



FEATURES

- ◆ Ultra wide **4:1** Input Range 9–36VDC or 18–75VDC
- ◆ Full SMD-Design
- ◆ High Efficiency up to 85%
- ◆ Indefinite Short-Circuit Protection
- ◆ Reverse Voltage Protection
- ◆ I / O-isolation 1500 VDC
- ◆ Input Filter meets EN 55022, Class A and FCC, Level A without external Components
- ◆ Shielded Metal Case with insulated Baseplate
- ◆ 24-pin DIP with industry Standard Pin out
- ◆ MTBF >1 Mio. H
- ◆ 2 Year Product Warranty

MODEL SELECTION

WRB^①24^②12^③Z^④D^⑤-4W^⑥

- ① Product Series ② Input Voltage
 ③ Output Voltage ④ Wide (4:1) Input Range
 ⑤ DIP24 Package Style ⑥ Rated Power

APPLICATIONS

The WRA(B)-ZD-4W series DC/DC converter is designed for applications requiring very wide operating voltage range. Typical applications are tele- and data communication systems, mobile battery powered equipments and industrial process control systems with operation from different input voltages i.e. 12/24 VDC or 24/48 VDC battery voltages. High efficiency allows operation up to 75°C without derating. Input filtering according EN 55022-A and FCC, level A. Low output ripple minimize design-in time and cost.

Models

Order code	Input voltage range *	Output voltage	Output current max.	Efficiency typ.
WRB2403ZD-4W	9 – 36VDC	3.3VDC	900mA	77%
WRB2405ZD-4W	9 – 36VDC	5VDC	660mA	81%
WRB2412ZD-4W	9 – 36VDC	12VDC	330mA	83%
WRB2415ZD-4W	9 – 36VDC	15VDC	265mA	83%
WRA2405ZD-4W	9 – 36VDC	± 5VDC	± 330mA	80%
WRA2412ZD-4W	9 – 36VDC	± 12VDC	± 165mA	83%
WRA2415ZD-4W	9 – 36VDC	± 15VDC	± 130mA	83%
WRB4803ZD-4W	18 – 75VDC	3.3VDC	900mA	78%
WRB4805ZD-4W	18 – 75VDC	5VDC	660mA	82%
WRB4812ZD-4W	18 – 75VDC	12VDC	330mA	85%
WRB4815ZD-4W	18 – 75VDC	15VDC	265mA	85%
WRA4805ZD-4W	18 – 75VDC	± 5VDC	± 300mA	82%
WRA4812ZD-4W	18 – 75VDC	± 12VDC	± 165mA	85%
WRA4815ZD-4W	18 – 75VDC	± 15VDC	± 130mA	85%

*Input voltage can't exceed this value, or will cause the permanent damage.

Physical Specifications

Case material	Steel chrome-nickel plated
Baseplate	Epoxy
Potting material	Silicon rubber TSE (flammability to UL 94V-0)
Weight	14 g (0.55 oz)
Soldering temperature	max. 260 °C / 10 sec

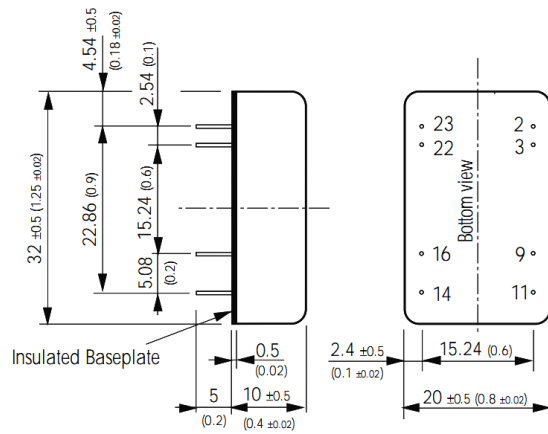


Input Specifications		
Input current no load /full load	24 Vin models	20 mA / 400 mA typ. (at 12 VDC Vin)
		20 mA / 200 mA typ. (at 24 VDC Vin)
	48 Vin models	6 mA / 200 mA typ. (at 24 VDC Vin)
		6 mA / 100 mA typ. (at 48 VDC Vin)
Start-up voltage / under voltage shut down	24 Vin models	8.5 VDC /8.0 VDC typ.
	48 Vin models	17 VDC /16 VDC typ.
Surge voltage (1 sec. max.)	24 Vin models	50 V max.
	48 Vin models	100 V max.
Reverse voltage protection		1.0 A max.
Conducted noise (input)		EN 55022 level A, FCC part 15, level A

Output Specifications		
Voltage set accuracy		± 1 %
Regulation	– Input variation Vin min. to Vin max.	± 0.3 % max.
	– Load variation 10 – 100%	
	– single output model	± 1.0 % max.
	– dual output models balanced load	± 1.0 % max.
	– dual output models unbalanced load	± 3.0 % max.
Ripple and noise (20 MHz Bandwidth)		450 mVpk-pk max
Temperature coefficient		± 0.02 % / °C
Current limitation		> 110% of Iout max., constant current
Short circuit protection		Hiccup mode, indefinite (automatic recovery)
Capacitive load	– single output model	680 µF max.
	– dual output model	300 µF max.

