

# Embedded Switch Mode Power Supplies (SMPS)

## FEATURES

- Universal 85 - 264V AC Active PFC
- Compact size: 3" × 2" × 1.22"
- Efficiency up to 95%
- Stand-by power consumption. < 0.3W
- Operating temperature range - 40°C to +70°C
- Conformally coated PCB
- Low leakage current < 0.1mA
- Output short circuit, over-current, over-voltage protection.
- EMI performance meets. CISPR32 / EN55032 CLASS B
- Medical and Industrial safety approvals. Suitable for BF application

IEC/EN/UL62368-1,  
IEC/EN60335-1,  
IEC/EN61558-1, GB4943-1,  
IEC/EN60601-1 (2 × MOPP)

## RS PRO Embedded Switch Mode Power Supplies

- 2336894
- 2336876
- 2336879



RS Professionally Approved Products bring to you professional quality parts across all product categories. Our product range has been tested by engineers and provides a comparable quality to the leading brands without paying a premium price.

## Embedded Switch Mode Power Supplies (SMPS)

### Product Description

AC-DC open frame power supply suitable for a wide range of Industrial, Medical and Dental applications. Featuring a universal AC input this cost-effective, high density design is available in a range of standard outputs. Complying with International and European EMC and safety standards IEC/EN/UL62368, GB4943, IEC/EN60335, IEC/EN61558, IEC/EN60601

### General Specifications

<b>Model</b>	AC-DC 120W Medical / Industrial power supply
<b>Mounting Type</b>	Chassis Mount
<b>MTBF</b>	MIL-HDBK-217F@25°C > 300,000 h
<b>Applications</b>	Industrial control systems, instrumentation and medical equipment

RS Stock #	Input Voltage	Output Voltage	Output Current	Adj'range (V)	Wattage	Transient Output Power*10S	Efficiency (Typ)
2336894	85 to 264V ac 120 to 370V dc	12V	9.5A	11.4-12.6V	114W	141.6W	94%
2336876	85 to 264V ac 120 to 370V dc	24V	5A	22.8-25.2V	120W	150W	95%
2336879	85 to 264V ac 120 to 370V dc	48V	2.5A	45.6-50.4V	120W	150W	94.5%

### Input Specifications

Input Specification	
<b>Voltage Range</b>	85 to 264V ac, 120 to 370V dc
<b>Frequency</b>	47 to 63Hz
<b>AC Current Rating</b>	2A/115V ac, 1A/230V ac
<b>Inrush Current</b>	40A/ 115V ac, 75A / 230V ac
<b>Leakage</b>	<0.1mA, single fault <0.5mA
<b>Power Factor</b>	0.98 115Vac, 0.94 230Vac
<b>Standby power consumption</b>	0.5W

## Output Specifications

Output Specification			
RS Stock #	2336894	2336876	2336879
Output voltage	12V	24V	48V
Trim range	11.4-12.6V	22.8-25.2V	45.6-50.4V
Rated Current	9.5A	5A	2.5A
Ripple & Noise (max.) *	120mV	150mV	200mV
Rated Power	114W	120W	120W
Peak output power 10S	141.6W	150W	150W
Line Regulation typ.	±0.5%	±0.5%	±0.5%
Load Regulation typ.	±1%	±1%	±1%
Max Capacitive load $\mu$ F	6000 $\mu$ F	3200 $\mu$ F	1600 $\mu$ F
Minimum Load	0%	0%	0%

Hold Up Time	15ms/230V ac
Over Voltage Protection	12V output $\leq$ 16V (Output voltage turn off, re-power on for recover)
	24V output $\leq$ 32V (Output voltage turn off, re-power on for recover)
	48V output $\leq$ 60V (Output voltage turn off, re-power on for recover)
Over-current Protection	$\geq$ 130% I <sub>o</sub> , hiccup, self-recovery
Short Circuit Protection	Hiccup, continuous, self-recovery
Isolation	4KVAC

Note: 1. \*Output voltage accuracy: including the setting error, line regulation, load regulation; 2. \*The "Tip and barrel method" is used for ripple and noise test, output parallel 10 $\mu$ F electrolytic capacitor and 0.1 $\mu$ F ceramic capacitor, please refer to AC-DC Converter Application Notes for specific information; 3. \*For all the above test items, please refer to our company standard "AC-DC Black Box Test Specification" for specific test specifications and methods; 4. \*When the product works at light load ( $\leq$ 15% I<sub>o</sub>), in order to improve the efficiency to reach at green working mode, the value of ripple and noise will be double; 5. \*Except for special instructions, the above data are measured at the full operating temperature range and humidity <75%.

