



#### ■ Features :

- DC input active surge current limiting
- Wide 4:1~2:1 DC input range (24V: 19~72VDC, 96V:72~144VDC)
- Protections: Short circuit / Overload / Over voltage / Over temperature / Input polarity (by fuse)
- 2000VAC I/O Isolation
- Forced air cooling by built-in DC fan with fan speed control function
- Output OK Signal
- Built-in remote ON-OFF control
- Built-in remote sense function
- 3 years warranty

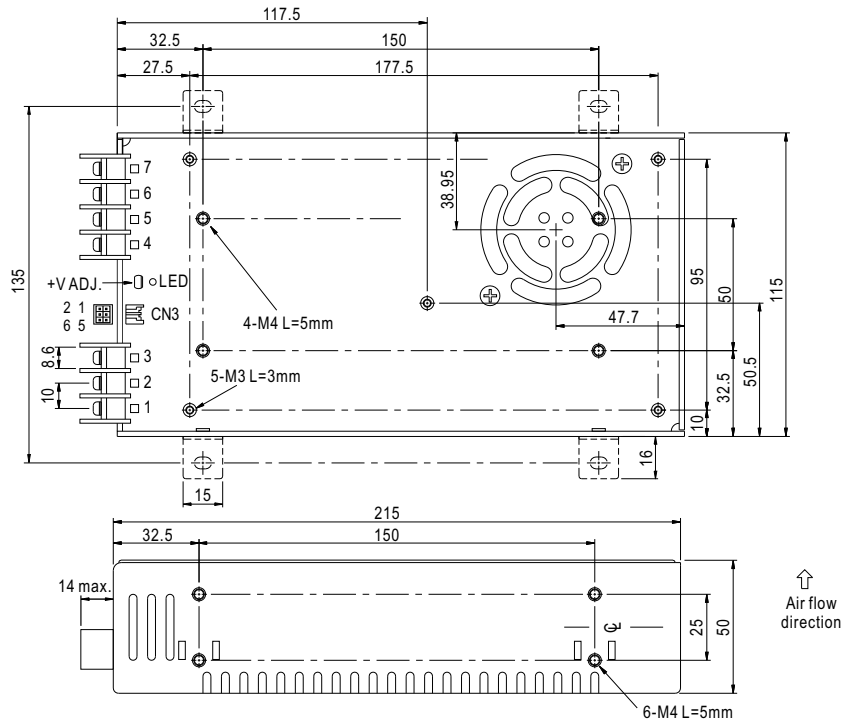
**CB CE**

#### SPECIFICATION

MODEL	SD-500L-12	SD-500L-24	SD-500L-48	SD-500H-12	SD-500H-24	SD-500H-48	
OUTPUT	DC VOLTAGE	12V	24V	48V	12V	24V	48V
	RATED CURRENT	40A	21A	10.5A	40A	21A	10.5A
	CURRENT RANGE	0 ~ 40A	0 ~ 21A	0 ~ 10.5A	0 ~ 40A	0 ~ 21A	0 ~ 10.5A
	RATED POWER	480W	504W	504W	480W	504W	504W
	RIPPLE & NOISE (max.) Note.2	150mVp-p	150mVp-p	150mVp-p	150mVp-p	150mVp-p	150mVp-p
	VOLTAGE ADJ. RANGE	11 ~ 15V	23 ~ 30V	46 ~ 60V	11 ~ 15V	23 ~ 30V	46 ~ 60V
	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	±0.5%	±0.5%	±0.5%	±0.5%	±0.5%	±0.5%
SETUP, RISE TIME	500ms, 50ms at full load						
INPUT	VOLTAGE RANGE Note.5	19 ~ 72VDC			72 ~ 144VDC		
	EFFICIENCY (Typ.)	86%	88%	89%	87%	89%	90%
	DC CURRENT (Typ.)	24.2A/19VDC	24.8A/24VDC	12A/48VDC	8A/72VDC	6A/96VDC	
	CURRENT (AT NO LOAD)	Max. 0.2A/48VDC			Max. 0.1A/96VDC		
	INRUSH CURRENT (Typ.)	60A/48VDC			60A/96VDC		
PROTECTION	OVERLOAD	105 ~ 125% rated output power Protection type : Constant current limiting, shut down o/p voltage after about 5 sec., re-power on to recover					
	OVER VOLTAGE	16 ~ 19V	30.8 ~ 35.2V	62 ~ 68V	16 ~ 19V	30.8 ~ 35.2V	62 ~ 68V
	OVER TEMPERATURE	80°C ±5°C (TSW1 ) detect on heatsink of power transistor 80°C ±5°C (L-48V,H-24V,H-48V), 85°C ±5°C (L-24V), 90°C ±5°C (L-12V), 95°C ±5°C (H-12V) (TSW2 : detect on heatsink of o/p diode) Protection type : Shut down o/p voltage, recovers automatically after temperature goes down					
