

Features

- Ultra-compact DIP/SMD package
- Wide 2:1 input voltage range
- Operating ambient temperature range: -40°C to +85°C
- I/O isolation test voltage: 1.5K VDC
- Short circuit protection (continuous)
- Industry standard pin-out
- EN62368 approved



Ideal Power's 36WRB-ST-1WR2 1W Isolated DC/DC Converter in SMD Series are certified to cRUus, CE, RoHS & IEC/UL60950/EN62368 Standards and comply with the relevant Efficiency Regulations. These are primarily used in ITE, Audio & Video Industries and customised solutions are available upon request.

Models

Model No.	Input Voltage (VDC)		Output		Ripple & Noise ② (mVp-p) Typ/Max	Full Load Efficiency (%) Min/Typ.	Capacitive Load (µF) Max.
	Nominal (Range)	Max. ①	Voltage (VDC)	Current (mA) Max/Min.			
36WRB1203ST-1WR2	12 (9-18)	40	3.3	303/15	100/150	73/75	2700
36WRB1205ST-1WR2			5	200/10		75/77	2200
36WRB1212ST-1WR2			12	83/4		77/79	1000
36WRB1215ST-1WR2			15	67/3		78/80	680
36WRB1224ST-1WR2			24	42/2		74/76	470
36WRB2403ST-1WR2	24 (18-36)	80	3.3	303/15	50/100	73/75	2700
36WRB2405ST-1WR2			5	200/10		75/77	2200
36WRB2412ST-1WR2			12	83/4		76/78	1000
36WRB2415ST-1WR2			15	67/3		76/78	680
36WRB2424ST-1WR2			24	42/2		75/77	470

Notes:

- ① Exceeding the maximum input voltage may cause permanent damage.
 ② Efficiency is measured at nominal input voltage and rated output load.

Input Specifications

	Conditions	Min	Typ	Max	Unit
Input Current (full load / no-load)	12VDC input voltage	--	111/15	114/30	mA
	24VDC input voltage	--	55/6	57/10	
Reflected Ripple Current	12VDC input voltage	--	40	--	mA
	24VDC input voltage	--	55	--	
Surge Voltage (1sec. max.)	12VDC input voltage	-0.7	--	25	VDC
	24VDC input voltage	-0.7	--	50	
Start-up Voltage	12VDC input voltage	--	--	9	VDC
	24VDC input voltage	--	--	18	
Input Filter	12VDC input voltage	Capacitance filter			
Hot Plug		Unavailable			

Output Specifications

Parameter	Conditions	Min	Typ	Max	Unit	
Voltage Accuracy	5%-100% load, input voltage range		±1	±3		
No-load Output Voltage Accuracy	Input voltage range	3.3VDC output	--	±5	±7	%
		Others	--	±1.5	±5	
Linear Regulation	Input voltage variation from low to high at full load		±0.2	±0.5		
Load Regulation	5%-100% load		±0.5	±1		
Transient Recovery Time	25% load step change		1	3	µs	
Transient Response Deviation	25% load step change		±2.5	±5	%	
Temperature Coefficient	Full load			±0.03	%/°C	
Short-circuit Protection		Continuous, self-recovery				

General Specifications

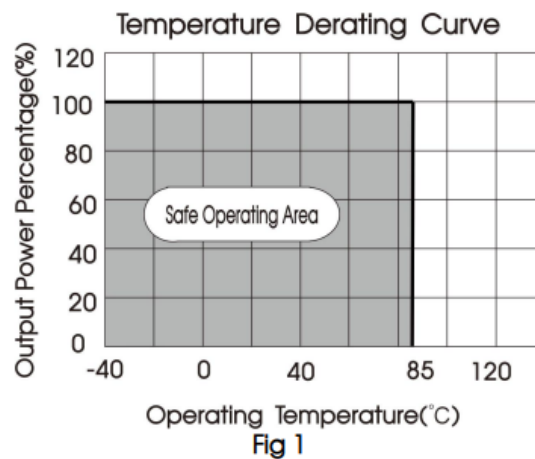
Parameter	Conditions	Min	Typ	Max	Unit
Isolation	Input-output Electric Strength Test for 1 minute with a leakage current of 1mA max.	1500			VDC
Insulation Resistance	Input-output resistance at 500VDC	1000			MΩ
Isolation Capacitance	Input-output capacitance at 100kHz/0.1V		1000		pF
Operating Temperature	see Fig. 1	-40		+85	
Storage Temperature		-55		+125	°C
Pin Soldering Resistance Temperature	Soldering spot is 1.5mm away from case for 10			+300	
Reflow Soldering Temperature		Peak temperature ≤245°C, duration ≤60s max over 217°C. see also IPC/JEDEC J-STD-020D.1.			
Storage Humidity	Non-condensing			95	%RH
Switching Frequency (PFM Mode)	Full load, nominal input voltage		300		kHz
MTBF	MIL-HDBK-217F@25°C	1000			k hours

