



450W Single Output Power Supply

SE-450 series



■ Features :

- AC input active surge current limiting
- AC input range selected by switch
- Protections: Short circuit / Overload / Over voltage / Over temperature
- Forced air cooling by built-in DC fan
- Built-in remote sense function
- LED indicator for power on
- UL approved
- Low cost, high reliability
- 100% full load burn-in test
- 2 years warranty



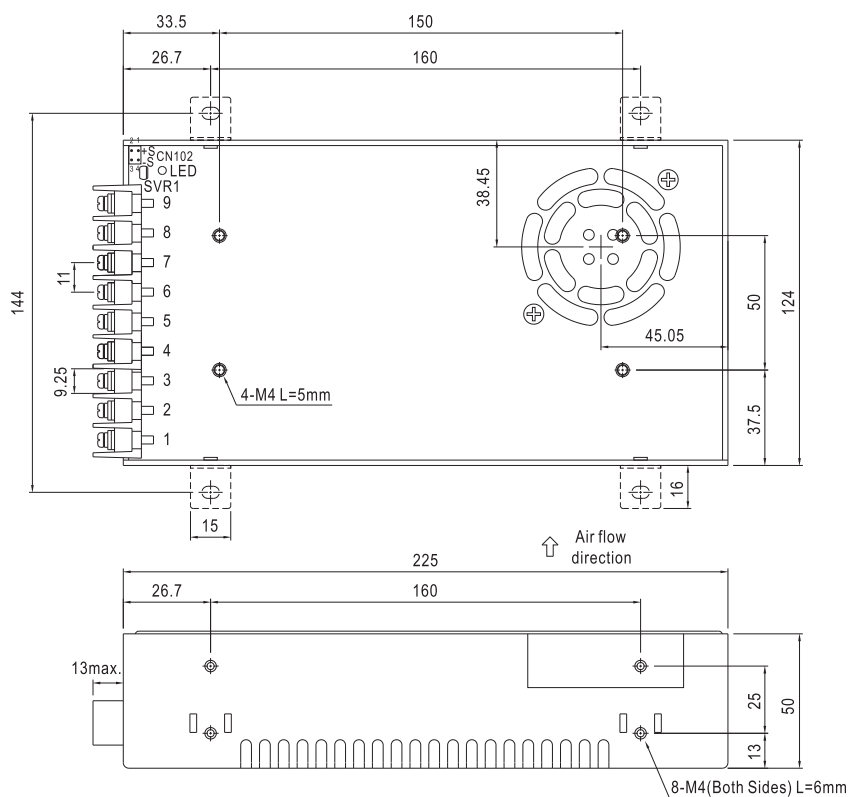
SPECIFICATION

MODEL		SE-450-3.3	SE-450-5	SE-450-12	SE-450-15	SE-450-24	SE-450-36	SE-450-48
OUTPUT	DC VOLTAGE	3.3V	5V	12V	15V	24V	36V	48V
	RATED CURRENT	75A	75A	37.5A	30A	18.8A	12.5A	9.4A
	CURRENT RANGE	0 ~ 75A	0 ~ 75A	0 ~ 37.5A	0 ~ 30A	0 ~ 18.8A	0 ~ 12.5A	0 ~ 9.4A
	RATED POWER	247.5W	375W	450W	450W	451.2W	450W	451.2W
	RIPPLE & NOISE (max.) Note.2	200mVp-p	200mVp-p	200mVp-p	200mVp-p	200mVp-p	200mVp-p	200mVp-p
	VOLTAGE ADJ. RANGE	2.97 ~ 3.63V	4.5 ~ 5.5V	10.8 ~ 13.5V	13.5 ~ 16.5V	21.6 ~ 28.5V	32.4 ~ 39.6V	43.2 ~ 52.8V
	VOLTAGE TOLERANCE Note.3	±3.0%	±3.0%	±1.0%	±1.0%	±1.5%	±1.0%	±1.0%
	LINE REGULATION	±0.5%	±0.5%	±0.3%	±0.3%	±0.2%	±0.2%	±0.2%
	LOAD REGULATION	±2.0%	±2.0%	±0.5%	±0.5%	±0.5%	±0.5%	±0.5%
	SETUP, RISE TIME	1500ms, 50ms/230VAC 1500ms, 50ms/115VAC at full load						
	HOLD UP TIME (Typ.)	16ms/230VAC 12ms/115VAC at full load						
INPUT	VOLTAGE RANGE	90 ~ 132VAC / 180 ~ 264VAC selected by switch 254 ~ 370VDC						
	FREQUENCY RANGE	47 ~ 63Hz						
	EFFICIENCY (Typ.)	74%	78%	83%	84%	86%	86%	88%
	AC CURRENT (Typ.)	10A/115VAC 6A/230VAC						
	INRUSH CURRENT (Typ.)	35A/115VAC 55A/230VAC						
	LEAKAGE CURRENT	<2.5mA / 240VAC						
PROTECTION	OVERLOAD	105 ~ 150% rated output power Protection type : Shut down o/p voltage, re-power on to recovery						
	OVER VOLTAGE	3.8 ~ 4.6V	5.75 ~ 6.75V	13.8 ~ 16.2V	18 ~ 21V	32 ~ 36V	45 ~ 52V	57.6 ~ 67.2V
	OVER TEMPERATURE	80°C±5°C(3.3 ~ 12V), 90°C±5°C(15 ~ 48V) (TSW1) detect on heatsink of power transistor Protection type : Shut down o/p voltage, recovers automatically after temperature goes down						
ENVIRONMENT	WORKING TEMP.	-10 ~ +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	±0.05%/°C (0 ~ 50°C)						
	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 / 25°C/ 70% RH						
OTHERS	MTBF	200K hrs min. MIL-HDBK-217F (25°C)						
	DIMENSION	225*124*50mm (L*W*H)						
	PACKING	1.25Kg/12PCS/16Kg/1CUFT						
NOTE	1. All parameters NOT specially mentioned are measured at 230VAC input, rated load and 25°C 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.							

