



**COIL TECHNOLOGY
CORPORATION**

3W DC/DC CONVERTERS

SERIES	DESCRIPTION	Page
B3WR	2:1 Input Range 24 pin DIP and SMD packages Single and dual outputs Metal can option 2kv, 4kv & 6kv isolation options	2
B3WR4	4:1 Input Range 24 pin DIP and SMD packages Single and dual outputs Metal can option 2kv, 4kv & 6kv isolation options	6

Features:

- 2:1 Wide Input Range.
- 3W DIP-24 Package.
- High Efficiency up to 86%.
- UL94V-0 Package Material.
- Low Ripple and Noise.
- Continuous Short Circuit Protection, Auto-Restarting.
- 1KVdc Isolation.
- Input π Filter.
- Operating Temperature Range From - 40°C to +85°C.
- Case Temperature 40°C @ Ta = 25°C
- Meet CE EN-60950-1 Certified、CE EN-60601-1 Certified



Note : Metal case could be selected with “ M “after P/N

Description:

The B3WR-XXXX/D series is a wide input voltage range of DC-DC converters offering a single and dual regulated output. 24-pin DIP and high efficiency allows an operating temperature of -40 to +85°C except the 4.5 ~ 9V input voltage range.

Selection Guide				
P/N	Input Range	Output Voltage	Output Current	Efficiency Typ.
B3WR-053.3	4.5 ~ 9 VDC	3.3	900mA	76%
B3WR-0505/D		5 / ±5	600mA/ ±300mA	70%
B3WR-0509/D		9 / ±9	333mA/ ±167mA	74%
B3WR-0512/D		12 / ±12	250mA/ ±125mA	75%
B3WR-0515/D		15 / ±15	200mA/ ±100mA	76%
B3WR-123.3	9 ~ 18VDC	3.3	900mA	73%
B3WR-1205/D		5 / ±5	600mA/ ±300mA	76%
B3WR-1209/D		9 / ±9	333mA/ ±167mA	81%
B3WR-1212/D		12 / ±12	250mA/ ±125mA	83%
B3WR-1215/D		15 / ±15	200mA/ ±100mA	84%
B3WR-243.3	18 ~ 36VDC	3.3	900mA	76%
B3WR-2405/D		5 / ±5	600mA/ ±300mA	78%
B3WR-2409/D		9 / ±9	333mA/ ±167mA	82%
B3WR-2412/D		12 / ±12	250mA/ ±125mA	84%
B3WR-2415/D		15 / ±15	200mA/ ±100mA	86%

B3WR-483.3	36 ~72VDC	3.3	900mA	78%
B3WR-4805/D		5 / ±5	600mA/ ±300mA	80%
B3WR-4809/D		9 / ±9	333mA/ ±167mA	83%
B3WR-4812/D		12 / ±12	250mA/ ±125mA	85%
B3WR-4815/D		15 / ±15	200mA/ ±100mA	85%

Electrical Specifications

Input Filter	π type.			
Voltage set accuracy		MIN.	TYP.	MAX.
			±1%	±2%
Line Regulation	Low line to High line @Max. load			0.3%
Load Regulation	20% ~ 100% load			0.6%
Ripple & Noise @ 20MHz BW <small>Note 1</small>				50mVp-p
Operating Temperature	Vin = 5V	-40°C		+80°C
	Vin = 12V, 24V, 48V	-40°C		+85°C
Storage Temperature		-50°C		+125°C
Short-Circuit Protection	Continuous , Auto-Restarting			
Operating Frequency (Pulse Frequency Modulation,PFM)	Vin = Nominal Input	100KHz		
Isolation Test Voltage	Tested for 1 second Min.	MIN.	TYP.	MAX.
		1000Vdc		
Isolation Capacity			40pF	
Isolation Resistance		1GΩ		
Humidity				95%
MTBF (MIL-HDBK-217F)			10.4*10 ⁵ hours	
Case Temperature	Vin = Nominal Input @ Ta=25°C			100°C

