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Memorandum

PARAMAX
A Unisys Company

DATE: June 1, 1992 PPM-92-170
TO: J. Lohr/311
FROM: K. Sahu/7809 Ks
SUBJECT: Radiation Report on GGS/WIND/3D PLASMA Project
Part No. MP7623TD/883B (control no.6299)

cc: L. Rabb/406
A. Sharma/311
Library/300.1

A radiation evaluation was performed on the MP7623TD/883B D/A Converter to determine the total dose tolerance of these parts. A brief summary of the test results is provided below. For detailed information, refer to Tables I through IV and Figure 1.

The total dose testing was performed using a cobalt-60 gamma-ray source. During the radiation testing, one part* was 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, 15 and 20 krads (the term rad as used here means rad(Si)). After 20 krads, parts were annealed at +25°C for 168 hours. The dose rate was 0.05 - 0.11 krads/hour (see Table II for radiation schedule). After each radiation exposure and annealing treatment, the part was electrically tested at +25°C according to the test conditions and the specification limits listed in Table III.

The part passed all initial electrical tests and passed all electrical tests throughout all irradiation and annealing steps. No significant degradation was observed in any of the test parameters.

Table IV gives the electrical measurements for the irradiated part after each irradiation exposure and annealing step.

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

*No more parts were available from the requestor.

TABLE I. Part Information

Generic Part Number:	MP7623TD
GGG/WIND/3D PLASMA Part Number:	MP7623TD/883B
Control Number:	6299
Charge Number:	C23768
Manufacturer:	Micro Power Systems
Lot Date Code:	9032
Quantity Tested:	2
Serial Number of Radiation Sample:	66
Serial Number of Control Sample:	65
Part Function:	12-bit D/A Converter
Part Technology:	CMOS
Package Style:	18-pin DIP
Test Engineer:	A. Phung

TABLE II. Radiation Schedule for MP7623TD

EVENTS	DATE
1) INITIAL (PRE-IRRADIATION) ELECTRICAL MEASUREMENT	04/20/92
2) 5- KRAD IRRADIATION (0.11 krads/hour) POST-5-KRAD ELECTRICAL MEASUREMENT	04/20/92 04/22/92
3) 10-KRAD IRRADIATION (0.11 krads/hour) POST-10-KRAD ELECTRICAL MEASUREMENT	04/22/92 04/24/92
4) 15-KRAD IRRADIATION (0.05 krads/hour) POST-15-KRAD ELECTRICAL MEASUREMENT	04/24/92 04/29/92
5) 20-KRAD IRRADIATION (0.05 KRAD/HOUR) POST-20-KRAD ELECTRICAL MEASUREMENT	04/29/92 05/01/92
6) 168 HOURS ANNEALING AT +25°C POST-168-HOUR ELECTRICAL MEASUREMENTS	05/01/92 05/08/92

ALL ELECTRICAL MEASUREMENTS WERE PERFORMED AT +25°C.

PART WAS IRRADIATED AND ANNEALED UNDER BIAS; SEE FIGURE 1.

Table III. Electrical Characteristics of MP7623TD

TESTS PERFORMED @ 25°C

+V_{dd} = 15V, V_{ref} = 10V unless otherwise specified.

Test	Min	Max	Units
+ICC1	0	+2000	uA
GAIN1	-400	+400	m%FS
Linearity	-12.2	+12.2	m%FS
Diff. Lin.	-12.2	+12.2	m%FS
dFS1+	-10	+10	m%FS
IIL	-1	0	uA
IIH	0	-1	uA
IZS1	-10	+10	uA
IZS2	-10	+10	uA
IDD1	0	+100	uA
IDD2	0	+2	mA

TABLE IV: Summary of Electrical Measurements After Total Dose Exposures and Annealing Steps for MP7623TD 1/, 2/

