00E-9
SN43	9.85E-7	1.75E-9
SN44	6.51E-7	4.00E-10
SN45	1.12E-6	1.70E-9
SN46	1.29E-8	6.50E-10
SN47	2.25E-8	1.05E-9
SN48	2.26E-8	1.15E-9
SN49	5.60E-9	5.50E-10
SN50	3.09E-8	3.60E-9
Statistics		
Min	5.60E-9	4.00E-10
Max	1.18E-6	4.00E-9
Mean	4.77E-7	1.59E-9
Sigma	5.07E-7	1.25E-9

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.	

Test conditions : Tid

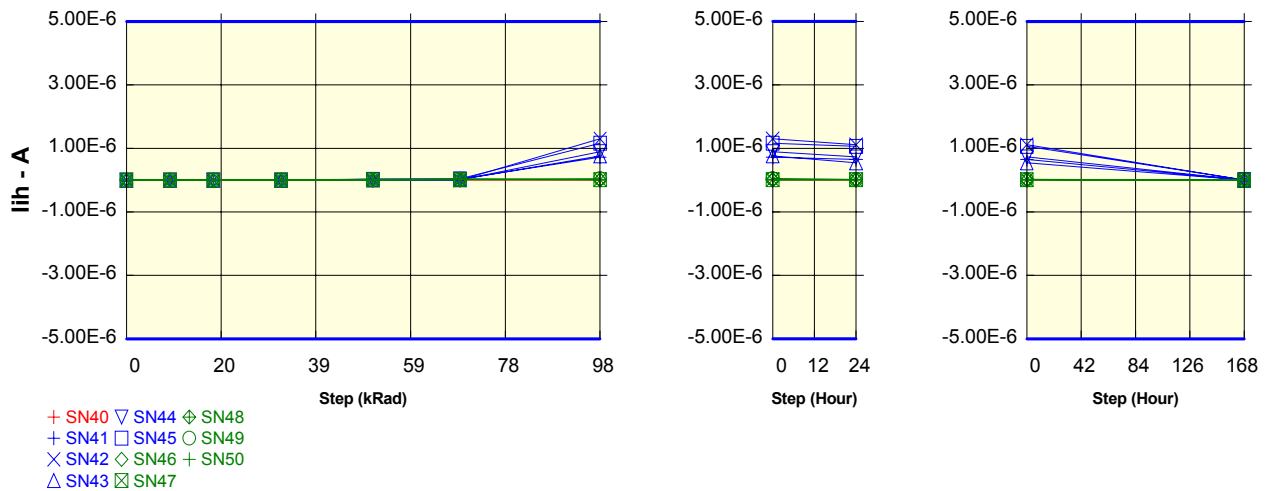
Parameter : Input High Leakage Current : IihA07

Unit : A

Spec Limit Min : -5.00E-6

Spec Limit Max : 5.00E-6

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	3.50E-10	3.00E-10	2.50E-10	2.50E-10	3.00E-10	2.50E-10	3.00E-10
SN41	4.00E-10	4.00E-10	1.05E-9	8.75E-9	3.34E-8	3.26E-8	7.20E-7
SN42	3.50E-10	3.00E-10	2.50E-10	6.50E-10	4.75E-9	2.45E-9	1.30E-6
SN43	3.50E-10	2.50E-10	2.00E-10	1.10E-9	8.35E-9	1.31E-8	7.61E-7
SN44	4.50E-10	3.00E-10	3.00E-10	1.75E-9	7.25E-9	8.10E-9	8.92E-7
SN45	3.50E-10	3.00E-10	4.50E-10	2.30E-9	2.57E-8	4.19E-8	1.16E-6
SN46	5.50E-10	2.50E-10	3.50E-10	3.20E-9	6.10E-9	3.33E-8	1.73E-8
SN47	2.50E-10	2.50E-10	4.00E-10	2.50E-9	6.20E-9	1.55E-8	1.49E-8
SN48	4.00E-10	3.00E-10	3.00E-10	1.00E-9	4.25E-9	1.70E-8	9.75E-9
SN49	2.50E-10	4.00E-10	2.50E-10	7.00E-10	3.60E-9	1.54E-8	4.73E-8
SN50	4.00E-10	3.00E-10	7.00E-10	3.65E-9	2.46E-8	4.08E-8	2.72E-8
Statistics							
Min	2.50E-10	2.50E-10	2.00E-10	6.50E-10	3.60E-9	2.45E-9	9.75E-9
Max	5.50E-10	4.00E-10	1.05E-9	8.75E-9	3.34E-8	4.19E-8	1.30E-6
Mean	3.75E-10	3.05E-10	4.25E-10	2.56E-9	1.24E-8	2.20E-8	4.95E-7
Sigma	8.90E-11	5.50E-11	2.62E-10	2.41E-9	1.10E-8	1.40E-8	5.25E-7

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	3.00E-10	2.00E-10
SN41	7.20E-7	6.51E-7
SN42	1.30E-6	1.12E-6
SN43	7.61E-7	5.46E-7
SN44	8.92E-7	7.33E-7
SN45	1.16E-6	1.07E-6
SN46	1.73E-8	1.68E-8
SN47	1.49E-8	1.37E-8
SN48	9.75E-9	9.15E-9
SN49	4.73E-8	1.45E-8
SN50	2.72E-8	2.77E-8
Statistics		
Min	9.75E-9	9.15E-9
Max	1.30E-6	1.12E-6
Mean	4.95E-7	4.19E-7
Sigma	5.25E-7	4.57E-7

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	2.00E-10	1.50E-10
SN41	6.51E-7	4.05E-9
SN42	1.12E-6	4.00E-10
SN43	5.46E-7	7.00E-10
SN44	7.33E-7	8.00E-10
SN45	1.07E-6	7.25E-9
SN46	1.68E-8	9.50E-10
SN47	1.37E-8	9.50E-10
SN48	9.15E-9	9.00E-10
SN49	1.45E-8	9.50E-10
SN50	2.77E-8	3.40E-9
Statistics		
Min	9.15E-9	4.00E-10
Max	1.12E-6	7.25E-9
Mean	4.19E-7	2.04E-9
Sigma	4.57E-7	2.21E-9

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.	

Test conditions : Tid

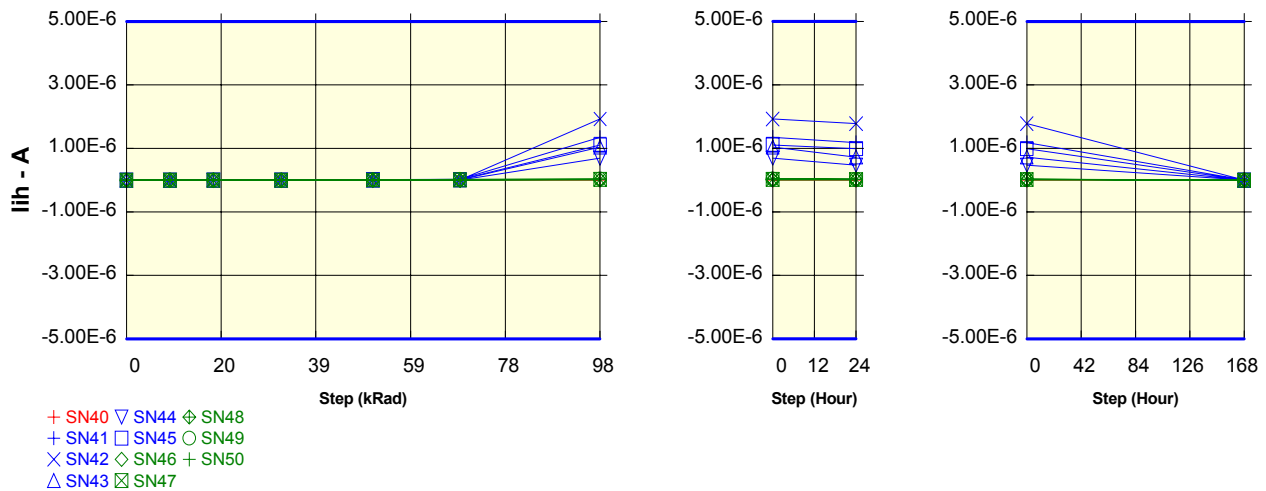
Parameter : Input High Leakage Current : lihA06

Unit : A

Spec Limit Min : -5.00E-6

Spec Limit Max : 5.00E-6

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	4.00E-10	3.50E-10	4.50E-10	4.50E-10	3.50E-10	5.50E-10	2.50E-10
SN41	5.50E-10	5.00E-10	8.00E-10	3.45E-9	1.52E-8	2.58E-8	1.35E-6
SN42	5.00E-10	4.00E-10	3.50E-10	3.20E-9	1.91E-8	1.13E-8	1.93E-6
SN43	4.50E-10	4.50E-10	2.50E-10	4.50E-10	1.65E-9	4.15E-9	1.04E-6
SN44	6.00E-10	4.50E-10	3.50E-10	4.50E-10	1.20E-9	1.95E-9	6.92E-7
SN45	4.50E-10	5.00E-10	4.00E-10	1.20E-9	1.57E-8	1.86E-8	1.11E-6
SN46	7.00E-10	4.00E-10	3.50E-10	5.00E-10	3.30E-9	1.95E-9	1.07E-8
SN47	4.00E-10	4.50E-10	4.00E-10	9.50E-10	3.35E-9	6.30E-9	2.19E-8
SN48	4.50E-10	4.00E-10	3.00E-10	6.00E-10	1.85E-9	2.55E-9	1.37E-8
SN49	4.50E-10	4.50E-10	4.00E-10	1.10E-9	5.70E-9	2.23E-8	3.41E-8
SN50	5.50E-10	3.50E-10	3.00E-10	6.00E-10	2.00E-9	1.51E-8	3.69E-8
Statistics							
Min	4.00E-10	3.50E-10	2.50E-10	4.50E-10	1.20E-9	1.95E-9	1.08E-8
Max	7.00E-10	5.00E-10	8.00E-10	3.45E-9	1.92E-8	2.58E-8	1.93E-6
Mean	5.10E-10	4.35E-10	3.90E-10	1.25E-9	6.91E-9	1.10E-8	6.23E-7
Sigma	9.07E-11	4.74E-11	1.52E-10	1.13E-9	6.94E-9	8.99E-9	7.02E-7

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	2.50E-10	2.00E-10
SN41	1.35E-6	1.18E-6
SN42	1.93E-6	1.78E-6
SN43	1.04E-6	7.27E-7
SN44	6.92E-7	4.73E-7
SN45	1.11E-6	9.90E-7
SN46	1.07E-8	1.07E-8
SN47	2.19E-8	2.08E-8
SN48	1.37E-8	1.34E-8
SN49	3.41E-8	2.31E-8
SN50	3.69E-8	3.18E-8
Statistics		
Min	1.08E-8	1.08E-8
Max	1.93E-6	1.78E-6
Mean	6.23E-7	5.25E-7
Sigma	7.02E-7	6.27E-7

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	2.00E-10	2.50E-10
SN41	1.18E-6	4.30E-9
SN42	1.78E-6	1.35E-9
SN43	7.27E-7	2.50E-10
SN44	4.73E-7	3.00E-10
SN45	9.90E-7	1.20E-9
SN46	1.07E-8	5.50E-10
SN47	2.08E-8	2.30E-9
SN48	1.34E-8	1.30E-9
SN49	2.31E-8	1.15E-9
SN50	3.18E-8	2.55E-9
Statistics		
Min	1.08E-8	2.50E-10
Max	1.78E-6	4.30E-9
Mean	5.25E-7	1.53E-9
Sigma	6.27E-7	1.24E-9

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.	

Test conditions : Tid

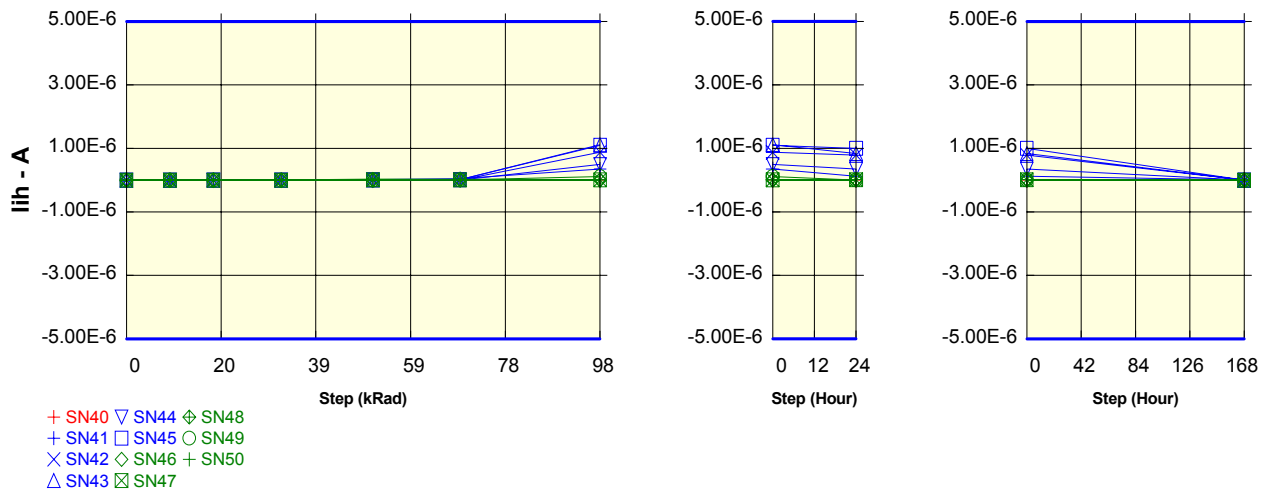
Parameter : Input High Leakage Current : lihA05

Unit : A

Spec Limit Min : -5.00E-6

Spec Limit Max : 5.00E-6

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	1.20E-9	8.50E-10	7.00E-10	9.50E-10	6.00E-10	9.00E-10	4.50E-10
SN41	1.05E-9	1.20E-9	1.30E-9	5.40E-9	1.56E-8	4.87E-8	3.47E-7
SN42	1.25E-9	9.50E-10	8.00E-10	1.75E-9	6.90E-9	4.05E-9	8.78E-7
SN43	1.00E-9	9.00E-10	6.50E-10	1.50E-9	6.60E-9	1.95E-8	1.12E-6
SN44	1.05E-9	1.05E-9	5.50E-10	1.85E-9	2.15E-9	3.65E-9	4.93E-7
SN45	1.00E-9	8.00E-10	6.00E-10	1.20E-9	8.50E-9	1.65E-8	1.10E-6
SN46	1.40E-9	8.50E-10	7.00E-10	1.00E-9	9.25E-9	6.40E-9	2.55E-9
SN47	8.50E-10	9.00E-10	8.50E-10	2.25E-9	9.35E-9	8.35E-9	7.85E-9
SN48	8.50E-10	8.00E-10	7.00E-10	4.00E-9	1.03E-8	1.36E-8	1.66E-8
SN49	8.50E-10	1.00E-9	7.00E-10	1.20E-9	3.05E-9	4.40E-9	1.16E-7
SN50	1.30E-9	8.50E-10	8.00E-10	4.20E-9	2.98E-8	2.17E-8	1.20E-8
Statistics							
Min	8.50E-10	8.00E-10	5.50E-10	1.00E-9	2.15E-9	3.65E-9	2.55E-9
Max	1.40E-9	1.20E-9	1.30E-9	5.40E-9	2.98E-8	4.87E-8	1.12E-6
Mean	1.06E-9	9.30E-10	7.65E-10	2.44E-9	1.01E-8	1.47E-8	4.09E-7
Sigma	1.97E-10	1.25E-10	2.10E-10	1.53E-9	7.87E-9	1.37E-8	4.63E-7

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	4.50E-10	2.50E-10
SN41	3.47E-7	1.22E-7
SN42	8.78E-7	7.92E-7
SN43	1.12E-6	8.36E-7
SN44	4.93E-7	3.46E-7
SN45	1.10E-6	1.00E-6
SN46	2.55E-9	1.85E-9
SN47	7.85E-9	1.22E-8
SN48	1.66E-8	1.83E-8
SN49	1.16E-7	3.50E-9
SN50	1.20E-8	1.26E-8
Statistics		
Min	2.55E-9	1.85E-9
Max	1.12E-6	1.00E-6
Mean	4.09E-7	3.14E-7
Sigma	4.63E-7	4.04E-7

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	2.50E-10	6.00E-10
SN41	1.22E-7	1.14E-8
SN42	7.92E-7	8.00E-10
SN43	8.36E-7	1.20E-9
SN44	3.46E-7	9.00E-10
SN45	1.00E-6	1.00E-9
SN46	1.85E-9	7.00E-10
SN47	1.22E-8	1.70E-9
SN48	1.83E-8	1.45E-9
SN49	3.50E-9	7.50E-10
SN50	1.26E-8	2.70E-9
Statistics		
Min	1.85E-9	7.00E-10
Max	1.00E-6	1.14E-8
Mean	3.14E-7	2.26E-9
Sigma	4.04E-7	3.25E-9

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.	

