

P10MU-xxxxE/Z(Hxx)LF



PM3-SERIES

Rev.11-2008

- ✓ 2 Watt
- ✓ Unregulated
- ✓ **Single** and **Dual** Output
- ✓ **DIP14** Case
- ✓ **3 - 6 kV** DC I/O Isolation
- ✓ Low Ripple and Noise

The PM3 series P10MU-xxxxE/Z(Hxx)LF is a family of cost effective 2 W single & dual output DC-DC converters. These converters are in an ultra miniature DIP14 case. Devices are encapsulated. High performance features: 3000VDC up to 6000VDC 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 pk-pk |

Output Specifications

| | |
|------------------------------------|---|
| Voltage Accuracy | $\pm 3\%$ |
| Short Circuit Protection | Short Term |
| Line Regulation | $\pm 1.2\% / 1\%$ Vin Change |
| Load Regulation (20% - 100%) | $\pm 10\%$ (3.3 Vout Models: $\pm 20\%$) |
| Ripple and Noise (20Mhz bandwidth) | 75 mV pk-pk |
| Temperature Coefficient | $\pm 0.02\% / ^\circ\text{C}$ |

General Specifications

| | |
|---|-------------------------------------|
| Efficiency | See table |
| I/O Isolation Voltage (3 sec.) | 3000 VDC (up to 6000 VDC optional)* |
| I/O Isolation Capacity | 60 pF, typ. |
| I/O Isolation Resistance | 1000 M Ohm |
| Switching Frequency | 80 kHz (Variable) |
| Humidity | 95% rel H |
| Reliability Calculated MTBF (MIL-HDBK-217F) | >1.121 Mhrs |

Physical Specifications

| | |
|------------------|--|
| Case Material | Non Conductive Black Plastic (UL94V-0 rated) |
| Potting Material | Epoxy (UL94V-0 rated) |
| Weight | ~ 2.6g, 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 |
| RoHS Conform | Soldering 260 $^\circ\text{C}$, max. (1.5mm from case 10s.) |

Selection Guide

Single Output

| Order # | Input Voltage (VDC) | Input Current No Load (mA) | Input Current Full Load (mA) | Output Voltage (VDC) | Output Current Full Load (mA) | Efficiency (%) | Capacitor Load (uF) ² |
|----------------------|---------------------|----------------------------|------------------------------|----------------------|-------------------------------|----------------|----------------------------------|
| SINGLE OUTPUT | | | | | | | |
| P10MU-053R3ELF | 5 | 30 | 367 | 3.3 | 400 | 72 | 470 |
| P10MU-0505ELF | 5 | 30 | 512 | 5 | 400 | 78 | 470 |
| P10MU-057R2ELF | 5 | 30 | 500 | 7.2 | 277.7 | 80 | 470 |
| P10MU-0509ELF | 5 | 30 | 500 | 9 | 222.2 | 80 | 470 |
| P10MU-0512ELF | 5 | 30 | 487 | 12 | 166.7 | 82 | 470 |
| P10MU-0515ELF | 5 | 30 | 487 | 15 | 133.3 | 82 | 470 |
| P10MU-0518ELF | 5 | 30 | 487 | 18 | 111.1 | 82 | 470 |
| P10MU-0524ELF | 5 | 30 | 487 | 24 | 83.3 | 82 | 470 |
| P10MU-123R3ELF | 12 | 20 | 152 | 3.3 | 400 | 72 | 470 |
| P10MU-1205ELF | 12 | 20 | 216 | 5 | 400 | 77 | 470 |
| P10MU-127R2ELF | 12 | 20 | 208 | 7.2 | 277.7 | 80 | 470 |
| P10MU-1209ELF | 12 | 20 | 208 | 9 | 222.2 | 80 | 470 |
| P10MU-1212ELF | 12 | 20 | 208 | 12 | 166.7 | 80 | 470 |
| P10MU-1215ELF | 12 | 20 | 208 | 15 | 133.3 | 80 | 470 |
| P10MU-1218ELF | 12 | 20 | 208 | 18 | 111.1 | 80 | 470 |
| P10MU-1224ELF | 12 | 20 | 208 | 24 | 83.3 | 80 | 470 |
| P10MU-243R3ELF | 24 | 10 | 76 | 3.3 | 400 | 72 | 470 |
| P10MU-2405ELF | 24 | 10 | 105 | 5 | 400 | 79 | 470 |
| P10MU-247R2ELF | 24 | 10 | 115 | 7.2 | 277.7 | 72 | 470 |
| P10MU-2409ELF | 24 | 10 | 104 | 9 | 222.2 | 80 | 470 |
| P10MU-2412ELF | 24 | 10 | 104 | 12 | 166.7 | 80 | 470 |
| P10MU-2415ELF | 24 | 10 | 104 | 15 | 133.3 | 80 | 470 |
| P10MU-2418ELF | 24 | 10 | 104 | 18 | 111.1 | 80 | 470 |
| P10MU-2424ELF | 24 | 10 | 104 | 24 | 83.3 | 80 | 470 |

