RIR IN:- 79836

RIR OUT:- 79836

PARTS HISTORY LOG

Radiation Testing

PROGRAMME:- INTEGRAL

PART TYPE:- CD54HC4046AF/3A

RADIATION REPORT:- RD 259

IGG TASK NUMBER:- 2020

SUMMARY OF TEST RESULTS

All parts failed ICC at the 5KRad(Si) test stage. SN 4 and 5 failed IIN(LOW) at 10KRad(Si) and SN 2 and 3 failed this parameter at 20KRad(Si). SN 4 and 5 also failed VOL and IIN(HIGH) at 30KRad(Si) with SN 5 additionally failing IOZ at this stage. No other parameter showed any significant drift and no other failures were recorded.
(NB:- The ATE automatically overranged when measuring Supply Current for ICC>12μA, where the range was set for a limit of 8μA maximum.)

Radiation Report Number:- RD 259

Project:- INTEGRAL

Part Type:- CD54HC4046AF/3A Date Code:- 9714

Manufacturer:- HAR/U IGG Task No:- 2020

Project Approval of Lot Traveller:-

Signed..... Date.....

Position.....

Serial Number Range:-

01 through 05 (inclusive)

I certify that the subject component has been tested in accordance with the following radiation specifications:-

Test Method - ESA/SCC22900 ISSUE- 4 DATE- Jan '95

Irradiation Test Plan- IN-PL-IGG-0010 ISSUE- 2 DATE- Jan '98

Closed/Approved NCR No:- N N/A

Approved Waiver No:- WAR N/A

Signed... P.A. Russell... Date.20/3/98

Upscreening Engineer

Signed... ..... Date.20/3/98..

Upscreening Manager

RADIATION REPORT NUMBER:- RD 259 DATE:- 20.3.98

PROJECT:- INTEGRAL RIR IN:- 79836

PART NUMBER:- CD54HC4046AF/3A MANUFACTURER:- HAR/U

PROCUREMENT LEVEL:- 5962-8960901EA DATE CODE:- 9714

TEST METHOD - ESA/SCC22900 ISSUE- 4 DATE- Jan '95

IRRADIATION TEST PLAN- IN-PL-IGG-0010 ISSUE- 2 DATE- Jan '98

START QUANTITY:- 5

No.	Test (Sample Size)	IN-PL-IGG-0010 Test Method and Conditions	Date in	Qty in	Date out	Qty out	SIGNED Op/QA
1	Serialisation and Selection of Control Sample (100%)	Control Sample= SN 01	02/03/98	5	02/03/98	4 + CONTROL SAMPLE	IGG 16 CT
2	Initial Electrical Measurements (100% read and record)	Table A Testing at IGG	02/03/98	4	02/03/98	4	IGG 16 CT
3	Initial Electrical Measurements (100% read and record)	Table A Testing at ERA	05/03/98	4	05/03/98	4	IGG 16 CT
4	Set-up and apply Bias per Figure 1	Verify Bias Circuit and conditions (in-situ) for all 4 test samples	05/03/98	4	05/03/98	4	IGG 16 CT
5	Irradiation 1 (4 samples)	Dose=2.5kRAD(Si) Rate= 10RAD(Si) per second Time= 250secs	05/03/98	4	05/03/98	4	IGG 16 CT
6	Interim 1 Electrical Measurements (100% read and record)	Table A. Bias to be maintained until testing is performed. Tdwell=10mins maximum	05/03/98	4	05/03/98	4	IGG 16 CT

Report No: RD 256	Part Type: CD54HC4046AF/3A	Date: 20.3.98

No.	Test (Sample Size)	IN-PL-IGG-0010 Test Method and Conditions	Date in	Qty in	Date out	Qty out	SIGNED Op/QA
7	Irradiation 2 (4 samples)	As Test 5	05/03/98	4	05/03/98	4	IGG 16 CT
8	Interim 2 Electrical Measurements (100% read and record)	As Test 6	05/03/98	4	05/03/98	0	IGG 16 CT
9	Irradiation 3 (4 samples)	As Test 5	05/03/98	4	05/03/98	4	IGG 16 CT
10	Interim 3 Electrical Measurements (100% read and record)	As Test 6	05/03/98	4	05/03/98	0	IGG 16 CT
11	Irradiation 4 (4 samples)	As Test 5	05/03/98	4	05/03/98	4	IGG 16 CT
12	Interim 4 Electrical Measurements (100% read and record)	As Test 6	05/03/98	4	05/03/98	0	IGG 16 CT
13	Irradiation 5 (4 samples)	Dose= 10kRAD(Si) Rate= 10RAD(Si) per second Time=1000secs	05/03/98	4	05/03/98	4	IGG 16 CT
14	Interim 5 Electrical Measurements (100% read and record)	As Test 6	05/03/98	4	05/03/98	0	IGG 16 CT
15	Irradiation 6 (4 samples)	Dose= 10kRAD(Si) Rate= 10RAD(Si) per second Time=1000secs	05/03/98	4	05/03/98	4	IGG 16 CT

Report No: RD 259	Part Type: CD54HC4046AF/3A	Date: 20.3.98

No.	Test (Sample Size)	IN-PL-IGG-0010 Test Method and Conditions	Date in	Qty in	Date out	Qty out	SIGNED Op/QA
16	Intermediate Electrical Measurements (100% read and record)	As Test 6 At ERA	05/03/98	4	05/03/98	0	IGG 16 CT
17	Annealing Test (4 samples)	Bias for 24hrs min at +25°C (record exact time)	05/03/98	4	06/03/98	4	IGG 16 CT
18	Post Annealing Electrical Measurements (100% read and record)	Table A At IGG	06/03/98	4	06/03/98	0	IGG 16 CT
19	Accelerated Aging under bias (4 samples)	168 hours bias at +100±5°C	06/03/98	4	16/03/98	4	IGG 16 CT
20	Final Electrical Measurements (100% read and record)	Table A	16/03/98	4	16/03/98	1	IGG 16 CT
21	Test Report Collation	[redacted]	[redacted]	[redacted]	20/3/98	[redacted]	IGG 2 CT
22	Test Report Approval	[redacted]	[redacted]	[redacted]	20/3/98	[redacted]	IGG 2 CT
23	NOTES:-						

Report No: RD 259 Part Type: CD54HC4046AF/3A Date: 20.3.98

FAILURE LIST AND APPLICABLE NCR

Test No.	Serial Number(s)	Failed Parameter and Failure Mode	Applicable NCR
8	2,3,4,5	FAIL I_{CC}.	–
12	4, 5	FAIL $I_{IN\,(LOW)}$.	–
14	2,3	FAIL $I_{IN\,(LOW)}$.	–
16	4 5	FAILS V_{OL}, $I_{IN\,(HIGH)}$. FAILS V_{OL}, $I_{IN\,(HIGH)}$, I_{OZ}.	–

Report No: RD 259 Part Type: CD54HC4046AF/3A Date: 20.3.98

TEST EQUIPMENT LIST

Item, Type Number and Serial Number	CT Inventory Number	Function	Calibration Due
Item: Radiation Source Type No: Cobalt 60 Serial No: N/A	ERA's Facility	Irradiation	1 / 1 /1999
Item: SZ Type No: M8000 Serial No: 884769	CT 339	ATE	28 / 3 /1998
Item: THURLBY Type No: PL320 Serial No: 26P0246	CT296	PSU	30 / 3 /1998
Item: FARNELL Type No: LT30 Serial No: 06916	SM	PSU	- / - /199-
Item: Type No: Serial No:			/ /199
Item: Type No: Serial No:			/ /199
Item: Type No: Serial No:			/ /199
Item: Type No: Serial No:			/ /199
Item: Type No: Serial No:			/ /199
Item: Type No: Serial No:			/ /199
Item: Type No: Serial No:			/ /199
Item: Type No: Serial No:			/ /199

RADIATION TEST SUMMARY

PART TYPE : 54HC4046

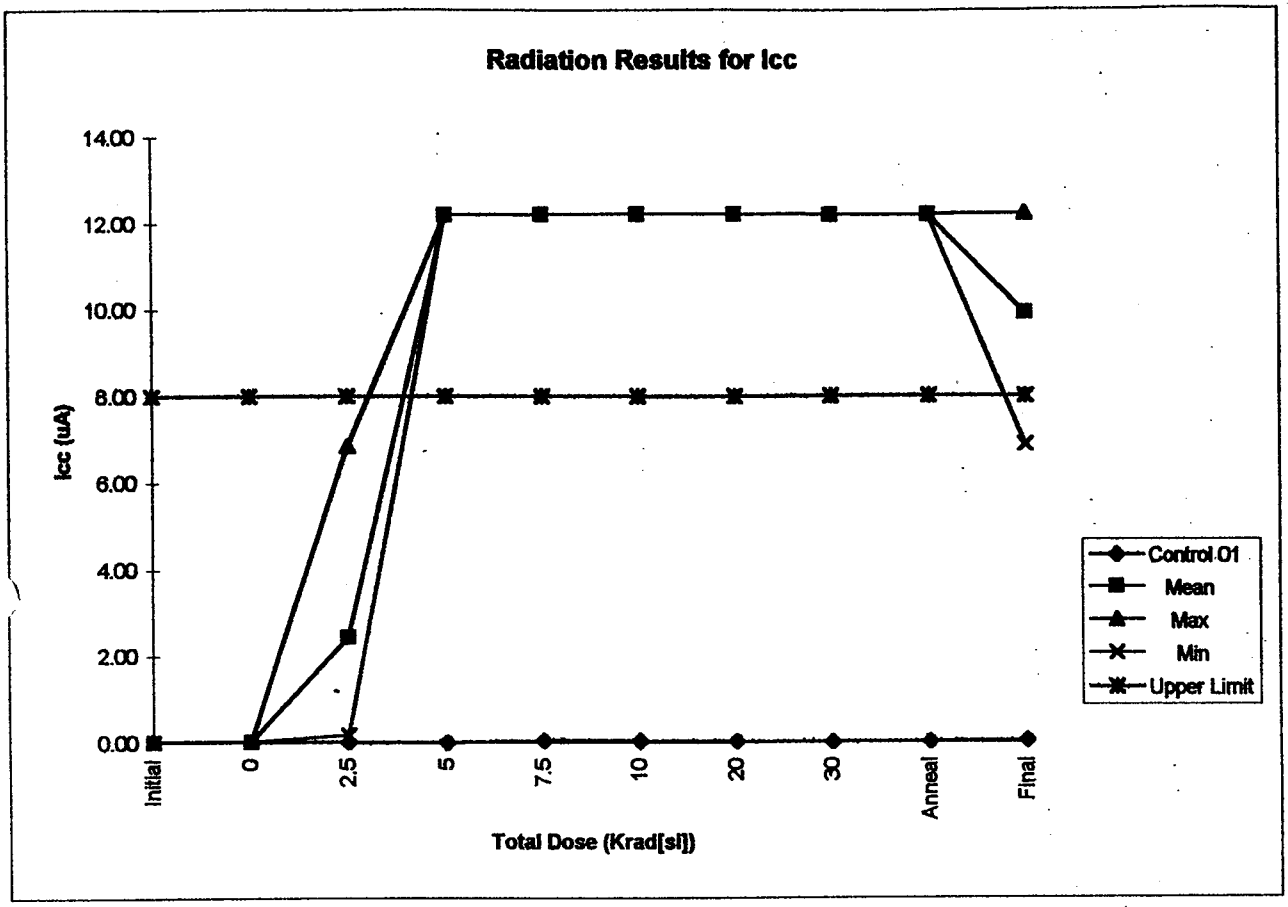
DESCRIPTION : PHASE LOCKED LOOP

REPORT NO. : RD 259

PARAMETERS PLOTTED :

Icc
Vol
I-in low
I-in high
I-oz

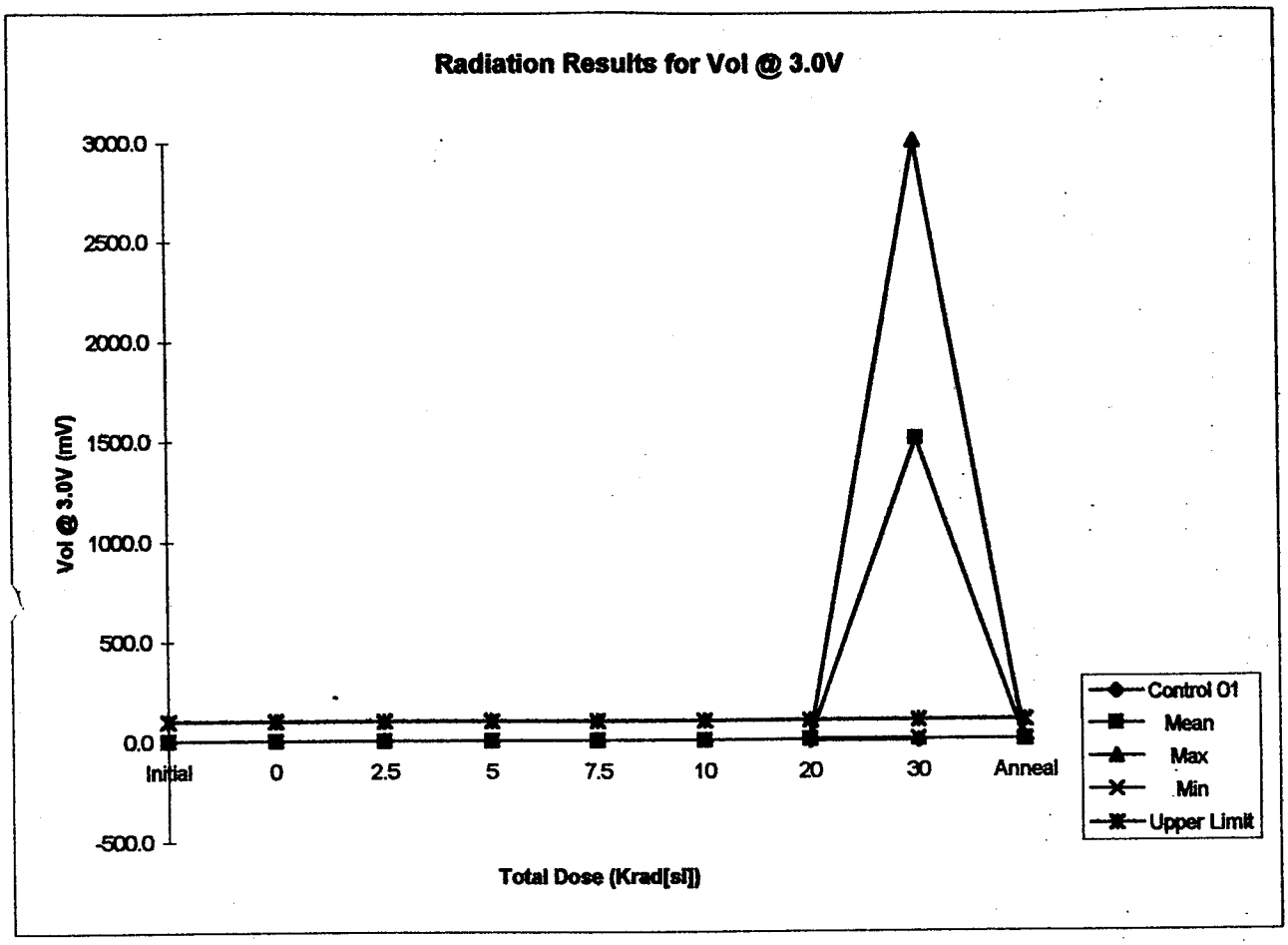
NOTE : The results for the remaining parameters showed no significant change and hence plots were not considered necessary.



Dose (kRad)	Control 01	Mean	Max	Min	Upper Limit	Lower Limit	Std.Dev.
	(uA)	(uA)	(uA)	(uA)	(uA)	(uA)	
Initial	0.01	0.01	0.01	0.00	8.0	-	0.01
0	0.02	0.02	0.02	0.01	8.0	-	0.01
2.5	0.01	2.42	6.83	0.16	8.0	-	3.14
5	0.00	12.18	12.18	12.18	8.0	-	0.00
7.5	0.04	12.20	12.20	12.20	8.0	-	0.00
10	0.05	12.20	12.20	12.20	8.0	-	0.00
20	0.03	12.20	12.20	12.20	8.0	-	0.00
30	0.01	12.17	12.17	12.17	8.0	-	0.00
Anneal	0.01	12.19	12.19	12.19	8.0	-	0.00
Final	0.04	9.90	12.21	6.85	8.0	-	2.73

Lot size for statistics : 4 devices

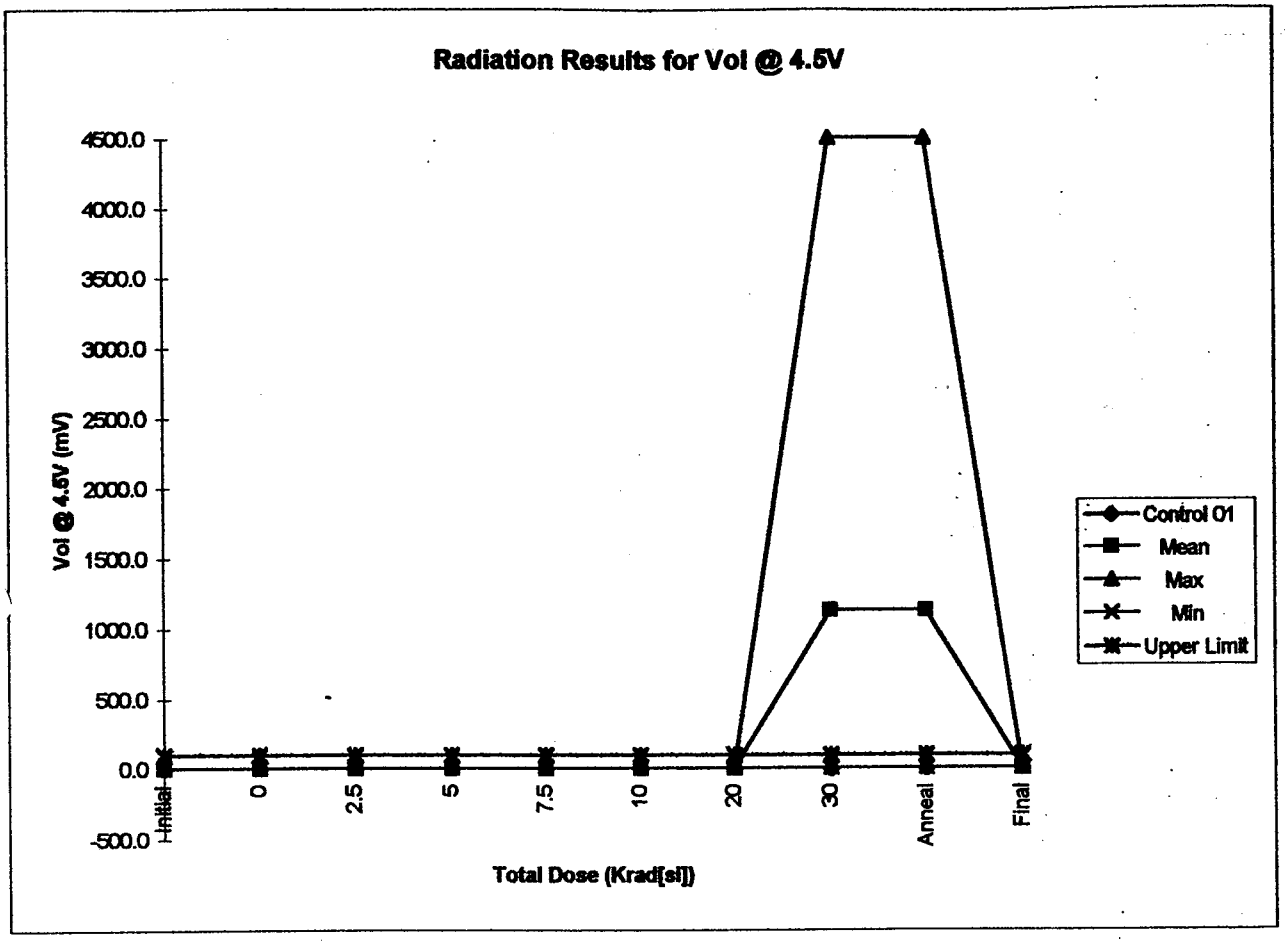
RD 259 Date code 9714



Dose (kRad)	Control 01 (mV)	Mean (mV)	Max (mV)	Min (mV)	Upper Limit (mV)	Lower Limit (mV)	Std.Dev.
Initial	0.4	0.4	0.5	0.2	100.0	-	0.13
0	0.4	0.3	0.4	0.1	100.0	-	0.15
2.5	0.4	0.3	0.5	0.2	100.0	-	0.14
5	0.4	0.3	0.4	0.1	100.0	-	0.14
7.5	0.4	0.5	0.5	0.3	100.0	-	0.10
10	0.5	0.7	0.8	0.5	100.0	-	0.15
20	0.3	1.7	2.2	1.4	100.0	-	0.36
30	0.2	1500.9	2999.8	2.1	100.0	-	1730.58
Anneal	-0.2	0.1	0.2	0.0	100.0	-	0.10
Final	0.0	0.3	0.4	0.2	100.0	-	0.10