Test conditions : Tid

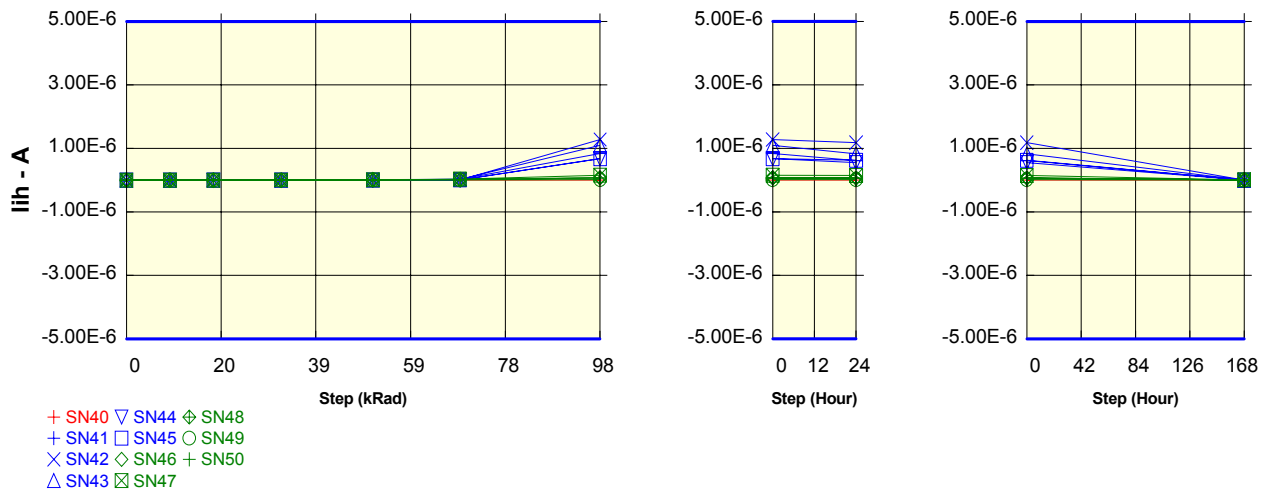
Parameter : Input High Leakage Current : IihA04

Unit : A

Spec Limit Min : -5.00E-6

Spec Limit Max : 5.00E-6

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	3.50E-10	3.00E-10	3.00E-10	3.50E-10	2.00E-10	4.00E-10	2.00E-10
SN41	4.00E-10	4.00E-10	3.50E-10	1.30E-9	6.40E-9	2.05E-8	8.39E-7
SN42	4.00E-10	4.00E-10	3.00E-10	6.50E-10	4.85E-9	5.05E-9	1.28E-6
SN43	4.00E-10	4.00E-10	3.00E-10	1.00E-9	1.50E-8	2.48E-8	1.10E-6
SN44	4.50E-10	3.50E-10	3.50E-10	1.50E-9	4.60E-9	9.15E-9	6.75E-7
SN45	4.00E-10	3.00E-10	2.50E-10	4.00E-10	2.00E-9	4.25E-9	6.76E-7
SN46	4.50E-10	3.00E-10	3.50E-10	1.90E-9	7.55E-9	1.95E-8	7.88E-8
SN47	4.00E-10	3.50E-10	4.50E-10	4.40E-9	7.70E-9	2.94E-8	1.53E-7
SN48	2.50E-10	3.50E-10	4.00E-10	1.50E-9	8.05E-9	1.78E-8	6.27E-8
SN49	2.50E-10	4.00E-10	4.00E-10	9.00E-10	5.05E-9	7.25E-9	1.87E-8
SN50	5.00E-10	3.50E-10	3.50E-10	7.00E-10	2.75E-9	1.45E-8	6.26E-8
Statistics							
Min	2.50E-10	3.00E-10	2.50E-10	4.00E-10	2.00E-9	4.25E-9	1.87E-8
Max	5.00E-10	4.00E-10	4.50E-10	4.40E-9	1.50E-8	2.94E-8	1.28E-6
Mean	3.90E-10	3.60E-10	3.50E-10	1.43E-9	6.40E-9	1.52E-8	4.95E-7
Sigma	8.10E-11	3.94E-11	5.77E-11	1.14E-9	3.65E-9	8.63E-9	4.78E-7

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	2.00E-10	2.00E-10
SN41	8.39E-7	6.21E-7
SN42	1.28E-6	1.18E-6
SN43	1.10E-6	8.27E-7
SN44	6.75E-7	5.50E-7
SN45	6.76E-7	6.25E-7
SN46	7.88E-8	7.72E-8
SN47	1.53E-7	1.49E-7
SN48	6.27E-8	5.42E-8
SN49	1.87E-8	1.57E-8
SN50	6.26E-8	6.13E-8
Statistics		
Min	1.87E-8	1.58E-8
Max	1.28E-6	1.18E-6
Mean	4.95E-7	4.16E-7
Sigma	4.78E-7	4.03E-7

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	2.00E-10	3.00E-10
SN41	6.21E-7	2.20E-9
SN42	1.18E-6	1.75E-9
SN43	8.27E-7	2.20E-9
SN44	5.50E-7	1.15E-9
SN45	6.25E-7	6.50E-10
SN46	7.72E-8	1.05E-8
SN47	1.49E-7	6.80E-9
SN48	5.42E-8	5.15E-9
SN49	1.57E-8	1.40E-9
SN50	6.13E-8	6.00E-9
Statistics		
Min	1.58E-8	6.50E-10
Max	1.18E-6	1.05E-8
Mean	4.16E-7	3.78E-9
Sigma	4.03E-7	3.20E-9

HIREX Engineering	Total Dose Test Report		Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.

Test conditions : Tid

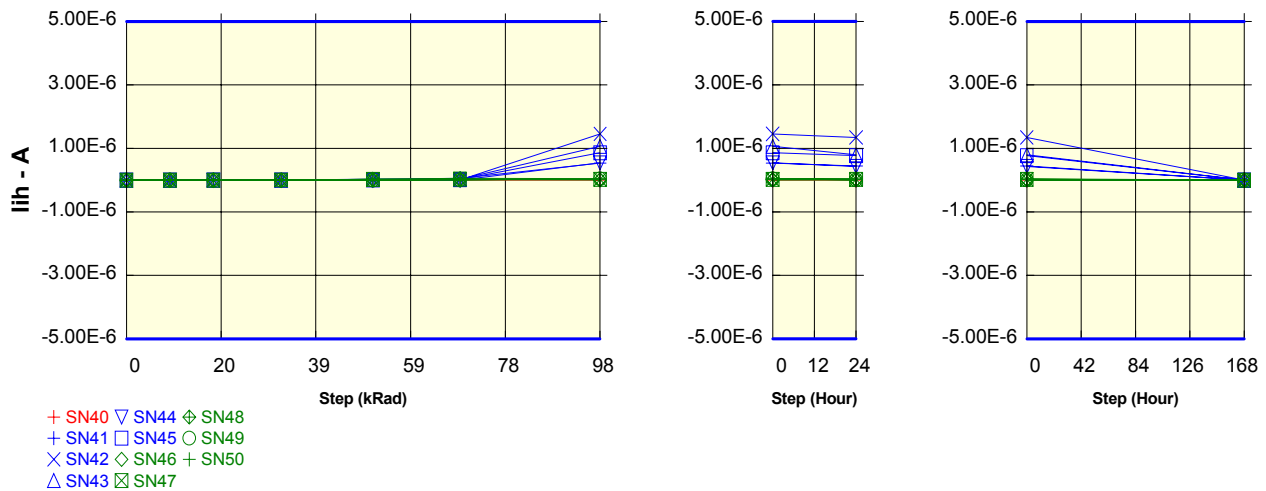
Parameter : Input High Leakage Current : IihA03

Unit : A

Spec Limit Min : -5.00E-6

Spec Limit Max : 5.00E-6

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	2.50E-10	2.00E-10	2.50E-10	3.00E-10	3.00E-10	3.00E-10	2.00E-10
SN41	3.00E-10	4.00E-10	8.50E-10	2.15E-9	2.92E-8	6.08E-8	5.33E-7
SN42	3.00E-10	2.50E-10	3.00E-10	1.60E-9	4.05E-9	7.80E-9	1.46E-6
SN43	3.00E-10	3.00E-10	3.00E-10	1.90E-9	1.42E-8	2.30E-8	1.07E-6
SN44	2.50E-10	3.00E-10	2.50E-10	3.00E-10	9.50E-10	2.00E-9	5.47E-7
SN45	2.50E-10	2.00E-10	3.00E-10	9.00E-10	7.50E-9	1.87E-8	8.59E-7
SN46	4.00E-10	1.50E-10	3.00E-10	8.00E-10	2.27E-8	2.11E-8	8.90E-9
SN47	2.50E-10	2.00E-10	3.50E-10	3.55E-9	2.31E-8	3.58E-8	2.34E-8
SN48	2.50E-10	2.50E-10	3.00E-10	5.00E-10	3.60E-9	9.80E-9	1.76E-8
SN49	2.50E-10	2.00E-10	3.00E-10	1.00E-9	1.60E-9	4.30E-9	4.19E-8
SN50	3.50E-10	3.00E-10	4.00E-10	2.50E-9	2.36E-8	6.01E-8	4.69E-8
Statistics							
Min	2.50E-10	1.50E-10	2.50E-10	3.00E-10	9.50E-10	2.00E-9	8.90E-9
Max	4.00E-10	4.00E-10	8.50E-10	3.55E-9	2.93E-8	6.08E-8	1.46E-6
Mean	2.90E-10	2.55E-10	3.65E-10	1.52E-9	1.31E-8	2.43E-8	4.60E-7
Sigma	5.16E-11	7.25E-11	1.75E-10	1.02E-9	1.08E-8	2.15E-8	5.23E-7

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	2.00E-10	1.50E-10
SN41	5.33E-7	4.45E-7
SN42	1.46E-6	1.35E-6
SN43	1.07E-6	7.94E-7
SN44	5.47E-7	4.32E-7
SN45	8.59E-7	7.74E-7
SN46	8.90E-9	8.30E-9
SN47	2.34E-8	2.42E-8
SN48	1.76E-8	1.57E-8
SN49	4.19E-8	8.00E-9
SN50	4.69E-8	4.07E-8
Statistics		
Min	8.90E-9	8.00E-9
Max	1.46E-6	1.35E-6
Mean	4.60E-7	3.89E-7
Sigma	5.23E-7	4.61E-7

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	1.50E-10	2.00E-10
SN41	4.45E-7	2.30E-9
SN42	1.35E-6	5.00E-10
SN43	7.94E-7	1.20E-9
SN44	4.32E-7	2.50E-10
SN45	7.74E-7	7.00E-10
SN46	8.30E-9	5.00E-10
SN47	2.42E-8	1.15E-9
SN48	1.57E-8	5.00E-10
SN49	8.00E-9	4.00E-10
SN50	4.07E-8	3.05E-9
Statistics		
Min	8.00E-9	2.50E-10
Max	1.35E-6	3.05E-9
Mean	3.89E-7	1.06E-9
Sigma	4.61E-7	9.24E-10

HIREX Engineering	Total Dose Test Report		Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.

Test conditions : Tid

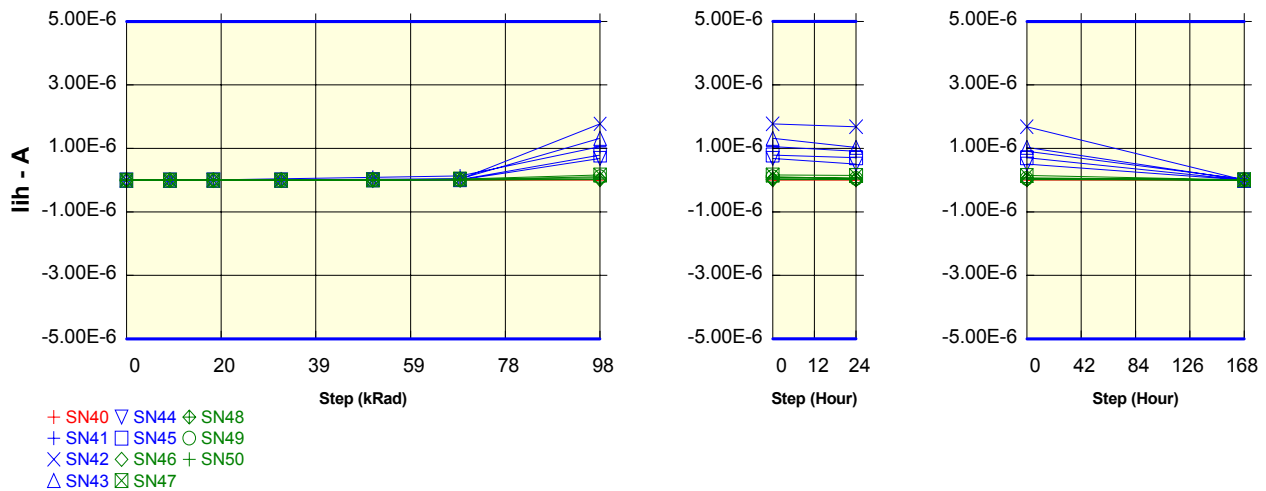
Parameter : Input High Leakage Current : lihA02

Unit : A

Spec Limit Min : -5.00E-6

Spec Limit Max : 5.00E-6

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	4.00E-10	2.50E-10	2.00E-10	3.50E-10	2.50E-10	3.50E-10	2.00E-10
SN41	4.50E-10	5.50E-10	6.70E-9	4.33E-8	9.05E-8	1.30E-7	1.06E-6
SN42	3.50E-10	3.00E-10	3.00E-10	1.65E-9	1.27E-8	2.14E-8	1.78E-6
SN43	4.00E-10	3.00E-10	3.50E-10	2.45E-9	2.83E-8	4.14E-8	1.32E-6
SN44	4.00E-10	3.00E-10	2.00E-10	1.00E-9	1.95E-9	5.05E-9	6.81E-7
SN45	3.50E-10	2.00E-10	2.00E-10	9.00E-10	5.40E-9	1.66E-8	7.91E-7
SN46	5.00E-10	2.50E-10	3.00E-10	4.00E-10	1.03E-8	6.40E-9	1.94E-8
SN47	3.50E-10	3.00E-10	3.50E-10	1.80E-9	1.05E-8	2.92E-8	1.66E-7
SN48	3.50E-10	2.50E-10	3.50E-10	1.25E-9	5.25E-9	1.06E-8	3.12E-8
SN49	2.50E-10	3.00E-10	4.00E-10	7.00E-10	4.05E-9	1.24E-8	1.10E-7
SN50	4.00E-10	4.00E-10	3.00E-10	1.10E-9	9.60E-9	2.26E-8	7.10E-8
Statistics							
Min	2.50E-10	2.00E-10	2.00E-10	4.00E-10	1.95E-9	5.05E-9	1.94E-8
Max	5.00E-10	5.50E-10	6.70E-9	4.33E-8	9.05E-8	1.30E-7	1.78E-6
Mean	3.80E-10	3.15E-10	9.45E-10	5.45E-9	1.79E-8	2.95E-8	6.01E-7
Sigma	6.75E-11	9.73E-11	2.02E-9	1.33E-8	2.66E-8	3.68E-8	6.25E-7

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	2.00E-10	2.00E-10
SN41	1.06E-6	9.14E-7
SN42	1.78E-6	1.69E-6
SN43	1.32E-6	1.04E-6
SN44	6.81E-7	5.04E-7
SN45	7.91E-7	7.04E-7
SN46	1.94E-8	1.83E-8
SN47	1.66E-7	1.49E-7
SN48	3.12E-8	3.19E-8
SN49	1.10E-7	4.76E-8
SN50	7.10E-8	7.31E-8
Statistics		
Min	1.94E-8	1.83E-8
Max	1.78E-6	1.69E-6
Mean	6.01E-7	5.16E-7
Sigma	6.25E-7	5.64E-7

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	2.00E-10	2.50E-10
SN41	9.14E-7	2.40E-8
SN42	1.69E-6	1.70E-9
SN43	1.04E-6	2.10E-9
SN44	5.04E-7	5.50E-10
SN45	7.04E-7	1.00E-9
SN46	1.83E-8	1.45E-9
SN47	1.49E-7	5.10E-9
SN48	3.19E-8	2.45E-9
SN49	4.76E-8	4.20E-9
SN50	7.31E-8	1.18E-8
Statistics		
Min	1.83E-8	5.50E-10
Max	1.69E-6	2.40E-8
Mean	5.16E-7	5.43E-9
Sigma	5.64E-7	7.29E-9

HIREX Engineering	Total Dose Test Report		Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.

