

CRATER FLIGHT DETECTORS
THICKNESS: 140 MICRONS
40 DEG.C BURN-IN 168 HOURS AT 32 VOLTS
Leakage current Measurements

TIME		0 HOURS	24 HOURS	48 HOURS	72 HOURS	96 HOURS	168 HOURS
CALIB	CHAMBER T	39.8	39.9	41	41.5	40.1	40
INDICATE	CHAMBER T	41.1	41.1	39.9	41.7	41.1	41
DEVICE NO	SECTOR	0 HOURS	24 HOURS	48 HOURS	72 HOURS	96 HOURS	168 HOURS

SPEC @ 40 DEG.C (THEORETICAL LEAKAGE DOUBLES EVERY 7 DEG.C) ACTIVE AREA = 2400 nA GUARD = 1600 nA)

SPEC @ 20 DEG.C MAIN AREA = 300nA AND GUARD RING = 200nA AT DEPLETION VOLTAGE

DEVICE NO	SECTOR	0 HOURS	24 HOURS	48 HOURS	72 HOURS	96 HOURS	168 HOURS	Change
D008	AA	880	870	850	890	892	875	-1%
D008	GR	750	745	740	745	745	750	0%
D010	AA	870	870	870	890	850	870	0%
D010	GR	730	730	730	770	740	745	2%
D007	AA	1010	1000	990	1160	1111	1010	0%
D004	GR	740	730	725	740	820	750	1%
D009	AA	825	820	810	820	870	820	-1%
D009	GR	680	675	670	680	730	680	0%
D003	AA	880	879	870	880	850	870	-1%
D003	GR	620	625	620	980	740	700	13%
D001	AA	840	826	830	1050	860	845	1%
D001	GR	660	659	650	930	720	740	12%
D002	AA	700	710	680	1100	680	670	-4%
D002	GR	520	530	610	1030	600	620	19%
D005	AA	800	790	765	830	850	840	5%
D004	GR	600	620	640	800	740	680	13%
D006	AA	780	778	790	890	860	785	1%
D007	GR	650	642	625	830	730	730	12%
D006	AA	800	790	780	830	790	785	-2%
D005	GR	630	624	625	680	730	720	14%

CRATER FLIGHT DETECTORS
21 DAY THERMAL-VACUUM LIFE TEST BIASED AT 200 VOLTS
Leakage current Measurements

MICRONS	<u>RS</u>	<u>RS</u>	<u>RS</u>	<u>RS</u>	<u>RS</u>	<u>RS</u>	PT-100	PT-100	PT-100	PT-100		PT-100
	2 hours	31st May	2nd June	4th June	5th June	6th June	11th June	15th June	20th June	21st June		22nd June
	28.8	40	43	43	43	43	SEE TEMP GRAPH ATTACHED					
	26.2	42	41	41	42	41	42	42	41	41		23
	1.60E-07	3.40E-08	2.50E-08	2.50E-08	2.50E-08	2.50E-08	2.50E-08	3.00E-08	3.00E-08	3.00E-08		4.60E-08

SECTOR

											$I_2 = I_1 \cdot \exp(0.1 \cdot (T_2 - T_1))$			
											Ref.Current	Change		
	All units in nanoamps													
AA+GR	875	3785	3869	3781	3884	3747	3768	3832	3859	3776 E010	AA+GR	681	635	7%
GUARD RING	31.3	386	313	310	387	406	392	265	263	250 E011	GUARD RING	78	23	243%
ACTIVE AREA	200	900	920	893	917	805	902	903	923	899 E011	ACTIVE AREA	150	145	3%
GUARD RING	39	210	206	198	204	183	201	198	207	198 E006	GUARD RING	30	28	6%
ACTIVE AREA	227	980	990	952	976	870	976	957	991	950 E006	ACTIVE AREA	175	165	6%
AA+GR	1411	4204	4673	4654	4750	3910	4690	4870	4890	4850 E003	AA+GR	425	1025	-59%
ACTIVE AREA	206	895	920	890	912	860	915	908	935	890 E007	ACTIVE AREA	150	150	0%
AA+GR	206	895	920	890	912	860	915	920	950	935 E005	AA+GR	204	150	36%
GUARD RING	31	195	195	190	193	178	193	191	198	185 E007	GUARD RING	28	23	24%
GUARD RING	70	300	302	295	300	260	293	292	300	280 E008	GUARD RING	50	51	-2%
AA+GR	275	1510	1595	1560	1600	1350	1532	1598	1630	1570 E001	AA+GR	362	200	81%
ACTIVE AREA	420	1910	1945	1880	1932	1780	1915	1910	1953	1895 E008	ACTIVE AREA	330	305	8%