Lot size for statistics : 4 devices

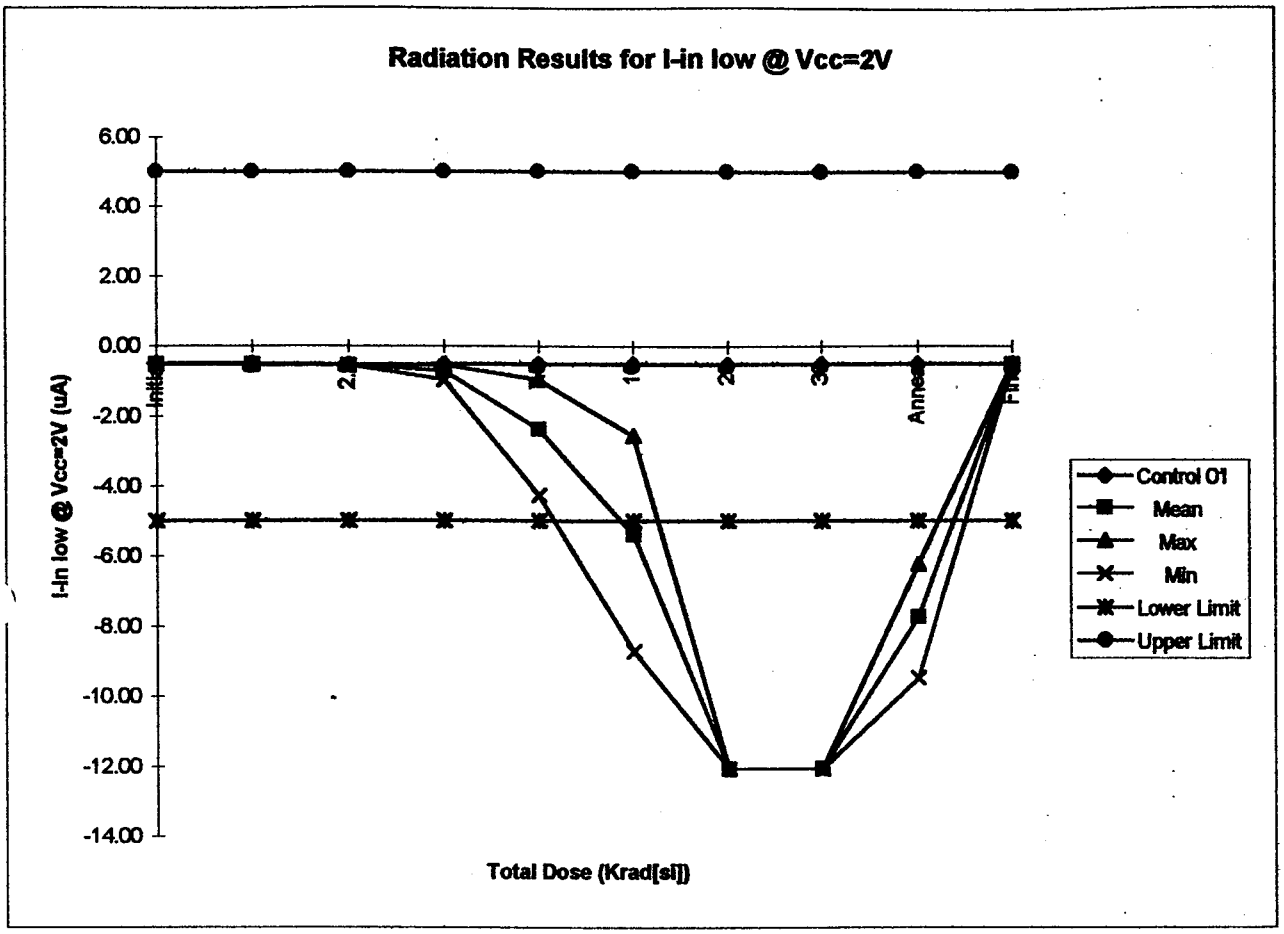
RD 259 Date code 9714



Dose (kRad)	Control 01	Mean	Max	Min	Upper Limit	Lower Limit	Std.Dev.
	(mV)	(mV)	(mV)	(mV)	(mV)	(mV)	
Initial	0.2	0.2	0.3	0.1	100.0	-	0.08
0	0.1	0.1	0.2	0.0	100.0	-	0.10
2.5	0.0	0.2	0.4	0.1	100.0	-	0.15
5	0.1	0.3	0.4	0.1	100.0	-	0.13
7.5	0.2	0.5	0.5	0.5	100.0	-	0.00
10	0.4	0.9	1.3	0.6	100.0	-	0.32
20	0.1	2.4	3.0	1.9	100.0	-	0.52
30	0.1	1127.1	4498.4	2.9	100.0	-	2247.55
Anneal	-0.6	1124.9	4498.6	0.0	100.0	-	2249.17
Final	-0.3	-0.2	-0.2	-0.3	100.0	-	0.05

Lot size for statistics : 4 devices

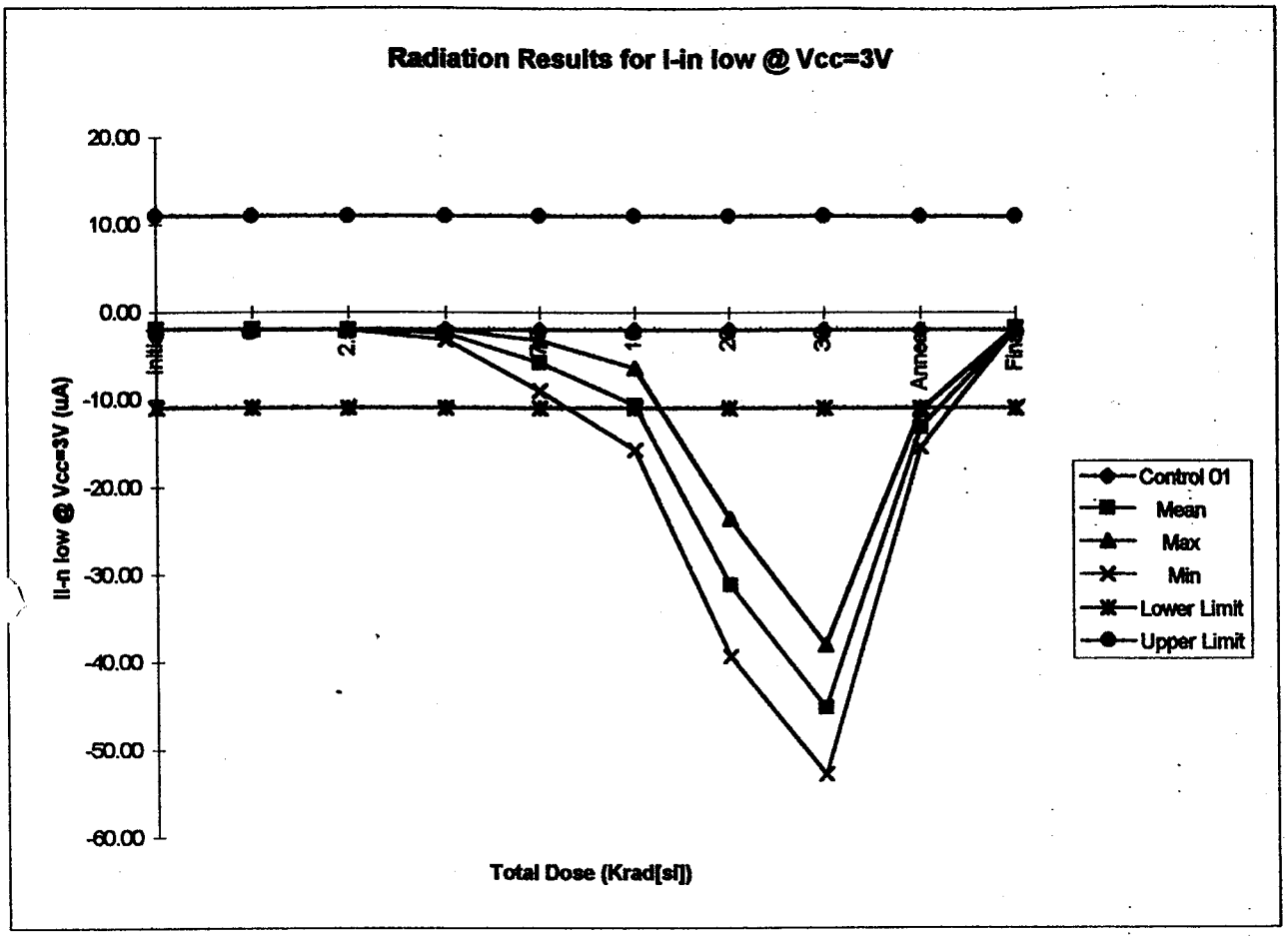
RD 259 Date code 9714



Dose (kRad)	Control 01	Mean	Max	Min	Lower Limit	Upper Limit	Std.Dev.
	(uA)	(uA)	(uA)	(uA)	(uA)	(uA)	
Initial	-0.53	-0.54	-0.52	-0.55	-5.0	5.0	0.01
0	-0.53	-0.54	-0.53	-0.55	-5.0	5.0	0.01
2.5	-0.54	-0.57	-0.55	-0.58	-5.0	5.0	0.01
5	-0.53	-0.74	-0.58	-0.99	-5.0	5.0	0.19
7.5	-0.53	-2.41	-0.99	-4.29	-5.0	5.0	1.61
10	-0.53	-5.41	-2.59	-8.74	-5.0	5.0	2.99
20	-0.53	-12.09	-12.09	-12.09	-5.0	5.0	0.00
30	-0.53	-12.09	-12.08	-12.09	-5.0	5.0	0.01
Anneal	-0.53	-7.77	-6.26	-9.50	-5.0	5.0	1.42
Final	-0.53	-0.56	-0.56	-0.57	-5.0	5.0	0.01

Lot size for statistics : 4 devices

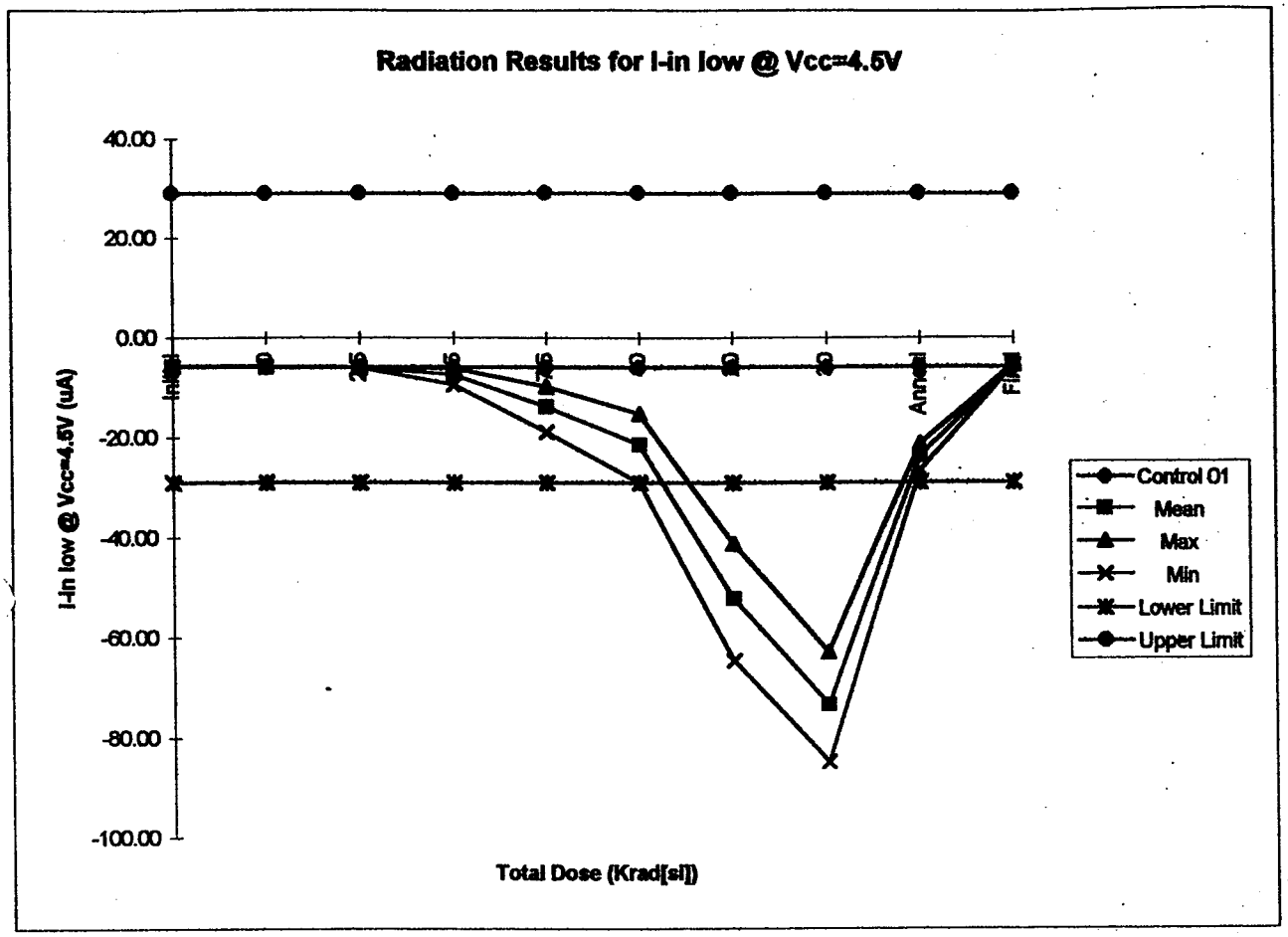
RD 259 Date code 9714



Dose (kRad)	Control 01	Mean	Max	Min	Lower Limit	Upper Limit	Std.Dev.
	(uA)	(uA)	(uA)	(uA)	(uA)	(uA)	
Initial	-2.03	-2.04	-1.99	-2.08	-11.0	11.0	0.04
0	-2.05	-2.06	-2.01	-2.10	-11.0	11.0	0.04
2.5	-2.06	-2.14	-2.09	-2.17	-11.0	11.0	0.04
5	-2.05	-2.57	-2.13	-3.27	-11.0	11.0	0.53
7.5	-2.05	-5.87	-3.36	-9.12	-11.0	11.0	2.79
10	-2.05	-10.76	-6.50	-15.93	-11.0	11.0	4.56
20	-2.05	-31.29	-23.76	-39.49	-11.0	11.0	7.55
30	-2.05	-45.31	-38.17	-52.95	-11.0	11.0	6.78
Anneal	-2.02	-13.31	-11.38	-15.60	-11.0	11.0	1.83
Final	-2.04	-1.91	-1.89	-1.94	-11.0	11.0	0.02

Lot size for statistics : 4 devices

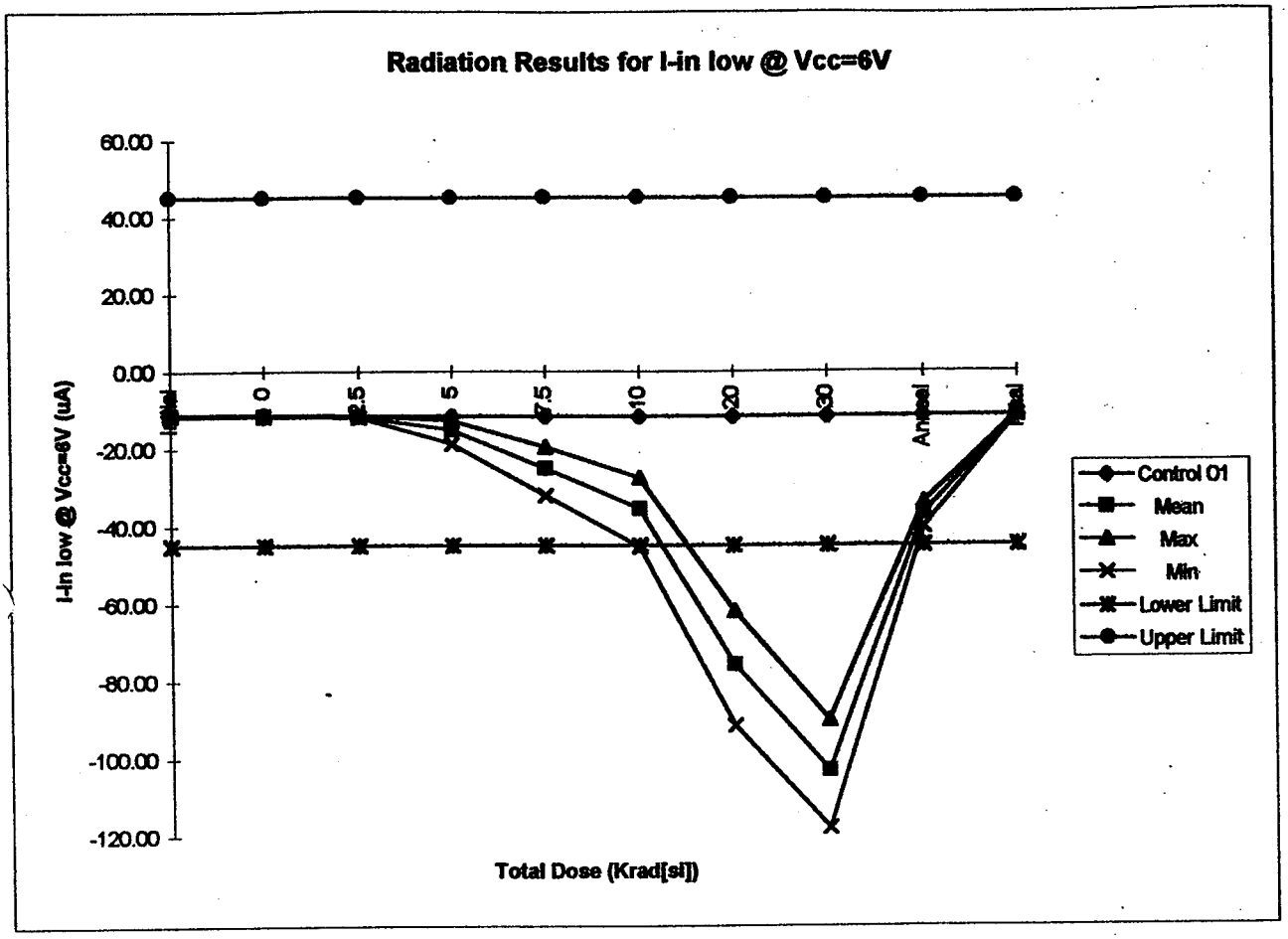
RD 259 Date code 9714



Dose (kRad)	Control 01	Mean	Max	Min	Lower Limit	Upper Limit	Std.Dev.
	(uA)	(uA)	(uA)	(uA)	(uA)	(uA)	
Initial	-5.91	-5.89	-5.77	-6.00	-29.0	29.0	0.10
0	-5.98	-5.97	-5.84	-6.08	-29.0	29.0	0.10
2.5	-5.99	-6.17	-6.03	-6.26	-29.0	29.0	0.10
5	-5.98	-7.63	-6.31	-9.65	-29.0	29.0	1.58
7.5	-5.97	-13.98	-9.99	-19.14	-29.0	29.0	4.44
10	-5.97	-21.63	-15.48	-29.25	-29.0	29.0	6.66
20	-5.98	-52.38	-41.39	-64.76	-29.0	29.0	11.20
30	-5.98	-73.61	-63.14	-85.16	-29.0	29.0	10.12
Anneal	-5.88	-23.84	-21.42	-26.80	-29.0	29.0	2.30
Final	-5.89	-5.68	-5.59	-5.81	-29.0	29.0	0.09