Mechanical Specifications

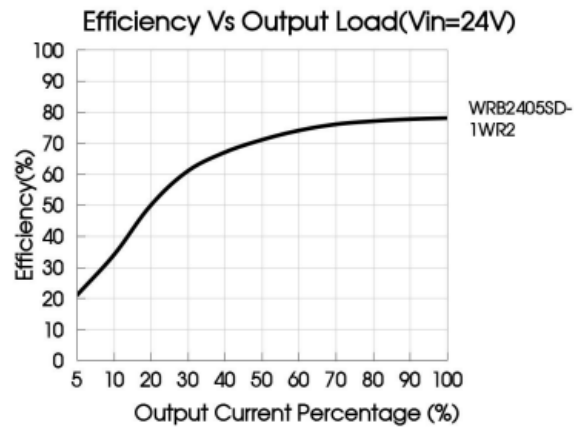
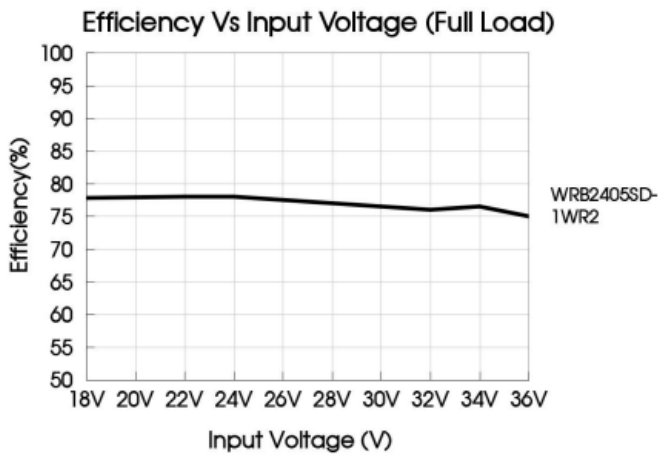
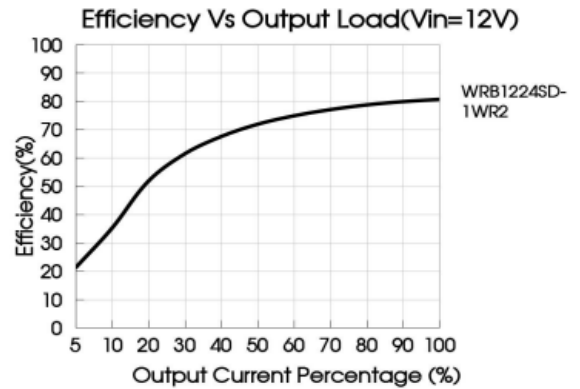
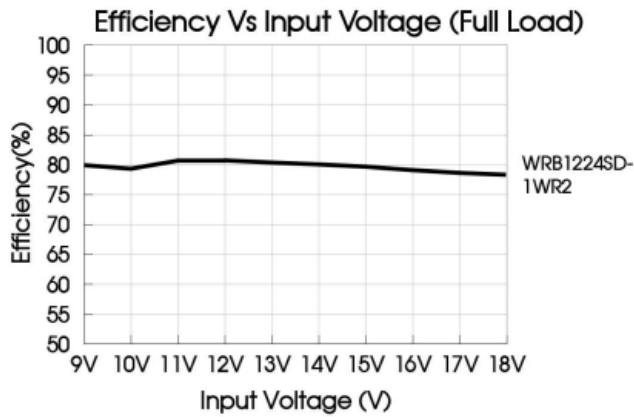
Case material	Black plastic; flame-retardant and heat-resistant
Dimensions	15.00 × 14.00 × 9.10 mm
Weight	2.2g(Typ.)
Cooling method	Free air convection

