



1000W Single Output DC-DC Converter

SD-1000 series

MODEL : SD-1000H-48

OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	RIPPLE & NOISE	V1: 150 mVp-p (Max)	I/P: 96 VDC O/P:FULL LOAD Ta:25°C	V1: 35 mVp-p (Max)	P
2	OUTPUT VOLTAGE ADJUST RANGE	CH1:46 V~ 60 V	I/P: 96 VDC O/P:MIN LOAD Ta:25°C	43.97 V~ 61.7 V	P
3	OUTPUT VOLTAGE TOLERANCE	V1: 1%~ -1 % (Max)	I/P: 96 VDC / 144VDC O/P:FULL/ MIN LOAD Ta:25°C	V1: 0.02 %~- -0.02 %	P
4	LINE REGULATION	V1: 0.5 %~ -0.5 % (Max)	I/P: 96VDC ~ 144VDC O/P:FULL LOAD Ta:25°C	V1: 0.02 %~- -0.02 %	P
5	LOAD REGULATION	V1: 0.5 %~ -0.5 % (Max)	I/P: 96 VDC O/P:FULL ~MIN LOAD Ta:25°C	V1: 0.02 %~- -0.02 %	P
6	SET UP TIME	500 ms (Max)	I/P: 96 VDC O/P:FULL LOAD Ta:25°C	137 ms	P
7	RISE TIME	50 ms (Max)	I/P: 96 VDC O/P:FULL LOAD Ta:25°C	33 ms	P
8	OVER/UNDERSHOOT TEST	< ±5%	I/P: 96 VDC O/P:FULL LOAD Ta:25°C	TEST: < 5 %	P
9	DYNAMIC LOAD	V1: 4800 mVp-p	I/P: 96 VDC O/P:FULL /Min LOAD 90%DUTY/1KHZ Ta:25°C	761 mVp-p	P

INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	INPUT VOLTAGE RANGE	72VDC~ 144VDC	I/P:TESTING O/P:FULL LOAD Ta:25°C	69.8V~ 144V	P
			I/P: LOW-LINE-0.2V= 71.8V HIGH-LINE+5%= 151V O/P:FULL/MIN LOAD ON: 30 Sec . OFF: 30 Sec 10MIN (AC POWER ON/OFF NO DAMAGE)	TEST: OK	
2	EFFICIENCY	92 % (TYP)	I/P: 96 VDC O/P:FULL LOAD Ta:25°C	93 %	P
3	INPUT CURRENT	11.6 A / 96 V(TYP)	I/P: 96VDC O/P:FULL LOAD Ta:25°C	I = 11.36 A	P
4	INRUSH CURRENT	100 A /96V (TYP) COLD START	I/P: 96 VDC O/P:FULL LOAD Ta:25°C	I = 78.5 A	P

PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	OVER LOAD PROTECTION	105 %~ 125 %	I/P: 96VDC O/P:TESTING Ta:25°C	118 % Constant Current Limiting, unit will shut down o/p voltage above 5sec Re-power on to recover	P
2	OVER VOLTAGE PROTECTION	CH1: 62V~ 68V	I/P: 96VDC O/P:MIN LOAD Ta:25°C	65 V Shunt down Re- power ON	P
3	OVER TEMPERATURE PROTECTION	SPEC: 75°C ±5°C OT.P. (TSW1) 85°C ±5°C OT.P. (TSW2) NO DAMAGE	I/P: 96 VDC O/P:FULL LOAD	O.T.P. Active Shut down o/p volotage , recovers automatically after temperature goes down	P
4	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P: 144VDC O/P: FULL LOAD Ta:25°C	NO DAMAGE Constant Current Limiting, unit will shut down o/p voltage above 5sec Re-power on to recover	P