Test conditions : Tid

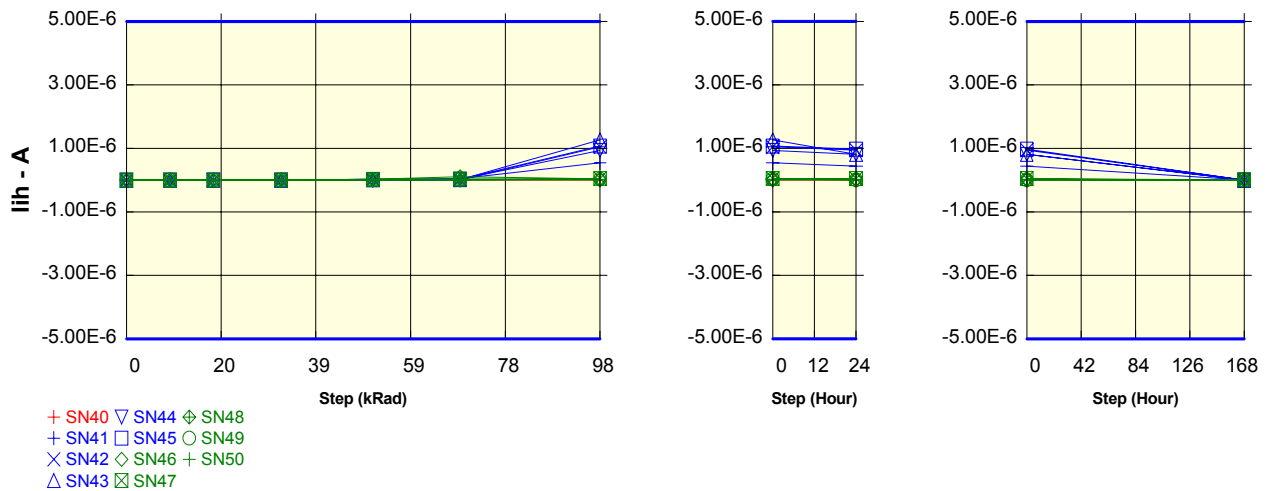
Parameter : Input High Leakage Current : IihA01

Unit : A

Spec Limit Min : -5.00E-6

Spec Limit Max : 5.00E-6

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	8.00E-10	6.50E-10	5.00E-10	7.00E-10	4.50E-10	7.00E-10	4.00E-10
SN41	8.00E-10	8.00E-10	1.80E-9	6.50E-9	2.26E-8	4.89E-8	5.48E-7
SN42	8.00E-10	7.00E-10	4.50E-10	1.60E-9	1.48E-8	6.60E-9	1.05E-6
SN43	7.00E-10	7.00E-10	5.00E-10	1.15E-9	5.40E-9	1.40E-8	1.27E-6
SN44	8.00E-10	6.50E-10	6.00E-10	2.55E-9	9.30E-9	2.14E-8	9.35E-7
SN45	7.50E-10	5.50E-10	5.00E-10	1.05E-9	2.03E-8	2.78E-8	1.07E-6
SN46	1.05E-9	7.50E-10	1.70E-9	8.50E-9	2.48E-8	1.05E-7	3.92E-8
SN47	6.50E-10	6.50E-10	7.00E-10	3.70E-9	2.54E-8	3.12E-8	5.28E-8
SN48	7.00E-10	6.50E-10	5.00E-10	9.50E-10	5.60E-9	1.06E-8	8.90E-9
SN49	7.00E-10	6.50E-10	5.00E-10	1.35E-9	5.75E-9	1.11E-8	3.21E-8
SN50	9.00E-10	6.50E-10	7.00E-10	4.00E-9	1.41E-8	2.36E-8	2.18E-8
Statistics							
Min	6.50E-10	5.50E-10	4.50E-10	9.50E-10	5.40E-9	6.60E-9	8.90E-9
Max	1.05E-9	8.00E-10	1.80E-9	8.50E-9	2.55E-8	1.05E-7	1.27E-6
Mean	7.85E-10	6.75E-10	7.95E-10	3.14E-9	1.48E-8	3.00E-8	5.02E-7
Sigma	1.18E-10	6.77E-11	5.11E-10	2.58E-9	8.10E-9	2.90E-8	5.27E-7

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	4.00E-10	2.00E-10
SN41	5.48E-7	4.39E-7
SN42	1.05E-6	9.47E-7
SN43	1.27E-6	8.15E-7
SN44	9.35E-7	8.10E-7
SN45	1.07E-6	9.75E-7
SN46	3.92E-8	3.30E-8
SN47	5.28E-8	5.15E-8
SN48	8.90E-9	9.70E-9
SN49	3.21E-8	5.30E-9
SN50	2.18E-8	2.18E-8
Statistics		
Min	8.90E-9	5.30E-9
Max	1.27E-6	9.75E-7
Mean	5.02E-7	4.11E-7
Sigma	5.27E-7	4.32E-7

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	2.00E-10	3.50E-10
SN41	4.39E-7	4.55E-9
SN42	9.47E-7	7.00E-10
SN43	8.15E-7	9.00E-10
SN44	8.10E-7	1.10E-9
SN45	9.75E-7	8.00E-10
SN46	3.30E-8	4.65E-9
SN47	5.15E-8	4.90E-9
SN48	9.70E-9	1.00E-9
SN49	5.30E-9	6.00E-10
SN50	2.18E-8	3.30E-9
Statistics		
Min	5.30E-9	6.00E-10
Max	9.75E-7	4.90E-9
Mean	4.11E-7	2.25E-9
Sigma	4.32E-7	1.86E-9

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.	

Test conditions : Tid

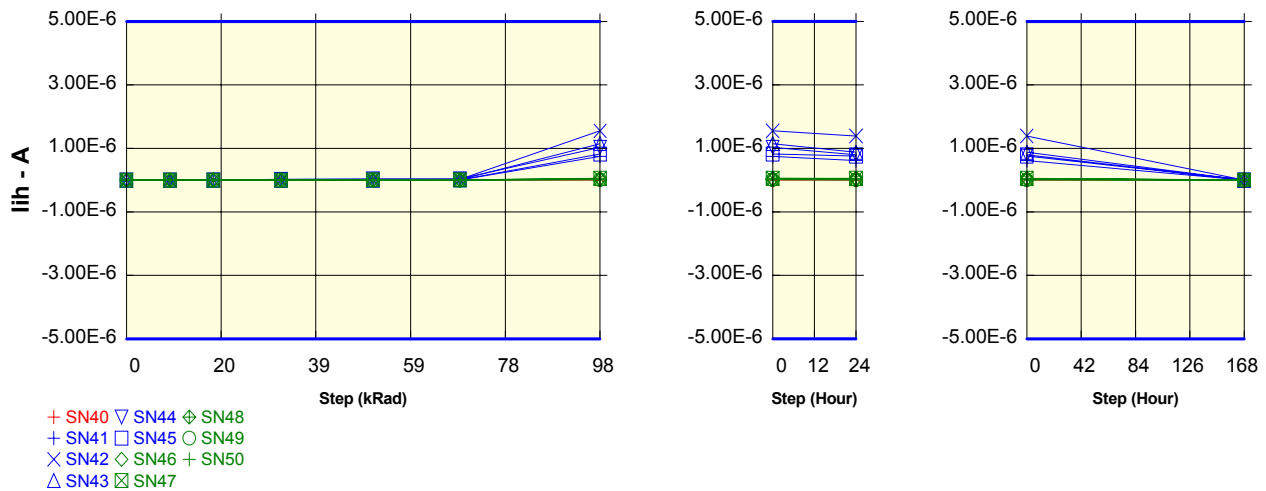
Parameter : Input High Leakage Current : IihA00

Unit : A

Spec Limit Min : -5.00E-6

Spec Limit Max : 5.00E-6

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	2.00E-10	2.00E-10	1.50E-10	2.00E-10	2.50E-10	2.00E-10	1.50E-10
SN41	2.00E-10	2.00E-10	2.50E-10	9.00E-10	3.25E-9	7.85E-9	7.47E-7
SN42	1.50E-10	2.00E-10	3.00E-10	4.60E-9	1.13E-8	2.06E-8	1.56E-6
SN43	2.50E-10	1.50E-10	2.00E-10	8.50E-10	5.15E-9	1.68E-8	1.15E-6
SN44	2.50E-10	4.00E-10	1.10E-9	2.17E-8	3.77E-8	4.30E-8	1.04E-6
SN45	2.50E-10	2.00E-10	2.50E-10	4.00E-10	1.60E-9	6.25E-9	8.18E-7
SN46	2.50E-10	2.00E-10	2.00E-10	1.00E-9	4.55E-9	1.21E-8	4.86E-8
SN47	2.50E-10	3.00E-10	4.00E-10	1.50E-9	5.20E-9	8.10E-9	5.93E-8
SN48	3.00E-10	2.00E-10	2.00E-10	4.00E-10	2.35E-9	2.85E-9	1.69E-8
SN49	3.00E-10	2.50E-10	1.50E-10	3.00E-10	7.00E-10	1.40E-9	1.86E-8
SN50	2.50E-10	1.50E-10	2.00E-10	8.00E-10	3.85E-9	8.90E-9	5.41E-8
Statistics							
Min	1.50E-10	1.50E-10	1.50E-10	3.00E-10	7.00E-10	1.40E-9	1.70E-8
Max	3.00E-10	4.00E-10	1.10E-9	2.17E-8	3.77E-8	4.30E-8	1.56E-6
Mean	2.45E-10	2.25E-10	3.25E-10	3.24E-9	7.56E-9	1.28E-8	5.50E-7
Sigma	4.38E-11	7.55E-11	2.81E-10	6.59E-9	1.10E-8	1.21E-8	5.79E-7

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	1.50E-10	2.00E-10
SN41	7.47E-7	6.21E-7
SN42	1.56E-6	1.39E-6
SN43	1.15E-6	8.77E-7
SN44	1.04E-6	8.01E-7
SN45	8.18E-7	7.57E-7
SN46	4.86E-8	4.93E-8
SN47	5.93E-8	5.88E-8
SN48	1.69E-8	1.54E-8
SN49	1.86E-8	8.85E-9
SN50	5.41E-8	4.69E-8
Statistics		
Min	1.70E-8	8.85E-9
Max	1.56E-6	1.39E-6
Mean	5.50E-7	4.62E-7
Sigma	5.79E-7	4.91E-7

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	2.00E-10	1.50E-10
SN41	6.21E-7	1.60E-9
SN42	1.39E-6	1.75E-9
SN43	8.77E-7	2.00E-9
SN44	8.01E-7	3.00E-9
SN45	7.57E-7	6.00E-10
SN46	4.93E-8	1.10E-9
SN47	5.88E-8	4.75E-9
SN48	1.54E-8	1.40E-9
SN49	8.85E-9	1.00E-9
SN50	4.69E-8	7.25E-9
Statistics		
Min	8.85E-9	6.00E-10
Max	1.39E-6	7.25E-9
Mean	4.62E-7	2.45E-9
Sigma	4.91E-7	2.07E-9

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.	

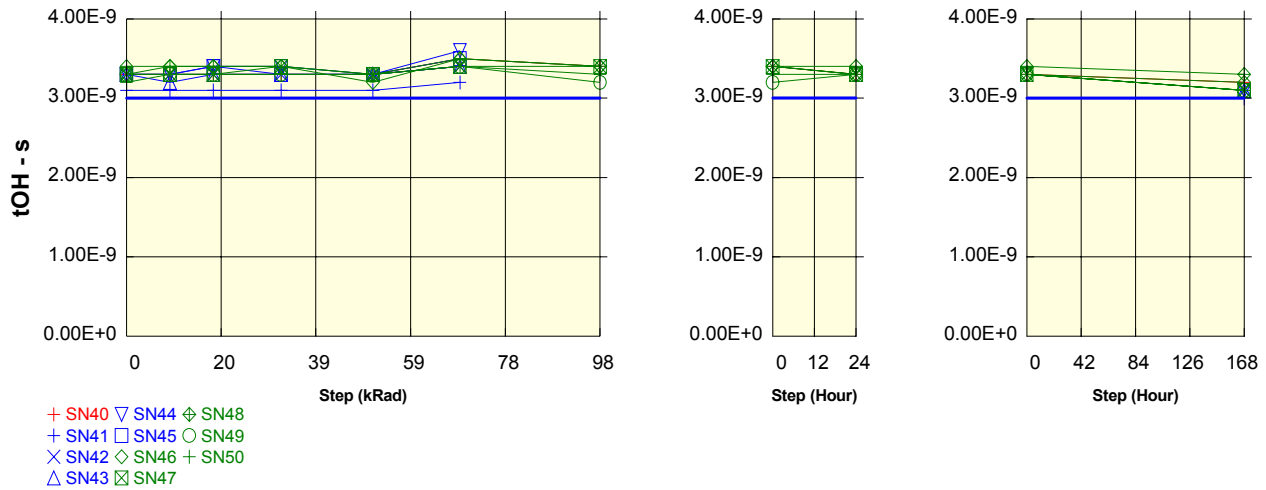
Test conditions : Tid

Parameter : Data Out Hold Time : tOH

Unit : s

Spec Limit Min : 3.00E-9

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	3.30E-9	3.30E-9	3.30E-9	3.30E-9	3.30E-9	3.50E-9	3.40E-9
SN41	3.10E-9	3.10E-9	3.10E-9	3.10E-9	3.10E-9	3.20E-9	
SN42	3.30E-9	3.30E-9	3.30E-9	3.30E-9	3.30E-9	3.40E-9	
SN43	3.30E-9	3.20E-9	3.30E-9	3.30E-9	3.30E-9	3.40E-9	
SN44	3.30E-9	3.30E-9	3.40E-9	3.40E-9	3.30E-9	3.60E-9	
SN45	3.30E-9	3.30E-9	3.40E-9	3.30E-9	3.30E-9	3.50E-9	
SN46	3.30E-9	3.40E-9	3.40E-9	3.40E-9	3.20E-9	3.50E-9	3.40E-9
SN47	3.30E-9	3.30E-9	3.30E-9	3.40E-9	3.30E-9	3.40E-9	3.40E-9
SN48	3.40E-9	3.40E-9	3.40E-9	3.40E-9	3.30E-9	3.50E-9	3.40E-9
SN49	3.30E-9	3.30E-9	3.30E-9	3.30E-9	3.30E-9	3.40E-9	3.20E-9
SN50	3.20E-9	3.30E-9	3.30E-9	3.30E-9	3.30E-9	3.40E-9	3.30E-9
Statistics							
Min	3.10E-9	3.10E-9	3.10E-9	3.10E-9	3.10E-9	3.20E-9	0.00E+0
Max	3.40E-9	3.40E-9	3.40E-9	3.40E-9	3.30E-9	3.60E-9	3.40E-9
Mean	3.28E-9	3.29E-9	3.32E-9	3.32E-9	3.27E-9	3.43E-9	1.67E-9
Sigma	7.89E-11	8.76E-11	9.19E-11	9.19E-11	6.75E-11	1.06E-10	1.76E-9

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	3.40E-9	3.30E-9
SN41		
SN42		
SN43		
SN44		
SN45		
SN46	3.40E-9	3.30E-9
SN47	3.40E-9	3.30E-9
SN48	3.40E-9	3.40E-9
SN49	3.20E-9	3.30E-9
SN50	3.30E-9	3.30E-9
Statistics		
Min	3.20E-9	0.00E+0
Max	3.40E-9	3.40E-9
Mean	3.34E-9	1.66E-9
Sigma	8.94E-11	1.75E-9

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	3.30E-9	3.20E-9
SN41		3.00E-9
SN42		3.10E-9
SN43		3.10E-9
SN44		3.10E-9
SN45		
SN46	3.30E-9	3.20E-9
SN47	3.30E-9	3.10E-9
SN48	3.40E-9	3.30E-9
SN49	3.30E-9	3.10E-9
SN50	3.30E-9	3.10E-9
Statistics		
Min	3.30E-9	0.00E+0
Max	3.40E-9	3.30E-9
Mean	3.32E-9	2.81E-9
Sigma	4.47E-11	9.90E-10

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.	

