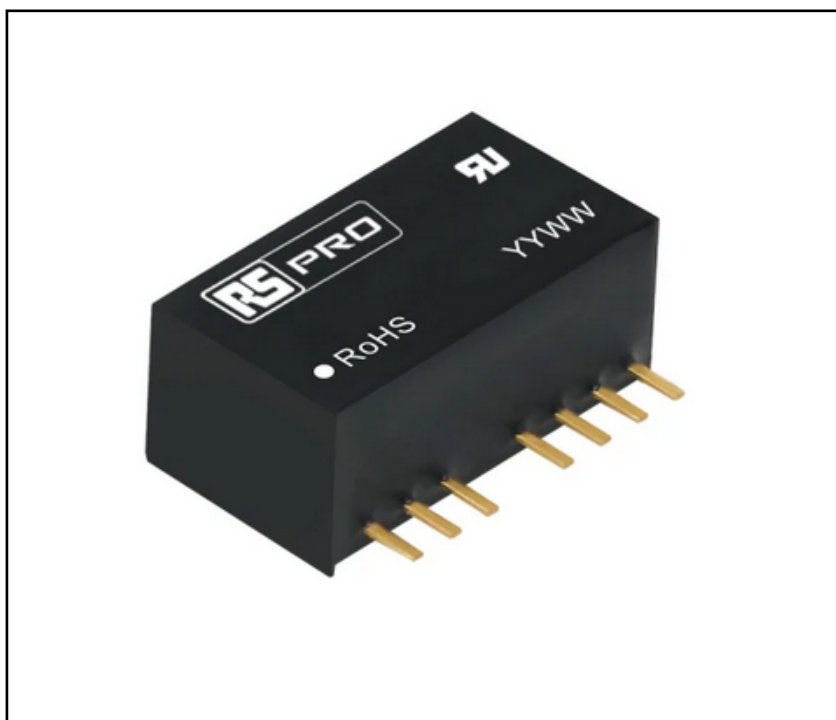


FEATURES

- Ultra-wide input and regulated single/dual output
- Input 4.5....36Vdc
- Industry standard pin-out
- I/O isolation test voltage 3K VDC
- Operating temperature range - 40°C to +105°C
- Input under-voltage, output short-circuit, over-current protection.
- No-load power consumption as low as 0.12W
- EN62368 Approved

RS PRO 3W Ultra-wide Input DC-DC

- 2233700, 2233701, 2233702, 2233703,
- 2233704



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.

Isolated DC-DC converters

Product Description

PCB Mount DC-DC converters feature an ultra-wide 8:1 input voltage range. They feature efficiencies of up to 79%, 3000VDC input to output isolation, operating ambient temperature range of -40°C to +105°C, input under-voltage protection, output over-current, short circuit protection and they are widely used in applications such as medical care, industrial control, electric power, instruments and communication fields.

General Specifications

Model	DC-DC 3W Industrial DC-DC converter
Mounting Type	PCB
MTBF	MIL-HDBK-217F@25°C > 1,000,000 hrs
Applications	Industrial control systems, instrumentation and battery powered equipment

RS Stock#	Input Voltage (Vdc)		Output Voltage	Output Current	Wattage	Max. Capacitive Load(μF)	Efficiency (Typ)
	Nominal	Max					
2233703	4.5 to 36	40	5V	600mA	3W	1000	77%
2233704	4.5 to 36	40	12V	250mA	3W	330	79%
2233700	4.5 to 36	40	±5V	±300mA	3W	470	77%
2233701	4.5 to 36	40	±12V	±125mA	3W	220	79%
2233702	4.5 to 36	40	±15V	±100mA	3W	100	79%

Input Specifications

Input Specification						
Item	Operating Conditions	Min.	Typ.	Max.	Unit	
Input Current (full load / no-load)	5V/±5V output	-	324/8	334/16	mA	
	Others	-	316/8	325/16		
Reflected Ripple Current	Nominal input voltage	-	50	-	VDC	
Surge Voltage (1sec. max.)		-0.7	-	50		
Start-up Voltage		-	-	4.5		
Input under-voltage protection		2.5	3.5	-		
Input Filter		Capacitance Filter				
Hot Plug		Unavailable				

