

PEA1-xxxxE/Z (H30) LF



PMM1-SERIES

Rev.07-2010

- ✓ 1 Watt
- ✓ Semi Regulated
- ✓ **Single** and **Dual** Output
- ✓ **SIP7** Case
- ✓ **1 - 3 kV** DC I/O Isolation
- ✓ Low Ripple and Noise
- ✓ **High Efficiency**

The PMM1 series PEA1-xxxxE/Z(H30)LF is a family of cost effective 1 W single & dual output DC-DC converters. These converters are in an ultra miniature SIP7 case. Devices are encapsulated. High performance features: 1000 – 3000 VDC input/output isolation, high efficiency operation, output voltage accuracy of $\pm 3\%$ maximum, input range of $\pm 10\%$ tolerance and low output ripple and noise.

All specifications typical at $T_a=25^\circ\text{C}$, nominal input voltage and full load unless otherwise specified

Input Specifications

| | |
|---|--|
| Voltage Range | $\pm 10\%$ |
| Input Filter | Capacitor |
| Input Reflected Ripple Current ¹ | 20 mA (5, 12V) 30mA (15V) 40mA (24V) 50mA (48V) pk-pk |

Output Specifications

| | |
|------------------------------------|----------------------------------|
| Voltage Accuracy | $\pm 3\%$ |
| Short Circuit Protection | Short Term |
| Line Regulation | $\pm 1.2\%$ / 1% V_{in} Change |
| Load Regulation (10% - 100%) | See table |
| Ripple and Noise (20Mhz bandwidth) | 50 mV pk-pk |
| Temperature Coefficient | $\pm 0.02\%$ / $^\circ\text{C}$ |

General Specifications

| | |
|---|------------------------------|
| Efficiency | See Table |
| I/O Isolation Voltage (3 sec.) | 1000 VDC (3000VDC optional)* |
| I/O Isolation Capacity | 60 pF, typ. |
| I/O Isolation Resistance | 1G Ohm |
| Switching Frequency | 70 kHz (Variable) |
| Humidity | 95% rel H |
| Reliability Calculated MTBF (MIL-HDBK-217F) | > 2 Mhrs |

Physical Specifications

| | |
|------------------|--|
| Case Material | Non Conductive Black Plastic (UL94V-0 rated) |
| Potting Material | Epoxy (UL94V-0 rated) |
| Weight | ~ 2.3g, typ. |

Environment Specifications

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

Selection Guide

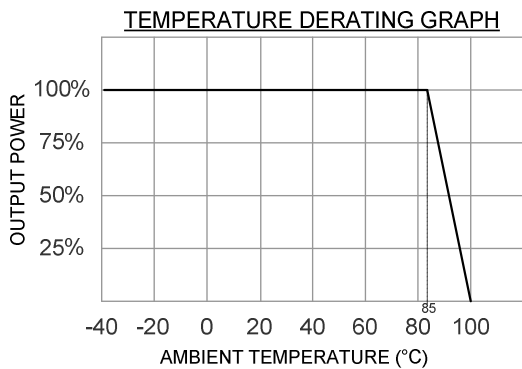
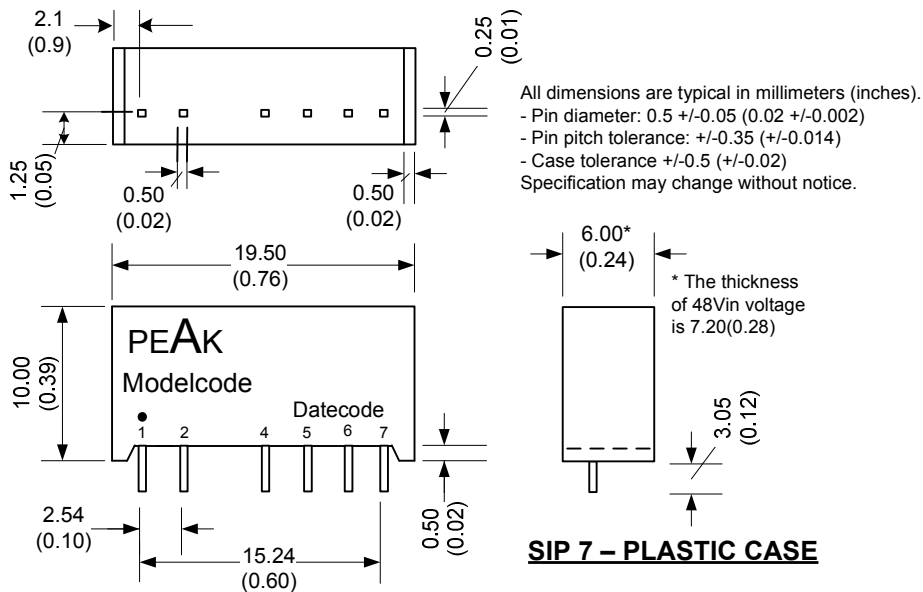
Single / Dual Output