If you need other specifications, please enquire.

***OPTIONS:**

H40 = 4000 VDC ISOLATION
H52 = 5200 VDC ISOLATION
H60 = 6000 VDC ISOLATION

For other I/O Isolation please see table on the left hand side and add "Hxx" before LF
 (P10MU-2412EH60LF for 6KV)

Selection Guide

Dual Output

| Order # | Input Voltage (VDC) | Input Current No Load (mA) | Input Current Full Load (mA) | Output Voltage (VDC) | Output Current Full Load (mA) | Efficiency (%) | Capacitor Load (µF) ² |
|--------------------|---------------------|----------------------------|------------------------------|----------------------|-------------------------------|----------------|----------------------------------|
| DUAL OUTPUT | | | | | | | |
| P10MU-053R3ZLF | 5 | 30 | 406 | ± 3.3 | ± 200 | 65 | ± 220 |
| P10MU-0505ZLF | 5 | 30 | 555 | ± 5 | ± 200 | 72 | ± 220 |
| P10MU-057R2ZLF | 5 | 30 | 555 | ± 7.2 | ± 138.8 | 72 | ± 220 |
| P10MU-0509ZLF | 5 | 30 | 519 | ± 9 | ± 111.1 | 77 | ± 220 |
| P10MU-0512ZLF | 5 | 30 | 512 | ± 12 | ± 83.3 | 78 | ± 220 |
| P10MU-0515ZLF | 5 | 30 | 500 | ± 15 | ± 66.67 | 80 | ± 220 |
| P10MU-0518ZLF | 5 | 30 | 500 | ± 18 | ± 55.55 | 80 | ± 220 |
| P10MU-0524ZLF | 5 | 30 | 500 | ± 24 | ± 41.67 | 80 | ± 220 |
| P10MU-123R3ZLF | 12 | 20 | 164 | ± 3.3 | ± 200 | 67 | ± 220 |
| P10MU-1205ZLF | 12 | 20 | 222 | ± 5 | ± 200 | 75 | ± 220 |
| P10MU-127R2ZLF | 12 | 20 | 219 | ± 7.2 | ± 138.8 | 76 | ± 220 |
| P10MU-1209ZLF | 12 | 20 | 216 | ± 9 | ± 111.1 | 77 | ± 220 |
| P10MU-1212ZLF | 12 | 20 | 203 | ± 12 | ± 83.3 | 82 | ± 220 |
| P10MU-1215ZLF | 12 | 20 | 203 | ± 15 | ± 66.67 | 82 | ± 220 |
| P10MU-1218ZLF | 12 | 20 | 203 | ± 18 | ± 55.55 | 82 | ± 220 |
| P10MU-1224ZLF | 12 | 20 | 203 | ± 24 | ± 41.67 | 82 | ± 220 |
| P10MU-243R3ZLF | 24 | 10 | 80 | ± 3.3 | ± 200 | 68 | ± 220 |
| P10MU-2405ZLF | 24 | 10 | 111 | ± 5 | ± 200 | 75 | ± 220 |
| P10MU-247R2ZLF | 24 | 10 | 111 | ± 7.2 | ± 138.8 | 75 | ± 220 |
| P10MU-2409ZLF | 24 | 10 | 104 | ± 9 | ± 111.1 | 80 | ± 220 |
| P10MU-2412ZLF | 24 | 10 | 101 | ± 12 | ± 83.3 | 82 | ± 220 |
| P10MU-2415ZLF | 24 | 10 | 101 | ± 15 | ± 66.67 | 82 | ± 220 |
| P10MU-2418ZLF | 24 | 10 | 101 | ± 18 | ± 55.55 | 82 | ± 220 |
| P10MU-2424ZLF | 24 | 10 | 101 | ± 24 | ± 41.67 | 82 | ± 220 |

