JAMECO ELECTRONICS **Jameco SKU Number: 2102473**

MEAN WELL

240W Single Output with PFC Function

SP-240 series

■ Features :

- Universal AC input / Full range
- Built-in active PFC function, PF>0.95
- Protections: Short circuit / Overload / Over voltage / Over temperature
- Forced air cooling by built-in DC Fan
- Built-in fan ON / OFF control
- LED indicator for power on
- Fixed switching frequency at 90KHz
- 3 years warranty

SPECIFICATION

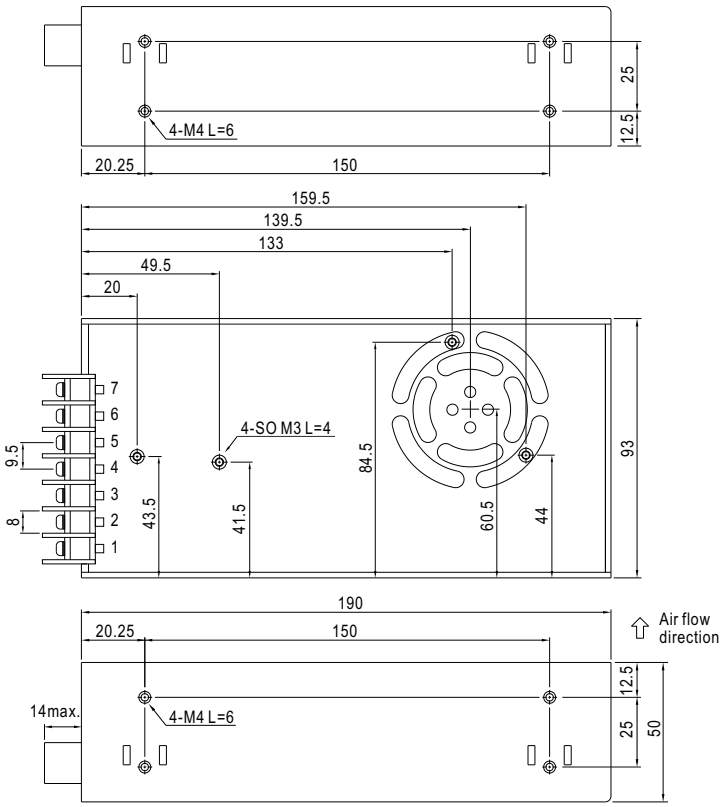
MODEL		SP-240-5	SP-240-7.5	SP-240-12	SP-240-15	SP-240-24	SP-240-30	SP-240-48
OUTPUT	DC VOLTAGE	5V	7.5V	12V	15V	24V	30V	48V
	RATED CURRENT	45A	32A	20A	16A	10A	8A	5A
	CURRENT RANGE	0 ~ 45A	0 ~ 32A	0 ~ 20A	0 ~ 16A	0 ~ 10A	0 ~ 8A	0 ~ 5A
	RATED POWER	225W	240W	240W	240W	240W	240W	240W
	RIPPLE & NOISE (max.) Note.2	150mVp-p	150mVp-p	150mVp-p	150mVp-p	150mVp-p	150mVp-p	150mVp-p
	VOLTAGE ADJ. RANGE	4 ~ 6V	6 ~ 9V	10 ~ 14V	12 ~ 18V	20 ~ 28V	27 ~ 33V	41 ~ 56V
	VOLTAGE TOLERANCE Note.3	±2.0%	±2.0%	±1.0%	±1.0%	±1.0%	±1.0%	±1.0%
	LINE REGULATION	±0.5%	±0.5%	±0.3%	±0.3%	±0.2%	±0.2%	±0.2%
	LOAD REGULATION	±1.0%	±1.0%	±0.5%	±0.5%	±0.5%	±0.5%	±0.5%
	SETUP, RISE TIME	800ms, 50ms/230VAC 1500ms, 50ms/115VAC at full load						
	HOLD UP TIME (Typ.)	20ms/230VAC 20ms/115VAC at full load						
INPUT	VOLTAGE RANGE Note.5	88 ~ 264VAC 124 ~ 370VDC						
	FREQUENCY RANGE	47 ~ 63Hz						
	POWER FACTOR (Typ.)	PF>0.95/230VAC PF>0.98/115VAC at full load						
	EFFICIENCY (Typ.)	79%	83%	86%	86%	87%	88%	89%
	AC CURRENT (Typ.)	3.6A/115VAC 1.8A/230VAC						
	INRUSH CURRENT (Typ.)	25A/115VAC 40A/230VAC						
	LEAKAGE CURRENT	<2mA / 240VAC						
PROTECTION	OVERLOAD	105 ~ 135% rated output power						
		Protection type : Hiccup mode, recovers automatically after fault condition is removed						
	OVER VOLTAGE	6.3 ~ 7.5V	9.4 ~ 10.9V	14.7 ~ 17.5V	19 ~ 22.5V	29.5 ~ 35V	34.7 ~ 41V	57.6 ~ 67.2V
		Protection type : Shut down o/p voltage, re-power on to recover						
	OVER TEMPERATURE	90℃ ±5℃ (5V,7.5V), 85℃ ±5℃ (12V,15V,24V,30V,48V) (TSW1 : detect on heatsink of power transistor)						
		Protection type : Shut down o/p voltage, recovers automatically after temperature goes down						
FUNCTION	FAN CONTROL	RTH2≧40℃ FAN ON, ≦35℃ FAN OFF(Typ.)						
ENVIRONMENT	WORKING TEMP.	-20 ~ +70℃ (Refer to output load derating curve)						
	WORKING HUMIDITY	20 ~ 90% RH non-condensing						
	STORAGE TEMP., HUMIDITY	-40 ~ +85℃, 10 ~ 95% RH						
	TEMP. COEFFICIENT	±0.03%/℃ (0 ~ 50℃)						
	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	284K hrs min. MIL-HDBK-217F (25℃)						
	DIMENSION	190*93*50mm (L*W*H)						
	PACKING	0.8Kg; 18pcs/15.4Kg/1.04CUFT						

