

■ Features :

- Universal AC input / Full range
- Low leakage current $\leq 0.3\text{mA}$
- Protections: Short circuit / Overload / Over voltage
- Cooling by free air convection
- 100% full load burn-in test
- Fixed switching frequency at 45KHz
- 3 years warranty

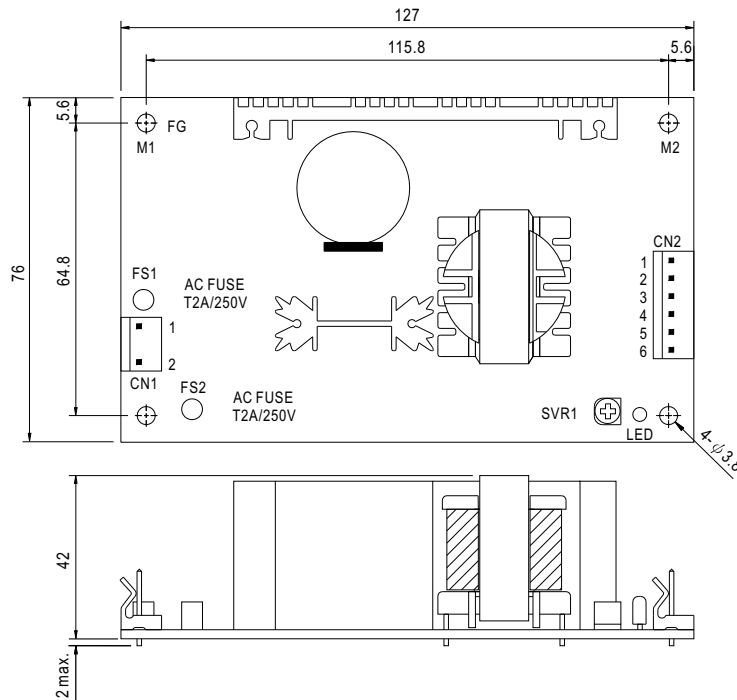


SPECIFICATION

MODEL	MPS-65-3.3	MPS-65-5	MPS-65-7.5	MPS-65-12	MPS-65-13.5	MPS-65-15	MPS-65-24	MPS-65-27	MPS-65-48		
OUTPUT	DC VOLTAGE	3.3V	5V	7.5V	12V	13.5V	15V	24V	27V	48V	
	RATED CURRENT	12A	12A	8A	5.2A	4.7A	4.2A	2.7A	2.4A	1.35A	
	CURRENT RANGE	0 ~ 15.2A	0 ~ 13.8A	0 ~ 9.6A	0 ~ 6A	0 ~ 5.4A	0 ~ 4.8A	0 ~ 3A	0 ~ 2.7A	0 ~ 1.5A	
	RATED POWER	39.6W	60W	60W	62.4W	63.5W	63W	64.8W	64.8W	64.8W	
	OUTPUT POWER (max.)	72W(+3.3V:50W;+5V:69W)with 18CFM min. Forced air convection									
	RIPPLE & NOISE (max.) Note.2	80mVp-p	100mVp-p	100mVp-p	100mVp-p	100mVp-p	100mVp-p	100mVp-p	100mVp-p	100mVp-p	
	VOLTAGE ADJ. RANGE	2.97 ~ 3.63V	4.5 ~ 5.5V	6.75 ~ 8.25V	10.8 ~ 13.2V	12.2 ~ 14.85V	13.5 ~ 16.5V	21.6 ~ 26.4V	24.3 ~ 29.7V	43.2 ~ 52.8V	
	VOLTAGE TOLERANCE Note.3	$\pm 3.0\%$	$\pm 3.0\%$	$\pm 3.0\%$	$\pm 2.0\%$	$\pm 2.0\%$	$\pm 2.0\%$	$\pm 2.0\%$	$\pm 2.0\%$	$\pm 2.0\%$	
	LINE REGULATION	$\pm 1.0\%$	$\pm 1.0\%$	$\pm 1.0\%$	$\pm 1.0\%$	$\pm 1.0\%$	$\pm 1.0\%$	$\pm 1.0\%$	$\pm 1.0\%$	$\pm 1.0\%$	
	LOAD REGULATION	$\pm 3.0\%$	$\pm 3.0\%$	$\pm 3.0\%$	$\pm 2.0\%$	$\pm 2.0\%$	$\pm 2.0\%$	$\pm 2.0\%$	$\pm 2.0\%$	$\pm 2.0\%$	
SETUP, RISE TIME	800ms, 30ms/230VAC		800ms, 30ms/115VAC at full load								
HOLD UP TIME (Typ.)	50ms/230VAC		16ms/115VAC at full load								
INPUT	VOLTAGE RANGE	90 ~ 264VAC		127 ~ 370VDC							
	FREQUENCY RANGE	47 ~ 440Hz									
	EFFICIENCY(Typ.)	66%	74%	76%	77%	78%	79%	80%	80%	80%	
