



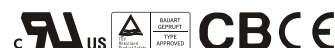
### 35W Single Output Switching Power Supply

## PS-35 series



#### ■ Features :

- Universal AC input/Full range
- Protections:Short circuit/Over load/Over voltage
- Cooling by free air convection
- 100% full load burn-in test
- Fixed switching frequency at 60KHz
- 2 years warranty

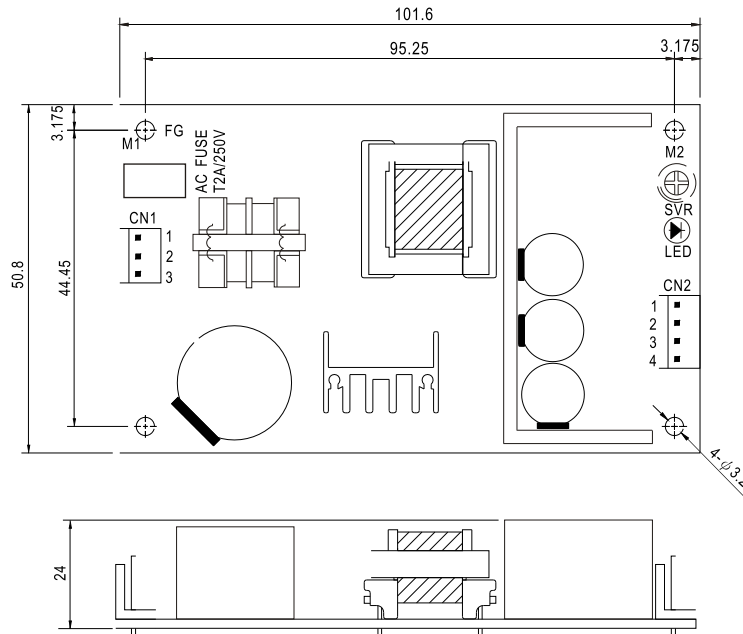


#### SPECIFICATION

MODEL	PS-35-3.3	PS-35-5	PS-35-7.5	PS-35-12	PS-35-13.5	PS-35-15	PS-35-24	PS-35-48		
OUTPUT	DC VOLTAGE	3.3V	5V	7.5V	12V	13.5V	15V	24V	48V	
	RATED CURRENT	6A	6A	4.7A	3A	2.6A	2.4A	1.5A	0.75A	
	CURRENT RANGE	0 ~ 6A	0 ~ 6A	0 ~ 4.7A	0 ~ 3A	0 ~ 2.6A	0 ~ 2.4A	0 ~ 1.5A	0 ~ 0.75A	
	RATED POWER	19.8W	30W	35.25W	36W	35.1W	36W	36W	36W	
	RIPPLE & NOISE (max.) Note.2	80mVp-p	100mVp-p	100mVp-p	120mVp-p	120mVp-p	150mVp-p	200mVp-p	240mVp-p	
	VOLTAGE ADJ. RANGE	3.14 ~ 3.63V	4.75 ~ 5.5V	7.13 ~ 8.25V	10.8 ~ 13.2V	12.15 ~ 14.85V	13.5 ~ 16.5V	21.6 ~ 26.4V	43.2 ~ 52.8V	
	VOLTAGE TOLERANCE Note.3	±2.0%	±2.0%	±2.0%	±1.0%	±1.0%	±1.0%	±1.0%	±1.0%	
	LINE REGULATION	±0.5%	±0.5%	±0.5%	±0.5%	±0.5%	±0.5%	±0.5%	±0.5%	
	LOAD REGULATION	±1%	±1%	±1%	±0.5%	±0.5%	±0.5%	±0.5%	±0.5%	
	SETUP, RISE TIME	1200ms, 30ms/230VAC, 1200ms, 30ms/115VAC at full load								
HOLD TIME (Typ.)	50ms/230VAC, 10ms/115VAC at full load									
INPUT	VOLTAGE RANGE	90 ~ 264VAC 127 ~ 370VDC								
	FREQUENCY RANGE	47 ~ 440Hz								
	EFFICIENCY(Typ.)	70%	78%	80%	81%	81%	81%	85%	84%	
	AC CURRENT (Typ.)	0.75A/115VAC 0.5A/230VAC								
	INRUSH CURRENT (Typ.)	COLD START 23A/115VAC 45A/230VAC								
LEAKAGE CURRENT	<2mA / 240VAC									
PROTECTION	OVER LOAD	105 ~ 150% rated output power (3.3V:105 ~ 160% rated output power) Protection type : Hiccup mode, recovers automatically after fault condition is removed.								
	OVER VOLTAGE	3.8 ~ 4.95V	5.75 ~ 6.75V	8.63 ~ 10.5V	13.8 ~ 16.2V	15.5 ~ 18.2V	17.25 ~ 20.25V	27.6 ~ 32.4V	55.2 ~ 62.4V	
		Protection type : shut down O/P voltage, re-power on to recover								
ENVIRONMENT	WORKING TEMP.	-20 ~ +65°C (Refer to output load derating curve)								
	WORKING HUMIDITY	20 ~ 90% RH non-condensing								
	STORAGE TEMP., HUMIDITY	-20 ~ +85°C, 10 ~ 95% RH								
	TEMP. COEFFICIENT	±0.05%/°C (0 ~ 50°C)								
VIBRATION	10 ~ 500Hz, 2G 10min./1cycle, Period for 60min. each along X, Y, Z axes									
SAFETY & EMC (Note 4)	SAFETY STANDARDS	UL60950, 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								
	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	588.8Khrs								
	DIMENSION	101.6*50.8*24mm (L*W*H)								
	PACKING	0.124Kg;96PCS/12.9Kg/0.8CUFT								
NOTE	<ol style="list-style-type: none"> <li>1. All parameters NOT specially mentioned are measured at 230VAC 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> </ol>									

