PPM - 91 - 337

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UNISYS

(33)

Interoffice Memorandum

To
C.S. Eveland
Department
Code 311
From
K. Sahu KS
Department
7809
Subject
Radiation Report on ISTP
Common Buy Part No. HCS4538KMSR

PPM-91-337
Date
May 13, 1991
Location
GSFC
Telephone
731-8954
Location
Lanham

cc
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V. Edson
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M. Fowler

The radiation evaluation on HCS4538KMSR was repeated in an attempt to duplicate the latch-up experienced on the previous testing (see PPM-91-004) in January 1991. A brief summary of the test results is provided below.

The total dose testing was performed using a cobalt-60 gamma ray source. During the radiation testing, four parts were irradiated under bias (see Figure 1 for bias configuration), and one part was used as a control sample. The total dose radiation steps were 5, 10, 20, 30, 40, 50, 75, 100, and 200 krads. The dose rate was between 0.3 - 4.2 krads/hour, depending on the total dose level (see Table II for radiation schedule). After each radiation exposure, a functional test was performed immediately after irradiation, while the devices were still in the radiation bias fixture. This test was performed using a bench set-up at the radiation facility (see Figure 1 for more details).

All parts passed the functional tests up to 200 krads; no latch-ups were observed after any total dose exposure.

Any further details about this evaluation can be obtained upon request. If you have any questions, please call me at 301-731-8954.

TABLE I. Part Information

Generic Part Number:	HCS4538KMSR
ISTP Common Buy Part Number:	HCS4538KMSR
ISTP Common Buy Control Number:	374, 374A
Manufacturer:	Harris Corp
Quantity Procured:	87
Lot Date Code:	9025
Quantity Tested:	5
Serial Numbers of Radiation Samples:	3817, 3818, 3835, 3836
Serial Numbers of Control Sample:	3748
Part Function:	Dual Monostable Multivibrator
Part Technology:	CMOS/SOS - Radiation Hard
Package Style:	16-Lead Flat Pack

