

LGA C Series

15-100 Watts

Total Power: 15-100 Watts
No. of Outputs: Single

Special Features

- 3,6,10,15 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 | 15/20 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 | 75/100 W |
| Overshoot | At turn-on | 0% | |
| Undershoot | At turn-off | 0 mV | |
| Ripple and noise 5 Hz to 20 MHz | See Note 1 $V_{in} = 5 V, V_{out} = 2.5 V$ | 20/25/30 mV | 20/30 mV |
| Transient response | See Notes 1 and 2 $V_{in} = 5 V, V_{out} = 2.5 V$ | 100/160/160 mV 15 μ s recovery to within regulation band | 160/175 mV 15 μ s recovery to within regulation band |
| Input | | | |
| Input voltage range ³ | | 3-14 Vdc | 4.5-14 Vdc |
| Input current | Enable On at (0 A) Enable Off | 50 mA 5 mA | |
| Start-up time | Power up Enable On/Off | 3 ms 2 ms | |
| General | | | |
| Efficiency | $V_{in}=5 V_{out}, V_o=2.5 V,$ $I_{out} = 50\% I_{max}$ | 92% typ. | 93/92% typ. |
| Switching frequency | | 1 MHz | 800 kHz |
| Material flammability | | UL94V-0 | |
| MTBF | 12 V @ 40 °C 100% load Bellcore 332 | > 20,000,000 hours | |
| Coplanarity | | 150 μ m | |

Electrical Specifications (cont'd)

| | | |
|---|--|---------------------------------------|
| Thermal performance See Technical Reference Note | Operating ambient Non-operating ambient | -40 °C to +85 °C -40 °C to +125 °C |
|---|--|---------------------------------------|

Protection

| | |
|---------------|----------------------|
| Short circuit | Hiccup, non-latching |
| Overvoltage | Hiccup, non-latching |

| Minimum Recommended System Capacitance | 3/6/10 A Model | 20 A Model |
|--|----------------|------------|
| Input capacitance | 1 µF | 10 µF |
| Output capacitance | 10 µF | 50 µF |

Operating Information

| Output Power (Max.) | Input Voltage | Output Voltage | Output Current (Min.) | Output Current (Max.) | Efficiency (Typical) | Regulation Line | Regulation Load | Standard Model Numbers |
|---------------------|---------------|----------------|-----------------------|-----------------------|----------------------|-----------------|-----------------|------------------------|
| 15 W | 3-14.0 Vdc | 0.59-5.1 Vdc | 0 A | 3 A | 92% | ±0.2% | ±0.5% | LGA03C-00SADJJ |
| 30 W | 3-14.0 Vdc | 0.59-5.1 Vdc | 0 A | 6 A | 92% | ±0.2% | ±0.5% | LGA06C-00SADJJ |
| 50 W | 3-14.0 Vdc | 0.59-5.1 Vdc | 0 A | 10 A | 92% | ±0.2% | ±0.5% | LGA10C-00SADJJ |
| 75 W | 4.5-14.0 Vdc | 0.59-5.1 Vdc | 0 A | 15 A | 93% | ±0.2% | ±0.5% | LGA15C-01SADJJ |
| 100 W | 4.5-14.0 Vdc | 0.59-5.1 Vdc | 0 A | 20 A | 91% | ±0.2% | ±0.5% | LGA20C-01SADJJ |

Model Number System with Options



| Product Family | Rated Output Current | Performance | Input Voltage | Type of Output | Options | RoHS Compliance |
|----------------|---|-----------------------------------|---|--|--|---|
| LGA | XX | C | - 00 | SADJ | X | J |
| | Rated Output Current 03 = 3 Amp 06 = 6 Amp 10 = 10 Amp 15 = 15 Amp 20 = 20 Amp | Performance C = Cost Optimized | Input Voltage 00 = 3-14.0 V 01 = 4.5-14.0 V | Type of Output Single Adjustable Output | Options X = Various Options (see Sales Rep) | RoHS Compliance J = Pb free (RoHS 6/6 compliant) |

Heatsink Number System with Options



| Product Family | Product | Purpose | Height* |
|-----------------|---------------|-----------------------|--|
| LGA | - HTSK | - KIT | - XXX |
| Land Grid Array | Heatsink | Heatsink and Adhesive | Total Height (LGA20 + Heatsink) 045 = 0.45" 048 = 0.48" 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 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 - 15 and 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:

$$R_{\text{UVlo}}(\text{k}\Omega) = \frac{30.1 * 4.22}{(8.577 * V_{\text{Turn_on}}) - 34.32}$$

