## Eighth-Brick B Series

Total Power: Up to 80 Watts Input Voltage: $36-75 \mathrm{Vdc}$ No. of Outputs: Single

## Special Features

- High efficiency topology
- Industry standard eighth-brick foot print (identical to quarter-brick pinout)
- Low profile through-hole and surface mount version
- $38 \%$ space savings over quarterbrick converters
- Wide ambient temperature range, $-40^{\circ} \mathrm{C}$ to $+85^{\circ} \mathrm{C}$
- $90 \%$ to $110 \%$ output trim
- 100 V, 100 ms input voltage transient rated
- Meets basic insulation requirements of EN60950-1
- Industry standard feature sets: UVLO, OVP, OCP, OTP, O/P trim, remote sense
- Regulation to zero load
- Fixed frequency switching
- Fast transient switching
- EU directive 2002/95/EC compliant for RoHS


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## Electrical Specifications*

| Output |  |  |
| :---: | :---: | :---: |
| Voltage adjustability: |  | 90\% to 110\% |
| Minimum load: |  | 0 A |
| Overshoot: | At turn-on and turn-off | None |
| Undershoot: | At turn-on and turn-off | None |
| Transient Response: (See Note 1) |  | 5\% Vout typ. deviation $40 \mu \mathrm{~s}$ recovery |
| Input |  |  |
| Input voltage range: | 48 V nominal | 36-75 Vdc |
| Input current: | No load Remote OFF | $\begin{gathered} 100 \mathrm{~mA} \\ 10 \mathrm{~mA} \end{gathered}$ |
| Active high remote ON/OFF Logic compatibility: <br> ON <br> OFF |  | TTL compatible ref to -input $\begin{aligned} & >2.4 \mathrm{Vdc} \\ & <0.8 \mathrm{Vdc} \end{aligned}$ |
| Undervoltage Lockout: | Power up | 35.5 V (typ.) |
|  | Power up | 35.5 V (typ.) |
| Start-up time: (See Note 2) | Power up <br> Remote ON/OFF | $\begin{aligned} & 25 \mathrm{~ms} \text { (typ.) } \\ & 5 \mathrm{~ms} \text { (typ.) } \end{aligned}$ |

*All specifications are typical at nominal input, full load at $25^{\circ} \mathrm{C}$ ambient unless otherwise stated.

## Safety

- UL/cUL60950-1 CAN/CSA 22.2
- TUV EN/IEC60950-1


## Electrical Specifications

| General |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Basic insulation: |  |  | Input/output |  |  | 2250 V dc |  |
| Switching frequency: |  |  | Fixed |  |  | 500 kHz |  |
| Approvals and standards: |  |  | EN60950-1 VDEUL/cUL60950-1 |  |  |  |  |
| Material flammability: |  |  | UL94V-0 |  |  |  |  |
| Weight: |  |  | Telcordia SR-332 Issue 1, $50 \%$ stress, $40^{\circ} \mathrm{C}$ ambient |  |  | 20 g (0.70 oz) |  |
| MTBF: |  |  |  |  |  | 4.2 M hours |  |
| EMC Characteristics |  |  |  |  |  |  |  |
| Immunity: ESD air enclosure: Radiated field enclosure: Conducted: Input transients: |  |  | EN1000-4-2 8 kV/6 kV <br> EN1000-4-3 $10 \mathrm{~V} / \mathrm{m}$ <br> EN1000-4-6 10 V <br> $100 \mathrm{~V}, 100 \mathrm{~ms}$ |  |  | ( $\mathrm{O} / \mathrm{P}$ within spec.)(O/P within spec.)(O/P within spec.) |  |
| Environmental Characteristics |  |  |  |  |  |  |  |
| Thermal performance: |  |  | Operating ambient temperature |  |  | $-40^{\circ} \mathrm{C}$ to $+85^{\circ} \mathrm{C}$ |  |
|  |  |  | Non-operating |  |  | $-40^{\circ} \mathrm{C}$ to $+125^{\circ} \mathrm{C}$ |  |
| Protection |  |  |  |  |  |  |  |
| Short-circuit: <br> Overvoltage: <br> Thermal: |  |  | $115 \%$ with automatic recovery $125 \%$ Vo (typ) with automatic recovery $125^{\circ} \mathrm{C}$ hot spot temperature with automatic recovery |  |  |  |  |
| Ordering Information |  |  |  |  |  |  |  |
| Output Voltage | Output Current (Max) | Efficiency (Typ) | Set Point Accuracy (Typ) | Line | Load | Ripple \& Noise (Typ) | Model Number(7) |
| 12.0 V | 6.7 | 92\% | $\pm 1 \%$ | $\pm 0.1 \%$ | $\pm 0.2 \%$ | 70 mVp -p | LES06B48-12VOREJ |
| 5.0 V | 13 | 92\% | $\pm 1 \%$ | $\pm 0.1 \%$ | $\pm 0.2 \%$ | 30 mVp -p | LES13B48-5VOREJ |
| 3.3 V | 20 | 91\% | $\pm 1 \%$ | $\pm 0.1 \%$ | $\pm 0.2 \%$ | 30 mVp -p | LES20B48-3V3REJ |
| 2.5 V | 22 | 90\% | $\pm 1 \%$ | $\pm 0.1 \%$ | $\pm 0.2 \%$ | 30 mVp -p | LES22B48-2V5REJ |
| 1.8 V | 25 | 89\% | $\pm 1 \%$ | $\pm 0.1 \%$ | $\pm 0.2 \%$ | 30 mVp -p | LES25B48-1V8REJ |
| 1.5 V | 25 | 88\% | $\pm 1 \%$ | $\pm 0.1 \%$ | $\pm 0.2 \%$ | 25 mV p-p | LES25B48-1V5REJ |
| 1.2 V | 25 | 86\% | $\pm 1 \%$ | $\pm 0.1 \%$ | $\pm 0.2 \%$ | 25 mVp -p | LES25B48-1V2REJ |
| 1.0 V | 25 | 85\% | $\pm 1 \%$ | $\pm 0.1 \%$ | $\pm 0.2 \%$ | 20 mVp -p | LES25B48-1VOREJ |