	AC CURRENT (Typ.)	1.6A/115VAC		0.9A/230VAC							
	INRUSH CURRENT (Typ.)	COLD START 15A/115VAC		30A/230VAC							
LEAKAGE CURRENT	<0.3mA / 264VAC										
PROTECTION	OVERLOAD	73 ~ 105W (3.3V:51 ~ 75W)(5V:70 ~ 105W) rated output power Protection type : Hiccup mode, recovers automatically after fault condition is removed									
	OVER VOLTAGE	3.8 ~ 4.46V	5.75 ~ 6.75V	8.63 ~ 10.1V	13.8 ~ 16.2V	15.5 ~ 18.2V	17.25 ~ 20.25V	27.6 ~ 32.4V	31 ~ 36.45V	55.2 ~ 64.8V	
ENVIRONMENT	WORKING TEMP.	-10 ~ +60°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	$\pm 0.04\%/^{\circ}\text{C}$ (0 ~ 50°C)									
	VIBRATION	10 ~ 500Hz, 2G 10min./1cycle, period for 60min. each along X, Y, Z axes									
SAFETY & EMC (Note 4)	SAFETY STANDARDS	UL2601-1, TUV EN60601-1, IEC60601-1 approved									
	WITHSTAND VOLTAGE	I/P-O/P:4KVAC			I/P-FG:1.5KVAC		O/P-FG:0.5KVAC				
	ISOLATION RESISTANCE	I/P-O/P, I/P-FG:100M Ohms/500VDC									
	EMI CONDUCTION & RADIATION	Compliance to EN55011 (CISPR11) Class B									
	HARMONIC CURRENT	Compliance to EN61000-3-2,-3									
OTHERS	EMC IMMUNITY	Compliance to EN61000-4-2,3,4,5,6,8,11; ENV50204, EN60601-1-2, medical level, criteria A									
	MTBF	359.7Khrs min. MIL-HDBK-217F (25°C)									
	DIMENSION	127*76*42mm (L*W*H)									
NOTE	PACKING	0.23Kg; 54pcs/14.6Kg/1.35CUFT									
		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. 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. Mounting holes M1 and M2 should be grounded for EMI purposes.									

Mechanical Specification

Unit:mm



AC Input Connector (CN1) : Molex 5277-02 or equivalent

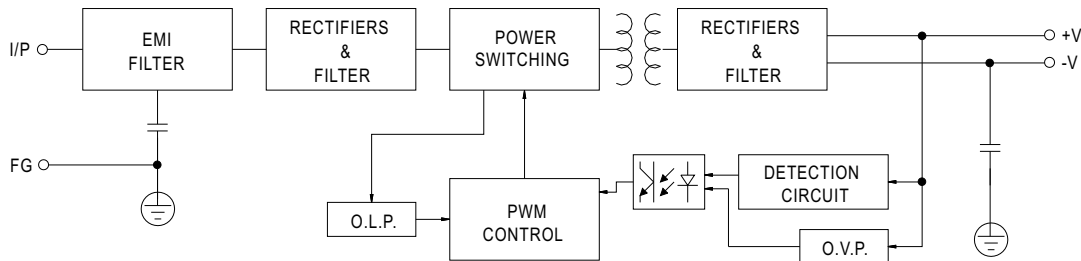
Pin No.	Assignment	Mating Housing	Terminal
1	AC/L	Molex 5195 or equivalent	Molex 5194 or equivalent
2	AC/N		