Output Specifications

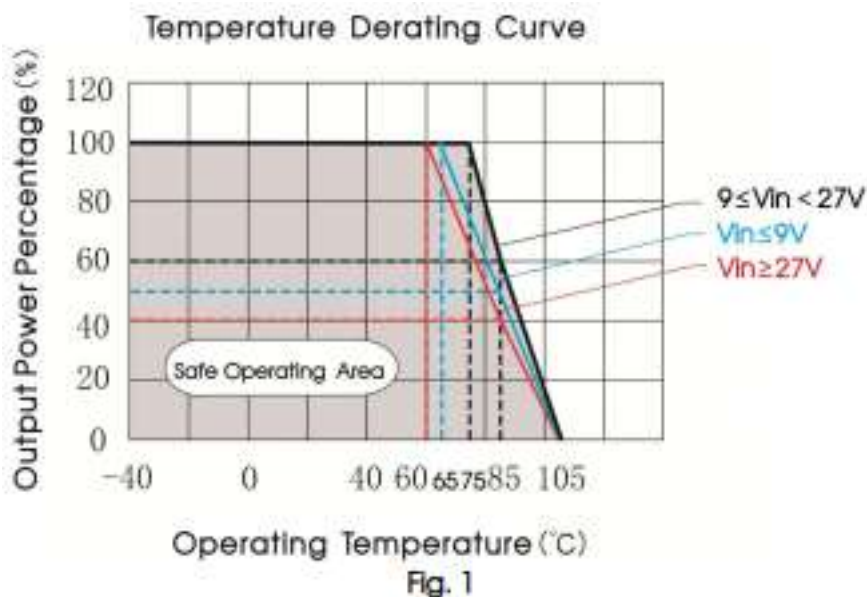
Output Specification						
Item	Operating Conditions		Min	Typ.	Max	Unit
Voltage Accuracy	0%-100% load		-	±1	±3	%
Linear Regulation	Full load, the input voltage is from low to high	Vo1	-	-	±0.5	
		Vo2	-	-	±1	
Load Regulation	5%-100% load	Vo1	-	-	±1	
		Vo2	-	-	±1.5	
Cross Regulation	Dual outputs, Vo1 load at 50%, Vo2 load at range of 25%-100%		-	-	±5	
Transient Recovery Time			-	300	500	µs
Transient Response Deviation	25% load step change, nominal input voltage	5V/ ±5V output	-	±5	±8	%
Transient Response Deviation		Others	-	±3	±5	
Temperature Coefficient	Full load		-	-	±0.03	%/°C
Ripple & Noise *	20MHz bandwidth, 5% -100% load		-	60	100	mV p-p
Over-current Protection	Input voltage range		110	-	300	%Io
Short circuit Protection			Continuous, self-recovery			

Note: *Ripple & Noise at < 5% load is 5%Vo max. The "parallel cable" method is used for Ripple and Noise test.

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.	3000	-	-	VDC
Insulation Resistance	Input-output resistance at 500VDC	1000	-	-	MΩ
Isolation Capacitance	Input-output capacitance at 100KHz/0.1V		40		pF
Operating Temperature	See Fig. 1	-40	-	+105	°C
Storage Temperature		-55	-	+125	
Storage Humidity	Without condensation	5	-	95	%RH
Pin Soldering Resistance Temperature	Soldering spot is 1.5mm away from case for 10 seconds	-	-	+300	°C
Vibration		10-150Hz, 5G, 0.75mm. along X, Y and Z axis			
Switching Frequency *	PWM mode	-	300	-	KHz
MTBF	MIL-HDBK-217F@25°C		1000		K hours

Derating



Design Reference

Typical application

All the DC/DC converters of this series are tested according to the recommended circuit (see Fig. 2) before delivery. If it is required to further reduce input and output ripple, properly increase the input & output of additional capacitors C_{in} and C_{out} or select capacitors of low equivalent impedance provided that the capacitance is no larger than the max. capacitive load of the product.

