IU PERFORMANCE REPORT

Product Code: 29E-AP00-800-ABA Serial Number: MARS # 1 Test Date : 21/12/09

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2. ELECTRICAL PERFORMANCE TESTS

2.1 Un-Powered Tests

2.1.1 Output Resistance to ground

	MIN	Result	MAX	UNITS
+Ve O/P to Sea case resistance	440	490.9	500	K Ohm
Sea case to -Ve O/P resistance	440	490.9	500	K Ohm
+Ve O/P to – Ve O/P	20.4	20.73	20.8	K Ohm
Sea GND to Sea case	.9	0.996	1.1	Mohm

2.1.2 Input resistance to Sea Earth

	MIN	Result	MAX	UNITS
HV(-ve) to Sea Earth (+ve)	17	18.7	21	Mohm

2.1.3 Input reverse voltage to Sea Earth

	MIN	Result	MAX	UNITS
Input Voltage at 0.5 A I/P Current	65	73.4	80	V
Input Voltage at 1.4 A I/P Current	80	89.5	100	V
Sea case temperature		16.7		°C

2.2 Powered Tests

2.2.1 Start-up Voltage

	MIN	Result	MAX	UNITS	
HV input Start-up voltage	5.6	5.69	5.8	kV	TEK 0
Output voltage V Start-up (stabilised)	100	110	120	V	TEK 1
Initial start up ramp time t1	1	2.32	5	ms	
Total Start-up ramp time t2	4.7	4.92	5.1	s	TEK 2

2.2.2 Shutdown Voltage

	MIN	Result	MAX	UNITS	
Shutdown voltage	5.1	5.21	5.3	kV	TEK 3

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2.3 Input/Output Characteristics

2.3.1 Conversion efficiency characteristics

2.3.1.1 6 kV input Voltage

Sea Case Temperature : 15 °C

Output Current :	No load	5 A	12.5 A	25 A	
PFE voltage	6.02	6.05	6.10	6.18	kV
PFE current	0.08	0.39	0.87	1.74	A
HV input voltage	6000.3	6000.5	6000.1	6000.9	V
HV input current	0.090	0.398	0.885	1.754	A
Output voltage *	374.2	373.7	372.8	371.2	V
Output current	0	4.974	12.485	25.17	A
Input power	540.03	2388.20	5310.09	10525.58	W
Output power	0	1858.78	4654.41	9343.10	W
Losses	540.03	529.42	655.68	1182.47	W
Efficiency	0	77.83	87.65	88.77	%
Output ripple **	0.78			0.88	Vp-p

TEK 4 TEK 5

* Output Voltage limits = 371 V to 379 V

* * Output Ripple limit = 2.8 Vp-p max

Losses and Efficiency

	Input V (kV)	Output I (A)	MIN	Result	MAX	UNITS
Losses	6.0	0	500	540.03	700	W
	6.0	25.0	1020	1182.47	1300	W
Efficiency	6.0	25.0	87.8	88.77	90.2	%

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2.3.1.2 10 kV input Voltage

Sea Case Temperature : 15.5°C

Output Current :	No load	5 A	12.5 A	25 A	
PFE voltage	10.02	10.04	10.07	10.12	kV
PFE current	0.09	0.28	0.57	1.08	A
HV input voltage	10000.6	10001.2	10000.0	10000.6	V
HV input current	0.105	0.290	0.582	1.094	A
Output voltage *	375.9	375.4	374.7	373.4	V
Output current	0	5.005	12.52	25.00	A
Input power	1050.06	2900.35	5820.00	10940.66	W
Output power	0	1878.88	4691.24	9335.00	W
Losses	1050.06	1021.47	1128.76	1605.66	W
Efficiency	0	64.78	80.61	85.32	%
Output ripple **	0.93			1.02	Vp-p
	TEK 6			TEK 7	

* Output Voltage limits = 371 V to 379 V

* * Output Ripple limit = 2.8 Vp-p max

Losses and Efficiency

	Input V (kV)	**Output I (A)**	MIN	Result	MAX	UNITS
Losses	10.0	0	950	1050.06	1 100	W
	10.0	25.0	1 400	1605.66	1 700	W
Efficiency	10.0	25.0	84.7	85.32	87.0	%

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2.3.2 Onset of Current limit

	MIN	Result	MAX	UNITS
Current limit @ 10kV input	29.5	29.98	30.5	A

2.3.3 Step load response

Sea Case Temperature : 17.7 °C

2.3.3.1 10% to 90 % step up

	Result	MAX	UNITS	
Input Voltage	10	10	kV	
Voltage undershoot	39	45	V	
Time to recover within 5 %	1.99	5	ms	TEK 8

2.3.3.2 90 % to 10 % step down

	Result	MAX	UNITS	
Voltage overshoot	43	45	V	
Time to recover within 5 %	1.67	5	ms	TEK 9

3 OUTPUT SHORT CIRCUIT TEST

3.1 Short circuit

Peak output current : 242 A TEK 10

IU shuts down (Y/N) : Y

3.2 Post-test reverse input check

	MIN	Result	MAX	UNITS
Sea case temperature		18.6		°C
Input Voltage at 0.5 A I/P Current	65	72.45	80	V

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4 FLOATING OUTPUT TESTS

4.1 Steady state output to Ground voltage

Voltage to GND	MIN	Result	MAX	UNITS
+Ve output	177.5	178.9	187.5	V
-Ve output	177.5	178.8	187.5	V

5 COLD START

Sea Case Temperature: 2 °C

IU starts OK with 6kV input (Y/N): Y

5.1 Final reverse input check

	MIN	Result	MAX	UNITS
Sea case temperature	0	2	2	°C
Input Voltage at 0.5 A I/P Current	65	75.45	80	V

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