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■ Mechanical Specification

Case No. 986 Unit:mm



CN102:Remote Sense

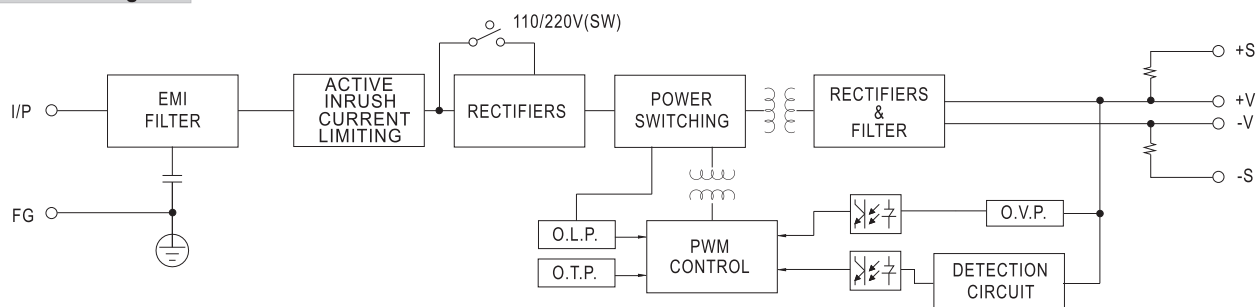
Pin No.	Assignment
1,2	RS+
3,4	RS-

Terminal Pin No. Assignment :

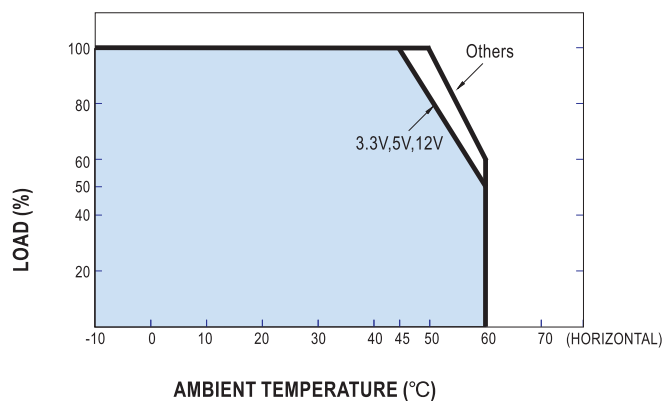
Pin No.	Assignment	Pin No.	Assignment
1	AC/L	4~6	DC OUTPUT -V
2	AC/N	7~9	DC OUTPUT +V
3	FG $\perp$		