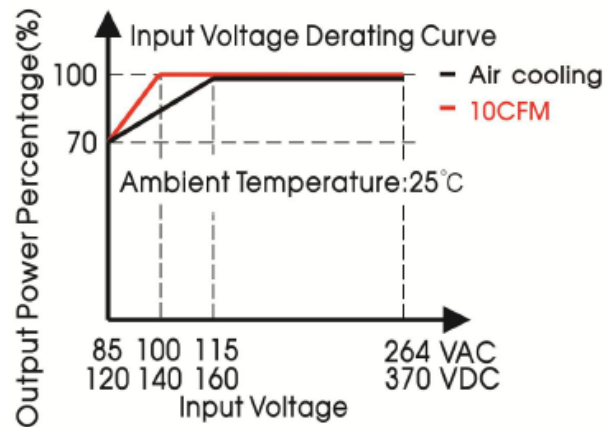
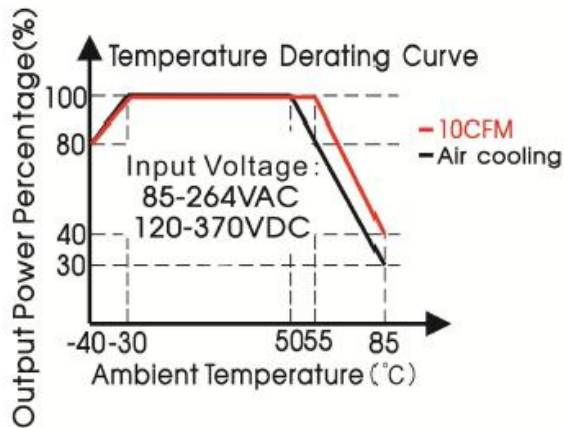
# Embedded Switch Mode Power Supplies (SMPS)

## General Specifications

Item	Operating Conditions		Min	Typ	Max.	Unit
Isolation	Input-Earth	Electric Strength Test for 1min, leakage current <10mA	1500	-	-	VAC
	Input-Output	Electric Strength Test for 1min, leakage current <10mA	4000	-	-	
	Output-Earth	Electric Strength Test for 1min, leakage current <5mA	1500	-	-	
Insulation Resistance	Input-Earth	500VDC, 25±5°C, Humidity < 95%RH, non-condensing 500VDC	100	-	-	MΩ
	Input-Output		100	-	-	
	Output-Earth		100	-	-	
Isolation level	Input-Output		2 × MOPP			
	Input-Earth		1 × MOPP			
	Output-Earth		1 × MOPP			
Operating Temperature			-40	-	+85	°C
Storage Temperature			-40	-	+85	
Storage Humidity		Non-condensing	10	-	95	%RH
Operating Humidity			20		90	
Power Derating	Operating temperature derating	+50 to +85°C	2.0	-	-	% / °C
		+55 to +85°C				
		-40 to -30°C		2.0	-	
	Input voltage derating	85-115VAC	1.0	-	-	% / VAC
		85-100VAC				
Safety Standard		Meet IEC/EN/UL62368-1/EN60335-1 IEC/EN61558-1 /GB4943-1 IEC/EN60601-1 CAN/CSA-C22.2 No.60601-1:14- Edition 3 EN60601-1-2 Edition 4				
Safety Certification		IEC/EN/UL62368-1/EN60335/EN61558/EN60601				
Safety Class		CLASS I (PE and must be connected)				
MTBF		MIL-HDBK-217F@25°C		> 300,000 h		

# Embedded Switch Mode Power Supplies (SMPS)

## Derating



## EMC Specifications

Emissions	CE	CISPR32/EN55032 CLASS B	
	RE	CISPR32/EN55032 CLASS B	
	Harmonic Current	IEC/EN61000-3-2 CLASS D	
	Voltage Flicker	IEC/EN61000-3-3	
Immunity	ESD	IEC/EN 61000-4-2 Contact ±8KV/Air ±15KV	Perf. Criteria A
	RS	IEC/EN 61000-4-3 10V/m	Perf. Criteria A
	EFT	IEC/EN 61000-4-4 ±2KV	Perf. Criteria A
	Surge	IEC/EN 61000-4-5 line to line ±2KV/line to ground ±4KV	Perf. Criteria A
	CS	IEC/EN61000-4-6 10 Vr.m.s	Perf. Criteria A
	DIP (AC input)	IEC/EN61000-4-11 0%, 70%	Perf. Criteria B