Lot size for statistics : 4 devices

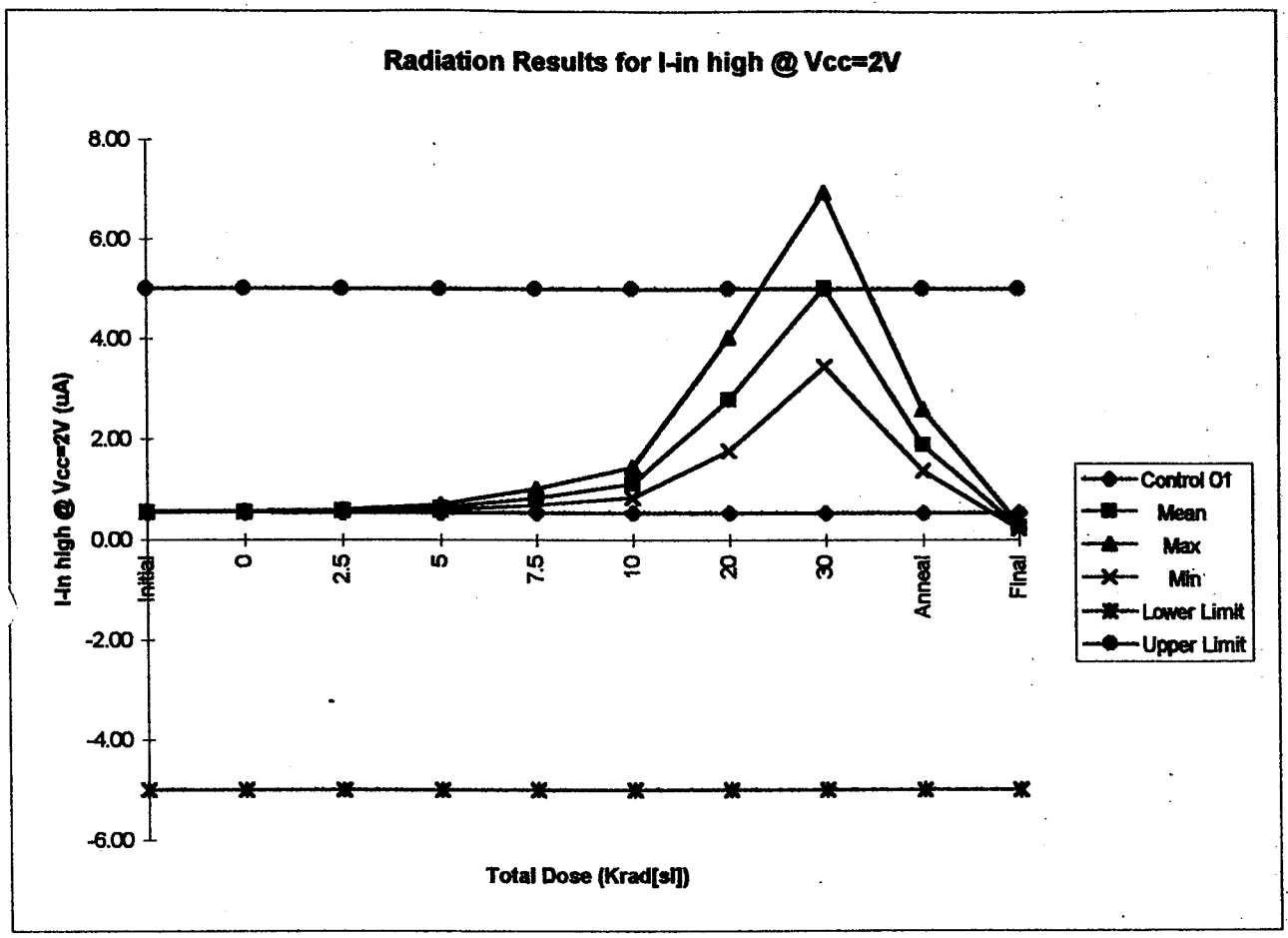
RD 259 Date code 9714



Dose (kRad)	Control 01	Mean	Max	Min	Lower Limit	Upper Limit	Std.Dev.
	(uA)	(uA)	(uA)	(uA)	(uA)	(uA)	
Initial	-11.57	-11.53	-11.29	-11.74	-45.0	45.0	0.19
0	-11.74	-11.69	-11.43	-11.89	-45.0	45.0	0.19
2.5	-11.75	-12.06	-11.77	-12.23	-45.0	45.0	0.22
5	-11.73	-15.40	-12.96	-19.08	-45.0	45.0	2.96
7.5	-11.72	-25.31	-19.85	-32.35	-45.0	45.0	6.08
10	-11.70	-35.80	-27.80	-45.77	-45.0	45.0	8.67
20	-11.72	-76.02	-62.26	-91.80	-45.0	45.0	14.12
30	-11.73	-103.45	-90.34	-118.23	-45.0	45.0	12.80
Anneal	-11.53	-37.02	-34.22	-40.56	-45.0	45.0	2.68
Final	-11.53	-11.62	-11.45	-11.90	-45.0	45.0	0.19

Lot size for statistics : 4 devices

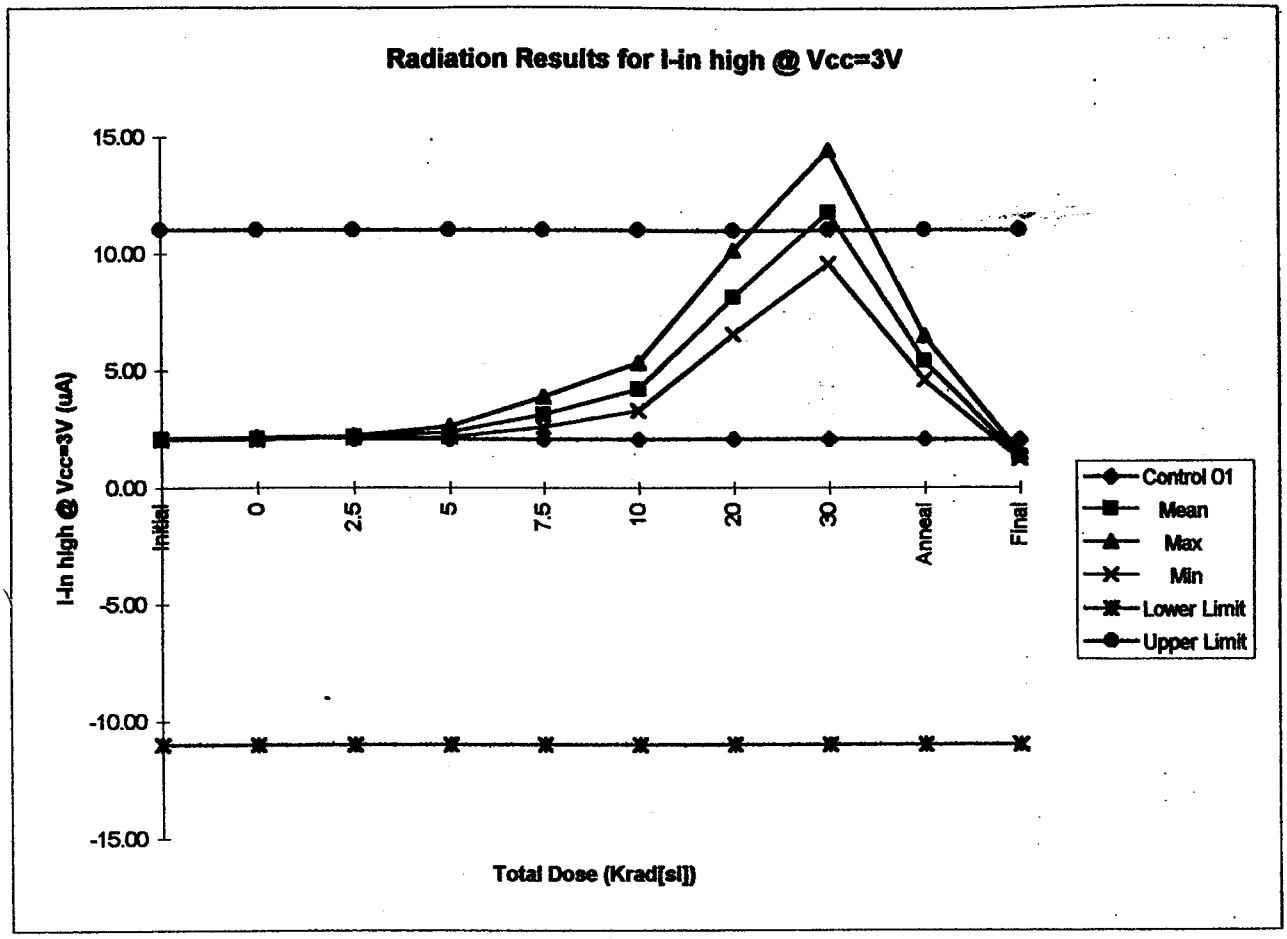
RD 259 Date code 9714



Dose (kRad)	Control 01	Mean	Max	Min	Lower Limit	Upper Limit	Std.Dev.
	(uA)	(uA)	(uA)	(uA)	(uA)	(uA)	
Initial	0.53	0.54	0.55	0.52	-5.0	5.0	0.01
0	0.53	0.54	0.55	0.52	-5.0	5.0	0.01
2.5	0.53	0.57	0.58	0.55	-5.0	5.0	0.01
5	0.53	0.62	0.68	0.57	-5.0	5.0	0.05
7.5	0.53	0.81	0.99	0.67	-5.0	5.0	0.16
10	0.53	1.09	1.42	0.82	-5.0	5.0	0.30
20	0.53	2.78	4.02	1.75	-5.0	5.0	1.12
30	0.53	5.02	6.92	3.44	-5.0	5.0	1.70
Anneal	0.53	1.87	2.58	1.35	-5.0	5.0	0.58
Final	0.53	0.22	0.28	0.18	-5.0	5.0	0.05

Lot size for statistics : 4 devices

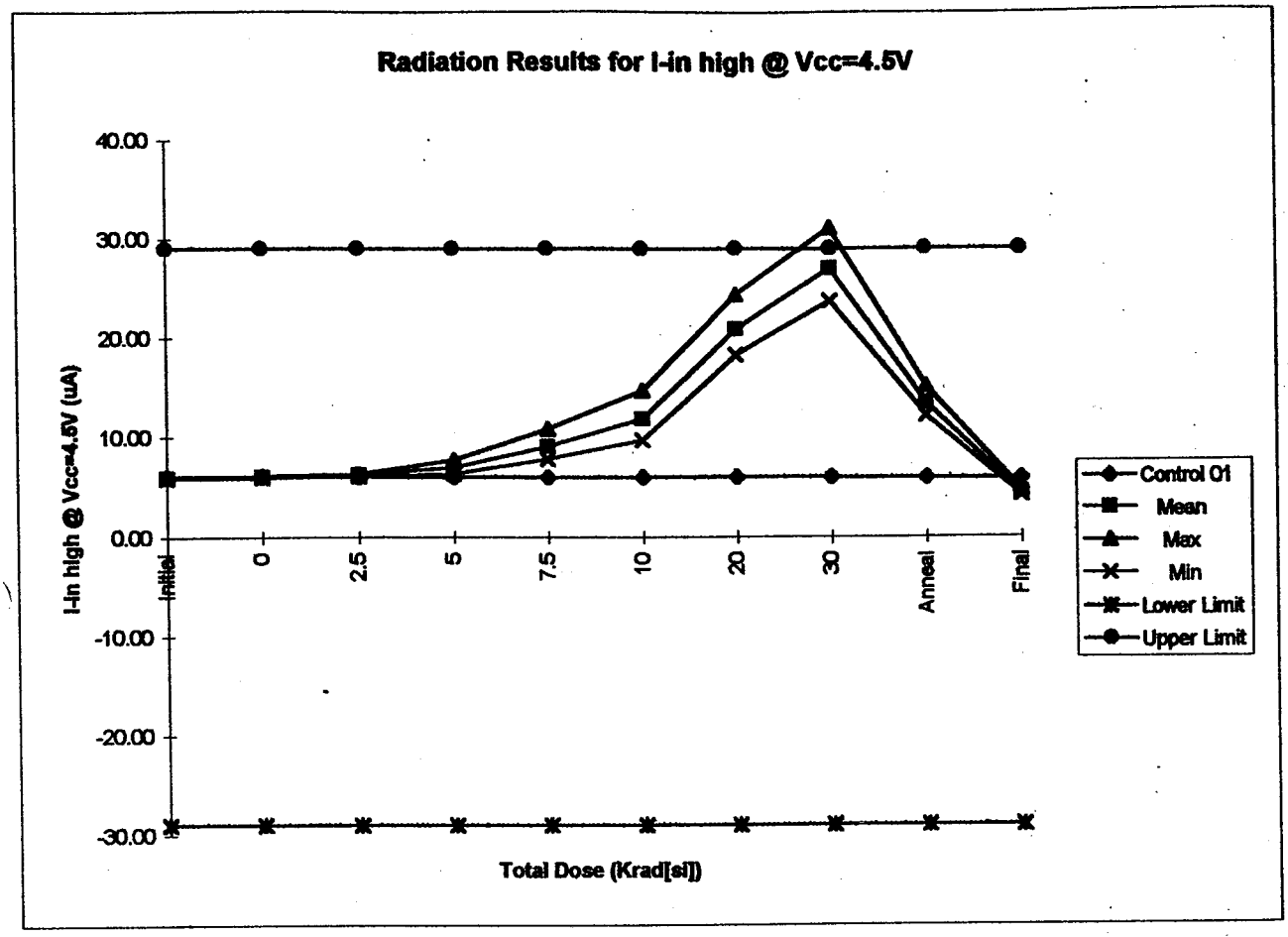
RD 259 Date code 9714



Dose (kRad)	Control 01	Mean	Max	Min	Lower Limit	Upper Limit	Std.Dev.
	(uA)	(uA)	(uA)	(uA)	(uA)	(uA)	
Initial	2.03	2.03	2.07	1.98	-11.0	11.0	0.04
0	2.05	2.05	2.09	2.00	-11.0	11.0	0.04
2.5	2.05	2.13	2.16	2.07	-11.0	11.0	0.04
5	2.05	2.31	2.56	2.10	-11.0	11.0	0.21
7.5	2.04	3.08	3.82	2.53	-11.0	11.0	0.64
10	2.04	4.16	5.28	3.22	-11.0	11.0	1.05
20	2.04	8.11	10.11	6.51	-11.0	11.0	1.78
30	2.05	11.72	14.41	9.51	-11.0	11.0	2.37
Anneal	2.03	5.34	6.43	4.54	-11.0	11.0	0.88
Final	2.02	1.27	1.41	1.16	-11.0	11.0	0.12

Lot size for statistics : 4 devices

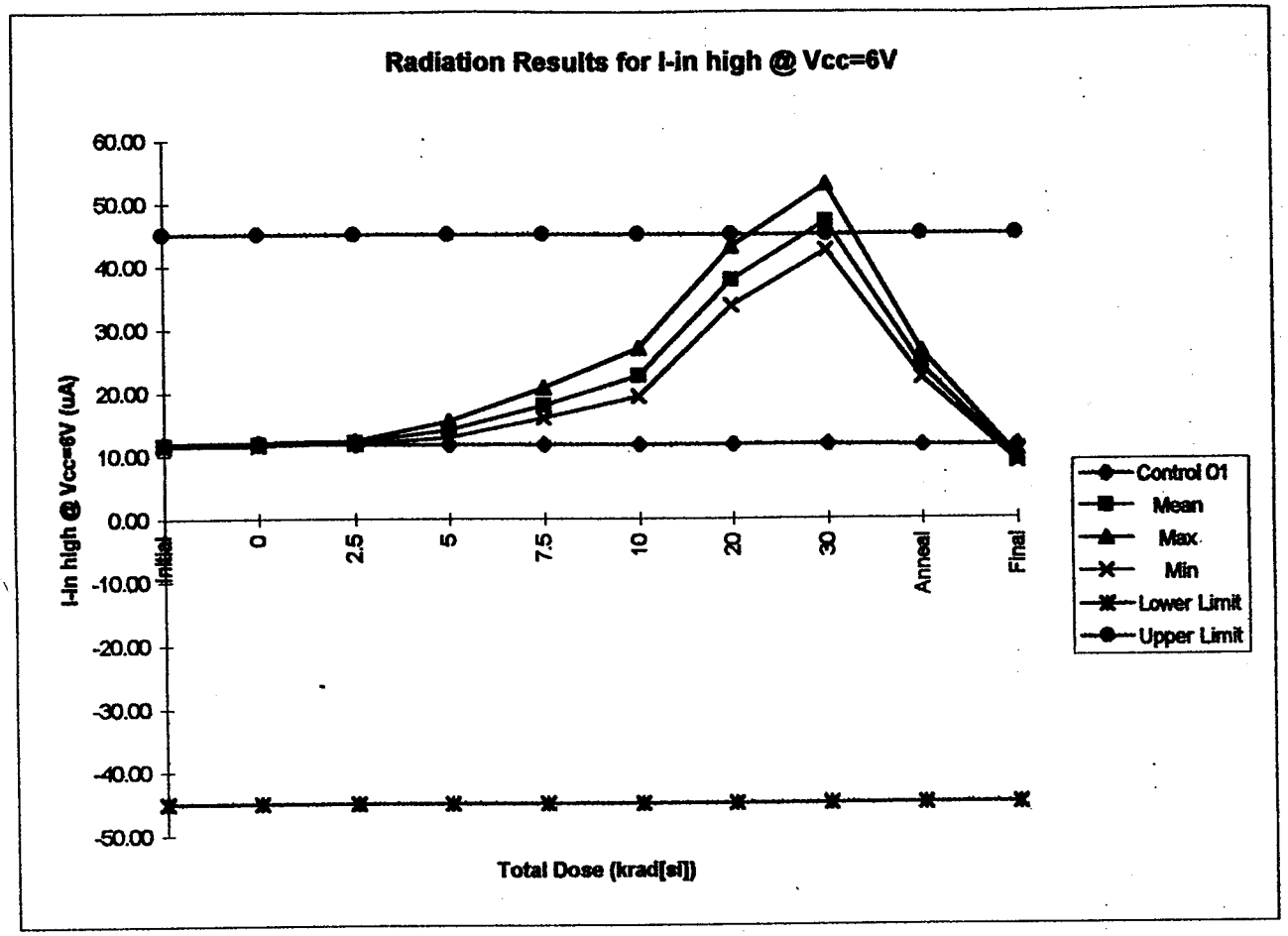
RD 259 Date code 9714



Dose (kRad)	Control 01	Mean	Max	Min	Lower Limit	Upper Limit	Std.Dev.
	(uA)	(uA)	(uA)	(uA)	(uA)	(uA)	
Initial	5.90	5.89	5.99	5.76	-29.0	29.0	0.10
0	5.98	5.96	6.06	5.83	-29.0	29.0	0.10
2.5	5.99	6.15	6.24	6.01	-29.0	29.0	0.10
5	5.98	6.86	7.61	6.22	-29.0	29.0	0.67
7.5	5.96	9.02	10.76	7.77	-29.0	29.0	1.49
10	5.96	11.82	14.62	9.66	-29.0	29.0	2.48
20	5.97	20.81	24.25	18.16	-29.0	29.0	3.00
30	5.97	26.93	31.05	23.60	-29.0	29.0	3.52
Anneal	5.89	13.32	15.03	12.05	-29.0	29.0	1.36
Final	5.88	4.31	4.63	4.09	-29.0	29.0	0.25

