



# Eighth-Brick Series

## Single output

**ARTESYN**  
TECHNOLOGIES

DC/DC CONVERTERS

High Current, High Efficiency, Low Profile

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**NEW Product**

- **Ultra-high efficiency topology**
- **Industry standard eighth brick footprint (identical to quarter-brick pinout)**
- **Low profile through-hole version**
- **Low profile with 38% space savings over other quarter-brick converters**
- **Wide ambient temperature range, -40 °C to +85 °C**
- **80% to 110% output trim**
- **Monotonic start-up in normal and prebiased loads**
- **Basic insulation system**
- **Overvoltage and overtemperature protection**
- **Secondary side control, no optocouplers, fast transient response**
- **100 V, 100 ms input voltage transient rated**
- **Available RoHS compliant**



Patent No. 6,765,810  
Other Patents Pending



**2 YEAR WARRANTY**

This is a new high efficiency, open-frame, low profile, single board, isolated dc-dc converter series in an industry standard eight-brick footprint that provides up to 100 W of output power. The series delivers very high output current at low voltages, and excellent useable power for today's high performance applications. The series features an input voltage range of 18 Vdc to 36 Vdc and 36 Vdc to 75 Vdc and is available with output voltages of 1.2 V, 1.5 V 1.8 V, 2.5 V, 3.3 V and 5.0 V. The output voltage is adjustable from 80% to 110% of the nominal value. The series also has a remote ON/OFF capability. Overcurrent, overvoltage and overtemperature protection features are included as standard. Full international safety approval including EN60950-1 VDE and UL/cUL60950, reduces compliance costs and time to market.

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

### SPECIFICATIONS

#### OUTPUT SPECIFICATIONS

|                                    |                                                       |             |
|------------------------------------|-------------------------------------------------------|-------------|
| Voltage adjustability              |                                                       | 80% to 110% |
| Minimum load                       |                                                       | 0%          |
| Overshoot                          | At turn-on and turn-off                               | None        |
| Undershoot                         |                                                       | None        |
| Transient response<br>(See Note 1) | 60 mV to 150 mV typ. deviation<br>20 $\mu$ s recovery |             |

#### INPUT SPECIFICATIONS

|                                      |                              |                                |
|--------------------------------------|------------------------------|--------------------------------|
| Input voltage range                  | 24 V nominal<br>48 V nominal | 18-36 Vdc<br>36-75 Vdc         |
| Input current                        | No load<br>Remote OFF        | 50 mA<br>5 mA                  |
| Active high remote ON/OFF            |                              |                                |
| Logic compatibility                  |                              | Open collector ref to -input   |
| ON                                   |                              | Open circuit or >2.4 Vdc       |
| OFF                                  |                              | <0.4 Vdc                       |
| Undervoltage Lockout                 |                              |                                |
| 24 Vin                               | Power up<br>Power down       | 17.5 V (typ.)<br>16.5 V (typ.) |
| 48 Vin                               | Power up<br>Power down       | 35.5 V (typ.)<br>33.5 V (typ.) |
| 48 Vin Start-up time<br>(See Note 2) | Power up<br>Remote ON/OFF    | 15 ms (typ.)<br>15 ms (typ.)   |

#### EMC CHARACTERISTICS

|                          |                                         |
|--------------------------|-----------------------------------------|
| Immunity:                |                                         |
| ESD air enclosure        | EN61000-4-2 8 kV/6 kV(O/P within spec.) |
| Radiated field enclosure | EN61000-4-3 10 V/m (O/P within spec.)   |
| Conducted                | EN61000-4-6 10 V (O/P within spec.)     |
| Input transients         | 100 V, 100 ms                           |

#### GENERAL SPECIFICATIONS

|                         |                       |                               |
|-------------------------|-----------------------|-------------------------------|
| Basic insulation        | Input/output          | 2250 Vdc                      |
| Switching frequency     | Fixed                 | 480 kHz                       |
| Approvals and standards | (See Note 3)          | EN60950-1 VDE<br>UL/cUL 60950 |
| Material flammability   |                       | UL94V-0                       |
| Weight                  |                       | 21 g (0.73 oz)                |
| MTBF                    | Telcordia Tech SR-332 | 4,034,120 hours               |

#### ENVIRONMENTAL SPECIFICATIONS

|                     |                               |                   |
|---------------------|-------------------------------|-------------------|
| Thermal performance | Operating ambient temperature | -40 °C to +85 °C  |
|                     | Non-operating                 | -55 °C to +125 °C |

