SC20A SERIES

HDLV Family



Description

The SC20A is a low-cost, 20-Amp, non-isolated DC-DC converter with an amazingly small footprint of only 0.8 in^2. Designed for today's high power microprocessors, the SC20A accepts either 5 V or 3.3 V inputs and offers outputs from 1.3 V to 3.3 V. The SC20A also uses an industry-standard pin-out making it easy to increase power in existing designs.

Using Bourns Switch Power's proprietary V^{2TM} architecture, the SC20A provides ultrafast transient response, improved line and load regulation, and very high efficiency. It also incorporates short-circuit protection, Enable / Disable control, output voltage trim, and remote sense.

Features

- Low Cost
- 20-Amp Output Current
- 90 % Efficiency
- Industry-standard Pin-out
- Low 0.6 " Profile
- Nonisolated Output
- Remote Sense
- Trim Function
- Enable / Disable
- Short-circuit Protection with auto-restart
- Fast Transient Response
- High-temperature Operation
- Output Precharge Capability

Patents 5,770,940
5,978,195
6,127,814

Common Specifications

	Min	Nom	Max	Units	Notes
Input					
Voltage	4.5	5	5.5	Vdc	4.75 V_{in} Startup
	3.0	3.3	3.6	Vdc	
Current			20	A	
Control Voltage					
High = Disable	2.4			Vdc	Source 500 mA
Low = Enable			0.4	Vdc	Open=Enable
E/D Current		1		mA	
Output					
Current			20	A	
Voltage Setpoint Accuracy			±2	$\%V_{nom}$	
Voltage Trim Range	-10		+10	$\%V_{nom}$	
Line Regulation		±0.1		$\%V_{nom}$	
Load Regulation		±0.3		$\%V_{nom}$	
Current Limit	22	25	34	A	
Dynamic Response					
0 to 20 A load		200		mV	$\Delta i/\Delta t$ = 3 A/µs
		19		µs	
20 to 0 A load		200		mV	$\Delta i/\Delta t$ = 3 A/µs
		19		µs	
Temperature Regulation			±0.02	$\%V_{out}$/°C	
General					
MTBF		1,000		kHrs	Bellcore TR332, 25 °C
Operating Temperature	-25		85	°C	
	-40		85	°C	optional
Storage Temperature	-40		125	°C	
Switching Frequency	200	300	400	kHz	

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Asia-Pacific: TEL +886- (0)2 25624117 • FAX +886- (0)2 25624116
Europe: TEL +41-41 768 5555 • FAX +41-41 768 5510
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www.bourns.com

Specifications are subject to change without notice.
Customers should verify actual device performance in their specific applications.

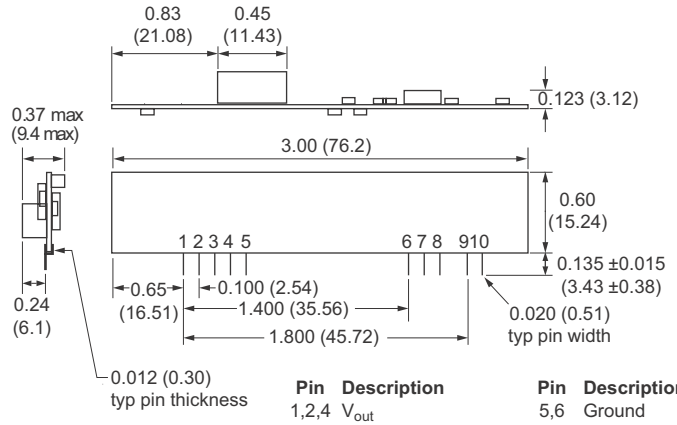
Electrical Specifications

	Nominal Input (V)	Output Voltage (V)	Output Current (A)	Short-circuit Current (A) typ	Noise (mV pp) typ	Efficiency (%) typ
SC20A-5S3.3	5	3.3	20	27	100	
SC20A-5S2.5	5	2.5	20	27	100	
SC20A-5S1.9	5	1.9	20	27	100	89
SC20A-5S1.8	5	1.8	20	27	100	
SC20A-5S1.5	5	1.5	20	27	100	
SC20A-3S2.5	3.3	2.5	20	27	100	
SC20A-3S1.9	3.3	1.9	20	27	100	92
SC20A-3S1.8	3.3	1.8	20	27	100	
SC20A-3S1.5	3.3	1.5	20	27	100	

Standard Options

Add option designators to the end of the part number. Example; SC20A-5S3.3-B

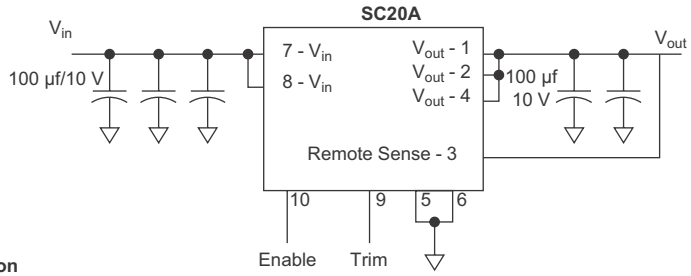
Option	Description
B	No Remote Sense option removes sense pin
F	1 % Setpoint Accuracy
Z	-40 °C Operation
X	Modified pin length followed by three digits (in mils)



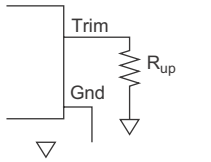
inches (mm)
0.xx ±0.01 inches
0.xxx ±0.005 inches

Pin	Description	Pin	Description
1,2,4	V_{out}	5,6	Ground
3	Remote Sense (Removed for B option)	7,8	V_{in}
		9	Trim
		10	Enable

Note: Component placement may change. Recommended keep-out area equals maximum length and width.



Trim Up



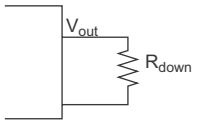
All outputs other than 1.5 V V_{nom}

$$R_{up} = \frac{8.09}{V_{out} - V_{nom}} - 22 \text{ (in k}\Omega\text{)}$$

Trim up when V_{nom} = 1.5 V

$$R_{up} = \frac{3.176}{V_{out} - V_{nom}} - 10 \text{ (in k}\Omega\text{)}$$

Trim Down



All outputs other than 1.5 V V_{nom}

$$R_{down} = \frac{6.04\,V_{out} - 8.09}{V_{nom} - V_{out}} - 22 \text{ (in k}\Omega\text{)}$$

Trim down when V_{nom} = 1.5V

$$R_{down} = \frac{2.37\,Vout - 3.176}{V_{nom} - V_{out}} - 10 \text{ (in k}\Omega\text{)}$$

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