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. Derating may be needed under low input voltages. Please check the derating curve for more details.

■ Mechanical Specification

Case No.987A Unit:mm

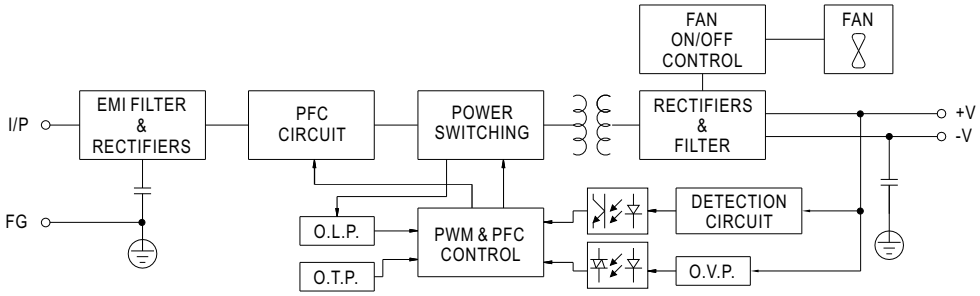


Terminal Pin No. Assignment

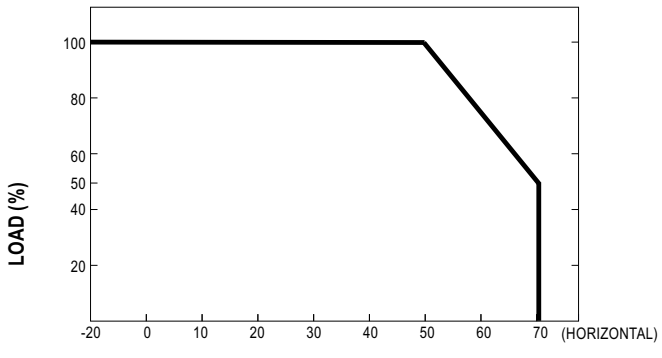
Pin No.	Assignment	Pin No.	Assignment
1	AC/L	4,5	DC OUTPUT -V
2	AC/N	6,7	DC OUTPUT +V
3	FG ⏚		

