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Interoffice Memorandum

To
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Department
Code 310.1
From
K. Sahu *KS*
Department
7809
Subject
Radiation Report on ISTP
Non-Common Buy Part No. JTXV1N759A-1

PPM-91-123
Date
February 25, 1991
Location
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Telephone
731-8954
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A radiation evaluation was performed on JTXV1N759A-1 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, eight parts were irradiated under bias (see Figure 1 for bias configuration), and two parts were used as control samples. The total dose radiation steps were 25, 50, 75 and 100 krads. After 100 krads, parts were annealed at 25°C for 24 and 192 hours, and then the irradiation was continued to 200 and 300 krads (cumulative). The dose rate was between 367 - 5000 rads/hour, depending on the total dose level (see Table II for radiation schedule). After each radiation exposure and annealing treatment, parts were electrically tested according to the test conditions and the specification limits listed in Table III.

All parts passed all tests on irradiation up to 300 krads, without any significant degradation in any of the electrical parameters.

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

TABLE I. Part Information

Generic Part Number:	1N759A-1
ISTP Non-Common Buy Part Number:	JTXV1N759A-1 (MIL-S-19500/127J)
ISTP Non-Common Buy Control Number:	2018
Manufacturer:	BKC International
Quantity Procured:	68
Lot Date Code:	9008
Quantity Tested:	10
Serial Numbers of Radiation Samples:	3,4,5,6,7,8,9,10
Serial Numbers of Control Samples:	1, 2
Part Function:	Zener Diode
Part Technology:	Bipolar
Package Style:	DO-7

TABLE II. Radiation Schedule

EVENTS	DATE
1) Initial Electrical Measurements	01/17/91
2) 25 krads irradiation @ 1250 rads/hr	01/17/91
Post 25 krads Electrical Measurements	01/18/91
3) 50 krads irradiation @ 367 rads/hr	01/18/91
Post 50 krads Electrical Measurements	01/21/91
4) 75 krads irradiation @ 1250 rads/hr	01/21/91
Post 75 krads Electrical Measurements	01/22/91
5) 100 krads irradiation @ 1250 rads/hr	01/22/91
Post 100 krads Electrical Measurements	01/23/91
6) 24 hrs annealing	01/23/91
Post 24 hr Electrical Measurements	01/24/91
7) 192 hrs annealing	01/24/91
Post 192 hr Electrical Measurements	01/31/91
8) 200 krads irradiation @ 5000 rads/hr	01/31/91
Post 200 krads Electrical Measurements	02/01/91
9) 300 krads irradiation @ 1470 rads/hr	02/01/91
Post 300 krads Electrical Measurements	02/04/91

Notes:

- 1) All parts were radiated under bias at the cobalt-60 gamma ray facility at GSFC.
- 2) All electrical measurements were performed off-site at 25°C.
- 3) Annealing performed at 25°C under bias.

Table III. Electrical Characteristics of JTXV1N759A-1

<u>Test</u>	<u>Conditions</u>	<u>MIN</u>	<u>MAX</u>
I_R	$V_R = 9V$	0uA	1.0
V_F	$I_F = 200mA$	0V	1.5V
V_{Z1}	$I_{Z1} = 250uA$	11.0V	12.6V
V_{Z2}	$I_{Z2} = 20mA$	11.4V	12.6V

TABLE IV: Summary of Electrical Measurements after
 Total Dose Exposures and Annealing for JTXVIN759A-1 1/, 2/

Parameters	Units	Spec. Limits		Initials	Total Dose Exposure (krads)								Anneal		Total Dose Exposure (krads)				
					25		50		75		100		192 hrs		200		300		
					mean	sd	mean	sd	mean	sd	mean	sd	mean	sd	mean	sd	mean	sd	
IR	uA	0	1.0	0	0	0	0	0	0	.01	0	.01	0	.01	0	.01	0	.01	0
VF	V	0	1.5	0.9	0	0.9	0	0.9	0	0.9	0	0.9	0	0.9	0	0.9	0	0.9	0
VZ1	V	11.0	12.6	11.4	.05	11.4	.05	11.4	.05	11.4	.05	11.4	.05	11.4	0	11.4	0	11.4	0
VZ2	V	11.4	12.6	12.1	0.1	12.1	0	12.1	0	12.1	0	12.1	0	12.1	0	12.1	0	12.1	0

Notes:

1/ The mean and standard deviation values were calculated over the eight parts irradiated in this testing. The control samples remained constant throughout the testing and are not included in this table.

2/ Post 24-hour anneal electrical measurements are not provided in this table. This data is available and can be obtained upon request.

Figure 1. Radiation Bias Circuit for JTXV1N759A-1