Test conditions : Tid

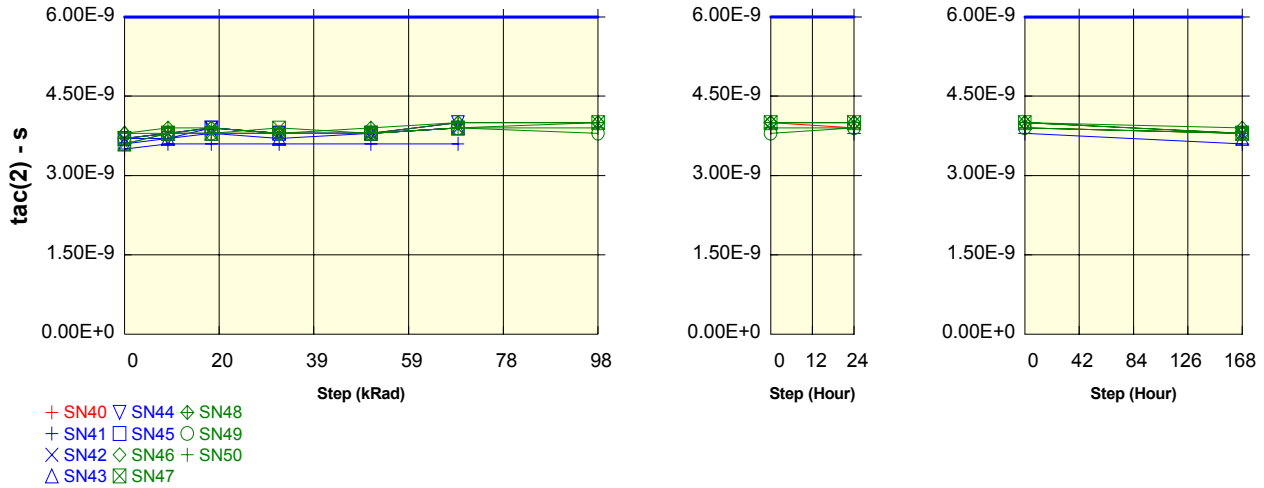
Parameter : Access Time from a positive edge of CLK : tac(2)

CAS Latency = 2

Unit : s

Spec Limit Max : 6.00E-9

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	3.70E-9	3.80E-9	3.80E-9	3.80E-9	3.80E-9	4.00E-9	4.00E-9
SN41	3.50E-9	3.60E-9	3.60E-9	3.60E-9	3.60E-9	3.60E-9	
SN42	3.70E-9	3.80E-9	3.90E-9	3.80E-9	3.80E-9	3.90E-9	
SN43	3.60E-9	3.70E-9	3.80E-9	3.70E-9	3.80E-9	3.90E-9	
SN44	3.70E-9	3.70E-9	3.90E-9	3.80E-9	3.80E-9	4.00E-9	
SN45	3.70E-9	3.80E-9	3.90E-9	3.80E-9	3.80E-9	3.90E-9	
SN46	3.80E-9	3.80E-9	3.90E-9	3.80E-9	3.80E-9	4.00E-9	4.00E-9
SN47	3.60E-9	3.80E-9	3.80E-9	3.90E-9	3.80E-9	3.90E-9	4.00E-9
SN48	3.80E-9	3.90E-9	3.90E-9	3.80E-9	3.90E-9	4.00E-9	4.00E-9
SN49	3.70E-9	3.80E-9	3.80E-9	3.80E-9	3.80E-9	3.90E-9	3.80E-9
SN50	3.60E-9	3.80E-9	3.80E-9	3.80E-9	3.80E-9	3.90E-9	3.90E-9
Statistics							
Min	3.50E-9	3.60E-9	3.60E-9	3.60E-9	3.60E-9	3.60E-9	0.00E+0
Max	3.80E-9	3.90E-9	3.90E-9	3.90E-9	3.90E-9	4.00E-9	4.00E-9
Mean	3.67E-9	3.77E-9	3.83E-9	3.78E-9	3.79E-9	3.90E-9	1.97E-9
Sigma	9.49E-11	8.23E-11	9.49E-11	7.89E-11	7.38E-11	1.15E-10	2.08E-9

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	4.00E-9	3.90E-9
SN41		3.80E-9
SN42		
SN43		
SN44		
SN45		
SN46	4.00E-9	4.00E-9
SN47	4.00E-9	4.00E-9
SN48	4.00E-9	4.00E-9
SN49	3.80E-9	3.90E-9
SN50	3.90E-9	3.90E-9
Statistics		
Min	3.80E-9	0.00E+0
Max	4.00E-9	4.00E-9
Mean	3.94E-9	2.36E-9
Sigma	8.94E-11	2.03E-9

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	3.90E-9	3.80E-9
SN41	3.80E-9	3.60E-9
SN42		3.80E-9
SN43		3.70E-9
SN44		3.80E-9
SN45		
SN46	4.00E-9	3.80E-9
SN47	4.00E-9	3.80E-9
SN48	4.00E-9	3.90E-9
SN49	3.90E-9	3.80E-9
SN50	3.90E-9	3.80E-9
Statistics		
Min	3.80E-9	0.00E+0
Max	4.00E-9	3.90E-9
Mean	3.93E-9	3.40E-9
Sigma	8.16E-11	1.20E-9

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.	

Test conditions : Tid

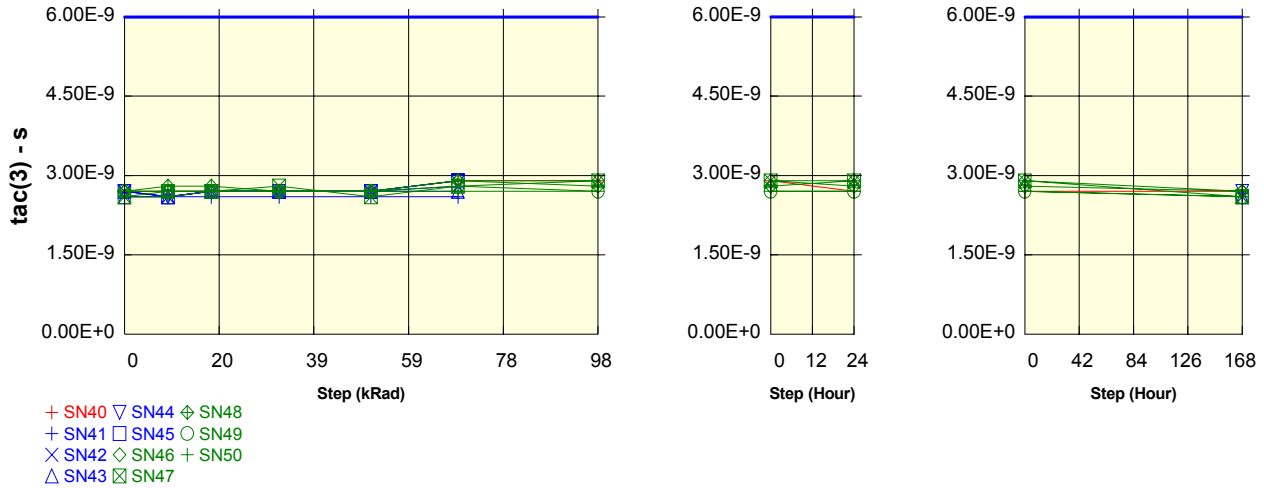
Parameter : Access Time from a positive edge of CLK : tac(3)

CAS Latency = 3

Unit : s

Spec Limit Max : 6.00E-9

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	2.70E-9	2.70E-9	2.70E-9	2.70E-9	2.70E-9	2.90E-9	2.90E-9
SN41	2.60E-9	2.60E-9	2.60E-9	2.60E-9	2.60E-9	2.60E-9	
SN42	2.70E-9	2.60E-9	2.70E-9	2.70E-9	2.70E-9	2.80E-9	
SN43	2.60E-9	2.60E-9	2.70E-9	2.70E-9	2.70E-9	2.70E-9	
SN44	2.70E-9	2.60E-9	2.70E-9	2.70E-9	2.70E-9	2.90E-9	
SN45	2.70E-9	2.60E-9	2.70E-9	2.70E-9	2.70E-9	2.90E-9	
SN46	2.70E-9	2.70E-9	2.70E-9	2.70E-9	2.70E-9	2.90E-9	2.90E-9
SN47	2.60E-9	2.70E-9	2.70E-9	2.80E-9	2.60E-9	2.80E-9	2.90E-9
SN48	2.70E-9	2.80E-9	2.80E-9	2.70E-9	2.70E-9	2.90E-9	2.80E-9
SN49	2.70E-9	2.70E-9	2.70E-9	2.70E-9	2.70E-9	2.80E-9	2.70E-9
SN50	2.60E-9	2.60E-9	2.70E-9	2.70E-9	2.70E-9	2.70E-9	2.70E-9
Statistics							
Min	2.60E-9	2.60E-9	2.60E-9	2.60E-9	2.60E-9	2.60E-9	0.00E+0
Max	2.70E-9	2.80E-9	2.80E-9	2.80E-9	2.70E-9	2.90E-9	2.90E-9
Mean	2.66E-9	2.65E-9	2.70E-9	2.70E-9	2.68E-9	2.80E-9	1.40E-9
Sigma	5.16E-11	7.07E-11	4.71E-11	4.71E-11	4.22E-11	1.05E-10	1.48E-9

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	2.90E-9	2.70E-9
SN41		
SN42		
SN43		
SN44		
SN45		
SN46	2.90E-9	2.80E-9
SN47	2.90E-9	2.90E-9
SN48	2.80E-9	2.90E-9
SN49	2.70E-9	2.70E-9
SN50	2.70E-9	2.70E-9
Statistics		
Min	2.70E-9	0.00E+0
Max	2.90E-9	2.90E-9
Mean	2.80E-9	1.40E-9
Sigma	1.00E-10	1.48E-9

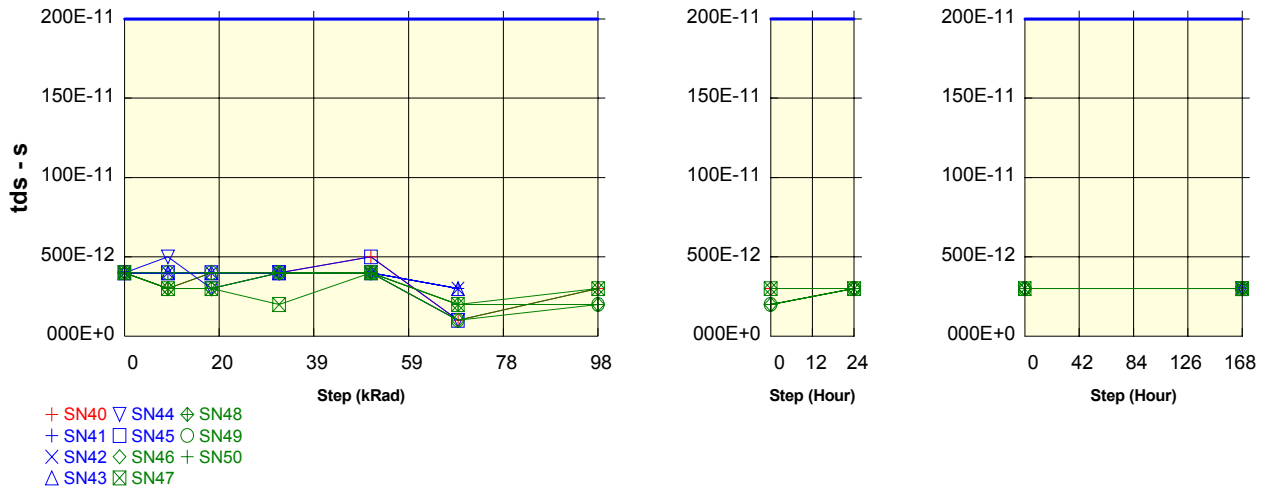
Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	2.70E-9	2.70E-9
SN41		2.60E-9
SN42		2.60E-9
SN43		2.60E-9
SN44		2.70E-9
SN45		
SN46	2.80E-9	2.70E-9
SN47	2.90E-9	2.60E-9
SN48	2.90E-9	2.70E-9
SN49	2.70E-9	2.60E-9
SN50	2.70E-9	2.60E-9
Statistics		
Min	2.70E-9	0.00E+0
Max	2.90E-9	2.70E-9
Mean	2.80E-9	2.37E-9
Sigma	1.00E-10	8.34E-10

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.	

