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DATE: July 7, 1994 PPM-94-014

TO: S. Pszcolka/311.1
FROM: K. Sahu/300.1
SUBJECT: Radiation Report on ISTP/SOHO/CELIAS
Part No. CD54HC4053F/3A (54HC4053)
Control No. 10468

cc: A. Sharma/311
Library/300.1

A radiation evaluation was performed on CD54HC4053 (Analog Multiplexer/Demultiplexer) 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, two parts were irradiated under bias (see Figure 1 for bias configuration), and one part was used as a control sample. The total dose radiation levels were 2, 5, 10, 15, 20 and 50 krads*. The dose rate was between .074 and 1.50 krads/hour, depending on the total dose level (see Table II for radiation schedule). After the 50 krad irradiation, parts were annealed at 25°C for 168 hours, after which the parts were annealed at 100°C for 168 hours. After each radiation exposure and annealing treatment, parts were electrically tested according to the test conditions and the specification limits** listed in Table III. Electrical tests included six functional tests at 1.0 MHz; two at V_{cc} = 2.0 V,, two at V_{cc} = 4.5 V and two at V_{cc} = 6.0 V.

All parts passed initial electrical measurements. Both irradiated parts passed all electrical and functional tests up to and including the 2 krad irradiation level. At the 5 krad irradiation level, both irradiated parts (S/N 51 and 52) exceeded the maximum specification limits of ± 2 µA for IIZON_2, with readings of -2.99 µA and -3.38 µA, respectively. After the 10 krad irradiation, both irradiated parts exceeded the maximum specification limit of ±1 µA for IIZON_1, with readings of -3.17 µA and -3.96µA and continued to exceed the maximum specification limit for IIZON_2, with readings of -8.58 and -10.16 µA. After the 15 krad irradiation, the same failures continued, with readings of -6.57 µA and -8.40 µA for IIZON_1 and -13.73 µA and -16.66 µA for IIZON_2. In addition, S/N 52 exceeded the maximum specification limit of ±1 µA for IIZOFF_1, with a reading of 1.41 µA. After the 20 krad irradiation, both irradiated parts exceededed the specification limits of ±1 µA for IIZON_1 and IIZOFF_1, and ±2 µA for IIZON_2 and IIZOFF_2, with maximum readings of -7.54, 3.37, -14.85 and -2.74 µA, respectively. After the 50 krad irradiation, the same failures continued, with readings of 68.40, 68.10, -36.84 and -50.47 µA, respectively. In addition, at the 50 krad level, both parts failed functional test # 4 (Vcc = 2.0 V).

After annealing for 168 hours at 25°C, both irradiated parts continued to fail IIZON_1, IIZOFF_1, IIZON_2 and IIZOFF_2, with maximum readings of 243µA, 233µA, 12.51µA and 15.08µA. Both irradiated parts passed all functional tests at this level. Both parts passed all other electrical tests, including the functional tests at 4.5V and 6V, throughout all irradiation and annealing steps.

After annealing for 168 hours at 100°C, no rebound effects were observed.

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*The term rads, as used in this document, means rads(silicon). All radiation levels cited are cumulative.
**These are manufacturer's non-irradiation data specification limits. No post-irradiation limits were provided by the manufacturer at the time these tests were performed.

Table IV provides a summary of the functional test results, as well as the mean and standard deviation values for each parameter after different irradiation exposures and annealing steps.

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:	54HC4053
ISTP/SOHO/CELIAS Part Number.	CD54HC4053F/3A
ISTP/SOHO/CELIAS Control Number:	10468
Charge Number:	C42954
Manufacturer:	Harris
Lot Date Code:	9332
Quantity Tested:	3
Serial Number of Control Sample:	50
Serial Numbers of Radiation Samples:	51, 52
Part Function:	Analog Multiplexer/Demultiplexer
Part Technology:	CMOS
Package Style:	16-pin DIP
Test Equipment:	Sentry S-50
Test Engineer:	T. Scharer

