

40W

DC-DC
converters



The BCT40T series of PCB mount DC-DC converters deliver an output power of 40W in a compact 25.4 x 25.4mm (1" x 1") metal package and offer regulated single outputs from 3.3V to 24VDC and dual outputs at $\pm 12V$ & $\pm 15VDC$. The single output models support $\pm 10\%$ adjustment via trim resistor, offering flexibility to meet specific voltage needs.

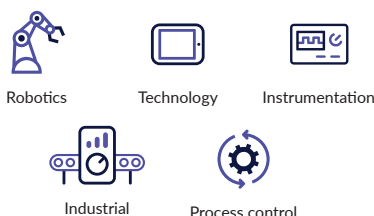
Featuring a wide 4:1 input, high efficiency, world-wide ITE safety approvals, UVLO, remote on/off and a wide operating temperature range, the BCT40T series is ideal for a wide range of ITE, industrial and communications applications.



Features

- ▶ Single regulated outputs from 3.3V to 24VDC
- ▶ Dual regulated outputs $\pm 12V$ & $\pm 15VDC$
- ▶ 4:1 wide input voltage range
- ▶ 25.4 x 25.4mm (1" x 1") compact package
- ▶ 2kVDC isolation
- ▶ UL62368-1 & EN62368-1 safety approvals
- ▶ Continuous short circuit protection
- ▶ Remote on/off
- ▶ -40°C to +105°C operation temperature
- ▶ 3 year warranty

Applications



Dimensions

25.4 x 25.4 x 10.5mm (1.0" x 1.0" x 0.41")

Documentation

For further information click the link or scan the code

→ xppower.com



Models & ratings

Model number	Input voltage	Output voltage	Output current	Efficiency ⁽¹⁾	Maximum capacitive load
BCT40T24S3V3	24V (9.0V-36.0V)	3.3V	10.00A	87%	10000 μ F
BCT40T24S05		5V	8.00A	88%	6000 μ F
BCT40T24S12		12V	3.33A	88%	3000 μ F
BCT40T24S15		15V	2.67A	88%	1000 μ F
BCT40T24S24		24V	1.67A	89%	680 μ F
BCT40T24D12		$\pm 12V$	$\pm 1.67A$	88%	$\pm 1500\mu$ F
BCT40T24D15		$\pm 15V$	$\pm 1.33A$	88%	$\pm 1000\mu$ F
BCT40T48S3V3	48V (18.0V-75.0V)	3.3V	10.00A	86%	10000 μ F
BCT40T48S05		5V	8.00A	88%	6000 μ F
BCT40T48S12		12V	3.33A	89%	3000μF
BCT40T48S15		15V	2.67A	88%	1000 μ F
BCT40T48S24		24V	1.67A	88%	680 μ F
BCT40T48D12		$\pm 12V$	$\pm 1.67A$	88%	$\pm 1500\mu$ F
BCT40T48D15		$\pm 15V$	$\pm 1.33A$	88%	$\pm 1000\mu$ F

Notes:

1. Typical value at nominal input voltage and full load.

Input

Characteristic	Minimum	Typical	Maximum	Units	Notes & conditions
Input voltage range	9.0		36.0	VDC	24V nominal
	18.0		75.0		48V nominal
No load input current			12	mA	24V model
			10		48V model
Input filter	Pi type				
Input surge voltage			50	VDC	24V model for 1s
			100		48V model for 1s
Under voltage lockout		7.5		VDC	24V model
		16.0			48V model