Test conditions : Tid
Parameter : Data In Setup Time : tds

Unit : s
Spec Limit Max : 200E-11
Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	400E-12	300E-12	400E-12	400E-12	500E-12	100E-12	300E-12
SN41	400E-12	400E-12	400E-12	400E-12	400E-12	300E-12	
SN42	400E-12	400E-12	400E-12	400E-12	400E-12	300E-12	
SN43	400E-12	400E-12	400E-12	400E-12	400E-12	300E-12	
SN44	400E-12	500E-12	300E-12	400E-12	400E-12	100E-12	
SN45	400E-12	400E-12	400E-12	400E-12	500E-12	100E-12	
SN46	400E-12	300E-12	300E-12	400E-12	400E-12	100E-12	300E-12
SN47	400E-12	300E-12	300E-12	200E-12	400E-12	200E-12	300E-12
SN48	400E-12	300E-12	300E-12	400E-12	400E-12	200E-12	200E-12
SN49	400E-12	400E-12	400E-12	400E-12	400E-12	100E-12	200E-12
SN50	400E-12	300E-12	400E-12	400E-12	400E-12	200E-12	200E-12
Statistics							
Min	400E-12	300E-12	300E-12	200E-12	400E-12	100E-12	000E+0
Max	400E-12	500E-12	400E-12	400E-12	500E-12	300E-12	300E-12
Mean	400E-12	370E-12	360E-12	380E-12	410E-12	190E-12	120E-12
Sigma	654E-20	675E-13	516E-13	632E-13	316E-13	876E-13	132E-12

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	300E-12	300E-12
SN41		
SN42		
SN43		
SN44		
SN45		
SN46	300E-12	300E-12
SN47	300E-12	300E-12
SN48	200E-12	300E-12
SN49	200E-12	300E-12
SN50	200E-12	300E-12
Statistics		
Min	200E-12	000E+0
Max	300E-12	300E-12
Mean	240E-12	150E-12
Sigma	548E-13	158E-12

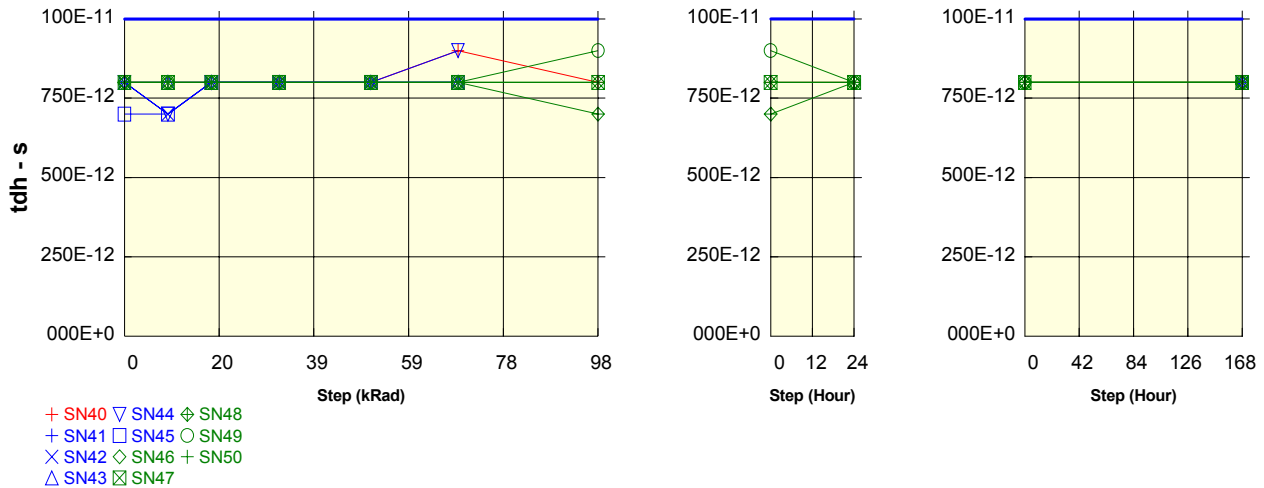
Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	300E-12	300E-12
SN41		300E-12
SN42		300E-12
SN43		300E-12
SN44		300E-12
SN45		
SN46	300E-12	300E-12
SN47	300E-12	300E-12
SN48	300E-12	300E-12
SN49	300E-12	300E-12
SN50	300E-12	300E-12
Statistics		
Min	300E-12	000E+0
Max	300E-12	300E-12
Mean	300E-12	270E-12
Sigma	000E+0	949E-13

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.	

Test conditions : Tid
Parameter : Data In Hold Time : tdh

Unit : s
Spec Limit Max : 100E-11
Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	800E-12	800E-12	800E-12	800E-12	800E-12	900E-12	800E-12
SN41	800E-12	800E-12	800E-12	800E-12	800E-12	800E-12	
SN42	800E-12	700E-12	800E-12	800E-12	800E-12	800E-12	
SN43	800E-12	800E-12	800E-12	800E-12	800E-12	800E-12	
SN44	800E-12	700E-12	800E-12	800E-12	800E-12	900E-12	
SN45	700E-12	700E-12	800E-12	800E-12	800E-12	800E-12	
SN46	800E-12	800E-12	800E-12	800E-12	800E-12	800E-12	800E-12
SN47	800E-12	800E-12	800E-12	800E-12	800E-12	800E-12	800E-12
SN48	800E-12	800E-12	800E-12	800E-12	800E-12	800E-12	700E-12
SN49	800E-12	800E-12	800E-12	800E-12	800E-12	800E-12	900E-12
SN50	800E-12	800E-12	800E-12	800E-12	800E-12	800E-12	800E-12
Statistics							
Min	700E-12	700E-12	800E-12	800E-12	800E-12	800E-12	000E+0
Max	800E-12	800E-12	800E-12	800E-12	800E-12	900E-12	900E-12
Mean	790E-12	770E-12	800E-12	800E-12	800E-12	810E-12	400E-12
Sigma	316E-13	483E-13	131E-19	131E-19	131E-19	316E-13	424E-12

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	800E-12	800E-12
SN41		
SN42		
SN43		
SN44		
SN45		
SN46	800E-12	800E-12
SN47	800E-12	800E-12
SN48	700E-12	800E-12
SN49	900E-12	800E-12
SN50	800E-12	800E-12
Statistics		
Min	700E-12	000E+0
Max	900E-12	800E-12
Mean	800E-12	400E-12
Sigma	707E-13	422E-12

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	800E-12	800E-12
SN41		800E-12
SN42		800E-12
SN43		800E-12
SN44		800E-12
SN45		
SN46	800E-12	800E-12
SN47	800E-12	800E-12
SN48	800E-12	800E-12
SN49	800E-12	800E-12
SN50	800E-12	800E-12
Statistics		
Min	800E-12	000E+0
Max	800E-12	800E-12
Mean	800E-12	720E-12
Sigma	000E+0	253E-12

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.	

Test conditions : Tid

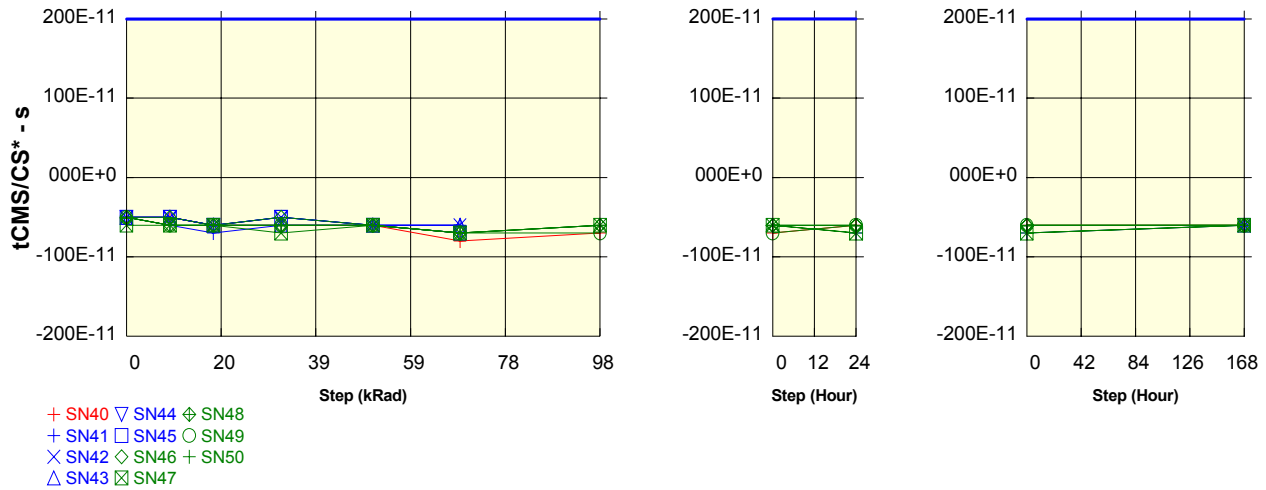
Parameter : Setup Time : tCMS/CS*

VIL = 0.4V et VIH = 2.4V. IOH = - 2mA. IOL = 2mA

Unit : s

Spec Limit Max : 200E-11

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	-500E-12	-500E-12	-600E-12	-600E-12	-600E-12	-800E-12	-700E-12
SN41	-500E-12	-600E-12	-700E-12	-600E-12	-600E-12	-600E-12	
SN42	-500E-12	-500E-12	-600E-12	-500E-12	-600E-12	-600E-12	
SN43	-500E-12	-500E-12	-600E-12	-600E-12	-600E-12	-600E-12	
SN44	-500E-12	-500E-12	-600E-12	-500E-12	-600E-12	-700E-12	
SN45	-500E-12	-500E-12	-600E-12	-500E-12	-600E-12	-700E-12	
SN46	-500E-12	-500E-12	-600E-12	-500E-12	-600E-12	-700E-12	-600E-12
SN47	-600E-12	-600E-12	-600E-12	-700E-12	-600E-12	-700E-12	-600E-12
SN48	-500E-12	-600E-12	-600E-12	-600E-12	-600E-12	-700E-12	-600E-12
SN49	-500E-12	-600E-12	-600E-12	-600E-12	-600E-12	-700E-12	-700E-12
SN50	-500E-12	-600E-12	-600E-12	-600E-12	-600E-12	-700E-12	-600E-12
Statistics							
Min	-600E-12	-600E-12	-700E-12	-700E-12	-600E-12	-700E-12	-700E-12
Max	-500E-12	-500E-12	-600E-12	-500E-12	-600E-12	-600E-12	000E+0
Mean	-510E-12	-550E-12	-610E-12	-570E-12	-600E-12	-670E-12	-310E-12
Sigma	316E-13	527E-13	316E-13	675E-13	925E-20	483E-13	328E-12

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	-700E-12	-600E-12
SN41		-700E-12
SN42		
SN43		
SN44		
SN45		
SN46	-600E-12	-600E-12
SN47	-600E-12	-700E-12
SN48	-600E-12	-600E-12
SN49	-700E-12	-600E-12
SN50	-600E-12	-700E-12
Statistics		
Min	-700E-12	-700E-12
Max	-600E-12	000E+0
Mean	-620E-12	-390E-12
Sigma	447E-13	338E-12

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	-600E-12	-600E-12
SN41	-700E-12	-600E-12
SN42		-600E-12
SN43		-600E-12
SN44		-600E-12
SN45		
SN46	-600E-12	-600E-12
SN47	-700E-12	-600E-12
SN48	-600E-12	-600E-12
SN49	-600E-12	-600E-12
SN50	-700E-12	-600E-12
Statistics		
Min	-700E-12	-600E-12
Max	-600E-12	000E+0
Mean	-650E-12	-540E-12
Sigma	548E-13	190E-12

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.	

Test conditions : Tid

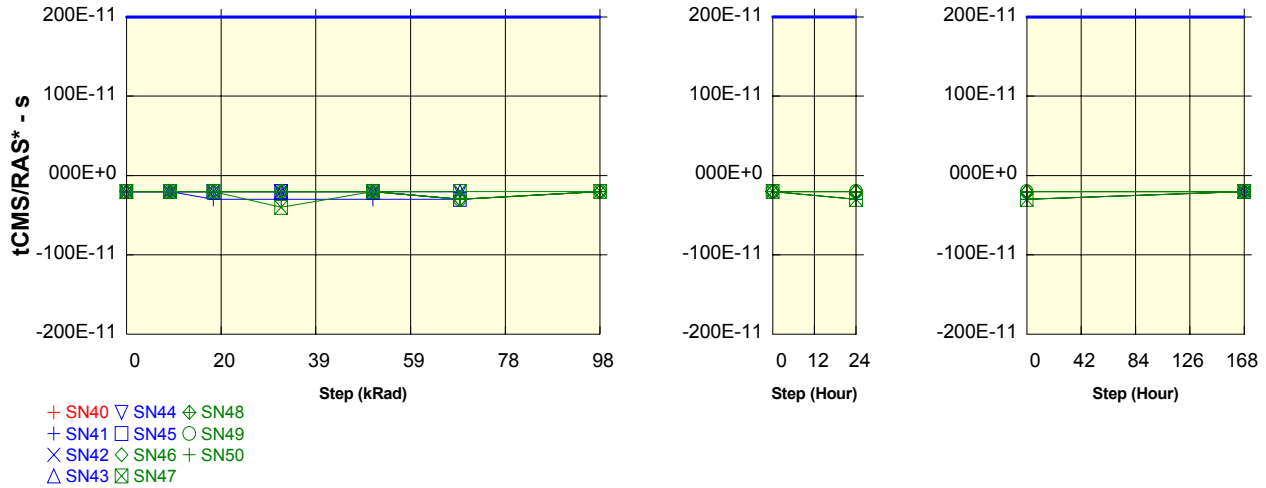
Parameter : Setup Time : tCMS/RAS*

VIL = 0.4V et VIH = 2.4V. IOH = - 2mA. IOL = 2mA

Unit : s

Spec Limit Max : 200E-11

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	-200E-12	-200E-12	-200E-12	-200E-12	-200E-12	-300E-12	-200E-12
SN41	-200E-12	-200E-12	-300E-12	-300E-12	-300E-12	-300E-12	
SN42	-200E-12	-200E-12	-200E-12	-200E-12	-200E-12	-200E-12	
SN43	-200E-12	-200E-12	-200E-12	-200E-12	-200E-12	-200E-12	
SN44	-200E-12	-200E-12	-200E-12	-200E-12	-200E-12	-200E-12	
SN45	-200E-12	-200E-12	-200E-12	-200E-12	-200E-12	-300E-12	
SN46	-200E-12	-200E-12	-200E-12	-200E-12	-200E-12	-300E-12	-200E-12
SN47	-200E-12	-200E-12	-200E-12	-400E-12	-200E-12	-200E-12	-200E-12
SN48	-200E-12	-200E-12	-200E-12	-200E-12	-200E-12	-300E-12	-200E-12
SN49	-200E-12	-200E-12	-200E-12	-200E-12	-200E-12	-300E-12	-200E-12
SN50	-200E-12	-200E-12	-200E-12	-200E-12	-200E-12	-300E-12	-200E-12
Statistics							
Min	-200E-12	-200E-12	-300E-12	-400E-12	-300E-12	-300E-12	-200E-12
Max	-200E-12	-200E-12	-200E-12	-200E-12	-200E-12	-200E-12	000E+0
Mean	-200E-12	-200E-12	-210E-12	-230E-12	-210E-12	-260E-12	-100E-12
Sigma	327E-20	327E-20	316E-13	675E-13	316E-13	516E-13	105E-12

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	-200E-12	-200E-12
SN41		-300E-12
SN42		
SN43		
SN44		
SN45		
SN46	-200E-12	-200E-12
SN47	-200E-12	-300E-12
SN48	-200E-12	-200E-12
SN49	-200E-12	-200E-12
SN50	-200E-12	-300E-12
Statistics		
Min	-200E-12	-300E-12
Max	-200E-12	000E+0
Mean	-200E-12	-150E-12
Sigma	000E+0	135E-12

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	-200E-12	-200E-12
SN41	-300E-12	-200E-12
SN42		-200E-12
SN43		-200E-12
SN44		-200E-12
SN45		
SN46	-200E-12	-200E-12
SN47	-300E-12	-200E-12
SN48	-200E-12	-200E-12
SN49	-200E-12	-200E-12
SN50	-300E-12	-200E-12
Statistics		
Min	-300E-12	-200E-12
Max	-200E-12	000E+0
Mean	-250E-12	-180E-12
Sigma	548E-13	632E-13

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.	

