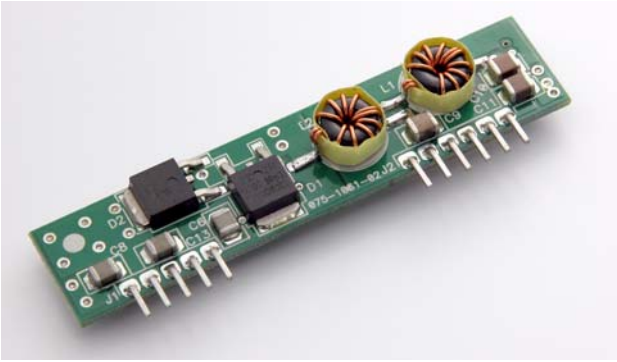
DC/DC Converter

3.3V Input, 5.0V Output, 5A

Features

- ✓ High Output 5A
- ✓ 3.3V ± 10% input voltage
- ✓ Regulation ±0.4% Line and Load
- ✓ Industry Standard Pin Configuration
- ✓ High Efficiency To 80%
- ✓ Remote Sense, Trim and Enable** Capable
- ✓ MTBF 8.11 million hours



This product is not fuse protected. User is responsible for providing system protection. Consult factory for application information.

Specifications *	SBST-03	
Input Specifications		
Input voltage range	3.3V ± 0.3V	Measured at $+V_{IN}$ pin
External input capacitor	Minimum 200µF with adequate ripple current rating	See also note on pg 5
Output Specifications		
Standard output voltages	5.0V	Standard setpoint accuracy varies ±3%. Contact factory for tighter tolerances. See note on pg 4 for trimming to different voltages.
Output current	5A	300 LFM at 50°C (see also derating curves)
Load regulation	±0.4%	0 to 5A load
Line regulation	±0.4%	Over specified input voltage range
External output capacitor	>470µF with low ESR	See also note on pg 5
Overcurrent protection	7.5A	95% V_{OUT} setpoint
General Specifications		
Enable **	ON - open or high / OFF - low	
Efficiency	80% typical	See efficiency curves on pg 4
Isolation	Non-isolated	
Switching frequency	300 kHz	Fixed
Approvals and Standards	UL 94V-0	
Protection	Fusing	Unit is not fused.
Operating Temperature	-40°C to 55°C	See also derating curves on pg 4
Storage Temperature	-40°C to 85°C	Non-condensing
Weight	.2 oz. (5.7 gm)	
MTBF	8.1 million hours	Per RAC PRISM at 50°C ambient and 400 LFM

* All specifications are typical at nominal input, full load at 25°C unless otherwise stated.

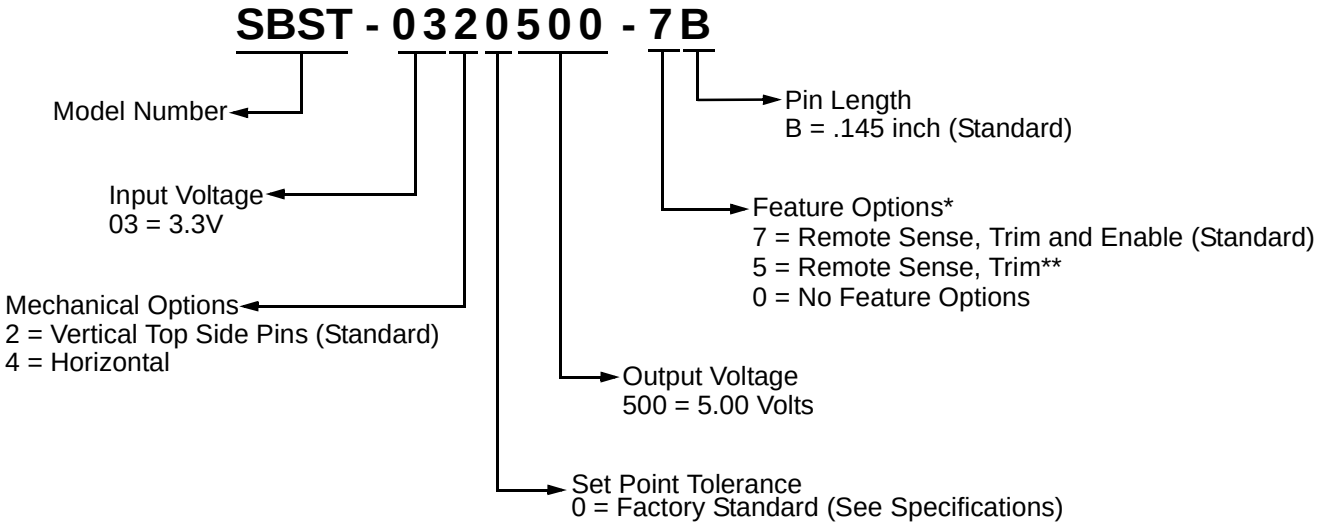
** Pull below 0.5V and sink greater than 2mA to disable the boost action: Vin = Vout; leave open or pull above 1.5V (10kΩ pull-up resistor connected to +3.3V) to enable the boost action: Vout = 5V.

