# ARTESYN LGA80D SERIES

Dual O/P Non-isolated 80 A Digital DC/DC Converter




Advanced Energy's Artesyn LGA80D is a non-isolated DC-DC converter that is designed for cost and space sensitive applications.

This non-isolated unit offers two independent and configurable 40 amp, 100 watt outputs, which can also be combined to a single configurable 80 amp, 200 watt output. With a footprint of 1 x 0.5 inches or 25.4 x 12.5 mm.

DATA SHEET

**Total Current:**

80 A (single)
40 A (dual)

**Input Voltage:**

7.5 - 14 Vdc

**Variable Output:**

0.6 - 5.2 V

## SPECIAL FEATURES

- Two-phase design
- Dual or single output configuration possible
- High efficiency up to 95.5%
- Small size 1" x 0.5" x 0.48" (LxWxH)
- Supports PMBus
- No minimum load requirement
- Wide operating temperature range
- Exceptional power density
- Automatic loop compensation
- Excellent transient response
- Analog or digital control
- IPC9592B compliant
- Tape and reel packaging
- Reflow compatible
- Possible to stack up to 8 phases for 320 A
- Two year warranty (Consult factory for extended terms)

## SAFETY

- Designed to meet IEC62368

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## ELECTRICAL SPECIFICATIONS

| | | |
|---|---|---|
| **Input** | | |
| Input voltage range | 7.5 -14 Vdc | |
| Max input current @ 7.5 V | 33 A | |
| Input capacitor (internal) | 120 µF | |
| **Environmental and General Information** | | |
| Operating ambient temperature | -40 °C to +85 °C | |
| Storage temperature | -40 °C to +125 °C | |
| Switching frequency (RSYNC = 23.7 Kohm) | 457 kHz typical (can be configured) | |
| CMTBF Telcordia SR-332, Issue 3, Method 1 Case 1 | 50 MHours | |
| **Protection** | | |
| Overcurrent protection | Refer to application note for detail | |
| Overvoltage protection | 110% Vo nominal | |
| Overtemperature protection (controller temperature) | 120 °C nominal | |
| **Output*** | | |
| Independent output 1 and 2 | 0.6 V to 1 V<br>1.8 V<br>2.5 V<br>3.3 V<br>5 V | 40 A<br>35 A<br>32.5 A<br>30 A<br>20 A |
| Combined output 1 and 2 | 0.6 V to 1 V<br>1.8 V<br>2.5 V<br>3.3 V<br>5 V | 80 A<br>70 A<br>65 A<br>60 A<br>40 A |
| Efficiency at 11 Vin and 25 °C | 1 V @ 80 A<br>1.8 V @ 70 A<br>2.5 V @ 65 A<br>3.3 V @ 60 A<br>5 V @ 40 A | 89.9% typical<br>93% typical<br>94.5% typical<br>95% typical<br>95.5% typical |
| Max output power (Watts) | 200 W | |