Test conditions : Tid

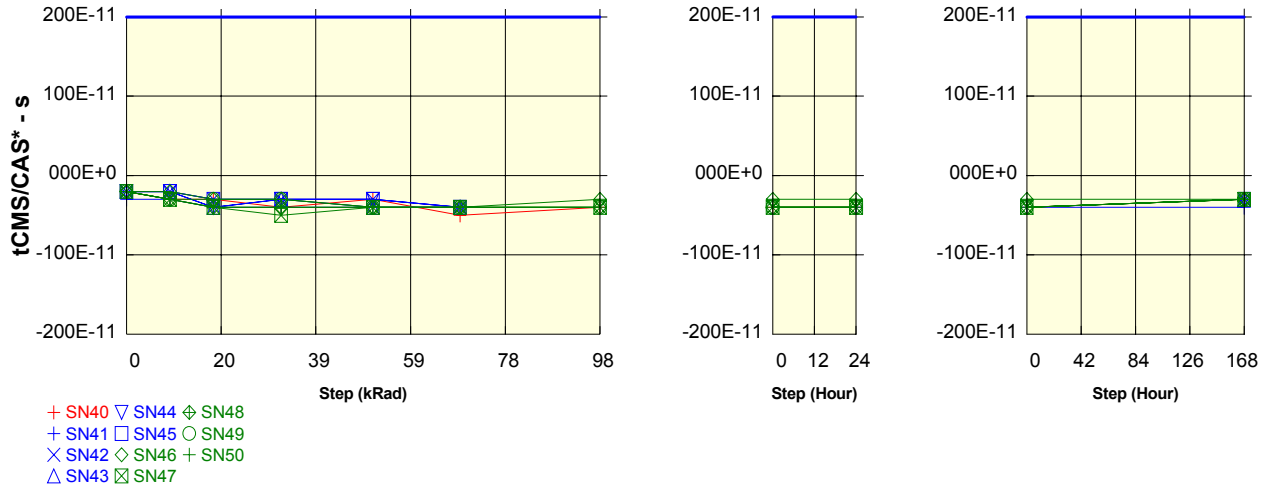
Parameter : Setup Time : tCMS/CAS*

VIL = 0.4V et VIH = 2.4V. IOH = - 2mA. IOL = 2mA

Unit : s

Spec Limit Max : 200E-11

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	-200E-12	-300E-12	-300E-12	-400E-12	-300E-12	-500E-12	-400E-12
SN41	-300E-12	-300E-12	-400E-12	-400E-12	-400E-12	-400E-12	
SN42	-200E-12	-200E-12	-300E-12	-300E-12	-300E-12	-400E-12	
SN43	-200E-12	-200E-12	-400E-12	-300E-12	-400E-12	-400E-12	
SN44	-200E-12	-200E-12	-400E-12	-300E-12	-300E-12	-400E-12	
SN45	-200E-12	-200E-12	-300E-12	-300E-12	-300E-12	-400E-12	
SN46	-200E-12	-200E-12	-300E-12	-300E-12	-400E-12	-400E-12	-400E-12
SN47	-200E-12	-300E-12	-400E-12	-500E-12	-400E-12	-400E-12	-400E-12
SN48	-200E-12	-300E-12	-400E-12	-400E-12	-400E-12	-400E-12	-300E-12
SN49	-200E-12	-300E-12	-300E-12	-300E-12	-400E-12	-400E-12	-400E-12
SN50	-200E-12	-300E-12	-400E-12	-400E-12	-400E-12	-400E-12	-400E-12
Statistics							
Min	-300E-12	-300E-12	-400E-12	-500E-12	-400E-12	-400E-12	-400E-12
Max	-200E-12	-200E-12	-300E-12	-300E-12	-300E-12	-400E-12	000E+0
Mean	-210E-12	-250E-12	-360E-12	-350E-12	-370E-12	-400E-12	-190E-12
Sigma	316E-13	527E-13	516E-13	707E-13	483E-13	654E-20	202E-12

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	-400E-12	-400E-12
SN41		-400E-12
SN42		
SN43		
SN44		
SN45		
SN46	-400E-12	-400E-12
SN47	-400E-12	-400E-12
SN48	-300E-12	-300E-12
SN49	-400E-12	-400E-12
SN50	-400E-12	-400E-12
Statistics		
Min	-400E-12	-400E-12
Max	-300E-12	000E+0
Mean	-380E-12	-230E-12
Sigma	447E-13	200E-12

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	-400E-12	-300E-12
SN41	-400E-12	-400E-12
SN42		-300E-12
SN43		-300E-12
SN44		-300E-12
SN45		
SN46	-400E-12	-300E-12
SN47	-400E-12	-300E-12
SN48	-300E-12	-300E-12
SN49	-400E-12	-300E-12
SN50	-400E-12	-300E-12
Statistics		
Min	-400E-12	-400E-12
Max	-300E-12	000E+0
Mean	-383E-12	-280E-12
Sigma	408E-13	103E-12

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.	

Test conditions : Tid

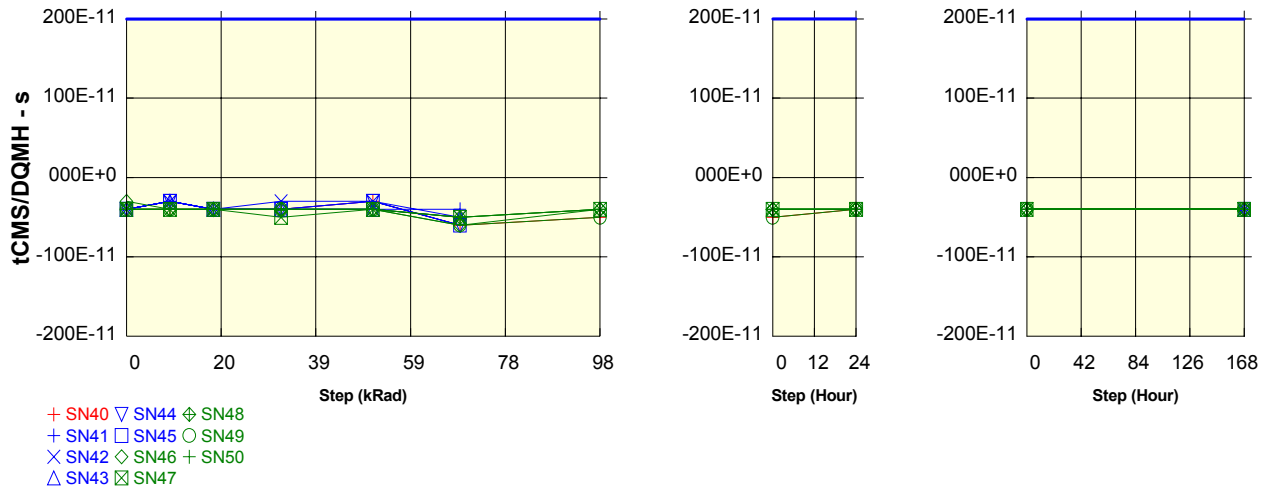
Parameter : Setup Time : tCMS/DQMH

VIL = 0.4V et VIH = 2.4V. IOH = - 2mA. IOL = 2mA

Unit : s

Spec Limit Max : 200E-11

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	-400E-12	-400E-12	-400E-12	-400E-12	-300E-12	-600E-12	-500E-12
SN41	-400E-12	-300E-12	-400E-12	-400E-12	-400E-12	-400E-12	
SN42	-400E-12	-300E-12	-400E-12	-300E-12	-300E-12	-500E-12	
SN43	-400E-12	-300E-12	-400E-12	-400E-12	-400E-12	-500E-12	
SN44	-400E-12	-300E-12	-400E-12	-400E-12	-300E-12	-600E-12	
SN45	-400E-12	-300E-12	-400E-12	-400E-12	-300E-12	-600E-12	
SN46	-300E-12	-400E-12	-400E-12	-400E-12	-400E-12	-600E-12	-400E-12
SN47	-400E-12	-400E-12	-400E-12	-500E-12	-400E-12	-500E-12	-400E-12
SN48	-400E-12	-400E-12	-400E-12	-400E-12	-400E-12	-500E-12	-400E-12
SN49	-400E-12	-400E-12	-400E-12	-400E-12	-400E-12	-600E-12	-500E-12
SN50	-400E-12	-400E-12	-400E-12	-400E-12	-400E-12	-500E-12	-400E-12
Statistics							
Min	-400E-12	-400E-12	-400E-12	-500E-12	-400E-12	-600E-12	-500E-12
Max	-300E-12	-300E-12	-400E-12	-300E-12	-300E-12	-400E-12	000E+0
Mean	-390E-12	-350E-12	-400E-12	-400E-12	-370E-12	-530E-12	-210E-12
Sigma	316E-13	527E-13	654E-20	471E-13	483E-13	675E-13	223E-12

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	-500E-12	-400E-12
SN41		-400E-12
SN42		
SN43		
SN44		
SN45		
SN46	-400E-12	-400E-12
SN47	-400E-12	-400E-12
SN48	-400E-12	-400E-12
SN49	-500E-12	-400E-12
SN50	-400E-12	-400E-12
Statistics		
Min	-500E-12	-400E-12
Max	-400E-12	000E+0
Mean	-420E-12	-240E-12
Sigma	447E-13	207E-12

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	-400E-12	-400E-12
SN41	-400E-12	-400E-12
SN42		-400E-12
SN43		-400E-12
SN44		-400E-12
SN45		
SN46	-400E-12	-400E-12
SN47	-400E-12	-400E-12
SN48	-400E-12	-400E-12
SN49	-400E-12	-400E-12
SN50	-400E-12	-400E-12
Statistics		
Min	-400E-12	-400E-12
Max	-400E-12	000E+0
Mean	-400E-12	-360E-12
Sigma	000E+0	126E-12

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.	

Test conditions : Tid

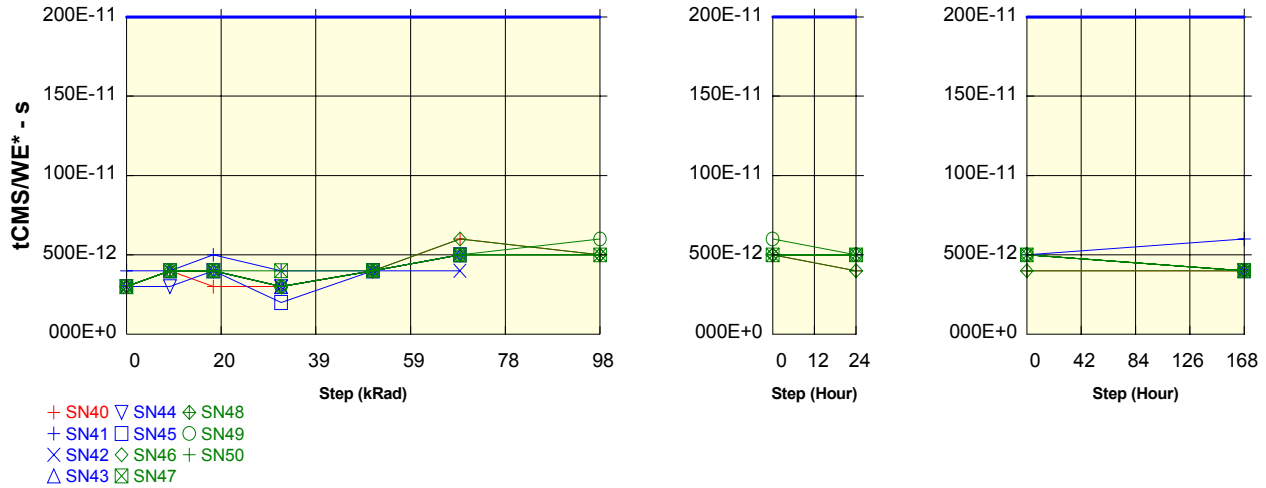
Parameter : Setup Time : tCMS/WE*

VIL = 0.4V et VIH = 2.4V. IOH = - 2mA. IOL = 2mA

Unit : s

Spec Limit Max : 200E-11

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	300E-12	400E-12	300E-12	300E-12	400E-12	600E-12	500E-12
SN41	400E-12	400E-12	500E-12	400E-12	400E-12	500E-12	
SN42	300E-12	400E-12	400E-12	300E-12	400E-12	400E-12	
SN43	300E-12	400E-12	400E-12	300E-12	400E-12	500E-12	
SN44	300E-12	300E-12	400E-12	300E-12	400E-12	500E-12	
SN45	300E-12	400E-12	400E-12	200E-12	400E-12	500E-12	
SN46	300E-12	400E-12	400E-12	300E-12	400E-12	600E-12	500E-12
SN47	300E-12	400E-12	400E-12	400E-12	400E-12	500E-12	500E-12
SN48	300E-12	400E-12	400E-12	300E-12	400E-12	500E-12	500E-12
SN49	300E-12	400E-12	400E-12	300E-12	400E-12	500E-12	600E-12
SN50	300E-12	400E-12	400E-12	300E-12	400E-12	500E-12	500E-12
Statistics							
Min	300E-12	300E-12	400E-12	200E-12	400E-12	400E-12	000E+0
Max	400E-12	400E-12	500E-12	400E-12	400E-12	600E-12	600E-12
Mean	310E-12	390E-12	410E-12	310E-12	400E-12	500E-12	260E-12
Sigma	316E-13	316E-13	316E-13	568E-13	654E-20	471E-13	276E-12

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	500E-12	400E-12
SN41		500E-12
SN42		
SN43		
SN44		
SN45		
SN46	500E-12	500E-12
SN47	500E-12	500E-12
SN48	500E-12	400E-12
SN49	600E-12	500E-12
SN50	500E-12	500E-12
Statistics		
Min	500E-12	000E+0
Max	600E-12	500E-12
Mean	520E-12	290E-12
Sigma	447E-13	251E-12

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	400E-12	400E-12
SN41	500E-12	600E-12
SN42		400E-12
SN43		400E-12
SN44		400E-12
SN45		
SN46	500E-12	400E-12
SN47	500E-12	400E-12
SN48	400E-12	400E-12
SN49	500E-12	400E-12
SN50	500E-12	400E-12
Statistics		
Min	400E-12	000E+0
Max	500E-12	600E-12
Mean	483E-12	380E-12
Sigma	408E-13	148E-12

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.	

