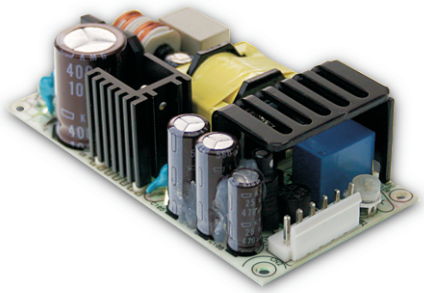
MEAN WELL

60W Single Output with Battery Charger(UPS Function)

PSC-60 series



Features :

- Universal AC input / Full range
- Protections: Short circuit / Overload / Over voltage
- Battery low protection / Battery polarity protection by fuse
- Alarm signal for AC OK and Battery low
- Cooling by free air convection
- 100% full load burn-in test
- 2 years warranty

SPECIFICATION

MODEL		PSC-60A		PSC-60B	
OUTPUT	OUTPUT NUMBER	CH1	CH2	CH1	CH2
	DC VOLTAGE	13.8V	13.8V	27.6V	27.6V
	RATED CURRENT	2.8A	1.5A	1.4A	0.75A
	CURRENT RANGE	0 ~ 4.3A	--------	0 ~ 2.15A	--------
	RATED POWER	59.34W		59.34W	
	RIPPLE & NOISE (max.) Note.2	120mVp-p	--------	240mVp-p	--------
	VOLTAGE ADJ. RANGE	CH1: 12 ~ 15V		CH1: 24 ~ 29V	
	VOLTAGE TOLERANCE Note.3	±1.0%	--------	±1.0%	--------
	LINE REGULATION	±0.5%	--------	±0.5%	--------
	LOAD REGULATION	±0.5%	--------	±0.5%	--------
	SETUP, RISE TIME Note.5	800ms, 50ms/230VAC 1600ms, 50ms/115VAC at full load			
	HOLD UP TIME (Typ.)	50ms/230VAC 10ms/115VAC at full load			
INPUT	VOLTAGE RANGE	90 ~ 264VAC 127 ~ 370VDC			
	FREQUENCY RANGE	47 ~ 63Hz			
	EFFICIENCY (Typ.)	84%		84%	
	AC CURRENT (Typ.)	1.6A/115VAC 1A/230VAC			
	INRUSH CURRENT (Typ.)	COLD START 30A/115VAC 60A/230VAC			
	LEAKAGE CURRENT	<1mA / 240VAC			
PROTECTION	OVERLOAD	105 ~ 150% rated output power			
		Protection type : Hiccup mode, recovers automatically after fault condition is removed			
	OVER VOLTAGE	CH1:14.49 ~ 18.63V		CH1:28.98 ~ 37.26V	
		Protection type : Hiccup mode, recovers automatically after fault condition is removed			
	BATTERY CUT OFF	10.5±0.5V		21±1V	
FUNCTION	AC OK	TTL open collector output, ON : AC OK ; OFF : AC Fail ; Ice : max. 30mA@ 50VDC			
	BATTERY LOW	TTL open collector output, ON : Battery Low ; OFF : Battery OK ; Ice : max. 30mA@ 50VDC			
		Battery low voltage : < 11V		Battery low voltage : < 22V	
ENVIRONMENT	WORKING TEMP.	-20 ~ +70℃ (Refer to output load derating curve)			
	WORKING HUMIDITY	20 ~ 90% RH non-condensing			
	STORAGE TEMP., HUMIDITY	-20 ~ +85℃, 10 ~ 95% RH			
	TEMP. COEFFICIENT	±0.03%/℃ (0~50℃) on CH1 output			
	VIBRATION	10 ~ 500Hz, 2G 10min./1cycle, 60min. each along X, Y, Z axes			
SAFETY & EMC (Note 4)	SAFETY STANDARDS	UL60950-1, TUV EN60950-1 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 / 25℃/ 70% RH			
	EMI CONDUCTION & RADIATION	Compliance to EN55022 (CISPR22) Class B			
	HARMONIC CURRENT	Compliance to EN61000-3-2,-3			
	EMS IMMUNITY	Compliance to EN61000-4-2,3,4,5,6,8,11; ENV50204, EN55024, light industry level, criteria A			
OTHERS	MTBF	589.7K hrs min. MIL-HDBK-217F (25℃)			
	DIMENSION	101.6*50.8*29mm (L*W*H)			
	PACKING	0.13Kg; 96pcs/13.5Kg/0.89CUFT			

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.
4. The power supply is considered a component which will be installed into a final equipment. The final equipment must be re-confirmed that it still meets EMC directives.
5. Length of set up time is measured at cold first start. Turning ON/OFF the power supply may lead to increase of the set up time.
6. Heat sink HS1,HS2 can not be shorted.
7. Heat sink HS1 must have safety isolation distance with system case.

