



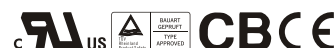
35W Single Output Switching Power Supply

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

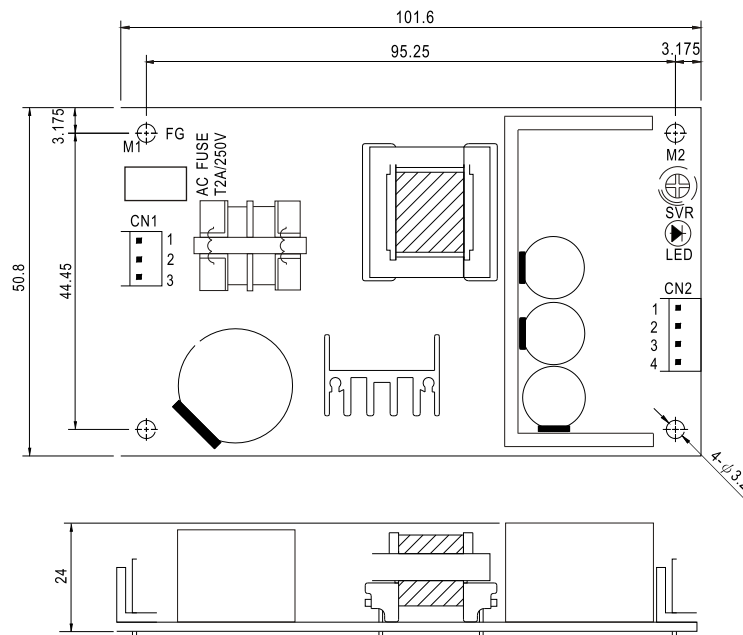


SPECIFICATION

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℃ (Refer to output load derating curve)							
	WORKING HUMIDITY	20 ~ 90% RH non-condensing							
	STORAGE TEMP., HUMIDITY	-20 ~ +85℃, 10 ~ 95% RH							
	TEMP. COEFFICIENT	±0.05%/℃ (0 ~ 50℃)							
	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	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.								

Mechanical Specification

Unit:mm



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

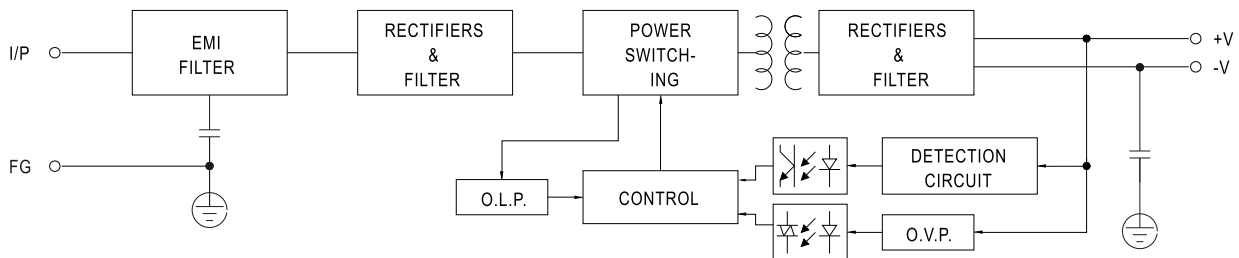
Pin No.	Assignment	Mating Housing	Terminal
1	AC/L	JST VHR or equivalent	JST SVH-21T-P1.1 or equivalent
3	AC/N		
2	NC		

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		

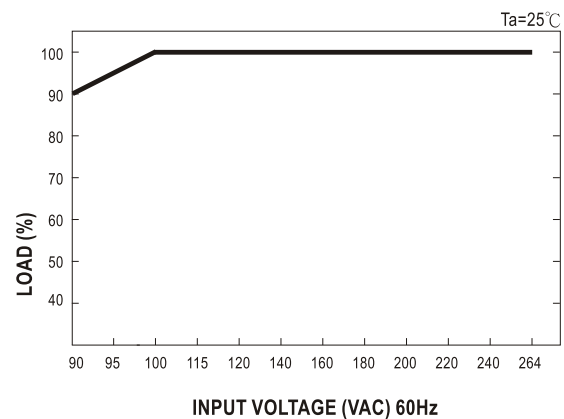
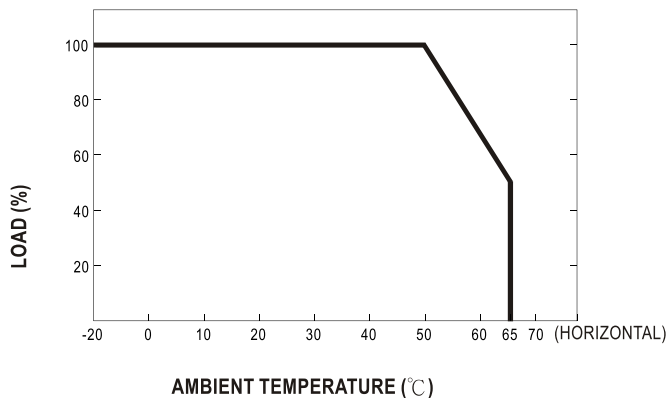
Block Diagram