### Mechanical Specification

Unit:mm



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

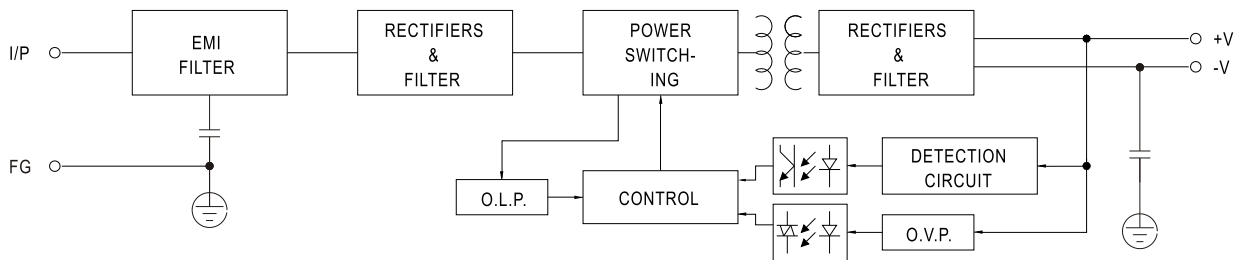
Pin No.	Assignment	Mating Housing	Terminal
1	AC/L	JST VHR or equivalent	JST SVH-21T-P1.1 or equivalent
3	AC/N		
2	NC		

DC Output Connector (CN2) : JST B4P-VH-B or equivalent

Pin No.	Assignment	Mating Housing	Terminal
1,2	+V	JST VHR or equivalent	JST SVH-21T-P1.1 or equivalent
3,4	-V		