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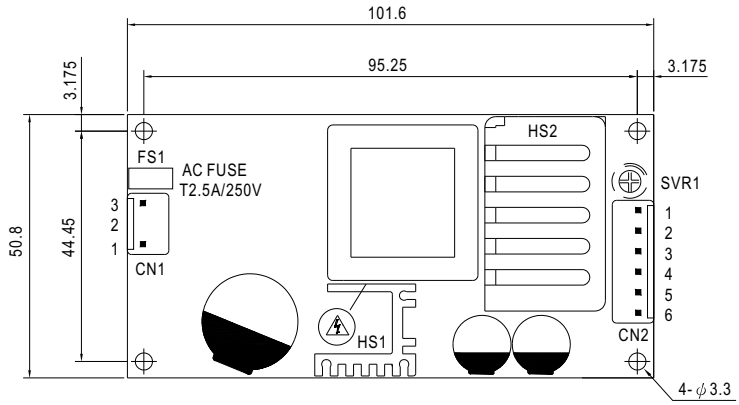
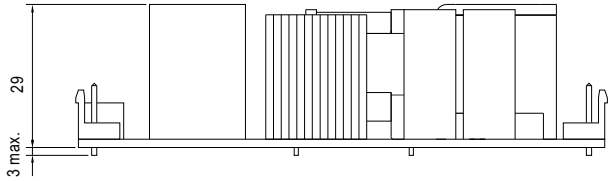
■ Mechanical Specification

Unit:mm





⚠ 1.HS1,HS2 can not be shorted.
2.HS1 must have safety isolation distance with system case.

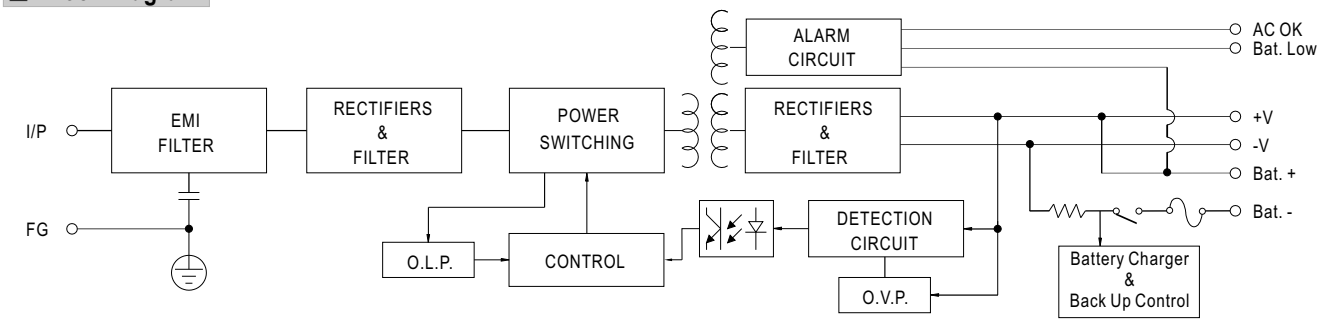
AC Input Connector (CN1) : JST B3P-VH or equivalent

Pin No.	Assignment	Mating Housing	Terminal
1	AC/N	JST VHR or equivalent	JST SVH-21T-P1.1 or equivalent
2	No Pin		
3	AC/L		

