

Description

The SC20A is a low-cost, 20-Amp, non-isolated DC-DC converter with an amazingly small footprint of only 0.8 in². 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 V²™ 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	Δi/Δt = 3 A/μs
		19		μs	
20 to 0 A load		200		mV	Δi/Δt = 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	



Reliable Electronic Solutions

Asia-Pacific: TEL +886- (0)2 25624117 • FAX +886- (0)2 25624116

Europe: TEL +41-41 768 5555 • FAX +41-41 768 5510

The Americas: TEL +1-951 781 5500 • FAX +1-951 781-5700

www.bourns.com

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

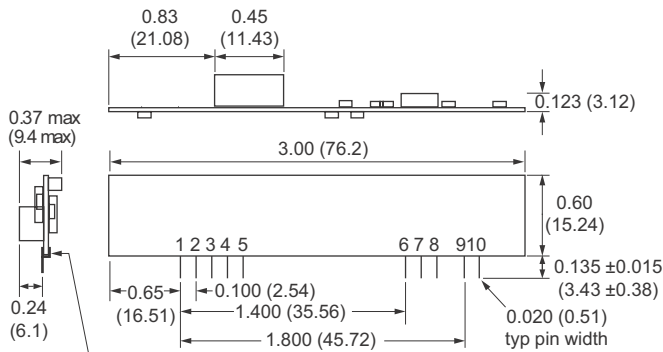
Electrical Specifications

	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

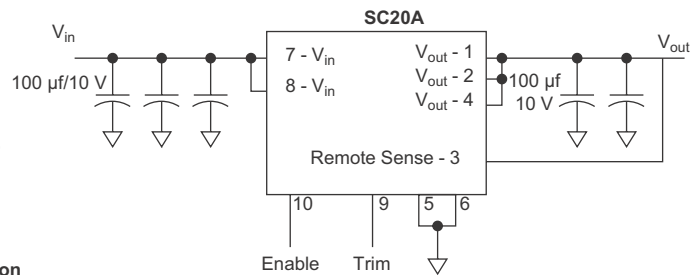
Option	Description
B	No Remote Sense option removes sense pin
F	1 % Setpoint Accuracy
Z	-40 °C Operation
X	Modified pin length followed by three digits (in mils)



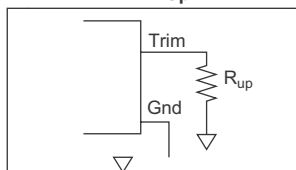
Pin	Description	Pin	Description
1,2,4	V _{out}	5,6	Ground
3	Remote Sense (Removed for B option)	7,8	V _{in}
		9	Trim
		10	Enable

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

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



Trim Up



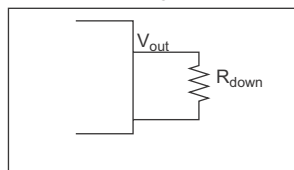
All outputs other than 1.5 V V_{nom}

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

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} = 1.5 V

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