

## FEATURES

- Universal 85 - 305VAC and 100 - 430VDC
- Industry standard footprint
- Efficiency up to 87%
- No Load power consumption < 0.1W
- Operating temperature range - 40°C to +85°C
- 5000m altitude operation
- Over-voltage category OVC 111 (meet EN61558)
- EMI performance meets. CISPR32 / EN55032 CLASS B EN55014
- IEC/EN/UL62368-1/EN60335-1 EN61558-1 safety approval

# RS PRO PCB mount Switch Mode Power Supplies

2333530, 2333531, 2333533



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

### Product Description

AC-DC PCB mount power supply suitable for a wide range of industrial, consumer and telecom instruments and applications. This compact, high efficiency series provides reinforced insulation and excellent EMC performance. The converters are approved to UL62368, EN62368, IEC62368, EN60335 and EN61558 and perform with the CLASS B limits of CISPR32 / EN55032/ EN55014 without external components.

### General Specifications

<b>Model</b>	AC-DC 20W power supply
<b>Mounting Type</b>	PCB mount
<b>Package Type</b>	Black plastic, flame-retardant and heat-resistant (UL94V-0)
<b>MTBF</b>	MIL-HDBK-217F@25°C > 1,500,000 h
<b>Applications</b>	Industrial control systems, instrumentation and electrical equipment

RS Item No.	Input Voltage	Output Voltage	Output Current	Output Wattage	Efficiency (Typ)
2333530	85 to 305V ac 100 to 430V dc	+ 5V DC	4A	20W	81%
2333531	85 to 305V ac 100 to 430V dc	+ 12V DC	1.67A	20W	86%
2333533	85 to 305V ac 100 to 430V dc	+ 24V DC	0.83A	20W	87%

### Electrical Specifications

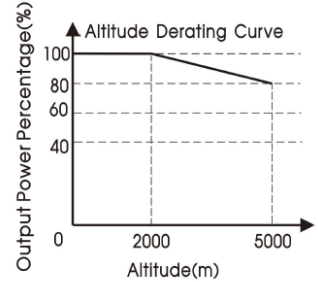
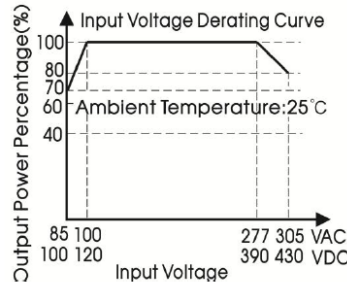
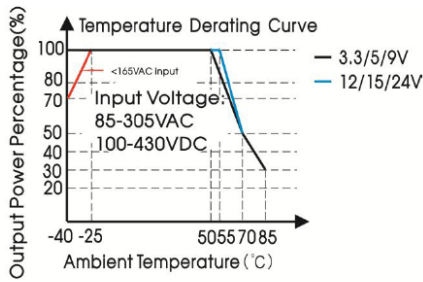
Input Specification	
<b>Voltage Range</b>	85 to 305V ac, 100 to 430V dc
<b>Frequency</b>	47 to 63Hz
<b>AC Current Rating</b>	0.5A/115V ac, 0.3A/230V ac
<b>Inrush Current</b>	20A / 115 ac, 45A / 230V ac
<b>Input Protection</b>	3.15A/300V, slow-blow

Output Specification			
Output voltage	5V	12V	24V
Rated Current	4A	1.67A	0.83A
Ripple & Noise (typ.)	100mVp-p	100mVp-p	100mVp-p
Ripple & Noise (max.)	150mVp-p	150mVp-p	150mVp-p
Rated Power	20W	20W	20W
Max. Capacitive Load	8000uF	4000uF	1000uF
Output Voltage Accuracy	±1.5%	±1.5%	±1.5%
Line Regulation typ.	±0.5%	±0.5%	±0.5%
Load Regulation typ.	±1%	±1%	±1%
Minimum Load	0%	0%	0%

Hold Up Time	50ms/230V ac, 8ms/115V ac	
Over Voltage Protection	5VDC	≤7.5VDC (Output voltage clamp or hiccup)
	12VDC	≤20VDC (Output voltage clamp or hiccup )
	24VDC	≤30VDC (Output voltage clamp or hiccup )
Over-current Protection	≥110%Io, self-recovery	
Short Circuit Protection	Hiccup, continuous, self-recovery	
Switching Frequency	65KHz	
Isolation	4KVAC	

### Operation Environment Specifications

Storage Humidity	95% RH		
Cooling	Free air convection		
Operating Temperature Range	-40 to 85°C		
Storage Temperature Range	-40 to 85°C		
Power Derating	-40°C to -25°C (85VAC-165VAC)	2	% / °C
	+50°C to +70°C (5V)	2.5	
	+50°C to +70°C (12V and 24V)	3.33	
	+70°C to +85°C	1.33	
	85VAC - 100VAC	2	% / VAC
	277VAC - 305VAC	0.71	
	2000m - 5000m	6.7	



Note: ① With an AC input between 85-100V/277-305VAC and a DC input between 100-120V/390-430VDC, the output power must be derated as per temperature derating curves;  
 ② This product is suitable for applications using natural air cooling; for applications in closed environment please consult factory or one of our FAE.

