



8 WATT Single & Dual Output

Regulated, 4:1 Ultra Wide Input Range

RAILWAY
DC/DC Converters



Specifications

INPUT

	24VDC nominal input.....	9 -36VDC
Voltage Range	48VDC nominal input.....	18 -75VDC
	110VDC nominal input.....	43-160VDC
Input filter	Pi Filter	
	24VDC input.....	50VDC 100ms, max.
Input Surge Voltage	48VDC input.....	100VDC 100ms, max.
	110VDC input.....	170VDC 100ms, max.
Input Reflected Ripple Current	20mA _{p-p}	

Start up Time	Normal input and constant resistive load	Power up.....	450ms
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Startup Voltage	24VDC input.....	9VDC, max.
	48VDC input.....	18VDC, max.
	110VDC input.....	43VDC, max.

Shutdown Voltage	24VDC input	8VDC
	48VDC input	16VDC
	110VDC input	42VDC

Remote ON/OFF (Note 5)	DC-DC ON.....	Open or 3V < Vr < 12V
	DC-DC OFF.....	Short or 0V < Vr < 1.2V
Input Current of Remote Control Pin.	Nominal input.....	0.5mA-0.5mA
Remote off state input current.....	Nominaal input.....	2.5mA

OUTPUT

Output Power.....	8 Watts max.	
Voltage Accuracy	±1%	
Minimum Load....	0%	
Line Regulation	LL to HL at Full Load.....	±0.2%

	.....No Load to Full Load.....	.....Single (DIP).....	±0.5%
		.....Single (SMD).....	±1.0%
Load Regulation		.....Dual (SMD, DIP).....	±1.0%
	.....10% Load to 90% Load.....	.....Single (DIP).....	±0.3%
		.....Single (SMD).....	±0.8%
		.....Dual (SMD, DIP).....	±0.8%

Cross Regulation Asymmetrical Load 25% / 100% FL	±5%	
Ripple and Noise.....	20MHz band width.....	See table
Temperature Coefficient.. ..	±0.2% / °C, max.	
Transient Response recovery Time	25% load step change.....	250µS
	.....3.3 VDC output.. ..	3.9VDC
Over voltage protection	5VDC output.....	6.2VDC
	.....12VDC output.....	15VDC
	.....15VDC output.....	18VDC
Overload Protection.....	% of FL at nominal input....	150%
Short Circuit Protection.....	Continuous, automatic recovery	

FEATURES

- **Railway Application**
- **4:1 Ultra Wide Input Voltage Range: 9-36 Vdc, 18-75 Vdc, and 43-160 Vdc**
- **Industry Standard 24 PIN DIP Package**
- **SMD Package Optional (Suffix "S")**
- **8 Watts Output Power**
- **Output Current up to 2.4A**
- **High Efficiency up to 88%**
- **Safety meets UL60950-1, EN60950-1, IEC60950-1, and EN50155**
- **CE Mark meets 2006/95/EC, 2011/95/EC, and 2004/108/EC**
- **RoHS Compliant to EU Directive 2011/65/EU**

TWB8 Series

See next page for additional specifications.



GENERAL

Efficiency.....	.....See table
Isolation Voltage	Input to Output .....1600Vdc, min. 1 minute
	Input (Output) to Case .....DIP.....1600Vdc, min. 1 minute
	.....SMD.....1000Vdc, min. 1 minute
Isolation Resistance	500VDC.....10 ⁹ ohms, min.
Isolation Capacitance .....	.....1500pF, max.
Switching Frequency .....	.....300kHz±10%
Approvals and Standard	IEC60950-1, UL60950-1, EN60950-1, EN50155
Case Material	Nickel Coated Copper
Base Material	Non-conductive black plastic
Potting Material	Epoxy (UL94-V0)
Dimensions	1.25 x 0.80 x 0.40 inches (31.8 x 20.3 x 10.2 mm)
Weight .....	.....18g (0.62 oz.)
MTBF (Note 1)	BELLCORE TR-NWT-000332.....2.350 x 10 ⁶ hrs
	.....MIL-HDBK-217F.....1.078 x 10 ⁶ hrs