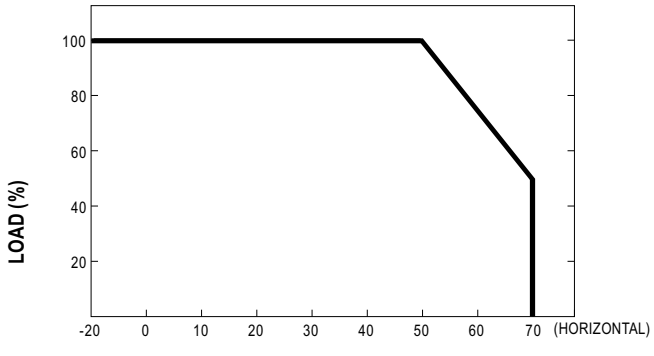
DC Output Connector (CN2) : JST B6P-VH or equivalent

Pin No.	Assignment	Pin No.	Assignment	Mating Housing	Terminal
1	Bat. Low	4	Battery +	JST VHR or equivalent	JST SVH-21T-P1.1 or equivalent
2	AC OK	5	DC Output +		
3	Battery -	6	DC Output COM		

■ Block Diagram

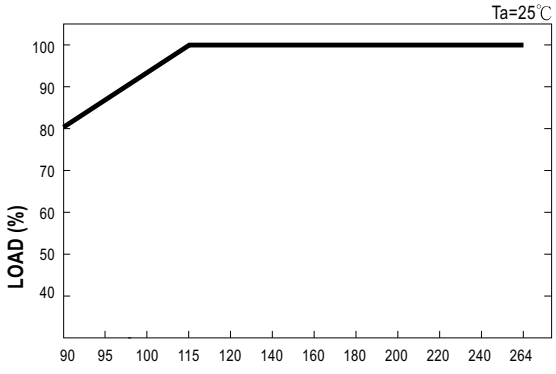


■ Output Derating



AMBIENT TEMPERATURE (℃)

■ Output Derating VS Input Voltage



INPUT VOLTAGE (VAC) 60Hz

■ Suggested Application

1.Back up connection for AC interruption

(1) Please refer to the Fig1.1 for suggested connection.

The power supply charge the battery and provide energy to the load in the same time when the AC main is OK.

The battery start to supply power to the load when the AC main fails.

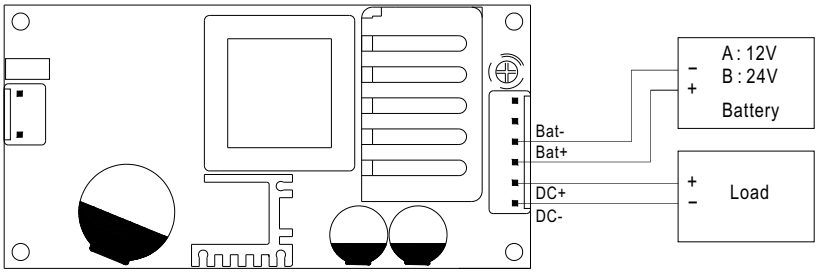


Fig 1.1 Suggested system connection

2.Alarm Signal for AC OK and Battery Low

(1) Alarm Signal is sent out through " AC OK " & " Battery Low " pins.

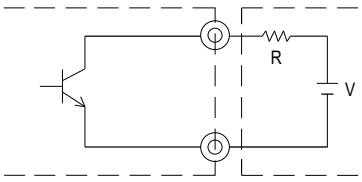
(2) An external voltage source is required for this function. The maximum applied voltage is 50V and the maximum sink current is 30mA.

(3) Table2.1 explain the alarm function built-in the power supply

Function	Description	Output of alarm
AC OK	The signal is "Low" when the power supply turns on	Low (0.3V max. at 30mA)
	The signal turns to be "High" when the power supply turns OFF	High or open(External applied voltage 30mA max.)
Battery Low	The signal is "Low" when the voltage of battery is under A:11V, B:22V	Low (0.3V max. at 30mA)
	The signal is "High" when the voltage of battery is above A:11V, B:22V	High or open(External applied voltage 30mA max.)