TABLE II. Radiation Schedule for 54HC4053

EVENTS	DATE
1) INITIAL ELECTRICAL MEASUREMENTS	04/22/94
2) 2 KRAD IRRADIATION (0.10 KRADS/HOUR)	05/02/94
POST-2 KRAD ELECTRICAL MEASUREMENT	05/03/94
3) 5 KRAD IRRADIATION (0.17 KRADS/HOUR)	05/03/94
POST-5 KRAD ELECTRICAL MEASUREMENT	05/04/94
4) 10 KRAD IRRADIATION (0.25 KRADS/HOUR)	05/04/94
POST-10 KRAD ELECTRICAL MEASUREMENT	05/05/94
5) 15 KRAD IRRADIATION (0.25 KRADS/HOUR)	05/05/94
POST-15 KRAD ELECTRICAL MEASUREMENT	05/06/94
6) 20 KRAD IRRADIATION (0.074 KRADS/HOUR)	05/06/94
POST-20 KRAD ELECTRICAL MEASUREMENT	05/09/94
7) 50 KRAD IRRADIATION (1.50 KRADS/HOUR)	05/09/94
POST-50 KRAD ELECTRICAL MEASUREMENT	05/17/94

(The 50 krad irradiation was completed on 05/10/94. The parts were stored under bias at 25°C until being tested on 05/17/94, due to difficulties with test equipment.)

8) 168-HOUR ANNEALING @25°C	05/17/94
POST-168 HOUR ANNEAL ELECTRICAL MEASUREMENT	06/01/94

(Parts were stored under bias at 25°C for approximately 360 hours due to test equipment problems.)

9) 168-HOUR ANNEALING @100°C**	06/01/94
POST-168 HOUR ANNEAL ELECTRICAL MEASUREMENT	06/08/94

PARTS WERE IRRADIATED AND ANNEALED UNDER BIAS; SEE FIGURE 1.

*High temperature annealing is performed to accelerate long term time dependent effects (TDE), namely, the "rebound" effect due to the growth of interface states after the radiation exposure. For more information on the need to perform this test, refer to MIL-STD-883D, Method 1019, Para. 3.10.1.

TABLE IV: Summary of Electrical Measurements after Total Dose Exposures and Annealing for CD54HC4053 /1