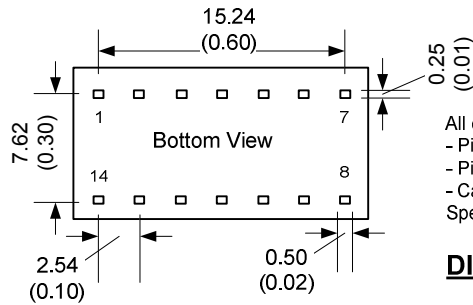
If you need other specifications, please enquire.

***OPTIONS:**

H40 = 4000 VDC ISOLATION
H52 = 5200 VDC ISOLATION
H60 = 6000 VDC ISOLATION

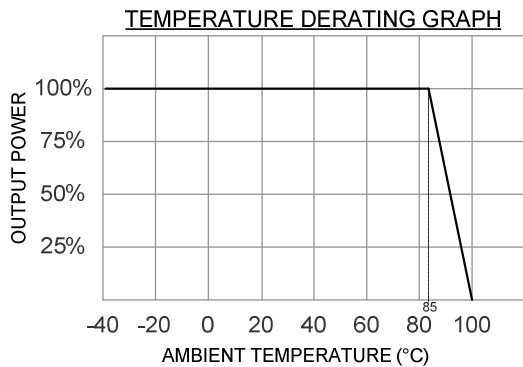
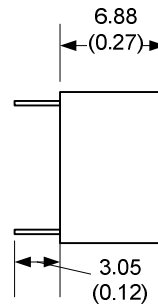
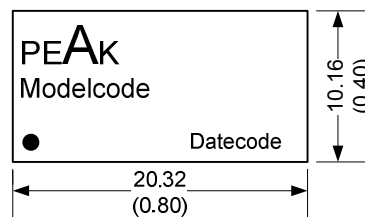
For other I/O Isolation please see table on the left hand side and add "Hxx" before LF (P10MU-2412ZH60LF for 6KV)

Package / Pinning / Derating



All dimensions are typical in millimeters (inches).
 - Pin diameter: 1.0 +/-0.05 (0.04 +/-0.002)
 - Pin pitch tolerance: +/-0.35 (+/-0.014)
 - Case tolerance +/-0.5 (+/-0.02)
 Specification may change without notice.

DIP14 – PLASTIC CASE



| PIN CONNECTIONS | | |
|-----------------|-------------|-----------|
| # | SINGLE ≥3KV | DUAL ≥3KV |
| 1 | - Vin | - Vin |
| 7 | N.C. | N.C. |
| 8 | +Vout | +Vout |
| 9 | Omitted | Common |
| 10 | - Vout | - Vout |
| 11 | Omitted | Omitted |
| 14 | +Vin | +Vin |

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 reduce converter's ripple & noise, it is recommended to add a 4.7µF~220µF(±4.7µF~±100µF for dual output) capacitor in output end. For EMI performance improvement, it is recommended to add a 12µH inductor and a 10µF~100µF capacitor in input end.