AMBER + CONTROL UNIT
75281
284

3Y PROBE)
025 S/N: 46547
agraph 8.2.4

CRaTER 140 MICRON SENSORS ENVIRONMENTAL TEMPERATURE CYCLING JUNCTION LEAKAGE CURRENT

CRaTER ENVIRONMENTAL TEMPERATURE CYCLING BETWEEN + 40 / -40 DEG.C AT 32 VOLTS
TIME: 2 hrs cycle

SPEC @ 40 DEG.C (THEORETICAL LEAKAGE DOUBLES EVERY 7 DEG.C) ACTIVE AREA = 2400 nA GUARD = 1600 nA)

SPEC @ 20 DEG.C MAIN AREA = 300nA AND GUARD RING = 200nA AT DEPLETION VOLTAGE

DEVICE																						DEVICE		End-to-end Change
S/N	SECTOR	-40 C	+40 C	-40 C	+40 C	-40 C	+40 C	-40 C	+40 C	-40 C	+40 C	-40 C	+40 C	-40 C	+40 C	-40 C	+40 C	-40 C	+40 C	-40 C	+40 C	S/N	SECTOR	
D008	AA	3.6	865	3.6	845	3.6	850	3.7	848	3.6	850	3.5	846	3.6	848	3.5	848	3.5	850	3.8	850	D008	AA	-2%
D008	GR	0.3	710	0.3	700	0.4	690	0.3	695	0.3	690	0.3	695	0.3	695	0.3	697	0.3	694	0.3	695	D008	GR	-2%
D010	AA	3.5	880	1.7	875	2.1	845	3.1	850	3.4	840	3.7	853	3.4	850	3.7	854	3.5	850	3.3	848	D010	AA	-4%
D010	GR	0.3	680	0.5	680	0.4	685	0.3	690	0.2	680	0.2	694	0.3	695	0.3	697	0.3	695	0.2	693	D010	GR	2%
D007	AA	2.1	1050	3.8	1060	3.8	1045	3.8	1040	3.7	1040	2.1	1040	2.2	1043	3.5	1040	3.2	1040	3.6	1040	D007	AA	-1%
D004	GR	0.5	775	0.6	770	0.6	774	0.5	775	0.6	770	0.7	774	0.5	775	0.6	778	0.5	775	0.5	770	D004	GR	-1%
D009	AA	3.7	825	3.8	823	3.7	825	3.8	830	3.7	825	3.7	830	3.7	830	3.6	835	3.7	834	3.7	835	D009	AA	1%
D009	GR	0.6	695	0.3	691	0.3	690	0.3	695	0.3	695	0.3	697	0.3	695	0.3	693	0.3	695	0.3	692	D009	GR	0%
D003	AA	3.6	895	3.9	880	3.9	868	3.8	873	3.7	869	3.5	875	3.6	870	3.8	868	3.7	878	3.7	875	D003	AA	-2%
D003	GR	0.3	670	0.3	655	0.3	665	0.3	668	0.3	660	0.4	667	0.3	675	0.3	675	0.3	677	0.3	675	D003	GR	1%
D001	AA	3.5	835	3.8	830	3.7	830	3.8	835	3.8	825	3.5	834	3.7	835	3.6	838	3.7	837	3.8	835	D001	AA	0%
D001	GR	0.3	675	0.3	675	0.3	669	0.3	670	0.4	669	0.3	669	0.3	670	0.3	668	0.3	670	0.3	670	D001	GR	-1%
D002	AA	3.6	840	3.6	840	3.6	840	3.7	845	3.8	834	3.7	850	3.7	848	3.8	847	3.7	847	3.7	848	D002	AA	1%
D002	GR	0.3	725	0.4	720	0.3	720	0.3	729	0.3	715	0.3	735	0.3	732	0.3	736	0.3	730	0.3	730	D002	GR	1%
D005	AA	3.5	820	3.6	820	3.5	825	3.6	830	3.5	825	3.5	827	3.5	830	3.5	831	3.5	834	3.5	836	D005	AA	2%
D004	GR	0.3	720	0.5	720	0.5	726	0.4	731	0.4	725	0.4	734	0.4	733	0.5	734	0.4	735	0.4	730	D004	GR	1%
D006	AA	3.6	835	3.9	830	3.8	825	3.7	830	3.7	830	3.7	832	3.6	830	3.7	830	3.7	831	3.7	830	D006	AA	-1%
D007	GR	0.6	738	0.3	740	0.3	735	0.3	745	0.3	730	0.3	748	0.3	746	0.3	734	0.3	735	0.3	735	D007	GR	0%
D006	AA	3.9	860	3.8	850	3.7	850	3.7	855	3.6	850	3.6	860	3.7	863	3.7	861	3.8	863	3.7	862	D006	AA	0%
D005	GR	0.3	730	0.3	730	0.3	729	0.3	735	0.3	729	0.3	736	0.3	736	0.3	737	0.3	735	0.3	735	D005	GR	1%