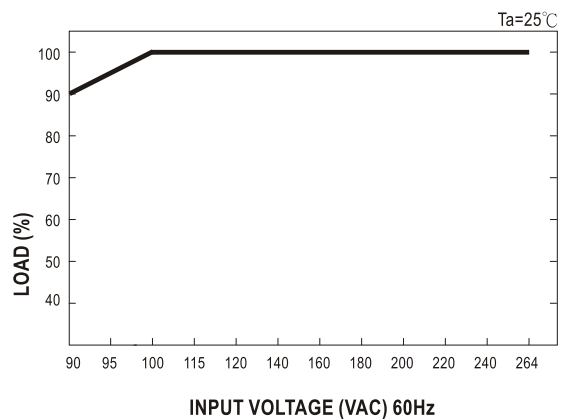
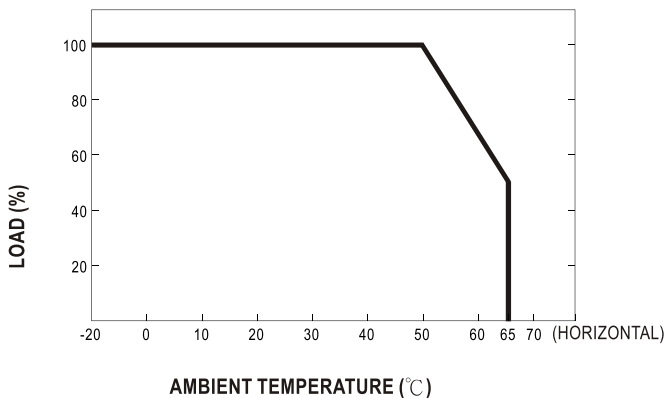
### Block Diagram

fosc : 60KHz



### Derating Curve

### Output Derating VS Input Voltage



MODEL : PS-35-13.5

## OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	RIPPLE & NOISE	V1: 120mVp-p (Max )	I/P: 230 VAC O/P:FULL LOAD Ta:25°C	V1: 14 mVp-p (Max )	P
2	OUTPUT VOLTAGE ADJUST RANGE	CH1: 12.15V-14.85V	I/P: 230 VAC I/P:115VAC O/P:MIN LOAD Ta:25°C	15.155V-11.396V/230vAC 15.158V-11.607V/115VAC	P
3	OUTPUT VOLTAGE TOLERANCE	V1: -2%~ 2 % (Max)	I/P: 100VAC / 264 VAC O/P:FULL/ 0 % LOAD Ta:25°C	V1: -0.009%~ 0.14 %	P
4	LINE REGULATION	V1: -0.5%~ 0.5 % (Max)	I/P: 100 VAC ~ 264VAC O/P:FULL LOAD Ta:25°C	V1: -0 %~ 0.04 %	P
5	LOAD REGULATION	V1 -1%~ 1% (Max)	I/P: 230 VAC O/P:FULL -MIN LOAD Ta:25°C	V1: -0.04%~ 0.04 %	P
6	SET UP TIME	230VAC/ 1200 ms (Max) 115VAC/ 1200 ms (Max)	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25°C	230 VAC/200.876 ms 115 VAC/ 192.415 ms	P
7	RISE TIME	230VAC/30 ms (Max) 115 VAC/30 ms (Max)	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25°C	230 VAC/12.819ms 115 VAC/12.454 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°C	230VAC/ 79.306ms 115 VAC/16.846 ms	P
9	OVER/UNDERSHOOT TEST	< ±5%	I/P: 230 VAC O/P:FULL LOAD Ta:25°C	TEST:2.9%	P
10	DYNAMIC LOAD	V1:1350mVp-p	I/P: 230 VAC O/P:FULL /Min LOAD 90%DUTY/1KHZ Ta:25°C	121mVp-p	P

## INPUT FUNCTION TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	INPUT VOLTAGE RANGE	90VAC~ 264 VAC (Typ)	I/P:TESTING O/P:FULL LOAD Ta:25°C	59.762 V~ 264 V	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 (Typ) NO DAMAGE OSC	I/P: 100 VAC ~264 VAC O/P:FULL-MIN LOAD Ta:25°C	TEST: OK	P
3	EFFICIENCY	81% (TYP)	I/P: 230 VAC O/P:FULL LOAD Ta:25°C	81.03%	P
4	INPUT CURRENT	230 V/ 0.5 A (Typ) 115 V/ 0.75 A (Typ)	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25°C	I =0.369 A/ 230VAC I = 0.66 A/ 115VAC	P
5	INRUSH CURRENT	230 V/ 45 A (Typ) 115 V/ 23 A (Typ) COLD START	I/P: 230 VAC I/P: 115 VAC O/P:FULL LOAD Ta:25°C	I = 30.421A/ 230VAC I =15.203 A/ 115VAC	P

## PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	OVER LOAD PROTECTION	105%- 150 % (Typ)	I/P: 115 VAC I/P: 230 VAC O/P:TESTING Ta:25°C	115VAC / 129.32% 230VAC / 131.07% Hiccup Mode	P
2	OVER VOLTAGE PROTECTION	CH1:15.5 V- 18.2V(Typ)	I/P: 115 VAC I/P: 230 VAC O/P:MIN LOAD Ta:25°C	16.72V/ 115VAC 16.76 V/ 230VAC Shunt down Re- power ON	P
3	SHORT PROTECTION	SHORT EVERY OUTPUT 1 HOUR NO DAMAGE	I/P: 264 VAC O/P: 100% LOAD Ta:25°C	NO DAMAGE Hiccup Mode	P



## 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:0.5KVAC/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: 6.2mA I/P-FG:6.44 mA O/P-FG:3.95mA 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: 9.43G Ω I/P-FG:21.8G Ω O/P-FG:3.24G Ω NO DAMAGE	P
3	GROUNDING CONTINUITY	FG(PE) TO CHASSIS OR TRACE < 100 mΩ	40A / 2min Ta:25°C	2 mΩ	P
4	LEAKAGE CURRENT	< 2 mA / 240VAC	I/P: 254 VAC O/P:Min LOAD Ta:25°C	L-FG: 1.05 mA N-FG: 1.05 mA	P
5	APPROVAL	TUV: Certificate NO : R50090375 UL: File NO :			P

## E.M.C TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	HARMONIC	EN61000-3-2 CLASS A	I/P: 230 VAC/50HZ O/P:FULL LOAD Ta:25°C	PASS	P
2	CONDUCTION	EN55022 CLASS B	I/P: 230 VAC (50HZ) O/P:FULL/50% LOAD Ta:25°C	PASS Test by certified Lab	P
3	RADIATION	EN55022 CLASS B	I/P: 230 VAC (50HZ) O/P:FULL/50% LOAD Ta:25°C	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°C	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°C	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°C	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	SUPPOSE C105 IS THE MOST CRITICAL COMPONENT PS-35-5 : I/P: 230VAC O/P:FULL LOAD Ta= 25°C LIFE TIME= 28168 HRS I/P: 230VAC O/P:FULL LOAD Ta= 50°C LIFE TIME= 10296 HRS I/P: 230VAC O/P:75% LOAD Ta= 50°C LIFE TIME= 20326 HRS			P
2	MTBF	MIL-HDBK-217F NOTICES2 PARTS COUNT TOTAL FAILURE RATE: 588.8K 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>	Q 1 Rated 2SK2545 : 600 V 6 A	I/P:High-Line +3V = 267 V O/P: (1)Full Load Turn on (2)Output Short Ta:25°C	(1) 476V (2) 492V	P
2	Diode <b>Peak Voltage</b>	D 100 Rated FMX-12SL : 200 V 10 A	I/P:High-Line +3V = 267 V O/P: (1)Full Load Turn on (2)Output Short Ta:25°C	(1) 98 V (2) 86V	P
3	Clamp Diode <b>Peak Voltage</b>	D 1 Rated HER206 : 600 V 2 A	I/P:High-Line +3V = 267 V O/P:(1) Dynamic Load 90%Duty/1KHz Ta:25°C	(1) 472V	P
4	<b>Control IC Voltage Test</b>	U 1 Rated 1203P : 16 V	I/P:High-Line +3V =267 V O/P:(1) Output Short (2)O.L.P (3)O.V.P. Ta:25°C	(1) 13.6 V (2) 13.6 V (3) 13.3 V	P

DATE	SAMPLE	TEST RESULT	TESTER	APPROVAL
2006/7/7	RD SAMPLE	PASS	Wangdz	MAX LIN

2003/12/12 A50-F023