

P47WG-xxxxE/Z2:1(H35)LF



PM7-SERIES

Rev.03-2009

- ✓ 15 Watt
- ✓ 2:1 Wide Input
- ✓ 2" x 1" Case
- ✓ 1.5 - 3.5 kV DC I/O Isolation
- ✓ Regulated Output
- ✓ **Single** and **Dual** Output
- ✓ Continuous Short Circuit Prot.

The PM7 series P47WG-xxxxE/Z2:1(H35)LF is a family of cost effective 15W, single & dual output DC-DC converters with a wide input range of 2:1. These converters are encapsulated in nickel coated brass 2"x1" case with high performance features: 1500VDC up to 3500VDC input/output isolation voltage, continuous short circuit protection with automatic restart and tight line / load regulation, high efficiency operation and output voltage accuracy of $\pm 1\%$ maximum.

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

Input Specifications

| | |
|-----------------------------------------------------------|----------------------------|
| Voltage Range | 2:1 Wide Input (See Table) |
| Input Filter | Capacitors |
| Input Reflected Ripple Current ¹ | 35 mA pk-pk |
| Start up Time (Nom. V_{in} and constant resistive load) | 20mS, typ. |

Output Specifications

| | |
|------------------------------------|---------------------------------|
| Voltage Accuracy | $\pm 1\%$ |
| Short Circuit Protection | Indefinite (Automatic Recovery) |
| Over Current Protection | 140% of max. I _{out} |
| Line Regulation | $\pm 0.5\%$ |
| Load Regulation (10% - 100%) | $\pm 0.5\%$ |
| Ripple and Noise (20Mhz bandwidth) | 100 mV pk-pk |
| Temperature Coefficient | $\pm 0.02\% / ^\circ\text{C}$ |

General Specifications

| | |
|---------------------------------------------|-------------------------------|
| Efficiency | See Table |
| I/O Isolation Voltage (3 sec.) | 1500 VDC (3000 VDC optional)* |
| I/O Isolation Capacitance | 470 pF, typ. |
| I/O Isolation Resistance | 1000 M Ohm |
| Switching Frequency | 200 kHz, typ. |
| Humidity | 95% rel H |
| Reliability Calculated MTBF (MIL-HDBK-217F) | > 1.121 Mhrs |

Physical Specifications

| | |
|------------------|-----------------------|
| Case Material | Nickel Coated Brass |
| Potting Material | Epoxy (UL94V-0 rated) |
| Weight | ~ 30g, typ. |

Environment Specifications

| | |
|--------------------------|--------------------------------------------------------------|
| Operating Temperature | -40 to +71 $^\circ\text{C}$ (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 Min. Load (mA) | Output Current Full Load (mA) | Efficiency (%) | Capacitor Load (µF) |
|----------------------|---------------------|----------------------------|------------------------------|----------------------|-------------------------------|-------------------------------|----------------|---------------------|
| SINGLE OUTPUT | | | | | | | | |
| P47WG-123R3E2:1LF | 9-18 | 30 | 1031 | 3.3 | 300 | 3000 | 80 | 3300 |
| P47WG-1205E2:1LF | 9-18 | 30 | 1524 | 5 | 300 | 3000 | 82 | 3300 |
| P47WG-127R2E2:1LF | 9-18 | 30 | 1506 | 7.2 | 208 | 2083 | 83 | 2200 |
| P47WG-1209E2:1LF | 9-18 | 30 | 1470 | 9 | 166 | 1666 | 85 | 1000 |
| P47WG-1212E2:1LF | 9-18 | 30 | 1470 | 12 | 125 | 1250 | 85 | 1000 |
| P47WG-1215E2:1LF | 9-18 | 30 | 1470 | 15 | 100 | 1000 | 85 | 680 |
| P47WG-1218E2:1LF | 9-18 | 30 | 1470 | 18 | 83 | 833 | 85 | 470 |
| P47WG-1224E2:1LF | 9-18 | 30 | 1453 | 24 | 62 | 625 | 86 | 470 |
| P47WG-243R3E2:1LF | 18-36 | 25 | 515 | 3.3 | 300 | 3000 | 80 | 3300 |
| P47WG-2405E2:1LF | 18-36 | 25 | 744 | 5 | 300 | 3000 | 84 | 3300 |
| P47WG-247R2E2:1LF | 18-36 | 25 | 744 | 7.2 | 208 | 2083 | 84 | 2200 |
| P47WG-2409E2:1LF | 18-36 | 25 | 735 | 9 | 166 | 1666 | 85 | 1000 |
| P47WG-2412E2:1LF | 18-36 | 25 | 735 | 12 | 125 | 1250 | 85 | 1000 |
| P47WG-2415E2:1LF | 18-36 | 25 | 726 | 15 | 100 | 1000 | 86 | 680 |
| P47WG-2418E2:1LF | 18-36 | 25 | 726 | 18 | 83 | 833 | 86 | 470 |
| P47WG-2424E2:1LF | 18-36 | 25 | 718 | 24 | 62 | 625 | 87 | 470 |
| P47WG-483R3E2:1LF | 36-72 | 20 | 257 | 3.3 | 300 | 3000 | 80 | 3300 |
| P47WG-4805E2:1LF | 36-72 | 20 | 372 | 5 | 300 | 3000 | 84 | 3300 |
| P47WG-487R2E2:1LF | 36-72 | 20 | 372 | 7.2 | 208 | 2083 | 84 | 2200 |
| P47WG-4809E2:1LF | 36-72 | 20 | 367 | 9 | 166 | 1666 | 85 | 1000 |
| P47WG-4812E2:1LF | 36-72 | 20 | 363 | 12 | 125 | 1250 | 86 | 1000 |
| P47WG-4815E2:1LF | 36-72 | 20 | 359 | 15 | 100 | 1000 | 87 | 680 |
| P47WG-4818E2:1LF | 36-72 | 20 | 359 | 18 | 83 | 833 | 87 | 470 |
| P47WG-4824E2:1LF | 36-72 | 20 | 359 | 24 | 62 | 625 | 87 | 470 |

If you need other specifications, please enquire.