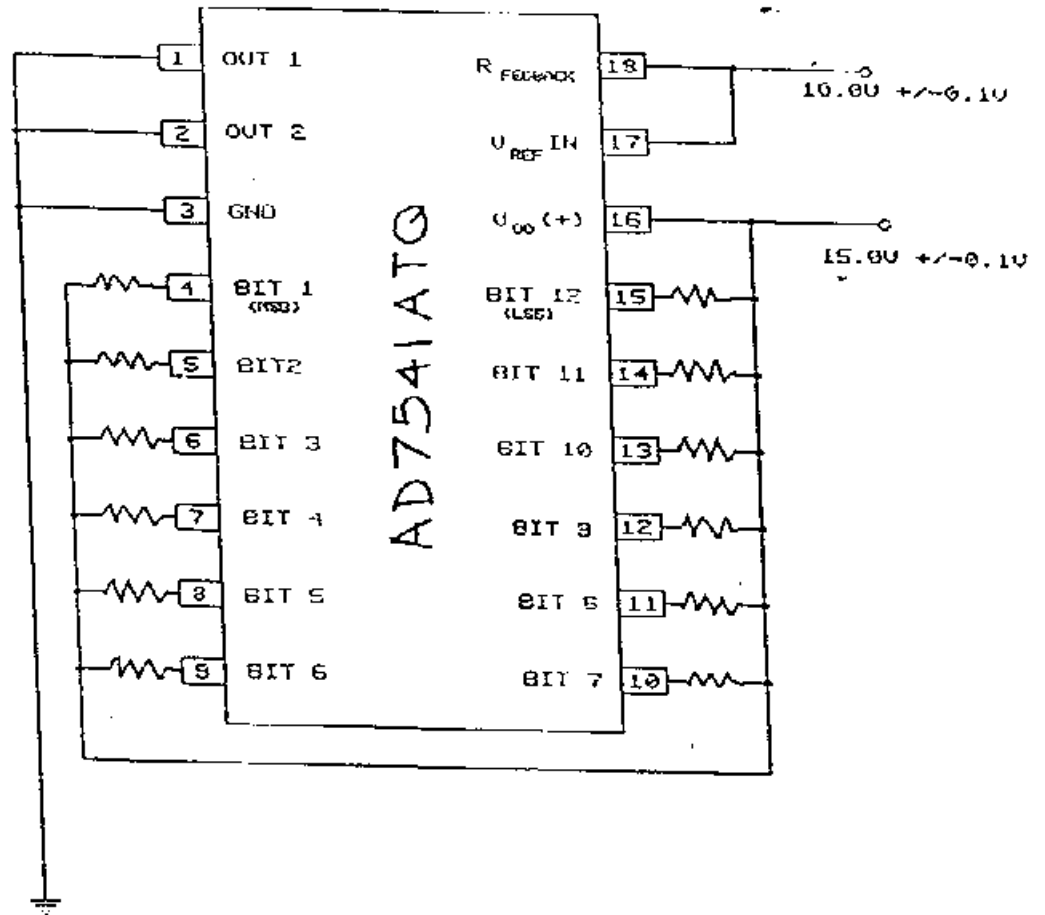
Parameters		Spec. Limits		Total Dose Exposure (krads)					Anneal hours @25°C
		min	max	0 (Pre Rad)	5	10	15	20	
+ICC1	uA	0	2000	228.0	235.9	234.1	236.5	233.5	211.2
GAIN1	m%FS	-400	400	57.24	55.04	78.92	91.49	81.43	17.93
LIN	m%FS	-12.2	12.2	6.29	6.29	6.92	6.60	6.29	10.06
DIFF LIN	m%FS	-12.2	12.2	5.98	5.66	5.97	5.66	5.97	6.92
dFS1+	m%FS	-	10	1.20	0.30	0.30	0.40	0.30	0.30
IIL	uA	-1	0	0	0	0	0	0	0
IIH	uA	0	-1	0	0	0	0	0	0
IZS1	nA	-10	10	0	0	0	0	0	0
IZS2	nA	-10	10	0	0	0	0	0	0
IDD1	uA	-	100	0	0	0	0	0	0
IDD2	mA	-	2	0	0	0	0	0	0

Notes:

1/ Values in this table are based on a single radiation sample, therefore, no mean or standard deviation is shown.

2/ The control sample remained constant throughout the testing and is not included in this table.

Figure 1. Radiation Bias Circuit for AD7541ATQ



* ALL R = 1K Ω , $\frac{1}{2}$ W, 5%