1150 Eglinton Avenue East
Toronto, Ontario M3C 1H7
1-866-740-1232

www.cdtechno-cps.com

4607 S.E. International Way
Milwaukie, Oregon 97222
1-971-206-2800

Part Number Designations



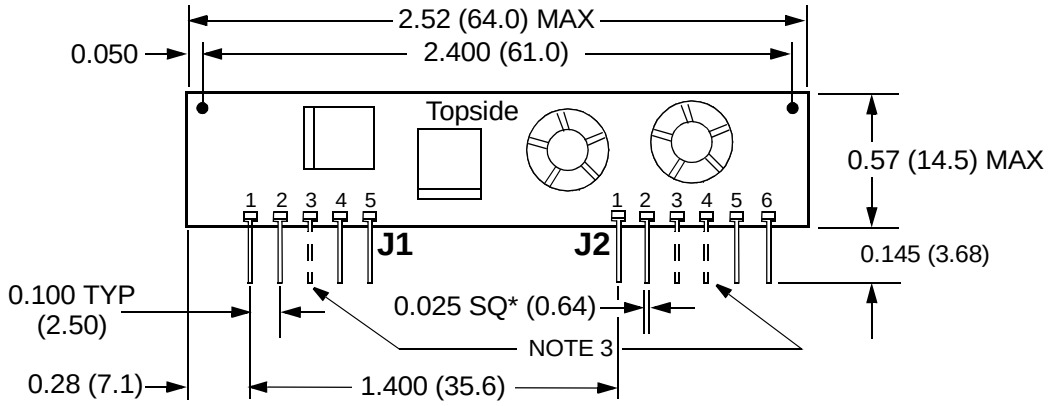
* Pin present only on selected features.
** Available only in vertical-mount option.

Pin Assignments*

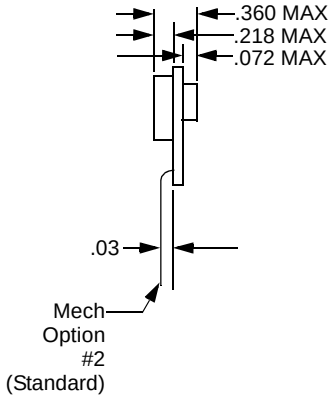
CONNECTOR	PIN	FUNCTION	CONNECTOR	PIN	FUNCTION
J1	1	V_{OUT}	J2	1	Ground
	2	V_{OUT}		2	Ground
	3*	Remote Sense (Empty Optional)		3*	Enable (Empty Optional)
	4	Ground		4*	Trim (Empty Optional)
	5	Ground		5	V_{IN}
				6	V_{IN}

* Pin present only when feature is selected.

Outline Drawings



Mechanical Option 2



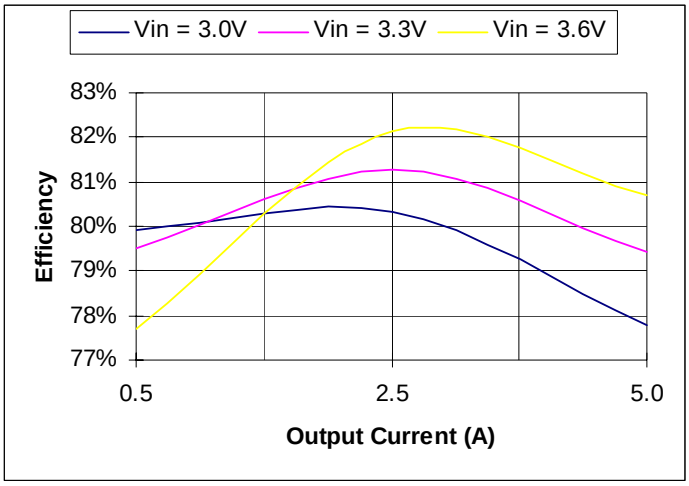
* Recommended Customer Hole Size 0.046 ±.003 with 0.070 pad both sides

