



1000W Single Output Power Supply

SE-1000 series



■ Features :

- AC input active surge current limiting
- AC input range selected by switch
- Protections: Short circuit/Over load/Over voltage/Over temperature
- Forced air cooling by built-in DC ball bearing fan
- High power density 7.3w/in³
- With DC_OK signal output
- Built-in remote ON-OFF control
- Built-in remote sense function
- UL / CUL approved
- Low cost
- 2 years warranty

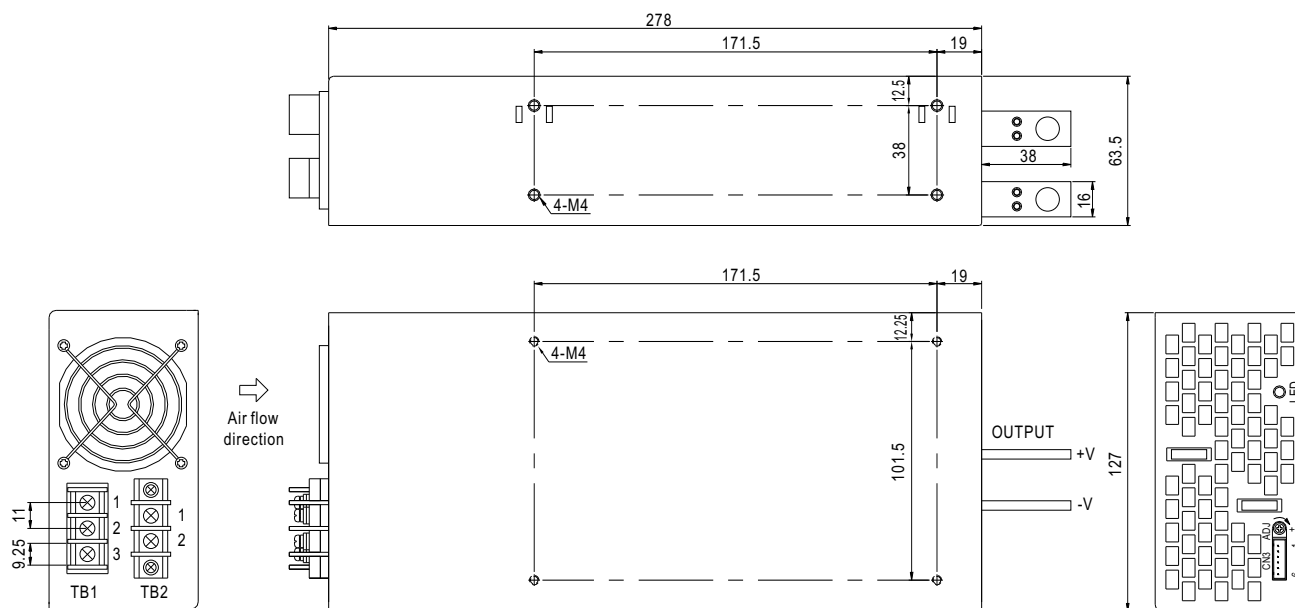


SPECIFICATION

MODEL		SE-1000-5	SE-1000-9	SE-1000-12	SE-1000-15	SE-1000-24	SE-1000-48
OUTPUT	DC VOLTAGE	5V	9V	12V	15V	24V	48V
	RATED CURRENT	150A	100A	83.3A	66.7A	41.7A	20.8A
	CURRENT RANGE	0 ~ 150A	0 ~ 100A	0 ~ 83.3A	0 ~ 66.7A	0 ~ 41.7A	0 ~ 20.8A
	RATED POWER	750W	900W	999.6W	1000.5W	1000.8W	998.4W
	RIPPLE & NOISE (max.) Note.2	150mVp-p	150mVp-p	150mVp-p	150mVp-p	200mVp-p	200mVp-p
	VOLTAGE ADJ. RANGE	3.3 ~ 5.5V	7.5 ~ 10V	10 ~ 13.5V	13.5 ~ 16.5V	22 ~ 27.5V	43 ~ 56V
	VOLTAGE TOLERANCE Note.3	±1.0%	±1.0%	±1.0%	±1.0%	±1.0%	±1.0%
	LINE REGULATION	±0.5%	±0.5%	±0.5%	±0.5%	±0.5%	±0.5%
	LOAD REGULATION	±1.0%	±0.5%	±0.5%	±0.5%	±0.5%	±0.5%
	SETUP, RISE TIME	300ms, 50ms/230VAC 300ms, 50ms/115VAC at full load					
	HOLD TIME (Typ.)	20ms/230VAC 15ms/115VAC at full load					
INPUT	VOLTAGE RANGE	90 ~ 132VAC / 180 ~ 264VAC selected by TB2 254 ~ 370VDC					
	FREQUENCY RANGE	47 ~ 63Hz					
	EFFICIENCY (Typ.)	81%	84%	85%	86%	88%	89%
	AC CURRENT (Typ.)	17.5A/115VAC 10A/230VAC					
	INRUSH CURRENT (Typ.)	35A/115VAC 55A/230VAC					