#### PROTECTION

|              |                                                     |
|--------------|-----------------------------------------------------|
| Shortcircuit | Continuous                                          |
| Overvoltage  | Non-latching                                        |
| Thermal      | 125 °C hot spot temperature with automatic recovery |

#### International Safety Standard Approvals



UL/cUL CAN/CSA 22.2 No. 60950-00 : UL 60950  
File No. E135734/60950



VDE Certificate No. 40005017. File No. 10401-3336-0197  
CB Report and Certificate to IEC60950, Certificate No. DE1-31103



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

**NEW Product**

| Output Voltage            | Input Current (Max.) <sup>(4)</sup> | Input Ripple Current <sup>(5)</sup> | Output Current (Max.) | Efficiency (Typ.) | Regulation                |       |       | Ripple & Noise (pk - pk) | Model Number <sup>(7,8)</sup> |
|---------------------------|-------------------------------------|-------------------------------------|-----------------------|-------------------|---------------------------|-------|-------|--------------------------|-------------------------------|
|                           |                                     |                                     |                       |                   | Set Point Accuracy (Max.) | Line  | Load  |                          |                               |
| 48 Vin VALUE MODELS       |                                     |                                     |                       |                   |                           |       |       |                          |                               |
| 1.2 V                     | 0.98 A                              | 100 mA                              | 25 A                  | 88%               | ±1.5%                     | ±0.1% | ±0.2% | 60 mV                    | LES25A48-1V2J                 |
| 1.5 V                     | 1.21 A                              | 100 mA                              | 25 A                  | 89.5%             | ±1.5%                     | ±0.1% | ±0.2% | 60 mV                    | LES25A48-1V5J                 |
| 1.8 V                     | 1.43 A                              | 100 mA                              | 25 A                  | 90.5%             | ±1.5%                     | ±0.1% | ±0.2% | 60 mV                    | LES25A48-1V8J                 |
| 2.5 V                     | 1.62 A                              | 150 mA                              | 20 A                  | 90%               | ±1.5%                     | ±0.1% | ±0.2% | 60 mV                    | LES20A48-2V5J                 |
| 3.3 V                     | 2.11 A                              | 150 mA                              | 20 A                  | 91%               | ±1.5%                     | ±0.1% | ±0.2% | 60 mV                    | LES20A48-3V3J                 |
| 5.0 V                     | 1.59 A                              | 100 mA                              | 10 A                  | 92%               | ±1.5%                     | ±0.1% | ±0.2% | 60 mV                    | LES10A48-5V0J                 |
| 48 Vin PERFORMANCE MODELS |                                     |                                     |                       |                   |                           |       |       |                          |                               |
| 1.2 V                     | 1.98 A                              | 150 mA                              | 50 A                  | 86%               | ±1.5%                     | ±0.1% | ±0.2% | 60 mV                    | LES50A48-1V2J                 |
| 1.5 V                     | 1.91 A                              | 150 mA                              | 40 A                  | 88.5%             | ±1.5%                     | ±0.1% | ±0.2% | 60 mV                    | LES40A48-1V5J                 |
| 1.8 V                     | 2.30 A                              | 150 mA                              | 40 A                  | 90%               | ±1.5%                     | ±0.1% | ±0.2% | 60 mV                    | LES40A48-1V8J                 |
| 2.5 V                     | 1.99 A                              | 200 mA                              | 25 A                  | 89.5%             | ±1.5%                     | ±0.1% | ±0.2% | 60 mV                    | LES25A48-2V5J                 |
| 3.3 V                     | 2.65 A                              | 200 mA                              | 25 A                  | 90.5%             | ±1.5%                     | ±0.1% | ±0.2% | 60 mV                    | LES25A48-3V3J                 |
| 5.0 V                     | 2.30 A                              | 150 mA                              | 15 A                  | 91.5%             | ±1.5%                     | ±0.1% | ±0.2% | 60 mV                    | LES15A48-5V0J                 |
| 48 Vin ULTRA MODELS       |                                     |                                     |                       |                   |                           |       |       |                          |                               |
| 2.5 V                     | 3.20 A                              | 150 mA                              | 40 A                  | 91%               | ±1.5%                     | ±0.1% | ±0.2% | 60 mV                    | LES40A48-2V5J                 |
| 3.3 V                     | 3.20 A                              | 150 mA                              | 30 A                  | 90.5%             | ±1.5%                     | ±0.1% | ±0.2% | 60 mV                    | LES30A48-3V3J                 |
| 5.0 V                     | 3.20 A                              | 150 mA                              | 20 A                  | 92%               | ±1.5%                     | ±0.1% | ±0.2% | 60 mV                    | LES20A48-5V0J                 |
| 24 Vin MODELS             |                                     |                                     |                       |                   |                           |       |       |                          |                               |
| 1.8 V                     | 2.40 A                              | 50 mA                               | 20 A                  | 91%               | ±1.5%                     | ±0.1% | ±0.2% | 35 mV                    | LES20A24-1V8J                 |
| 3.3 V                     | 4.25 A                              | 170 mA                              | 20 A                  | 90%               | ±1.5%                     | ±0.1% | ±0.2% | 60 mV                    | LES20A24-3V3J                 |

