

## LGA C Series

15 - 100 Watts

### Data Sheet

**Total Power:** 15 - 100 W  
**# of Outputs:** Single

### SPECIAL FEATURES

- 3, 6, 10 and 20 A output current rating
- Wide input voltage range; up to 14 V
- Adjustable output voltage; 0.59-5.1 V
- Excellent transient response
- High efficiency
- Output margining
- Power enable
- Minimal airflow requirement
- Termination voltage capability
- Ultra compact profile and footprint
- RoHS compliant
- Remote sense
- Termination voltage capability

### SAFETY

- Designed to meet EN60950
- International Standards for Solderability: J-STD-002B IEC-60068-2-58



### Electrical Specifications

| Output                                              |                                                                                                           | 3/6/10 A Models                                            |  | 20 A Model                                          |  |
|-----------------------------------------------------|-----------------------------------------------------------------------------------------------------------|------------------------------------------------------------|--|-----------------------------------------------------|--|
| Output voltage                                      | See Page 3                                                                                                | 0.59 - 5.1 V                                               |  |                                                     |  |
| Output setpoint accuracy                            | 0.1% trim resistors                                                                                       | ±1.0%                                                      |  |                                                     |  |
| Line regulation                                     |                                                                                                           | ±0.2%                                                      |  |                                                     |  |
| Load regulation                                     |                                                                                                           | ±0.5%                                                      |  |                                                     |  |
| Max Current Max Power                               |                                                                                                           | 15/30/50 W                                                 |  | 100 W                                               |  |
| Overshoot                                           | At turn-on                                                                                                | 0%                                                         |  |                                                     |  |
| Undershoot                                          | At turn-off                                                                                               | 0 mV                                                       |  |                                                     |  |
| Ripple and noise<br>5 Hz to 20 MHz                  | See Note 1<br>V <sub>in</sub> = 5 V, V <sub>out</sub> = 2.5 V                                             | 20/25/30 mV                                                |  | 30 mV                                               |  |
| Transient response                                  | See Notes 1 and 2<br>V <sub>in</sub> = 5 V, V <sub>out</sub> = 2.5 V                                      | 100/160/160 mV<br>15 μs recovery to within regulation band |  | 1175 mV<br>15 μs recovery to within regulation band |  |
| Input                                               |                                                                                                           |                                                            |  |                                                     |  |
| Input voltage range <sup>3</sup>                    |                                                                                                           | 3 - 14 Vdc                                                 |  | 4.5 - 14 Vdc                                        |  |
| Input current                                       | Enable On at (0 A)<br>Enable Off                                                                          | 50 mA<br>5 mA                                              |  |                                                     |  |
| Start-up time                                       | Power up<br>Enable On/Off                                                                                 | 3 ms<br>2 ms                                               |  |                                                     |  |
| General                                             |                                                                                                           |                                                            |  |                                                     |  |
| Efficiency                                          | V <sub>in</sub> = 5 V <sub>out</sub> , V <sub>O</sub> = 2.5 V,<br>I <sub>out</sub> = 50% I <sub>max</sub> | 92% typ.                                                   |  | 92% typ.                                            |  |
| Switching frequency                                 |                                                                                                           | 1 MHz                                                      |  | 800 kHz                                             |  |
| Material flammability                               |                                                                                                           | UL94V-0                                                    |  |                                                     |  |
| MTBF                                                | 12 V @ 40 °C<br>100% load<br>Bellcore 332                                                                 | > 20,000,000 hours                                         |  |                                                     |  |
| Coplanarity                                         |                                                                                                           | 150 μm                                                     |  |                                                     |  |
| Thermal performance<br>See Technical Reference Note | Operating ambient<br>Non-operating ambient                                                                | -40 °C to +85 °C<br>-40 °C to +125 °C                      |  |                                                     |  |

## Electrical Specifications

| Protection                             |                      |            |
|----------------------------------------|----------------------|------------|
| Short circuit                          | Hiccup, non-latching |            |
| Overvoltage                            | Hiccup, non-latching |            |
| Minimum Recommended System Capacitance | 3/6/10 A Model       | 20 A Model |
| Short circuit                          | 1 $\mu$ F            | 10 $\mu$ F |