	LEAKAGE CURRENT	<2.5mA / 240VAC					
PROTECTION	OVER LOAD	105 ~ 125% rated output power Protection type : Shut down o/p voltage, re-power on to recover					
	OVER VOLTAGE	5.75 ~ 6.3V	10.4 ~ 12.2V	13.8 ~ 16.2V	18 ~ 21V	28 ~ 32.4V	57.6 ~ 67.2V
		Protection type : Shut down o/p voltage, re-power on to recover					
	OVER TEMPERATURE	70℃±5℃ (TSW1) Detect on heatsink of power transistor Protection type : Shut down o/p voltage, recovers automatically after temperature goes down					
FUNCTION	DC_OK SIGNAL	PSU turn on:3.3V ~ 5.6V PUS turn off:0 ~ 1V					
	REMOTE CONTROL	RC+/RC-: 0 ~ 0.8V power on; 4 ~ 10V power off					
ENVIRONMENT	WORKING TEMP.	-20 ~ +60℃ (Refer to output load derating curve)					
	WORKING HUMIDITY	20 ~ 90% RH non-condensing					
	STORAGE TEMP., HUMIDITY	-40 ~ +85℃, 10 ~ 95% RH					
	TEMP. COEFFICIENT	±0.05%/℃ (0 ~ 50℃)					
	VIBRATION	10 ~ 500Hz, 2G 10min./1cycle, 60min. each along X, Y, Z axes					
SAFETY & EMC	SAFETY STANDARDS	UL60950-1 Approved					
	WITHSTAND VOLTAGE	I/P-O/P:3KVAC I/P-FG:1.5KVAC O/P-FG:0.5KVAC					
	ISOLATION RESISTANCE	I/P-O/P, I/P-FG, O/P-FG:100M Ohms/500VDC					
OTHERS	MTBF	251.6K hrs min. MIL-HDBK-217F (25℃)					
	DIMENSION	278*127*63.5mm (L*W*H)					
	PACKING	2.5Kg; 6pcs/16Kg/1.38CUFT					
NOTE	1. All parameters NOT specially mentioned are measured at 230VAC input, rated load and 25℃ of ambient temperature. 2. Ripple & noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1uf & 47uf parallel capacitor. 3. Tolerance : includes set up tolerance, line regulation and load regulation.						