## Notes

$1 \mathrm{di} / \mathrm{dt}=1 \mathrm{~A} / \mu \mathrm{s}, \mathrm{Vin}=48 \mathrm{Vdc}, \mathrm{Tc}=25^{\circ} \mathrm{C}$, load change $=$ $50 \%$ to $75 \%$ lo max. and $75 \%$ to $50 \%$ lo max. Deviation varies by model. For further details see Technical Reference Notes (TRN).
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 Warranty: 2 years.
6 through-hole version intended for wave soldering process.
7 The 'J' suffix indicates that these parts are Pb -free (RoHS 6/6) compliant.

## Part Number System with Options

| Product Family | Rated Output Current | Vintage | Nominal Rated Input Voltage | Type of Output | Remote ON/OFF LOGIC | Body Height, Package Type and Pin Length | RoHS <br> Compliance (7) |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| LES | 22 | B | 48 | 2V5 | R | E | J |
| $\begin{gathered} L=\text { Low Profile } \\ E=1 / 8 \text { Brick } \\ S=\text { Single Output } \end{gathered}$ | $22=22 \mathrm{Amps}$, $20=20 \mathrm{Amps}$, etc. | $A=1$ st generation $B=2 n d$ generation | $\begin{gathered} 48=48 \text { Volts } \\ (36-75 \text { VDC range } \end{gathered}$ | $\begin{aligned} & 2 \mathrm{~V} 5=2.5 \text { Volts } \\ & 3 \mathrm{~V} 3=3.3 \text { Volts } \end{aligned}$ | Blank = Positive $R=$ Negative | $\begin{gathered} A=0.33 \text { in }(8.1 \mathrm{~mm}) \text {, Through Hole } \\ 0.19 \text { in }(4.8 \mathrm{~mm}) \text {, Pins } \\ E=0.37 \text { in }(9.1 \mathrm{~mm}) \text {, Through Hole } \\ 0.19 \text { in }(4.8 \mathrm{~mm}) \text {, Pins } \\ S=0.33 \text { in }(8.1 \mathrm{~mm}) \text {, Surface Mount } \end{gathered}$ | J = Pb free (RoHS <br> 6/6 compliant) |

## Through-hole Mechanical Drawing (for 1.8, 1.5, 1.2 and 1.0 V )



Surface-mount Mechanical Drawing (for 1.8, 1.5, 1.2 and 1.0 V )

$[1.57 \pm 0.10]$



| Pin Connections |  |
| :---: | :---: |
| Pin number | Function |
| 1 | Vin+ |
| 2 | ON/OFF |
| 3 | Vin- |
| 4 | Vout- |
| 5 | Sense- |
| 6 | Trim |
| 7 | Sense+ |
| 8 | Vout+ |
| mensions are in inches (millimeter) erances (unless otherwise specified) |  |
|  |  |
| $X . X X \pm 0.02$ ( $\mathrm{X} . \mathrm{X} \pm 0.5$ ) |  |
| $X . X X X \pm 0.010(X . X X \pm 0.25)$ |  |

Through-hole Mechanical Drawing (for 2.5, 3.3, 6 and 12 V)


Surface-mount Mechanical Drawing (for 2.5, 3.3, 6 and 12 V)


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