PBT02F series

XP Power

2W

DC-DC converters

The PBT02F series of single and dual output 2W DC-DC converters are an ideal solution for isolating voltage rails in a distributed power supply architecture such as analog, digital, data and relay circuits.

The PBT02F offers high efficiency, short circuit protection and a wide operating temperature range in a compact SMD8/10 DIP design, allowing easy integration into industrial, instrumentation and technology applications.

Features

- Single & dual unregulated outputs 3.3V to 15VDC
- ±10% input range
- Nominal inputs 3.3V to 24VDC
- SMD8 single output & SMD10 dual output
- 1kVDC isolation, 3kVDC options
- UL62368-1 & IEC62368-1 safety approvals
- Continuous short circuit protection
- Tape & reel option
- -40°C to +95°C operating temperature
- 3 year warranty

Applications

Industrial

Instrumentation

Technology

Dimensions

Single:
12.75 x 10.7 x 7.0 mm (0.5" x 0.42" x 0.28")
Dual:
15.24 x 10.7 x 7.0 mm (0.6" x 0.42" x 0.28")

More resources

Click the link or scan the code

→ xppower.com

Models & ratings

Model number[1]	Input voltage	Output voltage	Output current	Efficiency[2]
PBT02F03S3V3	3.3V (3.0-3.6V)	3.3V	606mA	76.5%
PBT02F05S3V3	5V (4.5-5.5V)	3.3V	606mA	77%
PBT02F05S05		5.0V	400mA	79.5%
PBT02F05S12		12.0V	167mA	84.5%
PBT02F05S15		15.0V	133mA	85%
PBT02F12S09	12V (10.8-13.2)	9.0V	223mA	86%

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Notes:
1. Optional 3kVDC isolation add suffix '-H3'.
2. Typical value at nominal input voltage and full load.
3. For tape & reel option add suffix -TR. Reel quantity = 250

PBT02F series

Models & ratings

Model number[1]	Input voltage	Output voltage	Output current	Efficiency[2]
PBT02F15S15	15V (13.5-16.5V)	15V	133mA	85%
PBT02F15D15		±15V	±67mA	86%
PBT02F24S05	24V (21.6-26.4)	5.0V	400mA	84%
PBT02F24S12		12.0V	167mA	88%
PBT02F24D09		±9V	±112mA	87%
PBT02F24D12		±12V	±84mA	84.5%
PBT02F24D15		±15V	±67mA	85%

Notes:

1. Optional 3kVDC isolation add suffix '-H3'.
2. Typical value at nominal input voltage and full load.
3. For tape & reel option add suffix -TR. Reel quantity = 500

Input

Characteristic	Minimum	Typical	Maximum	Units	Notes & conditions
Input voltage	3.0		26.4	VDC	See models and ratings table
Input reflected ripple			130	mA pk-pk	3.3V input with 10µF MLCC
			75		5.0V input with 10µF MLCC
			45		12.0V input with 10µF MLCC
			30		15.0V input with 10µF MLCC
			25		24.0V input with 10µF MLCC
Input filter	Integrated capacitor				

Output

Characteristic	Minimum	Typical	Maximum	Units	Notes & conditions
Output voltage	3V3		30	VDC	See models and ratings table
Initial set accuracy	-5		+5		Nominal input and full load
Minimum load	0			%	No minimum load required
Line regulation		±1.2	±1.4	%	Per 1% change of input value
Load regulation			20/15/10	%	3.3V / 5V / 9V, 12V & 15V output from 10% to full load
Ripple and noise			150	mV pk-pk	Measured with 20MHz bandwidth and 0.1µF ceramic capacitor at nominal input 25°C
Short circuit protection	Continuous, with auto recovery				
Maximum capacitive load	See Models and Ratings table				
Temperature coefficient		±0.02		%/°C	Full load

General

Characteristic	Minimum	Typical	Maximum	Units	Notes & conditions
Efficiency	See Models and Ratings table.				
Isolation: input to output	1000/ 3000			VDC	Add suffix -H3 for 3kV isolation.
Switching frequency	20	40	80	kHz	Nominal input voltage at full load.
Isolation resistance	10^9			Ω	Input to output
Isolation capacitance		115		pF	Single/Dual. Input to output
Power density			14	W/in^3	
Mean time between failure		13		Mhrs	MIL-HDBK-217F, 25°C GB.
Weight		1.4/1.6 (0.004)		g(lb)	Single/Dual
Recommended solder profile	IPC/JEDEC J-STD-020D.1				
MSL	Level 1				
Case material	Black plastic, flame retardant UL94V-0				
Pin material	Phosphor bronze				
Water wash	Non-soaking water wash with de-ionised water. Dry thoroughly.				
Potting material	Epoxy UL94V-0 rated				

