

DC-DC CONVERTERS

**4:1 WIDE INPUT RANGE, SINGLE AND DUAL OUTPUT,
DIP PACKAGE 1.25" × 0.80" × 0.40" 10 WATTS**

RAILWAY APPLICATIONS

TWRB10 SERIES

FEATURES

- 4:1 Wide Input Voltage Range
- High Efficiency Up to 83%
- Isolation Voltage: 1500Vdc
- 10W DIP Package: 1.25" × 0.8" × 0.4"
- 100% Burned In
- UL94V-0 Package Material
- Custom Solutions Available
- Remote ON/OFF
- EN50155 Railway Standard
- Compliant to RoHS

SELECTION GUIDE All specifications are typical at nominal input, full load and 25°C, unless otherwise noted.

Input Voltage Range Vdc	Output Voltage Vdc	Output Current at Full Load mA	Input Current at No Load mA	Input Current at Full Load mA	Model Number	Efficiency %
9 - 36	3.3	3000	50	503	TWRB10-24S33	82
9 - 36	5	2000	50	508	TWRB10-24S5	82
9 - 36	12	833	30	502	TWRB10-24S12	83
9 - 36	15	670	30	505	TWRB10-24S15	83
18 - 75	3.3	3000	30	252	TWRB10-48S33	82
18 - 75	5	2000	30	254	TWRB10-48S5	82
18 - 75	12	833	20	251	TWRB10-48S12	83
18 - 75	15	670	20	252	TWRB10-48S15	83
40 - 160	3.3	3000	12	110	TWRB10-110S33	82
40 - 160	5	2000	12	111	TWRB10-110S5	82
40 - 160	12	833	6	110	TWRB10-110S12	83
40 - 160	15	670	6	110	TWRB10-110S15	83
9 - 36	±5	±1000	30	502	TWRB10-24-5	83
9 - 36	±12	±420	30	506	TWRB10-24-12	83
9 - 36	±15	±340	30	512	TWRB10-24-15	83
18 - 75	±5	±1000	20	251	TRB10-48-5	83
18 - 75	±12	±420	20	253	TRB10-48-12	83
18 - 75	±15	±340	20	256	TRB10-48-15	83
40 - 160	±5	±1000	6	110	TRB10-110-5	83
40 - 160	±12	±420	6	110	TRB10-110-12	83
40 - 160	±15	±340	6	112	TRB10-110-15	83

TWRB10 SERIES

Input Specifications		
Operating input voltage range, Vdc	9 - 36	12Vin(nom)
	18 - 75	24Vin(nom)
	40 - 160	48Vin(nom)
Start up voltage, Vdc	9 Vdc Max.	24Vin
	18 Vdc Max.	48Vin
Shutdown voltage, Vdc	8.5 Vdc Max.	24Vin
	17 Vdc Max.	48Vin
Voltage types	4:1	
Start up time, ms	450 Typ.	nominal Vin and constant resistive load
Input surge voltage, Vdc	50 Max.	24Vin, 100mS Max
	100 Max.	48Vin, 100mS Max
Input reflected ripple current, mAp-p	60	
Input filter	Pi network	
Remote ON/OFF	2.3~5V	ON
	0.1mA	ON Current
	0~2.1V	OFF
	-0.102mA	OFF Current

Output Specifications		
Voltage tolerance, %	-2 Min., +2 Max	Full load at Vin (nom)
Line regulation, %	-0.5 Min., +0.5 Max	
Load regulation, %	-0.5 Min., +0.5 Max	Single
	-0.5 Min., +0.5 Max	Dual (balanced load)
Cross regulation, %	-0.5 Min., +0.5 Max	Dual (25% to 100% load)
Ripple and noise, mVp-p	100 Max.	Output: 3-15V Types, BW=DC to 20MHz
	1% of Vout	Output > 15V Types, BW=DC to 20MHz
Temperature coefficient, %/°C	0.01	
Transient response setting time, µs	350 Max.	25% load step change
Short circuit protection	Hiccup, automatic recovery	

General Specifications			
Isolation voltage, Vdc		1500 Min.	
Isolation resistance, MΩ	500Vdc	1000 Min.	
Switching frequency, KHz			400 Typ.