Physical Specifications

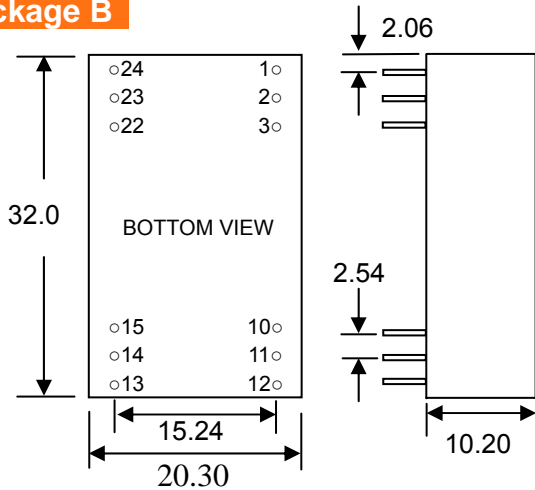
Case Material	Non conductive Black Plastic
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Potting Material	Epoxy(UL94V-0)
Weight	13.0g

All specifications valid at nominal input voltage, full load @ 25°C after warm-up time unless otherwise stated.

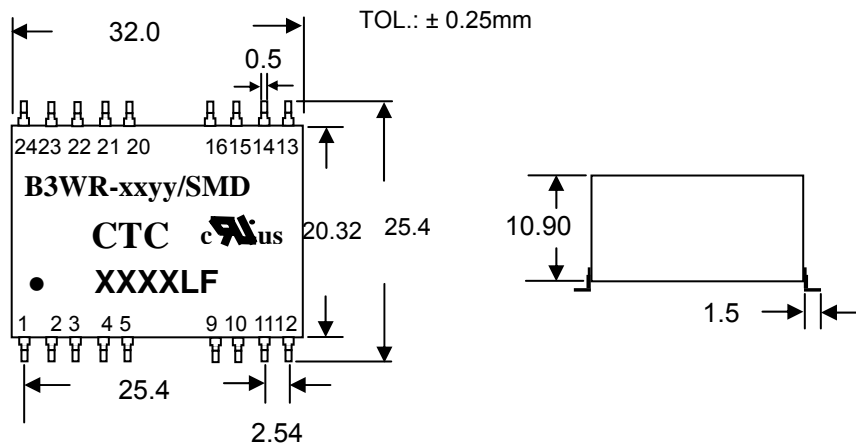
Package Style and Pinning (mm) DIP24 , Wide Input 2:1

Package B



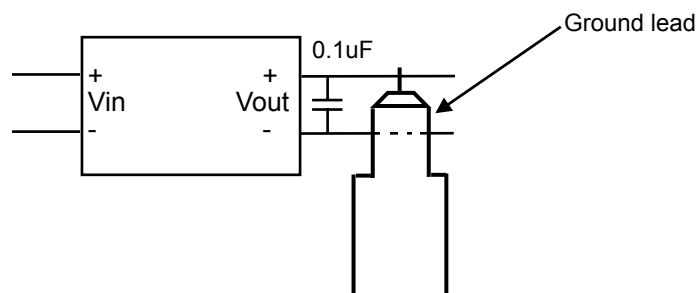
PIN	Single B3WR-xxxx	DUAL B3WR-xxxxD
1,24	+Vin	+Vin
2,23	No PIN	-Vout
3,22	No PIN	Common
10,15	-Vout	Common
11,14	+Vout	+Vout
12,13	-Vin	-Vin

Mechanical drawings of DIP24 SMD case



Note:

- To measure the output ripple & noise with short runs by 0.1uF/ 50V @ 20MHz nominal input and full load. Please see as below :



Features:

- 2:1&4 : 1 Ultra Wide Input Range.
- 3W DIP-24 Package.
- Full SMD-Design.
- High Efficiency up to 86% .
- Low Ripple and Noise.
- Lead free design , RoHS compliant
- Single & Dual Output
- UL 94V-0 Package Material.
- Continuous Short Circuit Protection,Auto-Restarting.
- 2KVDC Isolation min.
- Input π Filter.
- Case Temperature 35°C @ Ta = 25°C.