Table 2.1 Explanation of Alarm Signal

AC OK (Battery low)



Pin6 DC output com

External voltage and R
(The max. Sink is 30mA and 50V)

Fig 2.2 Internal circuit of AC OK (Battery Low)

MODEL：PSC-60A

OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	RIPPLE & NOISE	V1： 120 mVp-p (Max)	I/P： 230VAC O/P：FULL LOAD Ta：25℃	V1： 30 mVp-p (Max)	P
2	OUTPUT VOLTAGE ADJUST RANGE	CH1： 12 V~ 15 V	I/P： 230 VAC I/P： 115 VAC O/P：MIN LOAD Ta：25℃	11.71 V~ 15.58 V/ 230 VAC 11.71 V~ 15.57 V/115VAC	P
3	OUTPUT VOLTAGE TOLERANCE	V1： 1 %~ -1 % (Max)	I/P： 115 VAC / 264 VAC O/P：FULL/ MIN LOAD Ta：25℃	V1： 0.7 %~ -0.7 %	P
4	LINE REGULATION	V1： 0.5 %~ -0.5 % (Max)	I/P： 115VAC ~ 264 VAC O/P：FULL LOAD Ta：25℃	V1： 0 %~ 0 %	P
5	LOAD REGULATION	V1： 0.5%~ -0.5 % (Max)	I/P： 230 VAC O/P：FULL/MIN LOAD Ta：25℃	V1： 0.32 %~ -0.32 %	P
6	SET UP TIME	230VAC： 800 ms (Max) 115 VAC： 1600 ms (Max)	I/P： 230 VAC I/P： 115 VAC O/P：FULL LOAD Ta：25℃	230VAC/ 277 ms 115VAC/ 554 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℃	230VAC/ 7 ms 115VAC/ 6 ms	P
8	HOLD UP TIME	230VAC： 50 ms (TYP) 115VAC： 10 ms (TYP)	I/P： 230 VAC I/P： 115 VAC O/P：FULL LOAD Ta：25℃	230VAC/ 68 ms 115VAC/ 13 ms	P
9	OVER/UNDERSHOOT TEST	< ±5%	I/P： 230 VAC O/P：FULL LOAD Ta：25℃	TEST： < 5 %	P
10	DYNAMIC LOAD	V1： 1380 mVp-p	I/P： 230 VAC O/P：FULL /Min LOAD 90% DUTY/1KHZ Ta：25℃	322 mVp-p	P

INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	INPUT VOLTAGE RANGE	90VAC~264 VAC	I/P：TESTING O/P：FULL LOAD Ta：25℃	47 V~264V	P
			I/P： LOW-LINE-3V= 87 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： 90VAC ~ 264 VAC O/P：FULL~MIN LOAD Ta：25℃	TEST： OK	P
4	EFFICIENCY	84% (TYP)	I/P： 230 VAC O/P：FULL LOAD Ta：25℃	85 %	P
5	INPUT CURRENT	230V/ 1 A (TYP) 115V/ 1.6 A (TYP)	I/P： 230 VAC I/P： 115 VAC O/P：FULL LOAD Ta：25℃	I = 0.63 A/ 230 VAC I = 1.08 A/ 115 VAC	P
6	INRUSH CURRENT	230V/ 60 A (TYP) 115V/ 30 A(TYP) COLD START	I/P： 230 VAC I/P： 115 VAC O/P：FULL LOAD Ta：25℃	I = 45 A/ 230 VAC I = 22.5 A/ 115 VAC	P
7	LEAKAGE CURRENT	< 1 mA / 240 VAC	I/P： 264 VAC O/P：Min LOAD Ta：25℃	L-FG： 0.035 mA N-FG： 0.01 mA	P

PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	OVER LOAD PROTECTION	105%~ 150 %	I/P： 230 VAC I/P： 115 VAC O/P：TESTING Ta：25℃	132 %/ 230 VAC 134 %/ 115 VAC Hiccup Mode	P
2	OVER VOLTAGE PROTECTION	CH1： 14.49 V~ 18.63 V	I/P： 230 VAC I/P： 115 VAC O/P：MIN LOAD Ta：25℃	17.73 V/ 230 VAC 17.35 V/ 115 VAC Hiccup Model	P
3	BATTERY CUT OFF	10.5V ± 0.5V	I/P： 230 VAC O/P：FULL LOAD Ta：25℃	10.49 V/230VAC	P
4	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P： 264 VAC O/P：FULL LOAD Ta：25℃	NO DAMAGE Hiccup Mode	P

