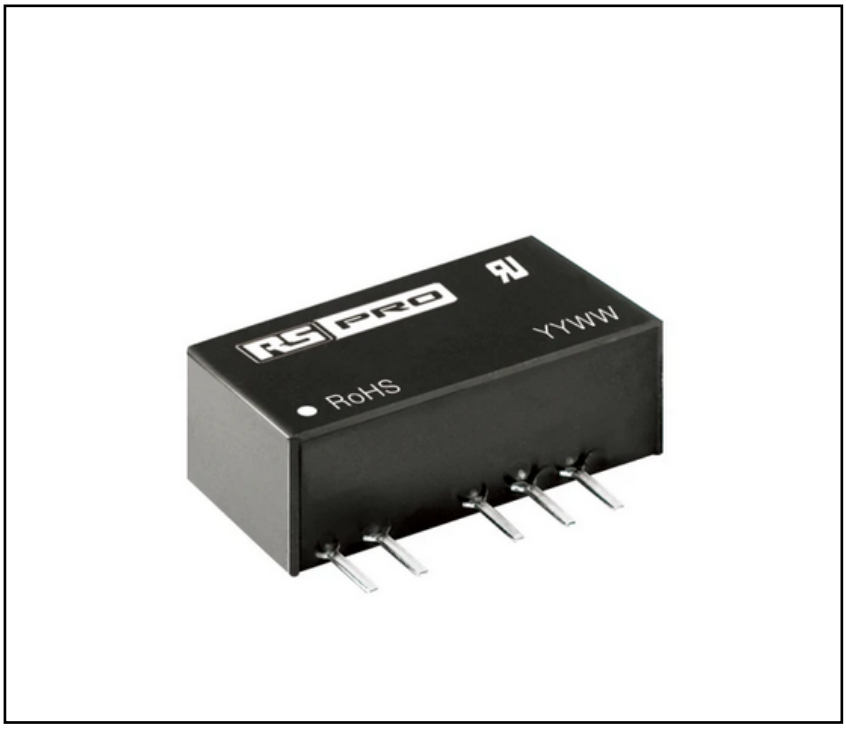
FEATURES

- Fix input unregulated dual output
- Continuous short-circuit protection.
- Industry standard pin-out
- I/O isolation test voltage 1.5KVDC
- No-load input current as low as 8mA
- Operating temperature range - 40℃ to +105℃
- High efficiency up to 81%
- IEC62368, UL62368, EN62368 approved

RS PRO 1W isolated DC-DC converters

- **2233644,2233645,2233647,2233649**
- **2233651,2233653,2233655**



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 are specially designed for applications where an isolated voltage is required in a distributed power supply system. They are suitable for: pure digital circuits, low frequency analog circuits, relay-driven circuits and data switching circuits. Featuring continuous short circuit protection and no-load input current as low as 8mA

General Specifications

Model	DC-DC 1W Isolated DC-DC converter
Mounting Type	PCB
MTBF	MIL-HDBK-217F@25°C > 3,500,000 hrs
Applications	Industrial control systems, instrumentation, analogue, relay-driven and data switching circuits.

RS Stock#	Input Voltage (Vdc)		Output Voltage	Output Current	Wattage	Max. Capacitive Load(µF)	Efficiency (Typ)
	Nominal	Max					
2233644	12V (10.8-13.2)		±3.3V	±152/±15mA	1W	1200	75%
2233645			±5V	±100/±10mA	1W	1200	80%
2233647			±12V	±42/±5mA	1W	220	81%
2233649			±24V	±21/±3mA	1W	100	80%
2233651	24V (21.6-26.4)		±5V	±100/±10mA	1W	1200	80%
2233653			±12V	±42/±5mA	1W	220	81%
2233655			±24V	±21/±3mA	1W	100	80%

