

Embedded Switch Mode Power Supplies (SMPS)

FEATURES

- Ultra-wide DIN rail mount DC-DC
 - 9...36Vdc
 - 18...75Vdc
- Efficiency up to 90%
- I/O isolation test voltage 1.5k VDC
- Inhibit
- Operating temperature range - 40°C to +105°C
- Input under-voltage protection, output short circuit, over-current, over-voltage protection.
- EMI performance meets CISPR32 / EN55032
- EN62368 Approved

RS PRO 20W PCB mount wide Input DC-DC

- 2351356
- 2351359
- 2351364
- 2351367



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

PCB mount DC-DC converters feature an ultra-wide 4:1 input voltage with efficiencies of up to 91%, 1500VDC input to output isolation, an operating ambient temperature range of -40°C to +105°C, input undervoltage protection, output overvoltage, overcurrent, short circuit protection, CISPR32/EN55032 CLASS A EMI compliant without external components, which makes them widely used in industrial control, instrumentation and communications applications.

General Specifications

Model	DC-DC 20W Industrial PCB power supply
Mounting Type	PCB mount
MTBF	MIL-HDBK-217F@25°C > 1,000,000 hrs
Applications	Industrial control systems, instrumentation and equipment

RS Stock#	Input (Vdc)		Output Voltage	Output Current	Max. Capacitive Load(μF)	Efficiency (Typ)
	Input range	Max				
2351356	9 to 36Vdc	40	±5V	±2A	2000	87%
2351359			±12V	±0.833A	800	90%
2351364			±24V	±0.417A	300	89%
2351367	18 to 75Vdc	80	±15V	±0.667A	600	90%

Input Specifications

Input Specification					
Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Current (full load / no-load)	24VDC nominal input series, nominal input voltage	-	958/10	-	mA
	48VDC nominal input series, nominal input voltage	-	969/5	-	
Reflected Ripple Current	Nominal input voltage	-	30	-	
Surge Voltage (1sec. max.)	24VDC nominal input series	-0.7	-	50	VDC
	48VDC nominal input series	-0.7	-	100	
Start-up Voltage	24VDC nominal input series	-	-	9	
	48VDC nominal input series	-	-	18	
Input under-voltage protection	24VDC nominal input series	5.5	6.5	-	
	48VDC nominal input series	12	15.5	-	
Start-up Time	Nominal input voltage & constant resistance load	-	10	-	ms
Input Filter		Pi filter			
Hot Plug		Unavailable			
Ctrl*	Module on	Ctrl pin open or pulled high (TTL 3.5-12VDC)			
	Module off	Ctrl pin pulled low to GND (0-1.2VDC)			
	Input current when off	-	2	7	mA

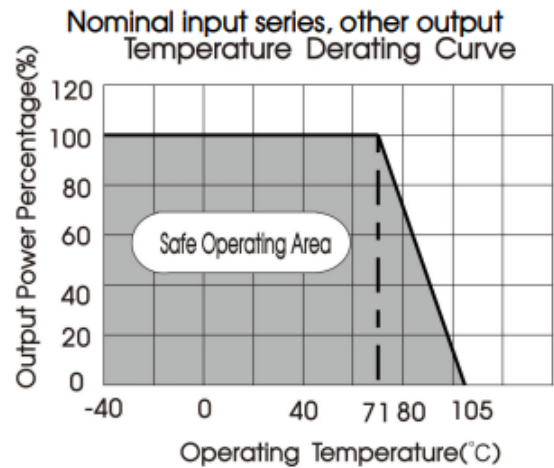
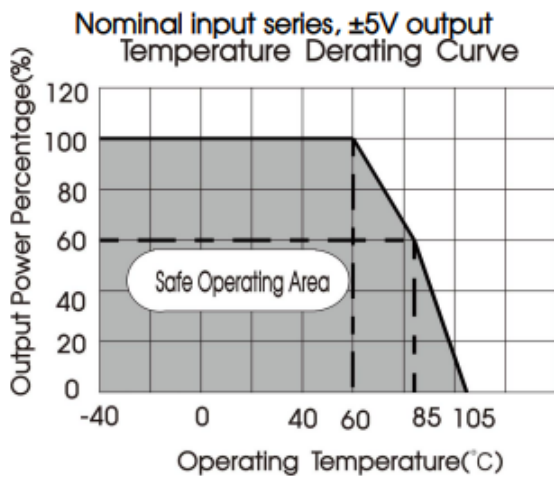
Note: *The Ctrl pin voltage is referenced to input GND