CONTROL FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	AC OK	TTL open collector output, ON ： AC OK ; OFF ： AC Fail ; Ice ： max. 30mA@ 50VDC	I/P： 230 VAC O/P：FULL LOAD Ta：25℃	OK	P
2	BATTERY LOW	TTL open collector output, ON ： Battery Low ; OFF ： Battery OK ; Ice ： max. 30mA@ 50VDC Battery low voltage < 11V	I/P： 230 VAC O/P：FULL LOAD Ta：25℃	10.62V	P

ENVIRONMENT TEST

<table>
<tr><th>NO</th><th>TEST ITEM</th><th>SPECIFICATION</th><th>TEST CONDITION</th><th>RESULT</th><th>VERDICT</th></tr>
<tr><td>1</td><td>TEMPERATURE RISE TEST</td><td colspan="3">MODEL： PSC-60A
1. ROOM AMBIENT BURN-IN： 31.5 HRS
I/P： 230VAC O/P： FULL LOAD Ta= 23.4 ℃
2. HIGH AMBIENT BURN-IN： 1.5 HRS
I/P： 230VAC O/P： FULL LOAD Ta= 54.5 ℃

<table>
<tr><th>NO</th><th>Position</th><th>P/N</th><th>ROOM AMBIENT Ta= 23.4 ℃</th><th>HIGH AMBIENT Ta= 54.5 ℃</th></tr>
<tr><td>1</td><td>LF1</td><td>LF853</td><td>58.3℃</td><td>83.0℃</td></tr>
<tr><td>2</td><td>BD1</td><td>4A/800V 梳型 SILICON</td><td>56.1℃</td><td>82.2℃</td></tr>
<tr><td>3</td><td>D1</td><td>EGP20J 2A/600V</td><td>76.4℃</td><td>102.5℃</td></tr>
<tr><td>4</td><td>C5</td><td>100u/400V 105℃ KMG</td><td>54.9℃</td><td>81.7℃</td></tr>
<tr><td>5</td><td>T1</td><td>TF1891</td><td>80.0℃</td><td>106.1℃</td></tr>
<tr><td>6</td><td>Q1</td><td>2SK4110 6A/600V</td><td>82.7℃</td><td>113.0℃</td></tr>
<tr><td>7</td><td>C36</td><td>100u/35V L7Kh 8*11.5 YXF</td><td>64.0℃</td><td>89.5℃</td></tr>
<tr><td>8</td><td>U1</td><td>NCP1200D</td><td>66.4℃</td><td>92.4℃</td></tr>
<tr><td>9</td><td>D100</td><td>20CTQ150 20A/150V</td><td>80.2℃</td><td>105.5℃</td></tr>
<tr><td>10</td><td>C105</td><td>560u/35V UL7Kh 10*25 KY</td><td>66.0℃</td><td>93.4℃</td></tr>
<tr><td>11</td><td>C107</td><td>220u/35V UL7Kh 8*15 KY</td><td>51.3℃</td><td>77.9℃</td></tr>
<tr><td>12</td><td>C108</td><td>470u/25V UL7Kh KY</td><td>73.9℃</td><td>98.7℃</td></tr>
<tr><td>13</td><td>L100</td><td>1.2Φ 1.1uH</td><td>67.6℃</td><td>93.9℃</td></tr>
</table></td><td>P</td></tr>
<tr><td>2</td><td>OVER LOAD BURN-IN TEST</td><td>NO DAMAGE
1 HOUR (MIN)</td><td>I/P： 230 VAC
O/P： 114 % LOAD
Ta：25.8 ℃</td><td>TEST：OK</td><td>P</td></tr>
<tr><td>3</td><td>LOW TEMPERATURE
TURN ON TEST</td><td>TURN ON AFTER 2 HOUR</td><td>I/P： 230 VAC
O/P： 100 % LOAD
Ta= -25 ℃</td><td>TEST：OK</td><td>P</td></tr>
<tr><td>4</td><td>HIGH HUMIDITY
HIGH TEMPERATURE
HIGH VOLTAGE
TURN ON TEST</td><td>AFTER 12 HOURS
IN CHAMBER ON
CONTROL 50 ℃
NO DAMAGE</td><td>I/P： 272 VAC
O/P：FULL LOAD
Ta= 50 ℃
HUMIDITY= 95 %R.H</td><td>TEST：OK</td><td>P</td></tr>
<tr><td>5</td><td>TEMPERATURE
COEFFICIENT</td><td>± 0.03 %(0~50℃)</td><td>I/P： 230 VAC
O/P：FULL LOAD</td><td>± 0.005 %(0~50℃)</td><td>P</td></tr>
<tr><td>6</td><td>VIBRATION TEST</td><td colspan="2">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℃</td><td>TEST：OK</td><td>P</td></tr>
</table>