| Order # | Input Voltage (VDC) | | Input Current No Load (mA) | | Input Current Full Load (mA) | | Output Voltage (VDC) | | Output Current Full Load (mA) | | Load Regulation (%) | Efficiency (%) | Capacitor Load (μF) |
|----------------------|---------------------|----|----------------------------|----------|------------------------------|-----|----------------------|-----------|-------------------------------|--|---------------------|----------------|----------------------------------|
| SINGLE OUTPUT | | | | | | | | | | | | | |
| PEA1-0505ELF | 5 | 20 | 250 | 5 | 200 | 6 | 84 | 220 | | | | | |
| PEA1-0509ELF | 5 | 20 | 230 | 9 | 111.1 | 5.5 | 86 | 220 | | | | | |
| PEA1-0512ELF | 5 | 20 | 230 | 12 | 83.3 | 5.5 | 87 | 100 | | | | | |
| PEA1-0515ELF | 5 | 20 | 230 | 15 | 66.7 | 5 | 87 | 100 | | | | | |
| PEA1-1205ELF | 12 | 15 | 98 | 5 | 200 | 4 | 84 | 220 | | | | | |
| PEA1-1209ELF | 12 | 15 | 96 | 9 | 111.1 | 3.5 | 86 | 220 | | | | | |
| PEA1-1212ELF | 12 | 15 | 95 | 12 | 83.3 | 3.5 | 88 | 100 | | | | | |
| PEA1-1215ELF | 12 | 15 | 95 | 15 | 66.7 | 3 | 88 | 100 | | | | | |
| PEA1-1505ELF | 15 | 10 | 79 | 5 | 200 | 4 | 84 | 220 | | | | | |
| PEA1-1509ELF | 15 | 10 | 77 | 9 | 111.1 | 3.5 | 86 | 220 | | | | | |
| PEA1-1512ELF | 15 | 10 | 76 | 12 | 83.3 | 3.5 | 87 | 100 | | | | | |
| PEA1-1515ELF | 15 | 10 | 76 | 15 | 66.7 | 3 | 89 | 100 | | | | | |
| PEA1-2405ELF | 24 | 7 | 50 | 5 | 200 | 4 | 83 | 220 | | | | | |
| PEA1-2409ELF | 24 | 7 | 49 | 9 | 111.1 | 3.5 | 86 | 220 | | | | | |
| PEA1-2412ELF | 24 | 7 | 49 | 12 | 83.3 | 3.5 | 87 | 100 | | | | | |
| PEA1-2415ELF | 24 | 7 | 49 | 15 | 66.7 | 3 | 87 | 100 | | | | | |
| PEA1-4805ELF | 48 | 5 | 27 | 5 | 200 | 4 | 79 | 220 | | | | | |
| PEA1-4809ELF | 48 | 5 | 26 | 9 | 111.1 | 3.5 | 82 | 220 | | | | | |
| PEA1-4812ELF | 48 | 5 | 26 | 12 | 83.3 | 3 | 82 | 100 | | | | | |
| PEA1-4815ELF | 48 | 5 | 26 | 15 | 66.7 | 3 | 81 | 100 | | | | | |
| DUAL OUTPUT | | | | | | | | | | | | | |
| PEA1-0505ZLF | 5 | 20 | 250 | ± 5 | ± 100 | 6 | 84 | ± 100 | | | | | |
| PEA1-0509ZLF | 5 | 20 | 228 | ± 9 | ± 55.55 | 5.5 | 86 | ± 100 | | | | | |
| PEA1-0512ZLF | 5 | 20 | 228 | ± 12 | ± 41.67 | 5.5 | 87 | ± 47 | | | | | |
| PEA1-0515ZLF | 5 | 20 | 225 | ± 15 | ± 33.33 | 5 | 88 | ± 47 | | | | | |
| PEA1-1205ZLF | 12 | 15 | 98 | ± 5 | ± 100 | 4 | 85 | ± 100 | | | | | |
| PEA1-1209ZLF | 12 | 15 | 95 | ± 9 | ± 55.55 | 3.5 | 86 | ± 100 | | | | | |
| PEA1-1212ZLF | 12 | 15 | 94 | ± 12 | ± 41.67 | 3.5 | 89 | ± 47 | | | | | |
| PEA1-1215ZLF | 12 | 15 | 94 | ± 15 | ± 33.33 | 3 | 89 | ± 47 | | | | | |
| PEA1-1505ZLF | 15 | 10 | 78 | ± 5 | ± 100 | 3.5 | 85 | ± 100 | | | | | |
| PEA1-1509ZLF | 15 | 10 | 76 | ± 9 | ± 55.55 | 2.5 | 87 | ± 100 | | | | | |
| PEA1-1512ZLF | 15 | 10 | 76 | ± 12 | ± 41.67 | 2.5 | 87 | ± 47 | | | | | |
| PEA1-1515ZLF | 15 | 10 | 75 | ± 15 | ± 33.33 | 2.5 | 89 | ± 47 | | | | | |
| PEA1-2405ZLF | 24 | 7 | 50 | ± 5 | ± 100 | 3.5 | 84 | ± 100 | | | | | |
| PEA1-2409ZLF | 24 | 7 | 48 | ± 9 | ± 55.55 | 2.5 | 87 | ± 100 | | | | | |
| PEA1-2412ZLF | 24 | 7 | 48 | ± 12 | ± 41.67 | 2.5 | 87 | ± 47 | | | | | |
| PEA1-2415ZLF | 24 | 7 | 48 | ± 15 | ± 33.33 | 2.5 | 87 | ± 47 | | | | | |
| PEA1-4805ZLF | 48 | 5 | 27 | ± 5 | ± 100 | 3 | 80 | ± 100 | | | | | |
| PEA1-4809ZLF | 48 | 5 | 26 | ± 9 | ± 55.55 | 3 | 82 | ± 100 | | | | | |
| PEA1-4812ZLF | 48 | 5 | 26 | ± 12 | ± 41.67 | 3 | 82 | ± 47 | | | | | |
| PEA1-4815ZLF | 48 | 5 | 26 | ± 15 | ± 33.33 | 2 | 82 | ± 47 | | | | | |