fosc : 60KHz



Derating Curve

Output Derating VS Input Voltage



MODEL : PS-35-48

OUTPUT FUNCTION TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	RIPPLE & NOISE	V1: 240 mVp-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: 43.2 V~ 52.8 V	I/P: 230 VAC I/P:115VAC O/P:MIN LOAD Ta:25°C	40.94V~53.79 V/230vAC 41.02V~53.81 V/115VAC	P
3	OUTPUT VOLTAGE TOLERANCE	V1: +1%~ -1 % (Max)	I/P: 100VAC / 264 VAC O/P:FULL/ 0 % LOAD Ta:25°C	V1: -0.04 %~ 0.08 %	P
4	LINE REGULATION	V1: -0.5%~ 0.5 % (Max)	I/P: 100 VAC ~ 264VAC O/P:FULL LOAD Ta:25°C	V1: -0.01 %~ 0.06 %	P
5	LOAD REGULATION	V1: -0.5%~ 0.05 % (Max)	I/P: 230 VAC O/P:FULL ~MIN LOAD Ta:25°C	V1: 0 %~ 0.08 %	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/213.59 ms 115 VAC/ 203.01 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/20.905 ms 115 VAC/20.301 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/ 79.29ms 115 VAC/17.76 ms	P
9	OVER/UNDERSHOOT TEST	< ±5%	I/P: 230 VAC O/P:FULL LOAD Ta:25°C	TEST:0.63%	P
10	DYNAMIC LOAD	V1: 4800 mVp-p	I/P: 230 VAC O/P:FULL /Min LOAD 90%DUTY/1KHZ Ta:25°C	154 mVp-p	P

INPUT FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	INPUT VOLTAGE RANGE	90VAC~ 264 VAC (Typ)	I/P:TESTING O/P:FULL LOAD Ta:25°C	63.775 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	84 % (TYP)	I/P: 230 VAC O/P:FULL LOAD Ta:25°C	84.4 %	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 = 0.39 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 = 30.69 A/ 230VAC I = 15.328 A/ 115VAC	P

PROTECTION FUNCTION TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT
1	OVER LOAD PROTECTION	105%~ 150 % (Typ)	I/P: 115VAC I/P: 230 VAC O/P:TESTING Ta:25°C	115VAC / 129.% 230VAC / 121% Hiccup Mode	P
2	OVER VOLTAGE PROTECTION	CH1: 55.2 V~ 62.4 V(Typ)	I/P: 115VAC I/P: 230 VAC O/P:MIN LOAD Ta:25°C	56.4 V/ 115VAC 56.4 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

