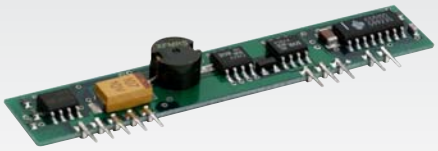

Description

The S6A is a 6-amp, full-featured, nonisolated DC-DC converter. The SIP form factor and high power density minimize the board area required for power. It uses an industry-standard pin-out, but also has a much lower height of only 0.48 inches. Using Switch Power's proprietary $V^2{}_{TM}$ architecture with a 5V input, the S6A provides ultrafast transient response, improved line and load regulation, and very high efficiency.

Features

- 6-amp Output Current
- 90% Efficiency
- Industry-standard Pin-out
- Low 0.5" Profile
- Nonisolated Output
- Overtemperature Protection
- Remote Sense
- Remote Enable
- Short-circuit Protection with auto-restart
- Fast Transient Response
- High-temperature Operation
- Trim Function
- 60W/in^3 Power Density
- FCC A

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

Common Specifications

	Min	Nom	Max	Units	Notes
Input					
Voltage	3.0	3.3	3.6	Vdc	3.1Vin startup
	4.5	5	5.5	Vdc	4.75Vin startup
Current		7		A	
Remote Enable					
High = Disable	2.4			Vdc	Source 500 µA
Low = Enable			0.4	Vdc	Open=Enable
Output					
Current	0		6	A	5Vin
	0.3		6	A	3.3Vin
	0		6	A	3.3Vin optional -M
Sense Compensation	-100		+100	mV	
Voltage Setpoint Accuracy		±0.5	±0.75	%Vnom	±3% for S6A-3SA
Voltage Trim Range	-7		+7	%Vnom	5Vin
Line Regulation		±0.1		%Vnom	
Load Regulation		±0.3		%Vnom	0.2% w/o remote sense
Current Limit	6.6			A	
Dynamic Response					
0 to 100% load		200		mV	Δi/Δt = 3A/µs
		19		µs	
100 to 0% load		200		mV	Δi/Δt = 3A/µs
		19		µs	
Temperature Regulation			±0.02	%Vo/°C	
General					
MTBF		1,677		k Hrs	22°C, 80% load,S6A-3SA
Operating Temperature	-25		85	°C	
Storage Temperature	-55		125	°C	
Switching Frequency		500		kHz	

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Electrical Specifications

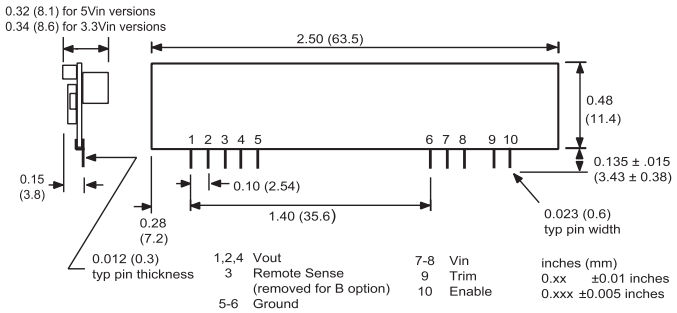
	Nominal Input (V)	Output Voltage (V)	Output Current (A)	Ripple (mV pp) typ	Efficiency (%) typ
S6A-3SA*	3.3	1.3-2.5	6	100	92
S6A-5S3.3-E	5	3.3	6	100	90
S6A-5S2.6-E	5	2.6	6	100	
S6A-5S2.5-E	5	2.5	6	100	
S6A-5S1.9-E	5	1.9	6	100	
S6A-5S1.8-E	5	1.8	6	100	
S6A-5S1.5-E	5	1.5	6	100	

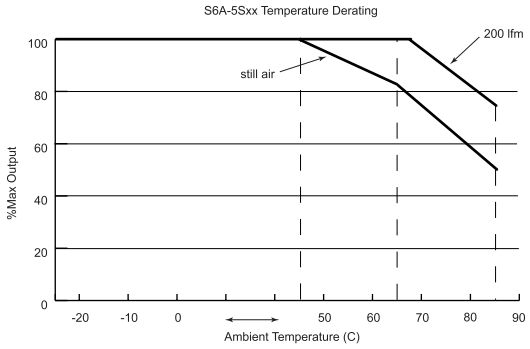
*Adjustable output. Voltage determined by trim resistor.

Standard Options

Add option designators to the end of the part number. Example; S6A-5S3.3-BE

Option	Description
B	No Remote Sense option removes sense pin
M	No minimum load (available on S6A-3SA)





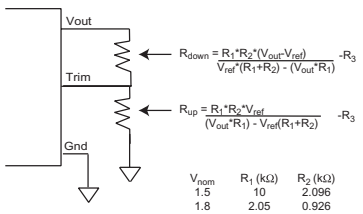
S6A-3SA Output Voltage Selection

$$R_2 + 53.6k\Omega = \frac{49.9}{\frac{V_{out}}{1.3} - 1}$$

V_{out}	R_2*
1.3V	Open
1.5V	267 kΩ
1.8V	76.8 kΩ
1.9V	53.6 kΩ
2.5V	0 kΩ

*Use 1% resistors
Attach R_2 between Trim and GND.

S6A Trim Circuit
5Vin only

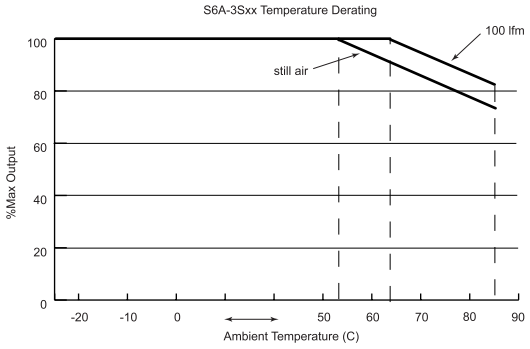


$$R_{down} = \frac{R_1 * R_2 * (V_{out} - V_{ref})}{V_{ref} * (R_1 + R_2) - (V_{out} * R_1)} - R_3$$

$$R_{up} = \frac{R_1 * R_2 * V_{ref}}{(V_{out} * R_1) - V_{ref}(R_1 + R_2)} - R_3$$

V_{nom}	R_1 (kΩ)	R_2 (kΩ)
1.5	10	2.096
1.8	2.05	0.926
1.9	2.05	1.091
2.05	2.05	1.339
2.5	2.05	2.083
2.6	2.05	2.248
3.3	1.24	2.06

R_3 = 6.8 kΩ
V_{ref} = 1.24 V



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