Lot size for statistics : 4 devices

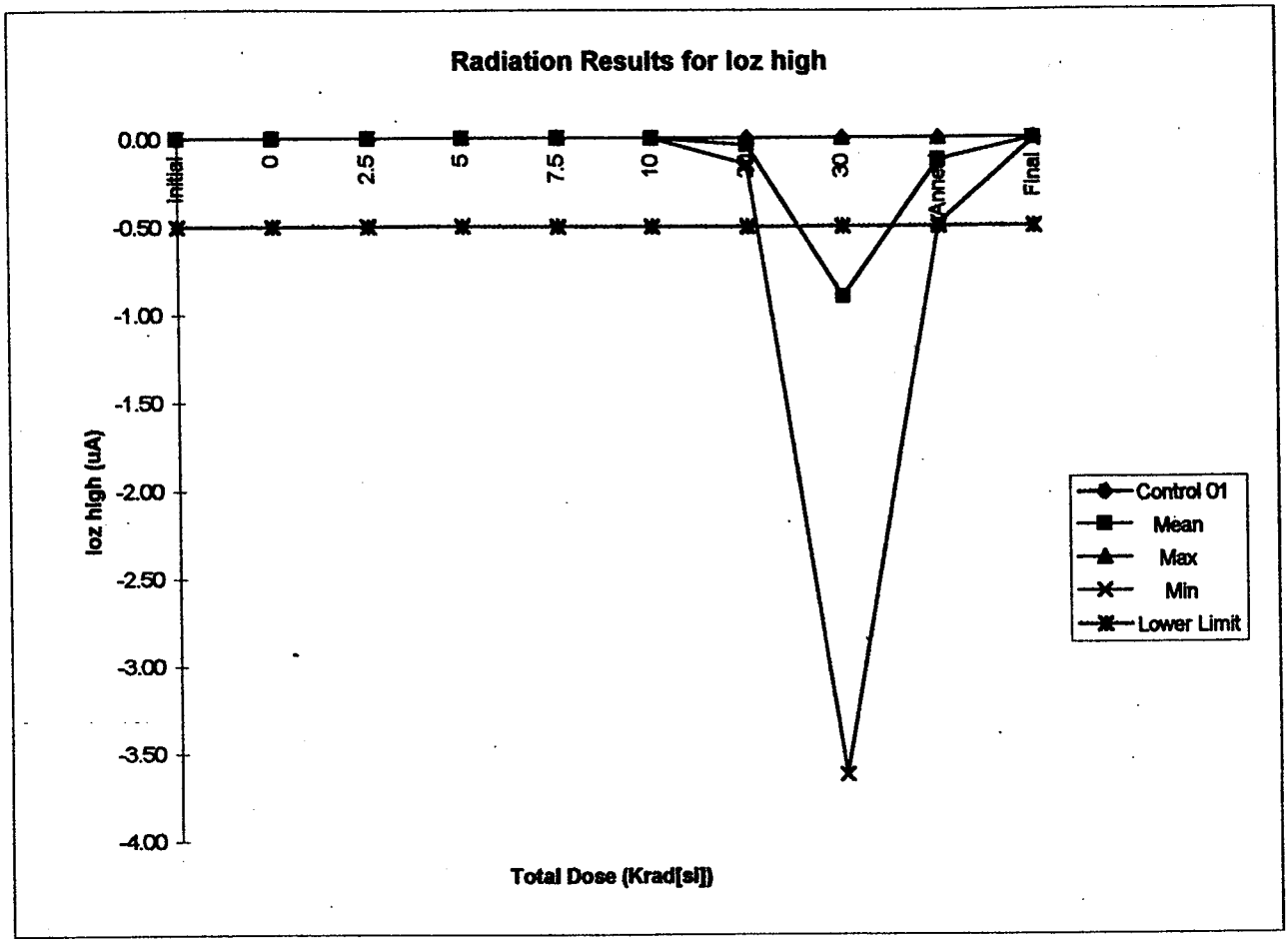
RD 259 Date code 9714



Dose (kRad)	Control 01	Mean	Max	Min	Lower Limit	Upper Limit	Std.Dev.
	(uA)	(uA)	(uA)	(uA)	(uA)	(uA)	
Initial	11.56	11.52	11.71	11.27	-45.0	45.0	0.19
0	11.73	11.68	11.87	11.42	-45.0	45.0	0.19
2.5	11.74	12.03	12.19	11.75	-45.0	45.0	0.21
5	11.72	13.88	15.25	12.74	-45.0	45.0	1.25
7.5	11.70	17.77	20.51	15.78	-45.0	45.0	2.35
10	11.68	22.41	26.86	19.13	-45.0	45.0	3.83
20	11.71	37.62	42.90	33.61	-45.0	45.0	4.54
30	11.73	46.92	52.76	42.35	-45.0	45.0	4.88
Anneal	11.53	23.80	26.18	22.05	-45.0	45.0	1.85
Final	11.52	9.02	9.56	8.68	-45.0	45.0	0.41

Lot size for statistics : 4 devices

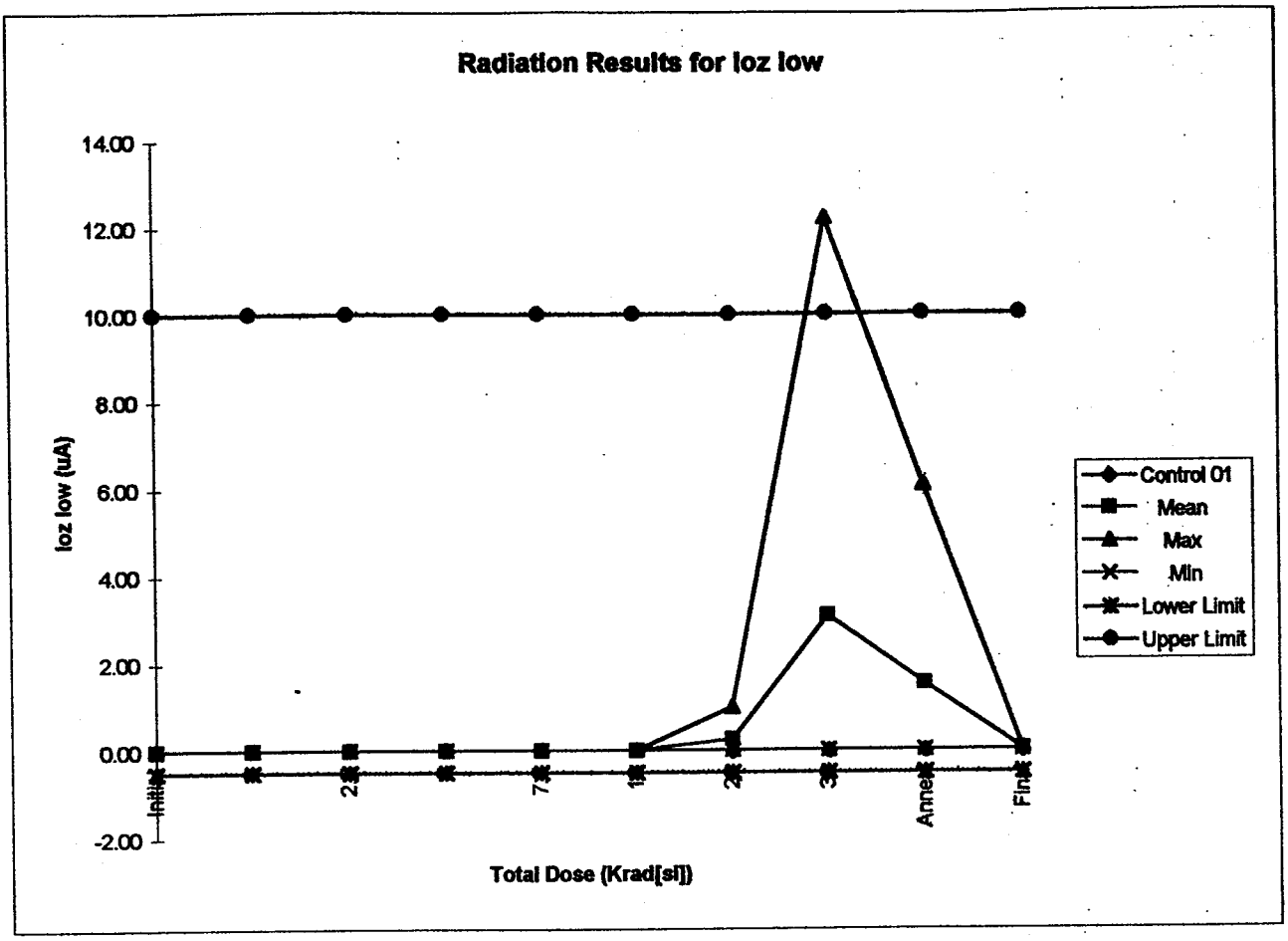
RD 259 Date code 9714



Dose (kRad)	Control 01 (uA)	Mean (uA)	Max (uA)	Min (uA)	Lower Limit (uA)	Upper Limit (uA)	Std.Dev.
Initial	0.00	0.00	0.00	0.00	-0.5	10.0	0.00
0	0.00	0.00	0.00	0.00	-0.5	10.0	0.00
2.5	0.00	0.00	0.00	0.00	-0.5	10.0	0.00
5	0.00	0.00	0.00	0.00	-0.5	10.0	0.00
7.5	0.00	0.00	0.00	0.00	-0.5	10.0	0.00
10	0.00	0.00	0.00	0.00	-0.5	10.0	0.00
20	0.00	-0.04	0.00	-0.15	-0.5	10.0	0.07
30	0.00	-0.91	0.00	-3.63	-0.5	10.0	1.81
Anneal	0.00	-0.13	0.00	-0.49	-0.5	10.0	0.24
Final	0.00	0.00	0.00	-0.01	-0.5	10.0	0.01

Lot size for statistics : 4 devices

RD 259 Date code 9714



Dose (kRad)	Control 01	Mean	Max	Min	Lower Limit	Upper Limit	Std.Dev.
	(uA)	(uA)	(uA)	(uA)	(uA)	(uA)	
Initial	0.00	0.00	0.00	0.00	-0.5	10.0	0.00
0	0.00	0.00	0.00	0.00	-0.5	10.0	0.00
2.5	0.00	0.00	0.00	0.00	-0.5	10.0	0.00
5	0.00	0.00	0.00	0.00	-0.5	10.0	0.00
7.5	0.00	0.00	0.00	0.00	-0.5	10.0	0.00
10	0.00	0.00	0.00	0.00	-0.5	10.0	0.00
20	0.00	0.24	0.98	-0.01	-0.5	10.0	0.49
30	0.00	3.06	12.21	0.00	-0.5	10.0	6.10
Anneal	0.00	1.52	6.05	0.00	-0.5	10.0	3.02
Final	0.00	0.01	0.02	0.00	-0.5	10.0	0.01

Lot size for statistics : 4 devices

RD 259 Date code 9714

IGG R0259 RIR 79836

INTEGRAL

IRRADIATION TEST PLAN NO: IN-PL-IGG-0010 (1)

Issue No: 2
Date: 23 January 1998
Page: 1/4 (2)

Component No: (3)	Component Designation: (4)	Irradiation Spec No: N/A (5)
5962-8960901EA	High Speed CMOS, Phase-Locked-Loop. Part No: CD54HC4046AF/3A	Iss: Rev.

Specification (6)	Acceptance (7)	Electrical Meas. (8)	Project/Programme (9)
Detail: SMD-5962-89609 Iss: Base	Evaluation ___ Element Diffusion ___ Lot X	In-situ ___ Remote X	INTEGRAL

Manufacturer: Harris Semiconductors (10)	Test Facility: ERA (11)	Originator: IGG CT (12)
Address: Melbourne, Florida, USA	Address: Leatherhead, Surrey, ENGLAND	Name: S Thacker

Radiation Source (13)	Sample Size: 4 (14)	Exposure (15)	Annealing Test (16)	Radiation Level: (17)
COBALT 60	Control Devices: 1	Single ___ Multiple X	YES X NO ___	2.5kRAD(Si) 10kRAD(Si) 5kRAD(Si) 20kRAD(Si) 7.5kRAD(Si) 30kRAD(Si)

Single Exposure (18)

Dose [kRAD(Si)]

Dose Rate [RAD(Si)/s]

Exposure Time

Not Applicable

Multiple Exposure: (19)

Irradiation Steps	1	2	3	4	5	6
Dose [kRAD(Si)]	2.5	2.5	2.5	2.5	10	10
Maximum Dose Rate [RAD(Si)/s]	10	10	10	10	10	10
Minimum Exposure Time[s]	250	250	250	250	1000	1000

Bias Requirements: During and after Exposure (for remote electrical measurements): YES

E Conditions:

Test Circuits: The Electrical Bias circuit is given in Figure 1 herein.

Shielding: Shielding is required to minimise dose enhancement effects caused by low energy, scattered radiation. The test specimens shall be enclosed in a Pb/Al container of Pb 1.5mm minimum, surrounding an inner shield of Al 0.7 to 1.0mm. (20)

Irradiation Test Sequence (21)

Test Step	Description	Requirements
1	Irradiation Test Samples	Quantity 5 devices shall be selected from the lot delivered to IGG.
2	Serialisation	Serialisation - (if the devices are not serialised). Test units shall be serialised 1 to 4 and the control unit shall be 5.
3	Initial Electrical Measurements (at IGG)	Per Table A herein - (Read and Record) - on all 5 parts at IGG. (See Remarks 1 and 2).
4	Initial Electrical Measurements (at ERA)	Per Table A herein - (Read and Record) - on all 5 parts at ERA. (See Remarks 1 and 2).

Irradiation Test Sequence (Cont.)

Test Step	Description	Requirements
5	Set-up Test	Verify Bias Circuit and Voltages (In-situ) for 4 test units. (See Remark 3).
6	Irradiation Exposure	Verify radiation dose rate and position in the chamber to achieve required dose. Verify and witness duration of exposure to achieve required dose. (See Remark 4).
7	Intermediate Electrical Measurement (at ERA)	Bias to be maintained until test is performed. Test per Table A herein - (Read and Record) - on all 5 parts. Test to be performed immediately upon removal from chamber (less than 10 mins interval). Upon completion of test, 4 test units shall be replaced in bias circuit and returned to chamber. Maximum interval between 2 consecutive exposures to be 30 mins. (See Remark 2).
8 to 22	Repeat Set-up/Exposure/Test sequence upto a Final Total Dose of 30kRAD(Si)	Repeat Steps 5, 6, 7 for a total of 6 cycles as per multiple exposure in Box No. 19. (See Remark 5).
23	Annealing	Bias shall be maintained during Annealing for 4 test units. Annealing shall be at room temperature for 24 hours. (See Remark 3).
24	Post Annealing Electrical Measurements (at IGG)	Per Table A herein - (Read and Record) - on all 5 parts at IGG. (See Remark 2).
25	Accelerated Aging under Bias	Bias shall be maintained during Aging for 4 test units. Aging shall be at T_{amb} = +100 ±5°C for 168 hours. (See Remark 3).
26	Final Electrical Measurements (at IGG)	Per Table A herein - (Read and Record) - on all 5 parts at IGG. (See Remark 2).
27	Total Dose Irradiation Test Report	ESA/SCC No: 22900.

Remarks

1. The initial electrical measurements performed at IGG (Test Step 3) shall be performed within 24 hours of the initial electrical measurements at ERA (Test Step 4).

2. All electrical testing shall be performed on the same set of equipment in order to achieve correlation of results both at IGG and ERA.

3. The control unit shall not be biased during testing.

4. The dose rates and exposure times given above, may be adjusted during irradiation testing to achieve convenient test points but shall not exceed the limits specified in Box No. 19. The dose rates and exposure times used during the testing shall be recorded for each test step.

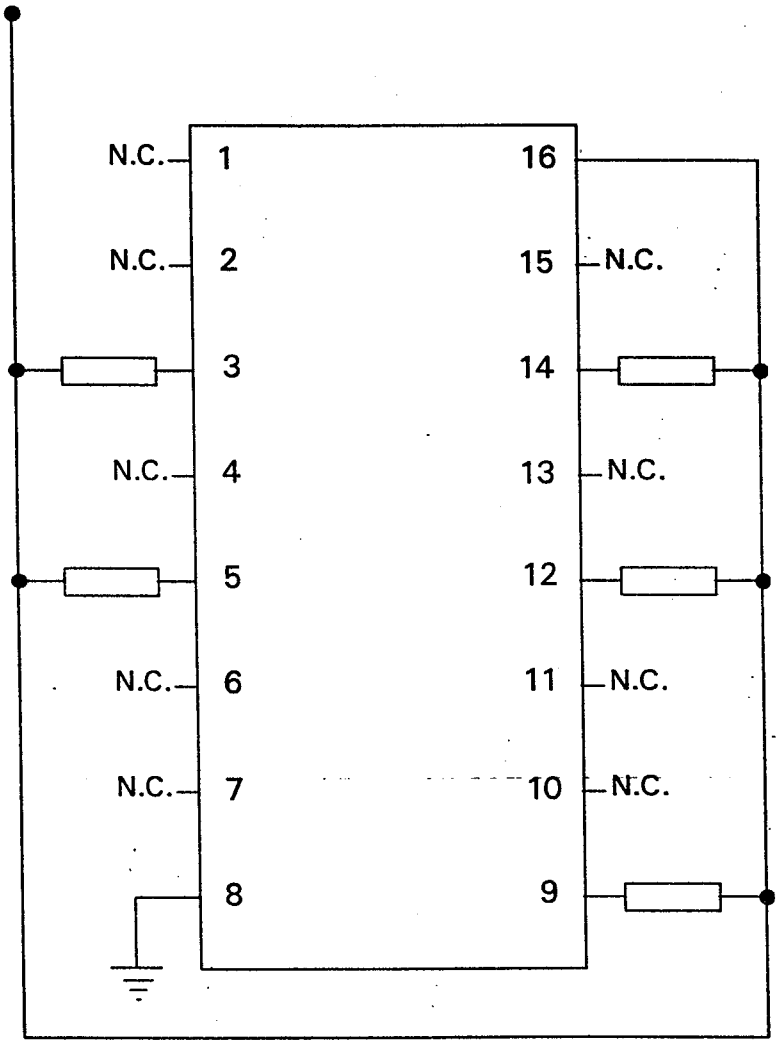
5. The set up/exposure/test sequence shall be stopped for any device that exhibits repeated functional failure.

TABLE A - ELECTRICAL MEASUREMENTS AT ROOM TEMPERATURE T_{amb} +25 ±5°C BEFORE, AT INTERMEDIATE POINTS AND ON COMPLETION OF IRRADIATION

Per SMD 5962-89609 - Table 1, Subgroups 1 and 7

FIGURE 1 - ELECTRICAL BIAS CIRCUIT FOR IRRADIATION TESTING

V_{CC} = 6 (+0 -1)V



Input Load Resistors: 47kΩ ±5%

T-50-17

REVISIONS			
LTR	DESCRIPTION	DATE (YR-MO-DA)	APPROVED

REV																									
SHEET																									
REV																									
SHEET																									
REV STATUS OF SHEETS	REV																								
	SHEET	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15									

PMIC N/A	PREPARED BY Marcia B Kelleher	DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO 45444	
STANDARDIZED MILITARY DRAWING THIS DRAWING IS AVAILABLE FOR USE BY ALL DEPARTMENTS AND AGENCIES OF THE DEPARTMENT OF DEFENSE AMSC N/A	CHECKED BY Monica L. Poelking APPROVED BY DRAWING APPROVAL DATE 20 NOVEMBER 1989 REVISION LEVEL	MICROCIRCUITS, DIGITAL, HIGH SPEED CMOS, PHASE LOCKED LOOP WITH A VOLTAGE CONTROLLED OSCILLATOR, MONOLITHIC SILICON	
		SIZE A	CAGE CODE 67268
		SHEET 1 OF 15	

DESC FORM 193
SEP 87

• U.S. GOVERNMENT PRINTING OFFICE: 1987 — 748-129/60911

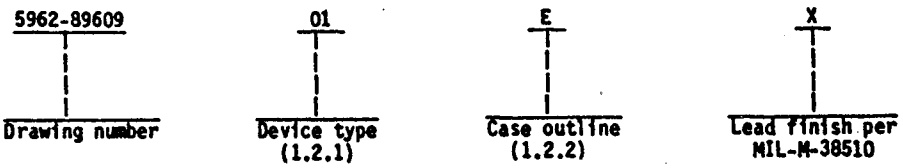
5962-E1387

DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.

1. SCOPE

1.1 Scope. This drawing describes device requirements for class B microcircuits in accordance with 1.2.1 of MIL-STD-883, "Provisions for the use of MIL-STD-883 in conjunction with compliant non-JAN devices".