Input Specifications

Input Specification					
Item	Operating Conditions	Min.	Typ.	Max.	Unit
Input Current (full load / no-load)	12VDC input	-	105/8	110/--	mA
	24VDC input	-	56/8	61/--	
Reflected Ripple Current	Nominal input voltage	-	15	-	
Surge Voltage (1sec. max.)	12VDC input	-0.7	-	18	VDC
	24VDC input	-0.7	-	30	
Input Filter		Capacitance Filter			
Hot Plug		Unavailable			

Output Specifications

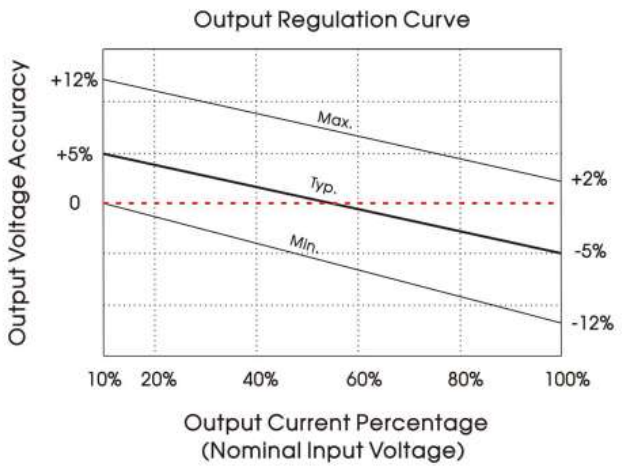
Output Specification						
Item	Operating Conditions		Min	Typ.	Max	Unit
Voltage Accuracy			See output regulation curves (Fig. 1)			
Linear Regulation	Input voltage change: ±1%	3.3VDC output	-	-	±1.5	%
		5VDC/12VDC & 24VDC output	-	-	±1.2	
Load Regulation	10% -100% load	3.3VDC output	-	8	20	
		5VDC output		5	15	
		12VDC output		3	10	
		24VDC output	-	2	10	
Temperature Coefficient	100% load		-	±0.02	-	%/℃
Ripple & Noise *	20MHz bandwidth	3.3VDC/5VDC & 12VDC output	-	30	75	mV p-p
		24VDC output		50	100	
Short circuit Protection			Continuous, self-recovery			
Note: * The “parallel cable” method is used for ripple and noise test, please refer to DC-DC Converter Application Notes for specific information.						

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
Insulation Resistance	Input-output resistance at 500VDC	1000	-	-	MΩ
Isolation Capacitance	Input-output capacitance at 100KHz/0.1V		20		pF
Operating Temperature	See Fig. 1	-40	-	+105	℃
Storage Temperature		-55	-	+125	
Case Temperature Rise	Ta=25℃	-	25	-	
Storage Humidity	Non-condensing	5	-	95	%RH
Pin Soldering Resistance Temperature	Soldering spot is 1.5mm away from case for 10 seconds	-	-	+300	℃
Vibration		10-150Hz, 5G, 0.75mm. along X,Y and Z axis			
Switching Frequency *	Full load, nominal input voltage	-	260	-	KHz
MTBF	MIL-HDBK-217F@25℃	3500			K hours