Mechanical Specification

Case No. 935B Unit:mm



TB1:AC input terminal

Pin No.	Assignment
1	AC/L
2	AC/N
3	FG

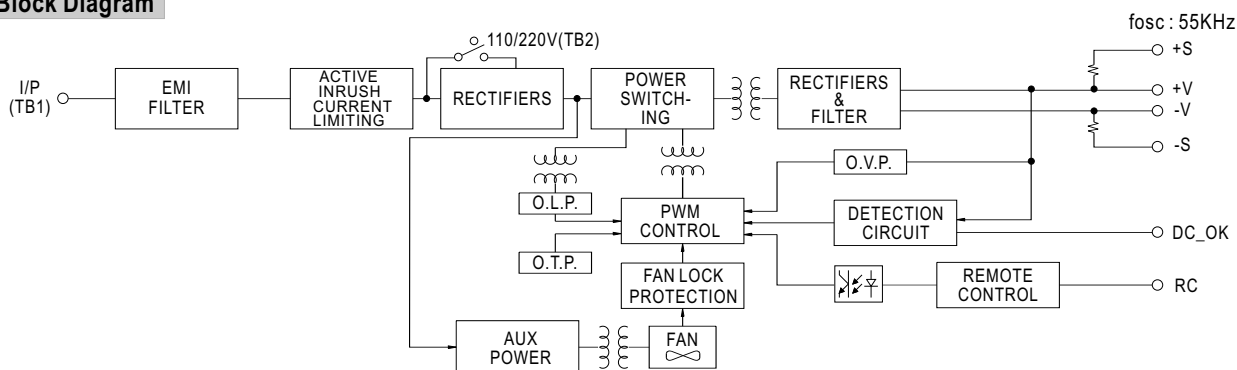
TB2:110/220V Change

Pin No.	110V	220V
1	Short	Open
2	Short	Open

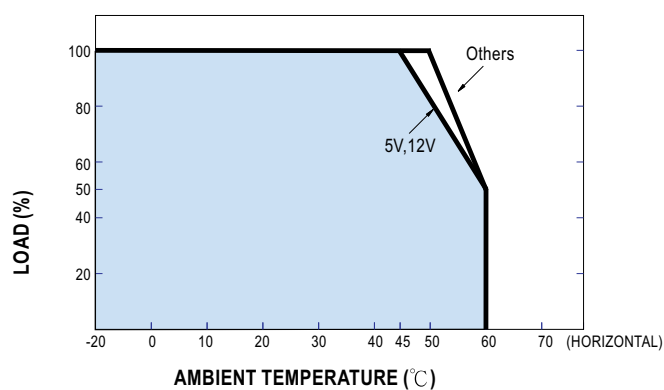
Control Pin (CN3) : JST B6B-XH or equivalent

Pin No.	Assignment	Pin No.	Assignment	Mating Housing	Terminal
1	DC_OK Signal	4	+S	JST XHP or equivalent	JST SXH-001T or equivalent
2	DC_OK GND	5	RC-		
3	-S	6	RC+		