ENVIRONMENTAL

Operating Ambient Temperature (Note 6)	Vo:5V, 12V, 15V	-40°C - +78°C (without derating)
	±12V, ±15V	+78°C - +105°C (with derating)
	Vo:3.3V, ±5V	-40°C - +70°C (without derating)
		+70°C - +105°C (with derating)
Maximum Case Temperature.....	.....	+105°C
Storage Temperature Range.....	.....	-55°C - +125°C
Thermal Impedance (Note 8)	Natural Convection.....	.....20°C/Watt
Thermal Shock.....	.....	EN61373, MIL-STD-810F
Vibration.....	.....	EN61373, MIL-STD-810F
Relative Humidity.....	.....	5% to 95% RH

EMC CHARACTERISTICS

EMI (Note 7).....	EN55022, EN55011 .....	.....Class A, Class B
ESD.....	..EN61000-4-2	Air.....±8KV .....Perf. Criteria A
		Contact.....±6KV
Radiated Immunity.....	EN61000-4-3	.....20 V/m .....Perf. Criteria A
Fast Transient (Note 8).....	EN61000-4-4	.....±2KV.....Perf. Criteria A
Surge (Note 8).....	EN61000-4-5	.....±2KV.....Perf. Criteria A
Conducted Immunity.....	EN61000-4-6	.....10Vr.m.s.....Perf. Criteria A

For SMD package, use suffix "S" after model number.

SELECTION GUIDE

Input Voltage Range	Output Voltage	Output Current		Output Ripple & Noise ⁽⁴⁾	Input Current No load ⁽²⁾	Efficiency (%) ⁽³⁾	Model Number	Capacitor Load max. ⁽⁴⁾
		Min. load	Full load					
9-36 Vdc	3.3 Vdc	0mA	2400mA	50mVp-p	40mA	85	TWB8-24S33	1330µF
9-36 Vdc	5 Vdc	0mA	1600mA	50mVp-p	40mA	87	TWB8-24S5	1330µF
9-36 Vdc	12 Vdc	0mA	666mA	50mVp-p	25mA	86	TWB8-24S12	288µF
9-36 Vdc	15 Vdc	0mA	533mA	50mVp-p	25mA	86	TWB8-24S15	200µF
18-75 Vdc	3.3 Vdc	0mA	2400mA	50mVp-p	20mA	85	TWB8-48S33	1330µF
18-75 Vdc	5 Vdc	0mA	1600mA	50mVp-p	20mA	87	TWB8-48S5	1330µF
18-75 Vdc	12 Vdc	0mA	666mA	50mVp-p	13mA	87	TWB8-48S12	288µF
18-75 Vdc	15 Vdc	0mA	533mA	50mVp-p	13mA	88	TWB8-48S15	200µF
43-160 Vdc	3.3 Vdc	0mA	2400mA	75mVp-p	8mA	84	TWB8-110S33	1330µF
43-160 Vdc	5 Vdc	0mA	1600mA	75mVp-p	8mA	85	TWB8-110S5	1330µF
43-160 Vdc	12 Vdc	0mA	666mA	75mVp-p	4mA	86	TWB8-110S12	288µF
43-160 Vdc	15 Vdc	0mA	533mA	75mVp-p	4mA	86	TWB8-110S15	200µF
9-36 Vdc	+/-5 Vdc	0mA	+/-800mA	50mVp-p	20mA	84	TWB8-24-5	+/-900µF
9-36 Vdc	+/-12 Vdc	0mA	+/-333mA	50mVp-p	25mA	86	TWB8-24-12	+/-133µF
9-36 Vdc	+/-15 Vdc	0mA	+/-267mA	50mVp-p	25mA	86	TWB8-24-15	+/-90µF
18-75 Vdc	+/-5 Vdc	0mA	+/-800mA	50mVp-p	10mA	84	TWB8-48-5	+/-900µF
18-75 Vdc	+/-12 Vdc	0mA	+/-333mA	50mVp-p	13mA	87	TWB8-48-12	+/-133µF
18-75 Vdc	+/-15 Vdc	0mA	+/-267mA	50mVp-p	13mA	87	TWB8-48-15	+/-90µF
43-160 Vdc	+/-5 Vdc	0mA	+/-800mA	75mVp-p	5mA	82	TWB8-110-5	+/-900µF
43-160 Vdc	+/-12 Vdc	0mA	+/-333mA	75mVp-p	5mA	85	TWB8-110-12	+/-133µF
43-160 Vdc	+/-15 Vdc	0mA	+/-267mA	75mVp-p	5mA	85	TWB8-110-15	+/-90µF

