Total Dose Test
Octal Bus Transceiver 74 ACT 245
Manufactured by Harris Semiconductor

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10 April 2000

1 Tested Device

- Octal Bus Transceiver, 74 ACT 245 from Harris Semiconductor
- Temperature range: $-40°C \ldots +85°C$
- Package: 20-lead plastic SOIC
- Package marks: ACT 245 , H9845 BFHX
- vH&S order 004437/COSIMA-We00, 13 January 2000

1.1 Device Marking

One device irradiated, second device for reference.

Mark	Total Dose
22krad	22 kRad H_2O
ref	non irradiated

2 Radiation Facility

Radiation Facility at ESTEC, Noordwijk, The Netherlands.

Date	2 March 2000	3 March 2000	2 March 2000
Total Dose	5 krad (H_2O)	10 krad (H_2O)	22 kRad (H_2O)
Log File	`d:\data\vh-s5k.txt`	`d:\data\vh-s10k.txt`	`d:\data\vh-s15k.txt`
Device	unbiased		
Project	vH&S		
Dosemeter	Farmer 2670		
Chamber	NE 0.6cc air ionisation type 2571 serial no. 2915		
Dose Rate	24 rad/min (H_2O)		
Test Eng.	Bob Nickson, QCA, ESTEC, Noordwijk		

All pins of all tested devices shorted during irradiation. No annealing was performed after irradiation.

3 Measured Device Parameters

- Current I_{CC} see section 4.
- Threshold voltages V_{IL}, V_{IH} at A1 input see section 5.
- Output Source Resistance R_i at Q1 output see section 6

4 I_{CC} Test

Measurements done on 10th of April 2000, vH&S.

4.1 Test Setup

Pins 2, 3, 4, 5, 6, 7, 8, 9, 10, 19 connected to GND
Pins 11, 12, 13, 14, 15, 16, 17, 18 not connected
Pin 1, 20 connected to $V_{CC} = 5\ V$

DC-Current into Pin 20 measured with digital multimeter.

4.2 Test Results

Device	Total Dose	I_{CC}
22krad	22 kRad H_2O	110 nA
ref	0 kRad H_2O	$\approx$ 2 nA

(current of reference device below sensitivity range)

5 Threshold Voltages Test

Measurements done on 10th of April 2000, vH&S.

5.1 Test Setup

Pins 3, 4, 5, 6, 7, 8, 9, 10, 19 connected to GND
Pins 11, 12, 13, 14, 15, 16, 17 not connected
Pin 1, 20 connected to $V_{CC} = 5\ V$
Pin 2 (A1) connected to variable voltage source 0...5 V
Pin 18 (Q1) connected to a) 10 MΩ load (multimeter), b) 1 kΩ load
Threshold voltage on pin 2 (A1) measured as voltage level on pin 18 (Q1) reaches final High- or Low-condition.

5.2 Test Results

Device	Total Dose	Load Resistance	$V_{IL_{max}}$	$V_{IH_{min}}$
22krad	22 kRad H_2O	10 MΩ	0.891 V	1.386 V
ref	0 kRad H_2O	10 MΩ	1.007 V	1.318 V
22krad	22 kRad H_2O	1 kΩ	0.920 V	1.314 V
ref	0 kRad H_2O	1 kΩ	1.014 V	1.355 V

6 Output Source Resistance Test

Measurements done on 10th of April 2000, vH&S.

6.1 Test Setup

Pins 3, 4, 5, 6, 7, 8, 9, 10, 19 connected to GND
Pins 11, 12, 13, 14, 15, 16, 17 not connected
Pin 1, 20 connected to $V_{CC} = 5,002\ V$
Pin 2 (A1) connected to +5 V
Pin 18 (Q1) connected to 1 kΩ load

Voltage over load on pin 18 measured, source resistance calculated

6.2 Test Results

Device	Total Dose	R_i
ref	0 kRad H_2O	10.02 Ω
22krad	22 kRad H_2O	10.62 Ω