				Total Dose Exposure (krads)														Annealing			
		Spec. Lim./3		Initials		2		5		10		15		20		50		168 hrs @25°C		168 hrs @100°C	
Parameters/2		min	max	mean	sd	mean	sd	mean	sd	mean	sd	mean	sd	mean	sd	mean	sd	mean	sd	mean	sd
R_ON_1_A	Ohms	0	160	72.5	6.0	75.1	5.0	77.6	4.3	76.7	4.7	77.6	6.0	77.6	7.3	79.2	4.9	81.7	9.9	82.6	4.3
R_ON_1_B	Ohms	0	160	86.3	1.1	86.5	1.3	86.0	1.6	85.6	1.4	85.4	2.4	86.5	3.1	81.9	1.7	79.5	8.4	106	14
R_ON_2_A	Ohms	0	120	50.1	1.8	45.0	5.0	46.7	4.7	48.4	3.7	49.2	4.9	47.5	6.0	48.4	3.7	45.1	5.0	46.7	4.7
R_ON_2_B	Ohms	0	120	50.1	1.8	52.6	4.4	52.5	4.3	52.5	4.3	54.2	4.9	54.2	4.9	50.1	1.8	55.1	5.0	61.7	3.7
R_PEAK_1	Ohms	0	200	118	3.5	118	5.6	120	4.5	118	4.0	118	3.9	118	2.8	115	3.3	124	12	142	17
R_PEAK_2	Ohms	0	130	74.7	4.8	75.0	7.0	77.1	5.5	77.0	4.9	77.4	5.3	78.3	3.9	77.4	5.5	76.2	4.2	85.9	2.4
IIH	uA	-1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IIL	uA	-1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IIZON_1_A	uA	-1	1	0	0	0	0	0	0	0.02	.02	0.47	.51	1.17	1.3	24.2	25	1.7E4	3.7E4	0	0
IIZON_1_B	uA	-1	1	0	0	0	0	-0.21	.22	-1.54	1.6	-3.23	3.3	-2.69	2.7	-3.17	4.5	-42.2	36	-0.14	.16
IIZON_2_A	uA	-2	2	0	0	0	0	0	0	0.01	.01	0.16	.23	0.35	.51	14.0	15	4.77	5.3	0	0
IIZON_2_B	uA	-2	2	0	0	-0.06	.06	-1.45	1.5	-4.19	4.2	-6.99	6.5	-6.52	5.0	-18.5	7.6	-1.78	6.4	-2.55	2.7
IIZOFF_1	uA	-1	1	0	0	0	0	0	0	0.03	.03	0.87	.58	1.35	1.4	22.5	24	8418	2.8E4	0	.01
IIZOFF_1	uA	-1	1	0	0	0	0	0	0	-0.02	.02	-0.41	.42	-0.96	.99	-15.1	16	-109	108	0	0
IIZOFF_2	uA	-2	2	0	0	0	0	0	0	0.02	.02	0.25	.26	0.56	.57	11.3	12	4.39	4.9	0	0
IIZOFF_2	uA	-2	2	0	0	0	0	0	0	-0.02	.02	-0.45	.46	-1.05	1.1	-16.9	18	1.72	1.9	0	0
ICCH_1	uA	0	160	0	0	0	0	1.23	.18	8.96	1.4	19.9	3.4	18.5	3.5	100	0	43.2	8.3	0.74	.20
ICCL_1	uA	0	160	0	0	0	0	3.58	.38	23.4	2.6	48.8	5.5	43.6	6.6	134	34	64.1	12	2.68	.42
ICCH_2	uA	0	320	0	0	0.79	.07	14.6	1.3	36.8	4.2	54.3	7.5	44.7	7.1	134	34	70.5	14	9.15	2.0
ICCL_2	uA	0	320	0	0	1.41	.19	25.2	2.2	65.5	6.7	102	11	87.5	12	202	34	110	20	25.0	5.0
TPHL_2V	nsec	0	60	21.8	.77	21.3	.72	20.6	.64	19.5	.65	18.5	.60	17.4	.64	13.1	3.1	6.79	4.5	13.8	2.4
TPLH_2V	nsec	0	60	16.2	2.1	16.2	1.8	16.3	1.4	16.3	1.1	16.2	1.0	16.1	1.2	15.7	3.2	16.1	4.2	14.6	5.9
TPHL_4P5V	nsec	0	12	9.62	.47	9.66	.47	9.71	.47	9.79	.50	9.89	.57	9.97	.55	10.2	.73	11.0	.88	12.1	.94
TPLH_4P5V	nsec	0	12	7.48	.65	7.53	.64	7.59	.64	7.61	.62	7.65	.62	7.70	.61	7.79	.59	8.46	.76	9.17	1.3
TPHL_6V	nsec	0	10	7.92	.53	7.98	.52	8.03	.51	8.10	.53	8.19	.59	8.25	.55	8.45	.70	9.28	.80	9.80	.51
TPLH_6V	nsec	0	10	6.81	.24	6.86	.27	6.92	.25	6.95	.24	6.98	.25	7.01	.23	7.03	.19	7.44	.45	7.90	.84

TABLE IV (Cont.): Summary of Electrical Measurements after Total Dose Exposures and Annealing for CD54HC4053 /1