## Ordering Information

| Standard Model Numbers | Output Power (Max.) | Input Voltage  | Output Voltage | Output Current |      | Efficiency (Typical) | Regulation  |             |
|------------------------|---------------------|----------------|----------------|----------------|------|----------------------|-------------|-------------|
|                        |                     |                |                | Min            | Max  |                      | Min         | Max         |
| LGA03C-00SADJJ         | 15 W                | 3 - 14.0 Vdc   | 0.59 - 5.1 Vdc | 0 A            | 3 A  | 92%                  | $\pm 0.2\%$ | $\pm 0.5\%$ |
| LGA06C-00SADJJ         | 30 W                | 3 - 14.0 Vdc   | 0.59 - 5.1 Vdc | 0 A            | 6 A  | 92%                  | $\pm 0.2\%$ | $\pm 0.5\%$ |
| LGA10C-00SADJJ         | 50 W                | 3 - 14.0 Vdc   | 0.59 - 5.1 Vdc | 0 A            | 10 A | 92%                  | $\pm 0.2\%$ | $\pm 0.5\%$ |
| LGA20C-01SADJJ         | 100 W               | 4.5 - 14.0 Vdc | 0.59 - 5.1 Vdc | 0 A            | 20 A | 91%                  | $\pm 0.2\%$ | $\pm 0.5\%$ |

## Model Number System with Options



| Product Family | Rated Output Current                                                                  | Performance                              | Input Voltage                                                | Type of Output                                    | Options                                               | RoHS Compliance                                            |
|----------------|---------------------------------------------------------------------------------------|------------------------------------------|--------------------------------------------------------------|---------------------------------------------------|-------------------------------------------------------|------------------------------------------------------------|
| <b>LGA</b>     | <b>XX</b>                                                                             | <b>C</b>                                 | <b>- 00</b>                                                  | <b>SADJ</b>                                       | <b>X</b>                                              | <b>J</b>                                                   |
|                | <b>Rated Output Current</b><br>03 = 3 Amp<br>06 = 6 Amp<br>10 = 10 Amp<br>20 = 20 Amp | <b>Performance</b><br>C = Cost Optimized | <b>Input Voltage</b><br>00 = 3 - 14.0 V<br>01 = 4.5 - 14.0 V | <b>Type of Output</b><br>Single Adjustable Output | <b>Options</b><br>X = Various Options (see Sales Rep) | <b>RoHS Compliance</b><br>J = Pb free (RoHS 6/6 compliant) |

## Heatsink Number System with Options



| Product Family  | Product       | Purpose               | Height*                                                                                |
|-----------------|---------------|-----------------------|----------------------------------------------------------------------------------------|
| <b>LGA</b>      | <b>- HTSK</b> | <b>- KIT</b>          | <b>- XXX</b>                                                                           |
| Land Grid Array | Heatsink      | Heatsink and Adhesive | <b>Total Height</b><br>(LGA20 + Heatsink)<br>045 = 0.45"<br>048 = 0.48"<br>050 = 0.50" |

\* Height is the total height of the LGA20C-00SADJJ with heatsink attached.

## Application Equations

### Setting Output Voltage

Default output voltage: 0.591 V

The output voltage may be adjusted with a resistor placed between the "Trim" and "-Sense" pin.

The formula for calculating the value of this resistor is:

$$R_{\text{trim}} (\text{k}\Omega) = \frac{1.182}{V_{\text{out}} - 0.591}$$

See Technical Reference Note for other trimming methods.

### Setting Margin Control

To margin the output up, pull the margin control pin high. To margin down, pull the margin control pin low. If the pin is left floating, the feature is disabled. The maximum margining range is  $\pm 33\%$  of the output default voltage setting, with maximum output at 5.5 V

$$V_{\text{margin\_up}} = 0.1182 * \frac{R_{\text{margin}}}{R_{\text{ofs+}}} * \frac{R_{\text{trim}} + 2\text{k}}{R_{\text{trim}}}$$

$$V_{\text{margin\_down}} = 0.1182 * \frac{R_{\text{margin}}}{R_{\text{ofs-}}} * \frac{R_{\text{trim}} + 2\text{k}}{R_{\text{trim}}}$$

### Setting Under Voltage Lock Out – 3, 6, 10 A Models

Default Turn-on voltage: 2.9 V (300 mV Hysteresis)

The Turn-on voltage may be adjusted with a resistor placed between the "Enable" and "Ground" pins.