CONTROL FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	FAN SPEED CONTROL	0%LOAD=6V~8.5V 100%LOAD=11.8V~12.8V	I/P: 96 VDC O/P:FULL LOAD Ta:25°C	Fan Voltage= 7.22 V/ NO LOAD Fan Voltage= 12.29 V/ 100%LOAD	P
2	REMOTE CONTROL	Rc+ / Rc- POWER ON:OPEN BETWEEN ON/OFF POWEROFF:SHORT BETWEEN ON/OFF (A) Using External Voltage Source (B) Using Internal 12V Auxiliary Output (C) Using Internal 12V Auxiliary Output (D)	I/P: 96 VDC O/P:FULL LOAD Ta:25°C	(A)OK (B)OK (C)OK	P
3	REMOTE SENSE	>0.3V	I/P: 96 VDC O/P:FULL LOAD Ta:25°C	> 0.3 V	P
4	OUTPUT OK SIGNAL	OPEN COLLECTOR SIGNAL LOW WHEN PSU TURN ON,MAX.SINK CURRENT 10mA,external voltage is 13V 0~0.5V OUTPUT STATUS ON 12~13V OUTPUT STATUS OFF	I/P: 96 VDC O/P:FULL LOAD Ta:25°C	SINK CURRENT: 10 mA OUTPUT STATUS ON= 0 V OUTPUT STATUS OFF= 12.54 V	P
5	FAN LOCK	SHUTDOWN RE-POWER ON	I/P: 96 VDC O/P:FULL LOAD Ta:25°C	SHUTDOWN RE-POWER ON	P
6	AUX POWER	0~0.25A(10.8V~13.2V)	I/P: 96VDC Ta:25°C	12.92V/0A 12.2V/0.25A	P
7	DC I/P UVP	69V~71.6V	O/P:100% LOAD Ta:25°C	69.8VDC	P