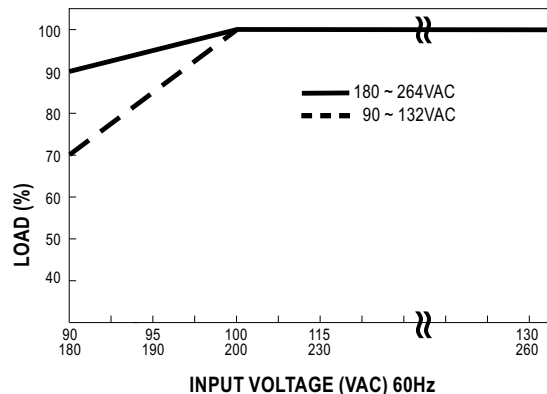
Block Diagram



Derating Curve



Static Characteristics



Mechanical Specification

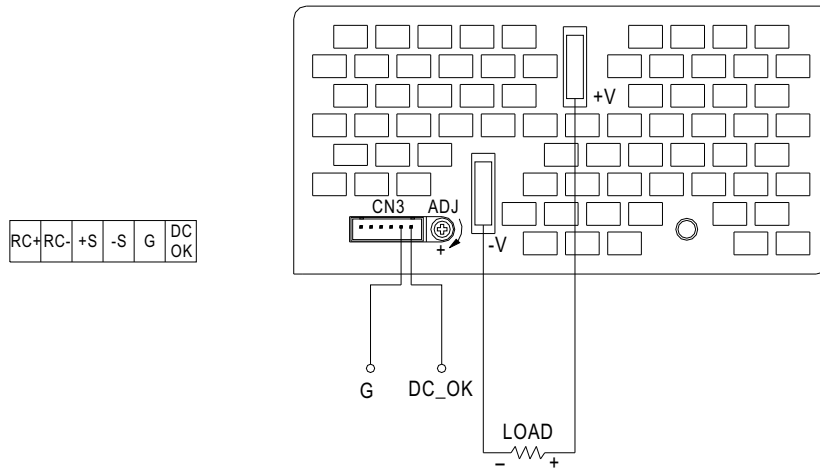
DC_OK Signal

DC_OK Signal is the voltage difference between "DC_OK" and "G" pin output

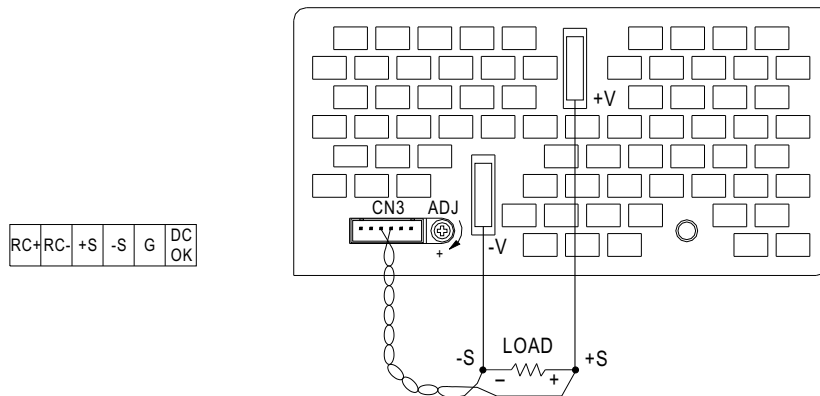
DC_OK Signal is a TTL level signal

PSU turn on: 3.3 ~ 5.6V

PSU turn off: 0 ~ 1V

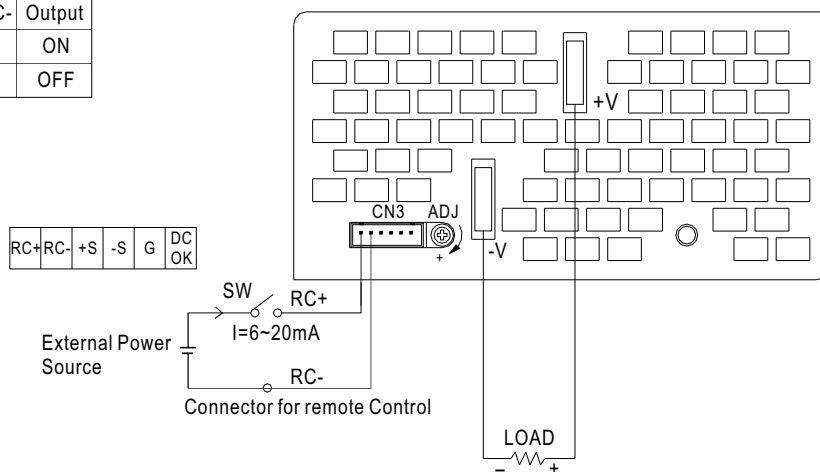


Remote Sensing



Remote Control

Between RC+ and RC-	Output
SW OFF(0 ~ 0.8V)	ON
SW ON(4 ~ 10V)	OFF



MODEL : SE-1000-9

OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	RIPPLE & NOISE	V1: 150 mVp-p (Max)	I/P: 230VAC O/P:FULL LOAD Ta:25°C	V1: 54 mVp-p (Max)	P
2	OUTPUT VOLTAGE ADJUST RANGE	CH1: 7.5V~ 10V	I/P: 230 VAC I/P: 115 VAC O/P:MIN LOAD Ta:25°C	7.31 V~ 10.52 V/ 230 VAC 7.31 V~ 10.52 V/ 115 VAC	P
3	OUTPUT VOLTAGE TOLERANCE	V1: 1 %~ -1 % (Max)	I/P: 200 VAC / 264 VAC O/P:FULL/ MIN LOAD Ta:25°C	V1: 0.1 %~ -0.1 %	P
4	LINE REGULATION	V1: 0.5 %~ -0.5 % (Max)	I/P: 200VAC ~ 264 VAC O/P:FULL LOAD Ta:25°C	V1: 0.07 %~ -0.07 %	P
5	LOAD REGULATION	V1: 0.5 %~ -0.5 % (Max)	I/P: 230 VAC O/P:FULL ~MIN LOAD Ta:25°C	V1: 0.07 %~ -0.07 %	P
6	SET UP TIME	230VAC: 1500 ms (Max) 115 VAC: 1500 ms (Max)	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25°C	230VAC/ 130 ms 115VAC/ 119 ms	P
7	RISE TIME	230VAC: 50 ms (Max) 115VAC: 50 ms (Max)	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25°C	230VAC/ 20 ms 115VAC/ 21 ms	P
8	HOLD UP TIME	230VAC: 20 ms (TYP) 115VAC: 15 ms(TYP)	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25°C	230VAC/ 24 ms 115VAC/ 18.9 ms	P
9	OVER/UNDERSHOOT TEST	< ±5%	I/P: 230 VAC O/P:FULL LOAD Ta:25°C	TEST: <5 %	P