FUNCTION	REMOTE ON/OFF CONTROL	Please refer to function manual					
	OUTPUT OK SIGNAL	Open collector signal low when PSU turns on, max. sink current : 10mA					
ENVIRONMENT	WORKING TEMP.	-20 ~ +60°C (Refer to output load derating curve)					
	WORKING HUMIDITY	20 ~ 90% RH non-condensing					
	STORAGE TEMP., HUMIDITY	-40 ~ +85°C, 10 ~ 95% RH					
	TEMP. COEFFICIENT	±0.02%/°C (0 ~ 50°C)					
	VIBRATION	10 ~ 500Hz, 2G 10min./1cycle, 60min. each along X, Y, Z axes					
SAFETY & EMC (Note 4)	SAFETY STANDARDS	IEC60950-1 CB approved by TUV					
	WITHSTAND VOLTAGE	I/P-O/P:2KVAC 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°C 70%RH					
	EMI CONDUCTION & RADIATION	Compliance to EN55022 (CISPR22) Class B					
	EMS IMMUNITY	Compliance to EN61000-4-2,3,4,6,8; ENV50204, light industry level, criteria A					
OTHERS	MTBF	196.3K hrs min. MIL-HDBK-217F (25°C)					
	DIMENSION	215*115*50mm (L*W*H)					
	PACKING	1.15Kg; 12pcs/14.8Kg/0.92CUFT					
NOTE	<ol style="list-style-type: none"> <li>1. All parameters NOT specially mentioned are measured at 48, 96VDC input, rated load and 25°C of ambient temperature.</li> <li>2. Ripple &amp; noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1uf &amp; 47uf parallel capacitor.</li> <li>3. Tolerance : includes set up tolerance, line regulation and load regulation.</li> <li>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.</li> <li>5. Derating may be needed under low input voltages. Please check the derating curve for more details.</li> </ol>						

### Mechanical Specification

Case No. 912A Unit:mm



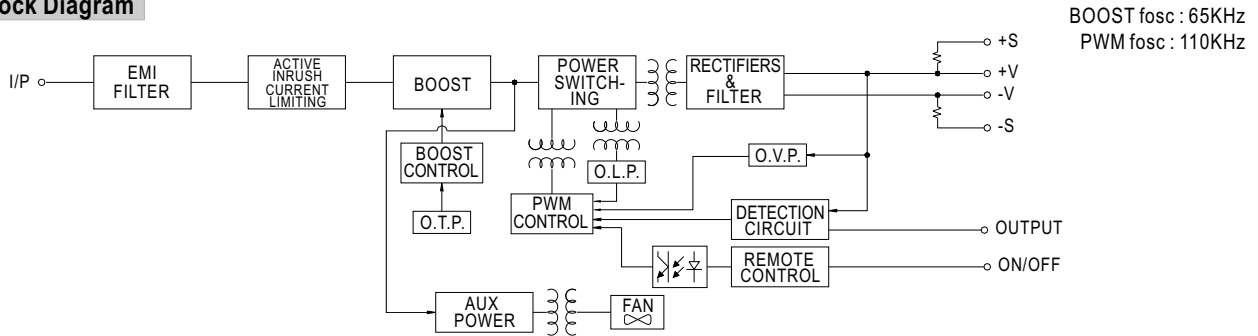
DC Input Terminal Pin No. Assignment

Pin No.	Assignment	Pin No.	Assignment
1	DC INPUT V+	4,5	-V
2	DC INPUT V-	6,7	+V
3	FG $\perp$		

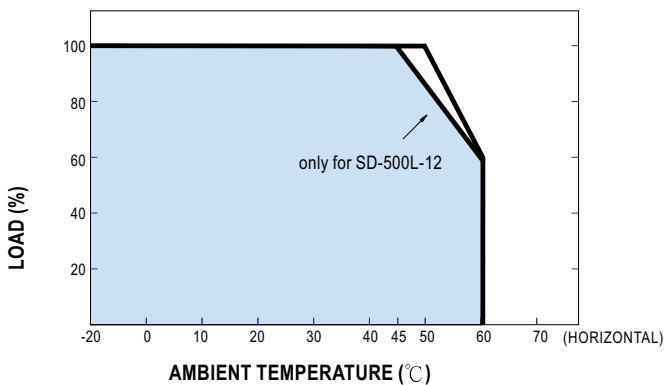
Control Pin No. Assignment (CN3) : JST B6B-PHDSS or equivalent