ENVIRONMENT TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT																																																																																																																			
1	TEMPERATURE RISE TEST	MODEL : SD-1000H-24 1. ROOM AMBIENT BURN-IN : 1 HRS I/P: 96VDC O/P: FULL LOAD Ta= 28.1℃ 2. HIGH AMBIENT BURN-IN : 2 HRS I/P: 96VDC O/P: FULL LOAD Ta= 53.7℃ <table><tr><th>NO</th><th>Position</th><th>P/N</th><th>ROOM AMBIENT Ta= 28.1 ℃</th><th>HIGH AMBIENT Ta= 53.7 ℃</th></tr><tr><td>1</td><td>U2</td><td>UCC28220D</td><td>41.4℃</td><td>63.2℃</td></tr><tr><td>2</td><td>D2</td><td>S20LC20U 20A/200V</td><td>37.0℃</td><td>58.3℃</td></tr><tr><td>3</td><td>Q3</td><td>IRFP260N 50A/200V</td><td>42.8℃</td><td>64.2℃</td></tr><tr><td>4</td><td>Q1</td><td>IRFP260N 50A/200V</td><td>42.3℃</td><td>63.5℃</td></tr><tr><td>5</td><td>TSW1</td><td>ST-22 75℃</td><td>38.2℃</td><td>59.1℃</td></tr><tr><td>6</td><td>LF1</td><td>TR-776</td><td>43.6℃</td><td>65.3℃</td></tr><tr><td>7</td><td>C8</td><td>470U/200V 105℃ MXR</td><td>39.4℃</td><td>59.9℃</td></tr><tr><td>8</td><td>T2 COIL</td><td>TF-1688A</td><td>57.2℃</td><td>80.4℃</td></tr><tr><td>9</td><td>D901</td><td>S3L60 2.2A/600V</td><td>47.1℃</td><td>69.1℃</td></tr><tr><td>10</td><td>L2</td><td>TF-1680</td><td>52.4℃</td><td>74.4℃</td></tr><tr><td>11</td><td>U9</td><td>TNY280PN</td><td>47.0℃</td><td>69.7℃</td></tr><tr><td>12</td><td>ZD10</td><td>P6KE100A</td><td>47.8℃</td><td>70.3℃</td></tr><tr><td>13</td><td>U1</td><td>IR1150IS(PbF)</td><td>37.1℃</td><td>57.7℃</td></tr><tr><td>14</td><td>Q903</td><td>IRFP460A 20A/500V</td><td>55.3℃</td><td>79.9℃</td></tr><tr><td>15</td><td>C303</td><td>100U/25V 105℃ YXG</td><td>46.5℃</td><td>68.9℃</td></tr><tr><td>16</td><td>L100</td><td>TF-1455</td><td>50.9℃</td><td>73.7℃</td></tr><tr><td>17</td><td>Q161</td><td>TIP42C -5A/100V</td><td>46.1℃</td><td>68.1℃</td></tr><tr><td>18</td><td>TSW2</td><td>ST-22 85℃</td><td>57.9℃</td><td>80.4℃</td></tr><tr><td>19</td><td>D202</td><td>ESAD83-006 30A/60V</td><td>63.7℃</td><td>86.3℃</td></tr><tr><td>20</td><td>PCB</td><td>T2 與 ZD10 間</td><td>50.5℃</td><td>73.6℃</td></tr><tr><td>21</td><td>內 TA</td><td>C303 上方處</td><td>43.2℃</td><td>65.3℃</td></tr><tr><td>22</td><td>C113</td><td>1000U/35V 105℃ YXG</td><td>51.0℃</td><td>73.5℃</td></tr></table>			NO	Position	P/N	ROOM AMBIENT Ta= 28.1 ℃	HIGH AMBIENT Ta= 53.7 ℃	1	U2	UCC28220D	41.4℃	63.2℃	2	D2	S20LC20U 20A/200V	37.0℃	58.3℃	3	Q3	IRFP260N 50A/200V	42.8℃	64.2℃	4	Q1	IRFP260N 50A/200V	42.3℃	63.5℃	5	TSW1	ST-22 75℃	38.2℃	59.1℃	6	LF1	TR-776	43.6℃	65.3℃	7	C8	470U/200V 105℃ MXR	39.4℃	59.9℃	8	T2 COIL	TF-1688A	57.2℃	80.4℃	9	D901	S3L60 2.2A/600V	47.1℃	69.1℃	10	L2	TF-1680	52.4℃	74.4℃	11	U9	TNY280PN	47.0℃	69.7℃	12	ZD10	P6KE100A	47.8℃	70.3℃	13	U1	IR1150IS(PbF)	37.1℃	57.7℃	14	Q903	IRFP460A 20A/500V	55.3℃	79.9℃	15	C303	100U/25V 105℃ YXG	46.5℃	68.9℃	16	L100	TF-1455	50.9℃	73.7℃	17	Q161	TIP42C -5A/100V	46.1℃	68.1℃	18	TSW2	ST-22 85℃	57.9℃	80.4℃	19	D202	ESAD83-006 30A/60V	63.7℃	86.3℃	20	PCB	T2 與 ZD10 間	50.5℃	73.6℃	21	內 TA	C303 上方處	43.2℃	65.3℃	22	C113	1000U/35V 105℃ YXG	51.0℃	73.5℃	P
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2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR (MIN)	I/P: 96VDC O/P: 112% LOAD Ta:25℃	TEST : OK	P																																																																																																																			
3	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P: 96VDC O/P: 100% LOAD Ta= -20 ℃	TEST : OK	P																																																																																																																			
4	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 50℃ NO DAMAGE	I/P: 147 VDC O/P:FULL LOAD Ta= 50℃ HUMIDITY= 95 %R.H	TEST : OK	P																																																																																																																			
5	TEMPERATURE COEFFICIENT	± 0.02%(0~50℃)	I/P: 96 VDC O/P:FULL LOAD	± 0.0017 %(0~50℃)	P																																																																																																																			
6	VIBRATION TEST	1 Carton & 1 Set (1) Waveform: Sine Wave (2) Frequency:10~500Hz (3) Sweep Time:10min/sweep cycle (4) Acceleration:2G (5) Test Time:1 hour in each axis (X.Y.Z) (6) Ta:25℃		TEST : OK	P																																																																																																																			