10	DYNAMIC LOAD	V1: 900 mVp-p	I/P: 230 VAC O/P:FULL /Min LOAD 90%DUTY/1KHZ Ta:25°C	449 mVp-p	P

INPUT FUNCTION TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	INPUT VOLTAGE RANGE	180VAC~264 VAC)	I/P:TESTING O/P:FULL LOAD Ta:25°C	137 V~264V	P
			I/P: LOW-LINE-3V= 177 V HIGH-LINE+15%=300 V O/P:FULL/MIN LOAD ON: 30 Sec . OFF: 30 Sec 10MIN (AC POWER ON/OFF NO DAMAGE)	TEST: OK	
2	INPUT FREQUENCY RANGE	47HZ ~63 HZ NO DAMAGE OSC	I/P: 180VAC ~ 264 VAC O/P:FULL~MIN LOAD Ta:25°C	TEST: OK	P
3	EFFICIENCY	84 % (TYP)	I/P: 230 VAC O/P:FULL LOAD Ta:25°C	85.3 %	P
4	INPUT CURRENT	230V/ 10 A (TYP) 115V/ 17.5 A(TYP)	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25°C	I = 9.12 A/ 230 VAC I = 15.5 A/ 115 VAC 5	P
5	INRUSH CURRENT	230V/ 55 A (TYP) 115V/ 35 A(TYP) COLD START	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25°C	I = 53 A/ 230 VAC I = 28 A/ 115 VAC	P
6	LEAKAGE CURRENT	< 2.5 mA / 240 VAC	I/P: 254 VAC O/P:Min LOAD Ta:25°C	L-FG: 1.4 mA N-FG: 1.4 mA	P

PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	OVER LOAD PROTECTION	105 %~ 125 %	I/P: 230 VAC I/P: 115 VAC O/P: TESTING Ta: 25°C	114 %/ 230 VAC 113 %/ 115 VAC Shunt down Re-power ON	P
2	OVER VOLTAGE PROTECTION	CH1: 10.4 V~ 12.2 V	I/P: 230 VAC I/P: 115 VAC O/P: MIN LOAD Ta: 25°C	11.1 V/ 230 VAC 11.1 V/ 115 VAC Shunt down Re- power ON	P
3	OVER TEMPERATURE PROTECTION	SPEC: TSW1: 70°C ± 5°C O.T.P. NO DAMAGE	I/P: 230 VAC O/P: FULL LOAD	O.T.P. Active Shut down o/p voltage , recovers automatically after temperature goes down	P
4	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P: 264 VAC O/P: FULL LOAD Ta: 25°C	NO DAMAGE Shunt down Re-power ON	P