* For optional **3kV Isolation** please add "**H30**" between E/Z and LF!

Example: PEA1-2415EH30LF for 3kV isolation.

Package / Pinning / Derating



| PIN CONNECTIONS | | | | |
|-----------------|---------|---------|------------|----------|
| # | SINGLE | DUAL | SINGLE 3kV | DUAL 3kV |
| 1 | +Vin | +Vin | +Vin | +Vin |
| 2 | - Vin | - Vin | - Vin | - Vin |
| 4 | - Vout | - Vout | Omitted | Omitted |
| 5 | Omitted | Common | - Vout | - Vout |
| 6 | +Vout | +Vout | Omitted | Common |
| 7 | Omitted | Omitted | +Vout | +Vout |

App Notes:

- ¹ = Measured Input reflected ripple current with a simulated source inductance of 12uH.
- ² = Tested by minimal Vin and constant resistive load.
- Operation under no-load conditions will not damage these devices, but they will not observe the listed specifications.
- * For optional 3kV Isolation please add "H30" between E/Z and LF! Example: PEA1-2415EH30LF for 3kV isolation.

| EMC SPECIFICATIONS | | |
|--------------------|---------------|------------------|
| Radiated Emissions | EN 55022 | CLASS A |
| ESD | IEC 61000-4-2 | Perf. Criteria A |
| RS | IEC 61000-4-3 | Perf. Criteria A |

Input filter components (C1, C2, L) are used to help meet conducted emissions requirement for the module. These components should be mounted as close as possible to the module; all leads should be minimized to decrease radiated noise.