				Total Dose Exposure (krads)														Annealing			
		Spec. Lim./3		Initials		2		5		10		15		20		50		168 hrs @25°C		168 hrs @100°C	
Parameters		min	max	mean	sd	mean	sd	mean	sd	mean	sd	mean	sd	mean	sd	mean	sd	mean	sd	mean	sd
TPH2_2V	nsec	0	210	133	.1.5	131	1.6	1.7E5	3.7E5	125	2.1	121	3.2	116	6.1	113	16	161	17	115	4.7
TPL2_2V	nsec	0	210	71.5	.93	71.8	1.1	72.5	1.5	73.6	2.2	74.8	2.6	76.6	3.0	94.1	7.4	161	9.6	3.3E5	4.7E5
TPH2_4P5V	nsec	0	210	33.0	0.67	32.8	.70	32.7	.70	32.5	.68	32.3	.70	32.1	.83	31.3	1.8	29.8	2.0	32.4	.73
TPL2_4P5V	nsec	0	42	32.0	.50	32.0	.50	32.0	.53	32.1	.62	32.2	.58	32.1	.72	33.5	.78	35.7	.61	31.9	2.4
TPH2_6V	nsec	0	42	24.5	.76	24.4	.74	24.3	.74	24.2	.76	24.1	.78	24.0	.83	23.7	.97	23.4	1.0	24.7	.48
TPL2_6V	nsec	0	36	23.9	.44	23.8	.45	23.8	.49	23.9	.48	24.0	.52	23.9	.54	24.7	.61	26.0	.48	23.8	1.8
TPZH_2V	nsec	0	36	73.9	1.3	73.9	1.5	74.0	1.7	74.8	2.5	76.7	3.3	80.7	4.3	123	18	272	54	169	21
TPZL_2V	nsec	0	220	83.0	1.4	82.6	1.5	82.0	1.7	82.2	2.4	83.5	3.2	87.1	4.2	1.7E5	3.7E5	263	38	3.3E5	4.7E5
TPZH_4P5V	nsec	0	220	19.5	.37	19.5	.36	19.5	.35	19.6	.40	19.7	.42	20.0	.48	21.5	1.4	26.0	3.0	25.0	1.3
TPZL_4P5V	nsec	0	44	20.2	.37	20.3	.32	20.3	.33	20.4	.31	20.4	.33	20.6	.34	20.9	.68	20.5	.22	26.8	1.6
TPZH_6V	nsec	0	44	15.7	.34	15.7	.33	15.8	.34	15.8	.34	15.9	.33	16.1	.37	17.0	.82	19.1	1.6	18.8	.82
TPZL_6V	nsec	0	37	15.6	.29	15.6	.28	15.6	.27	15.6	.27	15.6	.23	15.7	.23	15.4	.16	14.9	.17	19	.94
FUNC1, 2.0V, 1 MHz		-	-	PASS		PASS		PASS		PASS		PASS		PASS		PASS		PASS		PASS	
FUNC2, 4.5V, 1 MHz		-	-	PASS		PASS		PASS		PASS		PASS		PASS		PASS		PASS		PASS	
FUNC3, 6.0V, 1 MHz		-	-	PASS		PASS		PASS		PASS		PASS		PASS		PASS		PASS		PASS	
FUNC4, 2.0V, 1 MHz		-	-	PASS		PASS		PASS		PASS		PASS		PASS		FAIL		PASS		PASS	
FUNC5, 4.5V, 1 MHz		-	-	PASS		PASS		PASS		PASS		PASS		PASS		PASS		PASS		PASS	
FUNC6, 6.0V, 1 MHz		-	-	PASS		PASS		PASS		PASS		PASS		PASS		PASS		PASS		PASS	

1/ The mean and standard deviation values were calculated over the three parts irradiated in this testing. The control sample remained constant throughout the testing and is not included in this table.
2/ In the functional tests, "PASS" means that all samples passed this functional test at this radiation or annealing level, "FAIL" means that all samples failed this test at this radiation or annealing level, and "nP/mF" means that n samples passed at this level and m samples failed at this level.
3/ These are manufacturer's non-irradiated data sheet specification limits. No post-irradiation limits were provided by the manufacturer at the time the tests were performed.

Table III. Electrical Characteristics of 54HC4053

FUNCTIONAL TESTS PERFORMED

PARAMETER	VCC	VIL	VIH	CONDITIONS	PINS	-55C < TA < +125C
AO,A1,BO,B1,CO,C1 ARE DRIVEN AS INPUTS; AN,BN,CN ARE COMPARED AS OUTPUTS						
FUNCT 1	2.0V	0.3V	1.5V	FREQ=1.000MHZ	ALL I/O	VOL<1.0V , VOH>1.0V
FUNCT 2	4.5V	0.9V	3.15V	FREQ=1.000MHZ	ALL I/O	VOL<2.25V, VOH>2.25V
FUNCT 3	6.0V	1.2V	4.2V	FREQ=1.000MHZ	ALL I/O	VOL<3.0V , VOH>3.0V
AN,BN,CN ARE DRIVEN AS INPUTS; AO,A1,BO,B1,CO,C1 ARE COMPARED AS OUTPUTS						
FUNCT 4	2.0V	0.3V	1.5V	FREQ=1.000MHZ	ALL I/O	VOL<1.0V , VOH>1.0V
FUNCT 5	4.5V	0.9V	3.15V	FREQ=1.000MHZ	ALL I/O	VOL<2.25V, VOH>2.25V
FUNCT 6	6.0V	1.2V	4.2V	FREQ=1.000MHZ	ALL I/O	VOL<3.0V , VOH>3.0V