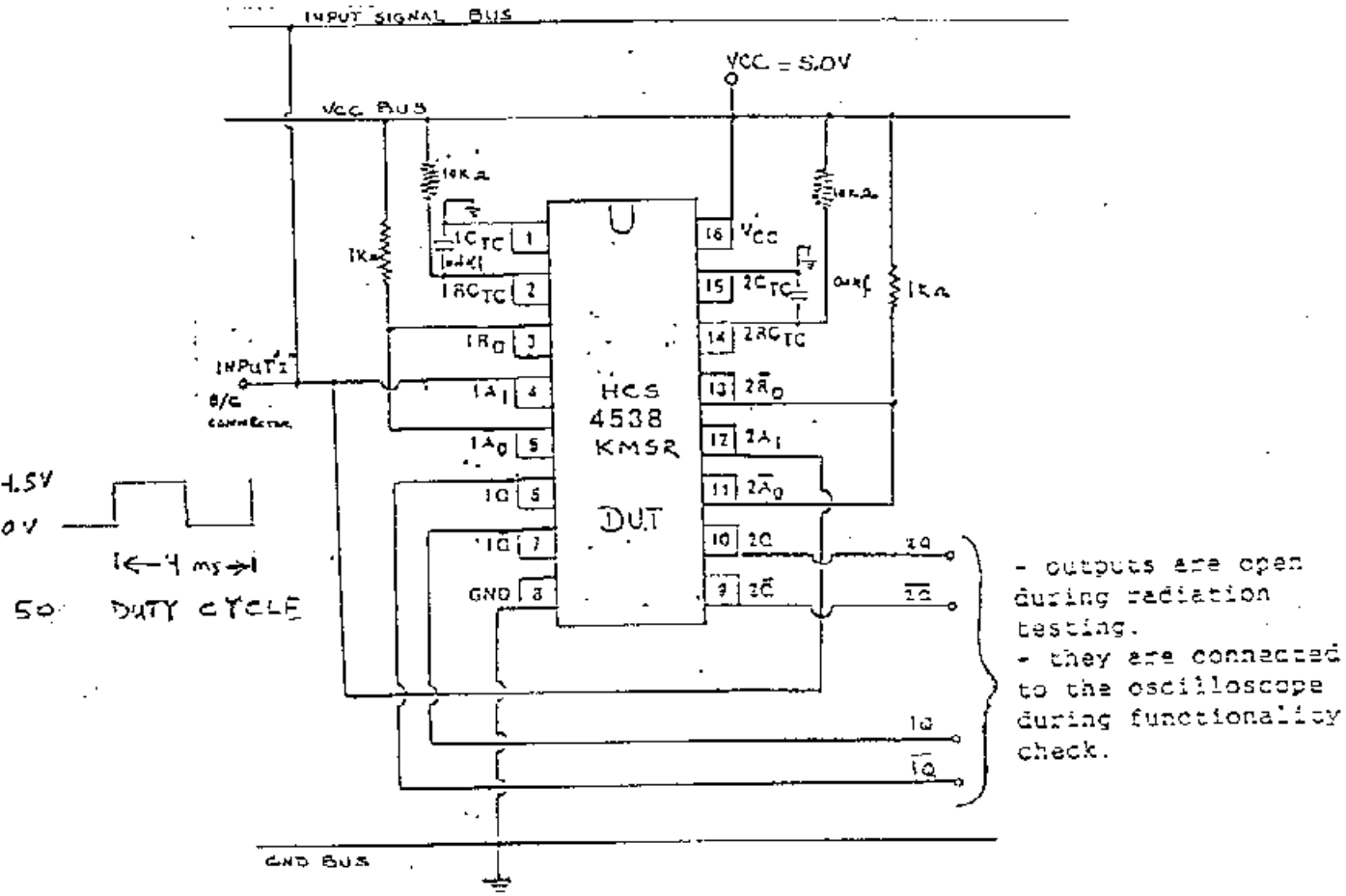
TABLE II. Radiation Schedule

EVENTS	DATE
1) Initial Electrical Measurements	04/17/91
2) 5 krads irradiation @ 278 rads/hr	04/18/91
Post 5 krads Electrical Measurements	04/19/91
3) 10 krads irradiation @ 213 rads/hr	04/19/91
Post 10 krads Electrical Measurements	04/20/91
4) 20 krads irradiation @ 455 rads/hr	04/20/91
Post 20 krads Electrical Measurements	04/21/91
5) 30 krads irradiation @ 426 rads/hr	04/21/91
Post 30 krads Electrical Measurements	04/22/91
6) 40 krads irradiation @ 426 rads/hr	04/22/91
Post 40 krads Electrical Measurements	04/23/91
7) 50 krads irradiation @ 426 rads/hr	04/23/91
Post 50 krads Electrical Measurements	04/24/91
8) 75 krads irradiation @ 1389 rads/hr	04/24/91
Post 75 krads Electrical Measurements	04/25/91
9) 100 krads irradiation @ 1062 rads/hr	04/25/91
Post 100 krads Electrical Measurements	04/26/91
10) 200 krads irradiation @ 4200 rads/hr	04/26/91
Post 200 krads Electrical Measurements	04/27/91

Notes:

- All parts were radiated under bias at the cobalt-60 gamma ray facility at GSFC.
- The functional test was performed on-site at 25°C using the set-up shown in Figure 1.
- Annealing was performed at 25°C under bias.

Figure 1. Radiation Bias Circuit and Bench Set-up for On-site Functional Testing of HCS4538KMSR.



Notes:

1. Use only ceramic capacitors in this set-up. All capacitors and resistors should be 1/4 W, ±10%.

2. During radiation exposures, connect Input "X" to GND. During on-site functional check at the radiation facility, disconnect Input "X" from GND and apply a square wave input (250 kHz @ 4.5V ±0.2V, 50% duty cycle). Monitor output with oscilloscope. Record failures.

3. This test must be performed immediately after radiation exposure - and without removal of DC bias.