MICRODC
Professional Power Module

WRA-ZMD-20W & WRB-ZMD -20W Series

20W, WIDE INPUT, ISOLATED & REGULATED DUAL/SINGLE OUTPUT DC-DC CONVERTER

FEATURES

- ◆High power density in 1" x 2" metal package
- ◆Ultra wide 4 : 1 input range
- ◆Extended operating temperature range
  －40℃ to +85℃ max.
- ◆No minimum load required
- ◆I/O-isolation 1500 VDC
- ◆Remote On/Off
- ◆Adjustable output voltage
- ◆Industry standard footprint
- ◆Shielded metal case with insulated baseplate
- ◆Optional heatsink
- ◆Lead free design - RoHS compliant
- ◆3-year product warranty

MODEL SELECTION

WRB①24②12③Z④M⑤D⑥-20W(1670)⑦

①Product Series ②Input Voltage
③Output Voltage ④Wide (4:1) Input Range
⑤Metal Shield ⑥2" x 1"DIP Package Style
⑦Rated Power(Output current)

APPLICATIONS

The WRA-ZMD-20W & WRB-ZMD-20W Series is a family of high performance 20W DC/DC converter modules featuring ultra wide 4:1 input voltage ranges in a ultra compact 2"x1" low profile package with industry-standard footprint. A very high efficiency al-lows an operating temperature range of –40°C to 85°C. Further standard features include remote On/Off, output voltage trimming,over voltage protection and short-circuit protection.

Typical applications for these converters are battery operated equipment and distributed power architectures in communication and industrial electronics, everywhere where isolated, tightly regulated voltages are required.

RoHS MICRODC Green Technology

CE REACH

SELECTION GUIDE

Order code	Input voltage range	Output voltage	Output current max.	Efficiency typ.
WRB2403ZMD-5500	9 – 36 VDC	3.3 VDC	5500 mA	85 %
WRB2405ZMD-20W	9 – 36 VDC	5 VDC	4000 mA	88 %
WRB2412ZMD-20W	9 – 36 VDC	12 VDC	1670 mA	86 %
WRB2415ZMD-20W	9 – 36 VDC	15 VDC	1330 mA	86 %
WRA2405ZMD-20W	9 – 36 VDC	± 5 VDC	± 2000 mA	88 %
WRA2412ZMD-20W	9 – 36 VDC	± 12 VDC	± 835 mA	87 %
WRA2415ZMD-20W	9 – 36 VDC	± 15 VDC	± 665 mA	87 %
WRB4803ZMD-5500	18 – 75 VDC	3.3 VDC	5500 mA	85 %
WRB4805ZMD-20W	18 – 75 VDC	5 VDC	4000 mA	88 %
WRB4812ZMD-20W	18 – 75 VDC	12 VDC	1670 mA	87 %
WRB4815ZMD-20W	18 – 75 VDC	15VDC	1330 mA	87 %
WRA4805ZMD-20W	18 – 75 VDC	± 5 VDC	± 2000 mA	89 %
WRA4812ZMD-20W	18 – 75 VDC	± 12 VDC	± 835 mA	88 %
WRA4815ZMD-20W	18 – 75 VDC	± 15 VDC	± 665 mA	88 %

Input Specifications

Input current at no load	24 Vin models:	50 mA typ.
	48 Vin models:	35 mA typ.
Input current at full load	24 Vin models:	1000 mA typ.
	48 Vin models:	500 mA typ.
Surge voltage (100 msec. max.)	24 Vin models:	50 V max.
	48 Vin models:	100 V max.
Input voltage variation (dv/df)		5 V / ms, max. (complies to ETS 300 132 part. 4.4)
Start-up voltage / under voltage lockout	24 Vin models:	9 VDC / 7.5 VDC typ.
	48 Vin models:	18 VDC / 15 VDC typ.
Conducted noise(input)		EN 55022 level A, FCC part 15, level A with external capacitor (see application note)
ESD (input)		EN 61000-4-2, perf. criteria B
Fast transient (input)		EN 61000-4-4, perf. criteria B
Surge (input)		EN 61000-4-5, perf. criteria B