1. Dimensions are in inches and (millimeters).
2. Tolerances: (unless otherwise noted)

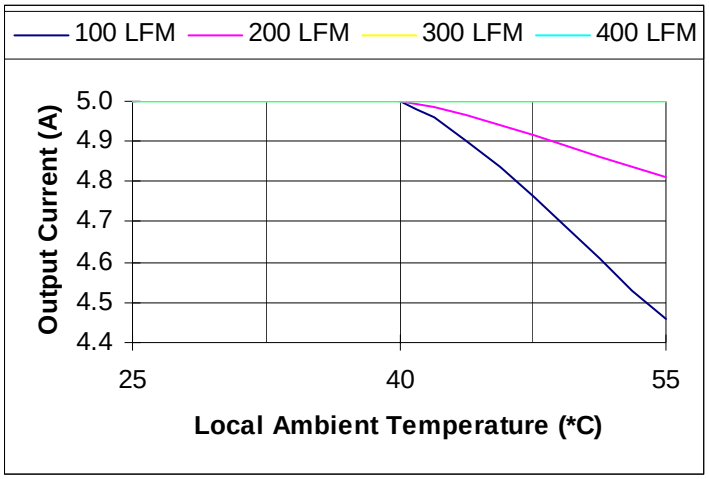
	Inches	Millimeters
	.XX ± .020	.X ± 0.5
	.XXX ± .010	.XX ± 0.25
Pin:	± .002	± 0.05

3. Pin is present only if feature is selected.

Efficiency Curves at 25°C



Derating Curves



Resistor Trim Equations

For 5.00V < V_{OUT} ≤ 5.50V, connect R_{TRIM} between the Trim pin and Ground.

$$R_{TRIM} = \frac{12400}{V_{OUT} - 4.9749}$$

For 4.50V ≤ V_{OUT} < 5.00V, connect R_{TRIM} between the Trim pin and the V_{OUT} pin.

$$R_{TRIM} = \frac{10000V_{OUT} - 12400}{4.9749 - V_{OUT}}$$

1150 Eglinton Avenue East
Toronto, Ontario M3C 1H7
1-866-740-1232

www.cdtechno-cps.com

4607 S.E. International Way
Milwaukie, Oregon 97222
1-971-206-2800

External Capacitance for the Boost SIP Product

All SIP products require external capacitors to be placed on the system board that the SIP will be designed into. The following guidelines should be applied to choose the external capacitors for the Boost SIP.

Input Capacitance

More relaxed requirements apply to the input capacitor.
A capacitor having at least 200µF has to be used. The capacitor must be able to handle the input AC ripple current. For the boost SIP, this can be approximated to 20% of the output current.
There is no specific requirement for ESR. The Boost SIP operation is not affected by this parameter. To minimize input voltage ripple the user may select to use a low ESR capacitor as well. An ESR lower than 0.05Ω is recommended.

Output Capacitance

The capacitor must be able to handle the AC ripple current. A conservative rule is to assume this is roughly equal to the output current of the boost SIP. If the boost is used to provide 5A, then the output capacitor's allowable ripple current needs to be at least 5A. If one capacitor's allowable ripple current is less than 5A, then several capacitors have to be used so the total allowable ripple current is at least 5A.

The capacitor needs to have a low ESR (Equivalent Series Resistance) to help reduce the output voltage ripple.

A rough calculation of the needed ESR can be done using the formula:

$$ESR = \frac{V_{RIPPLE}}{2 \times I_{OUT}}$$

Where: ESR = Capacitor's equivalent series resistance (Ω)
V_{RIPPLE} = Desired output voltage ripple (Vpk - to - pk)
I_{OUT} = Output current (A)

Example: Assume the Boost SIP provides a maximum current of 5A and the voltage ripple needs to be lower than 0.1V peak to peak.

$$ESR = \frac{0.1}{2 \times 5} = 0.01\Omega$$

The capacitance value should be at least 470µF, but due to the ripple current and ESR requirements the actual capacitors may end up having a much larger total capacitance.

Short Circuit / Over Current Protection

The Boost SIP does not have any means to protect against a short circuit at the output. The short circuit current will flow from the 3.3V input supply, through the boost diode (capable to handle close to 20A) and through the short circuit. The user is advised to implement over current protection on his 3.3V input supply that is used in the application.

There is an over current protection against excessive current required from the SIP. The Boost SIP will maintain its output voltage within regulation up to an output current of 7.5A (typical). If the current demanded by the load exceeds this value, the output voltage will start to decrease below its regulation value and go as low as one diode voltage drop below the input voltage. Note that this kind of protection will not limit the current that can be drawn from the Boost SIP.

Instructions for use are available from: www.cdtechno-cps.com

1150 Eglinton Avenue East
Toronto, Ontario M3C 1H7
1-866-740-1232

www.cdtechno-cps.com

4607 S.E. International Way
Milwaukie, Oregon 97222
1-971-206-2800