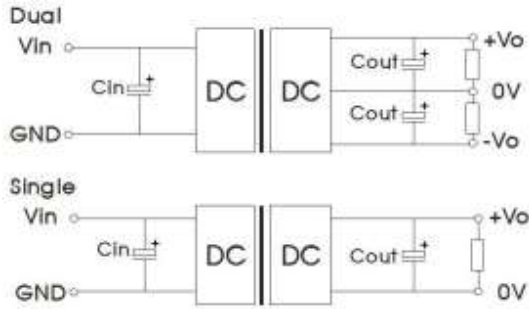


Fig. 2

Parameter description:

Single Vout (VDC)	Cout (μF)	Cin (μF)	Dual Vout (VDC)	Cout (μF)	Cin (μF)
5/12/15	22 (25V)	100 (50V)	±5/±12/±15	22 (25V)	100 (50V)

EMC compliance circuit

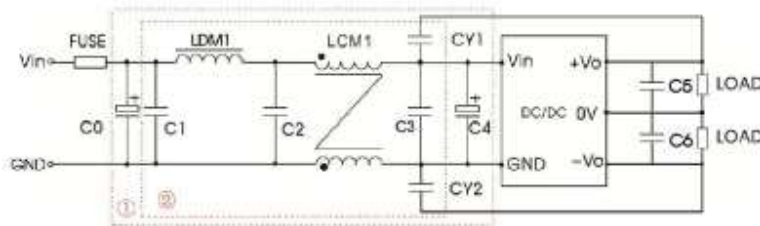


Fig. 3

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

Parameter description:

Components	Vin:12V
FUSE	Choose according to actual input current
C0	1000μF/50V
C4	330μF/50V
C1/C2/C3	10μF/50V
LCM1	3.3mH, recommended to use MORNSUN's FL2D-10-332
LDM1	4.7μH
CY1/CY2	1nF/3KV
C5/C6	Refer to the Cout in Fig.2

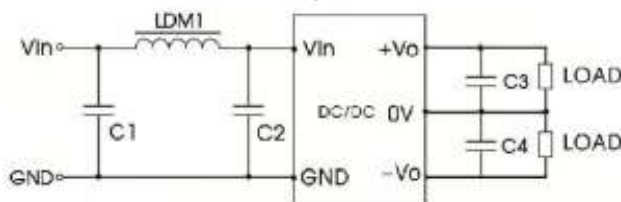


Fig. 4

Parameter description:

Components	Vin:12V
FUSE	Choose according to actual input current
C1/C2	10μF/50V
LDM1	22μH
C3/C4	Refer to the Cout in Fig.2