1.2 Part number. The complete part number shall be as shown in the following example:



1.2.1 Device type. The device type shall identify the circuit function as follows:

Device type	Generic number	Circuit function
01	54HC4046A	Phase-locked loop with voltage-controlled oscillator

1.2.2 Case outline. The case outline shall be as designated in appendix C of MIL-M-38510, and as follows:

Outline letter	Case outline
E	D-2 (16-lead, .840" x .310" x .200"), dual in-line package

1.3 Absolute maximum ratings. 1/

Supply voltage range	-0.5 V dc to +7.0 V dc
DC input voltage range	-0.5 V dc to V_{CC} + 0.5 V dc
DC output voltage range	-0.5 V dc to V_{CC} + 0.5 V dc
DC input diode current	±20 mA
DC output diode current	±20 mA
DC drain current	±25 mA
DC V_{CC} or GND current	±50 mA
Storage temperature range	-65°C to +150°C
Maximum power dissipation (P_D)	500 mW 2/
Lead temperature (soldering, 10 seconds)	+300°C
Thermal resistance, junction-to-case (θ_{JC})	See MIL-M-38510, appendix C
Junction temperature (T_J)	+175°C

1.4 Recommended operating conditions.

Supply voltage range (V_{CC})	+2.0 V dc to +6.0 V dc
Case operating temperature range (T_C)	-55°C to +125°C
Input voltage (V_{IN})	0 V to V_{CC}
Output voltage (V_{OUT})	0 V to V_{CC}
Input rise or fall time:	
V_{CC} = 2.0 V	0 to 1,000 ns
V_{CC} = 4.5 V	0 to 500 ns
V_{CC} = 6.0 V	0 to 400 ns

1/ Unless otherwise specified, all voltages are referenced to ground.
2/ For T_C = +100°C to +125°C, derate linearly at 8 mW/°C to 300 mW.

2. APPLICABLE DOCUMENTS

2.1 Government specification, standard, and bulletin. Unless otherwise specified, the following specification, standard, and bulletin of the issue listed in that issue of the Department of Defense Index of Specifications and Standards specified in the solicitation, form a part of this drawing to the extent specified herein.

SPECIFICATION

MILITARY

MIL-M-38510 - Microcircuits, General Specification for.

STANDARD

MILITARY

MIL-STD-883 - Test Methods and Procedures for Microelectronics.

BULLETIN

MILITARY

MIL-BUL-103 - List of Standardized Military Drawings (SMD's).

(Copies of the specification, standard, and bulletin required by manufacturers in connection with specific acquisition functions should be obtained from the contracting activity or as directed by the contracting activity.)

2.2 Order of precedence. In the event of a conflict between the text of this drawing and the references cited herein, the text of this drawing shall take precedence.

3. REQUIREMENTS

3.1 Item requirements. The individual item requirements shall be in accordance with 1.2.1 of MIL-M-38510, "Provisions for the use of MIL-STD-883 in conjunction with compliant non-JAN devices" and as specified herein.

3.2 Design, construction, and physical dimensions. The design, construction, and physical dimensions shall be as specified in MIL-M-38510 and herein.

3.2.1 Terminal connections. The terminal connections shall be as specified on figure 1.

3.2.2 Logic diagram. The logic diagram shall be as specified on figure 2.

3.2.3 Case outline. The case outline shall be in accordance with 1.2.2 herein.

3.3 Electrical performance characteristics. Unless otherwise specified herein, the electrical performance characteristics are as specified in table I and apply over the full case operating temperature range.

3.4 Electrical test requirements. The electrical test requirements shall be the subgroups specified in table II. The electrical tests for each subgroup are described in table I.

3.5 Marking. Marking shall be in accordance with MIL-STD-883 (see 3.1 herein). The part shall be marked with the part number listed in 1.2 herein. In addition, the manufacturer's part number may also be marked as listed in MIL-BUL-103 (see 6.6 herein).

TABLE I. Electrical performance characteristics.

Test	Symbol	Conditions 1/ $-55°C \le T_C \le +125°C$ unless otherwise specified		Group A subgroups	Limits Min	Limits Max	Unit
VOLTAGE-CONTROLLED OSCILLATOR SECTION							
High level output voltage	V_{OH}	$V_{IN} = V_{IH}$ minimum or V_{IL} maximum, $\lvert I_O \rvert \le 20$ µA	V_{CC} = 3.0 V	1,2,3	2.9		V
			V_{CC} = 4.5 V		4.4		
			V_{CC} = 6.0 V		5.9		
		$V_{IN} = V_{IH}$ minimum or V_{IL} maximum, $\lvert I_O \rvert \le 4.0$ mA	V_{CC} = 4.5 V		3.98		
		$V_{IN} = V_{IH}$ minimum or V_{IL} maximum, $\lvert I_O \rvert \le 5.2$ mA	V_{CC} = 6.0 V		5.48		
Low level output voltage	V_{OL}	$V_{IN} = V_{IH}$ minimum or V_{IL} maximum, $\lvert I_O \rvert \le 20$ µA	V_{CC} = 3.0 V	1,2,3		0.1	V
			V_{CC} = 4.5 V			0.1	
			V_{CC} = 6.0 V			0.1	
		$V_{IN} = V_{IH}$ minimum or V_{IL} maximum, $\lvert I_O \rvert \le 4.0$ mA	V_{CC} = 4.5 V			0.4	
		$V_{IN} = V_{IH}$ minimum or V_{IL} maximum, $\lvert I_O \rvert \le 5.2$ mA	V_{CC} = 6.0 V			0.4	
High level input voltage	V_{IH}	2/	V_{CC} = 3.0 V	1,2,3	2.1		V
			V_{CC} = 4.5 V		3.15		
			V_{CC} = 6.0 V		4.2		

See footnotes at end of table.

TABLE I. Electrical performance characteristics - Continued.

Test	Symbol	Conditions 1/ $-55°C \le T_C \le +125°C$ unless otherwise specified		Group A subgroups	Limits		Unit
					Min	Max	
Low level input voltage	V_{IL}	2/	V_{CC} = 3.0 V	1,2,3		0.9	V
			V_{CC} = 4.5 V			1.35	
			V_{CC} = 6.0 V			1.8	
Input leakage current	I_{IN}	V_{IN} = V_{CC} or GND	V_{CC} = 6.0 V	1,2,3		±1.0	µA
R1 and R2 range	R_{RNG}	3/ 4/	V_{CC} = 4.5 V	1	3.0	300	kΩ
C1 capacitance range	C_{RNG}	4/	V_{CC} = 4.5 V	1	0.0	5/	pF
VCO_{IN} operating voltage range	V_{OP}	4/ 6/	V_{CC} = 3.0 V	1	0.9	1.9	V
			V_{CC} = 4.5 V		0.9	3.2	
			V_{CC} = 6.0 V		0.9	4.6	
Frequency stability with temperature change	$\Delta f/\Delta T$	R1 = 100 kΩ, R2 = ∞, 4/ V_{CC} = 4.5 V		9		0.11	%/°C
Maximum frequency	f_{max}	C1 = 50 pF, R1 = 3.5 kΩ, R2 = ∞, V_{CC} = 4.5 V 4/		9	24		MHz
		C1 = 0 pF, R1 = 9.1 kΩ, R2 = ∞, V_{CC} = 4.5 V 4/		9	38		
Center frequency	f_{ctr}	C1 = 40 pF, R1 = 3 kΩ, V_{CC} = 4.5 V, R2 = ∞, VCO_{IN} = $V_{CC}/2$ 4/		9	17		MHz
Frequency linearity	Δf_{VCO}	R1 = 100 kΩ, R2 = ∞, C1 = 100 pF, V_{CC} = 4.5 V 4/		9		0.4	%
Offset frequency	f_{OFF}	R2 = 220 kΩ, V_{CC} = 4.5 V, 4/ C1 = 1 nF		9	400		kHz

See footnotes at end of table.

TABLE I. Electrical performance characteristics.

Test	Symbol	Conditions 1/ $-55°C \le T_C \le +125°C$ unless otherwise specified		Group A subgroups	Limits Min	Limits Max	Unit
DEMODULATOR SECTION							
Resistor range	R_S	At Rs > 300 kΩ leakage current can influence $V_{DEM\ OUT}$ 4/	V_{CC} = 3.0 V	1	50	300	kΩ
			V_{CC} = 4.5 V		50	300	
			V_{CC} = 6.0 V		50	300	
Offset voltage, VCO_{IN} to V_{DEM}	V_{OFF}	$V_{IN} = V_{VCO(IN)} = V_{CC}/2$, values taken over R_S range 4/	VCC = 3.0 V	1		±30.0	mV
			V_{CC} = 4.5 V			±20.0	
			V_{CC} = 6.0 V			±10.0	
Output resistance at DEM_{OUT}	R_D	$V_{DEM(OUT)} = V_{CC}/2$ 4/	V_{CC} = 3.0 V	1		25	Ω
			V_{CC} = 4.5 V			0.1	
			V_{CC} = 6.0 V			0.1	
Quiescent current	I_{CC}	$V_{IN} = V_{CC}$ or GND	V_{CC} = 6.0 V	1		8.0	µA
				2, 3		160.0	
Output voltage verses input frequency	V_{OUT}/f_{IN}	R1 = 100 kΩ, 4/ R2 = ∞, C1 = 100 pF, RS = 10 kΩ, R3 = 100 kΩ, C2 = 100 pF,	V_{CC} = 4.5 V	1		330	mV/KHz

See footnotes at end of table.

TABLE I. Electrical performance characteristics.

Test	Symbol	Conditions 1/ $-55°C \le T_C \le +125°C$ unless otherwise specified		Group A subgroups	Limits Min	Limits Max	Unit
PHASE COMPARATOR SECTION							
High level output voltage	V_{OH}	$V_{IN} = V_{IH}$ minimum or V_{IL} maximum, $\lvert I_O \rvert \le 20$ µA CMOS loads	$V_{CC} = 2.0$ V	1,2,3	1.9		V
			$V_{CC} = 4.5$ V		4.4		
			$V_{CC} = 6.0$ V		5.9		
		$V_{IN} = V_{IH}$ minimum or V_{IL} maximum, $\lvert I_O \rvert \le 4.0$ mA TTL loads	$V_{CC} = 4.5$ V		3.98		
		$V_{IN} = V_{IH}$ minimum or V_{IL} maximum, $\lvert I_O \rvert \le 5.2$ mA TTL loads	$V_{CC} = 6.0$ V		5.48		
Low level output voltage	V_{OL}	$V_{IN} = V_{IH}$ minimum or V_{IL} maximum, $\lvert I_O \rvert \le 20$ µA CMOS loads	$V_{CC} = 2.0$ V	1,2,3		0.1	V
			$V_{CC} = 4.5$ V			0.1	
			$V_{CC} = 6.0$ V			0.1	
		$V_{IN} = V_{IH}$ minimum or V_{IL} maximum, $\lvert I_O \rvert \le 4.0$ mA TTL loads	$V_{CC} = 4.5$ V			0.4	
		$V_{IN} = V_{IH}$ minimum or V_{IL} maximum, $\lvert I_O \rvert \le 5.2$ mA TTL loads	$V_{CC} = 6.0$ V			0.4	
High level input voltage	V_{IH}	2/	$V_{CC} = 2.0$ V	1,2,3	1.5		V
			$V_{CC} = 4.5$ V		3.15		
			$V_{CC} = 6.0$ V		4.2		

See footnotes at end of table.

TABLE I. Electrical performance characteristics - Continued.

Test	Symbol	Conditions 1/ $-55°C \le T_C \le +125°C$ unless otherwise specified		Group A subgroups	Limits Min	Limits Max	Unit
Low level input voltage	V_{IL}	2/	V_{CC} = 2.0 V	1,2,3		0.5	V
			V_{CC} = 4.5 V			1.35	
			V_{CC} = 6.0 V			1.8	
Input leakage current	I_{IN}	V_{IN} = V_{CC} or GND	V_{CC} = 2.0 V	1,2,3		±5.0	µA
			V_{CC} = 3.0 V			±11.0	
			V_{CC} = 4.5 V			±29.0	
			V_{CC} = 6.0 V			±45.0	
Functional tests		See 4.3.1d		7,8			
Three-state off-state current	I_{OZ}	V_{IN} = V_{CC} or GND	V_{CC} = 6.0 V	1,2,3	±0.5	±10.0	µA
Propagation delay time, SIG_{IN} or $COMP_{IN}$ to $PC1_{OUT}$	t_{PLH1}, t_{PHL1}	C_L = 50 pF See figure 3 7/	V_{CC} = 2.0 V	9		200	ns
				10,11		300	
			V_{CC} = 4.5 V	9		40	
				10,11		60	
			V_{CC} = 6.0 V	9		34	
				10,11		51	
Propagation delay time, SIG_{IN} or $COMP_{IN}$ to PCP_{OUT}	t_{PLH2}, t_{PHL2}		V_{CC} = 2.0 V	9		300	ns
				10,11		450	
			V_{CC} = 4.5 V	9		60	
				10,11		90	
			V_{CC} = 6.0 V	9		70	
				10,11		109	
Propagation delay time, SIG_{IN} or $COMP_{IN}$ to $PC3_{OUT}$	t_{PLH3}, t_{PHL3}		V_{CC} = 2.0 V	9		245	ns
				10,11		307	
			V_{CC} = 4.5 V	9		49	
				10,11		74	
			V_{CC} = 6.0 V	9		42	
				10,11		63	

TABLE I. Electrical performance characteristics - Continued.

Test	Symbol	Conditions 1/ $-55°C \le T_C \le +125°C$ unless otherwise specified		Group A subgroups	Limits Min	Limits Max	Unit
Output transition time,	t_{THL}, t_{TLH}	C_L = 50 pF, See figure 3 8/	V_{CC} = 2.0 V	9		75	ns
				10,11		110	
			V_{CC} = 4.5 V	9		15	
				10,11		22	
			V_{CC} = 6.0 V	9		13	
				10,11		19	
Output enable time, SIG_{IN} or $COMP_{IN}$ to $PC2_{OUT}$	t_{PZH}, t_{PZL}	C_L = 50 pF, See figure 3 7/	V_{CC} = 2.0 V	9		265	ns
				10,11		400	
			V_{CC} = 4.5 V	9		53	
				10,11		80	
			V_{CC} = 6.0 V	9		45	
				10,11		68	
Output disable time, SIG_{IN} or $COMP_{IN}$ to $PC2_{OUT}$	t_{PHZ}, t_{PLZ}		V_{CC} = 2.0 V	9		315	ns
				10,11		475	
			V_{CC} = 4.5 V	9		63	
				10,11		95	
			V_{CC} = 6.0 V	9		74	
				10,11		112	

1/ For a power supply of 5 V ±10%, the worse case output voltages (V_{OH} and V_{OL}) occur for HC at 4.5 V. Thus, the 4.5 V values should be used when designing with this supply. Worst case V_{IH} and V_{IL} occur at V_{CC} = 5.5 V and 4.5 V respectively. (The V_{IH} value at 5.5 V is 3.85 V.) The worst case leakage current (I_{IN}, I_{CC}, and I_{OZ}) occur for CMOS at the higher voltage and so the 6.0 V values should be used. Power dissipation capacitance (C_{PD}), typically 40 pF, determines the no load dynamic power consumption, $P_D = C_{PD} (V_{CC} \times V_{CC})f + (I_{CC} \times V_{CC})$, and the no load dynamic current consumption, $I_S = C_{PD} (V_{CC})f + I_{CC}$.

2/ The V_{IH} and V_{IL} tests are not required and shall be applied as forcing functions for the V_{OH} or V_{OL} tests.

3/ The value for R1 and R2 in parallel should exceed 2.7 kΩ.

4/ This parameter is characterization data, and is guaranteed, if not tested, to the limits specified in table I.

5/ No maximum limit for C1 capacitance range.

6/ The maximum operating voltage can be as high as V_{CC} -0.9 V, however, this may result in an increased offset voltage.

7/ AC testing at V_{CC} = 2.0 V and V_{CC} = 6.0 V shall be guaranteed, if not tested, to the specified limits in table I.

8/ Transition time (t_{TLH}, t_{THL}), if not tested, shall be guaranteed to the specified limits.

Device type	01
Case outline	E
Terminal number	Terminal symbol
1	PCP_{OUT}
2	$PC1_{OUT}$
3	$COMP_{IN}$
4	VCO_{OUT}
5	INH
6	C1A
7	C1B
8	GND
9	VCO_{IN}
10	DEM_{OUT}
11	R1
12	R2
13	$PC2_{OUT}$
14	SIG_{IN}
15	$PC3_{OUT}$
16	V_{CC}

Pin names	Pin description
PCP_{OUT}	Phase comparator pulse output
$PC1_{OUT}$	Phase comparator 1 output
$COMP_{IN}$	Comparator input
VCO_{OUT}	VCO output
INH	Inhibit input
C1A	Capacitor C1 connection A
C1B	Capacitor C1 connection B
GND	Ground
VCO_{IN}	VCO input
DEM_{OUT}	Demodulator output
R1	Resistor R1 connection
R2	Resistor R2 connection
$PC2_{OUT}$	Phase comparator 2 output
SIG_{IN}	Signal input
$PC3_{OUT}$	Phase comparator 3 output
V_{CC}	Positive supply voltage

FIGURE 1. Terminal connections.

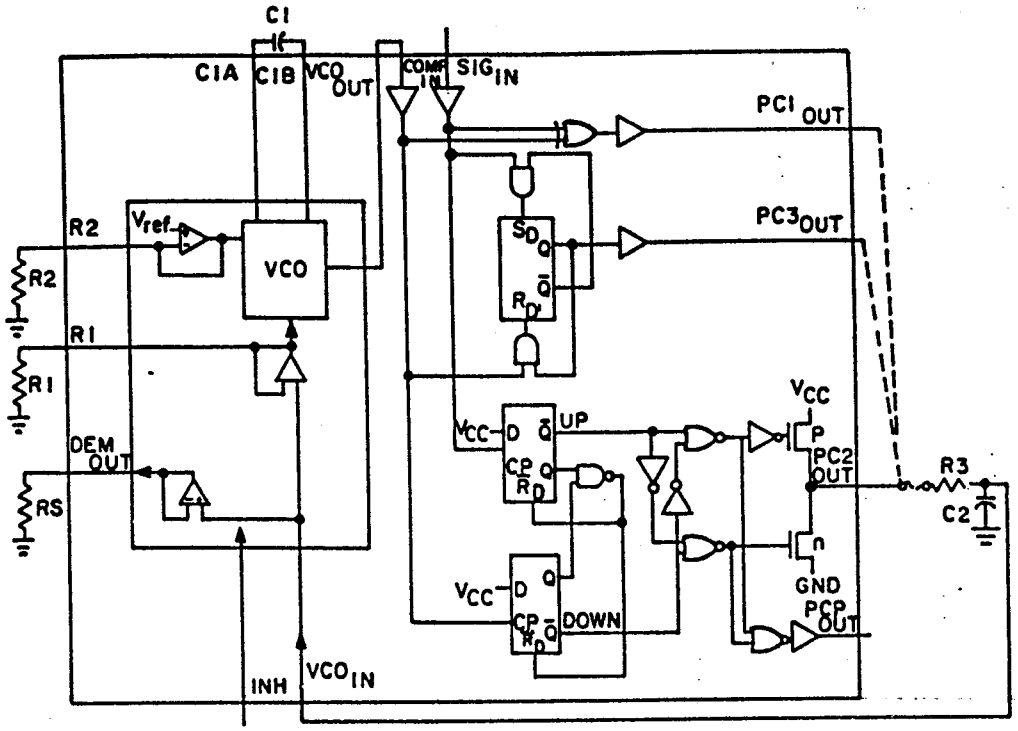


FIGURE 2. Logic diagram.