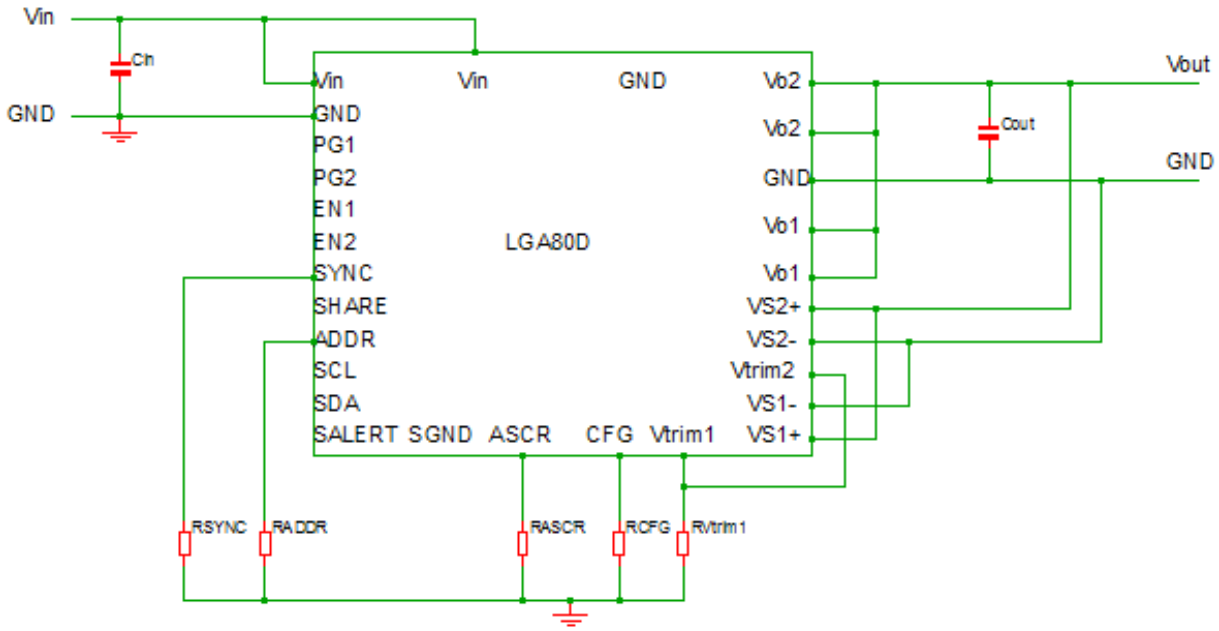
*Output @ Vin = 12 V, Ta = 25 °C, unless otherwise noted

| Parameter | Conditions | Min | Nom | Max |
|---|---|---|---|---|
| Line regulation<br>0.6 ~ 1.0 V<br>1.0 ~ 5.0 V | Measured at remote sense | — | <br>2 mV<br>0.2% | — |
| Load regulation<br>0.6 ~ 1.0 V<br>1.0 ~ 5.0 V | Measured at remote sense | — | <br>5 mV<br>0.5% | — |
| Output capacitor per output (external minimum) | 2 x 220 µF / 6.3 V polymer tan caps (6TPF220M5L or equivalent<br>3 x 100 µF / 6.3 V ceramic caps | — | 740 µF | — |
| Ripple and noise (with minimum caps) 5 Hz to 20 MHz<br>0.6 to 1.8 V<br>2.5 V to 3.3 V<br>5.0 V | One module one output | <br>—<br>—<br>— | <br>15 mV<br>25 mV<br>40 mV | <br>—<br>—<br>— |
| Ripple and noise (with minimum caps) 5 Hz to 20 MHz<br>0.6 to 1.8 V<br>2.5 V to 3.3 V<br>5.0 V | One module two outputs | <br>—<br>—<br>— | <br>18 mV<br>35 mV<br>50 mV | <br>—<br>—<br>— |

