

# PEN3-xxxxE/Z2:1LF



## PEN-SERIES

Rev.09-2009

- ✓ 2-3 Watt
- ✓ **2:1** Wide Input
- ✓ Reg. **Single** and **Dual** Output
- ✓ **DIP24 Plastic** Case
- ✓ **1.5 kV DC** I/O Isolation
- ✓ Continuous Short Circuit Prot.

All specifications typical at Ta=25°C, nominal input voltage and full load unless otherwise specified

### Input Specifications

|   |                |
|---|----------------|
| Voltage Range                               | 2:1 Wide Input |
| Input Filter                                | Pi Type        |
| Input Reflected Ripple Current <sup>1</sup> | 35 mA pk-pk    |

### Output Specifications

|                                    |   |
|------------------------------------|---|
| Voltage Accuracy                   | ± 1%  |
| Short Circuit Protection           | Indefinite (automatic recovery)               |
| Line Regulation                    | ± 0.5%  |
| Load Regulation                    | ± 0.5% / ± 1.5% (only 3.3 / ±3.3 Vout Models) |
| Ripple and Noise (20Mhz bandwidth) | 60 mV pk-pk                                   |
| Temperature Coefficient            | ± 0.02% / °C                                  |

### General Specifications

|   |               |
|---|---------------|
| Efficiency                                  | See Table     |
| I/O Isolation Voltage (3 sec.)              | 1500 VDC      |
| I/O Isolation Capacity                      | 470 pF, typ.  |
| I/O Isolation Resistance                    | 1000 MOhm     |
| Switching Frequency (typical)               | 266 kHz, typ. |
| Humidity                                    | 95% rel H     |
| Reliability Calculated MTBF (MIL-HDBK-217F) | > 1.121 Mhrs  |

### Physical Specifications

|                      |  |
|----------------------|--|
| Case / Base Material | Non-conductive Black Plastic (UL94V-0 rated) |
| Pin Material         | Brass Solder-coated (0.5mm)                  |
| Potting Material     | Epoxy (UL94V-0 rated)                        |
| Weight               | ~ 13.5g, typ.                                |

### Environment Specifications

|                          |   |
|--------------------------|---|
| Operating Temperature    | -40 to +85 °C (ambient)                       |
| Maximum Case Temperature | 100 °C  |
| Storage Temperature      | -40 to +125 °C                                |
| Cooling                  | Free Air Convection (10mm distance required)  |
| RoHS Conform             | Soldering 260 °C, max. (1.5mm from case 10s.) |