Electromagnetic Compatibility (EMC)

Emissions	CE	CISPR32/EN55032	CLASS B (see Fig. 3-② for recommended circuit)	
	RE	CISPR32/EN55032	CLASS B (see Fig. 3-② for recommended circuit)	
Immunity	ESD	IEC/EN61000-4-2	Contact ±6KV	perf. Criteria B
	RS	IEC/EN61000-4-3	10V/m	perf. Criteria A
	EFT	IEC/EN61000-4-4	±2KV (see Fig. 3-① for recommended circuit)	perf. Criteria B
	Surge	IEC/EN61000-4-5	line to line ±2KV (see Fig. 3-① for recommended circuit)	perf. Criteria B
	CS	IEC/EN61000-4-6	3 Vr.m.s	perf. Criteria A

Characteristic Curve


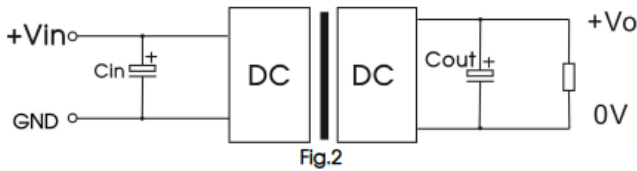
Characteristic Curve (Continued)



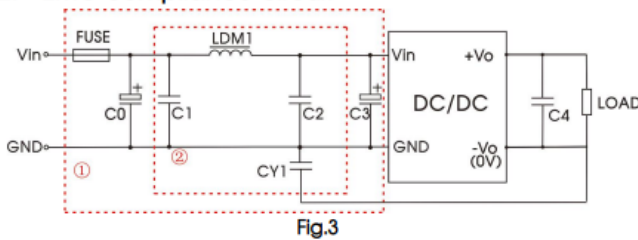
Design Reference (Figure 1)
1 Typical application

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 specified max. capacitive load value of the product.



$V_{in}(VDC)$	12	24
C_{in}	47 $\mu F/25V$	47 $\mu F/50V$
$V_{o}(VDC)$	3.3, 5	12, 15, 24
C_{out}	100 $\mu F/6.3V$	27 $\mu F/35V$

2. EMC compliance circuit


Parameter description:

Part No.	$V_{in}:12VDC$	$V_{in}:24VDC$
FUSE	slow blow, choose according to actual input current	
C0	1000 $\mu F/25V$	680 $\mu F/50V$
C1	4.7 $\mu F/50V$	
LDM1	15 μH	
C2	4.7 $\mu F/50V$	
C3	330 $\mu F/50V$	
CY1	1nF/2KV	
C4	Refer to the C_{out} Fig.2	

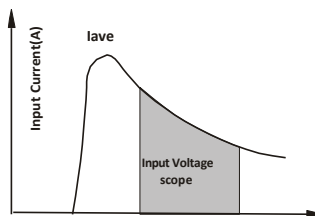
Notes: For EMC tests we use Part ① in Fig. 3 for immunity and part ② for emissions test. Selecting based on needs.