The formula for calculating the value of this resistor is:

$$R_{\text{UVLO}} (\text{k}\Omega) = \frac{14.81 * 6.81}{(6.81 * V_{\text{Turn\_on}}) - 18.16}$$

**\*ONLY USE WITH OPEN COLLECTOR DEVICE**  
**\*DO NOT DRIVE PIN WITH A VOLTAGE**

### Setting Under Voltage Lock Out – 20 A Models

Default Turn-on voltage: 4.3 V (300 mV Hysteresis)

The Turn-on voltage may be adjusted with a resistor placed between the "Enable" and "Ground" pins.

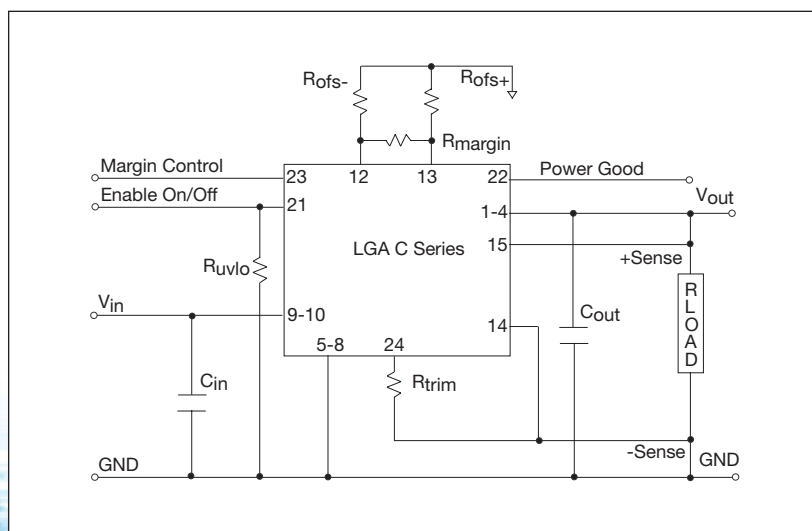
The formula for calculating the value of this resistor is:

$$R_{\text{UVLO}} (\text{k}\Omega) = \frac{30.1 * 4.22}{(8.577 * V_{\text{Turn\_on}}) - 34.32}$$

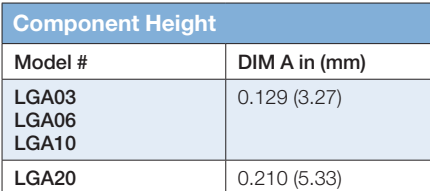
**\*ONLY USE WITH OPEN COLLECTOR DEVICE**  
**\*DO NOT DRIVE PIN WITH A VOLTAGE**

#### Notes:

1. Measured as per recommended minimum system capacitance.
2.  $di/dt = 10 \text{ A}/\mu\text{s}$ ,  $12 \text{ V}_{\text{in}} = \text{Norm}$ ,  $T_c = 25^\circ\text{C}$ , load change = 50% to 100%  $I_{\text{max}}$ .
3. Internal input capacitance is rated 16 Vdc maximum.



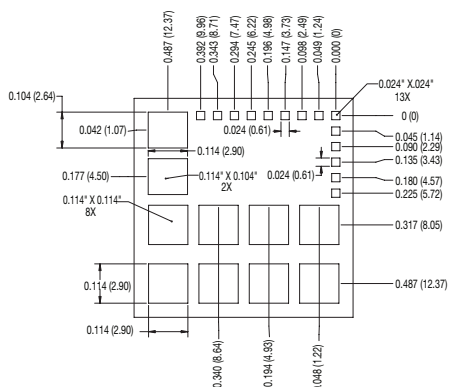
External input fusing is recommended.



## Pin Assignments



### Recommended Solder Paste Stencil



## LGA3-20C DS 03Nov2015