

# SIP20C Series

## Single output

- Updated version of SIP20
- Best-of-class wide output trim range
- Industry standard footprint
- High power density (60W/in<sup>3</sup>)
- High Efficiency 90%
- Fixed frequency (500kHz)
- Remote ON/OFF
- Undervoltage lockout (UVLO)
- Remote sense option



**2 YEAR WARRANTY**

The SIP20C 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. The SIP20C offers a best-of-class wide output trim range which allows maximum design flexibility and a pathway for future upgrades. For example, the 1.5V model can be trimmed as low as 1V. Local voltage conversion by the SIP20C from existing 5V system voltages eliminates the need for redesign of existing power architectures when voltage requirements change. The SIP20C is 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 SIP20C offers compact size and efficiencies of 90%. The SIP20C is an updated version of the original SIP20 and is fully compatible with the original model.

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

### SPECIFICATIONS

#### OUTPUT SPECIFICATIONS

|                                    |                                |   |
|------------------------------------|--------------------------------|---|
| Voltage adjustability              | S3V3<br>S2V5<br>S1V5           | 60% to 115%<br>60% to 110%<br>87% to 130%                 |
| Set point accuracy                 | (See Note 1)                   | ±2.7%   |
| Line regulation                    | V <sub>in</sub> = 4.5V to 5.5V | ±0.3%   |
| Load regulation                    | I <sub>o</sub> = 0A to 6A      | ±0.3%   |
| Minimum load                       |                                | 0A  |
| Overshoot/undershoot               |                                | None  |
| Ripple and noise<br>(See Note 8)   | 0 to 20MHz BW                  | 100mV pk-pk,<br>30mV rms max.                             |
| Temperature coefficient            |                                | ±0.01%/°C   |
| Transient response<br>(See Note 2) |                                | ±2.0% max. deviation<br>300µs recovery<br>to within ±1.0% |
| Remote sense                       | (See Note 6)                   | 0.5VDC compensation                                       |

#### INPUT SPECIFICATIONS

|                        |  |               |
|------------------------|--|---------------|
| Input voltage range    |  | 4.5 to 5.5VDC |
| Input current          | No load  | 150mA         |
| Input current          | @ I <sub>o</sub> max. and<br>V <sub>in</sub> = 0 to 5.5V | 5.3A max.     |
| Input reflected ripple | (See Note 3)   | 200mA         |
| Remote ON/OFF          |  | (See Note 5)  |
| Start-up time          |  | 1.0ms         |
| External capacitor     | (See Note 4)   | 100µF         |

#### EMC CHARACTERISTICS <sup>(4)</sup>

|                         |                         |         |
|-------------------------|-------------------------|---------|
| Radiated emissions      | EN55022/11, FCC part 15 | Level A |
| Electrostatic discharge | EN61000-4-2, IEC801-2   |         |


#### GENERAL SPECIFICATIONS

|   |               |   |
|---|---------------|---|
| Efficiency                              |               | See table   |
| Isolation voltage                       |               | Non-isolated  |
| Switching frequency                     | Fixed         | 500kHz typ.   |
| Approvals and standards<br>(See Note 7) |               | VDE0805, EN60950, IEC950<br>UL1950, CSA C22.2 No. 950 |
| Material flammability                   |               | UL94V-0   |
| Dimensions                              | (LxWxH)       | 63.5 x 13.97 x 5.84 mm<br>2.5 x 0.55 x 0.23 inches    |
| Pin length                              |               | 0.135 ±0.02 inches (3.43 ±0.5mm)                      |
| Weight                                  |               | 5g (0.18oz)   |
| MTBF                                    | MIL-HDBK-217F | >1,000,000 hours                                      |


#### ENVIRONMENTAL SPECIFICATIONS

|                     |   |                             |
|---------------------|---|-----------------------------|
| Thermal performance | Operating ambient,<br>convection cooled | See curve                   |
|                     | Operating ambient,<br>300LFM forced air | -25°C to +85°C<br>See Curve |
|                     | Non-operating                           | -55°C to +100°C             |
| Altitude            | Operating                               | 10,000 feet max.            |
|                     | Non-operating                           | 40,000 feet max.            |
| Vibration           | 5Hz to 500Hz                            | 2.4G rms (approx.)          |

