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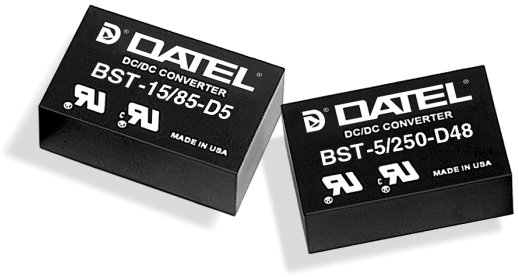
INNOVATION and EXCELLENCE



Dual Output
BST Models

Low-Cost, High-Reliability 3 Watt, DC/DC Converters

Features

- **Lowest cost! Highest reliability!**
- **100% SMT-on-pcb, including magnetics**
- **100% automatically assembled**
- **Standard "DIP" package and pinouts**
- **Fully isolated, 1000Vdc guaranteed**
- **±5, ±12 or ±15 Volt outputs**
- **Choice of 3 wide-range inputs:**
  - **4.5-9 Volts**
  - **9-18 Volts**
  - **18-72 Volts**
- **Guaranteed efficiencies to 75%**
- **–40 to +75°C full-power operation**
- **Internal input/output filtering**
- **UL1950/C22.2 No. 950/IEC950 certified**
- **Modifications and customs for OEM's**

Rarely, has a Series of low-power DC/DC converters been defined by both low cost and DATEL's made-in-the-USA quality and reliability. Our new BST Series of dual-output 3W DC/DC's achieves this "best-of-both-worlds" status by implementing a proven circuit architecture (170-200kHz flyback design) as a full, SMT-on-pcb assembly (including surface-mount magnetics) that is truly 100% automatically assembled. Packaged in miniature 1.25" x 0.8", DIP-like plastic packages (UL94V-0 rated) and requiring no external components, BST Series DC/DC's bring true component-like convenience to designers of today's distributed power systems.

Output voltages are ±5, ±12 or ±15 Volts. Input voltage ranges are 4.5-9V ("D5" models), 9-18V ("D12" models) or an ultra-wide 18-72V ("D48" models). BST DC/DC's are fully isolated (1000Vdc guaranteed) and include input (pi type) and output filters within their package. Output transient response is a quick 200µsec, while output ripple and noise are typically 75mVp-p.

These rugged modules are fully encapsulated with a thermally conductive potting compound that contributes to their outstanding moisture/vibration resistance and impressive MTBF. They operate over the full –40 to +75°C temperature range without derating. All models have been thoroughly characterized (electrically, mechanically and thermally), qualified (including HALT), and EMI/EMC tested. Additionally, they are certified to UL1950, CSA 22.2 No. 950 and IEC950.

DATEL's BST Model 3W DC/DC's are excellent selections for telecom/datacom, computer and process-control applications demanding small size, low cost and high reliability. If required, their design "flexibility" allows for easy modification to your application-specific requirements.