CONTROL FUNCTION TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	FAN LOCK TEST	POWER SUPPLY SHUT DOWN	I/P: 230 VAC O/P: FULL LOAD	OK	P
2	FAN SPEED CONTROL	-----	I/P: 230 VAC O/P: FULL LOAD Ta: 25°C	Fan Voltage= 12.61V	P
3	REMOTE CONTROL	Rc+ / Rc- 0V~ 0.8V POWER ON 4V~10V POWER OFF	I/P: 230 VAC O/P: FULL LOAD Ta: 25°C	0V ~ 2V POWER ON 2.1V ~ 10 V POWER OFF	P
4	DC OK SIGNAL	POWER ON: 3.3V~5.6V POWER OFF: 0V~1V	I/P: 230 VAC O/P: FULL LOAD/NO LOAD Ta: 25°C	POWER ON: 5.2V POWER OFF: 0 V	P
5	REMOTE SENSE	>0.3V	I/P: 230 VAC O/P: FULL LOAD Ta: 25°C	>0.3V	P

ENVIRONMENT TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT																																																																	
1	TEMPERATURE RISE TEST	MODEL : SE-1000-5 1. ROOM AMBIENT BURN-IN : 14 HRS I/P: 230VAC O/P: FULL LOAD Ta= 27.1℃ 2. HIGH AMBIENT BURN-IN : 2 HRS I/P: 230VAC O/P: FULL LOAD Ta= 51.2℃ <table><tr><th>NO</th><th>Position</th><th>P/N</th><th>ROOM AMBIENT Ta= 27.1℃</th><th>HIGH AMBIENT Ta=51.2℃</th></tr><tr><td>1</td><td>LF1</td><td>TR-631</td><td>34.6℃</td><td>55.1℃</td></tr><tr><td>2</td><td>C6</td><td>1500U/200V N.C.C 85℃</td><td>35.4℃</td><td>55.7℃</td></tr><tr><td>3</td><td>BD1</td><td>U30K80R 30A/800V</td><td>44.5℃</td><td>65.3℃</td></tr><tr><td>4</td><td>T1 COIL</td><td>TF-1358</td><td>58.1℃</td><td>78.6℃</td></tr><tr><td>5</td><td>U2</td><td>SG3525</td><td>34.6℃</td><td>55.3℃</td></tr><tr><td>6</td><td>L100</td><td>TR-632</td><td>78.5℃</td><td>102.1℃</td></tr><tr><td>7</td><td>C163</td><td>100U/25V RUB 105℃ YXG</td><td>36.6℃</td><td>57.7℃</td></tr><tr><td>8</td><td>C105</td><td>4700U /10V RUB 105℃</td><td>52.5℃</td><td>74.9℃</td></tr><tr><td>9</td><td>TSW1</td><td>ST-70</td><td>53.5℃</td><td>74.9℃</td></tr><tr><td>10</td><td>D104</td><td>S60SC4M 60A/40V SHI</td><td>77.8℃</td><td>100.0℃</td></tr><tr><td>11</td><td>Q6</td><td>IRGP50B60PD 50A/600V</td><td>68.3℃</td><td>93.2℃</td></tr><tr><td>12</td><td>U1</td><td>TOP224</td><td>47.6℃</td><td>70.0℃</td></tr></table>			NO	Position	P/N	ROOM AMBIENT Ta= 27.1℃	HIGH AMBIENT Ta=51.2℃	1	LF1	TR-631	34.6℃	55.1℃	2	C6	1500U/200V N.C.C 85℃	35.4℃	55.7℃	3	BD1	U30K80R 30A/800V	44.5℃	65.3℃	4	T1 COIL	TF-1358	58.1℃	78.6℃	5	U2	SG3525	34.6℃	55.3℃	6	L100	TR-632	78.5℃	102.1℃	7	C163	100U/25V RUB 105℃ YXG	36.6℃	57.7℃	8	C105	4700U /10V RUB 105℃	52.5℃	74.9℃	9	TSW1	ST-70	53.5℃	74.9℃	10	D104	S60SC4M 60A/40V SHI	77.8℃	100.0℃	11	Q6	IRGP50B60PD 50A/600V	68.3℃	93.2℃	12	U1	TOP224	47.6℃	70.0℃	P
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2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR (MIN)	I/P: 230 VAC O/P: 114 % LOAD Ta:25℃	TEST : OK	P																																																																	
3	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P: 230 VAC 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 45℃ NO DAMAGE	I/P: 272 VAC O/P:FULL LOAD Ta= 45 ℃ HUMIDITY= 95 %R.H	TEST : OK	P																																																																	
5	TEMPERATURE COEFFICIENT	± 0.05 %(0~50℃)	I/P: 230 VAC O/P:FULL LOAD	± 0.02 %(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																																																																	