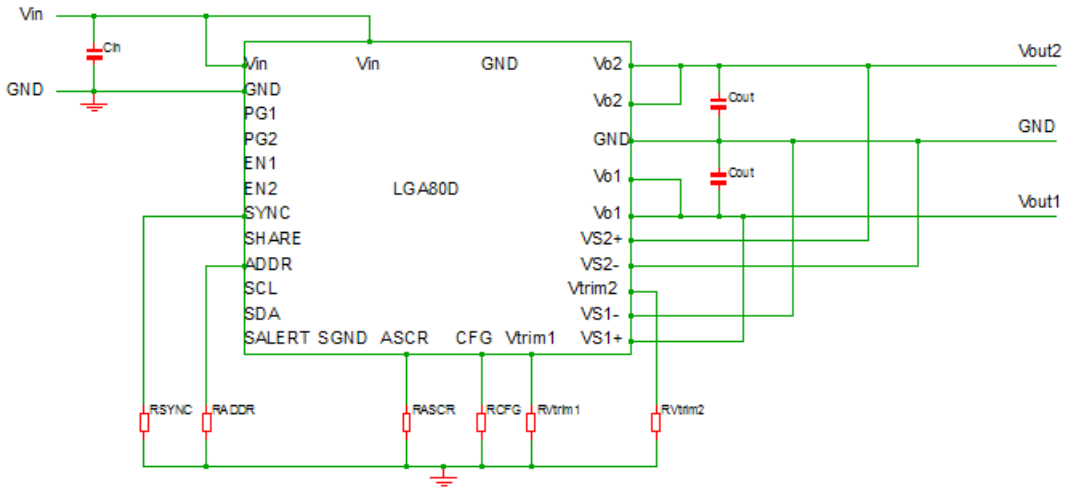
## ORDERING INFORMATION

| Model Number | Input Voltage | Output Voltage Set Point | Output Current | Efficiency |
|---|---|---|---|---|
| LGA80D-00DADJJ | 7.5 - 14 Vdc | See table | 80 A max | See table |

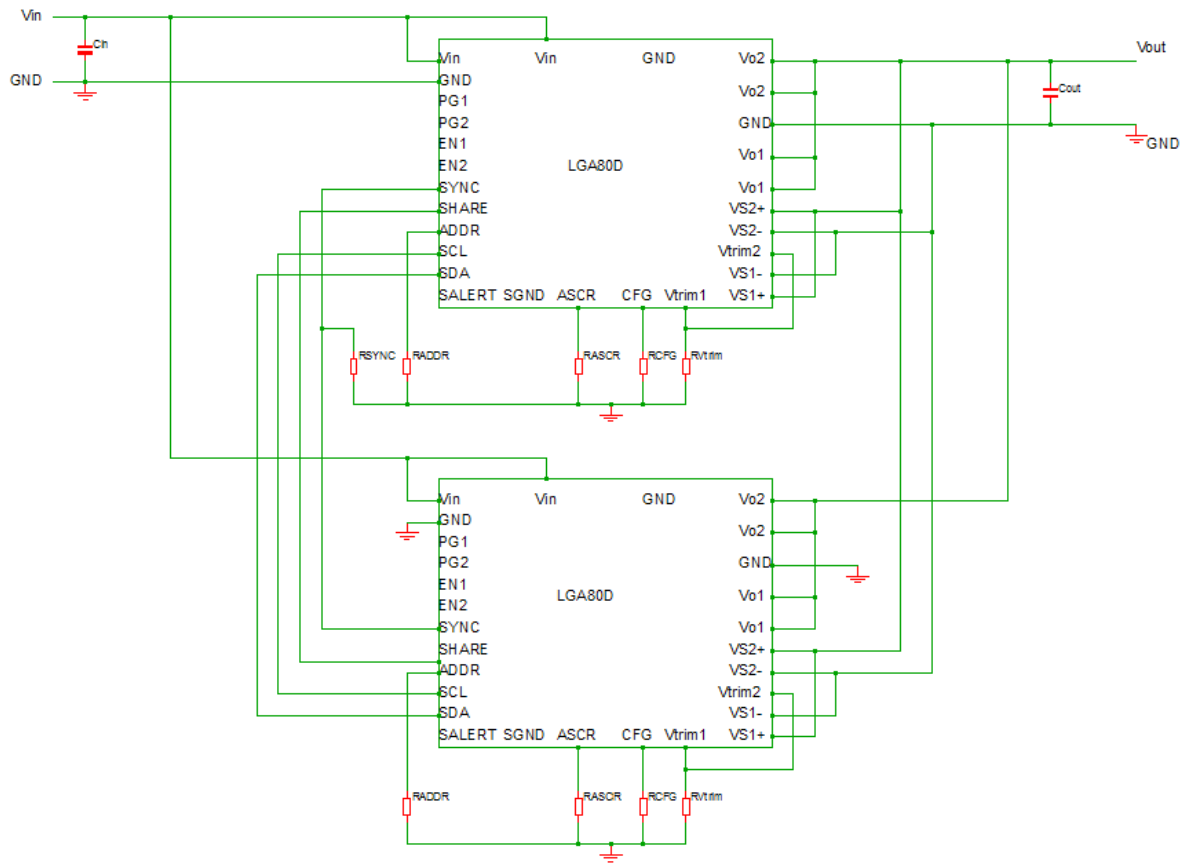
## BLOCK DIAGRAM - ONE MODULE ONE OUTPUT