# Selection Guide

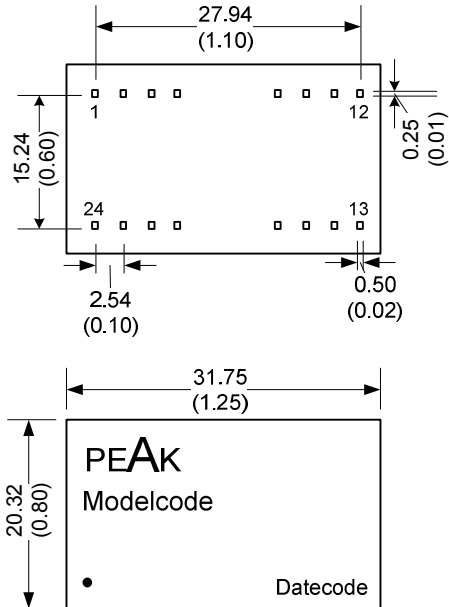
## Single/Dual Output

| Order #              | Watt | Input Voltage (VDC) | Output Voltage (VDC) | Output Current Min. Load (mA) | Output Current Full Load (mA) | Efficiency (%) | Capacitor Load (uF) <sup>2</sup> |
|----------------------|------|---------------------|----------------------|-------------------------------|-------------------------------|----------------|----------------------------------|
| <b>SINGLE OUTPUT</b> |      |                     |                      |                               |                               |                |                                  |
| PEN3-123R3E2:1LF     | 2    | 9 - 18              | 3.3                  | 0                             | 600                           | 74             | 680                              |
| PEN3-1205E2:1LF      | 2.5  | 9 - 18              | 5                    | 0                             | 500                           | 78             | 470                              |
| PEN3-1212E2:1LF      | 3    | 9 - 18              | 12                   | 0                             | 250                           | 82             | 47                               |
| PEN3-1215E2:1LF      | 3    | 9 - 18              | 15                   | 0                             | 200                           | 82             | 47                               |
| PEN3-243R3E2:1LF     | 2    | 18 - 36             | 3.3                  | 0                             | 600                           | 76             | 680                              |
| PEN3-2405E2:1LF      | 2.5  | 18 - 36             | 5                    | 0                             | 500                           | 79             | 330                              |
| PEN3-2412E2:1LF      | 3    | 18 - 36             | 12                   | 0                             | 250                           | 84             | 47                               |
| PEN3-2415E2:1LF      | 3    | 18 - 36             | 15                   | 0                             | 200                           | 84             | 47                               |
| PEN3-483R3E2:1LF     | 2    | 36 - 72             | 3.3                  | 0                             | 600                           | 76             | 680                              |
| PEN3-4805E2:1LF      | 2.5  | 36 - 72             | 5                    | 0                             | 500                           | 79             | 330                              |
| PEN3-4812E2:1LF      | 3    | 36 - 72             | 12                   | 0                             | 250                           | 84             | 47                               |
| PEN3-4815E2:1LF      | 3    | 36 - 72             | 15                   | 0                             | 200                           | 84             | 47                               |

|                    |     |         |      |   |       |    |       |
|--------------------|-----|---------|------|---|-------|----|-------|
| <b>DUAL OUTPUT</b> |     |         |      |   |       |    |       |
| PEN3-1205Z2:1LF    | 2.5 | 9 - 18  | ± 5  | 0 | ± 250 | 77 | ± 220 |
| PEN3-1212Z2:1LF    | 3   | 9 - 18  | ± 12 | 0 | ± 125 | 80 | ± 22  |
| PEN3-1215Z2:1LF    | 3   | 9 - 18  | ± 15 | 0 | ± 100 | 80 | ± 22  |
| PEN3-2405Z2:1LF    | 2.5 | 18 - 36 | ± 5  | 0 | ± 250 | 79 | ± 220 |
| PEN3-2412Z2:1LF    | 3   | 18 - 36 | ± 12 | 0 | ± 125 | 82 | ± 22  |
| PEN3-2415Z2:1LF    | 3   | 18 - 36 | ± 15 | 0 | ± 100 | 82 | ± 22  |
| PEN3-4805Z2:1LF    | 2.5 | 36 - 72 | ± 5  | 0 | ± 250 | 80 | ± 330 |
| PEN3-4812Z2:1LF    | 3   | 36 - 72 | ± 12 | 0 | ± 125 | 84 | ± 22  |
| PEN3-4815Z2:1LF    | 3   | 36 - 72 | ± 15 | 0 | ± 100 | 84 | ± 22  |

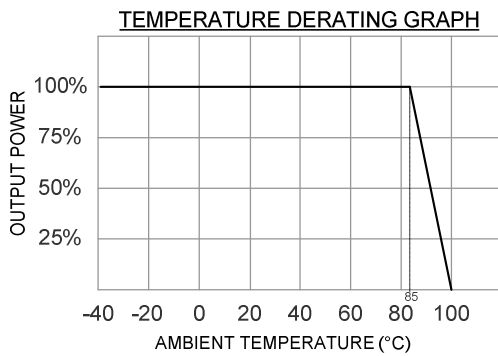
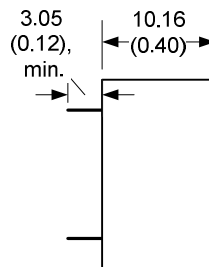
If you need other specifications, please enquire.

# Package / Pinning / Derating



All dimensions are typical in millimeters (inches).  
 - Pin diameter: 0.5 +/-0.05 (0.02 +/-0.002)  
 - Pin pitch tolerance: +/-0.35 (+/-0.014)  
 - Case tolerance +/-0.5 (+/-0.02)  
 Specification may change without notice.

## DIP24 – PLASTIC CASE



| PIN CONNECTIONS |         |         |
|-----------------|---------|---------|
| #               | SINGLE  | DUAL    |
| 2               | - Vin   | - Vin   |
| 3               | - Vin   | - Vin   |
| 9               | Omitted | Common  |
| 11              | N.C.    | - Vout  |
| 14              | +Vout   | +Vout   |
| 16              | - Vout  | Common  |
| 22              | +Vin    | +Vin    |
| 23              | +Vin    | +Vin    |
| others          | Omitted | Omitted |

### App Notes:

<sup>1</sup> = Measured Input reflected ripple current with a simulated source inductance of 12uH.

<sup>2</sup> = Test by nominal input voltage and constant resistor load.