JUNCTION LEAKAGE CURRENT

CRaTER 1000 MICRON SENSORS ENVIRONMENTAL TEMPERTAURE CYCLING
 BETWEEN -40 DEG.C AND + 40 DEG.C BIASED AT 200 VOLTS
 SPECIFICATION: 32-05001 REV. E, PARAGRAPH 8.2.2

DEVICE S/N	SECTOR	-40	40	-40	40	-40	40	-40	40	-40	40	-40	40	-40	40	-40	40	-40	40	-40	40	DEVICE S/N	SECTOR	End-to-end Change
SPEC @ 40 DEG.C (THEORETICAL LEAKAGE DOUBLES EVERY 7 DEG.C) ACTIVE AREA = 8000nA GUARD = 8000nA)																								
SPEC @ 20 DEG.C MAIN AREA = 2000nA AND GUARD RING = 2000nA AT DEPLETION VOLTAGE																								
E010	AA + GR	23nA	2768	40	2780	23.5	2790	48	2850	38.5	2800	15.1	2790	8.9	2760	12.1	2810	18.3	2795	8.9	2820	E010	AA + GR	2%
E011	GUARD	5.2nA	1821	15.3	180	7.4	185	7.2	180	3.6	200	2.7	210	3.2	205	3.2	198	3.9	193	2.3	205	E011	GUARD	-89%
E011	ACTIVE A	0.6nA	670	3.7	675	3.2	680	3.5	680	4.2	690	0.6	675	1.3	665	1.8	680	1.9	685	1.2	690	E011	ACTIVE A	3%
E006	GUARD	3.2nA	161	12.3	176	6.3	180	4.3	179	2.7	185	1.6	190	1.7	185	2.1	178	2.5	191	1.8	210	E006	GUARD	30%
E006	ACTIVE A	4.1nA	770	18.4	780	8.5	785	4.7	760	5.2	780	1.4	785	1.6	773	3.2	763	2.5	795	1.6	798	E006	ACTIVE A	4%
E003	AA + GR	3.8nA	883	10.3	885	5.3	890	3.8	870	7.1	910	1.7	915	1.6	891	2.1	898	3.8	897	1.7	900	E003	AA + GR	2%
E007	ACTIVE A	1.5nA	755	7.6	780	3.8	800	2.5	790	5.1	850	1.9	850	2.1	843	3.2	850	4.5	810	6.1	860	E007	ACTIVE A	14%
E005	AA + GR	3.3nA	980	8.3	987	6.2	995	4.1	994	10.2	1100	17.5	1150	20.2	1143	20.1	1150	25.1	998	15.5	1000	E005	AA + GR	2%
E007	GUARD	2.4nA	815	10.1	811	8.1	820	6.2	810	3.5	850	0.5	850	1.6	848	2.1	852	3.2	832	1.4	845	E007	GUARD	4%
E008	GUARD	2.1nA	350	8.3	330	6.3	340	4.1	335	2.9	350	0.3	360	1.7	345	3.2	351	3.7	345	1.5	350	E008	GUARD	0%
E001	AA + GR	9.1nA	1100	15.8	1020	10.1	1025	8.3	1030	10.6	1115	3.8	1120	5.2	1130	4.6	1135	4.8	1035	3.6	1124	E001	AA + GR	2%
E008	ACTIVE A	62nA	1410	18.1	1470	12.3	1476	10.1	1480	8.9	1530	2.7	1532	2.1	1550	2.3	1490	3.5	1485	1.6	1490	E008	ACTIVE A	6%

EQUIPMENT USED:-
 CLIMATIC CHAMBER: HERAEUS HT 4010
 POWER SUPPLY:- MODEL XM25025 GLASSMAN S/N:46547
 TEMPERATURE PROBE S/N 63003406 MULTIMETER KEITHLEY 175 S/N:319338
 PICOAMMETER KEITHLEY 485 S/N:1126629