



## FEATURES

- ◆ Wide 2:1 DC input range
- ◆ In/out capacitance 1000pF
- ◆ Protections : Short circuit / Overload / Over voltage
- ◆ 1500VDC I/O isolation for D/D
- ◆ Cooling by free air convection
- ◆ Built-in remote ON-OFF control
- ◆ 100% full load burn-in test
- ◆ Fixed switching frequency at 225KHz
- ◆ Lost cost
- ◆ MTBF>1000Khours
- ◆ High reliability
- ◆ 3 year warranty

## MODEL SELECTION

**WRB<sup>①</sup>24<sup>②</sup>12<sup>③</sup>Y<sup>④</sup>QD<sup>⑤</sup>-20W(1667)<sup>⑥</sup>**

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

## APPLICATIONS

The WRA(B)-YQD-20W Series of DC/DC converters has been designed for a wide range of applications including communications, industrial systems and battery powered mobile equipments. Key features are high power density and 2:1 wide input ranges of 18~36 VDC and 36~72 VDC.(But also can do high power density and 4:1 ultrawide input ranges of 9~36 VDC and 18~72 VDC.)



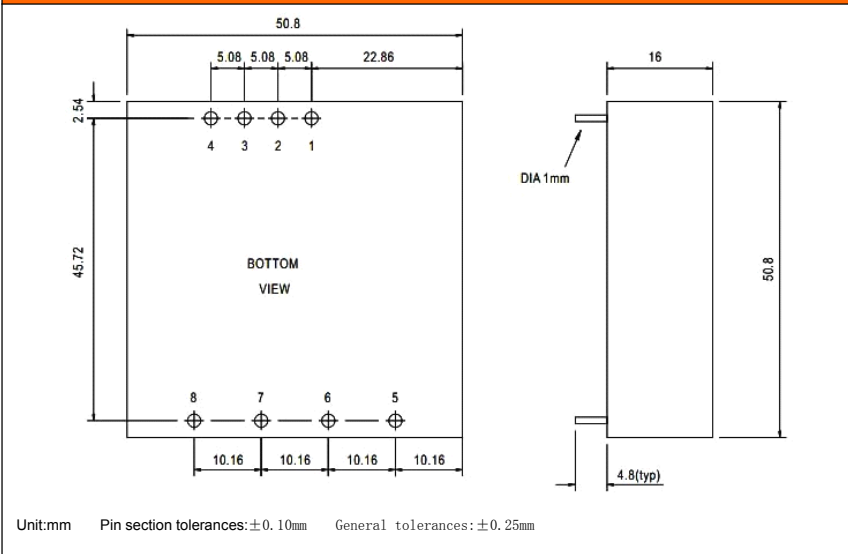
## SELECTION GUIDE

Order code	Input voltage range (VDC)	Output voltage (VDC)	Output current max.(mA)	Efficiency typ.(%)
WRA1205YQD-20W	9~18	±5	±2000	78
WRA1212YQD-20W	9~18	±12	±833	82
WRA1215YQD-20W	9~18	±15	±667	80
WRA1224YQD-20W	9~18	±24	±417	83
WRA2405YQD-20W	18~36	±5	±2000	79
WRA2412YQD-20W	18~36	±12	±833	82
WRA2415YQD-20W	18~36	±15	±667	83
WRA2424YQD-20W	18~36	±24	±417	78
WRA4805YQD-20W	36~72	±5	±2000	80
WRA4812YQD-20W	36~72	±12	±833	84
WRA4815YQD-20W	36~72	±15	±667	85
WRA4824YQD-20W	36~72	±24	±417	78
WRB1205YQD-20W	9~18	5	4000	79
WRB1212YQD-20W	9~18	12	1667	80
WRB1215YQD-20W	9~18	15	1333	80
WRB1224YQD-20W	9~18	24	833	78
WRB2405YQD-20W	18~36	5	4000	82
WRB2412YQD-20W	18~36	12	1667	82
WRB2415YQD-20W	18~36	15	1333	83
WRB2424YQD-20W	18~36	24	833	78
WRB4805YQD-20W	36~72	5	4000	80
WRB4812YQD-20W	36~72	12	1667	84
WRB4815YQD-20W	36~72	15	1333	85
WRB4824YQD-20W	36~72	24	833	79