■ Block Diagram

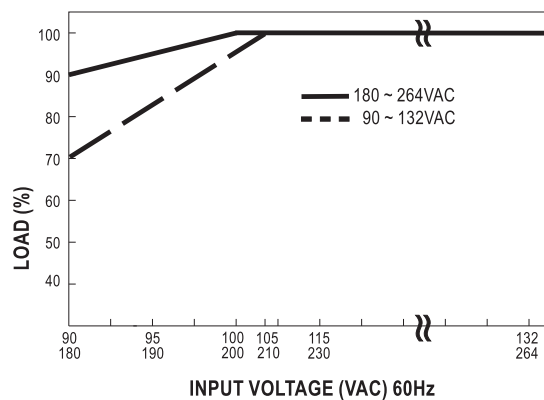
fosc : 100KHz



Derating Curve



■ Static Characteristics



MODEL : SE-450-36

OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	RIPPLE & NOISE	V1 : 200 mVp-p (Max)	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	V1 : 88 mVp-p (Max)	PASS
2	OUTPUT VOLTAGE ADJUST RANGE	CH1 : 32.4 V ~ 39.6 V	I/P : 230 VAC I/P : 115VAC O/P : MIN LOAD Ta : 25°C	28.995V~40.561V /230Vac 28.989V~40.554V/115VAC	PASS
3	OUTPUT VOLTAGE TOLERANCE	V1 : -1 %~ +1 % (Max)	I/P : 200VAC / 264 VAC O/P : FULL/ MIN LOAD Ta : 25°C	V1 : -0.119 %~ +0.102 %	PASS
4	LINE REGULATION	V1 : -0.2 %~ +0.2 % (Max)	I/P : 200 VAC ~ 264VAC O/P : FULL LOAD Ta : 25°C	V1 : -0.033 %~+0.05 %	PASS
5	LOAD REGULATION	V1 : -0.5 %~ +0.5 % (Max)	I/P : 230 VAC O/P : FULL ~MIN LOAD Ta : 25°C	V1 : -0.119%~+0.033 %	PASS
6	SET UP TIME	230VAC/ 1500 ms (Max) 115VAC/ 1500 ms (Max)	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	230 VAC/ 115.3 ms 115 VAC/ 81.0 ms	PASS
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	230 VAC/ 6.5 ms 115 VAC/ 7.9 ms	PASS
8	HOLD UP TIME	230VAC/ 16 ms (Typ) 115VAC/ 12 ms (Typ)	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	230VAC/ 26.9 ms 115 VAC/ 22.1 ms	PASS
9	OVER/UNDERSHOOT TEST	< ±5%	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	TEST : ±1.648 %	PASS
10	DYNAMIC LOAD	V1 : 3600 mVp-p	I/P : 230 VAC O/P : (1)FULL /Min LOAD 90%DUTY/1KHZ (2)FULL /Min LOAD 50%DUTY/120HZ Ta : 25°C	(1) 380 mVp-p (2) 790 mVp-p	PASS

INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	INPUT VOLTAGE RANGE	180 VAC~ 264 VAC	I/P : TESTING O/P : FULL LOAD Ta : 25°C	170 V~ 264 V	PASS
			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 : 180 VAC ~264 VAC O/P : FULL-MIN LOAD Ta : 25°C	TEST : OK	PASS
3	EFFICIENCY	86 % (Typ)	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	87.1 %	PASS
4	INPUT CURRENT	230 V/ 6 A (Typ) 115 V/ 10 A (Typ)	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	I = 3.54 A/ 230VAC I = 6.07 A/ 115VAC	PASS
5	INRUSH CURRENT	230 V/ 55 A (Typ) 115 V/ 35 A (Typ) COLD START	I/P : 230 VAC I/P : 115 VAC O/P : FULL LOAD Ta : 25°C	I = 37.1 A/ 230VAC I = 28.0 A/ 115VAC	PASS

PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	OVER LOAD PROTECTION	105%~150% RATED OUTPUT POWER	I/P : 264 VAC I/P : 230 VAC I/P : 200 VAC O/P : TESTING Ta : 25°C	129 %/264VAC 122 %/ 230VAC 114 %/200 VAC Shut down Re-power ON	PASS
2	OVER VOLTAGE PROTECTION	CH1 : 45 V~ 52 V	I/P : 264 VAC I/P : 230 VAC I/P : 180 VAC O/P : MIN LOAD Ta : 25°C	48.5 V/ 264VAC 48.3 V/ 230VAC 48.5 V/ 180VAC Shut down Re-power ON	PASS
3	OVER TEMPERATURE PROTECTION	SPEC : TSW1 : 90±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	PASS
4	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P : 264 VAC O/P : FULL LOAD Ta : 25°C	NO DAMAGE Shut down Re-power ON	PASS