M.T.B.F & LIFE CYCLE CALCULATION

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	CAPACITOR LIFE CYCLE	SUPPOSE C105 IS THE MOST CRITICAL COMPONENT I/P: 230VAC O/P:FULL LOAD Ta= 25 ℃ LIFE TIME= 500067 HRS I/P: 230VAC O/P:FULL LOAD Ta= 45 ℃ LIFE TIME= 140636 HRS			P
2	MTBF	MIL-HDBK-217F NOTICES2 PARTS COUNT TOTAL FAILURE RATE: 251.6K HRS			P
3	ORT (Ongoing Reliability test)	SE-1000-48:I/P : 230VAC O/P : 100% LOAD TA=45℃ Sample=5pcs		TEST TIME=1176HRS	P

SAFETY TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	WITHSTAND VOLTAGE	I/P-O/P: 3 KVAC/min I/P-FG: 1.5 KVAC/min O/P-FG: 0.5 KVAC/min	I/P-O/P: 3.6 KVAC/min I/P-FG: 1.8 KVAC/min O/P-FG: 0.6 KVAC/min Ta:25°C	I/P-O/P: 10.66 mA I/P-FG: 9.25 mA O/P-FG: 7.53 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: 3 GΩ I/P-FG: 1 GΩ O/P-FG: 1 GΩ NO DAMAGE	P
3	GROUNDING CONTINUITY	FG(PE) TO CHASSIS OR TRACE < 100 mΩ	40 A / 2min Ta:25°C	10 mΩ	P
4	APPROVAL	TUV: Certificate NO : ---- UL: File NO : E183223			P

COMPONENT STRESS TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	Power Transistor (D to S) or (C to E) Peak Voltage	Q1 Rated IRGP35B60PD : 600V 35 A	I/P:High-Line +3V = 267 V O/P: (1)Full Load Turn on (2) Full Load (3)Output Short Ta:25°C	(1) 424 V (2) 416 V (3) 456 V	P
2	Diode Peak Voltage	D100 Rated 63CPQ100 : 100V 60A	I/P:High-Line +3V = 267 V O/P: (1)Full Load Turn on (2) Full Load (3)Output Short Ta:25°C	(1) 67 V (2) 66 V (3) 68 V	P
3	Input Capacitor Voltage	C5 Rated :1500u / 200V/ 85°C	I/P:High-Line +3V = 267 V O/P: (1)Full Load Turn on /Off (2) Min load Turn on /Off (3)Full Load /Min load Change (4)Burn in 1hour Ta:25°C	(1) 179 V (2) 191 V (3) 179 V (4) 179 V	P
4	Control IC Voltage Test	U2 Rated SG3525AN : 40 V	I/P:High-Line +3V = 267 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) 15.6 V (2) 15.7 V (3) 15.7 V	P

DATE	SAMPLE	TEST RESULT	TESTER	APPROVAL
2005/12/21	RD SAMPLE	PASS	VINCENT TSENG	MAX LIN
2006/3/9	PRODUCT SAMPLE W0601B20	PASS	VINCENT TSENG	MAX LIN
2006/5/11	PRODUCT SAMPLE W0604B22	PASS	VINCENT TSENG	MAX LIN

2003/12/12 A50-F023