Typical Performance Curves

3.3V



5VDC/12VDC/24VDC

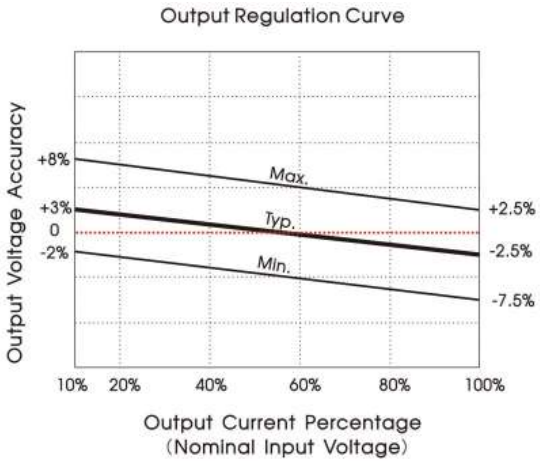


Fig. 1

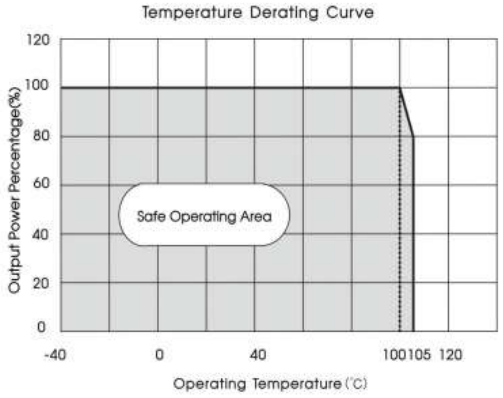


Fig. 2

Design Reference

Typical application

Input and/or output ripple can be further reduced, by connecting a filter capacitor from the input and/or output terminals to ground as shown in Fig.3. Choosing suitable filter capacitor values is very important for a smooth operation of the modules, particularly to avoid start-up problems caused by capacitor values that are too high. For recommended input and output capacitor values refer to Table 1.

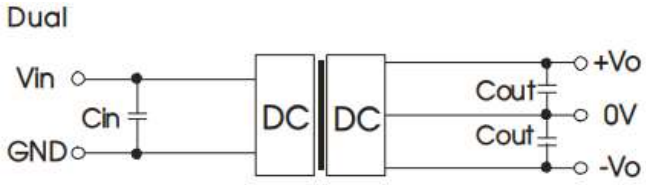


Fig.3

Table 1 : Recommended input and output capacitor values

Vin	Cin	Vout	Cout
12VDC	2.2µF/25V	±3.3VDC	4.7µF/16V
24VDC	1µF/50V	±5VDC	4.7µF/16V
		±12VDC	1µF/25V
		±24VDC	0.47µF/50V

EMC compliance circuit

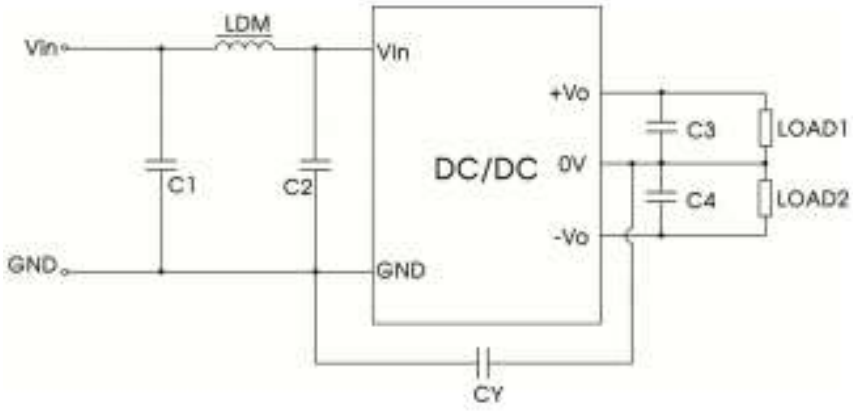


Fig 4.

Table 2 : EMC recommended circuit value table

Emissions	C1	4.7µF /50V
	C2	4.7µF /50V
	CY	270pF/2kV
	C3	Refer to the Cout in table 1
	C4	Refer to the Cout in table 1
	LDM	6.8µH