DC Output Connector (CN2) : Molex 5273-06 or equivalent

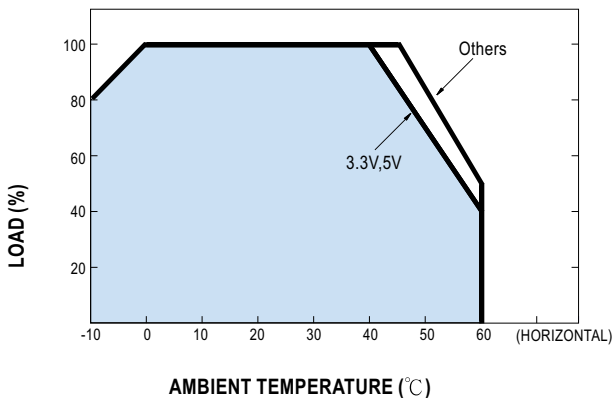
Pin No.	Assignment	Mating Housing	Terminal
1,2,3	+V	Molex 5195 or equivalent	Molex 5194 or equivalent
4,5,6	-V		

Block Diagram

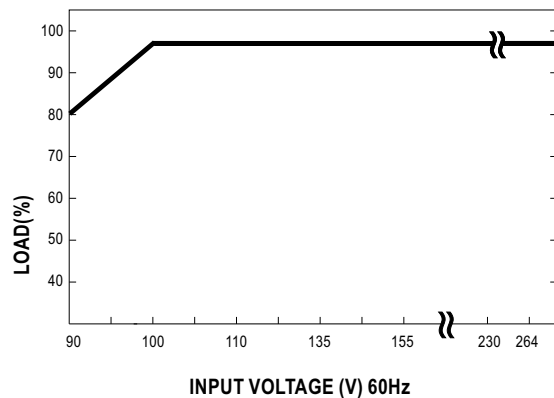
fosc : 45KHz



Derating Curve



Static Characteristics



Quality Engineering Test Report

SERIES: MPS-65 65W WATTS SIGLE OUTPUT SWITCHING POWER SUPPLY OPEN FRAME TYPE

SAMPLE: A.MPS-65-3.3 :3.3V/12A D.MPS-65- 12 :12V/5.2A G.MPS-65-24 :24V/2.7A
B.MPS-65- 5 :5V/12A E.MPS-65-13.5 :13.5V/4.7A H.MPS-65-27 :27V/2.4A
C.MPS-65-7.5 :7.5V/8A F.MPS-65- 15 :15V/4.2A I.MPS-65-48 :48V/1.35A

NO	TEST ITEM	TEST CONDITION / SPECIFICATION	RESULT	VERDICT
1	AC INPUT VOLTAGE RANGE	I/P:TESTING SPEC:90~264VAC O/P:FULL LOAD	B: <u>50.1VAC~264VAC</u>	P
2	LINE REGULATION	I/P:90~264VAC SPEC: A: ±1% O/P:FULL LOAD B: ±1% C: ±1% D: ±1% E: ±1% F: ±1% G: ±1% H: ±1% I: ±1%	A: -0.00% ~ +0.00% B: -0.00% ~ +0.00% C: -0.00% ~ +0.00% D: -0.00% ~ +0.00% E: -0.00% ~ +0.00% F: +0.00% ~ +0.04% G: -0.00% ~ +0.00% H: -0.00% ~ +0.00% I: -0.00% ~ +0.01%	P
3	LOAD REGULATION	I/P:230VAC SPEC: A: ±3% O/P: B: ±3% MIN. TO FULL LOAD C: ±3% D: ±2% E: ±2% F: ±2% G: ±2% H: ±2% I: ±2%	A: -0.76% ~ +0.76% B: -0.24% ~ +0.12% C: -0.24% ~ +0.16% D: -0.1% ~ +0.1% E: -0.04% ~ +0.09% F: -0.08% ~ +0.08% G: -0.05% ~ +0.05% H: -0.02% ~ +0.02% I: -0.01% ~ +0.01%	P
4	OUTPUT VOLTAGE TOLERANCE	I/P:90~264VAC SPEC: A: ±3% O/P: B: ±3% MIN. TO FULL LOAD C: ±3% D: ±2% E: ±2% F: ±2% G: ±2% H: ±2% I: ±2%	A: -1.15% ~ +0.18% B: -0.37% ~ +0.00% C: -0.49% ~ +0.00% D: -0.2% ~ +0.00% E: -0.04% ~ +0.09% F: -0.167% ~ +0.00% G: -0.16% ~ -0.05% H: -0.11% ~ -0.02% I: -0.01% ~ +0.01%	P
5	RIPPLE & NOISE	I/P:230VAC SPEC: A:80mV O/P: FULL LOAD B:100mV C:100mV D:100mV E:100mV F:100mV G:100mV H:100mV I:100mV	A: <u>16mV</u> B: <u>30mV</u> C: <u>18mV</u> D: <u>18mV</u> E: <u>16mV</u> F: <u>14mV</u> G: <u>18mV</u> H: <u>16mV</u> I: <u>13mV</u>	P
6	AC INPUT CURRENT	I/P:230VAC SPEC: 0.9A O/P:FULL LOAD	B: <u>0.729A</u>	P