Output Specifications

Output Specification						
Item	Operating Conditions		Min	Typ.	Max	Unit
Voltage Accuracy	5%-100% load		-	±1	±3	%
Linear Regulation	Input voltage variation from low to high at full load	Vo1	-	±0.2	±0.5	
		Vo2	-	±0.4	±0.1	
Load Regulation	5%-100% load		-	±0.5	±1	
Cross Regulation	Vo1 load at 50%, Vo2 load at range of 10%-100%		-	-	±5	
Transient Recovery Time	All products		-	300	500	µs
Transient Response Deviation	25% load step change, nominal input voltage	5V output	-	±3	±8	%
Transient Response Deviation		Others	-	±3	±5	
Temperature Coefficient	Full load		-	-	±0.03	%/°C
Ripple & Noise *	20MHz bandwidth, 5-100% load		-	100	200	mV p-p
Over-voltage Protection	Input voltage range		110	-	160	%Vo
Over-current Protection			110	150	200	%Io
Short circuit Protection			Continuous, self-recovery			
Note: ① Output voltage accuracy for 0%-5% load is ±4% max; ② Load regulation for 0%-100% load is ±5%; ③ Ripple & Noise at ≤5% load is 5%Vo max. The “parallel cable” method is used for Ripple and Noise test, please refer to DC-DC Converter Application Notes for specific information.						

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Derating



General Specifications

Item	Operating Conditions	Min	Typ	Max.	Unit
Isolation	Input-output Electric Strength Test for 1 minute with a leakage current of 1mA max.	1500	-	-	VDC
	Input/output-case Electric Strength Test for 1 minute with a leakage current of 1mA max.	1000	-	-	
Insulation Resistance	Input-output resistance at 500VDC	1000	-	-	M Ω
Isolation Capacitance	Input-output capacitance at 100KHz/0.1V		2000		pF
Operating Temperature		-40	-	+105	°C
Storage Temperature		-55	-	+125	
Storage Humidity	Non-condensing	5	-	95	%RH
MTBF	MIL-HDBK-217F@25°C	1000			K hours

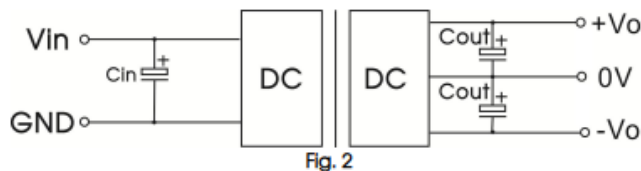
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EMC Specifications

Emissions	CE	CISPR32/EN55032 CLASS B (see Fig.3 for recommended circuit)	
	RE	CISPR32/EN55032 CLASS B (see Fig.3 for recommended circuit)	
Immunity	ESD	IEC/EN61000-4-2 Contact $\pm 4\text{KV}$	Perf. Criteria B
	RS	IEC/EN61000-4-3 10V/m	Perf. Criteria A
	EFT	IEC/EN61000-4-4 $\pm 2\text{KV}$ (see Fig.3 for recommended circuit)	Perf. Criteria B
	Surge	IEC/EN61000-4-5 line to line $\pm 2\text{KV}$ (see Fig.3 for recommended circuit)	Perf. Criteria B
	CS	IEC/EN61000-4-6 3 Vr.m.s	Perf. Criteria A

Typical Application

All the DC-DC converters of this series are tested before delivery using the recommended circuit shown in Fig. 2. Input and/or output ripple can be further reduced by appropriately increasing the input & output capacitor values C_{in} and C_{out} and/or by selecting capacitors with a low ESR (equivalent series resistance). Also make sure that the capacitance is not exceeding the max. capacitive load value of the product.



V_{in}	24V	48V
C_{in}	100 μF	10 μF -47 μF
C_{out}	10 μF	

2. EMC compliance circuit

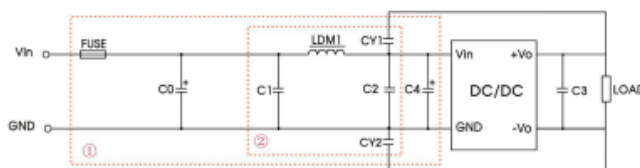


Fig. 3

Notes: For EMC tests we use Part ① in Fig. 3 for immunity and part ② for emissions test. Selecting based on needs.