EN-60950
EN-60601



Selection Guide

Part Number DIP 24	Input Voltage Range (VDC)	Rated Output Voltage (VDC)	Output current At full load (mA)	Efficiency		Capacitive Load (max)
				Input voltage (Vdc)	Typ (%)	
B3WR-xx3.3 (H4/H6)	4.5-9,9-18,18-36,36-72	3.3	900	5,12,24,48	66-76	2000 μ F
B3WR-xx05 (H4/H6)	4.5-9,9-18,18-36,36-72	5	600	5,12,24,48	71-79	1000 μ F
B3WR-xx09 (H4/H6)	4.5-9,9-18,18-36,36-72	9	333	5,12,24,48	74-83	470 μ F
B3WR-xx12 (H4/H6)	4.5-9,9-18,18-36,36-72	12	250	5,12,24,48	75-85	220 μ F
B3WR-xx15 (H4/H6)	4.5-9,9-18,18-36,36-72	15	200	5,12,24,48	75-86	120 μ F
B3WR-xx05D (H4/H6)	4.5-9,9-18,18-36,36-72	± 5	± 300	5,12,24,48	74-83	$\pm 470 \mu$ F
B3WR-xx09D (H4/H6)	4.5-9,9-18,18-36,36-72	± 9	± 167	5,12,24,48	74-83	$\pm 220 \mu$ F
B3WR-xx12D (H4/H6)	4.5-9,9-18,18-36,36-72	± 12	± 125	5,12,24,48	75-85	$\pm 100 \mu$ F
B3WR-xx15D (H4/H6)	4.5-9,9-18,18-36,36-72	± 15	± 100	5,12,24,48	75-86	$\pm 68 \mu$ F
B3WR4-xx3.3 (H4/H6)	9-36,18-72	3.3	900	24,48	77-79	2000 μ F
B3WR4-xx05 (H4/H6)	9-36,18-72	5	600	24,48	78-80	1000 μ F
B3WR4-xx09 (H4/H6)	9-36,18-72	9	333	24,48	80-83	470 μ F
B3WR4-xx12 (H4/H6)	9-36,18-72	12	250	24,48	83-85	220 μ F
B3WR4-xx15 (H4/H6)	9-36,18-72	15	200	24,48	83-85	120 μ F
B3WR4-xx05D (H4/H6)	9-36,18-72	± 5	± 300	24,48	77-80	$\pm 470 \mu$ F
B3WR4-xx09D (H4/H6)	9-36,18-72	± 9	± 167	24,48	82-83	$\pm 220 \mu$ F
B3WR4-xx12D (H4/H6)	9-36,18-72	± 12	± 125	24,48	83-85	$\pm 100 \mu$ F
B3WR4-xx15D (H4/H6)	9-36,18-72	± 15	± 100	24,48	83-85	$\pm 68 \mu$ F

2:1 Input
(B3WR-xyyDH4/H6)
xx = 4.5-9Vin = 05
xx = 9-18Vin = 12
xx = 18-36Vin = 24
xx = 36-72Vin = 48
yy = Vo

4:1 Input
(B3WR4-xyyDH4/H6)
xx = 9-36Vin = 24
xx = 18-72Vin = 48
yy = Vo

* Metal case could be selected with " M ".
* add suffix /SMD for SMD package.
* add suffix "A" or "C" for Pinning, see next page
"B" Pinning is NOT available for this series!
* add suffix "H4" for 4KVDC Isolation or "H6" for
6KVDC Isolation.
e.g. B3WR4-xyyCH4/SMD = 4KVDC
isol./Pinout "C"/Package "SMD".

Notes:

if the options "M" for metal case and "/SMD" for smd pinout are combined, the maximum allowed isolation voltage is 2KVDC because of the shorter distances between pins and the metal case, so only available SMD-option in metal-case is "/H2".