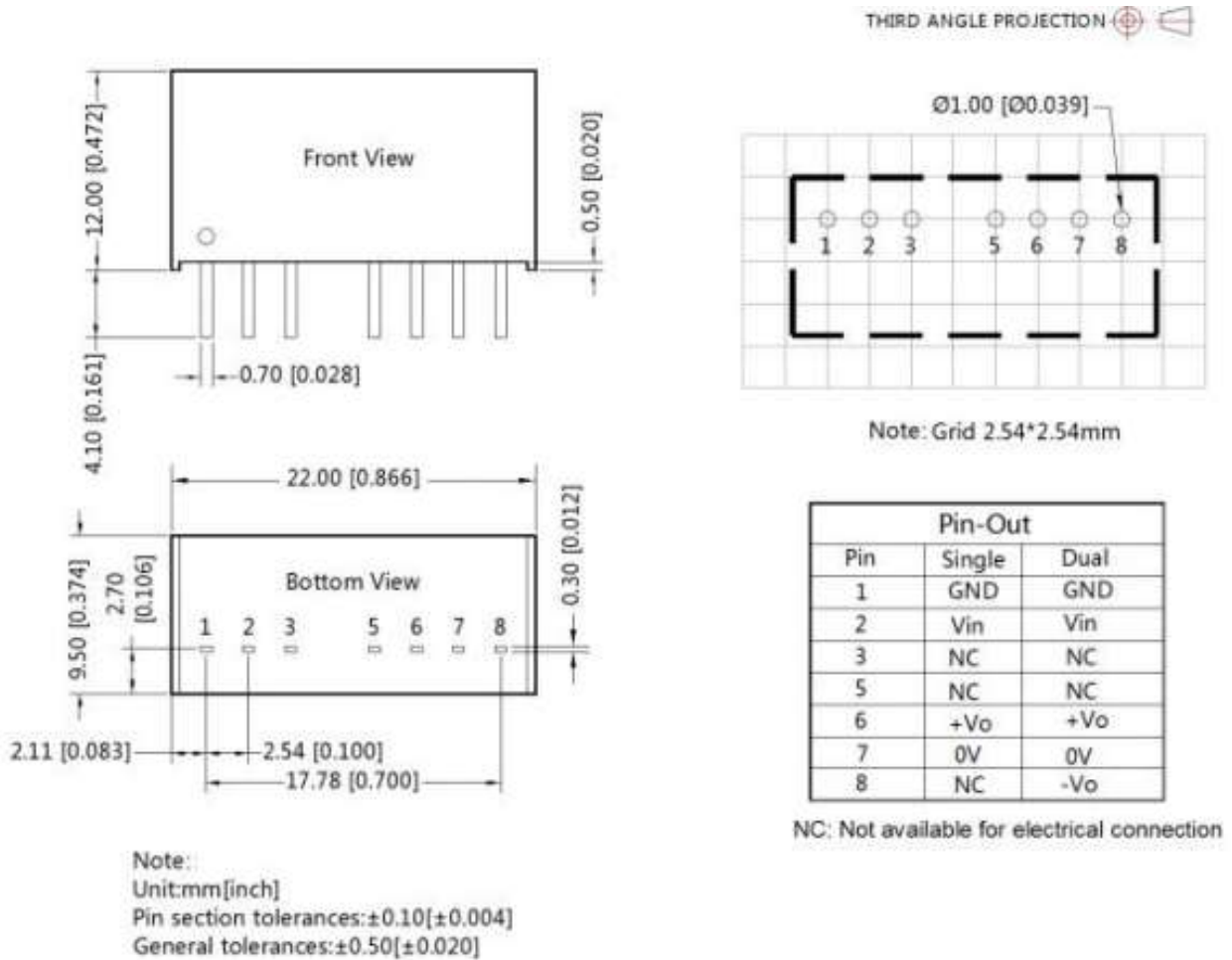
EMC Specifications

Emissions	CE	CISPR32/EN55032 CLASS B (see Fig.3-② for recommended circuit)/CLASS A (see Fig.4 for recommended circuit)	
	RE	CISPR32/EN55032 CLASS B (see Fig.3-② for recommended circuit)/CLASS A (see Fig.4 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.3-① for recommended circuit)	Perf. Criteria B
	Surge	IEC/EN61000-4-5 line to line $\pm 2\text{KV}$ (see Fig.3-① for recommended circuit)	perf. Criteria B
	CS	IEC/EN61000-4-6 3 Vr.m.s	perf. Criteria A

Mechanical Specifications

Case material	Black plastic; flame-retardant and heat-resistant (UL94-V0)
Dimensions	22.00 × 9.50 × 12.00 mm
Weight	4.5g (Typ.)
Cooling Method	Free air convection

Dimensions and recommended layout



Approvals

Safety Certification	EN62368
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1. The maximum capacitive load offered were tested at input voltage range and full load
2. Unless otherwise specified, parameters in this datasheet were measured under the conditions of Ta=25°C, humidity with nominal input voltage and rated output load
3. Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units.