CONTROL FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	REMOTE SENSE	S+ / S- >0.3V	I/P : 230 VAC O/P : FULL LOAD Ta : 25°C	0.32 V	PASS

ENVIRONMENT TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT																																																																																					
1	TEMPERATURE RISE TEST	MODEL : SE-450-24 1. ROOM AMBIENT BURN-IN : 1 HRS I/P : 230VAC O/P : FULL LOAD Ta= 33.6 °C 2. HIGH AMBIENT BURN-IN : 2 HRS I/P : 230VAC O/P : FULL LOAD Ta=51.4 °C <table><tr><th>NO</th><th>Position</th><th>P/N</th><th>ROOM AMBIENT Ta=33.6 °C</th><th>HIGH AMBIENT Ta=51.4 °C</th></tr><tr><td>1</td><td>LF2</td><td>TR348</td><td>41.0°C</td><td>57.8°C</td></tr><tr><td>2</td><td>BD1</td><td>D25XB60 25A/600V</td><td>53.0°C</td><td>68.3°C</td></tr><tr><td>3</td><td>C5</td><td>680u/220V LP 85°C</td><td>48.0°C</td><td>63.7°C</td></tr><tr><td>4</td><td>Q1</td><td>IRFP460 20A/500V</td><td>74.6°C</td><td>92.6°C</td></tr><tr><td>5</td><td>Q2</td><td>IRFP460 20A/500V</td><td>77.1°C</td><td>95.8°C</td></tr><tr><td>6</td><td>D15</td><td>31DF6 3A/600V</td><td>50.6°C</td><td>66.8°C</td></tr><tr><td>7</td><td>D16</td><td>31DF6 3A/600V</td><td>48.7°C</td><td>65.4°C</td></tr><tr><td>8</td><td>T1</td><td>TF-6146</td><td>59.6°C</td><td>78.2°C</td></tr><tr><td>9</td><td>D100</td><td>S20LC20U 200V/20A</td><td>67.0°C</td><td>83.0°C</td></tr><tr><td>10</td><td>D101</td><td>S20LC20U 200V/20A</td><td>70.8°C</td><td>86.3°C</td></tr><tr><td>11</td><td>D102</td><td>S20LC20U 200V/20A</td><td>68.8°C</td><td>84.0°C</td></tr><tr><td>12</td><td>L100</td><td>TR130</td><td>50.0°C</td><td>68.8°C</td></tr><tr><td>13</td><td>C105</td><td>1000u/35V GL 105°C</td><td>42.6°C</td><td>57.8°C</td></tr><tr><td>14</td><td>C107</td><td>1000u/35V GL 105°C</td><td>39.1°C</td><td>54.7°C</td></tr><tr><td>15</td><td>RG1</td><td>L7812CV 1A/12V</td><td>55.7°C</td><td>72.6°C</td></tr><tr><td>16</td><td>R31</td><td>2K7 / 3W</td><td>66.3°C</td><td>85.3°C</td></tr></table>			NO	Position	P/N	ROOM AMBIENT Ta=33.6 °C	HIGH AMBIENT Ta=51.4 °C	1	LF2	TR348	41.0°C	57.8°C	2	BD1	D25XB60 25A/600V	53.0°C	68.3°C	3	C5	680u/220V LP 85°C	48.0°C	63.7°C	4	Q1	IRFP460 20A/500V	74.6°C	92.6°C	5	Q2	IRFP460 20A/500V	77.1°C	95.8°C	6	D15	31DF6 3A/600V	50.6°C	66.8°C	7	D16	31DF6 3A/600V	48.7°C	65.4°C	8	T1	TF-6146	59.6°C	78.2°C	9	D100	S20LC20U 200V/20A	67.0°C	83.0°C	10	D101	S20LC20U 200V/20A	70.8°C	86.3°C	11	D102	S20LC20U 200V/20A	68.8°C	84.0°C	12	L100	TR130	50.0°C	68.8°C	13	C105	1000u/35V GL 105°C	42.6°C	57.8°C	14	C107	1000u/35V GL 105°C	39.1°C	54.7°C	15	RG1	L7812CV 1A/12V	55.7°C	72.6°C	16	R31	2K7 / 3W	66.3°C	85.3°C	PASS
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2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR (MIN)	I/P : 230 VAC O/P : 115 % LOAD Ta : 25°C	TEST : OK	PASS																																																																																					
3	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P : 230 VAC O/P : 115 % LOAD Ta= 40.6 °C	TEST : OK	PASS																																																																																					
4	HIGH HUMIDITY HIGH TEMPERATURE HIGH VOLTAGE TURN ON TEST	AFTER 12 HOURS IN CHAMBER ON CONTROL 50 °C NO DAMAGE	I/P : 272 VAC O/P : FULL LOAD Ta= 50 °C HUMIDITY= 95 %R.H	TEST : OK	PASS																																																																																					
5	TEMPERATURE COEFFICIENT	± 0.05 %(0~50°C)	I/P : 230 VAC O/P : FULL LOAD	± 0.006 %(0~50°C)	PASS																																																																																					
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	PASS																																																																																					