STANDARDIZED MILITARY DRAWING DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO 45444	SIZE A		5962-89609
		REVISION LEVEL	SHEET 11

DESC FORM 193A
SEP 87

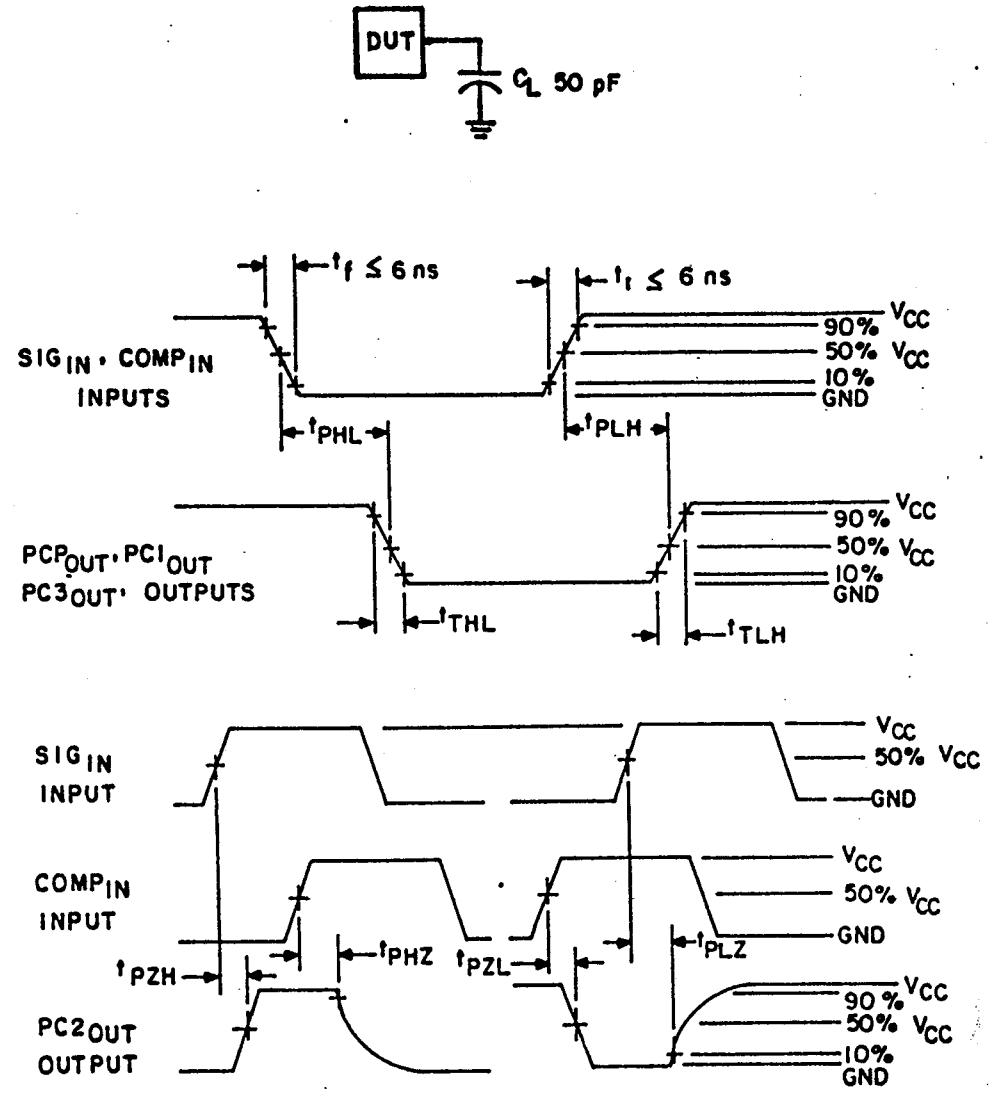


FIGURE 3. Test circuit and switching waveforms.

STANDARDIZED MILITARY DRAWING DEFENSE ELECTRONICS SUPPLY CENTER DAYTON, OHIO 45444	SIZE A		5962-89609
		REVISION LEVEL	SHEET 12

DESC FORM 193A
SEP 87

3.6 Certificate of compliance. A certificate of compliance shall be required from a manufacturer in order to be listed as an approved source of supply in MIL-BUL-103 (see 6.6 herein). The certificate of compliance submitted to DESC-ECS prior to listing as an approved source of supply shall affirm that the manufacturer's product meets the requirements of MIL-STD-883 (see 3.1 herein) and the requirements herein.

3.7 Certificate of conformance. A certificate of conformance as required in MIL-STD-883 (see 3.1 herein) shall be provided with each lot of microcircuits delivered to this drawing.

3.8 Notification of change. Notification of change to DESC-ECS shall be required in accordance with MIL-STD-883 (see 3.1 herein).

3.9 Verification and review. DESC, DESC's agent, and the acquiring activity retain the option to review the manufacturer's facility and applicable required documentation. Offshore documentation shall be made available onshore at the option of the reviewer.

4. QUALITY ASSURANCE PROVISIONS

4.1 Sampling and inspection. Sampling and inspection procedures shall be in accordance with section 4 of MIL-M-38510 to the extent specified in MIL-STD-883 (see 3.1 herein).

4.2 Screening. Screening shall be in accordance with method 5004 of MIL-STD-883, and shall be conducted on all devices prior to quality conformance inspection. The following additional criteria shall apply:

a. Burn-in test, method 1015 of MIL-STD-883.

(1) Test condition A, B, C, or D using the circuit submitted with the certificate of compliance (see 3.6 herein).

(2) T_A = +125°C, minimum.

b. Interim and final electrical test parameters shall be as specified in table II herein, except interim electrical parameter tests prior to burn-in are optional at the discretion of the manufacturer.

4.3 Quality conformance inspection. Quality conformance inspection shall be in accordance with method 5005 of MIL-STD-883 including groups A, B, C, and D inspections. The following additional criteria shall apply.

4.3.1 Group A inspection.

a. Tests shall be as specified in table II herein.

b. Subgroups 5 and 6 in table I, method 5005 of MIL-STD-883 shall be omitted.

c. Subgroup 4 (C_{IN} measurement) shall be measured only for the initial test and after process or design changes which may affect input capacitance. Test all applicable pins on 5 devices with zero failures.

d. Subgroups 7 and 8 shall consist of verifying the functionality of the device. These tests form a part of the vendors test tape and shall be maintained and available from the approved source of supply.

4.3.2 Groups C and D inspections.

a. End-point electrical parameters shall be as specified in table II herein.

b. Steady-state life test conditions, method 1005 of MIL-STD-883.

(1) Test condition A, B, C, or D using the circuit submitted with the certificate of compliance (see 3.6 herein).

(2) T_A = +125°C, minimum.

(3) Test duration: 1,000 hours, except as permitted by method 1005 of MIL-STD-883.

TABLE II. Electrical test requirements.

MIL-STD-883 test requirements	Subgroups (per method 5005, table I)
Interim electrical parameters (method 5004)	---
Final electrical test parameters (method 5004)	1*, 2, 3, 7, 8, 9
Group A test requirements (method 5005)	1, 2, 3, 4, 7, 8, 9, 10**, 11**
Groups C and D end-point electrical parameters (method 5005)	1, 2, 3

* PDA applies to subgroup 1.
** Subgroups 10 and 11, if not tested, shall be guaranteed to the specified limits in table I.

5. PACKAGING

5.1 Packaging requirements. The requirements for packaging shall be in accordance with MIL-M-38510.

6. NOTES

6.1 Intended use. Microcircuits conforming to this drawing are intended for use when military specifications do not exist and qualified military devices that will perform the required function are not available for OEM application. When a military specification exists and the product covered by this drawing has been qualified for listing on QPL-38510, the device specified herein will be inactivated and will not be used for new design. The QPL-38510 product shall be the preferred item for all applications.

6.2 Replaceability. Microcircuits covered by this drawing will replace the same generic device covered by contractor-prepared specification or drawing.

6.3 Configuration control of SMD's. All proposed changes to existing SMD's will be coordinated with the users of record for the individual documents. This coordination will be accomplished in accordance with MIL-STD-481 using DD Form 1693, Engineering Change Proposal (Short Form).

6.4 Record of users. Military and industrial users shall inform Defense Electronics Supply Center when a system application requires configuration control and the applicable SMD. DESC will maintain a record of users and this list will be used for coordination and distribution of changes to the drawings. Users of drawings covering microelectronics devices (FSC 5962) should contact DESC-ECS, telephone (513) 296-6022.

6.5 Comments. Comments on this drawing should be directed to DESC-ECS, Dayton, Ohio 45444, or telephone 513-296-5375.

6.6 Approved source of supply. An approved source of supply is listed in MIL-BUL-103. Additional sources will be added to MIL-BUL-103 as they become available. The vendor listed in MIL-BUL-103 has agreed to this drawing and a certificate of compliance (see 3.6 herein) has been submitted to and accepted by DESC-ECS. The approved source of supply listed below is for information purposes only and is current only to the date of the last action of this document.

Military drawing part number	Vendor CAGE number	Vendor 1/ similar part number
5962-8960901EX	18714	CD54HC4046AF/3A

1/ Caution. Do not use this number for item acquisition. Items acquired to this number may not satisfy the performance requirements of this drawing.

Vendor CAGE number	Vendor name and address
18714	RCA Corporation Semiconductor Sector Route 202 Somerville, NJ 08876-0591

SZ-TESTSYSTEME Statistics 03 Vers. 2.15 for TA10
RD259_54HC4046_INIT_EMS_@_IGG / 1.0 IR 22NOV97 16-PIN CMOS

Results file : RD259_54HC4046_INIT_EMS_@_IGG from: 02.03.98 / 13:11:45
Operator : PAUL RUSSELL
Part number : 54HC4046
Lot number : RD259
Order number : D/C 9714
Vendor : HARRIS
: CONTROL 01 ; RAD 02-05
: INITIAL EMS @ IGG
: 54HC4046 SMD 5962-89609 R/H/L 1.0 IR 22NOV97 16-PIN CMOS

Test steps

1. Continuity test	-1.00	...	-0.30	V
2. ICC	0.00	...	8.00	uA
3. Vol @ 3.0V	-10.0	...	100.0	mV
4. Vol @ 4.5V	-10.0	...	100.0	mV
5. Vol @ 6.0V	-10.0	...	100.0	mV
6. Vol @ 4.5V	-10.0	...	400.0	mV
7. Vol @ 6.0V	-10.0	...	400.0	mV
8. Voh @ 3.0V	2.90	...	3.50	V
9. Voh @ 4.5V	4.40	...	5.00	V
10. Voh @ 6.0V	5.90	...	6.50	V
11. Voh @ 4.5V	3.98	...	5.00	V
12. Voh @ 6.0V	5.48	...	6.50	V
13. Iin Low VCC=2V	-5.00	...	5.00	uA
14. Iin Low VCC=3V	-11.00	...	11.00	uA
15. Iin Low VCC=4.5V	-29.00	...	29.00	uA
16. Iin Low VCC=6V	-45.00	...	45.00	uA
17. Iin High VCC=2V	-5.00	...	5.00	uA
18. Iin High VCC=3V	-11.00	...	11.00	uA
19. Iin High VCC=4.5V	-29.00	...	29.00	uA
20. Iin High VCC=6V	-45.00	...	45.00	uA
21. IOZ	-0.50	...	10.00	uA
22. IOZ	-0.50	...	10.00	uA

	1	2	3	4	5
1.1 [V]	-0.81	-0.77	-0.82	-0.78	-0.80
1.2 [V]	-0.39	-0.39	-0.39	-0.39	-0.39
2.1 [uA]	0.01	0.00	0.01	0.01	0.00
2.2 [uA]	0.01	0.00	0.01	0.01	0.00
3.1 [mV]	0.1	0.1	0.1	0.0	0.0
3.2 [mV]	0.4	0.2	0.5	0.4	0.4
4.1 [mV]	-0.2	0.0	-0.3	-0.2	-0.1
4.2 [mV]	0.2	0.2	0.1	0.2	0.3
5.1 [mV]	-0.1	0.1	0.1	0.0	0.0
5.2 [mV]	0.5	0.7	0.5	0.6	0.4
6.1 [mV]	124.3	126.5	129.6	120.1	122.5
6.2 [mV]	129.3	133.4	138.8	124.9	127.9
7.1 [mV]	125.5	131.0	131.0	122.7	124.0
7.2 [mV]	132.0	140.4	141.0	129.1	130.7
8.1 [V]	3.00	3.00	3.00	3.00	3.00
8.2 [V]	3.00	3.00	3.00	3.00	3.00
9.1 [V]	4.50	4.50	4.50	4.50	4.50
9.2 [V]	4.50	4.50	4.50	4.50	4.50
10.1 [V]	6.00	6.00	6.00	6.00	6.00
10.2 [V]	6.00	6.00	6.00	6.00	6.00
11.1 [V]	4.64	4.63	4.64	4.63	4.64
11.2 [V]	4.64	4.63	4.65	4.64	4.64
12.1 [V]	6.15	6.14	6.15	6.14	6.14
12.2 [V]	6.15	6.14	6.15	6.14	6.15
13.1 [uA]	-0.53	-0.52	-0.55	-0.54	-0.53
13.2 [uA]	0.00	0.00	0.00	0.00	0.00
14.1 [uA]	-2.03	-1.99	-2.08	-2.06	-2.02
14.2 [uA]	0.00	0.00	0.00	-0.00	0.00
15.1 [uA]	-5.91	-5.77	-6.00	-5.93	-5.87
15.2 [uA]	0.00	0.00	-0.00	0.00	0.00
16.1 [uA]	-11.57	-11.29	-11.74	-11.59	-11.50
16.2 [uA]	0.00	0.00	0.00	0.00	0.00
17.1 [uA]	0.00	0.00	0.00	0.00	0.00
17.2 [uA]	0.53	0.52	0.55	0.54	0.53
18.1 [uA]	0.00	-0.00	-0.00	-0.00	0.00
18.2 [uA]	2.03	1.98	2.07	2.05	2.02
19.1 [uA]	0.00	0.00	0.00	0.00	0.00
19.2 [uA]	5.90	5.76	5.99	5.93	5.86
20.1 [uA]	0.00	0.00	-0.00	0.00	-0.00
20.2 [uA]	11.56	11.27	11.71	11.59	11.49
21.1 [uA]	0.00	0.00	0.00	0.00	0.00
21.2 [uA]	0.00	0.00	0.00	0.00	0.00
22.1 [uA]	0.00	0.00	0.00	0.00	0.00
22.2 [uA]	0.00	0.00	0.00	0.00	0.00

SZ-TESTSYSTEME Statistics 03 Vers. 2.15 for TA10
RD259_54HC4046_INIT_EMS_@_ERA / 1.0 IR 22NOV97 16-PIN CMOS

Results file : RD259_54HC4046_INIT_EMS_@_ERA from: 05.03.98 / 10:22:45
Operator : PAUL RUSSELL
Part number : 54HC4046
Lot number : RD259
Order number : D/C 9714
Vendor : HARRIS
: CONTROL 01 ; RAD 02-05
: INITIAL EMS @ ERA
: 54HC4046 SMD 5962-89609 R/H/L 1.0 IR 22NOV97 16-PIN CMOS

Test steps

1.	Continuity test	-1.00	...	-0.30 V
2.	ICC	0.00	...	8.00 uA
3.	Vol @ 3.0V	-10.0	...	100.0 mV
4.	Vol @ 4.5V	-10.0	...	100.0 mV
5.	Vol @ 6.0V	-10.0	...	100.0 mV
6.	Vol @ 4.5V	-10.0	...	400.0 mV
7.	Vol @ 6.0V	-10.0	...	400.0 mV
8.	Voh @ 3.0V	2.90	...	3.50 V
9.	Voh @ 4.5V	4.40	...	5.00 V
10.	Voh @ 6.0V	5.90	...	6.50 V
11.	Voh @ 4.5V	3.98	...	5.00 V
12.	Voh @ 6.0V	5.48	...	6.50 V
13.	Iin Low VCC=2V	-5.00	...	5.00 uA
14.	Iin Low VCC=3V	-11.00	...	11.00 uA
15.	Iin Low VCC=4.5V	-29.00	...	29.00 uA
16.	Iin Low VCC=6V	-45.00	...	45.00 uA
17.	Iin High VCC=2V	-5.00	...	5.00 uA
18.	Iin High VCC=3V	-11.00	...	11.00 uA
19.	Iin High VCC=4.5V	-29.00	...	29.00 uA
20.	Iin High VCC=6V	-45.00	...	45.00 uA
21.	IOZ	-0.50	...	10.00 uA
22.	IOZ	-0.50	...	10.00 uA

	1	2	3	4	5
1.1 [V]	-0.81	-0.77	-0.82	-0.78	-0.80
1.2 [V]	-0.39	-0.39	-0.39	-0.39	-0.39
2.1 [uA]	0.02	0.02	0.02	0.01	0.01
2.2 [uA]	0.02	0.02	0.02	0.01	0.01
3.1 [mV]	0.0	-0.1	0.1	-0.0	-0.0
3.2 [mV]	0.4	0.2	0.4	0.4	0.1
4.1 [mV]	-0.2	-0.1	-0.1	-0.1	-0.3
4.2 [mV]	0.1	0.2	0.1	0.2	0.0
5.1 [mV]	-0.0	0.0	0.0	-0.1	0.1
5.2 [mV]	0.6	0.8	0.5	0.6	0.5
6.1 [mV]	122.6	124.8	128.0	118.5	120.1
6.2 [mV]	127.3	132.0	136.7	123.2	125.5
7.1 [mV]	123.3	129.1	129.0	121.2	121.5
7.2 [mV]	129.9	138.7	139.0	127.9	128.0
8.1 [V]	3.00	3.00	3.00	3.00	3.00
8.2 [V]	3.00	3.00	3.00	3.00	3.00
9.1 [V]	4.50	4.50	4.50	4.50	4.50
9.2 [V]	4.50	4.50	4.50	4.50	4.50
10.1 [V]	6.00	6.00	6.00	6.00	6.00
10.2 [V]	6.00	6.00	6.00	6.00	6.00
11.1 [V]	4.64	4.63	4.64	4.63	4.63
11.2 [V]	4.64	4.63	4.65	4.63	4.64
12.1 [V]	6.14	6.14	6.15	6.14	6.14
12.2 [V]	6.15	6.14	6.15	6.14	6.15
13.1 [uA]	-0.53	-0.53	-0.55	-0.55	-0.54
13.2 [uA]	0.00	0.00	0.00	0.00	0.00
14.1 [uA]	-2.05	-2.01	-2.10	-2.07	-2.05
14.2 [uA]	0.00	0.00	0.00	0.00	0.00
15.1 [uA]	-5.98	-5.84	-6.08	-6.01	-5.96
15.2 [uA]	-0.00	0.00	0.00	0.00	0.00
16.1 [uA]	-11.74	-11.43	-11.89	-11.76	-11.68
16.2 [uA]	0.00	0.00	0.00	0.00	0.00
17.1 [uA]	0.00	0.00	0.00	0.00	0.00
17.2 [uA]	0.53	0.52	0.55	0.55	0.53
18.1 [uA]	-0.00	-0.00	0.00	-0.00	0.00
18.2 [uA]	2.05	2.00	2.09	2.07	2.04
19.1 [uA]	-0.00	-0.01	-0.00	-0.00	-0.00
19.2 [uA]	5.98	5.83	6.06	6.01	5.95
20.1 [uA]	-0.00	-0.00	-0.00	0.00	-0.00
20.2 [uA]	11.73	11.42	11.87	11.75	11.67
21.1 [uA]	0.00	0.00	0.00	0.00	0.00
21.2 [uA]	0.00	0.00	0.00	0.00	0.00
22.1 [uA]	0.00	0.00	0.00	0.00	0.00
22.2 [uA]	0.00	0.00	0.00	0.00	0.00

SZ-TESTSYSTEME Statistics 03 Vers. 2.15 for TA10
RD259_54HC4046_EMS_@_2.5_KRAD / 1.0 IR 22NOV97 16-PIN CMOS

Results file : RD259_54HC4046_EMS_@_2.5_KRAD from: 05.03.98 / 10:29:15
Operator : PAUL RUSSELL
Part number : 54HC4046
Lot number : RD259
Order number :
Vendor :
: CONTROL 01 ; RAD 02-05
: EMS @ 2.5 KRAD
:

Test steps

1.	Continuity test	-1.00	...	-0.30 V
2.	ICC	0.00	...	8.00 uA
3.	Vol @ 3.0V	-10.0	...	100.0 mV
4.	Vol @ 4.5V	-10.0	...	100.0 mV
5.	Vol @ 6.0V	-10.0	...	100.0 mV
6.	Vol @ 4.5V	-10.0	...	400.0 mV
7.	Vol @ 6.0V	-10.0	...	400.0 mV
8.	Voh @ 3.0V	2.90	...	3.50 V
9.	Voh @ 4.5V	4.40	...	5.00 V
10.	Voh @ 6.0V	5.90	...	6.50 V
11.	Voh @ 4.5V	3.98	...	5.00 V
12.	Voh @ 6.0V	5.48	...	6.50 V
13.	Iin Low VCC=2V	-5.00	...	5.00 uA
14.	Iin Low VCC=3V	-11.00	...	11.00 uA
15.	Iin Low VCC=4.5V	-29.00	...	29.00 uA
16.	Iin Low VCC=6V	-45.00	...	45.00 uA
17.	Iin High VCC=2V	-5.00	...	5.00 uA
18.	Iin High VCC=3V	-11.00	...	11.00 uA
19.	Iin High VCC=4.5V	-29.00	...	29.00 uA
20.	Iin High VCC=6V	-45.00	...	45.00 uA
21.	IOZ	-0.50	...	10.00 uA
22.	IOZ	-0.50	...	10.00 uA

	1	2	3	4	5
1.1 [V]	-0.81	-0.76	-0.81	-0.77	-0.80
1.2 [V]	-0.39	-0.37	-0.37	-0.33	-0.35
2.1 [uA]	0.01	0.18	0.16	6.83	2.49
2.2 [uA]	0.01	0.18	0.16	6.83	2.49
3.1 [mV]	0.2	0.0	0.0	0.0	-0.0
3.2 [mV]	0.4	0.2	0.5	0.2	0.3
4.1 [mV]	-0.0	-0.2	-0.1	-0.1	-0.0
4.2 [mV]	0.0	0.3	0.4	0.1	0.1
5.1 [mV]	-0.1	0.1	0.1	0.0	0.0
5.2 [mV]	0.6	0.7	0.5	0.7	0.7
6.1 [mV]	122.7	122.0	124.5	115.5	118.3
6.2 [mV]	127.3	129.4	132.8	120.0	122.7
7.1 [mV]	123.4	126.5	126.0	118.5	120.1
7.2 [mV]	130.1	136.2	135.0	124.6	125.5
8.1 [V]	3.00	3.00	3.00	3.00	3.00
8.2 [V]	3.00	3.00	3.00	3.00	3.00
9.1 [V]	4.50	4.50	4.50	4.50	4.50
9.2 [V]	4.50	4.50	4.50	4.50	4.50
10.1 [V]	6.00	6.00	6.00	6.00	6.00
10.2 [V]	6.00	6.00	6.00	6.00	6.00
11.1 [V]	4.64	4.63	4.64	4.63	4.63
11.2 [V]	4.64	4.63	4.64	4.63	4.64
12.1 [V]	6.14	6.14	6.15	6.14	6.14
12.2 [V]	6.15	6.14	6.15	6.14	6.14
13.1 [uA]	-0.54	-0.55	-0.58	-0.58	-0.57
13.2 [uA]	0.00	0.00	0.00	0.00	0.00
14.1 [uA]	-2.06	-2.09	-2.17	-2.17	-2.13
14.2 [uA]	-0.00	-0.00	0.00	-0.00	-0.01
15.1 [uA]	-5.99	-6.03	-6.26	-6.23	-6.15
15.2 [uA]	-0.00	-0.00	-0.01	-0.00	-0.00
16.1 [uA]	-11.75	-11.77	-12.22	-12.23	-12.02
16.2 [uA]	-0.00	-0.01	-0.00	-0.00	0.00
17.1 [uA]	0.00	0.00	0.00	0.00	0.00
17.2 [uA]	0.53	0.55	0.57	0.58	0.56
18.1 [uA]	-0.00	-0.00	-0.01	-0.01	-0.01
18.2 [uA]	2.05	2.07	2.15	2.16	2.12
19.1 [uA]	-0.00	-0.00	-0.01	-0.01	-0.00
19.2 [uA]	5.99	6.01	6.24	6.21	6.12
20.1 [uA]	-0.00	-0.00	-0.01	-0.00	-0.00
20.2 [uA]	11.74	11.75	12.19	12.18	12.00
21.1 [uA]	-0.00	-0.00	-0.00	-0.00	-0.00
21.2 [uA]	-0.00	-0.00	-0.00	-0.00	-0.00
22.1 [uA]	0.00	0.00	0.00	0.00	0.00
22.2 [uA]	0.00	0.00	0.00	0.00	0.00

SZ-TESTSYSTEME Statistics 03 Vers. 2.15 for TA10
RD259_54HC4046_EMS_@_5_KRAD / 1.0 IR 22NOV97 16-PIN CMOS

Results file : RD259_54HC4046_EMS_@_5_KRAD from: 05.03.98 / 10:47:02
Operator : PAUL RUSSELL
Part number : 54HC4046
Lot number : RD259
Order number :
Vendor :
: CONTROL 01 ; RAD 02-05
: EMS @ 5 KRAD
:

Test steps

1.	Continuity test	not active			
2.	ICC	0.00	...	8.00	uA
3.	Vol @ 3.0V	-10.0	...	100.0	mV
4.	Vol @ 4.5V	-10.0	...	100.0	mV
5.	Vol @ 6.0V	-10.0	...	100.0	mV
6.	Vol @ 4.5V	-10.0	...	400.0	mV
7.	Vol @ 6.0V	-10.0	...	400.0	mV
8.	Voh @ 3.0V	2.90	...	3.50	V
9.	Voh @ 4.5V	4.40	...	5.00	V
10.	Voh @ 6.0V	5.90	...	6.50	V
11.	Voh @ 4.5V	3.98	...	5.00	V
12.	Voh @ 6.0V	5.48	...	6.50	V
13.	Iin Low VCC=2V	-5.00	...	5.00	uA
14.	Iin Low VCC=3V	-11.00	...	11.00	uA
15.	Iin Low VCC=4.5V	-29.00	...	29.00	uA
16.	Iin Low VCC=6V	-45.00	...	45.00	uA
17.	Iin High VCC=2V	-5.00	...	5.00	uA
18.	Iin High VCC=3V	-11.00	...	11.00	uA
19.	Iin High VCC=4.5V	-29.00	...	29.00	uA
20.	Iin High VCC=6V	-45.00	...	45.00	uA
21.	IOZ	-0.50	...	10.00	uA
22.	IOZ	-0.50	...	10.00	uA

	1	2	3	4	5
2.1 [uA]	0.00	12.18 F	12.18 F	12.18 F	12.18 F
2.2 [uA]	0.00	12.18 F	12.18 F	12.18 F	12.18 F
3.1 [mV]	0.1	0.0	0.1	-0.0	-0.0
3.2 [mV]	0.4	0.1	0.4	0.4	0.3
4.1 [mV]	-0.1	-0.1	-0.1	0.0	-0.0
4.2 [mV]	0.1	0.3	0.4	0.3	0.1
5.1 [mV]	-0.0	0.2	0.1	-0.0	0.1
5.2 [mV]	0.7	0.7	0.6	0.8	0.7
6.1 [mV]	122.8	122.8	126.3	117.0	118.3
6.2 [mV]	127.6	129.3	134.4	121.5	122.7
7.1 [mV]	123.4	127.9	127.6	120.2	120.3
7.2 [mV]	130.5	136.6	138.0	126.9	126.5
8.1 [V]	3.00	3.00	3.00	3.00	3.00
8.2 [V]	3.00	3.00	3.00	3.00	3.00
9.1 [V]	4.50	4.50	4.50	4.50	4.50
9.2 [V]	4.50	4.50	4.50	4.50	4.50
10.1 [V]	6.00	6.00	6.00	6.00	6.00
10.2 [V]	6.00	6.00	6.00	6.00	6.00
11.1 [V]	4.64	4.63	4.64	4.63	4.64
11.2 [V]	4.64	4.63	4.65	4.64	4.64
12.1 [V]	6.14	6.14	6.15	6.14	6.14
12.2 [V]	6.15	6.14	6.15	6.14	6.15
13.1 [uA]	-0.53	-0.58	-0.60	-0.99	-0.78
13.2 [uA]	0.00	0.00	0.00	0.00	0.00
14.1 [uA]	-2.05	-2.13	-2.19	-3.27	-2.70
14.2 [uA]	0.00	0.00	0.00	0.00	0.00
15.1 [uA]	-5.98	-6.31	-6.44	-9.65	-8.10
15.2 [uA]	0.00	0.00	0.00	0.00	0.00
16.1 [uA]	-11.73	-12.96	-13.05	-19.08	-16.51
16.2 [uA]	-0.00	-0.00	0.00	-0.00	0.00
17.1 [uA]	0.00	0.00	0.00	0.00	0.00
17.2 [uA]	0.53	0.57	0.59	0.68	0.64
18.1 [uA]	-0.00	0.00	-0.00	0.00	-0.00
18.2 [uA]	2.05	2.10	2.18	2.56	2.41
19.1 [uA]	-0.00	0.00	-0.00	-0.00	-0.00
19.2 [uA]	5.98	6.22	6.37	7.61	7.25
20.1 [uA]	-0.00	0.00	-0.00	0.00	-0.00
20.2 [uA]	11.72	12.74	12.89	15.25	14.63
21.1 [uA]	0.00	0.00	0.00	-0.00	0.00
21.2 [uA]	0.00	0.00	0.00	-0.00	0.00
22.1 [uA]	0.00	0.00	0.00	0.00	0.00
22.2 [uA]	0.00	0.00	0.00	0.00	0.00

SZ-TESTSYSTEME Statistics 03 Vers. 2.15 for TA10
RD259_54HC4046_EMS_@_7.5_KRAD / 1.0 IR 22NOV97 16-PIN CMOS

Results file : RD259_54HC4046_EMS_@_7.5_KRAD from: 05.03.98 / 10:52:56
Operator : PAUL RUSSELL
Part number : 54HC4046
Lot number : RD259
Order number :
Vendor :
: CONTROL 01 ; RAD 02-05
: EMS @ 7.5 KRAD
:

Test steps

1.	Continuity test	not active			
2.	ICC	0.00	...	8.00	uA
3.	Vol @ 3.0V	-10.0	...	100.0	mV
4.	Vol @ 4.5V	-10.0	...	100.0	mV
5.	Vol @ 6.0V	-10.0	...	100.0	mV
6.	Vol @ 4.5V	-10.0	...	400.0	mV
7.	Vol @ 6.0V	-10.0	...	400.0	mV
8.	Voh @ 3.0V	2.90	...	3.50	V
9.	Voh @ 4.5V	4.40	...	5.00	V
10.	Voh @ 6.0V	5.90	...	6.50	V
11.	Voh @ 4.5V	3.98	...	5.00	V
12.	Voh @ 6.0V	5.48	...	6.50	V
13.	Iin Low VCC=2V	-5.00	...	5.00	uA
14.	Iin Low VCC=3V	-11.00	...	11.00	uA
15.	Iin Low VCC=4.5V	-29.00	...	29.00	uA
16.	Iin Low VCC=6V	-45.00	...	45.00	uA
17.	Iin High VCC=2V	-5.00	...	5.00	uA
18.	Iin High VCC=3V	-11.00	...	11.00	uA
19.	Iin High VCC=4.5V	-29.00	...	29.00	uA
20.	Iin High VCC=6V	-45.00	...	45.00	uA
21.	IOZ	-0.50	...	10.00	uA
22.	IOZ	-0.50	...	10.00	uA

	1	2	3	4	5
2.1 [uA]	0.04	12.20 F	12.20 F	12.20 F	12.20 F
2.2 [uA]	0.04	12.20 F	12.20 F	12.20 F	12.20 F
3.1 [mV]	0.1	0.0	0.0	0.1	0.1
3.2 [mV]	0.4	0.5	0.5	0.3	0.5
4.1 [mV]	-0.2	0.0	-0.1	-0.0	-0.0
4.2 [mV]	0.2	0.5	0.5	0.5	0.5
5.1 [mV]	0.1	0.4	0.1	0.2	0.4
5.2 [mV]	0.8	1.4	1.0	1.2	1.2
6.1 [mV]	123.7	122.4	124.5	115.0	116.6
6.2 [mV]	128.2	128.3	131.3	120.0	120.2
7.1 [mV]	124.8	127.5	125.8	118.6	119.1
7.2 [mV]	131.2	136.5	134.6	125.5	124.8
8.1 [V]	3.00	3.00	3.00	3.00	3.00
8.2 [V]	3.00	3.00	3.00	3.00	3.00
9.1 [V]	4.50	4.50	4.50	4.50	4.50
9.2 [V]	4.50	4.50	4.50	4.50	4.50
10.1 [V]	6.00	6.00	6.00	6.00	6.00
10.2 [V]	6.00	6.00	6.00	6.00	6.00
11.1 [V]	4.64	4.63	4.64	4.63	4.64
11.2 [V]	4.64	4.63	4.65	4.64	4.64
12.1 [V]	6.15	6.14	6.15	6.14	6.14
12.2 [V]	6.15	6.14	6.15	6.14	6.15
13.1 [uA]	-0.53	-1.16	-0.99	-4.29	-3.20
13.2 [uA]	0.00	0.00	0.00	-0.00	-0.00
14.1 [uA]	-2.05	-3.75	-3.36	-9.12	-7.26
14.2 [uA]	-0.00	0.00	-0.00	-0.00	0.00
15.1 [uA]	-5.97	-10.58	-9.99	-19.14	-16.22
15.2 [uA]	-0.00	-0.00	-0.00	-0.00	-0.00
16.1 [uA]	-11.72	-20.63	-19.85	-32.35	-28.40
16.2 [uA]	0.00	-0.00	-0.00	-0.00	-0.00
17.1 [uA]	0.00	0.00	0.00	0.00	0.00
17.2 [uA]	0.53	0.67	0.67	0.99	0.89
18.1 [uA]	-0.01	-0.00	-0.00	-0.00	-0.01
18.2 [uA]	2.04	2.57	2.53	3.82	3.41
19.1 [uA]	-0.01	-0.00	-0.01	-0.00	-0.01
19.2 [uA]	5.96	7.77	7.78	10.76	9.76
20.1 [uA]	-0.01	-0.01	-0.01	-0.01	-0.00
20.2 [uA]	11.70	15.78	15.85	20.51	18.95
21.1 [uA]	-0.00	-0.00	-0.00	-0.00	-0.00
21.2 [uA]	-0.00	-0.00	-0.00	-0.00	-0.00
22.1 [uA]	0.00	0.00	0.00	0.00	0.00
22.2 [uA]	0.00	0.00	0.00	0.00	0.00

SZ-TESTSYSTEME Statistics 03 Vers. 2.15 for TA10
RD259_54HC4046_EMS_@_10_KRAD / 1.0 IR 22NOV97 16-PIN CMOS

Results file : RD259_54HC4046_EMS_@_10_KRAD from: 05.03.98 / 10:59:48
Operator : PAUL RUSSELL
Part number : 54HC4046
Lot number : RD259
Order number :
Vendor :
: CONTROL 01 ; RAD 02-05
: EMS @ 10 KRAD
:

Test steps

1. Continuity test	not active			
2. ICC	0.00	...	8.00	uA
3. Vol @ 3.0V	-10.0	...	100.0	mV
4. Vol @ 4.5V	-10.0	...	100.0	mV
5. Vol @ 6.0V	-10.0	...	100.0	mV
6. Vol @ 4.5V	-10.0	...	400.0	mV
7. Vol @ 6.0V	-10.0	...	400.0	mV
8. Voh @ 3.0V	2.90	...	3.50	V
9. Voh @ 4.5V	4.40	...	5.00	V
10. Voh @ 6.0V	5.90	...	6.50	V
11. Voh @ 4.5V	3.98	...	5.00	V
12. Voh @ 6.0V	5.48	...	6.50	V
13. Iin Low VCC=2V	-5.00	...	5.00	uA
14. Iin Low VCC=3V	-11.00	...	11.00	uA
15. Iin Low VCC=4.5V	-29.00	...	29.00	uA
16. Iin Low VCC=6V	-45.00	...	45.00	uA
17. Iin High VCC=2V	-5.00	...	5.00	uA
18. Iin High VCC=3V	-11.00	...	11.00	uA
19. Iin High VCC=4.5V	-29.00	...	29.00	uA
20. Iin High VCC=6V	-45.00	...	45.00	uA
21. IOZ	-0.50	...	10.00	uA
22. IOZ	-0.50	...	10.00	uA

	1	2	3	4	5
2.1 [uA]	0.05	12.20 F	12.20 F	12.20 F	12.20 F
2.2 [uA]	0.05	12.20 F	12.20 F	12.20 F	12.20 F
3.1 [mV]	0.4	0.1	0.1	0.1	0.0
3.2 [mV]	0.5	0.8	0.5	0.8	0.8
4.1 [mV]	0.0	0.1	0.0	0.5	0.2
4.2 [mV]	0.4	0.6	0.7	1.3	1.0
5.1 [mV]	0.5	0.4	0.4	0.7	0.5
5.2 [mV]	0.9	1.5	1.2	1.7	1.7
6.1 [mV]	124.9	121.2	123.4	114.5	115.4
6.2 [mV]	129.7	126.9	130.4	119.7	119.7
7.1 [mV]	126.5	126.6	125.8	118.1	118.3
7.2 [mV]	133.0	135.0	133.9	125.2	124.3
8.1 [V]	3.00	3.00	3.00	3.00	3.00
8.2 [V]	3.00	3.00	3.00	3.00	3.00
9.1 [V]	4.50	4.50	4.50	4.50	4.50
9.2 [V]	4.50	4.50	4.50	4.50	4.50
10.1 [V]	6.00	6.00	6.00	6.00	6.00
10.2 [V]	6.00	6.00	6.00	6.00	6.00
11.1 [V]	4.64	4.63	4.64	4.63	4.64
11.2 [V]	4.64	4.63	4.65	4.64	4.64
12.1 [V]	6.15	6.14	6.15	6.14	6.14
12.2 [V]	6.15	6.14	6.15	6.15	6.15
13.1 [uA]	-0.53	-3.19	-2.59	-8.74 F	-7.10 F
13.2 [uA]	0.00	0.00	0.00	0.00	-0.00
14.1 [uA]	-2.05	-7.38	-6.50	-15.93 F	-13.24 F
14.2 [uA]	-0.00	-0.00	-0.00	-0.01	-0.01
15.1 [uA]	-5.97	-16.64	-15.48	-29.25 F	-25.15
15.2 [uA]	-0.00	-0.01	-0.01	-0.00	-0.00
16.1 [uA]	-11.70	-29.32	-27.80	-45.77 F	-40.30
16.2 [uA]	0.00	-0.00	0.00	-0.00	0.00
17.1 [uA]	-0.00	0.00	-0.00	0.00	0.00
17.2 [uA]	0.53	0.85	0.82	1.42	1.28
18.1 [uA]	-0.00	-0.01	-0.00	-0.01	-0.01
18.2 [uA]	2.04	3.31	3.22	5.28	4.82
19.1 [uA]	-0.01	-0.00	-0.00	-0.01	-0.01
19.2 [uA]	5.96	9.80	9.66	14.62	13.19
20.1 [uA]	-0.01	-0.01	-0.01	-0.01	-0.01
20.2 [uA]	11.68	19.30	19.13	26.86	24.33
21.1 [uA]	-0.00	-0.00	-0.00	-0.00	-0.00
21.2 [uA]	-0.00	-0.00	-0.00	-0.00	-0.00
22.1 [uA]	0.00	0.00	0.00	0.00	0.00
22.2 [uA]	0.00	0.00	0.00	0.00	0.00

SZ-TESTSYSTEME Statistics 03 Vers. 2.15 for TA10
RD259_54HC4046_EMS_@_20_KRAD / 1.0 IR 22NOV97 16-PIN CMOS

Results file : RD259_54HC4046_EMS_@_20_KRAD from: 05.03.98 / 11:07:52
Operator : PAUL RUSSELL
Part number : 54HC4046
Lot number : RD259
Order number :
Vendor :
: CONTROL 01 ; RAD 02-05
: EMS @ 20 KRAD
:

Test steps

1.	Continuity test	not active			
2.	ICC	0.00	...	8.00	uA
3.	Vol @ 3.0V	-10.0	...	100.0	mV
4.	Vol @ 4.5V	-10.0	...	100.0	mV
5.	Vol @ 6.0V	-10.0	...	100.0	mV
6.	Vol @ 4.5V	-10.0	...	400.0	mV
7.	Vol @ 6.0V	-10.0	...	400.0	mV
8.	Voh @ 3.0V	2.90	...	3.50	V
9.	Voh @ 4.5V	4.40	...	5.00	V
10.	Voh @ 6.0V	5.90	...	6.50	V
11.	Voh @ 4.5V	3.98	...	5.00	V
12.	Voh @ 6.0V	5.48	...	6.50	V
13.	Iin Low VCC=2V	-5.00	...	5.00	uA
14.	Iin Low VCC=3V	-11.00	...	11.00	uA
15.	Iin Low VCC=4.5V	-29.00	...	29.00	uA
16.	Iin Low VCC=6V	-45.00	...	45.00	uA
17.	Iin High VCC=2V	-5.00	...	5.00	uA
18.	Iin High VCC=3V	-11.00	...	11.00	uA
19.	Iin High VCC=4.5V	-29.00	...	29.00	uA
20.	Iin High VCC=6V	-45.00	...	45.00	uA
21.	IOZ	-0.50	...	10.00	uA
22.	IOZ	-0.50	...	10.00	uA

	1	2	3	4	5
2.1 [uA]	0.03	12.20 F	12.20 F	12.20 F	12.20 F
2.2 [uA]	0.03	12.20 F	12.20 F	12.20 F	12.20 F
3.1 [mV]	-0.0	0.5	0.5	0.7	1.0
3.2 [mV]	0.3	1.4	1.5	1.7	2.2
4.1 [mV]	-0.1	0.4	0.6	1.0	1.4
4.2 [mV]	0.1	2.0	1.9	2.6	3.0
5.1 [mV]	0.0	1.0	0.9	1.5	1.4
5.2 [mV]	0.5	2.9	2.5	3.5	4.0
6.1 [mV]	123.0	118.0	121.9	111.6	110.5
6.2 [mV]	128.8	123.1	128.8	118.3	115.5
7.1 [mV]	123.8	124.7	124.6	116.9	115.0
7.2 [mV]	131.5	132.5	133.1	124.9	122.2
8.1 [V]	3.00	3.00	3.00	3.00	3.00
8.2 [V]	3.00	3.00	3.00	3.00	3.00
9.1 [V]	4.50	4.50	4.50	4.50	4.50
9.2 [V]	4.50	4.50	4.50	4.50	4.50
10.1 [V]	6.00	6.00	6.00	6.00	6.00
10.2 [V]	6.00	6.00	6.00	6.00	6.00
11.1 [V]	4.64	4.63	4.64	4.63	4.64
11.2 [V]	4.64	4.63	4.65	4.64	4.64
12.1 [V]	6.15	6.14	6.15	6.14	6.14
12.2 [V]	6.15	6.14	6.15	6.14	6.15
13.1 [uA]	-0.53	-12.09 F	-12.09 F	-12.09 F	-12.09 F
13.2 [uA]	0.00	0.00	0.00	0.00	-0.00
14.1 [uA]	-2.05	-26.12 F	-23.76 F	-39.49 F	-35.79 F
14.2 [uA]	-0.01	-0.00	-0.01	-0.00	-0.00
15.1 [uA]	-5.98	-44.56 F	-41.39 F	-64.76 F	-58.79 F
15.2 [uA]	-0.01	-0.00	-0.00	-0.01	-0.01
16.1 [uA]	-11.72	-66.13 F	-62.26 F	-91.80 F	-83.90 F
16.2 [uA]	-0.00	0.00	-0.00	-0.01	0.00
17.1 [uA]	0.00	0.00	0.00	0.00	0.00
17.2 [uA]	0.53	1.92	1.75	4.02	3.43
18.1 [uA]	-0.00	-0.01	-0.01	-0.01	-0.01
18.2 [uA]	2.04	6.71	6.51	10.11	9.09
19.1 [uA]	-0.01	-0.01	-0.01	-0.00	-0.00
19.2 [uA]	5.97	18.44	18.16	24.25	22.38
20.1 [uA]	-0.01	-0.01	-0.01	-0.00	-0.00
20.2 [uA]	11.71	34.07	33.61	42.90	39.90
21.1 [uA]	-0.00	-0.00	-0.00	-0.01	-0.15
21.2 [uA]	-0.00	-0.00	-0.00	-0.01	-0.15
22.1 [uA]	0.00	0.00	0.00	0.00	0.98
22.2 [uA]	0.00	0.00	0.00	0.00	0.98

SZ-TESTSYSTEME Statistics 03 Vers. 2.15 for TA10
RD259_54HC4046_EMS_@_30_KRAD / 1.0 IR 22NOV97 16-PIN CMOS

Results file : RD259_54HC4046_EMS_@_30_KRAD from: 05.03.98 / 11:38:21
Operator : PAUL RUSSELL
Part number : 54HC4046
Lot number : RD259
Order number :
Vendor :
: CONTROL 01 ; RAD 02-05
: EMS @ 30 KRAD
:

Test steps

1.	Continuity test	not active			
2.	ICC	0.00	...	8.00	uA
3.	Vol @ 3.0V	-10.0	...	100.0	mV
4.	Vol @ 4.5V	-10.0	...	100.0	mV
5.	Vol @ 6.0V	-10.0	...	100.0	mV
6.	Vol @ 4.5V	-10.0	...	400.0	mV
7.	Vol @ 6.0V	-10.0	...	400.0	mV
8.	Voh @ 3.0V	2.90	...	3.50	V
9.	Voh @ 4.5V	4.40	...	5.00	V
10.	Voh @ 6.0V	5.90	...	6.50	V
11.	Voh @ 4.5V	3.98	...	5.00	V
12.	Voh @ 6.0V	5.48	...	6.50	V
13.	Iin Low VCC=2V	-5.00	...	5.00	uA
14.	Iin Low VCC=3V	-11.00	...	11.00	uA
15.	Iin Low VCC=4.5V	-29.00	...	29.00	uA
16.	Iin Low VCC=6V	-45.00	...	45.00	uA
17.	Iin High VCC=2V	-5.00	...	5.00	uA
18.	Iin High VCC=3V	-11.00	...	11.00	uA
19.	Iin High VCC=4.5V	-29.00	...	29.00	uA
20.	Iin High VCC=6V	-45.00	...	45.00	uA
21.	IOZ	-0.50	...	10.00	uA
22.	IOZ	-0.50	...	10.00	uA

	1	2	3	4	5
2.1 [uA]	0.01	12.17 F	12.17 F	12.17 F	12.17 F
2.2 [uA]	0.01	12.17 F	12.17 F	12.17 F	12.17 F
3.1 [mV]	0.1	0.9	1.0	1.8	1.6
3.2 [mV]	0.2	2.1	2.3	2999.5 F	2999.8 F
4.1 [mV]	-0.1	1.1	1.1	2.1	2.0
4.2 [mV]	0.1	3.2	2.9	4498.4 F	3.8
5.1 [mV]	0.0	1.6	1.9	2.9	2.5
5.2 [mV]	0.6	4.1	4.1	5.6	5.3
6.1 [mV]	122.8	115.6	121.0	110.0	106.7
6.2 [mV]	127.8	120.5	128.5	4634.6 F	114.0
7.1 [mV]	123.8	125.0	123.9	118.8	112.5
7.2 [mV]	130.6	131.2	133.4	129.4	120.4
8.1 [V]	3.00	3.00	3.00	2.99	2.99
8.2 [V]	3.00	3.00	3.00	3.00	3.00
9.1 [V]	4.50	4.50	4.50	4.49	4.50
9.2 [V]	4.50	4.50	4.50	4.50	4.50
10.1 [V]	6.00	6.00	6.00	5.99	6.00
10.2 [V]	6.00	6.00	6.00	6.00	6.00
11.1 [V]	4.64	4.63	4.64	4.63	4.64
11.2 [V]	4.64	4.64	4.65	4.64	4.65
12.1 [V]	6.15	6.14	6.15	6.14	6.14
12.2 [V]	6.15	6.14	6.16	6.15	6.15
13.1 [uA]	-0.53	-12.09 F	-12.09 F	-12.09 F	-12.08 F
13.2 [uA]	0.00	0.00	0.00	0.00	0.00
14.1 [uA]	-2.05	-41.27 F	-38.17 F	-52.95 F	-48.83 F
14.2 [uA]	0.00	0.00	0.00	0.00	0.00
15.1 [uA]	-5.98	-67.43 F	-63.14 F	-85.16 F	-78.70 F
15.2 [uA]	0.00	-0.00	0.00	0.00	0.00
16.1 [uA]	-11.73	-95.53 F	-90.34 F	-118.23 F	-109.68 F
16.2 [uA]	-0.00	0.00	0.00	-0.00	-0.00
17.1 [uA]	0.00	0.00	0.00	0.00	0.00
17.2 [uA]	0.53	3.72	3.44	6.92 F	5.98 F
18.1 [uA]	0.00	0.00	-0.00	-0.00	0.00
18.2 [uA]	2.05	9.96	9.51	14.41 F	12.99 F
19.1 [uA]	-0.00	0.00	-0.00	-0.00	-0.00
19.2 [uA]	5.97	24.43	23.60	31.05 F	28.65
20.1 [uA]	0.00	-0.00	-0.00	-0.00	0.00
20.2 [uA]	11.73	43.50	42.35	52.76 F	49.08 F
21.1 [uA]	0.00	-0.00	-0.00	-0.01	-3.63 F
21.2 [uA]	0.00	-0.00	-0.00	-0.01	-3.63 F
22.1 [uA]	0.00	0.00	0.00	0.03	12.21 F
22.2 [uA]	0.00	0.00	0.00	0.03	12.21 F

SZ-TESTSYSTEME Statistics 03 Vers. 2.15 for TA10
RD259_54HC4046_POST_ANNEAL_EMS / 1.0 IR 22NOV97 16-PIN CMOS

Results file : RD259_54HC4046_POST_ANNEAL_EMS from: 06.03.98 / 11:45:24
Operator : PAUL RUSSELL
Part number : 54HC4046
Lot number : RD259
Order number : D/C 9714
Vendor : HARRIS
: CONTROL 01 ; RAD 02-05
: POST 24HRS ANNEAL EMS
: 54HC4046 SMD 5962-89609 R/H/L 1.0 IR 22NOV97 16-PIN CMOS

Test steps

1.	Continuity test	not active			
2.	ICC	0.00	...	8.00	uA
3.	Vol @ 3.0V	-10.0	...	100.0	mV
4.	Vol @ 4.5V	-10.0	...	100.0	mV
5.	Vol @ 6.0V	-10.0	...	100.0	mV
6.	Vol @ 4.5V	-10.0	...	400.0	mV
7.	Vol @ 6.0V	-10.0	...	400.0	mV
8.	Voh @ 3.0V	2.90	...	3.50	V
9.	Voh @ 4.5V	4.40	...	5.00	V
10.	Voh @ 6.0V	5.90	...	6.50	V
11.	Voh @ 4.5V	3.98	...	5.00	V
12.	Voh @ 6.0V	5.48	...	6.50	V
13.	Iin Low VCC=2V	-5.00	...	5.00	uA
14.	Iin Low VCC=3V	-11.00	...	11.00	uA
15.	Iin Low VCC=4.5V	-29.00	...	29.00	uA
16.	Iin Low VCC=6V	-45.00	...	45.00	uA
17.	Iin High VCC=2V	-5.00	...	5.00	uA
18.	Iin High VCC=3V	-11.00	...	11.00	uA
19.	Iin High VCC=4.5V	-29.00	...	29.00	uA
20.	Iin High VCC=6V	-45.00	...	45.00	uA
21.	IOZ	-0.50	...	10.00	uA
22.	IOZ	-0.50	...	10.00	uA

	1	2	3	4	5
2.1 [uA]	0.01	12.19 F	12.19 F	12.19 F	12.19 F
2.2 [uA]	0.01	12.19 F	12.19 F	12.19 F	12.19 F
3.1 [mV]	-0.6	-0.6	-0.5	-0.4	-0.5
3.2 [mV]	-0.2	-0.0	0.0	0.2	0.0
4.1 [mV]	-0.8	-0.4	-0.4	-0.2	-0.5
4.2 [mV]	-0.6	0.4	0.0	4498.6 F	0.4
5.1 [mV]	-0.8	-0.1	-0.2	-0.1	-0.1
5.2 [mV]	-0.1	1.3	0.8	1.0	1.0
6.1 [mV]	124.2	124.0	127.2	116.8	116.1
6.2 [mV]	128.9	129.2	134.8	122.5	121.2
7.1 [mV]	125.0	130.7	129.8	121.6	120.4
7.2 [mV]	131.9	138.8	139.3	128.4	127.7
8.1 [V]	3.00	3.00	3.00	3.00	3.00
8.2 [V]	3.00	3.00	3.00	3.00	3.00
9.1 [V]	4.50	4.50	4.50	4.50	4.50
9.2 [V]	4.50	4.50	4.50	4.50	4.50
10.1 [V]	6.00	6.00	6.00	6.00	6.00
10.2 [V]	6.00	6.00	6.00	6.00	6.00
11.1 [V]	4.64	4.64	4.66	4.64	4.65
11.2 [V]	4.64	4.64	4.67	4.65	4.66
12.1 [V]	6.15	6.14	6.16	6.14	6.15
12.2 [V]	6.15	6.15	6.17	6.15	6.16
13.1 [uA]	-0.53	-7.05 F	-6.26 F	-9.50 F	-8.27 F
13.2 [uA]	0.00	0.00	0.00	0.00	0.00
14.1 [uA]	-2.02	-12.42 F	-11.38 F	-15.60 F	-13.83 F
14.2 [uA]	0.00	0.00	0.00	0.00	-0.00
15.1 [uA]	-5.88	-22.84	-21.42	-26.80	-24.29
15.2 [uA]	0.01	0.00	0.00	0.00	0.00
16.1 [uA]	-11.53	-35.97	-34.22	-40.56	-37.31
16.2 [uA]	0.00	0.00	0.00	0.00	0.00
17.1 [uA]	0.00	0.00	0.00	0.00	0.00
17.2 [uA]	0.53	1.44	1.35	2.58	2.12
18.1 [uA]	-0.00	-0.00	0.00	0.00	-0.00
18.2 [uA]	2.03	4.72	4.54	6.43	5.68
19.1 [uA]	-0.00	0.00	0.00	0.00	0.00
19.2 [uA]	5.89	12.42	12.05	15.03	13.76
20.1 [uA]	0.00	0.00	0.00	0.00	-0.00
20.2 [uA]	11.53	22.65	22.05	26.18	24.32
21.1 [uA]	0.00	-0.00	-0.00	-0.01	-0.49
21.2 [uA]	0.00	-0.00	-0.00	-0.01	-0.49
22.1 [uA]	0.00	0.00	0.00	0.02	6.05
22.2 [uA]	0.00	0.00	0.00	0.02	6.05

SZ-TESTSYSTEME Statistics 03 Vers. 2.15 for TA10
RD259_54HC4046_FINAL_EMS / 1.0 IR 22NOV97 16-PIN CMOS

Results file : RD259_54HC4046_FINAL_EMS from: 16.03.98 / 14:54:16
Operator : PAUL RUSSELL
Part number : 54HC4046
Lot number : RD259
Order number : D/C 9714
Vendor : HARRIS
: CONTROL 01 ; RAD 02-05
: FINAL POST AGEING EMS
: 43HC4046 SMD 5962-89609 R/H/L 1.0 IR 22NOV97 16-PIN CMOS

Test steps

1.	Continuity test	-1.00	...	-0.30	V
2.	ICC	0.00	...	8.00	uA
3.	Vol @ 3.0V	-10.0	...	100.0	mV
4.	Vol @ 4.5V	-10.0	...	100.0	mV
5.	Vol @ 6.0V	-10.0	...	100.0	mV
6.	Vol @ 4.5V	-10.0	...	400.0	mV
7.	Vol @ 6.0V	-10.0	...	400.0	mV
8.	Voh @ 3.0V	2.90	...	3.50	V
9.	Voh @ 4.5V	4.40	...	5.00	V
10.	Voh @ 6.0V	5.90	...	6.50	V
11.	Voh @ 4.5V	3.98	...	5.00	V
12.	Voh @ 6.0V	5.48	...	6.50	V
13.	Iin Low VCC=2V	-5.00	...	5.00	uA
14.	Iin Low VCC=3V	-11.00	...	11.00	uA
15.	Iin Low VCC=4.5V	-29.00	...	29.00	uA
16.	Iin Low VCC=6V	-45.00	...	45.00	uA
17.	Iin High VCC=2V	-5.00	...	5.00	uA
18.	Iin High VCC=3V	-11.00	...	11.00	uA
19.	Iin High VCC=4.5V	-29.00	...	29.00	uA
20.	Iin High VCC=6V	-45.00	...	45.00	uA
21.	IOZ	-0.50	...	10.00	uA
22.	IOZ	-0.50	...	10.00	uA

	1	2	3	4	5
1.1 [V]	-0.81	-0.67	-0.71	-0.64	-0.66
1.2 [V]	-0.39	-0.41	-0.39	-0.40	-0.33
2.1 [uA]	0.04	6.85	12.21 F	12.21 F	8.34 F
2.2 [uA]	0.04	6.85	12.21 F	12.21 F	8.34 F
3.1 [mV]	-0.3	-0.1	-0.2	-0.3	-0.3
3.2 [mV]	-0.0	0.2	0.4	0.4	0.3
4.1 [mV]	-0.5	-0.5	-0.9	-0.5	-0.6
4.2 [mV]	-0.3	-0.2	-0.2	-0.2	-0.3
5.1 [mV]	-0.4	-0.6	-0.5	-0.5	-0.7
5.2 [mV]	-0.0	0.0	-0.1	-0.2	-0.0
6.1 [mV]	124.3	142.1	135.5	142.0	127.6
6.2 [mV]	129.5	163.3	175.6	171.6	171.6
7.1 [mV]	125.4	142.3	135.8	138.7	128.0
7.2 [mV]	132.1	162.3	168.3	162.9	161.1
8.1 [V]	3.00	3.00	3.00	3.00	3.00
8.2 [V]	3.00	3.00	3.00	3.00	3.00
9.1 [V]	4.50	4.50	4.50	4.50	4.50
9.2 [V]	4.50	4.50	4.50	4.50	4.50
10.1 [V]	6.00	6.00	6.00	6.00	6.00
10.2 [V]	6.00	6.00	6.00	6.00	6.00
11.1 [V]	4.64	4.64	4.65	4.64	4.65
11.2 [V]	4.64	4.64	4.66	4.65	4.66
12.1 [V]	6.15	6.15	6.16	6.15	6.15
12.2 [V]	6.15	6.15	6.16	6.15	6.16
13.1 [uA]	-0.53	-0.56	-0.56	-0.57	-0.56
13.2 [uA]	-0.00	-0.00	-0.00	-0.00	-0.00
14.1 [uA]	-2.04	-1.90	-1.94	-1.92	-1.89
14.2 [uA]	-0.01	-0.01	-0.01	-0.01	-0.01
15.1 [uA]	-5.89	-5.65	-5.81	-5.66	-5.59
15.2 [uA]	-0.01	-0.01	-0.01	-0.01	-0.01
16.1 [uA]	-11.53	-11.58	-11.90	-11.56	-11.45
16.2 [uA]	-0.01	-0.01	-0.01	-0.01	-0.01
17.1 [uA]	-0.00	-0.00	-0.00	-0.00	-0.00
17.2 [uA]	0.53	0.25	0.28	0.18	0.18
18.1 [uA]	-0.01	-0.01	-0.01	-0.01	-0.01
18.2 [uA]	2.02	1.33	1.41	1.16	1.18
19.1 [uA]	-0.01	-0.02	-0.01	-0.01	-0.01
19.2 [uA]	5.88	4.40	4.63	4.09	4.13
20.1 [uA]	-0.01	-0.01	-0.02	-0.02	-0.01
20.2 [uA]	11.52	9.12	9.56	8.68	8.73
21.1 [uA]	-0.00	-0.00	-0.00	-0.00	-0.01
21.2 [uA]	-0.00	-0.00	-0.00	-0.00	-0.01
22.1 [uA]	-0.00	-0.00	0.00	0.00	0.02
22.2 [uA]	-0.00	-0.00	0.00	0.00	0.02