Pin No.	Assignment	Pin No.	Assignment	Mating Housing	Terminal
1	+S	4	GND	JST PHDR-06VS or equivalent	JST SPHD-002T-P0.5 or equivalent
2	-S	5	RC		
3	OUTPUT OK	6	RCG		

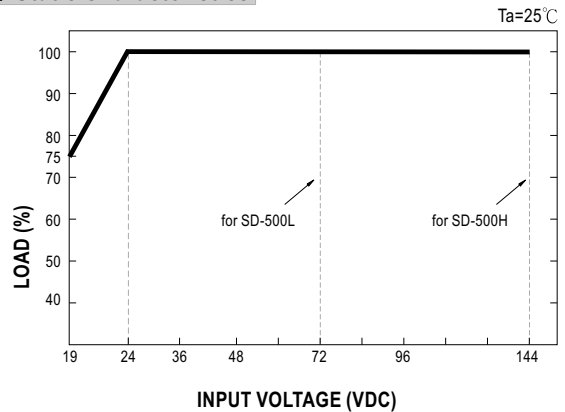
### Block Diagram



### Derating Curve



### Static Characteristics



### Function Description of CN3

Pin No.	Function	Description
1	+S	Positive sensing. The +S signal should be connected to the positive terminal of the load. The +S and -S leads should be twisted in pair to minimize noise pick-up effect. The maximum line drop compensation is 0.5V.
2	-S	Negative sensing. The -S signal should be connected to the negative terminal of the load. The -S and +S leads should be twisted in pair to minimize noise pick-up effect. The maximum line drop compensation is 0.5V.
3	O/P OK	Open collector signal, reference to pin4(GND). Low when PSU turns on. The maximum sink current is 10mA and the maximum external voltage is 13V.
4	GND	These pins connect to the negative terminal (-V).
5	RC	Remote ON/OFF
6	RCG	Remote ON/OFF ground

### Function Manual

#### 1. Remote ON/OFF

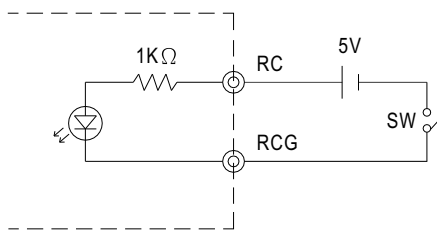
- (1) Remote ON/OFF control becomes available by applying voltage in CN3
- (2) Table 1.1 shows the specification of Remote ON/OFF function
- (3) Fig.1.2 shows the example to connect Remote ON/OFF control function

Table 1.1 Specification of Remote ON/OFF

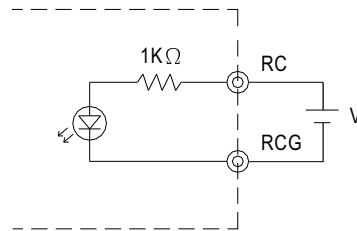
Connection Method	Fig. 1.2(A)	Fig. 1.2(B)
Output on	SW Open	V=0~0.8Vdc
Output off	SW Close	V=4~10Vdc

Fig.1.2 Examples of connecting remote ON/OFF

(A) Using external voltage source



(B) Using external voltage source



#### 2. Output OK signal

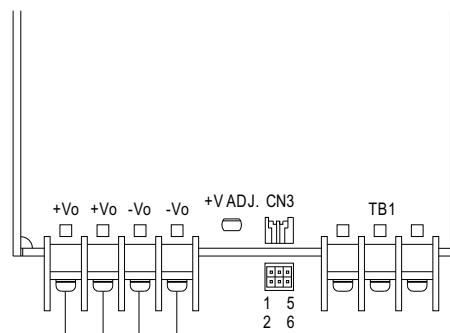
"Output OK" is an open collector signal. It indicates the output status of the PSU. It can operate in two ways : One is sinking current from external signal ; the other is sending out a voltage signal.

##### 2-1 Sink current :

The maximum sink current is 10mA and the maximum external voltage is 13V.