## BLOCK DIAGRAM - ONE MODULE TWO OUTPUTS




## BLOCK DIAGRAM - TWO MODULES ONE OUTPUT

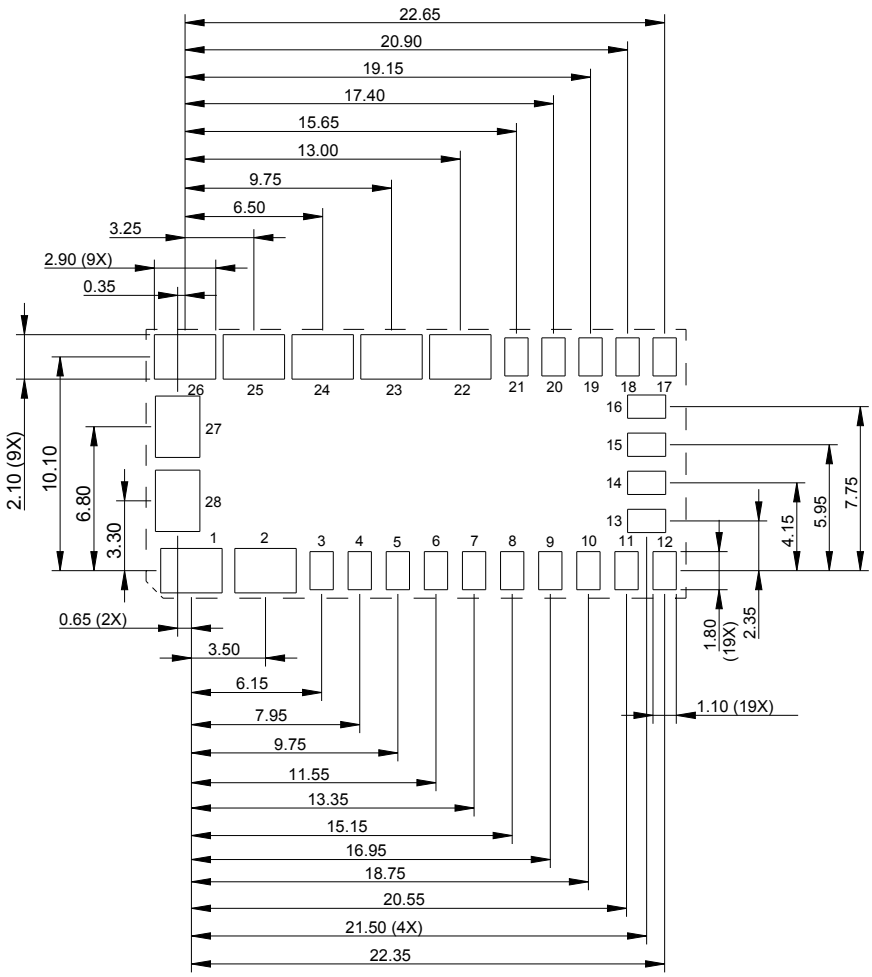


## VOUT & ADDRESS SETTINGS

| Vout Setting | |
|---|---|
| RVtrim (kΩ) | Vout (V) |
| LOW | 1 |
| OPEN | 1.2 |
| HIGH | 0.9 |
| 10 | 0.6 |
| 11 | 0.65 |
| 12.1 | 0.7 |
| 13.3 | 0.75 |
| 14.7 | 0.8 |
| 16.2 | 0.85 |
| 17.8 | 0.9 |
| 19.6 | 0.95 |
| 21.5 | 1 |
| 23.7 | 1.05 |
| 26.1 | 1.1 |
| 28.7 | 1.15 |
| 31.6 | 1.2 |
| 34.8 | 1.25 |
| 38.3 | 1.3 |
| 42.2 | 1.4 |
| 46.4 | 1.5 |
| 51.1 | 1.6 |
| 56.2 | 1.7 |
| 61.9 | 1.8 |
| 68.1 | 1.9 |
| 75 | 2 |
| 82.5 | 2.1 |
| 90.9 | 2.2 |
| 100 | 2.3 |
| 110 | 2.5 |
| 121 | 2.8 |
| 133 | 3 |
| 147 | 3.3 |
| 162 | 4 |
| 178 | 5 |

| Address Setting | |
|---|---|
| RADDR (kΩ) | SMbus ADDRESS |
| LOW | 40h |
| OPEN | 42h |
| 10 | 41h |
| 11 | 43h |
| 12.1 | 44h |
| 13.3 | 45h |
| 14.7 | 46h |