Environmental Specifications			
Operating temperature, °C	With derating	-40 Min.	100 Max.
Storage temperature range, °C		-55 Min.	125 Max.
Humidity, %			95 Max.
Cooling	Free air convection		

Physical Specifications	
Design meet safety standard	EN50155
Case material	Nickel coated copper with non-conductive base
Dimensions, in (mm)	1.2 × 0.8 × 0.4 (31.6 × 20.1 × 10)
Weight	17.5g (0.62.oz)
MTBF	9×10 ⁵ hrs, MIL-HDBK-217F at 25°C

EMC Specifications			
Specifications	Conditions		Level
ESD	EN 61000-4-2	Air ±8kV, contact ±6kV	Perf. Criteria B
Fast transient	EN 61000-4-4	±2kV	Perf. Criteria B
Surge	EN61000-4-5	±1kV	Perf. Criteria A

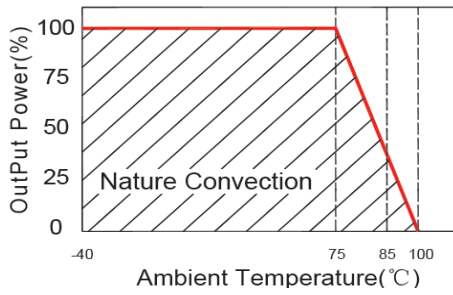
Note:

1. For further information, please contact Polytron Devices.

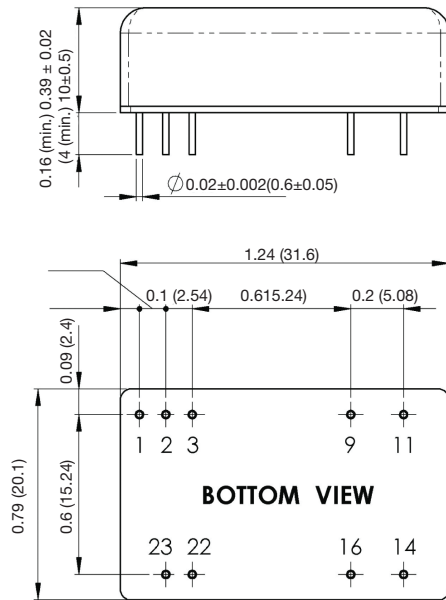
CAUTION: This power module is not internally fused. An input line fuse must always be used.

TWRB10 SERIES

Temperature Derating Curve



Mechanical Drawing

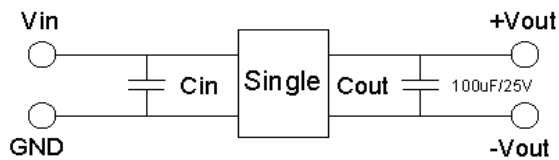


PIN CONNECTION

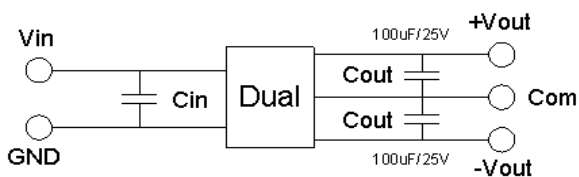
PIN	SINGLE	DUAL
1	Remote ON/OFF	Remote ON/OFF
2,3	-Vin	-Vin
9	NC	Common
11	NC	-Vout
14	+Vout	+Vout
16	-Vout	Common
22, 23	+Vin	+Vin

1. All dimensions in inches (mm)
2. Tolerance: x.xx±0.02 (x.x±0.5)x.xxx±0.01 (x.xx±0.25)
3. Pin pitch tolerance ±0.01 (0.25)
4. Pin dimension tolerance ±0.004(0.1)

Recommended Test Circuit



24V & 28V: Cin 10uF, 100V



24V & 28V: Cin 10uF, 100V