Test conditions : Tid

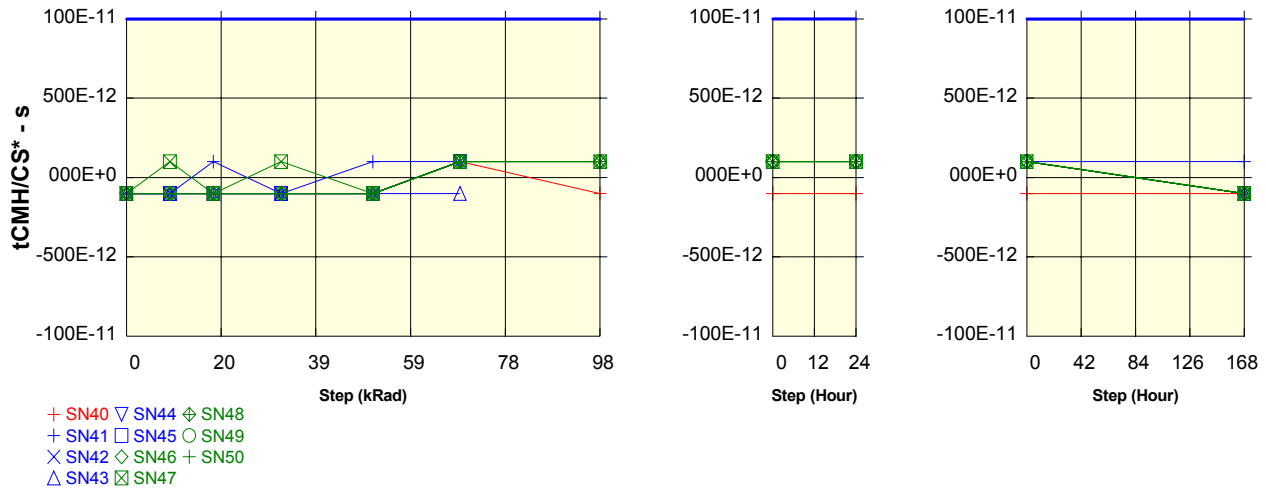
Parameter : Hold Time : tCMH/CS*

VIL = 0.4V et VIH = 2.4V. IOH = - 2mA. IOL = 2mA

Unit : s

Spec Limit Max : 100E-11

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	-100E-12	-100E-12	-100E-12	-100E-12	-100E-12	100E-12	-100E-12
SN41	-100E-12	-100E-12	100E-12	-100E-12	100E-12	100E-12	
SN42	-100E-12	-100E-12	-100E-12	-100E-12	-100E-12	100E-12	
SN43	-100E-12	-100E-12	-100E-12	-100E-12	-100E-12	-100E-12	
SN44	-100E-12	-100E-12	-100E-12	-100E-12	-100E-12	100E-12	
SN45	-100E-12	-100E-12	-100E-12	-100E-12	-100E-12	100E-12	
SN46	-100E-12	-100E-12	-100E-12	-100E-12	-100E-12	100E-12	100E-12
SN47	-100E-12	100E-12	-100E-12	100E-12	-100E-12	100E-12	100E-12
SN48	-100E-12	-100E-12	-100E-12	-100E-12	-100E-12	100E-12	100E-12
SN49	-100E-12	-100E-12	-100E-12	-100E-12	-100E-12	100E-12	100E-12
SN50	-100E-12	-100E-12	-100E-12	-100E-12	-100E-12	100E-12	100E-12
Statistics							
Min	-100E-12	-100E-12	-100E-12	-100E-12	-100E-12	-100E-12	000E+0
Max	-100E-12	100E-12	100E-12	100E-12	100E-12	100E-12	100E-12
Mean	-100E-12	-800E-13	-800E-13	-800E-13	-800E-13	800E-13	500E-13
Sigma	164E-20	632E-13	632E-13	632E-13	632E-13	632E-13	527E-13

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	-100E-12	-100E-12
SN41		100E-12
SN42		
SN43		
SN44		
SN45		
SN46	100E-12	100E-12
SN47	100E-12	100E-12
SN48	100E-12	100E-12
SN49	100E-12	100E-12
SN50	100E-12	100E-12
Statistics		
Min	100E-12	000E+0
Max	100E-12	100E-12
Mean	100E-12	600E-13
Sigma	000E+0	516E-13

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	-100E-12	-100E-12
SN41	100E-12	100E-12
SN42		-100E-12
SN43		-100E-12
SN44		-100E-12
SN45		
SN46	100E-12	-100E-12
SN47	100E-12	-100E-12
SN48	100E-12	-100E-12
SN49	100E-12	-100E-12
SN50	100E-12	-100E-12
Statistics		
Min	100E-12	-100E-12
Max	100E-12	100E-12
Mean	100E-12	-700E-13
Sigma	000E+0	675E-13

HIREX Engineering	Total Dose Test Report		Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.

Test conditions : Tid

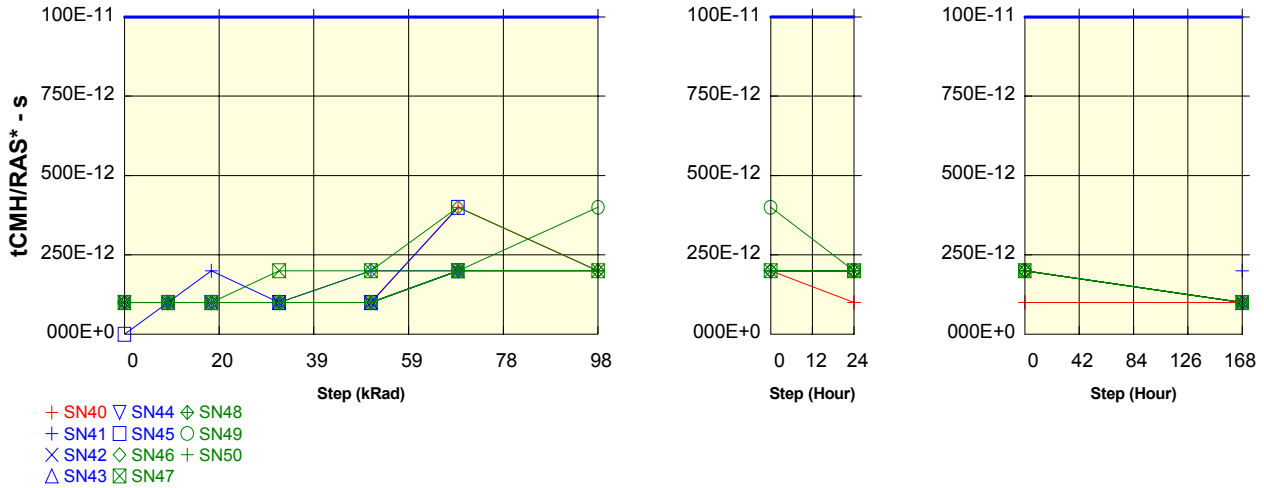
Parameter : Hold Time : tCMH/RAS*

VIL = 0.4V et VIH = 2.4V. IOH = - 2mA. IOL = 2mA

Unit : s

Spec Limit Max : 100E-11

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	100E-12	100E-12	100E-12	100E-12	100E-12	400E-12	200E-12
SN41	100E-12	100E-12	200E-12	100E-12	200E-12	200E-12	
SN42	100E-12	100E-12	100E-12	100E-12	100E-12	200E-12	
SN43	100E-12	100E-12	100E-12	100E-12	100E-12	200E-12	
SN44	100E-12	100E-12	100E-12	100E-12	100E-12	200E-12	
SN45	000E+0	100E-12	100E-12	100E-12	100E-12	400E-12	
SN46	100E-12	100E-12	100E-12	100E-12	200E-12	400E-12	200E-12
SN47	100E-12	100E-12	100E-12	200E-12	200E-12	200E-12	200E-12
SN48	100E-12	100E-12	100E-12	100E-12	100E-12	200E-12	200E-12
SN49	100E-12	100E-12	100E-12	100E-12	100E-12	200E-12	400E-12
SN50	100E-12	100E-12	100E-12	100E-12	100E-12	200E-12	200E-12
Statistics							
Min	000E+0	100E-12	100E-12	100E-12	100E-12	200E-12	000E+0
Max	100E-12	100E-12	200E-12	200E-12	200E-12	400E-12	400E-12
Mean	900E-13	100E-12	110E-12	110E-12	130E-12	240E-12	120E-12
Sigma	316E-13	164E-20	316E-13	316E-13	483E-13	843E-13	140E-12

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	200E-12	100E-12
SN41		
SN42		
SN43		
SN44		
SN45		
SN46	200E-12	200E-12
SN47	200E-12	200E-12
SN48	200E-12	200E-12
SN49	400E-12	200E-12
SN50	200E-12	200E-12
Statistics		
Min	200E-12	000E+0
Max	400E-12	200E-12
Mean	240E-12	100E-12
Sigma	894E-13	105E-12

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	100E-12	100E-12
SN41		200E-12
SN42		100E-12
SN43		100E-12
SN44		100E-12
SN45		
SN46	200E-12	100E-12
SN47	200E-12	100E-12
SN48	200E-12	100E-12
SN49	200E-12	100E-12
SN50	200E-12	100E-12
Statistics		
Min	200E-12	000E+0
Max	200E-12	200E-12
Mean	200E-12	100E-12
Sigma	000E+0	471E-13

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.	

Test conditions : Tid

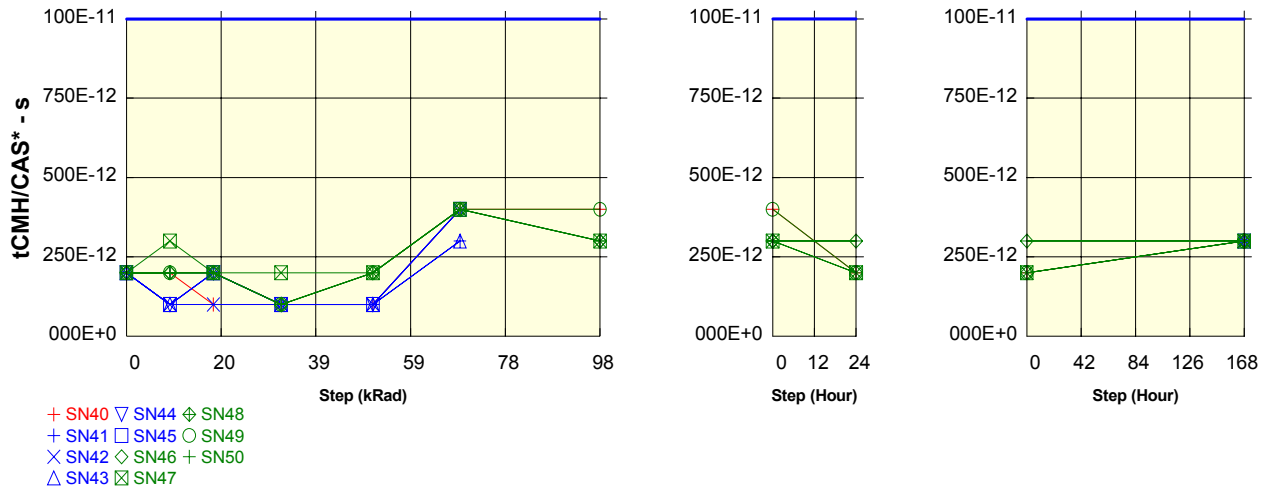
Parameter : Hold Time : tCMH/CAS*

VIL = 0.4V et VIH = 2.4V. IOH = - 2mA. IOL = 2mA

Unit : s

Spec Limit Max : 100E-11

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	200E-12	200E-12	100E-12	100E-12	100E-12	400E-12	400E-12
SN41	200E-12	200E-12	200E-12	100E-12	100E-12	300E-12	
SN42	200E-12	100E-12	100E-12	100E-12	100E-12	400E-12	
SN43	200E-12	100E-12	200E-12	100E-12	100E-12	300E-12	
SN44	200E-12	100E-12	200E-12	100E-12	100E-12	400E-12	
SN45	200E-12	100E-12	200E-12	100E-12	100E-12	400E-12	
SN46	200E-12	200E-12	200E-12	100E-12	200E-12	400E-12	300E-12
SN47	200E-12	300E-12	200E-12	200E-12	200E-12	400E-12	300E-12
SN48	200E-12	200E-12	200E-12	100E-12	200E-12	400E-12	300E-12
SN49	200E-12	200E-12	200E-12	100E-12	200E-12	400E-12	400E-12
SN50	200E-12	200E-12	200E-12	100E-12	200E-12	400E-12	300E-12
Statistics							
Min	200E-12	100E-12	100E-12	100E-12	100E-12	300E-12	000E+0
Max	200E-12	300E-12	200E-12	200E-12	200E-12	400E-12	400E-12
Mean	200E-12	170E-12	190E-12	110E-12	150E-12	380E-12	160E-12
Sigma	327E-20	675E-13	316E-13	316E-13	527E-13	422E-13	171E-12

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	400E-12	200E-12
SN41		
SN42		
SN43		
SN44		
SN45		
SN46	300E-12	300E-12
SN47	300E-12	200E-12
SN48	300E-12	200E-12
SN49	400E-12	200E-12
SN50	300E-12	300E-12
Statistics		
Min	300E-12	000E+0
Max	400E-12	300E-12
Mean	320E-12	120E-12
Sigma	447E-13	132E-12

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	200E-12	300E-12
SN41		300E-12
SN42		300E-12
SN43		300E-12
SN44		300E-12
SN45		
SN46	300E-12	300E-12
SN47	200E-12	300E-12
SN48	200E-12	300E-12
SN49	200E-12	300E-12
SN50	300E-12	300E-12
Statistics		
Min	200E-12	000E+0
Max	300E-12	300E-12
Mean	240E-12	270E-12
Sigma	548E-13	949E-13

HIREX Engineering	Total Dose Test Report		Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.

Test conditions : Tid

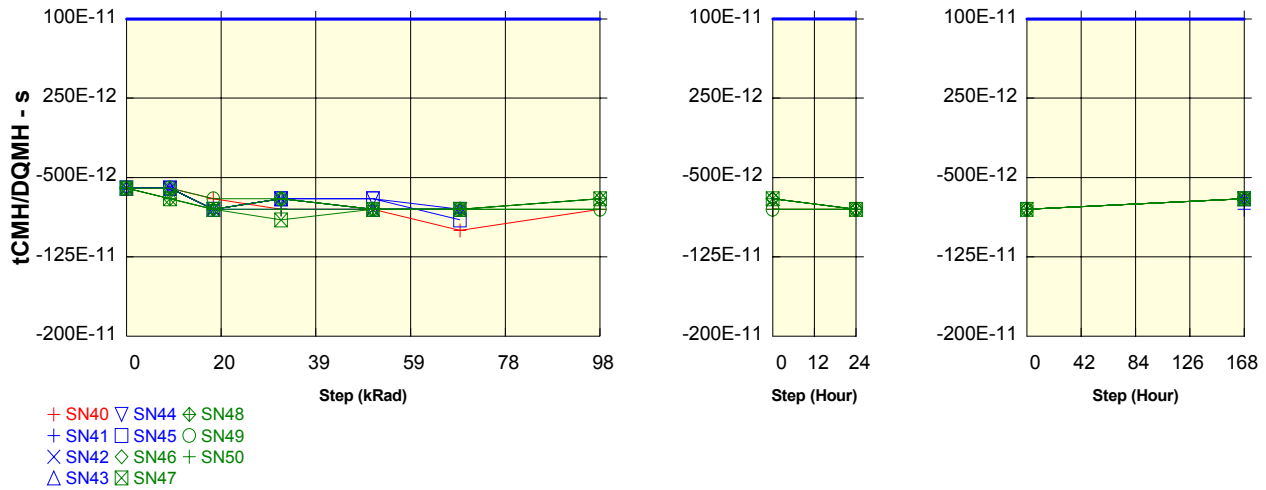
Parameter : Hold Time : tCMH/DQMH

VIL = 0.4V et VIH = 2.4V. IOH = - 2mA. IOL = 2mA

Unit : s

Spec Limit Max : 100E-11

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	-600E-12	-600E-12	-700E-12	-800E-12	-800E-12	-100E-11	-800E-12
SN41	-600E-12	-600E-12	-800E-12	-800E-12	-800E-12	-800E-12	
SN42	-600E-12	-600E-12	-800E-12	-700E-12	-800E-12	-800E-12	
SN43	-600E-12	-600E-12	-800E-12	-700E-12	-800E-12	-800E-12	
SN44	-600E-12	-600E-12	-800E-12	-700E-12	-700E-12	-800E-12	
SN45	-600E-12	-600E-12	-800E-12	-700E-12	-700E-12	-900E-12	
SN46	-600E-12	-600E-12	-800E-12	-700E-12	-800E-12	-800E-12	-700E-12
SN47	-600E-12	-700E-12	-800E-12	-900E-12	-800E-12	-800E-12	-700E-12
SN48	-600E-12	-700E-12	-800E-12	-700E-12	-800E-12	-800E-12	-700E-12
SN49	-600E-12	-600E-12	-700E-12	-700E-12	-800E-12	-800E-12	-800E-12
SN50	-600E-12	-700E-12	-800E-12	-800E-12	-800E-12	-800E-12	-800E-12
Statistics							
Min	-600E-12	-700E-12	-800E-12	-900E-12	-800E-12	-900E-12	-800E-12
Max	-600E-12	-600E-12	-700E-12	-700E-12	-700E-12	-800E-12	000E+0
Mean	-600E-12	-630E-12	-790E-12	-740E-12	-780E-12	-810E-12	-370E-12
Sigma	925E-20	483E-13	316E-13	699E-13	422E-13	316E-13	392E-12

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	-800E-12	-800E-12
SN41		
SN42		
SN43		
SN44		
SN45		
SN46	-700E-12	-800E-12
SN47	-700E-12	-800E-12
SN48	-700E-12	-800E-12
SN49	-800E-12	-800E-12
SN50	-800E-12	-800E-12
Statistics		
Min	-800E-12	-800E-12
Max	-700E-12	000E+0
Mean	-740E-12	-400E-12
Sigma	548E-13	422E-12

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	-800E-12	-700E-12
SN41		-800E-12
SN42		-700E-12
SN43		-700E-12
SN44		-700E-12
SN45		
SN46	-800E-12	-700E-12
SN47	-800E-12	-700E-12
SN48	-800E-12	-700E-12
SN49	-800E-12	-700E-12
SN50	-800E-12	-700E-12
Statistics		
Min	-800E-12	-800E-12
Max	-800E-12	000E+0
Mean	-800E-12	-640E-12
Sigma	000E+0	227E-12

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.	