##### 2-2 Voltage signal :

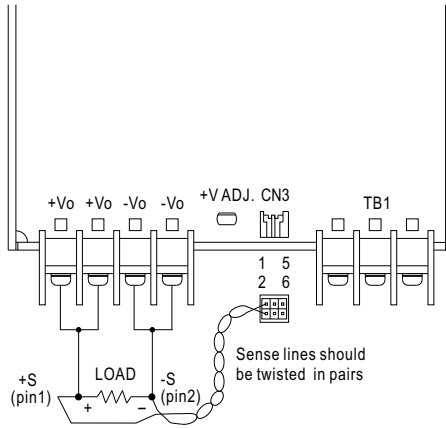
Between O/P OK(pin3) and GND(pin4)	Output Status
0 ~ 0.5V	ON
12 ~ 13V	OFF



1	CN3	5
+S	O/P OK	RC
-S	GND	RCG
2		6

### 3.Remote Sense

The remote sensing compensates voltage drop on the load wiring up to 0.5V.



1	CN3	5
+S	O/P OK	RC
-S	GND	RCG
2		6

MODEL : SD-500H-24

### 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: 42 mVp-p (Max )	P
2	OUTPUT VOLTAGE ADJUST RANGE	CH1: 23V - 30V	I/P: 96VDC O/P:MIN LOAD Ta:25°C	22.4V - 30.6 V	P
3	OUTPUT VOLTAGE TOLERANCE	V1: 1%~ -1%	I/P: 72 VDC / 144 VDC O/P:FULL/ MIN LOAD Ta:25°C	V1: 0.03 %~ -0.03 %	P
4	LINE REGULATION	V1: 0.5 %~ -0.5 %	I/P: 72VDC -144VDC O/P:FULL LOAD Ta:25°C	V1: 0.03 %~ -0.03 %	P
5	LOAD REGULATION	V1: 0.5 %~ -0.5 %	I/P: 96VDC O/P:FULL -MIN LOAD Ta:25°C	V1: 0.03 %~ -0.03 %	P
6	SET UP TIME	500 ms	I/P: 96VDC O/P:FULL LOAD Ta:25°C	146 ms	P
7	RISE TIME	50ms	I/P: 96VDC O/P:FULL LOAD Ta:25°C	22 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: 2400mVp-p	I/P: 96 VDC O/P:FULL /Min LOAD 90%DUTY/1KHZ Ta:25°C	395 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	70.5 V~ 144V	P
			I/P: LOW-LINE-0.2V= 71.8 V HIGH-LINE+5%= 151 V O/P:FULL/MIN LOAD ON: 30 Sec . OFF: 30 Sec 10MIN ( AC POWER ON/OFF NO DAMAGE )	TEST: OK	
2	EFFICIENCY	89 % (TYP)	I/P: 96 VDC O/P:FULL LOAD Ta:25°C	89.4 %	P
3	INPUT CURRENT	6 A(TYP)	I/P: 96 VDC O/P:FULL LOAD Ta:25°C	I = 5.94 A	P
4	INRUSH CURRENT	60A (TYP) COLD START	I/P: 96 VDC O/P:FULL LOAD Ta:25°C	I = 47 A	P
5	CURRENT (at no load)	0.1A (MAX)	I/P: 96 VDC O/P:NO LOAD Ta:25°C	I = 0.07 A	P

### PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	OVER LOAD PROTECTION	105 %- 125 %	I/P: 96 VDC O/P:TESTING Ta:25°C	112.8 % Constant Current Limiting , Shut down O/P voltage ,after about 5 sec Re-power ON to recover	P
2	OVER VOLTAGE PROTECTION	CH1: 30.8 V~ 35.2V	I/P: 96 VDC O/P:MIN LOAD Ta:25°C	32.4 V Shut down Re- power ON	P
3	OVER TEMPERATURE PROTECTION	SPEC: TSW2 > 80°C ±5°C O.T.P TSW1 > 80°C ±5°C O.T.P  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: 144 VDC O/P: FULL LOAD Ta:25°C	NO DAMAGE Constant Current Limiting , Shut down O/P voltage ,after about 5 sec Re-power ON to recover	P