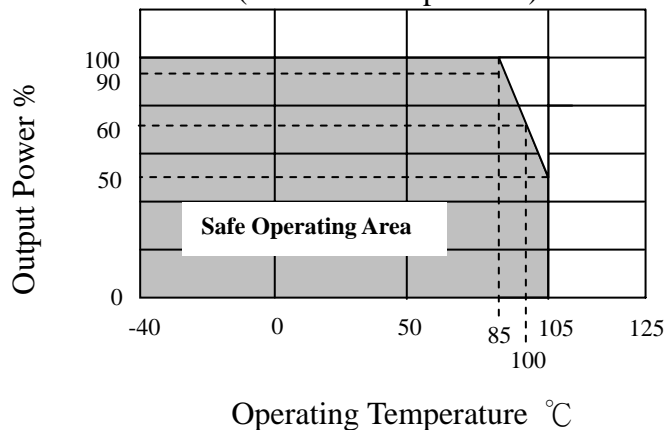
DIP-24 through-hole case and SMD-plastic case are not affected and offer the full isolation barriers of 4KVDC for "/H4" option and 6KVDC for "/H6".

Description:

The **B3WR4-xyyDH4/H6** series is a very wide input voltage range of DC-DC converters offering a single and Dual regulated output. 24-pin DIP and high efficiency allows an operating temperature of -40 to $+85^{\circ}\text{C}$. The applications include industrial system, communications equipment, battery powered equipments etc....

Derating-Graph

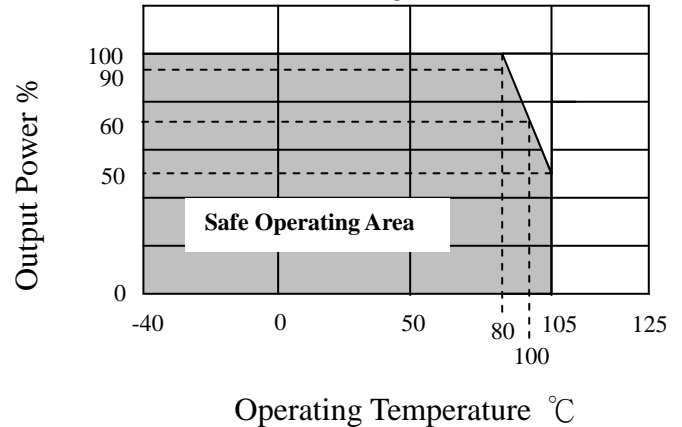
(Ambient Temperature)



Derating-Graph

(Ambient Temperature)

Vin=5V



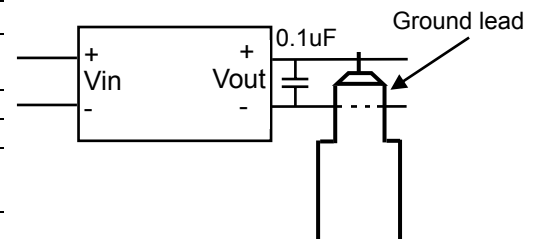
Electrical Specifications

(measured at $T_A = 25^{\circ}\text{C}$, at nominal input voltage and rated output current unless otherwise specified)

All specifications valid at nominal input voltage, full load @ 25°C after warm-up time unless otherwise stated.