Test conditions : Tid

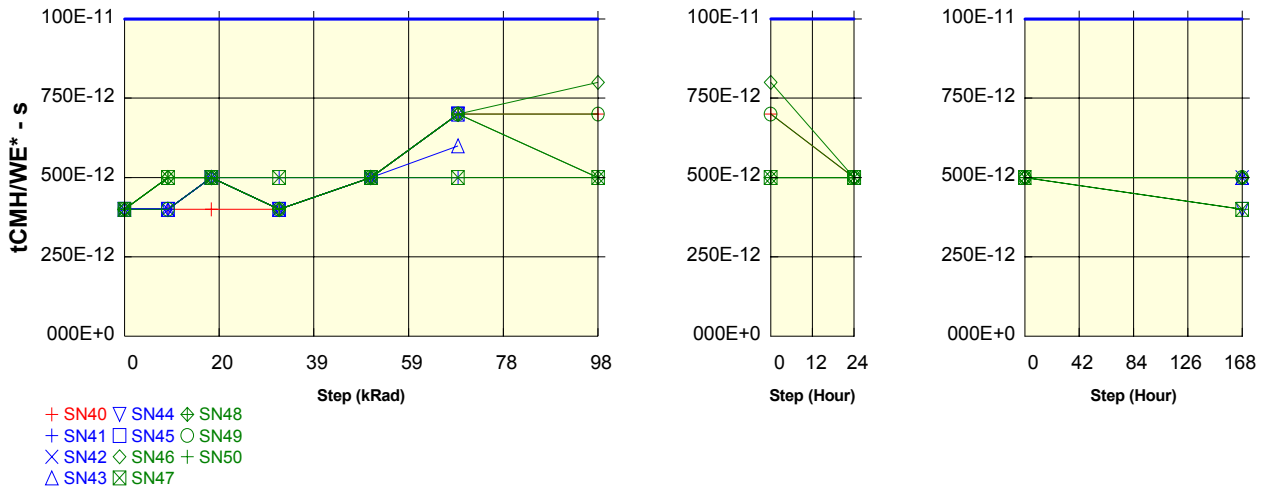
Parameter : Hold Time : tCMH/WE*

VIL = 0.4V et VIH = 2.4V. IOH = - 2mA. IOL = 2mA

Unit : s

Spec Limit Max : 100E-11

Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	400E-12	400E-12	400E-12	400E-12	500E-12	700E-12	700E-12
SN41	400E-12	400E-12	500E-12	500E-12	500E-12	500E-12	
SN42	400E-12	400E-12	500E-12	400E-12	500E-12	700E-12	
SN43	400E-12	400E-12	500E-12	400E-12	500E-12	600E-12	
SN44	400E-12	400E-12	500E-12	400E-12	500E-12	700E-12	
SN45	400E-12	400E-12	500E-12	400E-12	500E-12	700E-12	
SN46	400E-12	500E-12	500E-12	400E-12	500E-12	700E-12	800E-12
SN47	400E-12	500E-12	500E-12	500E-12	500E-12	500E-12	500E-12
SN48	400E-12	500E-12	500E-12	400E-12	500E-12	700E-12	500E-12
SN49	400E-12	400E-12	500E-12	400E-12	500E-12	700E-12	700E-12
SN50	400E-12	500E-12	500E-12	400E-12	500E-12	700E-12	500E-12
Statistics							
Min	400E-12	400E-12	500E-12	400E-12	500E-12	500E-12	000E+0
Max	400E-12	500E-12	500E-12	500E-12	500E-12	700E-12	800E-12
Mean	400E-12	440E-12	500E-12	420E-12	500E-12	650E-12	300E-12
Sigma	654E-20	516E-13	925E-20	422E-13	925E-20	850E-13	330E-12

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	700E-12	500E-12
SN41		
SN42		
SN43		
SN44		
SN45		
SN46	800E-12	500E-12
SN47	500E-12	500E-12
SN48	500E-12	500E-12
SN49	700E-12	500E-12
SN50	500E-12	500E-12
Statistics		
Min	500E-12	000E+0
Max	800E-12	500E-12
Mean	600E-12	250E-12
Sigma	141E-12	264E-12

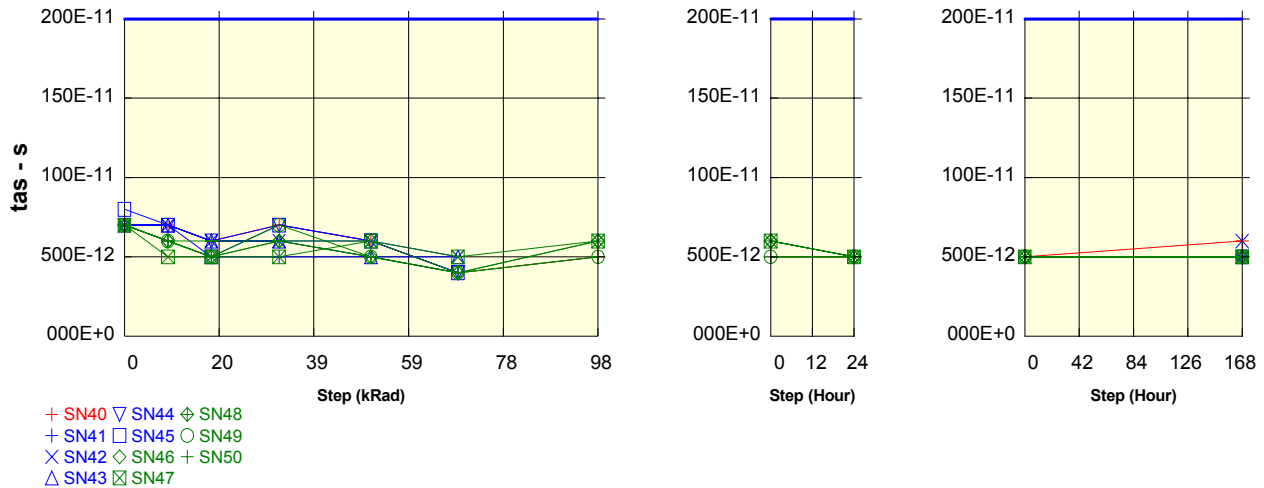
Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	500E-12	500E-12
SN41		500E-12
SN42		500E-12
SN43		500E-12
SN44		400E-12
SN45		
SN46	500E-12	500E-12
SN47	500E-12	400E-12
SN48	500E-12	500E-12
SN49	500E-12	500E-12
SN50	500E-12	400E-12
Statistics		
Min	500E-12	000E+0
Max	500E-12	500E-12
Mean	500E-12	420E-12
Sigma	000E+0	155E-12

HIREX Engineering	Total Dose Test Report			Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.	

Test conditions : Tid
Parameter : Address Setup Time : tas

Unit : s
Spec Limit Max : 200E-11
Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	700E-12	700E-12	600E-12	700E-12	600E-12	400E-12	500E-12
SN41	700E-12	600E-12	500E-12	500E-12	500E-12	400E-12	
SN42	700E-12	700E-12	600E-12	600E-12	600E-12	500E-12	
SN43	700E-12	700E-12	600E-12	600E-12	500E-12	500E-12	
SN44	700E-12	700E-12	600E-12	700E-12	600E-12	400E-12	
SN45	800E-12	700E-12	500E-12	700E-12	600E-12	400E-12	
SN46	700E-12	600E-12	500E-12	600E-12	600E-12	400E-12	600E-12
SN47	700E-12	500E-12	500E-12	500E-12	600E-12	500E-12	600E-12
SN48	700E-12	600E-12	500E-12	600E-12	500E-12	400E-12	600E-12
SN49	700E-12	600E-12	500E-12	700E-12	500E-12	400E-12	500E-12
SN50	700E-12	600E-12	600E-12	600E-12	500E-12	400E-12	500E-12
Statistics							
Min	700E-12	500E-12	500E-12	500E-12	500E-12	400E-12	000E+0
Max	800E-12	700E-12	600E-12	700E-12	600E-12	500E-12	600E-12
Mean	710E-12	630E-12	540E-12	610E-12	550E-12	430E-12	280E-12
Sigma	316E-13	675E-13	516E-13	738E-13	527E-13	483E-13	297E-12

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	500E-12	500E-12
SN41		
SN42		
SN43		
SN44		
SN45		
SN46	600E-12	500E-12
SN47	600E-12	500E-12
SN48	600E-12	500E-12
SN49	500E-12	500E-12
SN50	500E-12	500E-12
Statistics		
Min	500E-12	000E+0
Max	600E-12	500E-12
Mean	560E-12	250E-12
Sigma	548E-13	264E-12

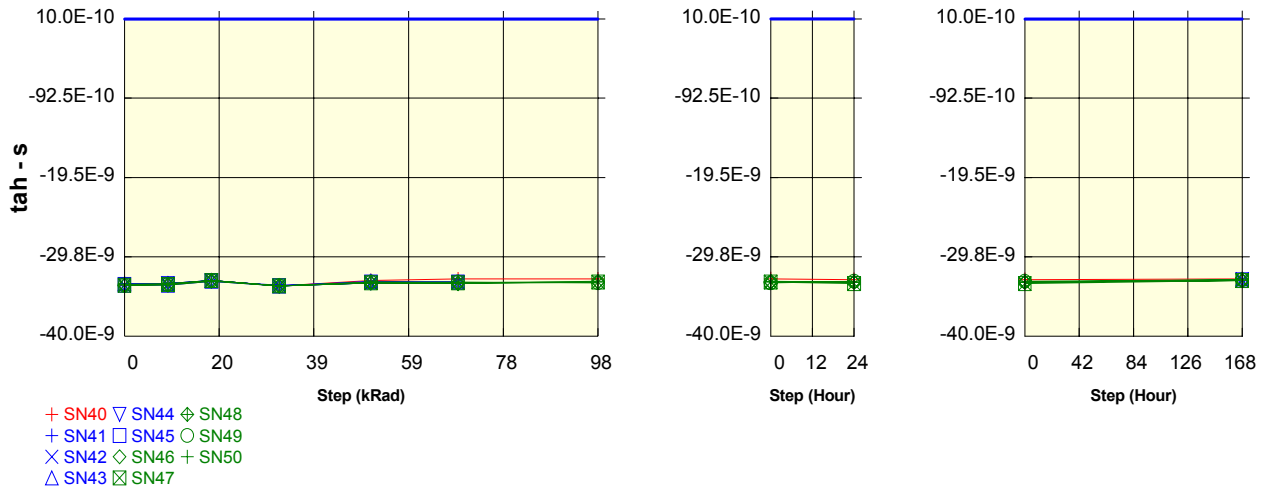
Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	500E-12	600E-12
SN41		500E-12
SN42		600E-12
SN43		500E-12
SN44		500E-12
SN45		
SN46	500E-12	500E-12
SN47	500E-12	500E-12
SN48	500E-12	500E-12
SN49	500E-12	500E-12
SN50	500E-12	500E-12
Statistics		
Min	500E-12	000E+0
Max	500E-12	600E-12
Mean	500E-12	460E-12
Sigma	000E+0	165E-12

HIREX Engineering	Total Dose Test Report		Ref. : HRX/TID/0241 Issue : 01
Part Type :	MT48LC16M8A2	Manufacturer :	Micron Technology Inc.

Test conditions : Tid
Parameter : Address Hold Time : tah

Unit : s
Spec Limit Max : 10.0E-10
Spec limits are represented in bold lines on the graphic.



Test TST001 : Exposure

	0 kRad	9 kRad	18 kRad	32 kRad	51 kRad	69 kRad	98 kRad
SN40	-33.4E-9	-33.3E-9	-32.8E-9	-33.5E-9	-32.8E-9	-32.6E-9	-32.6E-9
SN41	-33.2E-9	-33.2E-9	-32.9E-9	-33.4E-9	-33.1E-9	-33.1E-9	
SN42	-33.4E-9	-33.3E-9	-32.8E-9	-33.5E-9	-33.1E-9	-33.0E-9	
SN43	-33.2E-9	-33.2E-9	-32.8E-9	-33.5E-9	-32.9E-9	-33.0E-9	
SN44	-33.3E-9	-33.2E-9	-32.8E-9	-33.5E-9	-33.1E-9	-33.1E-9	
SN45	-33.4E-9	-33.4E-9	-32.9E-9	-33.5E-9	-33.0E-9	-33.0E-9	
SN46	-33.4E-9	-33.4E-9	-32.9E-9	-33.5E-9	-33.1E-9	-33.2E-9	-33.0E-9
SN47	-33.4E-9	-33.3E-9	-32.8E-9	-33.5E-9	-33.1E-9	-33.1E-9	-33.0E-9
SN48	-33.4E-9	-33.3E-9	-32.8E-9	-33.5E-9	-33.1E-9	-33.1E-9	-33.0E-9
SN49	-33.4E-9	-33.3E-9	-32.8E-9	-33.5E-9	-33.0E-9	-33.0E-9	-33.1E-9
SN50	-33.3E-9	-33.2E-9	-32.8E-9	-33.5E-9	-33.0E-9	-33.1E-9	-32.9E-9
Statistics							
Min	-33.4E-9	-33.4E-9	-32.9E-9	-33.5E-9	-33.1E-9	-33.2E-9	-33.1E-9
Max	-33.2E-9	-33.2E-9	-32.8E-9	-33.4E-9	-32.9E-9	-33.0E-9	00.0E+0
Mean	-33.3E-9	-33.3E-9	-32.8E-9	-33.5E-9	-33.1E-9	-33.1E-9	-16.5E-9
Sigma	84.3E-12	78.9E-12	48.3E-12	31.6E-12	70.7E-12	67.5E-12	17.4E-9

Test TST002 : Annealing 24H

	0 Hour	24 Hour
SN40	-32.6E-9	-32.7E-9
SN41		
SN42		
SN43		
SN44		
SN45		
SN46	-33.0E-9	-33.0E-9
SN47	-33.0E-9	-33.2E-9
SN48	-33.0E-9	-33.0E-9
SN49	-33.1E-9	-32.9E-9
SN50	-32.9E-9	-33.0E-9
Statistics		
Min	-33.1E-9	-33.2E-9
Max	-32.9E-9	00.0E+0
Mean	-33.0E-9	-16.5E-9
Sigma	70.7E-12	17.4E-9

Test TST003 : Annealing 168H

	0 Hour	168 Hour
SN40	-32.7E-9	-32.6E-9
SN41		-32.8E-9
SN42		-32.7E-9
SN43		-32.6E-9
SN44		-32.7E-9
SN45		
SN46	-33.0E-9	-32.8E-9
SN47	-33.2E-9	-32.8E-9
SN48	-33.0E-9	-32.8E-9
SN49	-32.9E-9	-32.7E-9
SN50	-33.0E-9	-32.7E-9
Statistics		
Min	-33.2E-9	-32.8E-9
Max	-32.9E-9	00.0E+0
Mean	-33.0E-9	-29.5E-9
Sigma	11.0E-11	10.4E-9