DC PARAMETRIC TESTS PERFORMED

PARAMETER	VCC	VEE	VIL	VIH	CONDITIONS	PINS	+25C
R_ON_1_A	4.5V	0V	0.9V	3.15V	VIS=4.5V IO=1MA	OUTS	>+0.00HMS, <+160OHMS
R_ON_1_B	4.5V	0V	0.9V	3.15V	VIS=0.0V IO=1MA	OUTS	>+0.00HMS, <+160OHMS
R_ON_2_A	4.5V	-4.5V	0.9V	3.15V	VIS=4.5V IO=1MA	OUTS	>+0.00HMS, <+120OHMS
R_ON_2_B	4.5V	-4.5V	0.9V	3.15V	VIS=-4.0V IO=1MA	OUTS	>+0.00HMS, <+120OHMS

PARAMETER	VCC	VEE	VIL	VIH	CONDITIONS	PINS	-55C,+125C
R_ON_1_A	4.5V	0V	0.9V	3.15V	VIS=4.5V IO=1MA	OUTS	>+0.00HMS, <+240OHMS
R_ON_1_B	4.5V	0V	0.9V	3.15V	VIS=0.0V IO=1MA	OUTS	>+0.00HMS, <+240OHMS
R_ON_2_A	4.5V	-4.5V	0.9V	3.15V	VIS=4.5V IO=1MA	OUTS	>+0.00HMS, <+180OHMS
R_ON_2_B	4.5V	-4.5V	0.9V	3.15V	VIS=-4.0V IO=1MA	OUTS	>+0.00HMS, <+180OHMS

PARAMETER	VCC	VEE	VIL	VIH	CONDITIONS	PINS	+25C
R_PEAK_1	4.5V	0V	0.9V	3.15V	IO=1MA	OUTS	>+0.00HMS, <+200OHMS
					VIS=0V TO 4.5V IN 0.5V INCREMENTS		
R_PEAK_2	4.5V	-4.5	0.9V	3.15V	IO=1MA	OUTS	>+0.00HMS, <+130OHMS
					VIS=-4.0V TO 4.5V IN 0.5V INCREMENTS		

PARAMETER	VCC	VEE	VIL	VIH	CONDITIONS	PINS	-55C < TC < +125C
R_PEAK_1	4.5V	0V	0.9V	3.15V	IO=1MA	OUTS	>+0.00HMS, <+300OHMS
					VIS=0V TO 4.5V IN 0.5V INCREMENTS		
R_PEAK_2	4.5V	-4.5	0.9V	3.15V	IO=1MA	OUTS	>+0.00HMS, <+195OHMS

Table III (Cont.) Electrical Characteristics of 54HC4053

VIS=-4.0V TO 4.5V IN 0.5V INCREMENTS

PARAMETER	VCC	VIS		CONDITIONS	PINS	-55C < TC < +125C
IIH	6.0V	0.0V	6.0V	VIN = 6.0V	INS	>-1UA , <+1UA
IIL	6.0V	0.0V	6.0V	VIN = 0.0V	INS	>-1UA , <+1UA

PARAMETER	VCC	VEE	VIL	VIH	CONDITIONS	PINS	-55C < TC < +125C
ENABLE IS LOGIC ZERO							
IIZON_1_A	6.0V	0.0V	1.2V	4.2V	VIS=6.0V,NO LOAD	INS	>-1UA , <+1UA
IIZON_1_B	6.0V	0.0V	1.2V	4.2V	VIS=0.0V,NO LOAD	INS	>-1UA , <+1UA
IIZON_2_A	5.0V	-5.0V	0.0V	5.0V	VIS=5.0V,NO LOAD	INS	>-2UA , <+2UA
IIZON_2_B	5.0V	-5.0V	0.0V	5.0V	VIS=-5.0V,NO LOAD	INS	>-2UA , <+2UA