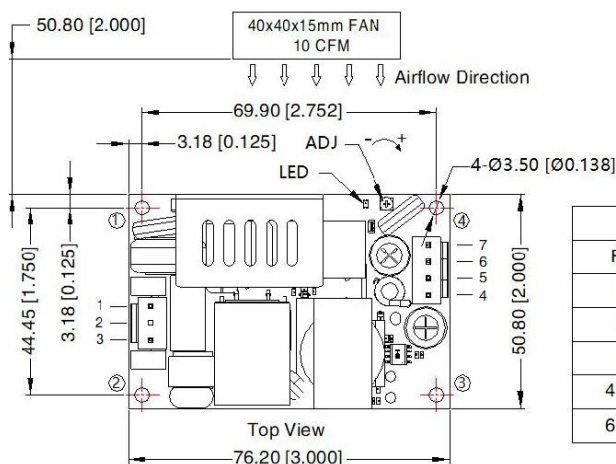
Note: 1.\*The power supply should be considered as a part of the components in the system. EMC performance has been tested on a metal plate with a thickness of 1mm and a length of 360mm × 360mm. The power supply must be combined with the terminal equipment for electromagnetic compatibility confirmation; 2.\*Category I products with PE (which must be connected)

# Embedded Switch Mode Power Supplies (SMPS)

## Mechanical Specifications

Case Material	Open Frame
Dimensions	76.2 x 50.80 x 31.00mm
Weight	125g (Typ.)
Cooling Method	Air cooling / 10CFM

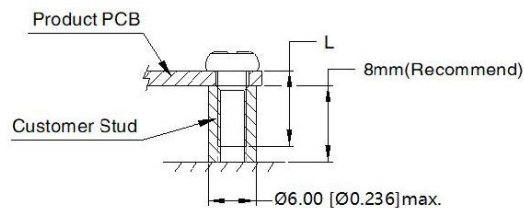
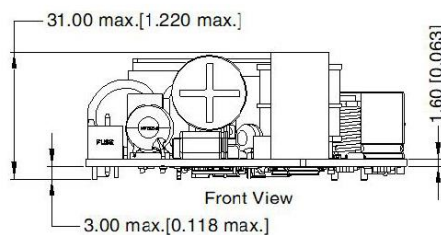
## Dimensions and recommended layout



THIRD ANGLE PROJECTION

Pin-Out			
Pin	Function	Product Connector	Customer Connector
1	AC(N)	JST B3P-VH or equivalent	Housing: JST VHR Contact: JST SVH-21T-P1.1 or equivalent
2	NC		
3	AC(L)		
4, 5	-Vo	JST B4P-VH or equivalent	Housing: JST VHR Contact: JST SVH-21T-P1.1 or equivalent
6, 7	+Vo		

Position	Screw Spec.	L(Recommend)	Torque(max)
① - ④	M3	6mm	0.4N·m



### Note:

- Unit: mm[inch]
- ADJ: Output adjustable resistor
- General tolerances:  $\pm 1.00[\pm 0.039]$
- The layout of the device is for reference only, please refer to the actual product
- Reserved safety distance between PCB edge and customer components, recommended 10mm
- Class I system ①, ④ positions must be connected to the earth (⊕)
- Class II system ①, ④ positions must be connected together

## Embedded Switch Mode Power Supplies (SMPS)

### Approvals

<b>Safety Certification</b>	IEC/EN/UL62368-1, EN60335, IEC61558, UL/EN60601
<b>Safety Class</b>	Class I (PE and must be connected)

### Additional Information

<b>Custom Tariff Number</b>	85044030
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Note:

1. Unless otherwise specified, parameters in this datasheet were measured under the conditions of Ta=25°C, humidity<75%RH with nominal input voltage and rated output load.
2. All index testing methods in this datasheet are based on our company corporate standards.
3. In order to improve the efficiency at high input voltage, there will be audible noise generated, but it does not affect product performance and reliability.
4. Products are related to laws and regulations: see "Features" and "EMC".
5. Our products shall be classified according to ISO14001 and related environmental laws and regulations and shall be handled by qualified units.
6. CAUTION: Double pole, neutral fusing. Disconnect mains before servicing."/"/ ATTENTION: Double pôle/fusible sur le neutre. Débrancher l'alimentation avant l'entretien;
7. The power supply is considered a component which will be installed into a terminal.