| 16.2 | 47h |
| 17.8 | 48h |
| 19.6 | 49h |
| 21.5 | 4Ah |
| 23.7 | 4Bh |
| 26.1 | 4Ch |
| 28.7 | 4Dh |
| 31.6 | 4Eh |
| 34.8 | 4Fh |
| 42.2 | 51h |
| 46.4 | 52h |
| 51.1 | 53h |
| 56.2 | 54h |
| 61.9 | 55h |
| 68.1 | 56h |
| 75 | 57h |
| 82.5 | 58h |
| 90.9 | 59h |
| 100 | 5Ah |
| 110 | 5Bh |
| 121 | 5Ch |
| 133 | 5Dh |
| 147 | 5Eh |
| 162 | 5Fh |
| 178 | 60h |

## MECHANICAL DRAWINGS




| Pin Assignments Single Output | |
|---|---|
| Pin # | Function |
| 1 | Vin |
| 2 | GND |
| 3 | PG1 |
| 4 | PG2 |
| 5 | EN1 |
| 6 | EN2 |
| 7 | SYNC |
| 8 | SHARE |
| 9 | ADDR |
| 10 | SCL |
| 11 | SDA |
| 12 | SALERT |
| 13 | SGND |
| 14 | ASCRCFG |
| 15 | CFG |
| 16 | Vtrim1 |
| 17 | VS1+ |
| 18 | VS1- |
| 19 | Vtrim2 |
| 20 | VS2- |
| 21 | VS2+ |
| 22 | Vo1 |
| 23 | Vo1 |
| 24 | GND |
| 25 | Vo2 |
| 26 | Vo2 |
| 27 | GND |
| 28 | Vin |

RECOMMENDED PAD LAYOUT (FOOTPRINT)