## SPECIFICATION

OUTPUT	Ripple&Noise(max.)	(Note.2)	100mVp-p
	Line Regulation	(Note.3)	±0.5%
	Load Regulation	(Note.4)	±0.5%
PROTECTION	Overload	Above 105% rated output power Protection type : Over power limiting, recovers automatically after fault condition is removed	
	Over Voltage	XX03 :3.8~4.95V	XX05 :5.75 ~ 7.5V
		XX12:13.8 ~ 18V	XX15:17.25 ~ 22.5V
Short Circuit	Protection type : Shut off o/p voltage, clamping by zener diode		
FUNCTION	ON/OFF Control	Logic "1" or open: power on Logic "0" short to Vin-: power off	
ENVIRONMENT	Working Temp.	-25~+85℃ (Refer to output load derating curve)	
	Storage Temp.,Humidity	-25~+85℃, 0~95% RH	
	Temp. Coefficient	±0.03%/℃ (0~50℃)	
SAFETY&EMC (Note 5)	Safety Standards	Design refer to LVD	
	Isolation Voltage	I/P-O/P:1.5KVDC	
	Isolation Resistance	I/P-O/P:100M Ohms/500VDC	
OTHERS	MTBF	322.4K hrs min.	MIL-HDBK-217F (25℃)
	Dimension	50.8×50.8×16mm (2"×2"×0.63") (L×W×H)	
	Packing	110g;150pcs/15.8Kg/0.97CUFT	
NOTE	1. All parameters are specified at normal input, rated load, 2570% RH ambient. 2. Ripple & noise are measured at 20MHz of bandwidth by using a 12" twisted pair-wire terminated with a 0.1uf & 47uf parallel capacitor. 3.Line regulation is measured from low line to high line at rated load. 4.Load regulation is measured from 10% to 100%rated load 5. Please prevent the converter from operating in overload or short circuit condition for more than 30 seconds.		

### Mechanical Specification



### SINGLE OUTPUT(WRB-YQD-20W)

Pin	Assignment	Pin	Assignment
1	+Vin	6	+Vout
2	-Vin	7	-Vout
3,5	No pin	8	Trim
4	CTRL (ON/OFF)		

### DUAL OUTPUT(WRA-YQD-20W)

Pin	Assignment	Pin	Assignment
1	+Vin	5	+Vout
2	-Vin	6	Common
3	No pin	7	-Vout
4	CTRL (ON/OFF)	8	Trim

### APPLICATION NOTE

#### Requirement on output load

In order to ensure the product operate efficiently and reliably, in addition to a max load (namely full load), a minimum load is specified for this kind of DC/DC converter. Make sure the specified range of input voltage is not exceeded, the minimum output load no less than 10% load. If the actual load is less than the specified minimum load, the output ripple may increase sharply while its efficiency and reliability will reduce greatly. If the actual output power is very small, please add an appropriate resistor as extra loading, or contact our company for other lower output power products.

#### Recommended Circuit

All the WR-YQD-20W Series have been tested according to the following recommended testing circuit before leaving factory. This series should be tested under load (see Figure 1).

If you want to further decrease the input/output ripple, you can increase capacitance properly or choose capacitors with low ESR. However, the capacitance of the output filter capacitor must be proper. If the capacitance is too big, a startup problem might arise. For every channel of output, provided the safe and reliable operation is ensured, the greatest capacitance of its filter capacitor sees (Table 1). General:

$$C_{in}: 10\mu F-47\mu F$$

$$C_{out}: 10\mu F/100mA$$

#### CTRL Terminal

When open or high impedance, the converter work well; When this pin is 'high'; the converter shutdown; It should be note that the input current (Ic) should between 5-10mA, exceeding the maximum 20mA will cause permanence damage to the converter.

The value of R Can be derived as follows :

$$R = \frac{V_C - V_D - 1.0}{I_C}$$

#### Input current

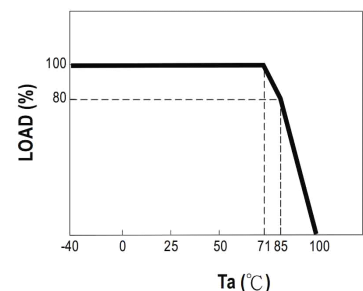
While using unstable power source, please ensure the output voltage and ripple voltage do not exceed indexes of the converter. The preceding power source must be able to provide for converter sufficient starting current I<sub>p</sub>.