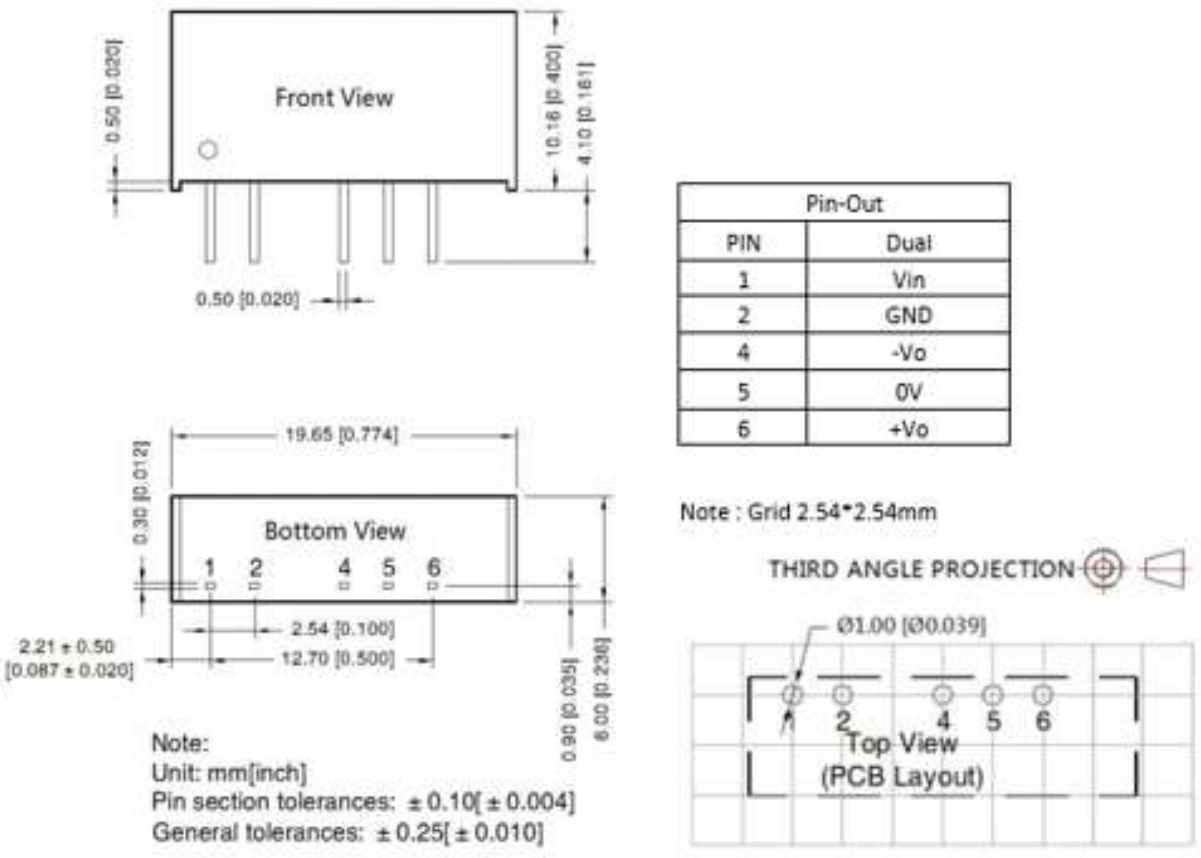
EMC Specifications

Emissions	CE	CISPR32/EN55032 CLASS B	
	RE	CISPR32/EN55032 CLASS B	
Immunity	ESD	IEC/EN61000-4-2 Air ±8kV, Contact ±6kV perf.	Perf. Criteria B
Note: Refer to Fig.4 for recommended circuit test			

Mechanical Specifications

Case material	Black plastic; flame-retardant and heat-resistant (UL94 V-0)
Dimensions	19.65 x 6.00 x 10.16mm
Weight	2.1g (Typ.)
Cooling Method	Free air convection

Dimensions and recommended layout



Pin-Out	
PIN	Dual
1	Vin
2	GND
4	-Vo
5	0V
6	+Vo

Note : Grid 2.54*2.54mm

Approvals

Safety Certification	IEC62368, UL62368, EN62368 approved

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℃, humidity
4. Our products shall be classified according to ISO14001 and related environmental laws and regulations.