PARAMETER	VCC	VEE	VIL	VIH	CONDITIONS	PINS	-55C < TC < +125C
ENABLE IS LOGIC ONE							
IIZON_1_A	6.0V	0.0V	1.2V	4.2V	VIS=6.0V,VOS=0.0V	INS	>-1UA , <+1UA
IIZON_1_B	6.0V	0.0V	1.2V	4.2V	VIS=0.0V,VOS=6.0V	INS	>-1UA , <+1UA
IIZON_2_A	5.0V	-5.0V	0.0V	5.0V	VIS=5.0V,VOS=-4.0V	INS	>-2UA , <+2UA
IIZON_2_B	5.0V	-5.0V	0.0V	5.0V	VIS=-5.0V,VOS=-5.0V	INS	>-2UA , <+2UA

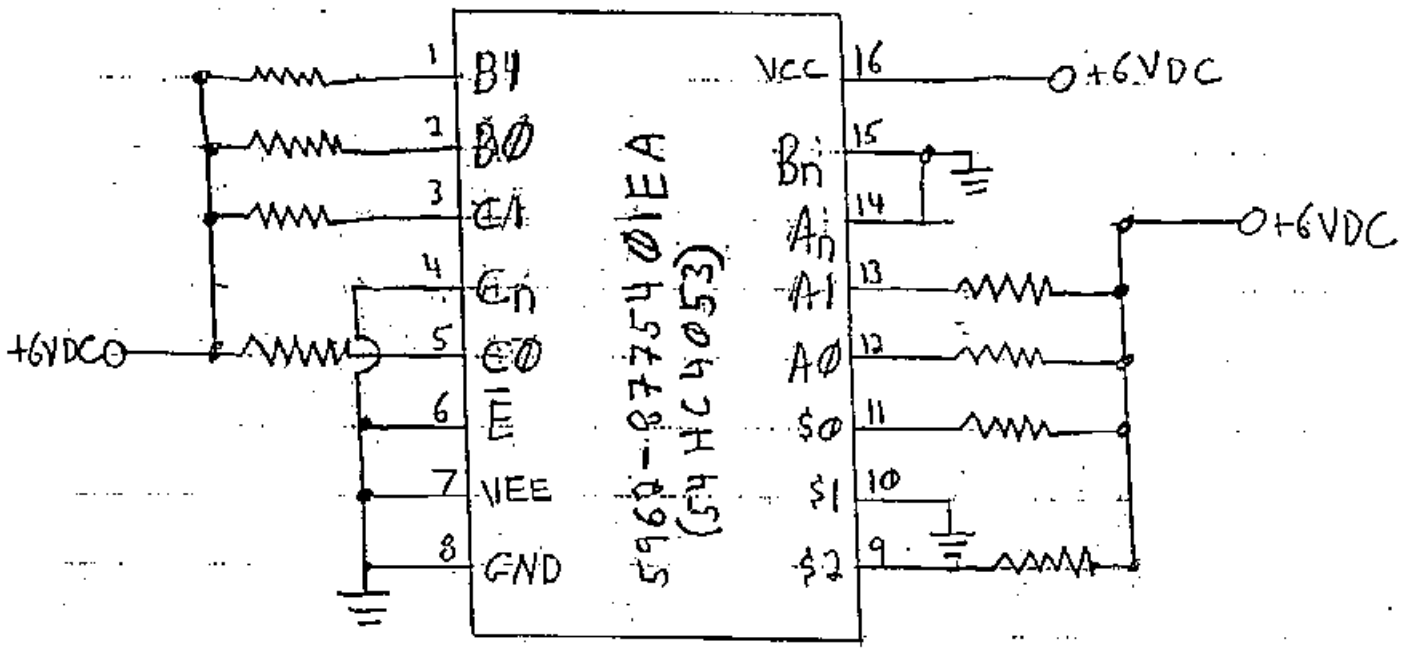
PARAMETER	VCC	VEE	VIL	VIH	CONDITIONS	PINS	-55C < TC < +125C
PINS DRIVEN HIGH/LOW ARE CONTROL LOGIC AND AN,BN,CN							
ICCH_1	6.0V	0.0V	0.0V	6.0V	VINS= 6.0V	VCC	>+0.0MA , <+160UA
ICCL_1	6.0V	0.0V	0.0V	6.0V	VINS= 0.0V	VCC	>+0.0MA , <+160UA
ICCH_2	5.0V	-5.0V	0.0V	5.0V	VINS= 5.0V	VCC	>+0.0MA , <+320UA
ICCL_2	5.0V	-5.0V	0.0V	5.0V	VINS= 0.0V	VCC	>+0.0MA , <+320UA