Environmental

Characteristic	Minimum	Typical	Maximum	Units	Notes & conditions
Operating temperature	-40		+95	°C	See derating graphs.
Storage temperature	-55		+125	°C	
Case temperature			+110	°C	
Operating humidity			95	%RH	Non-condensing
Cooling	Natural convection				

Safety approvals

Safety agency	Standard	Notes & conditions
CE	Meets all applicable directives	
UKCA	Meets all applicable legislation	

EMC: Emissions

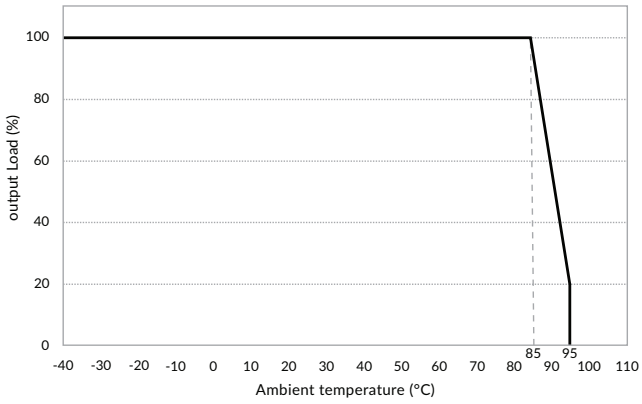
Phenomenon	Standard	Test level	Notes & conditions
Conducted	EN55032	Class B	See application notes
Radiated	EN55032	Class B	See application notes

EMC: Immunity

Phenomenon	Standard	Test level	Criteria	Notes & conditions
Immunity	EN55035			
ESD	EN61000-4-2	3	A	±6kV contact, ±8kV air discharge
Radiated	EN61000-4-3	3V/m	A	
EFT/burst	EN61000-4-4	2	A	±1kV (Line to line)
Surges	EN61000-4-5	1	A	±0.5kV (Line to line)
Conducted	EN61000-4-6	3V	A	
Magnetic field	EN61000-4-8	1A/m	A	

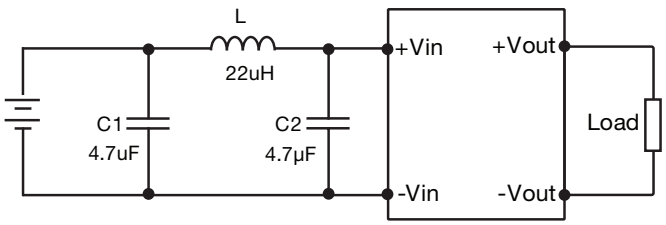
Application notes

Derating curves (Nominal input voltage)