■ Block Diagram

fosc : 90KHz

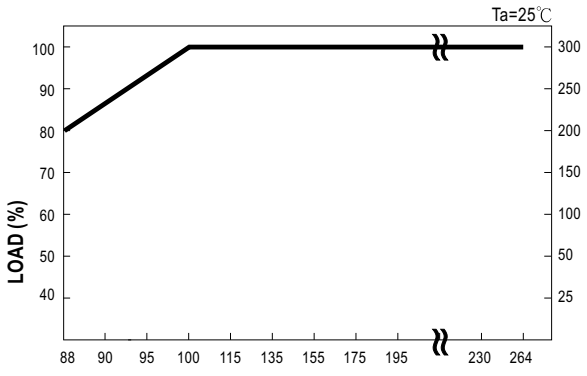


■ Derating Curve



AMBIENT TEMPERATURE (℃)

■ Static Characteristics



INPUT VOLTAGE (VAC) 60Hz

MODEL：SP-240-30

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℃	V1： 17 mVp-p (Max)	P
2	OUTPUT VOLTAGE ADJUST RANGE	CH1：27 V ~ 33 V	I/P： 230 VAC I/P： 115 VAC O/P：MIN LOAD Ta：25℃	23.78 V ~ 33.85 V/ 230 VAC 23.78 V ~ 33.85 V/ 115 VAC	P
3	OUTPUT VOLTAGE TOLERANCE	V1：1 %~ -1 % (Max)	I/P：100 VAC / 264 VAC O/P：FULL/ MIN LOAD Ta：25℃	V1： 0.03 %~ -0.03 %	P
4	LINE REGULATION	V1： 0.2 %~ -0.2 % (Max)	I/P：100 VAC ~ 264 VAC O/P：FULL LOAD Ta：25℃	V1： 0 %~ -0.02 %	P
5	LOAD REGULATION	V1： 0.5 %~ -0.5 % (Max)	I/P： 230 VAC O/P：FULL ~MIN LOAD Ta：25℃	V1： 0.04 %~ -0.02 %	P
6	SET UP TIME	230VAC： 800 ms (Max) 115VAC： 1500 ms (Max)	I/P： 230 VAC I/P： 115 VAC O/P：FULL LOAD Ta：25℃	230VAC/ 412.56 ms 115VAC/ 753.92 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/ 23.14 ms 115VAC/ 22.67 ms	P
8	HOLD UP TIME	230VAC： 20 ms (TYP) 115VAC： 20 ms (TYP)	I/P： 230 VAC I/P： 115 VAC O/P：FULL LOAD Ta：25℃	230VAC/ 24.15 ms 115VAC/ 24.18 ms	P
9	OVER/UNDERSHOOT TEST	< ±5%	I/P： 230 VAC O/P：FULL LOAD Ta：25℃	TEST： <±5 %	P
10	DYNAMIC LOAD	V1： 3000 mVp-p	I/P： 230 VAC O/P：FULL /Min LOAD 90%DUTY/ 1KHZ Ta：25℃	672 mVp-p	P

INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	INPUT VOLTAGE RANGE	100VAC~264 VAC	I/P：TESTING O/P：FULL LOAD Ta：25℃	56.112 V~264V	P
			I/P： LOW-LINE-3V= 97 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：100VAC ~ 264 VAC O/P：FULL~MIN LOAD Ta：25℃	TEST： OK	P
3	POWER FACTOR	0.95 / 230 VAC(TYP) 0.98 / 115 VAC(TYP)	I/P： 230 VAC I/P： 115 VAC O/P：FULL LOAD Ta：25℃	PF= 0.976 / 230 VAC PF= 1 / 115 VAC	P
4	EFFICIENCY	88% (TYP)	I/P： 230 VAC O/P：FULL LOAD Ta：25℃	88 %	P
5	INPUT CURRENT	230V/ 1.8 A (TYP) 115V/ 3.6 A (TYP)	I/P： 230 VAC I/P： 115 VAC O/P：FULL LOAD Ta：25℃	I = 1.228 A/ 230 VAC I = 2.488 A/ 115 VAC	P
6	INRUSH CURRENT	230V/ 40 A (TYP) 115V/ 25 A(TYP) COLD START	I/P： 230 VAC I/P： 115 VAC O/P：FULL LOAD Ta：25℃	I = 35 A/ 230 VAC I = 17 A/ 115 VAC	P
7	LEAKAGE CURRENT	< 2 mA / 240 VAC	I/P： 264 VAC O/P：Min LOAD Ta：25℃	L-FG： 0.8 mA N-FG： 0.8 mA	P

PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	OVER LOAD PROTECTION	105 %~ 135 %	I/P： 230 VAC I/P： 115 VAC O/P：TESTING Ta：25℃	116.8%/ 230 VAC 118.3%/ 115 VAC Hiccup Mode	P
2	OVER VOLTAGE PROTECTION	CH1： 34.7 V~ 41 V	I/P： 230 VAC I/P： 115 VAC O/P：MIN LOAD Ta：25℃	36.7 V/ 230 VAC 36.8 V/ 115 VAC Shut down Re- power ON	P
3	OVER TEMPERATURE PROTECTION	SPEC： TSW1： 85± 5℃ 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℃	NO DAMAGE Hiccup Mode	P

CONTROL FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	FAN ON/OFF CONTROL (TYP)	RTH2 ≧ 40 ℃ FAN ON RTH2 ≦ 35 ℃ FAN OFF	I/P： 230 VAC O/P：FULL LOAD	35.4 ℃ FAN ON 36 ℃ FAN OFF	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：SP-240-5
1. ROOM AMBIENT BURN-IN：0.5 HRS
I/P： 230VAC O/P： FULL LOAD Ta= 26.6 ℃
2. HIGH AMBIENT BURN-IN： 2 HRS
I/P： 230VAC O/P： FULL LOAD Ta= 49.5 ℃

<table>
<tr><th>NO</th><th>Position</th><th>P/N</th><th>ROOM AMBIENT
Ta= 26.6 ℃</th><th>HIGH AMBIENT
Ta= 49.5 ℃</th></tr>
<tr><td>1</td><td>LF1</td><td>LF108-R2</td><td>38.9℃</td><td>56.7℃</td></tr>
<tr><td>2</td><td>BD1</td><td>6A/800V 梳型 GLASS
KBJ608G</td><td>45.2℃</td><td>65.0℃</td></tr>
<tr><td>3</td><td>TSW1</td><td>ST-22W-R2 90℃</td><td>45.7℃</td><td>64.2℃</td></tr>
<tr><td>4</td><td>Q1</td><td>IRFB20N50K 20A/500V</td><td>47.2℃</td><td>65.9℃</td></tr>
<tr><td>5</td><td>D2</td><td>STTH8S06D</td><td>47.7℃</td><td>65.1℃</td></tr>
<tr><td>6</td><td>C5</td><td>100u/400V 105℃ 18*25 KMG</td><td>41.1℃</td><td>58.8℃</td></tr>
<tr><td>7</td><td>L1</td><td>TR412</td><td>47.6℃</td><td>66.6℃</td></tr>
<tr><td>8</td><td>Q2</td><td>2SK4115 7A/900V</td><td>53.2℃</td><td>77.5℃</td></tr>
<tr><td>9</td><td>U1</td><td>FAN4800IN</td><td>48.7℃</td><td>66.1℃</td></tr>
<tr><td>10</td><td>T1</td><td>TF1926</td><td>80.4℃</td><td>97.0℃</td></tr>
<tr><td>11</td><td>D3</td><td>BYV26EGP 1A/1KV</td><td>64.3℃</td><td>83.6℃</td></tr>
<tr><td>12</td><td>RG1</td><td>L7812CV 1.0A/12V</td><td>50.4℃</td><td>69.6℃</td></tr>
<tr><td>13</td><td>C201</td><td>47u/35V L6Kh 5*11 ZLH</td><td>52.5℃</td><td>77.9℃</td></tr>
<tr><td>14</td><td>L100</td><td>TR901 Ku106125-2</td><td>52.5℃</td><td>76.7℃</td></tr>
<tr><td>15</td><td>D101</td><td>STPS30L30CT</td><td>59.3℃</td><td>75.7℃</td></tr>
<tr><td>16</td><td>C103</td><td>3900u/10V UL10Kh 12.5*25 ZLH</td><td>51.4℃</td><td>69.3℃</td></tr>
<tr><td>17</td><td>R10</td><td>3W 100Ω 5% MINI</td><td>79.7℃</td><td>99.6℃</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：110 % LOAD
Ta：25℃</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= -30 ℃</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>± 0.01 %(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： 6.81 mA I/P-FG： 6.17 mA O/P-FG： 5.12 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： 7.91 GΩ O/P-FG： 22.1 GΩ NO DAMAGE	P
3	GROUNDING CONTINUITY	FG(PE) TO CHASSIS OR TRACE < 100 mΩ	40 A / 2min Ta：25℃ / 70%RH	8 mΩ	P
4	APPROVAL	TUV： Certificate NO ：R50159049 UL： File NO ：E183223			P