List of components:

Model	$V_{in}:24\text{V}$	$V_{in}:48\text{V}$
FUSE	Choose according to actual input current	
C0, C4	330 $\mu\text{F}/50\text{V}$	330 $\mu\text{F}/100\text{V}$
C1, C2	4.7 $\mu\text{F}/50\text{V}$	4.7 $\mu\text{F}/100\text{V}$
C3	Refer to the C_{out} in Fig.2	
LDM1	4.7 μH	
CY1, CY2	1nF/2KV	

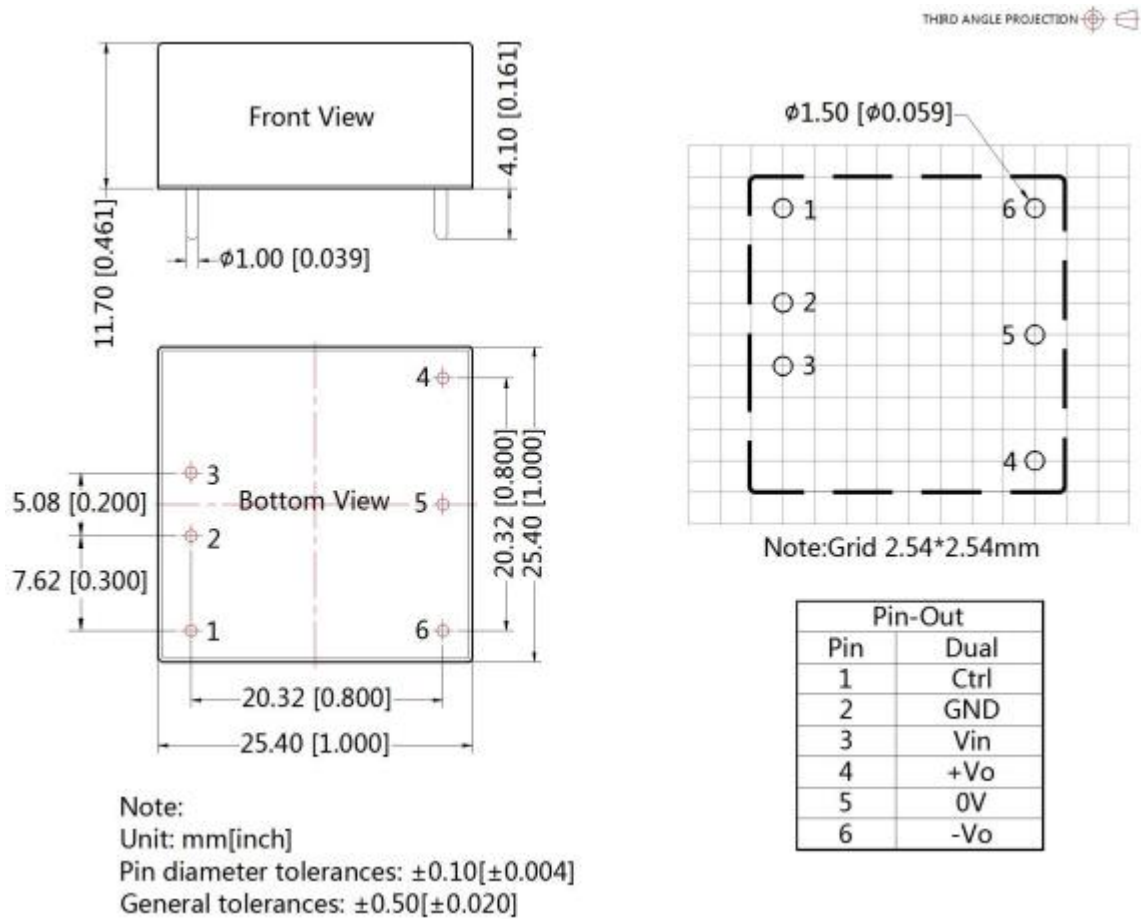
Mechanical Specifications

Case material	Aluminium alloy
Dimensions	25.40 × 25.40 × 11.70 mm
Weight	15g (Typ.)

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Cooling Method	Free air convection
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Dimensions and recommended layout



Approvals

Safety Certification	EN62368
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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. The maximum capacitive load offered were tested at input voltage range and full load.
3. Unless otherwise specified, parameters in this datasheet were measured under the conditions of Ta=25°C, humidity