Notes:

- BELLCORE TR-NWT-000332. Case 1: 50% Stress, Temperature at 40°C.
MIL-HDBK-217F Notice2 @Ta=25°C, Full load(Ground, Benign, controlled environment)
- Typical value at nominal input and no load.
- Typical value at nominal input and full load.
- Test by minimum input and constant resistive load.
- The ON/OFF control pin voltage is referenced to -INPUT.
- Operating ambient temperature:
Converter can meet the railway T2 and TX temperature requirement.
T2: -40°C - +70°C as all models, TX: -40°C - +85°C as power derating to 55% output power.
- The TWB8 series standard module meets EN55022 Class A and Class B with external components.
For more detailed information please contact Polytron Devices, Inc.
- An external input filter capacitor is required if the module has to meet EN61000-4-4, EN61000-4-5.
The filter capacitor Polytron suggests: 24 VIn & 48 VIn input: Nippon cheni-con KY series, 220 µF/100V.
110 VIn input: Nippon cheni-con KXJ series, 150 µF/200V.
Caution: This power module is not internally fused. An input line fuse must always be used.

See next page for mechanical specifications.

POLYTRON DEVICES, Inc.



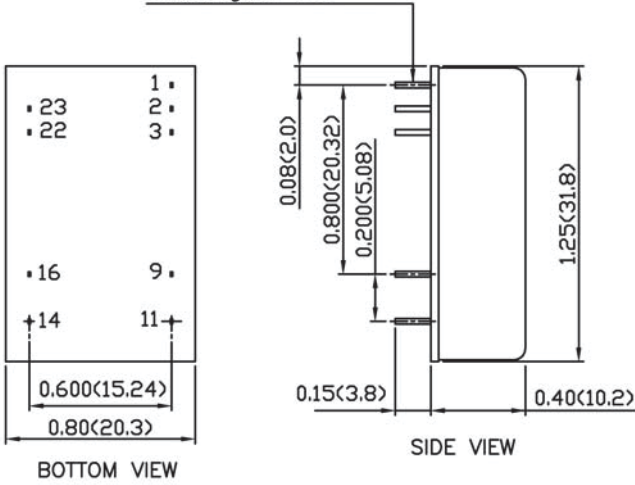
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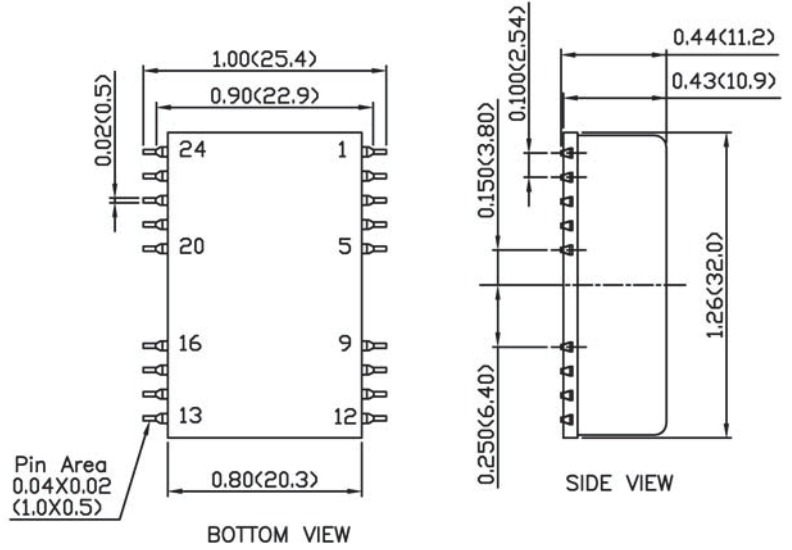
Mechanical Drawings