NO	TEST ITEM	TEST CONDITION / SPECIFICATION		RESULT	VERDICT
7	MAX. INRUSH CURRENT	I/P:230VAC O/P:FULL LOAD	SPEC: 40A	<u>B:26.921A</u>	P
8	O/P VOLTAGE ADJ.RANGE	I/P:230VAC O/P:MIN. LOAD	SPEC:±10% A:2.97V~3.63V B:4.5V~5.5V C:6.75V~8.25V D:10.8V~13.2V E:12.15V~14.85V F:13.5V~16.5V G:21.6V~26.4V H:24.3V~29.7V I:43.2V~52.8V	A:2.724V~4.01V B:4.173V~5.596V C:6.2V~9.00V D:10.081V~13.792V E:11.47V~16.34V F:12.2V~17.26V G:19.74V~27.29V H:22.37V~32.20V I:39.74V~54.68V	P
9	SET UP TIME	I/P:230VAC O/P:FULL LOAD	SPEC:800ms	<u>B:276.14mS</u>	P
10	HOLD UP TIME	I/P:230VAC O/P:FULL LOAD	SPEC:20mS	<u>B:85.126mS</u>	P
11	EFFICIENCY	I/P:230VAC O/P: FULL LOAD	SPEC: A:66% B:74% C:76% D:77% E:78% F:79% G:80% H:80% I:80%	A: <u>69.79%</u> B: <u>75.65%</u> C: <u>77.47%</u> D: <u>78.68%</u> E: <u>79.25%</u> F: <u>80.62%</u> G: <u>82.89%</u> H: <u>82.45%</u> I: <u>83.33%</u>	P
12	OVER LOAD PROTECTION	I/P:230VAC O/P: TESTING	SPEC: A: 51~75W B: 70~105W C: 73~105W D: 73~105W E: 73~105W F: 73~105W G: 73~105W H: 73~105W I: 73~105W	A: <u>63.39W</u> B: <u>86.51W</u> C: <u>89.07W</u> D: <u>88.98W</u> E: <u>86.67W</u> F: <u>94.95W</u> G: <u>95.99W</u> H: <u>90.92W</u> I: <u>80.96W</u>	P
13	OVER VOLTAGE PROTECTION	I/P:230VAC O/P:TESTING	SPEC:115%~135% A : 3.795V~4.455V B : 5.75V~6.75V C : 8.625V~10.125V D : 13.8V~16.2V E : 15.525V~18.225V F : 17.25V~20.25V G : 27.6V~32.4V H : 31.05V~36.45V I : 55.2V~64.8V	A: <u>4.03V</u> B: <u>6.18V</u> C: <u>9.49V</u> D: <u>15.2V</u> E: <u>16.7V</u> F: <u>18.4V</u> G: <u>31.8V</u> H: <u>33.5V</u> I: <u>59.1V</u>	P