**EMC Specifications**

Emissions	CE	CISPR32/EN55032 CLASS B (See Fig.3 for recommended circuit) CISPR11/EN55011 CLASS B EN55014-1	
	RE	CISPR32/EN55032 CLASS B (See Fig.3 for recommended circuit) CISPR11/EN55011 CLASS B EN55014-1	
Immunity	ESD	IEC/EN 61000-4-2 Contact ±6KV / Air ±8KV	Perf. Criteria A
		IEC/EN55014-2	Perf. Criteria A
	RS	IEC/EN 61000-4-3 10V/m	Perf. Criteria A
		IEC/EN55014-2	Perf. Criteria A
	EFT	IEC/EN 61000-4-4 ±2KV	Perf. Criteria A
		IEC/EN61000-4-4 ±4KV (See Fig.2, Fig.3 for recommended circuit)	Perf. Criteria A
	Surge	IEC/EN61000-4-5 line to line ±1KV	Perf. Criteria A
		IEC/EN61000-4-5 line to line ±2KV (See Fig.2 for recommended circuit)	Perf. Criteria A
		IEC/EN61000-4-5 line to line ±2KV/line to ground ±4KV (See Fig.3 for recommended circuit)	Perf. Criteria A
		IEC/EN55014-2	Perf. Criteria A
CS	IEC/EN61000-4-6 10 Vr.m.s	Perf. Criteria A	
	IEC/EN55014-2	Perf. Criteria A	
PFMF	IEC/EN6100-4-8 10A/m	Perf. Criteria A	
	IEC/EN55014-2	Perf. Criteria A	
Voltage dips, short interruptions and	IEC/EN61000-4-11 0%, 70%	Perf. Criteria B	

	voltage variations immunity	IEC/EN55014-2	Perf. Criteria B
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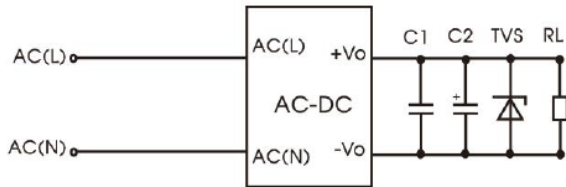


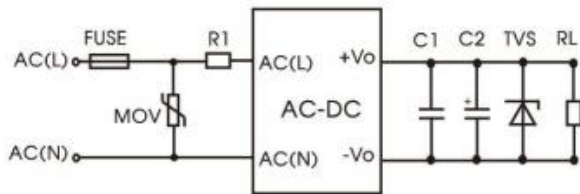
Fig. 1: Typical circuit diagram

RS Item No.	C1(μF)	C2(μF)	TVS
2333530	1μF/50V	10μF /16V	SMBJ7.0A
2333531		10μF /25V	SMBJ20A
2333533		10μF /35V	SMBJ30A

Output Filter Components:

C1 is a ceramic capacitor used for filtering high-frequency noise and TVS is a recommended suppressor diode to protect the application in case of a converter failure.

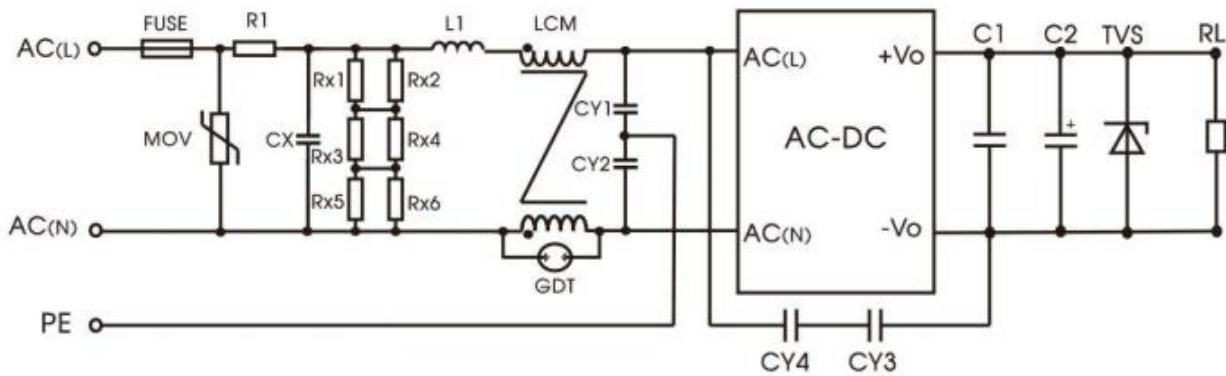
Fig 2 Recommended circuit compliance IEC/EN61000-4-5 line to line ±2KV



Component	Recommended value
FUSE	3.15A/300V, slow-blow, required
MOV1	S14K350
R1	3Ω/3W (wire-wound resistor)
C1	As above
C2	As above