General Specifications

Reliability, calculated MTBF	(MIL-HDBK-217F ground benign)	>560000 h @ + 25 °C
Isolation voltage (60 sec.)	– Input/Output	1500 VDC
Isolation capacity	– Input/Output	1500 pF max
Isolation resistance	– Input/Output	>1000 M Ohm
Switching frequency (fixed)		400 kHz typ. (pulse width modulation PWM)
Vibration		10-55Hz, 10G, 30 minutes along X,Y,Z
Remote On/Off	– On:	3.0 to 12 VDC or open circuit.
	– Off:	0 to 1.2 VDC or short circuit pin 2 and pin 6
	– Off idle current:	2.5 mA typ.
Safety standards		UL 60950

Output Specifications

Voltage set accuracy		±1 %
Output voltage adjustment	(single output models only)	±10 % by external resistor, see application note: http://www.microdc.cn/uploadfiles/WRA-ZMD-20W&WRB-ZMD-20W.pdf
Regulation	– Input variation Vin min. to Vin max.	0.2 % max.
	– Load variation 0 – 100%:	
	single output models:	0.5 % max.
	dual output models:	1 % max. (balanced load)
	– Load cross variation 25 % / 100 %	5 % max.
Temperature coefficient		0.02 % /K
Ripple and noise	(20 MHz Bandwidth) single output models:	75 mVpk-pk max.
	dual output models:	100 mVpk-pk max.
Start up time	(nominal Vin and constant resistive load)	20 ms typ.
Transient Response	(25% load step change)	20 ms typ.
Transient Response	(25% load step change)	250 µs typ.
Short circuit protection		indefinite (automatic recovery)
Over load protection		150% of Iout max typ.
Over voltage protection	3.3 Vout models:	3.9 V
	5 /±5 Vout models:	6.2 / ±6.2 V
	12 /±12 Vout models:	15 / ±15 V
	15 /±15 Vout models:	18 / ±18 V
Capacitive load	3.3 Vout models:	18'000 µF max.
	5 Vout models / ± 5 Vout models:	9600 µF max. / ± 4800 µF max.
	12 Vout models / ±12 Vout models:	1600 µF max. / ± 800 µF max.
	15 Vout models / ±15 Vout models:	1000 µF max. / ± 500 µF max.

General Specifications

Temperature ranges	– Operating	–40 °C to +85 °C
	– Case temperature	+105 °C max.
	– Storage	–55 °C to +125 °C
Humidity (non condensing)		95 % rel H max.

Physical Specifications

Case material	copper, nickel plated
Baseplate material	non conductive FR4
Potting material	epoxy (UL 94V-0 - rated)
Weight	27 g (0.95 oz)
Soldering temperature	max. 265 °C / 10 sec.

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 WRA_ZMD-20W&WRB_ZMD-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 apacitance 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:

Cin: 10µF-47µF
Cout: 10µF/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 :

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

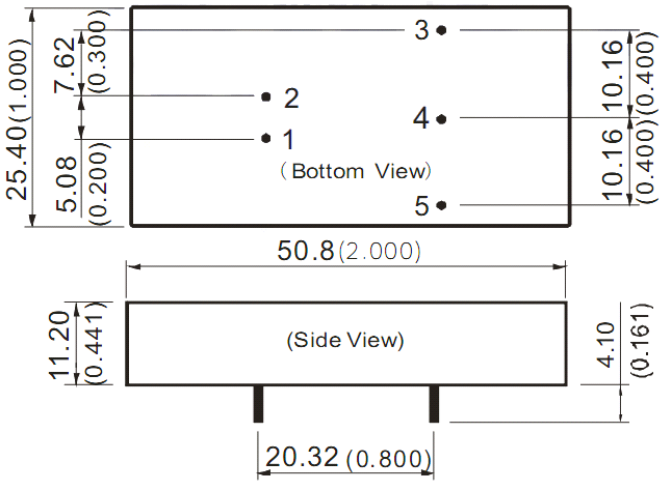
Input current

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 Ip(Figure 2).
General:Ip≤1.6*Iin-max