SAFETY TEST

NO	TEST ITEM	SPECIFICATION	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℃	I/P-O/P： 0.886 mA I/P-FG： 0.586 mA O/P-FG： 0.11 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℃/70%RH	I/P-O/P： 30 GΩ I/P-FG： 30 GΩ O/P-FG： 30 GΩ NO DAMAGE	P
3	APPROVAL	TUV： Certificate NO ： UL： File NO ：			N/A

E.M.C TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	HARMONIC	EN61000-3-2 CLASS A	I/P： 220/230 /240VAC/50HZ O/P：100/75/50/25%LOAD Ta：25℃	PASS	P
2	CONDUCTION	EN55022 CLASS B	I/P：230 VAC (50HZ)/115V(60HZ) O/P：FULL/50% LOAD Ta：25℃	PASS Test by certified Lab	P
3	RADIATION	EN55022 ，EN55011 CLASS B	I/P：230 VAC(50HZ) /115V(60HZ) O/P：FULL LOAD Ta：25℃	PASS Test by certified Lab	P
4	E.S.D	EN61000-4-2 LIGHT INDUSTRY AIR：8KV / Contact：4KV	I/P： 230 VAC/50HZ O/P：FULL LOAD Ta：25℃	CRITERIA A	P
5	E.F.T	EN61000-4-4 LIGHT INDUSTRY INPUT： 1KV	I/P： 230 VAC/50HZ O/P：FULL LOAD Ta：25℃	CRITERIA A	P
6	SURGE	IEC61000-4-5 LIGHT INDUSTRY L-N ：1KV L,N-PE：2KV	I/P： 230 VAC/50HZ O/P：FULL LOAD Ta：25℃	CRITERIA A	P
7	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	PSC-60A： SUPPOSE C105 IS THE MOST CRITICAL COMPONENT I/P： 230VAC O/P：FULL LOAD Ta= 25 ℃ LIFE TIME= 96887 HRS I/P： 230VAC O/P：FULL LOAD Ta= 50 ℃ LIFE TIME= 22119 HRS			P
2	MTBF	MIL-HDBK-217F NOTICES2 PARTS COUNT TOTAL FAILURE RATE： 589.7 KHRS			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 1 Rated 2SK4110 6A/600V	I/P：High-Line +3V = 267 V O/P：(1)Full Load Turn on (2) Output Short Ta：25℃	(1) 550 V (2) 552 V	P
2	Diode Peak Voltage	D100Rated 20CTQ150 20A/150V	I/P：High-Line +3V = 267 V O/P：(1)Full Load Turn on (2)Output Short Ta：25℃	(1) 138 V (2) 120 V	P
3	Clamp Diode Peak Voltage	D1 Rated EGP20J 2A/600V	I/P：High-Line +3V = 267 V O/P：(1) Dynamic Load 90%DUTY/ 1KHz Ta：25℃	(1) 488 V	P
4	Input Capacitor Voltage	C 5 Rated 100u/400V 105℃ KMG	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℃	(1) 373 V (2) 381 V (3) 381 V	P
5	Control IC Voltage Test	U1Rated NCP1200 16V	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℃	(1) 14.119 V (2) 12.868 V (3) 12.866 V	P

DATE	SAMPLE	TEST RESULT	TESTER	APPROVAL
2008/11/3	RD SAMPLE	PASS	SANFORD SU	VINCENT TSENG
2009/2/20	PRODUCT SAMPLE W0811C37	PASS	SANFORD SU	VINCENT TSENG
2009/3/11	PRODUCT SAMPLE W0901D38	PASS	SANFORD SU	VINCENT TSENG

2003/12/12 A50-F023