PARAMETER	VCC	VEE	VIL	VIH	CONDITIONS	PINS	+25C
TPHL_2V	2.0V	0.0V	0.0V	2.0V	LOAD=1MA	SW IN TO OUT	>+0.0NS , <+60NS
TPLH_2V	2.0V	0.0V	0.0V	2.0V	LOAD=1MA	SW IN TO OUT	>+0.0NS , <+60NS
TPHL_4P5	4.5V	0.0V	0.0V	4.5V	LOAD=1MA	SW IN TO OUT	>+0.0NS , <+12NS
TPLH_4P5	4.5V	0.0V	0.0V	4.5V	LOAD=1MA	SW IN TO OUT	>+0.0NS , <+12NS
TPHL_6V	6.0V	0.0V	0.0V	6.0V	LOAD=1MA	SW IN TO OUT	>+0.0NS , <+10NS
TPLH_6V	6.0V	0.0V	0.0V	6.0V	LOAD=1MA	SW IN TO OUT	>+0.0NS , <+10NS

PARAMETER	VCC	VEE	VIL	VIH	CONDITIONS	PINS	+25C
TPHZ_2V	2.0V	0.0V	0.0V	2.0V	LOAD=1MA	EN TO OUT	>+0.0NS , <+210NS
TPLZ_2V	2.0V	0.0V	0.0V	2.0V	LOAD=1MA	EN TO OUT	>+0.0NS , <+210NS
TPHZ_4P5	4.5V	0.0V	0.0V	4.5V	LOAD=4.5MA	EN TO OUT	>+0.0NS , <+42NS
TPLZ_4P5	4.5V	0.0V	0.0V	4.5V	LOAD=4.5MA	EN TO OUT	>+0.0NS , <+42NS
TPHZ_6V	6.0V	0.0V	0.0V	6.0V	LOAD=6MA	EN TO OUT	>+0.0NS , <+36NS
TPLZ_6V	6.0V	0.0V	0.0V	6.0V	LOAD=6MA	EN TO OUT	>+0.0NS , <+36NS

PARAMETER	VCC	VEE	VIL	VIH	CONDITIONS	PINS	+25C
TPZH_2V	2.0V	0.0V	0.0V	2.0V	LOAD=2MA	EN TO OUT	>+0.0NS , <+220NS
TPZL_2V	2.0V	0.0V	0.0V	2.0V	LOAD=2MA	EN TO OUT	>+0.0NS , <+220NS
TPZH_4P5	4.5V	0.0V	0.0V	4.5V	LOAD=4.5MA	EN TO OUT	>+0.0NS , <+44NS
TPZL_4P5	4.5V	0.0V	0.0V	4.5V	LOAD=4.5MA	EN TO OUT	>+0.0NS , <+44NS
TPZH_6V	6.0V	0.0V	0.0V	6.0V	LOAD=6MA	EN TO OUT	>+0.0NS , <+37NS
TPZL_6V	6.0V	0.0V	0.0V	6.0V	LOAD=6MA	EN TO OUT	>+0.0NS , <+37NS

Figure 1. Radiation Bias Circuit for 54HC4053



1) V^{CC} = +6.0 VDC ± 600 mV

2) All R = 6.2 k_ ± 10 %, 1/4 W (minimum).