SAFETY TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	WITHSTAND VOLTAGE	I/P-O/P: 2 KVAC/min I/P-FG: 1.5 KVAC/min O/P-FG: 0.5 KVAC/min	I/P-O/P: 2.4 KVAC/min I/P-FG: 1.8 KVAC/min O/P-FG: 0.6 KVAC/min Ta:25°C / 70%RH	I/P-O/P: 4.87 mA I/P-FG: 4.59 mA O/P-FG: 4.66 mA NO DAMAGE	P
2	ISOLATION RESISTANCE	I/P-O/P:500VDC>100MΩ I/P-FG: 500VDC>100MΩ O/P-FG:500VDC>100MΩ	I/P-O/P: 500 VDC I/P-FG: 500 VDC O/P-FG: 500 VDC Ta:25°C	I/P-O/P: 4.7 GΩ I/P-FG: 1.7 GΩ O/P-FG: 6 GΩ NO DAMAGE	P
3	GROUNDING CONTINUITY	FG(PE) TO CHASSIS OR TRACE < 100 mΩ	40 A / 2min Ta:25°C / 70%RH	8mΩ	P
4	APPROVAL	TUV: Certificate NO : UL: File NO :			N/A

E.M.C TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	RADIATION	EN55022 CLASS B	I/P: 96VDC O/P:FULL LOAD Ta:25°C	PASS Test by certified Lab	P
2	E.S.D	EN61000-4-2 LIGHT INDUSTRY AIR:8KV / Contact:4KV	I/P: 96 VDC O/P:FULL LOAD Ta:25°C	CRITERIA A	P
3	E.F.T	EN61000-4-4 LIGHT INDUSTRY INPUT: 1KV	I/P: 96VDC O/P:FULL LOAD Ta:25°C	CRITERIA A	P
4	SURGE	IEC61000-4-5 LIGHT INDUSTRY L-N :0.5KV L,N-PE:0.5KV	I/P: 96 VDC O/P:FULL LOAD Ta:25°C	CRITERIA A	P
5	Test by certified Lab & Test Report Prepare				

M.T.B.F & LIFE CYCLE CALCULATION

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	CAPACITOR LIFE CYCLE	SD-1000H-24 : SUPPOSE C113 IS THE MOST CRITICAL COMPONENT I/P: 96VDC O/P:FULL LOAD Ta=25 °C LIFE TIME= 370952 HRS I/P: 96VDC O/P:FULL LOAD Ta=50 °C LIFE TIME= 91276 HRS			P
2	MTBF	MIL-HDBK-217F NOTICES2 PARTS COUNT TOTAL FAILURE RATE: 32KHRS			P
3	DMTBF/Accelerated Life Test	Demonstration Mean Time Between Failure : Above 30,000 hours @ TA 50°C			P

COMPONENT STRESS TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	Power Transistor (D to S) or (C to E) Peak Voltage	Q 900 Rated IRFP460A 20A/500V	I/P:High-Line +3V = 147V O/P: (1)Full Load Turn on (2) Output Short Ta:25°C	(1) 378 V (2) 362 V	P
2	Diode Peak Voltage	D101 Rated ESAD92-02 20A/200V	I/P:High-Line +3V = 147 V O/P: (1)Full Load Turn on (2)Output Short Ta:25°C	(1) 157 V (2) 89 VV	P
3	Clamp Diode Peak Voltage	D 900 Rated S3L60 2.2A/600V	I/P:High-Line +3V = 147 V O/P: (1) Dynamic Load 90%Duty/1KHz Ta:25°C	(1) 336 V	P
4	Input Capacitor Voltage	C5 Rated 470u/200V 105°C	I/P:High-Line +3V = 147 V O/P: (1)Full Load Turn on /Off (2) Min load Turn on /Off (3)Full Load /Min load Change Ta:25°C	(1) 153 V (2) 153 V (3) 153 V	P
5	Control IC Voltage Test	U2 Rated UCC28220: 8V~14 V	I/P:High-Line +3V = 147 V O/P: (1)Full Load Turn on /Off (2) Min load Turn on /Off (3)Full Load /Min load Change Ta:25°C	(1) 13.44 V (2) 13.27 V (3) 13.44 V	P

DATE	SAMPLE	TEST RESULT	TESTER	APPROVAL
2007/9/14	RD SAMPLE	PASS	VINCENT TSENG	MAX LIN
2007/11/16	PRODUCT SAMPLE W0710C50	PASS	VINCENT TSENG	MAX LIN
2008/1/10	PRODUCT SAMPLE W0712D55	PASS	SANFORD SU	VINCENT TSENG

2003/12/12 A50-F023