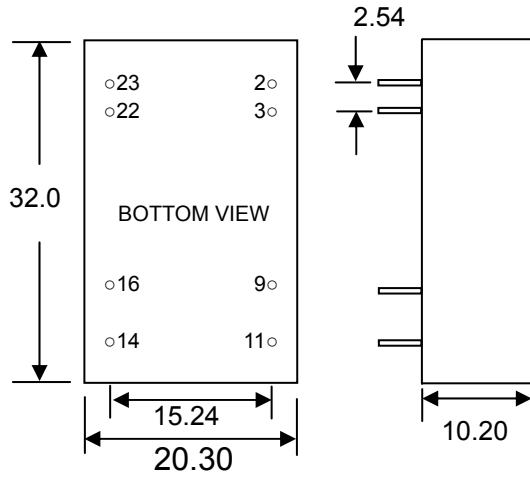
Input Voltage Range	2:1&4:1	Note:
Output Accuracy	$\pm 2\%$ typ	
Rated Power	3W max	
Isolation Voltage	B3WR-xyyDH4 types	4K VDC.min
Isolation Voltage	B3WR-xyyDH6 types	6K VDC.min
Isolation capacitance(at 100KHz)	2:1 Input types	40PF typ
	4:1 Input types	60PF typ
Isolation resistance		1G ohms min
Ripple & Noise (B/W = 20MHz)	Note:1	50mVp-p max
Line Regulation (Input Voltage high to Low at full load)		$\pm 0.3\%$ max
Load Regulation (20% to 100% Load at normal Vin)		$\pm 0.6\%$ typ
Switching Frequency	2:1 Input types	100KHz
(Pulse Frequency Modulation,PFM)	4:1 Input types	160KHz
Short Circuit Protection		Continuous automatic recovery
Minimum load		20% of rated max current
Operating Temperature Range (free air convection)	5V input types	-40°C to $+80^{\circ}\text{C}$ (see graph)
	others	-40°C to $+85^{\circ}\text{C}$ (see graph)
Storage Temperature Range		-50°C to $+125^{\circ}\text{C}$
Case Temperature Range		$+100^{\circ}\text{C}$ max
Efficiency		86% max
Package Weight		13g typ
Relative Humidity		95% RH
Case Material		Non conductive Black Plastic
Potting Material		Epoxy(UL94V-0)
MTBF($+25^{\circ}\text{C}$)	using MIL-HDBK 217F	1043K hours
($+85^{\circ}\text{C}$)	using MIL-HDBK 217F	186K hours

- To measure the output ripple & noise with short runs by 0.1uF/ 50V @ 20MHz nominal input and full load. Please see as below :



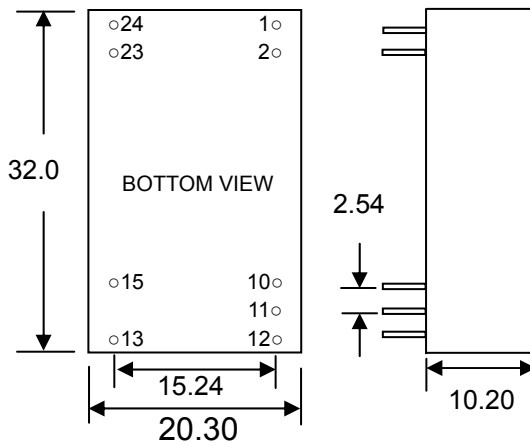
Package Style and Pinning (mm) DIP24 , Wide Input 2:1& 4:1

Package A



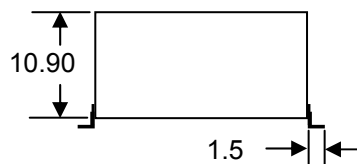
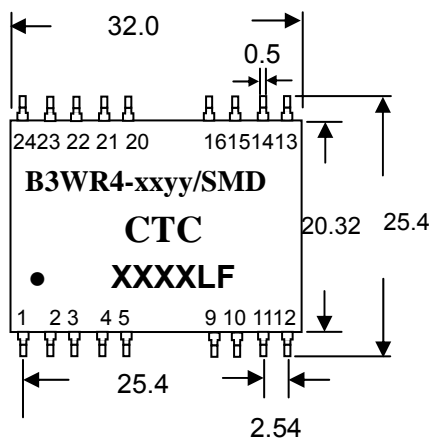
PIN	SINGLE B3WR4-xxxxA	DUAL B3WR4-xxxxDA
2,3	-Vin	-Vin
9	NC	Common
11	NC	-Vout
14	+Vout	+Vout
16	-Vout	Common
22,23	+Vin	+Vin

Package C



PIN	SINGLE B3WR-xyyyC	DUAL B3WR-xyyyDC
1,2	+Vin	+Vin
10	NC	Common
11	NC	Common
12	-Vout	NC
13	+Vout	-Vout
15	NC	+Vout
23,24	-Vin	-Vin

Mechanical drawings of DIP24 SMD case



TOL.: ± 0.25mm