

SIP20 SERIES

Single output



[2 YEAR WARRANTY]

- Industry standard footprint
- High power density (60W/in³)
- High Efficiency 90% to 95%
- MTBF >9.6 million hours (Bellcore 332)
- Adjustable output voltage
- Fixed frequency (500kHz)
- Remote ON/OFF
- Undervoltage lockout (UVLO)
- Remote sense option

The SIP20 series are non-isolated DC/DC converters packaged in a single-in-line footprint (2.5 x 0.55 x 0.23 inches) giving designers a cost effective solution for conversion of 5VDC to 3.3VDC and lower voltages. Design flexibility is ensured with local voltage conversion by the SIP20 from existing system voltages by eliminating the need for redesign of existing power architectures. The SIP20 was designed for applications that include distributed power, workstations, computers and file servers. Implementing state of the art surface mount technology and automated manufacturing techniques, the SIP20 offers 9.6 million hours MTBF, compact size and efficiencies of 90%.

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

OUTPUT SPECIFICATIONS		
Voltage adjustability	See Note 6	60% to 115%
Set point accuracy	See Note 1	±2.7%
Line regulation	Vin 4.5V to 5.5V	±0.3% typ.
Load regulation	I _o = 0A to 6A	±0.3% typ.
Minimum load		0
Overshoot/undershoot		None
Ripple and noise	0 to 20MHz BW See Note 10	100mV pk-pk, 30mV rms max.
Temperature coefficient		±0.01%/°C
Transient response	See Note 2	±2.0% max. deviation 300µs recovery to within ±1.0%
Remote sense	See Note 7	0.5VDC compensation
INPUT SPECIFICATIONS		
Input voltage range		4.5 to 5.5VDC
Input current	No load	35mA typ.
Input current (max.)		5.3A max. @ I _o max. and Vin = 0 to 5.5V
Input reflected ripple	See Note 3	200mA typ., 100mA typ.
Remote ON/OFF Logic compatibility		See Note 5 Ref. to ground
ON		1VDC max. or open circuit
OFF		3.2VDC min.
Undervoltage lockout (UVLO)		Vin <3.5VDC
Start-up time		1.0ms, max.
Integral input cap.	See Note 7	Option
External capacitor	See Note 4	100µF

EMC CHARACTERISTICS ^(4,7)		
Radiated emissions	EN55022/11, FCC part 15	Level A
Electrostatic discharge	EN61000-4-2, IEC801-2	
GENERAL SPECIFICATIONS		
Efficiency		90% typ.
Isolation voltage		Non-isolated
Switching frequency	Fixed	500kHz typ.
Approvals and standards	Note 8	VDE0805, EN60950, IEC950 UL1950, CSA C22.2 No. 950
Material flammability		UL94V-0
Dimensions	(LxWxH)	63.5 x 13.97 x 5.84 mm 2.5 x 0.55 x 0.23 inches
Pin length		0.12 ±0.02 inches (3 ±0.5mm)
Weight		8.4g (0.3oz)
MTBF	Bellcore 332 MIL-HDBK-217F	>9,600,000 hours >2,500,000 hours
ENVIRONMENTAL SPECIFICATIONS		
Thermal performance	Operating ambient, convection cooled	See curve
	Operating ambient, 300LFM forced air	-25°C to +85°C See Curve
	Non-operating	-55°C to +100°C
Altitude	Operating Non-operating	10,000 feet max. 40,000 feet max.
Vibration	5Hz to 500Hz	2.4G rms (approx.)

International Safety Standard Approvals

 VDE0805/EN60950/IEC950 File No. 10401-3336-0105

 UL1950 File No. E136005

 CSA 22.2 No. 950 File No. LR41062C

20 Watt Non-isolated DC/DC regulators

OUTPUT POWER (MAX.)	INPUT VOLTAGE	OUTPUT VOLTAGE	OUTPUT CURRENT (MIN.)	OUTPUT CURRENT (MAX.)	EFFICIENCY (TYP.)	REGULATION		MODEL NUMBER (7)
						LINE	LOAD	
20W	4.5-5.5VDC	3.3V	0A	6A	90%	±0.3%	±0.3%	SIP20-05S3V3
15W	4.5-5.5VDC	2.5V	0A	6A	82%	±0.3%	±0.3%	SIP20-05S2V5
9W	4.5-5.5VDC	1.5V	0A	6A	75%	±0.3%	±0.3%	SIP20-05S1V5