Output

Characteristic	Minimum	Typical	Maximum	Units	Notes & conditions
Output voltage	3.3		30	VDC	See Models & ratings table
Output voltage trim			±10	%	Via external resistors, see Application Notes. Single output model only
Initial set accuracy		±1		%	Full load
Minimum load					No minimum load required
Start up time			50/30	ms	3V3/others, Nominal input, full load
Line regulation		±0.2/±0.5		%	Single/dual outputs, min. input to max. input, full load
Load regulation		±0.5/±1.0		%	Single/dual outputs from 0% to full load
Cross regulation			±5	%	On dual output models, with one output set to 50% load and the other varied from 10% to 100% load
Ripple & noise			75	mV/pk-pk	Measured with 20MHz bandwidth and 22µF ceramic capacitor (single output) and 10µF ceramic capacitor (dual output) at nominal input +25°C 3V3 & 5V models measured with 20MHz bandwidth and using 100mm twisted pair wire terminated with 22µF ceramic capacitor at nominal input +25°C
Transient response			10/5	%	3V3/other models. Deviation, recovery to within 1% in <300µs for a 25% load change (75% - 100% - 75%) at nominal input
Overload protection	130		180	%	Nominal input +25°C
Short circuit protection	Continuous, with autorecovery				
Overtemperature protection		+115		°C	Case temperature
Maximum capacitive load	See Models & ratings table				
Temperature coefficient		±0.05		%/°C	Full load
Remote ON/OFF	Output is ON if pin 3 is open or >3.0VDC and output is OFF if pin 3 is short to -Vin or <1.2VDC				
Overvoltage protection (Zener diode clamp)	3.7		5.3	VDC	3.3VDC models
	5.6		8		5VDC models
	13.4		19.2		12VDC models
	16.8		24		15VDC models
	26.8		38.4		24VDC models
	±13.4		±19.2		±12VDC models
	±16.8		±24.0		±15VDC models

General

Characteristic	Minimum	Typical	Maximum	Units	Notes & conditions
Efficiency	See models and ratings table				
Isolation: input to output	2000			VDC	
Isolation resistance	1 ⁹			Ω	Input to output
Isolation capacitance		2200		pF	Input to output
Switching frequency		300		kHz	3V3 models, full load
		400			Other models, full load
Power density			5.95 (97.56)	W/cm ³ (W/in ³)	
Mean time between failure	500			khrs	MIL-HDBK-217F, +25°C, GB
Weight		21 (0.05)		g (lb)	

Environmental

Characteristic	Minimum	Typical	Maximum	Units	Notes & conditions
Operating temperature	-40		+105	°C	See derating curve
Storage temperature	-55		+125	°C	
Maximum case temperature			+110	°C	
Humidity	5		95	%RH	Non-condensing
Cooling	Natural convection				
Operating altitude			3000	m	

Safety approvals

Safety agency	Standard	Notes & conditions
CB	IEC62368-1	
TUV	EN62368-1	
UL	UL/cUL62368-1	
CE	Meets all applicable legislation	
UKCA	Meets all applicable legislation	

EMC: Emissions

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

EMC: Immunity⁽¹⁾

Phenomenon	Standard	Test level	Criteria	Notes & conditions
ESD immunity	EN61000-4-2	3	A	±6kV contact, ±8kV air discharge
Radiated	EN61000-4-3	10V/m	A	
EFT/burst	EN61000-4-4	±2kV	A	Line to line
Surges	EN61000-4-5	±2kV	A	Line to line
Conducted	EN61000-4-6	10V	A	
Magnetic field	EN61000-4-8	10A/m	A	

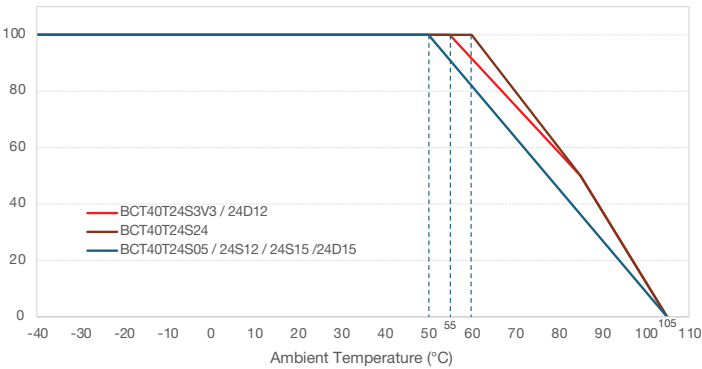
Notes:

1. External 680µF/100V input capacitor required.

Application notes

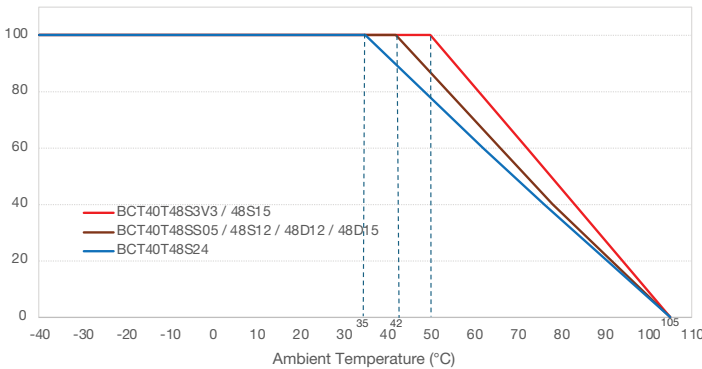
Derating curve (nominal input voltage)

24V models



Measured at 24VDC input

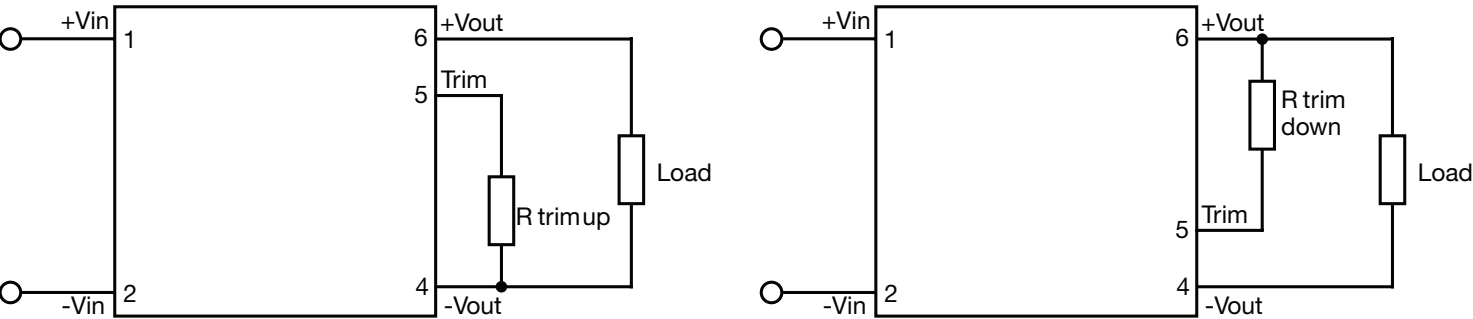
48V models



Measured at 48VDC input

Application notes

Single output voltage adjustment



In order to trim the voltage up or down, connect the trim resistor either between the trim pin and -Vout for trim-up and between trim pin and +Vout for trim-down. The output voltage trim range is ±10%.

The value of R trim-up defined as:

$$R \text{ trim-up} = \left(\frac{V_r \times R1 \times R2}{(V_o - V_o \text{ nom}) \times R2} \right) - R3$$

Where

R trim-up is the external resistor in Kohm.
Vo nom is the nominal output voltage.
Vo is the desired output voltage.
R1, R2, R3 and Vr are internal to the unit and are defined in the table to the below.

The value of R trim-down defined as:

$$R \text{ trim-down} = R1 \times \left(\frac{V_r \times R1}{(V_o \text{ nom} - V_o) \times R2} - 1 \right) - R3$$