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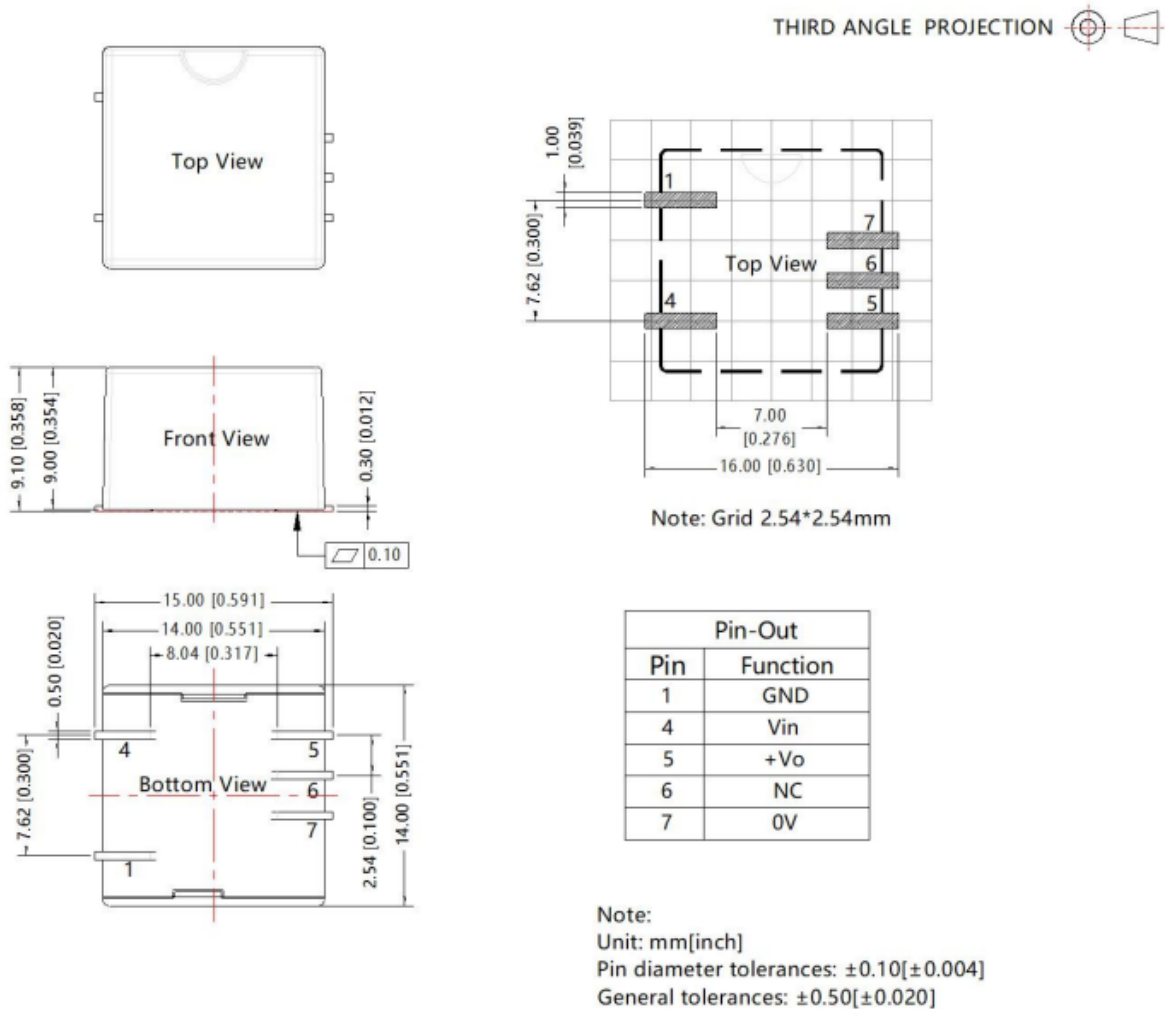
Input current

When the electricity is provided by the unstable power supply, please make sure that the range of the output voltage fluctuation and the ripple voltage of the power supply do not exceed the indicators of the modules. Input current of power supply should afford the flash startup current of this kind of DC/DC module (see Fig. 4).

Generally: $V_{in}=12V$ series $I_{ave}=205mA$ $V_{in}=24V$ series $I_{ave}=104mA$


Output load requirements

When using, the minimum load of the module output should not be less than 5% of the nominal load. To meet the performance parameters of this datasheet, please connect a 5% dummy load in parallel at the output end, the dummy load is generally a resistor, please note that the resistor needs to be used in derating.

Dimensions and Recommended Layout

Notes:

For additional information on Product Packaging please refer to www.idealpower.com.

Recommend using module with more than 5% load, if not, the ripple of the product may exceed the specification, but does not affect the reliability of the product.

The maximum capacitive load offered were tested at input voltage range and full load.

Unless otherwise specified, parameters in this datasheet were measured under the conditions of $T_a=25^\circ\text{C}$, humidity<75%RH with nominal input voltage and rated output load.

All index testing methods in this datasheet are based on company corporate standards.

We can provide product customization service, please contact our technicians directly for specific information.

Products are related to laws and regulations: see "Features" and "EMC".

Our products shall be classified according to ISO14001 and related environmental laws and regulations and shall be handled by qualified units.