E.M.C TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	HARMONIC	EN61000-3-2 CLASS A CLASS D	I/P： 230 VAC/50HZ O/P：FULL LOAD Ta：25℃	PASS	P
2	CONDUCTION	EN55022 CLASS B	I/P： 230 VAC (50HZ) O/P：FULL/50% LOAD Ta：25℃	PASS Test by certified Lab	P
3	RADIATION	EN55022 CLASS B	I/P： 230 VAC (50HZ) 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	SP-240-5：SUPPOSE C103 IS THE MOST CRITICAL COMPONENT I/P： 230VAC O/P：FULL LOAD Ta= 25 ℃ LIFE TIME=498365.4 HRS I/P： 230VAC O/P：FULL LOAD Ta=40 ℃ LIFE TIME=249128.4 HRS			P
2	MTBF	MIL-HDBK-217F NOTICES2 PARTS COUNT TOTAL FAILURE RATE： 284K HRS			P

COMPONENT STRESS TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	Power Transistor (D to S) or (C to E) Peak Voltage	Q2 Rated : 2SK4115 7A/900V	I/P : High-Line +3V = 267 V O/P : (1)Full Load Turn on (2) Output Short Ta : 25℃	(1) 796 V (2) 816 V	P
2	Diode Peak Voltage	D 101 Rated : 20CTQ150 20A/150V	I/P : High-Line +3V = 267 V O/P : (1)Full Load Turn on (2)Output Short Ta : 25℃	(1) 117 V (2) 110 V	P
3	PFC Transistor (D to S) or (C to E) Peak Voltage	Q1 Rated : IRFB20N50K 20A/500V	I/P : High-Line +3V = 267 V O/P : (1)Full Load Turn on (2)Output Short Ta : 25℃	(1) 448 V (2) 424 V	P
4	Input Capacitor Voltage	C 5 Rated : 100u/400V 105℃ 18*25 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) 378.6 V (2) 416 V (3) 393.8 V	P
5	Control IC Voltage Test	U 1 Rated : PWM FAN4800IN 18V	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) 15.281 V (2) 16.071 V (3) 15.71 V	P

DATE	SAMPLE	TEST RESULT	TESTER	APPROVAL
2009/6/5	RD SAMPLE	PASS	SANFORD SU	VINCENT TSENG
2009/7/28	PRODUCT SAMPLE W0907A36	PASS	SANFORD SU	VINCENT TSENG

2003/12/12 A50-F023