General: I<sub>p</sub> ≤ 1.6 \* I<sub>in-max</sub>

#### No parallel connection or plug and play

### TYPICAL CHARACTERISTICS

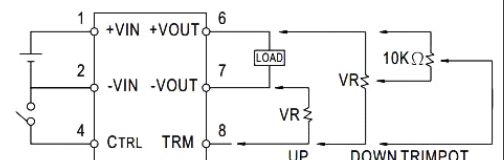
Temperature Derating Graph



AMBIENT TEMPERATURE (°C)

### External Output Trimming

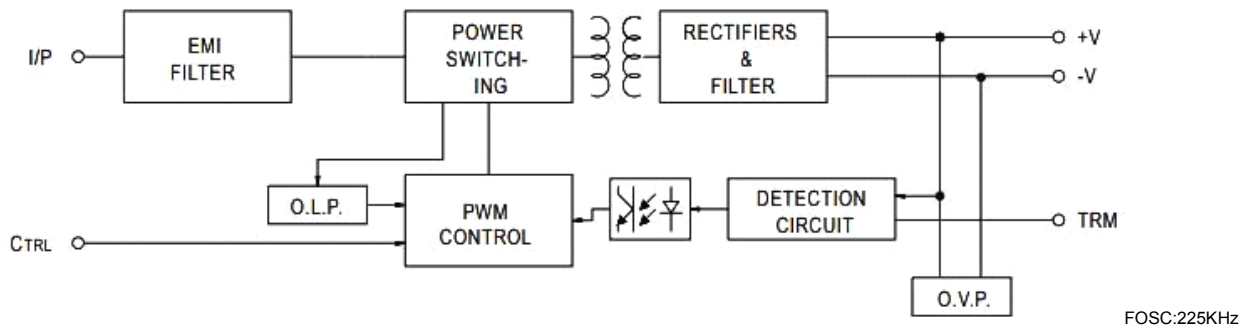
OUTPUT MAY OPTIONALLY BE EXTERNALLY TRIMMED (10%)  
A FIXED RESISTOR OR AN EXTERNAL TRIMPOT AS SHOWN



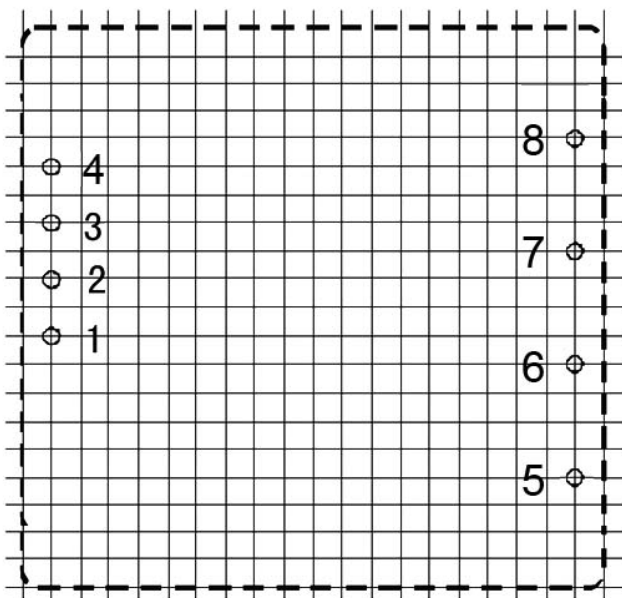
### ON/OFF Control Pin

CONTROL INPUT.....PIN4  
CONTROL COMMON.....PIN2  
LOGIC COMPATIBILITY.....CMOS OR OPEN COLLECTOR TTL  
**CONTROL VOLTAGE**  
ON.....+5.5VDC min OR OPEN CIRCUIT  
OFF.....+2.5VDC max. OR SHORT TO PIN2

### OUTLINE DIMENSIONS & FOOTPRINT DETAILS



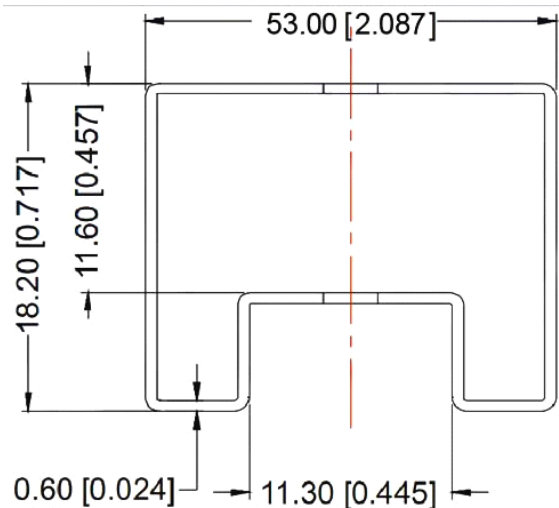
### RECOMMENDED FOOTPRINT



Grid: 2.54×2.54mm(0.1×0.1inch)

Diameter: 1.00mm(0.039inch)

### TUBE OUTLINE DIMENSIONS



Unit :mm[inch]

General tolerances:±0.50mm[±0.020inch]

L=230mm[9.055inch] Tube Quantity: 7pcs

#### 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.