ENVIRONMENT TEST

NO	TEST ITEM	SPECIFICATION	TEST CONDITION	RESULT	VERDICT																																																																	
1	TEMPERATURE RISE TEST	MODEL : PS-35-24 1. ROOM AMBIENT BURN-IN : 12 HRS I/P: 230VAC O/P: FULL LOAD Ta= 30.6 °C 2. HIGH AMBIENT BURN-IN : 1.5 HRS I/P: 230 VAC O/P: FULL LOAD Ta= 51.6 °C <table><tr><th>NO</th><th>Position</th><th>P/N</th><th>ROOM AMBIENT Ta= 30.6 °C</th><th>HIGH AMBIENT Ta= 51.6 °C</th></tr><tr><td>1</td><td>BD1</td><td>KBP208G 2A/800V LT</td><td>63.8°C</td><td>78.7°C</td></tr><tr><td>2</td><td>D1</td><td>HER206 2A/600V REC</td><td>84.4°C</td><td>99.8°C</td></tr><tr><td>3</td><td>Q2</td><td>K2545 6A/600V TOS</td><td>82.7°C</td><td>98.5°C</td></tr><tr><td>4</td><td>ZD1</td><td>5.6K/2W R/MO</td><td>108.2°C</td><td>121.8°C</td></tr><tr><td>5</td><td>C36</td><td>100U/35V RUB 105°C YXF</td><td>71.6°C</td><td>85.6°C</td></tr><tr><td>6</td><td>LF1</td><td>LF-158</td><td>54.9°C</td><td>69.2°C</td></tr><tr><td>7</td><td>C5</td><td>68U/400V CAPX 85°C GW</td><td>55.1°C</td><td>72.3°C</td></tr><tr><td>8</td><td>T1 COIL</td><td>TF-6070 TWI</td><td>73.6°C</td><td>87.4°C</td></tr><tr><td>9</td><td>U1</td><td>1203D</td><td>70.4°C</td><td>84.6°C</td></tr><tr><td>10</td><td>D100</td><td>BYQ28X-200 10A/200V PH</td><td>72.4°C</td><td>86.4°C</td></tr><tr><td>11</td><td>C105</td><td>470U/35V CAPX 105°C GL</td><td>66.2°C</td><td>77.1°C</td></tr><tr><td>12</td><td>L100</td><td>RB009E</td><td>65.5°C</td><td>74.9°C</td></tr></table>			NO	Position	P/N	ROOM AMBIENT Ta= 30.6 °C	HIGH AMBIENT Ta= 51.6 °C	1	BD1	KBP208G 2A/800V LT	63.8°C	78.7°C	2	D1	HER206 2A/600V REC	84.4°C	99.8°C	3	Q2	K2545 6A/600V TOS	82.7°C	98.5°C	4	ZD1	5.6K/2W R/MO	108.2°C	121.8°C	5	C36	100U/35V RUB 105°C YXF	71.6°C	85.6°C	6	LF1	LF-158	54.9°C	69.2°C	7	C5	68U/400V CAPX 85°C GW	55.1°C	72.3°C	8	T1 COIL	TF-6070 TWI	73.6°C	87.4°C	9	U1	1203D	70.4°C	84.6°C	10	D100	BYQ28X-200 10A/200V PH	72.4°C	86.4°C	11	C105	470U/35V CAPX 105°C GL	66.2°C	77.1°C	12	L100	RB009E	65.5°C	74.9°C	P
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2	OVER LOAD BURN-IN TEST	NO DAMAGE 1 HOUR (MIN)	I/P: 230 VAC O/P: 137% LOAD Ta:25°C	TEST : OK	P																																																																	
3	LOW TEMPERATURE TURN ON TEST	TURN ON AFTER 2 HOUR	I/P: 230VAC O/P: 100% LOAD Ta= -20 °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: 272 VAC O/P:FULL LOAD Ta= 50°C HUMIDITY= 95 %R.H	TEST : OK	P																																																																	
5	TEMPERATURE COEFFICIENT	± 0.05 %(0~50°C)	I/P: 230 VAC O/P:FULL LOAD	± 0.01 %(0~50°C)	P																																																																	
6	VIBRATION TEST	1 Carton & 1 Set Operating (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	SPECICATION	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℃	I/P-O/P: 5.43 mA I/P-FG: 5.54 mA O/P-FG: 3.33 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℃	I/P-O/P: 12.4G Ω I/P-FG: 19.2G Ω O/P-FG: 19.2G Ω NO DAMAGE	P
3	GROUNDING CONTINUITY	FG(PE) TO CHASSIS OR TRACE < 100 mΩ	40A / 2min Ta:25℃	2 mΩ	P
4	LEAKAGE CURRENT	< 2 mA / 240VAC	I/P: 254 VAC O/P: Min LOAD Ta:25℃	L-FG: 1 mA N-FG: 1 mA	P
5	APPROVAL	TUV: Certificate NO : R50090375 UL: File NO :			P

E.M.C TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	HARMONIC	EN61000-3-2 CLASS A	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/50% 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	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	CAPACITOR LIFE CYCLE	SUPPOSE C105 IS THE MOST CRITICAL COMPONENT PS-35-24 : I/P: 230VAC O/P: FULL LOAD Ta= 25℃ LIFE TIME= 127980 HRS I/P: 230VAC O/P: FULL LOAD Ta= 50℃ LIFE TIME= 45568 HRS I/P: 230VAC O/P: 75% LOAD Ta= 50℃ LIFE TIME= 45214 HRS			P
2	MTBF	MIL-HDBK-217F NOTICES2 PARTS COUNT TOTAL FAILURE RATE: 588.8K HRS			P

COMPONENT STRESS TEST

NO	TEST ITEM	SPECICATION	TEST CONDITION	RESULT	VERDICT
1	Power Transistor (D to S) or (C to E) Peak Voltage	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) 468 V (2) 472 V	P
2	Diode Peak Voltage	D 100 Rated F10P40F : 400 V 10 A	I/P:High-Line +3V = 267 V O/P: (1)Full Load Turn on (2)Output Short Ta:25°C	(1) 342 V (2) 292 V	P
3	Clamp Diode Peak Voltage	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) 450 V	P
4	Control IC Voltage Test	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) 13.6V	P

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

2003/12/12 A50-F023