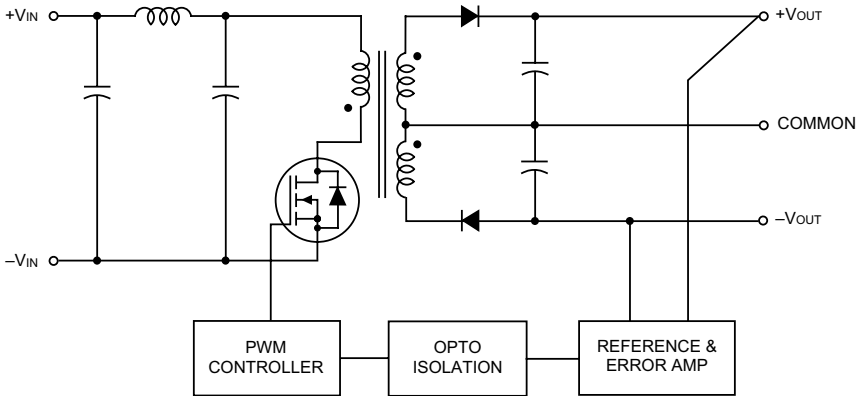


Figure 1. Simplified Schematic

Performance Specifications and Ordering Guide ①

Model	Output						Input			Efficiency		Package (Case, Pinout)
	V_{OUT} (Volts)	I_{OUT} (mA, Max.)	R/N (mVp-p) ②		Regulation (Max.)		V_{IN} Nom. (Volts)	Range (Volts)	I_{IN} ④ (mA)			
			Typ.	Max.	Line	Load ③				Min.	Typ.	
BST-5/250-D12	±5	±250	75	120	±0.5%	±0.5%	12	9-18	25/267	75%	78%	C1, P2
BST-5/250-D48	±5	±250	75	120	±0.5%	±0.5%	48	18-72	7/69	72%	76%	C1, P2
BST-12/105-D5	±12	±105	75	150	±0.5%	±0.5%	5	4.5-9	60/690	71%	73%	C1, P2
BST-12/125-D12	±12	±125	75	150	±0.5%	±0.5%	12	9-18	25/329	74%	76%	C1, P2
BST-12/125-D48	±12	±125	75	150	±0.5%	±0.5%	48	18-72	8/81	73%	77%	C1, P2
BST-15/85-D5	±15	±85	75	150	±0.5%	±0.5%	5	4.5-9	68/689	72%	74%	C1, P2
BST-15/100-D12	±15	±100	75	150	±0.5%	±0.5%	12	9-18	25/329	74%	76%	C1, P2
BST-15/100-D48	±15	±100	75	150	±0.5%	±0.5%	48	18-72	8/81	73%	77%	C1, P2

① Typical at T_A = +25°C under nominal line voltage and full-load conditions unless otherwise noted.
② Ripple/Noise (R/N) measured over a 20MHz bandwidth.
③ Balanced loads, 10% to 100% load.
④ Nominal line voltage, no-load/full-load conditions.

PART NUMBER STRUCTURE

B ST - 15 / 100 - D48

Output Configuration:
B = Bipolar

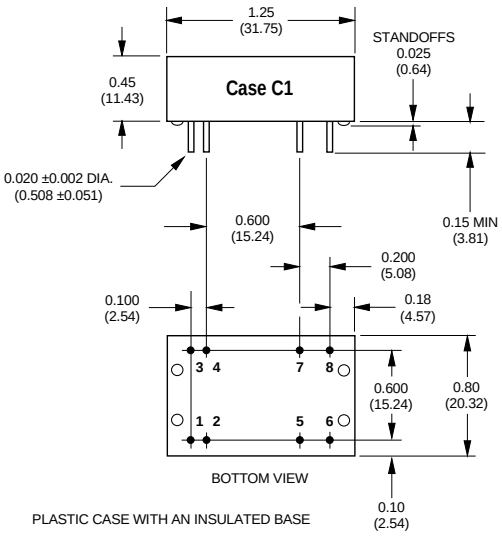
Product Series

Nominal Output Voltages:
±5, ±12 or ±15 Volts

Maximum Output Current
in mA from each output

Input Voltage Range:
D5 = 4.5-9 Volts (5V nominal)
D12 = 9-18 Volts (12V nominal)
D48 = 18-72 Volts (48V nominal)

MECHANICAL SPECIFICATIONS



I/O Connectiions	
Pin	Function P2
1	+Input
2	+Input
3	–Input
4	–Input
5	Common
6	+Output
7	Common
8	–Output

Performance/Functional Specifications

Typical @ T_A = +25°C under nominal line voltage and full-load conditions unless noted. ①

Input	
Input Voltage Range:	
"D5" Models	4.5-9 Volts (5V nominal)
"D12" Models	9-18 Volts (12V nominal)
"D48" Models	18-72 Volts (48V nominal)
Input Current	See Ordering Guide
Input Filter Type ②	Pi
Reverse-Polarity Protection	Yes (Instantaneous, 2A maximum)
Output	
V_{OUT} **Accuracy** (50% load)	±1%, maximum
Temperature Coefficient	±0.02% per °C
Ripple/Noise (20MHz BW) ②	See Ordering Guide
Line/Load Regulation	See Ordering Guide
Efficiency	See Ordering Guide
Isolation Voltage ③	1000Vdc, minimum
Current Limiting:	
"D5" Models	Power-limiting technique, auto-recovery
"D12" and "D48" Models	Hiccup technique, auto-recovery
Dynamic Characteristics	
Transient Response (50% load step)	200µsec to ±1.5% of final value
Switching Frequency:	
"D48" Models	200kHz
"D5" and "D12" Models	170kHz
Environmental	
Operating Temperature (Ambient, no derating)	–40 to +75°C
Storage Temperature	–40 to +100°C
Physical	
Dimensions	1.25" x 0.8" x 0.45" (31.8 x 20.3 x 11.4mm)
Case Material	Diallyl phthalate, UL94V-0 rated
Pin Material	Brass, solder coated
Weight	0.5 ounces (14.2 grams)

① These power converters require a minimum 10% loading to maintain specified regulation. Operation under no-load conditions will not damage these devices; however they may not meet all listed specifications.
② Application-specific internal input/output filtering can be recommended and perhaps added internally upon request. Contact DATEL Applications Engineering for details.
③ Devices can be screened or modified for higher guaranteed isolation voltages. Contact DATEL Applications Engineering for details.