General Specifications		
Temperature ranges	– Operating	– 40°C ... + 75°C(no derating)
	– Case temperature	+ 95 °C max.
	– Storage	– 40 °C ... + 125 °C
Humidity (non condensing)		95 % rel H max.
Reliability, calculated MTBF (MIL-HDBK-217 E)		>1 Mio. h @ + 25 °C
Isolation voltage	Input/Output	1500 VDC
Isolation capacity	Input/Output	380 pF typ
Isolation resistance	Input/Output (500 VDC)	> 1000 M Ohm
Switching frequency		350 kHz typ. (Pulse frequency modulation PFM)
Safety standards		UL 1950 , IEC 60950, EN 60950 Compliance up to 60 VDC input voltage(SELV limit)
Safety approval		cUL / UL File E188913
All specifications valid at nominal input voltage, full load and +25°C after warm-up time unless otherwise stated.		

Outline Dimensions mm (Inches)

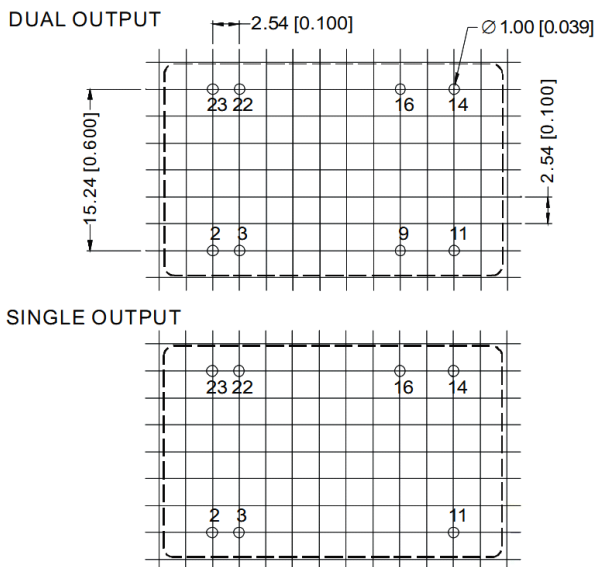


Pin-Out		
Pin	Single	Dual
2	-Vin (GND)	-Vin (GND)
3	-Vin (GND)	-Vin (GND)
9	No pin	Common
11	No function	-Vout
14	+Vout	+Vout
16	-Vout	Common
22	+Vin (Vcc)	+Vin (Vcc)
23	+Vin (Vcc)	+Vin (Vcc)

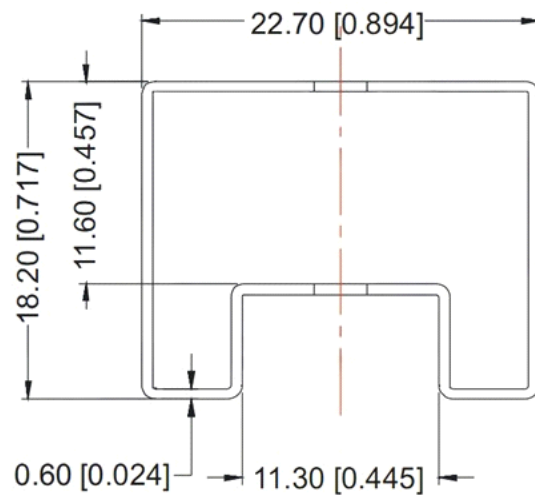
Pin diameter $\varnothing 0.5 \pm 0.05$ (0.02 \pm 0.002)

Tolerances ± 0.5 (0.02)

RECOMMENDED FOOTPRINT



TUBE OUTLINE DIMENSIONS



RoHS COMPLIANT INFORMATION

This series is compatible with RoHS soldering systems with a peak wave solder temperature of 300° C for 10 seconds.

The pin termination finish on the SIP package type is Tin Plate, Hot Dipped over Matte Tin with Nickel Preplate. The DIP types are Matte Tin over Nickel Preplate. Both types in this series are backward compatible with Sn/Pb soldering systems.

REACH COMPLIANT INFORMATION

This series has proven that this product does not contain harmful chemicals, it also has harmful chemical substances through the registration, inspection and approval.