### Recommended circuit Class I equipment

Fig 3 Recommended circuit for Class I equipment

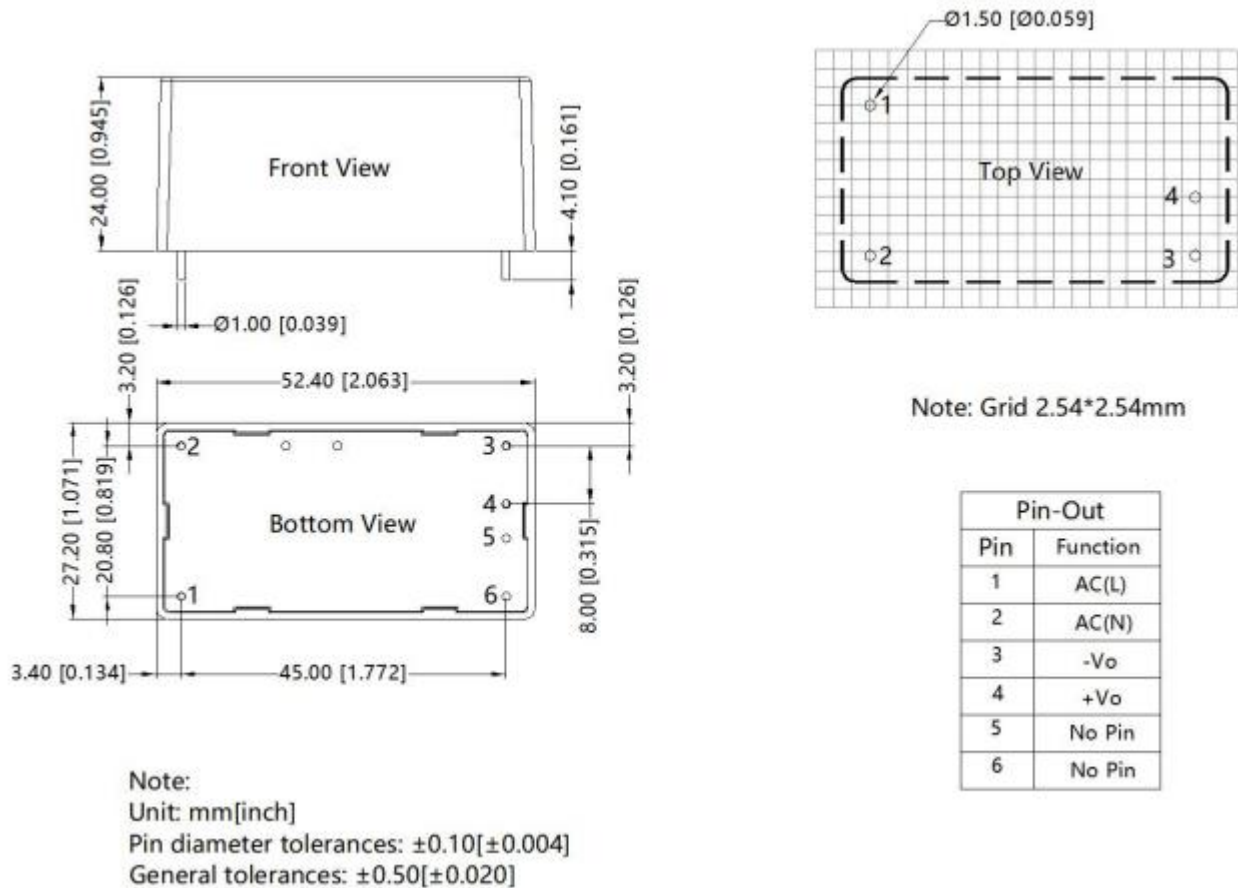


Component	Recommended value
FUSE	3.15A/300V, slow-blow,
MOV1	S14K350
CX	334K/305VAC
R1	6.8Ω/5W (wire-wound resistor)
L1	1.2mH/0.5A
CY1/CY2	2.2nF/400VAC
CY3/CY4	1nF/400VAC
GDT	300V/1KA
LCM	20 mH, we recommended using part no. FL2D-10-203 (MORNSUN)
Note: Rx1/Rx2/Rx3/Rx4/Rx5/Rx6 is the bleeder resistance of CX, and the recommended resistance value is 1.5MΩ/150VDC	

### Mechanical Specifications

Overall Length	52.4mm
Overall Depth	24mm
Overall Width	27.2mm
Weight	55g (Typ.)

## Dimensions and recommended layout



## Approvals

Safety Standard	IEC/EN/UL62368/EN60335/EN61558
Safety Certificate	IEC/EN/UL62368/EN60335/EN61558
Safety Class	CLASS II
Declaration	CE and UKCA

## Additional Information

Custom Tariff Number	85044030
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## Notes

1. If the product is not operated within the required load range, the product performance cannot be guaranteed to comply with all parameters in the datasheet.
2. Unless otherwise specified, parameters in this datasheet were measured under the conditions of  $T_a=25^{\circ}\text{C}$ , humidity<75% with nominal input voltage and rated output load.
3. All index testing methods in this datasheet are based on our Company's corporate standards.
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.

Connection Diagrams / Assembly Diagrams / Illustrations / Accessories