Absolute Maximum Ratings	
Input Voltage:	
"D5" Models	12 Volts
"D12" Models	20 Volts
"D48" Models	80 Volts
Input Reverse-Polarity Protection	Current must be <2A. Brief duration only. Fusing recommended.
Output Overvoltage Protection	None
Output Current	Current limited. Max. current and short-circuit duration are model dependent. "D12" and "D48" models can withstand sustained output short circuits.
Storage Temperature	–40 to +100°C
Lead Temperature (soldering, 10 sec.)	+300°C

These are stress ratings. Exposure of devices to any of these conditions may adversely affect long-term reliability. Proper operation under conditions other than those listed in the Performance/Functional Specifications Table is not implied.

TECHNICAL NOTES

Floating Outputs

Since these are isolated DC/DC converters, their outputs are "floating." Any BST model may be configured to produce an output of 10V, 24V or 30V (for ±5V, ±12V or ±15V models, respectively) by applying the load across the +Output (pin 6) and –Output (pin 8), with either output grounded. The Common (pins 5 and 7) should be left open. Minimum 20% loading is recommended under these conditions.

Filtering and Noise Reduction

All BST 3 Watt DC/DC Converters achieve their rated ripple and noise specifications without the use of external input/output capacitors. In critical applications, input/output ripple and noise may be further reduced by installing electrolytic capacitors across the input terminals and/or low-ESR tantalum or electrolytic capacitors across the output terminals. Output capacitors should be connected between their respective output pin (pins 6 and 8) and Common (pins 5 and 7) as shown in Figure 2. The caps should be located as close to the power converters as possible. Typical values are listed in the tables below. In many applications, using values greater than those listed will yield better results.

To Reduce Input Ripple

"D5" Models	47µF, 15V
"D12" Models	10µF, 35V
"D48" Models	4.7µF, 100V

To Reduce Output Ripple

±5V Outputs	47µF, 10V, Low ESR
±12/15V Outputs	22µF, 20V, Low ESR

In critical, space-sensitive applications, DATEL may be able to tailor the internal input/output filtering of these units to meet your specific requirements. Contact our Applications Engineering Group for additional details.

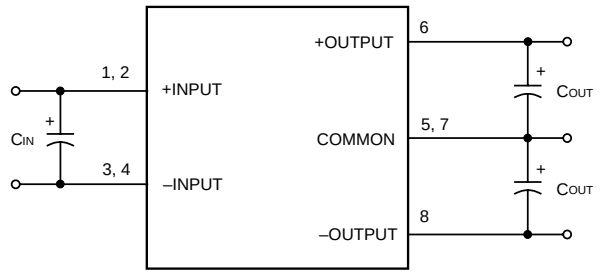


Figure 2. Using External Capacitors to Reduce Input/Output Ripple/Noise

Input Fusing

Certain applications and/or safety agencies may require the installation of fuses at the inputs of power conversion components. For DATEL BST 3 Watt DC/DC Converters, you should use slow-blow type fuses with values no greater than the following:

V_{IN} Range	Fuse Value
"D5"	1.5A
"D12"	1A
"D48"	0.5A

CUSTOM CAPABILITIES

DATEL's world-class design, development and manufacturing team stands ready to work with you to deliver the exact power converter you need for your demanding, large volume, OEM applications. And ... we'll do it on time and within budget!

Our experienced applications and design staffs; quick-turn prototype capability; highly automated, SMT assembly facilities; and in-line SPC quality-control techniques combine to give us the unique ability to design and deliver any quantity of power converters to the highest standards of quality and reliability.

We have compiled a large library of DC/DC designs that are currently used in a variety of telecom, medical, computer, railway, aerospace and industrial applications. We may already have the converter you need.

Contact us. Our goal is to provide you the highest-quality, most cost-effective power converters available.

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