#### International Safety Standard Approvals

 VDE0805/EN60950/IEC950 pending

 UL1950

 CSA 22.2 No. 950 pending

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## Single output

For the most current data and application support visit [www.artesyn.com/powergroup/products.htm](http://www.artesyn.com/powergroup/products.htm)

| OUTPUT POWER (MAX.) | INPUT VOLTAGE | OUTPUT VOLTAGE | OUTPUT CURRENT (MIN.) | OUTPUT CURRENT (MAX.) | EFFICIENCY (TYP.) | REGULATION |       | MODEL NUMBER (6) |
|---------------------|---------------|----------------|-----------------------|-----------------------|-------------------|------------|-------|------------------|
|                     |               |                |                       |                       |                   | LINE       | LOAD  |                  |
| 20W                 | 4.5-5.5VDC    | 3.3V           | 0A                    | 6A                    | 90%               | ±0.3%      | ±0.3% | SIP20C-05S3V3    |
| 15W                 | 4.5-5.5VDC    | 2.5V           | 0A                    | 6A                    | 82%               | ±0.3%      | ±0.3% | SIP20C-05S2V5    |
| 9W                  | 4.5-5.5VDC    | 1.5V           | 0A                    | 6A                    | 75%               | ±0.3%      | ±0.3% | SIP20C-05S1V5    |

### Notes

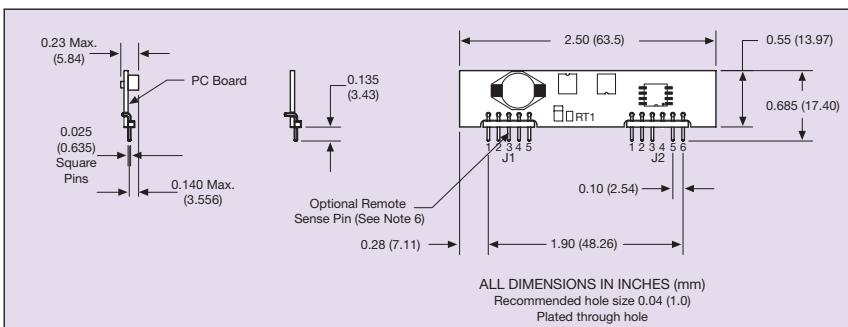
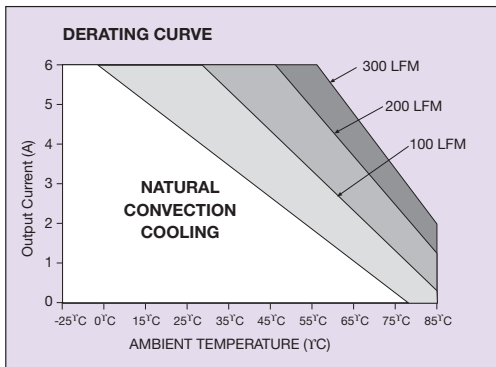
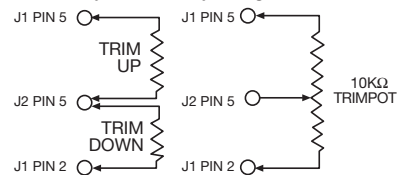
- 1  $V_{in} = 5.0V$ ,  $I_o = \text{full load}$ ,  $T_A = 25^\circ C$ . Total error band  $\pm 4.5\%$  over all operating conditions and temperatures until end of life.
- 2  $di/dt = 1A/1\mu s$ ,  $V_{in} = 5VDC$ ,  $T_c = 25^\circ C$ , load change = 0.5  $I_o$  max. to  $I_o$  max. and  $I_o$  max. to 0.5  $I_o$  max.
- 3 With simulated source impedance of 500nH. 5Hz to 20MHz.
- 4 Use a 100 $\mu F$  with ESR = 0.045 $\Omega$  max. at 100kHz @ 25 $^\circ C$ .
- 5 Referenced to ground for shutdown. If pin 6 is high unit will shut down. If pin 6 is open unit will operate as normal.
- 6 Single line sense; 0.5VDC compensation. Designate with the suffix 'R' e.g. SIP20C-05S3V3R.
- 7 This product is only for inclusion by professional installers within other equipment and must not be operated as a stand alone product.
- 8 0-20MHz BW, 0.1 $\mu F$  ceramic, 1 $\mu F$  tantalum on output.
- 9 A short from +Vout to ground of less than 100m $\Omega$  may cause the unit to enter a non-destructive latch-up mode. If latch-up does occur the power supply to the unit may need to be cycled.

### PROTECTION

|                          |  |
|--------------------------|--|
| Short circuit protection | Continuous (See Note 9)  |
| Input surge protection   | 6VDC continuous max.   |
| Undervoltage protection  | UVLO $V_{in} < 3.8V$   |
| Thermal protection       | Automatic recovery, unit will shut down if RT1 exceeds 85 $^\circ C$ (See diagram below) |

### EXTERNAL OUTPUT TRIMMING

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



### J1 PIN CONNECTIONS

| PIN NUMBER | FUNCTION              |
|------------|-----------------------|
| 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 |

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