DIP

Pin size is 0.020(0.50) Dia or 0.010X0.020(0.25X0.50) Rectangular Pin



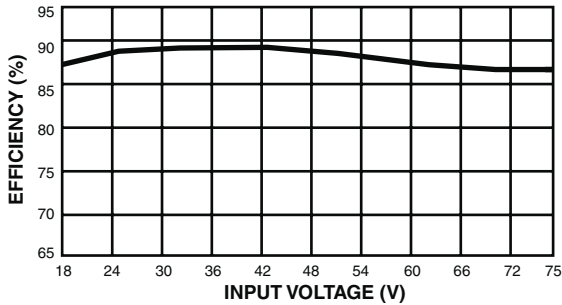
SMD



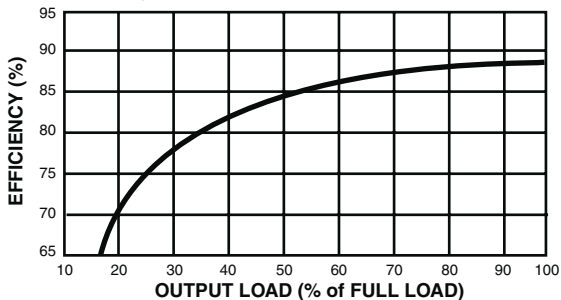
PIN CONNECTION - DIP		
PIN	SINGLE	DUAL
1	CTRL	CTRL
2	-INPUT	-INPUT
3	-INPUT	-INPUT
9	NC	COMMON
11	NC	-OUTPUT
23	+INPUT	+INPUT
22	+INPUT	+INPUT
16	-OUTPUT	COMMON
14	+OUTPUT	+OUTPUT

PIN CONNECTION - SMD		
PIN	SINGLE	DUAL
1	CTRL	CTRL
2	-INPUT	-INPUT
3	-INPUT	-INPUT
9	NC	COMMON
11	NC	-OUTPUT
23	+INPUT	+INPUT
22	+INPUT	+INPUT
16	-OUTPUT	COMMON
14	+OUTPUT	+OUTPUT
OTHERS	NC	NC

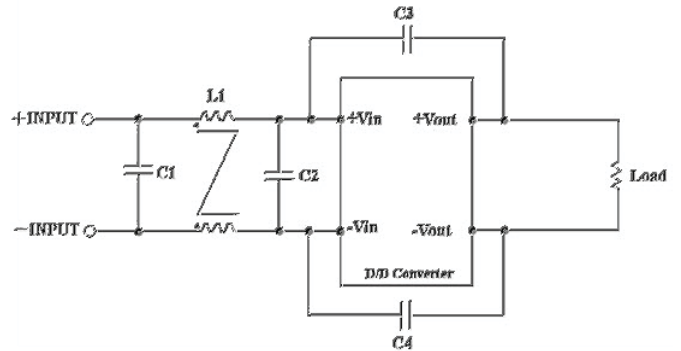
TWB8-48S5 Efficiency VS Input Voltage



TWB8-48S5 Efficiency VS Output Load



Recommended Filter for EN55022 Class B Compliance



The components used in the above figure, together with the manufacturers' part numbers for these components, are as follows:

	C1	C2	C3	C4	L1
24 Vdc In	4.7µF/50V 1812 MLCC	N/A	1000pF/2KV MLCC	1000pF/2KV MLCC	325µH Common Choke PMT-050
48 Vdc In	1.5µF/100V 1812 MLCC	1.5µF/100V 1812 MLCC	1000pF/2KV MLCC	1000pF/2KV MLCC	325µH Common Choke PMT-050



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