NO	TEST ITEM	TEST CONDITION / SPECIFICATION	RESULT	VERDICT																																								
14	GROUND LEAKAGE CURRENT	I/P:264VAC SPEC: L-FG--<0.3mA N-FG--<0.3mA	A: L-FG:0.22 mA N-FG:0.23mA	P																																								
15	INSULATION RESISTANCE	SPEC: O/P-FG 500VDC/100MOhms MIN. I/P-O/P 500VDC/100MOhms MIN. I/P-FG 500VDC/100MOhms MIN.	B: O/P-FG >100MOhms I/P-O/P >100MOhms I/P-FG >100MOhms	P																																								
16	DIELECTRIC / WITHSTAND VOLTAGE	SPEC: I/P- O/P: 4000VAC/ 60 sec (10mA CUT-OFF) I/P - FG: 1500VAC/ 60 sec (10mA CUT-OFF) O/P - FG : 500VAC/ 60sec (10mA CUT-OFF)	B: I/P-O/P :2.44mA I/P-FG :1.539mA O/P- FG :3.56mA	P																																								
17	BURN-IN TEST	I/P: 230VAC O/P:FULL LOAD TA:25°C BURN-IN DURATION : 1 hrs	B: NON BREAK	P																																								
18	ENVIRONMENT TEST	1.LOW TEMPERATURE TEST I/P:230VAC O/P:FULL LOAD AMBIENT TEMPERATURE:-7.3°C	AFTER 5.5 hrs POWER ON OK	P																																								
		2.HIGH AMBIENT TEMPERATURE FULL LOAD TEST I/P:230VAC O/P:FULL LOAD AMBIENT TEMPERATURE:44.3°C	AFTER 12.5 hrs NON BREAK																																									
		3.ACCELERATED LIFE TEST I/P:267VAC O/P:FULL LOAD AMBIENT TEMPERATURE: 25 °C AMBIENT HUMIDITY: 95 %	AFTER 14.5 hrs NON BREAK																																									
19	TEMPERATURE RISE TEST Trise OF PARTS	I/P :230VAC O/P :FULL LOAD AFTER 3 hrs BURN-IN TA:31.0°C	<table border="1"> <thead> <tr> <th>POSITION</th> <th>P/N</th> <th>TEMP</th> <th>Trise</th> </tr> </thead> <tbody> <tr> <td>BD1</td> <td>BRIDGE DIODE</td> <td>72.0°C</td> <td>41°C</td> </tr> <tr> <td>Q1</td> <td>MAIN TRANSISTOR</td> <td>83.3°C</td> <td>52.3°C</td> </tr> <tr> <td>T1</td> <td>MAIN TRANSFORMER COIL</td> <td>76.4°C</td> <td>45.4°C</td> </tr> <tr> <td>D40</td> <td>O/P DIODE</td> <td>97.9°C</td> <td>66.9°C</td> </tr> <tr> <td>C5</td> <td>I/P FILTER CAPACITOR</td> <td>86.5°C</td> <td>55.5°C</td> </tr> <tr> <td>C41</td> <td>O/P FILTER CAPACITOR</td> <td>76.6°C</td> <td>45.6°C</td> </tr> <tr> <td>T1</td> <td>MAIN TRANSFORMER CORE</td> <td>88.5°C</td> <td>57.5°C</td> </tr> <tr> <td>D1</td> <td>CLAMP DIODE</td> <td>98.6°C</td> <td>67.6°C</td> </tr> <tr> <td>LF1</td> <td>LINE FILTER</td> <td>55.3°C</td> <td>24.3°C</td> </tr> </tbody> </table>	POSITION	P/N	TEMP	Trise	BD1	BRIDGE DIODE	72.0°C	41°C	Q1	MAIN TRANSISTOR	83.3°C	52.3°C	T1	MAIN TRANSFORMER COIL	76.4°C	45.4°C	D40	O/P DIODE	97.9°C	66.9°C	C5	I/P FILTER CAPACITOR	86.5°C	55.5°C	C41	O/P FILTER CAPACITOR	76.6°C	45.6°C	T1	MAIN TRANSFORMER CORE	88.5°C	57.5°C	D1	CLAMP DIODE	98.6°C	67.6°C	LF1	LINE FILTER	55.3°C	24.3°C	P
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20	LIFE CYCLE	SUPPOSE C41 IS THE MOST CRITICAL COMPONENT I/P:230VAC O/P:FULL LOAD Ta:25°C Tc41:76.6°C Life: 47045.6 hrs I/P:230VAC O/P:FULL LOAD Ta:40°C Tc41:89.2°C Life: 17474.1 hrs		P																																								
21	CRITICAL COMPONENT RECORD (FOR QC INSPECTION REFERENCE ONLY)	FUSE :4A/250VAC MET BRIDGE DIODE :D3SB60 LINE FILTER :TF-484. TRANSFOMER :LS TF-765 POWER SWITCHER :2SK2628 OUTPUT DIODE :D83-004. OUTPUT CAPACITOR :ELNA 1200uF/16V , 105°C, ZL INPUT CAPACITOR :HITACHI 150uF/400V,85°C P.C.B :MPS-65,CEM-3 2OZ SS																																										

DATE	SAMPLE	TEST RESULT	TEST	PROVAL
20010605	RD SAMPLE 3.3V,5V,7.5V,12V 13.5V,24V,27V,48V	PASS	VINCENT	Max Lin
20010824	PRODUCT A107C28 3.3V,5V,7.5V,12V 13.5V,24V,27V,48V	PASS	VINCENT	Max Lin
20020411	PRODUCT A203B04 5V,12V	PASS	VINCENT	Max Lin
20020620	PRODUCT A205D03B 27V	PASS	VINCENT	Max Lin