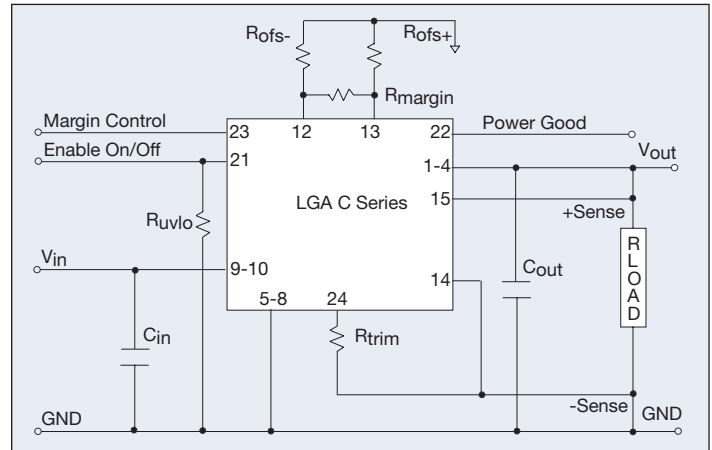
*** ONLY USE WITH OPEN COLLECTOR DEVICE**
*** DO NOT DRIVE PIN WITH A VOLTAGE**

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

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

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

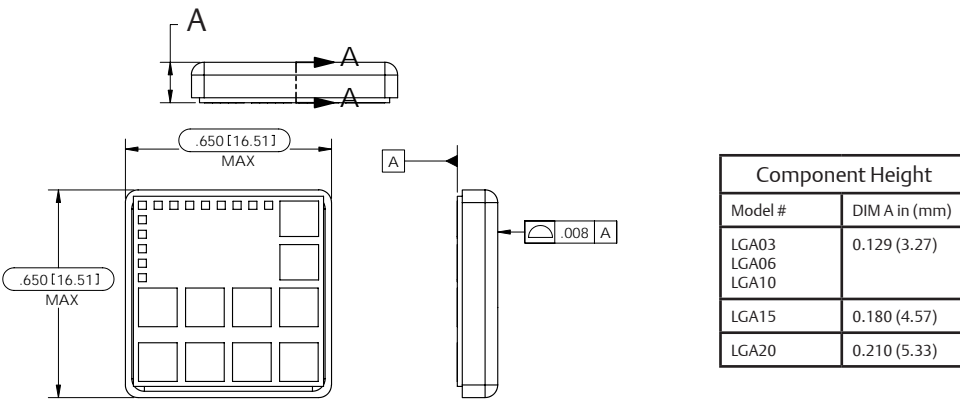


External input fusing is recommended.

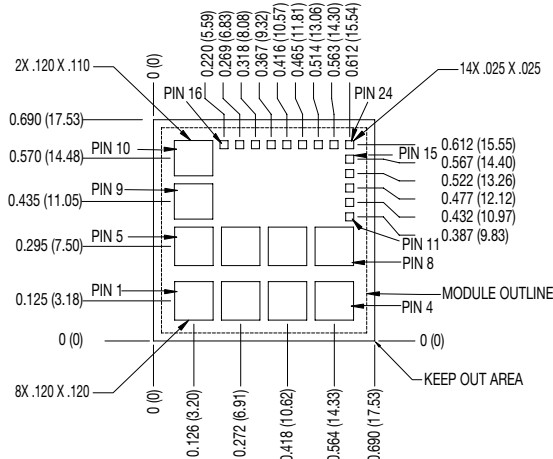
Notes:

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

Mechanical Drawing and Footprint

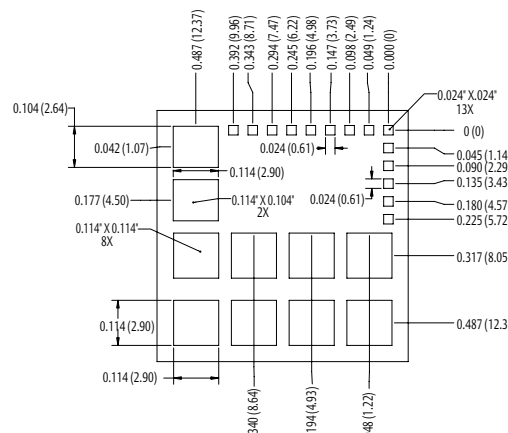


Recommended System Board Footprint



Tolerance Note: ± 0.010 (0.25)

Recommended Solder Paste Stencil



Pin Assignments

Single Output

| | |
|----|----------------|
| 1 | Vout |
| 2 | Vout |
| 3 | Vout |
| 4 | Vout |
| 5 | GND |
| 6 | GND |
| 7 | GND |
| 8 | GND |
| 9 | Vin |
| 10 | Vin |
| 11 | NC |
| 12 | - Offset |
| 13 | + Offset |
| 14 | - Sense |
| 15 | + Sense |
| 16 | NC |
| 17 | NC |
| 18 | NC |
| 19 | NC |
| 20 | NC |
| 21 | Enable |
| 22 | Power Good |
| 23 | Margin Control |
| 24 | Trim |

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