Notes

- 1 Vin = 5.0V, Io = full load, TA = 25°C. ±4.5% over all operating conditions. Resistive load and temperature until end of life.
- 2 di/dt = 1A/1µs, Vin = 5VDC, Tc = 25°C, load change = 0.5 Io max. to Io max. and Io max. to 0.5 Io max.
- 3 200mA typical with simulated source impedance of 500nH. Source impedance from 5Hz to 20MHz.
- 4 An external capacitor is required for filtering. Use a 100µF with ESR = 0.045Ω max. at 100kHz @ 25°C.
- 5 Referenced to +Vin for shutdown.
- 6 Voltage adjustability for SIP20-05S1V5 is 67% to 130%. Voltage adjustability for SIP20-05S2V5 is 60% to 110%.
- 7 Combined option with remote sense and input filter capacitor. Removes the need for external capacitance required for operation. Single line sense: 0.5VDC compensation. Designate with the suffix 'RF' e.g. SIP20-05S3V3RF. RF suffix not available for SIP20-05S2V5.
- 8 This product is only for inclusion by professional installers within other equipment and must not be operated as a stand alone product.
- 9 For additional output configurations, please consult factory.
- 10 0-20MHz BW, 0.1µF ceramic, 1µF tantalum and scope socket measurement.
- 11 A short from +Vout to ground of less than 100mΩ may cause the unit to enter a non-destructive latch-up mode. If latch-up does occur the power supply to the unit must be recycled.

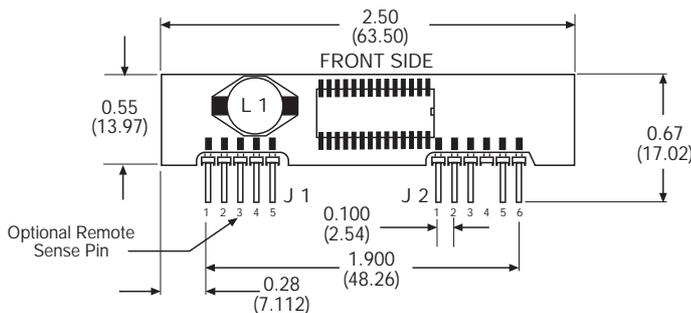
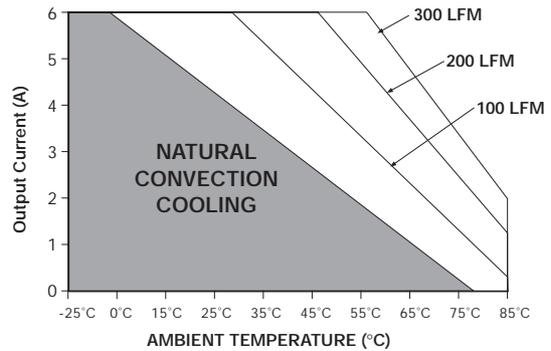
PROTECTION	
Short circuit protection	Continuous, 9.5A max., See Note 11
Input surge protection	5.5VDC max.
Overvoltage protection	None, implemented via external circuitry
Undervoltage protection	UVLO Vin < 3.5V
Thermal protection	Non-latching, pin 11 of IC1 should never exceed 110°C, 40°C hysteresis

EXTERNAL OUTPUT TRIMMING

Output can be externally trimmed by using either method shown below.

1	+Vout
2	+Vout
3	Opt. Remote Sense (+)
4	+Vout
5	Ground
J2 PIN CONNECTIONS	
PIN NUMBER	FUNCTION
1	Ground
2	+Vin
3	+Vin
4	No Pin
5	Trim
6	Remote ON/OFF

DERATING CURVE



ALL DIMENSIONS IN INCHES (mm)

Tolerances unless otherwise specified
 .xx = ± 0.02
 .xxx = ± 0.010

Option without Capacitors on Back Side