### Part Number System with Options

**LES50A48-1V2RANJ**

**L** = Low Profile

**E** = 1/8 Brick

**Number of outputs**  
S = Single

**Rated Output Current**  
10 A = 10 Amps, 15 A = 15 Amps etc.

**Nominal Rated Input Voltage**  
24 = 24 Volts (18 Vdc to 36 Vdc range)  
48 = 48 Volts (36 Vdc to 75 Vdc range)

**Output Voltage**  
1V2 = 1.2 Volts, 1V5 = 1.5 Volts etc.

**RoHS Compliance (7)**

J = Pb-free (RoHS 6/6 compliant)

**Pin Length Options**

Blank = 0.188" (4.78 mm)

N = 0.145" (3.68 mm)

K = 0.110" (2.79 mm)

**Body Height, Package Type and Pin Length**

A = 0.300" (7.62 mm), Through Hole,  
0.188" (4.78 mm) Pins

E = 0.340" (8.64 mm), Through Hole,  
0.188" (4.78 mm) Pins

S = Surface Mount

**Remote ON/OFF Logic**

Blank = Positive

R = Negative

### Notes

- 1 di/dt = 1 A/μs, Vin = 24 or 48 Vdc, Tc = 25 °C, load change = 50% to 75% lo max. and 75% to 50% lo max. Deviation varies by model. For further details see long form data sheets.
- 2 Start-up into resistive load.
- 3 This product is only for inclusion by professional installers within other equipment and must not be operated as a stand alone product.
- 4 Recommended input fusing is up to 10 A HRC 200 V rated fuse.
- 5 Peak to peak measured with no external Pi filter. Significant reduction possible with external filter. See Application Note 138 for further details.

- 6 Active low Remote ON/OFF is available. Standard product is Active High. When ordering active low parts, designate with the Suffix 'R' e.g. **LES50A48-1V2RAJ**.
- 7 TSE RoHS 5/6 (non Pb-free) compliant versions may be available on special request, please contact your local sales representative for details.
- 8 NOTICE: Some models do not support all options. Please contact your local Artesyn representative or use the on-line model number search tool at <http://www.artesyn.com/powergroup/products.htm> to find a suitable alternative.



| DIMENSION OPTIONS |               |                                |
|-------------------|---------------|--------------------------------|
| OPTION            | CLEARANCE     | HEIGHT                         |
|                   | ±0.016 (0.41) | +0.022 (0.56)<br>-0.030 (0.76) |
| A                 | 0.030 (0.76)  | 0.300 (7.62)                   |
| E                 | 0.070 (1.78)  | 0.340 (8.64)                   |

| PIN CONNECTIONS |          |            |          |
|-----------------|----------|------------|----------|
| PIN NUMBER      | FUNCTION | PIN NUMBER | FUNCTION |
| 1               | +Vin     | 5          | -Sense   |
| 2               | ON/OFF   | 6          | Trim     |
| 3               | -Vin     | 7          | +Sense   |
| 4               | -Vout    | 8          | +Vout    |

Through-hole Mechanical Drawing, Dimension Options and Pinout Table



| PIN CONNECTIONS |          |            |          |
|-----------------|----------|------------|----------|
| PIN NUMBER      | FUNCTION | PIN NUMBER | FUNCTION |
| 1               | +Vin     | 5          | -Sense   |
| 2               | ON/OFF   | 6          | Trim     |
| 3               | -Vin     | 7          | +Sense   |
| 4               | -Vout    | 8          | +Vout    |

Surface-mount Mechanical Drawing and Pinout Table

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