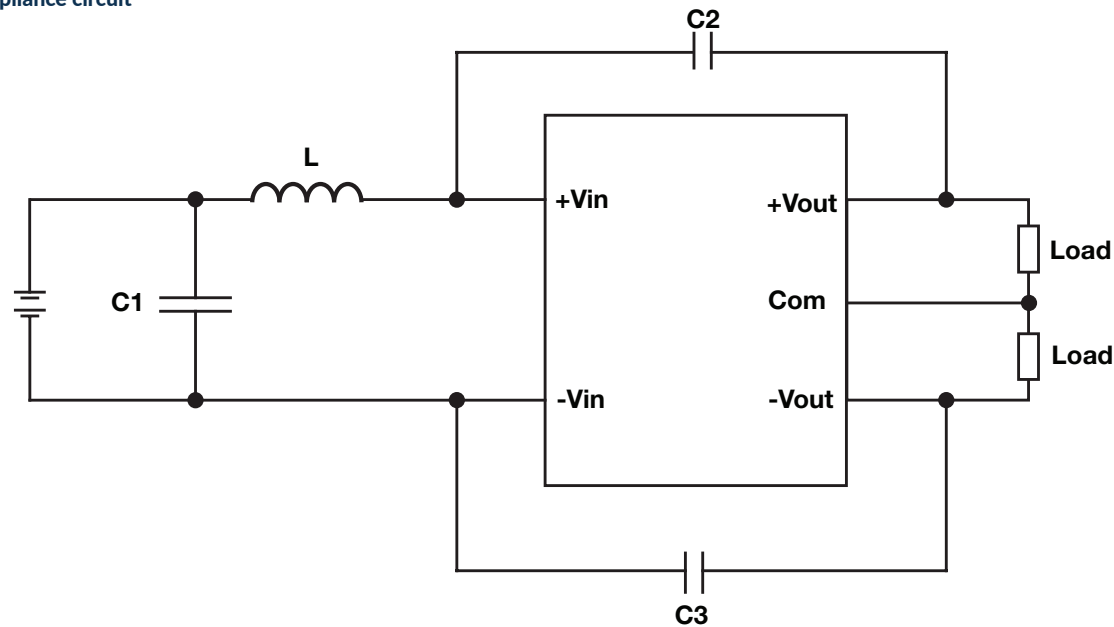
Where

R trim-up is the external resistor in Kohm.
Vo nom is the nominal output voltage.
Vo is the desired output voltage.
R1, R2, R3 and Vr are internal to the unit and are defined in the table to the below.

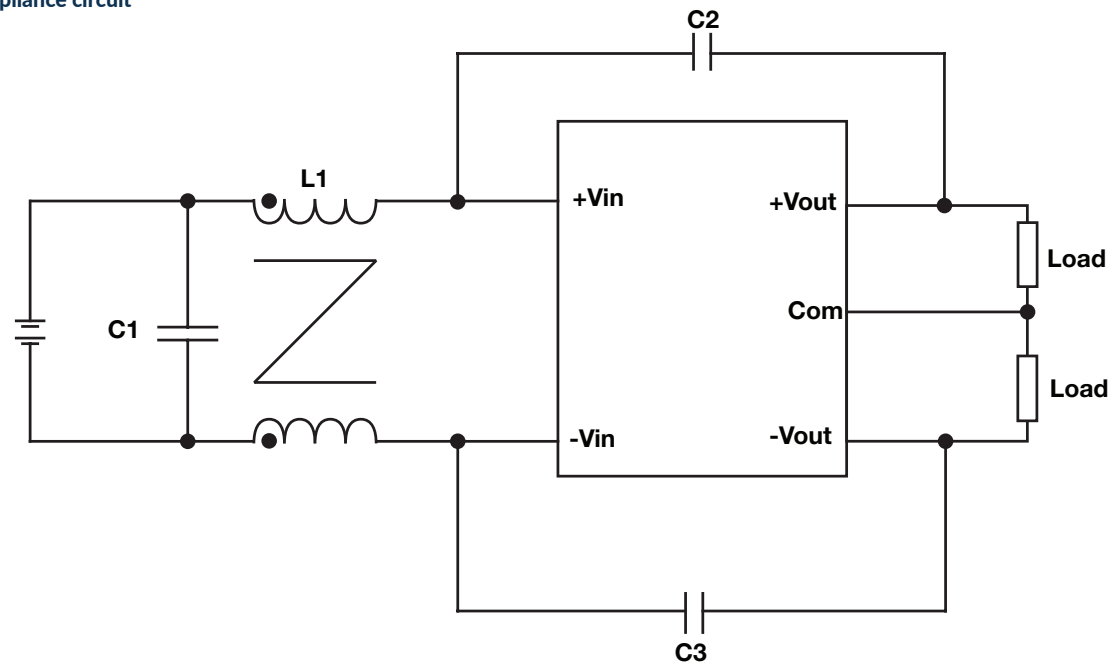
Vout	Vr (V)	R1 (kΩ)	R2 (kΩ))	R3 (kΩ))
3V3	1.24	16.7	10.0	52.3
5V	1.24	33.5	11.0	73.2
12V	2.50	38.0	10.0	48.7
15V	2.50	50.1	10.0	64.9
24V	2.50	86.0	10.0	73.2