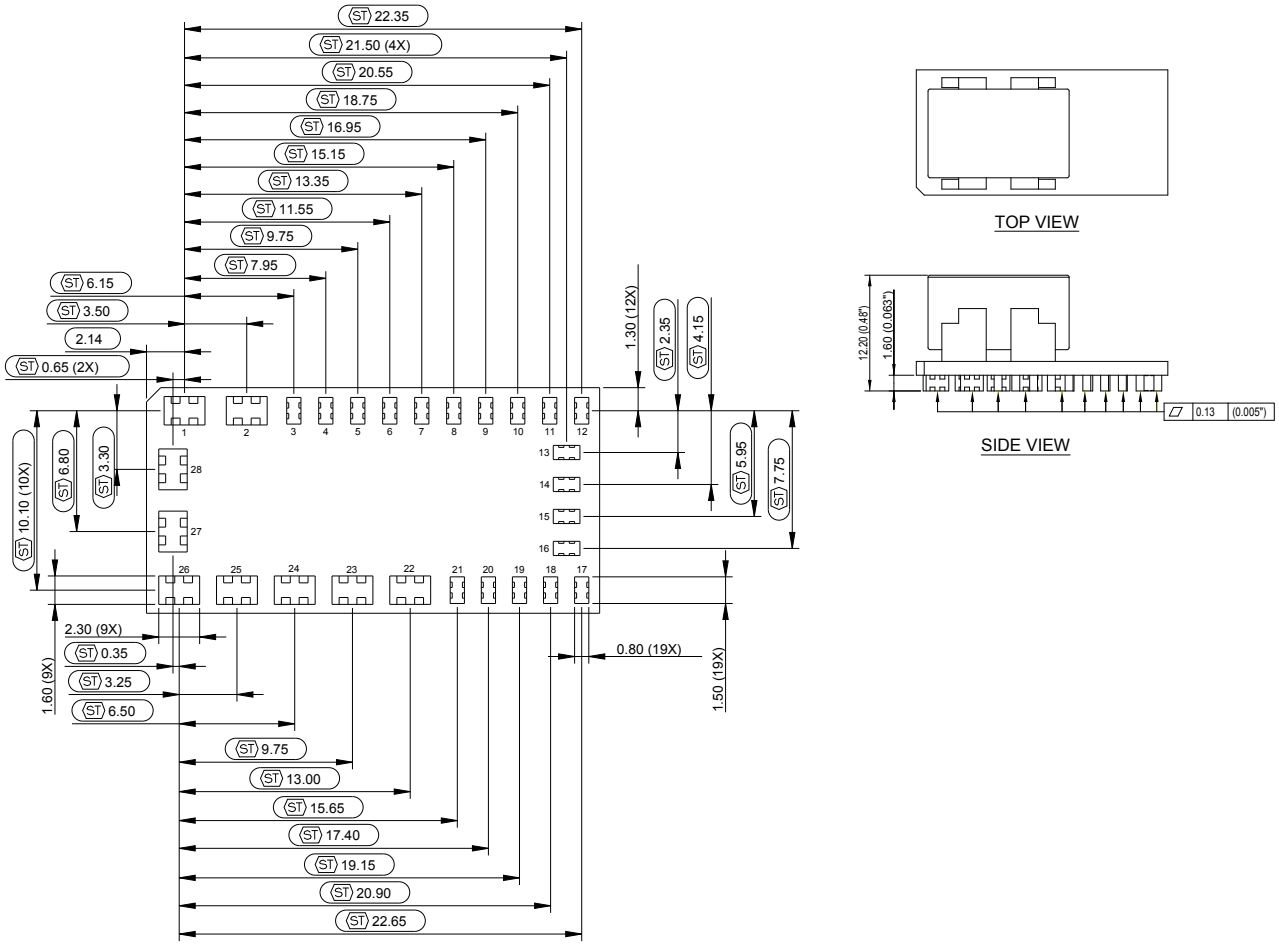
Notes:

Dimensions are in millimeters and (inches)

Tolerance: X.X mm ±0.5 mm (X.XX in. ±0.02 in.)

X.XX mm ±0.25 mm (X.XXX in. ±0.010 in.)

## MECHANICAL DRAWINGS (CONTINUED)




FOOTPRINT DRAWING OF METAL PINS
(BOTTOM VIEW)
Notes:
Dimensions are in millimeters and (inches)
Tolerance: X.X mm ±0.5 mm (X.XX in. ±0.02 in.)
X.XX mm ±0.25 mm (X.XXX in. ±0.010 in.)

## ABOUT ADVANCED ENERGY

Advanced Energy (AE) has devoted more than three decades to perfecting power for its global customers. AE designs and manufactures highly engineered, precision power conversion, measurement and control solutions for mission-critical applications and processes.

Our products enable customer innovation in complex applications for a wide range of industries including semiconductor equipment, industrial, manufacturing, telecommunications, data center computing, and medical. With deep applications know-how and responsive service and support across the globe, we build collaborative partnerships to meet rapid technological developments, propel growth for our customers, and innovate the future of power.

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