M.T.B.F & LIFE CYCLE CALCULATION

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	CAPACITOR LIFE CYCLE	SE-450-24 : SUPPOSE C 105 IS THE MOST CRITICAL COMPONENT I/P : 230 VAC O/P : FULL LOAD Ta=25 °C LIFE TIME=826569.8 HRS I/P : 230 VAC O/P : FULL LOAD Ta=50 °C LIFE TIME=174966 HRS			PASS
2	MTBF	MIL-HDBK-217F NOTICES2 PARTS COUNT TOTAL FAILURE RATE : 200K HRS			PASS

SAFETY TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	WITHSTAND VOLTAGE	I/P-FG : 1.5 KVAC/min I/P-O/P : 3.0 KVAC/min O/P-FG : 0.5 KVAC/min	I/P-FG : 1.6 KVAC/min I/P-O/P : 3.1 KVAC/min O/P-FG : 0.6 KVAC/min Ta : 25°C	I/P-FG : 5.22 mA I/P-O/P : 6.22 mA O/P-FG : 4.07 mA NO DAMAGE	PASS
2	ISOLATION RESISTANCE	I/P-FG : 500VDC>100MΩ I/P-O/P : 500VDC>100MΩ O/P-FG : 500VDC>100MΩ	I/P-FG : 500 VDC I/P-O/P : 500 VDC O/P-FG : 500 VDC Ta : 25°C	I/P-FG : 1477 MΩ I/P-O/P : 3570 MΩ O/P-FG : 1354 MΩ NO DAMAGE	PASS
3	GROUNDING CONTINUITY	FG(PE) TO CHASSIS OR TRACE < 100 mΩ	25A / 1min Ta : 25°C	5 mΩ	PASS
4	LEAKAGE CURRENT	< 2.5 mA / 240VAC	I/P : 264 VAC O/P : NO LOAD Ta : 25°C	L-FG : 1.00 mA N-FG : 1.03 mA	PASS

COMPONENT STRESS TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	Power Transistor (D to S) or (C to E) Peak Voltage	Q 1/2 Rated IRFP460 : 500 V / 20 A	I/P : High-Line +3V = 267 V O/P : (1)Full Load Turn on (2)Output Short (3)Dynamic Load Full Load/ Min. Load 90%Duty/1KHz (4)Dynamic Load 50% Load/ Min. Load 90%Duty/1KHz Ta : 25°C	Q1 Q2 (1) 324 V (1) 386 V (2) 0 V (2) 0 V (3) 324 V (3) 386 V (4) 232 V (4) 332 V	PASS
2	Diode Peak Voltage	D 100 Rated S20LC30 : 300 V / 20 A	I/P : High-Line +3V = 267 V O/P : (1)Full Load Turn on (2)Output Short (3)Dynamic Load Full Load/ Min. Load 90%Duty/1KHz (4)Dynamic Load 50% Load/ Min. Load 90%Duty/1KHz Ta : 25°C	(1) 189 V (2) 0 V (3) 132 V (4) 123 V	PASS
3	Clamp Diode Peak Voltage	D15/16 Rated 31DF6 : 600 V / 3 A	I/P : High-Line +3V = 267 V O/P : (1)Dynamic Load Full Load/ Min. Load 90%Duty/1KHz (2)Dynamic Load 50% Load/ Min. Load 90%Duty/1KHz Ta : 25°C	D15 D16 (1) 360 V (1) 362 V (2) 370 V (2) 370 V	PASS
4	Control IC Voltage Test	U 1 Rated TL3843P : 30 V	I/P : High-Line +3V =267 V O/P : (1) Output Short (2)O.L.P Ta : 25°C	(1) 21.1 V (2) 19.6 V	PASS

DATE	SAMPLE	TEST RESULT	TESTER	APPROVAL
2008.11.7	RD SAMPLE	PASS	SKY	LIUWY

2003/12/12 A50-F023



450W Single Output Switching Power Supply

SE-450 series