Application notes

EMI (Class A) compliance circuit



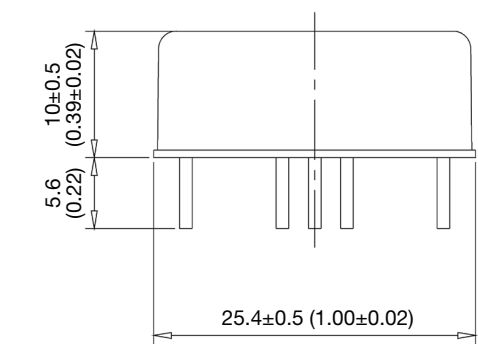
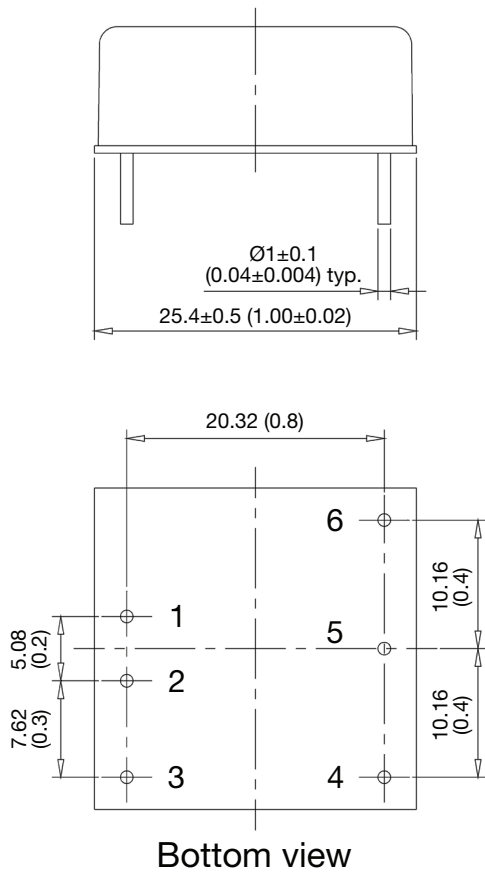
EMI (Class B) compliance circuit



EMI	L1	C1	C2 ⁽¹⁾	C3
Class A	2.2μH	10μF	2200pF	2200pF
Class B	CMC: 70μH (K5B T20X5X10C, 10Ts)	10μF	2200pF	2200pF

Notes:
1. Not applicable for BCT40T24S3V3 / 24D12 / 48D12 / 24D15 / 48D15

Mechanical details



Pin connections		
Pin	Single	Dual
1	+Vin	+Vin
2	-Vin	-Vin
3	Remote	Remote
4	-Vout	-Vout
5	Trim	Common
6	+Vout	+Vout

- Notes:
- 1. All dimensions shown in mm (inches).
 - 2. Weight: 21g (0.05lb) typical.
 - 3. Pin diameter tolerance: ± 0.1 (± 0.004)

- 4. Pin pitch tolerance: ± 0.25 (± 0.01)
- 5. Case tolerance: ± 0.5 (± 0.02)