## CONTROL FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT									
1	FAN SPEED CONTROL	NO LOAD= 8.5V ± 1V FULL LOAD= 12.6V ± 0.5V	I/P: 96VDC O/P:FULL LOAD Ta:25°C	NO LOAD= 8.8 V FULL LOAD= 12.69 V	P									
2	REMOTE CONTROL	Remote on/off control becomes available by applying voltage in CN3 (RC/RCG) <table border="1" data-bbox="375 499 804 633"> <tr> <td>Connection method</td> <td>Fig 1.2(A)</td> <td>Fig 1.2(B)</td> </tr> <tr> <td>Output on</td> <td>SW Open</td> <td>V=0-0.8VDC</td> </tr> <tr> <td>Output off</td> <td>SW Close</td> <td>V=4VDC-10VDC</td> </tr> </table> Fig 1.2(A)/ Fig 1.2(B) see SPEC function manual	Connection method	Fig 1.2(A)	Fig 1.2(B)	Output on	SW Open	V=0-0.8VDC	Output off	SW Close	V=4VDC-10VDC	I/P: 96VDC O/P:FULL LOAD Ta:25°C	a. OK b. 0 V ~2.4 V POWER ON 2.5V-10 V POWER OFF	P
Connection method	Fig 1.2(A)	Fig 1.2(B)												
Output on	SW Open	V=0-0.8VDC												
Output off	SW Close	V=4VDC-10VDC												
3	REMOTE SENSE	S+ / S- >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 0.03V: OUTPUT STATUS ON 12.8V:OUTPUT STATUS OFF	P									

## ENVIRONMENT TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	TEMPERATURE RISE TEST	MODEL : SD-500H--24 1. ROOM AMBIENT BURN-IN : 1.5 HRS I/P: 96VDC O/P: FULL LOAD Ta=30.7 °C 2. HIGH AMBIENT BURN-IN : 13 HRS I/P: 96 VDC O/P: FULL LOAD Ta=54.7 °C			P
2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR ( MIN )	I/P: 96 VDC O/P: 111 % LOAD Ta:25°C	TEST : OK	
3	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P: 144 VDC / 72VDC O/P: 100% LOAD Ta= -25°C	TEST : OK	P
4	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 50°C NO DAMAGE	I/P: 144VDC O/P:FULL LOAD Ta= 50 °C HUMIDITY= 95 %R.H	TEST : OK	P
5	TEMPERATURE COEFFICIENT	± 0.02 % (0-50°C)	I/P: 96 VDC O/P:FULL LOAD	± 0.005 % (0-50°C)	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°C		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: 4.23 mA I/P-FG: 4.02 mA O/P-FG: 5.53 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: 5.58 GΩ I/P-FG: 1.85 GΩ O/P-FG: 12.9 GΩ NO DAMAGE	P
3	GROUNDING CONTINUITY	FG(PE) TO CHASSIS OR TRACE < 100 mΩ	40 A / 2min Ta:25°C / 70%RH	7 mΩ	P
4	APPROVAL	TUV: Certificate NO : UL: File NO :			N

## 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: 96 VDC O/P:FULL LOAD Ta:25°C	CRITERIA A	P
4	Test by certified Lab & Test Report Prepare				



## M.T.B.F &amp; LIFE CYCLE CALCULATION

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	CAPACITOR LIFE CYCLE	SD-500H-24 : SUPPOSE C110 IS THE MOST CRITICAL COMPONENT I/P:96VDC O/P:FULL LOAD Ta= 25°C LIFE TIME= 2249259 HRS I/P:96 VDC O/P:FULL LOAD Ta= 50 °C LIFE TIME= 301329 HRS			P
2	MTBF	MIL-HDBK-217F NOTICES2 PARTS COUNT TOTAL FAILURE RATE: 196.3K HRS			P

## COMPONENT STRESS TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	Power Transistor ( D to S) or (C to E) <b>Peak Voltage</b>	Q201 Rated IRFP460A 20A/500V	I/P:High-Line +3V = 147 V O/P: (1)Full Load Turn on (2) Output Short Ta:25°C	(1) 390 V (2) 400 V	P
2	Diode <b>Peak Voltage</b>	D100 Rated 30CPQ150 30A/150V	I/P:High-Line +3V = 147 V O/P: (1)Full Load Turn on (2)Output Short Ta:25°C	(1) 121 V (2) 126 V	P
3	<b>Input Capacitor Voltage</b>	C5 Rated 330u/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) 168 V (2) 167 V (3) 168 V	P
4	<b>Control IC Voltage Test</b>	U2 Rated KA3846 :40 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) 12.73 V (2) 12.8 V (3) 12.8 V	P

DATE	SAMPLE	TEST RESULT	TESTER	APPROVAL
2008/1/21	RD SAMPLE	PASS	SANFORD SU	VINCENT TSENG
2008/3/17	PRODUCT SAMPLE W0802B72	PASS	SANFORD SU	VINCENT TSENG
2008/5/29	PRODUCT SAMPLE W0804B61	PASS	SANFORD SU	VINCENT TSENG

2003/12/12 A50-F023