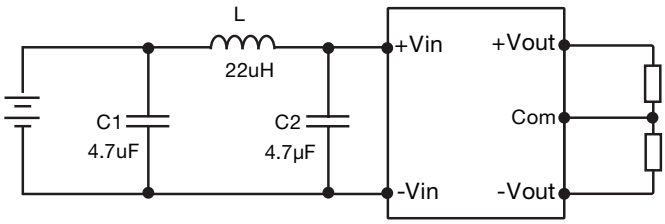


EMI (Class A) filter

Single

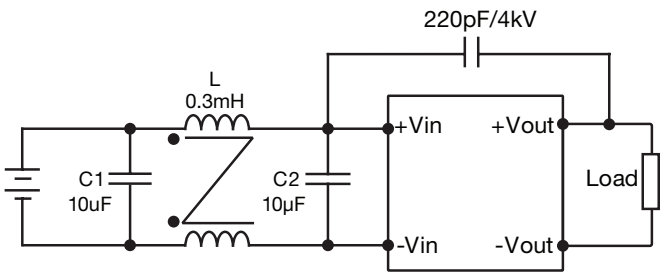


Dual

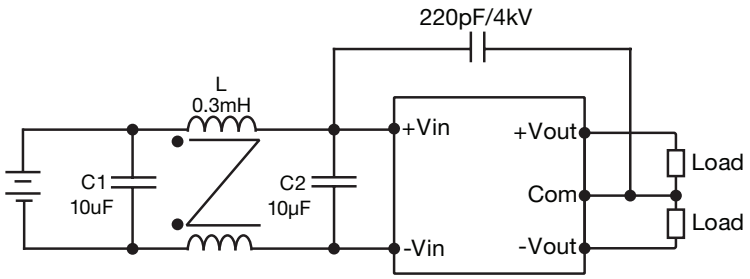


EMI (Class B) filter

Single

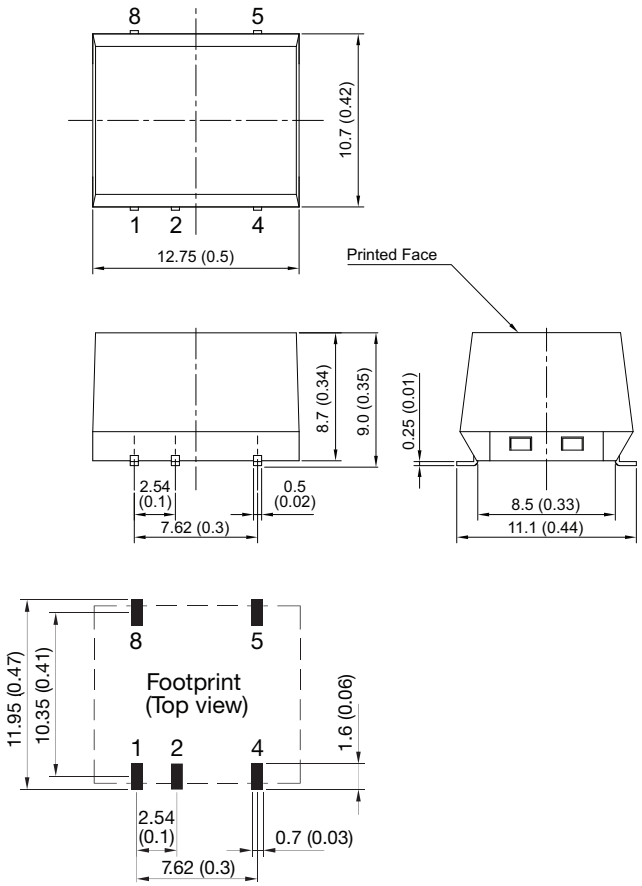


Dual

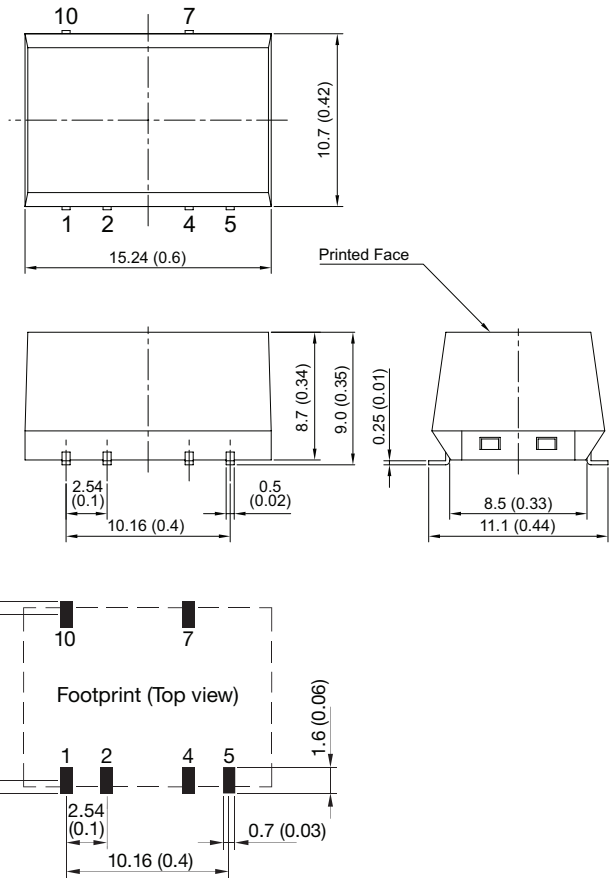


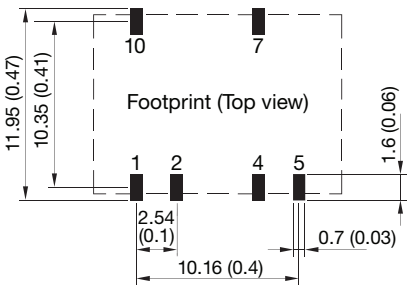
Mechanical details

Single



Dual





Pin connections		
Pin	**Single**	**Dual**
1	-Vin	-Vin
2	+Vin	+Vin
3	No pin	No pin
4	-Vout	Com
5	+Vout	-Vout
6	No pin	No pin
7	No pin	+Vout
8	Not connected	No pin
9	-	No pin
10	-	Not connected

Notes:

1. All dimensions are in mm (inches)
2. Weight: 1.4g (0.003lbs) for single, 1.6g (0.004lbs) for dual typical.
3. Pin diameter tolerance: ±0.1 (±0.004)
4. Pin pitch tolerance: ±0.25 (±0.01)
5. Case tolerance: ±0.5 (±0.02)