No parallel connection or plug and play

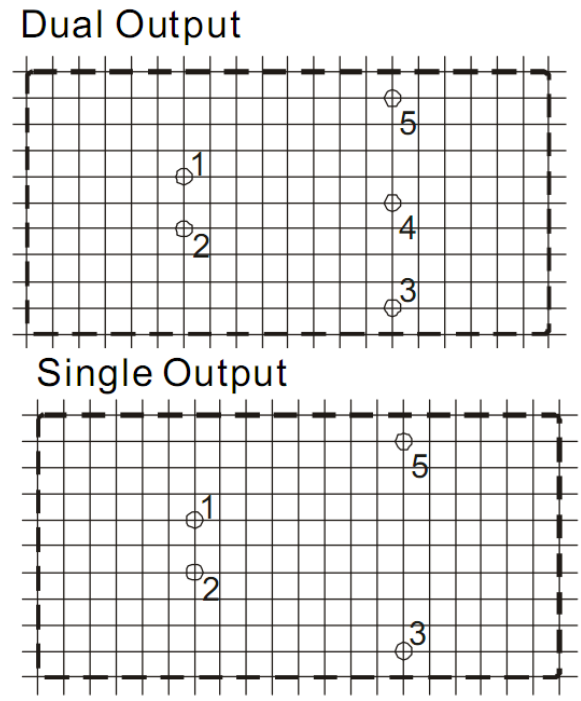
OUTLINE DIMENSIONS & FOOTPRINT DETAILS

MECHANICAL DIMENSIONS



Note:
Unit:mm[inch]
Pin section tolerances:±0.10mm[±0.004inch]
General tolerances:±0.25mm[±0.010inch]

RECOMMENDED FOOTPRINT



RECOMMENDED FOOTPRINT

FOOTPRINT DETAILS

Pin	Single	Dual
1	GND	GND
2	Vin	Vin
3	+Vo	+Vo
4	NC	0V
5	0V	-Vo

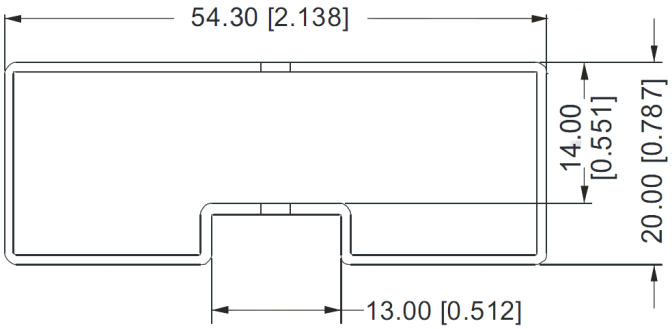
NC:No connection

When the environment temperature is higher than 71℃, the product output power should be less then 60% of the rated power.

No parallel connection or plug and play.

Use dual output simultaneously,forbid pening output pin (0V) to use as single output.

TUBE OUTLINE DIMENSIONS



Unit :mm[inch]
General tolerances:±0.50mm[±0.020inch]
L=230mm[9.055inch] Tube Quantity: 7pcs

Note:

1. The load shouldn't be less than 10%, otherwise ripple will increase dramatically.
2. Operation under 10% load will not damage the converter; However, they may not meet all specification listed.
3. All specifications measured at Ta=25°C, humidity<75%, nominal input voltage and rated output load unless otherwise specified.
4. In this datasheet, all the test methods of indications are based on corporate standards.
5. Only typical models listed, other models may be different, please contact our technical person for more details.