*** For optional 3.5kV DC I/O Isolation, please add "H35" before LF!**

→ Example: P47WG-2409E2:1H35LF for 3.5kV

Notes:

Selection Guide

Dual Output

| Order # | Input Voltage (VDC) | Input Current No Load (mA) | Input Current Full Load (mA) | Output Voltage (VDC) | Output Current Min. Load (mA) | Output Current Full Load (mA) | Efficiency (%) | Capacitor Load (µF) |
|--------------------|---------------------|----------------------------|------------------------------|----------------------|-------------------------------|-------------------------------|----------------|---------------------|
| DUAL OUTPUT | | | | | | | | |
| P47WG-123R3Z2:1LF | 9-18 | 30 | 1562 | ± 3.3 | ± 150 | ± 1500 | 80 | ± 1000 |
| P47WG-1205Z2:1LF | 9-18 | 30 | 1524 | ± 5 | ± 150 | ± 1500 | 82 | ± 1000 |
| P47WG-127R2Z2:1LF | 9-18 | 30 | 1506 | ± 7.2 | ± 104 | ± 1041 | 83 | ± 680 |
| P47WG-1209Z2:1LF | 9-18 | 30 | 1488 | ± 9 | ± 83 | ± 833 | 84 | ± 470 |
| P47WG-1212Z2:1LF | 9-18 | 30 | 1488 | ± 12 | ± 62 | ± 625 | 84 | ± 470 |
| P47WG-1215Z2:1LF | 9-18 | 30 | 1488 | ± 15 | ± 50 | ± 500 | 84 | ± 330 |
| P47WG-1218Z2:1LF | 9-18 | 30 | 1470 | ± 18 | ± 41 | ± 416 | 85 | ± 220 |
| P47WG-1224Z2:1LF | 9-18 | 30 | 1470 | ± 24 | ± 31 | ± 312 | 85 | ± 220 |
| P47WG-243R3Z2:1LF | 18-36 | 25 | 515 | ± 3.3 | ± 150 | ± 1500 | 80 | ± 1000 |
| P47WG-2405Z2:1LF | 18-36 | 25 | 753 | ± 5 | ± 150 | ± 1500 | 83 | ± 1000 |
| P47WG-247R2Z2:1LF | 18-36 | 25 | 744 | ± 7.2 | ± 104 | ± 1041 | 84 | ± 680 |
| P47WG-2409Z2:1LF | 18-36 | 25 | 735 | ± 9 | ± 83 | ± 833 | 85 | ± 470 |
| P47WG-2412Z2:1LF | 18-36 | 25 | 726 | ± 12 | ± 62 | ± 625 | 86 | ± 470 |
| P47WG-2415Z2:1LF | 18-36 | 25 | 726 | ± 15 | ± 50 | ± 500 | 86 | ± 330 |
| P47WG-2418Z2:1LF | 18-36 | 25 | 718 | ± 18 | ± 41 | ± 416 | 87 | ± 220 |
| P47WG-2424Z2:1LF | 18-36 | 25 | 718 | ± 24 | ± 31 | ± 312 | 87 | ± 220 |
| P47WG-483R3Z2:1LF | 36-72 | 20 | 257 | ± 3.3 | ± 150 | ± 1500 | 80 | ± 1000 |
| P47WG-4805Z2:1LF | 36-72 | 20 | 372 | ± 5 | ± 150 | ± 1500 | 84 | ± 1000 |
| P47WG-487R2Z2:1LF | 36-72 | 20 | 372 | ± 7.2 | ± 104 | ± 1041 | 84 | ± 680 |
| P47WG-4809Z2:1LF | 36-72 | 20 | 367 | ± 9 | ± 83 | ± 833 | 85 | ± 470 |
| P47WG-4812Z2:1LF | 36-72 | 20 | 363 | ± 12 | ± 62 | ± 625 | 86 | ± 470 |
| P47WG-4815Z2:1LF | 36-72 | 20 | 359 | ± 15 | ± 50 | ± 500 | 87 | ± 330 |
| P47WG-4818Z2:1LF | 36-72 | 20 | 359 | ± 18 | ± 41 | ± 416 | 87 | ± 220 |
| P47WG-4824Z2:1LF | 36-72 | 20 | 359 | ± 24 | ± 31 | ± 312 | 87 | ± 220 |

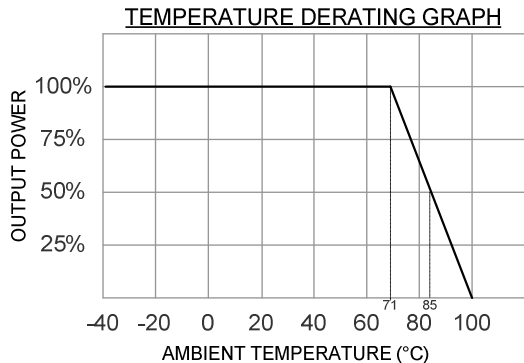
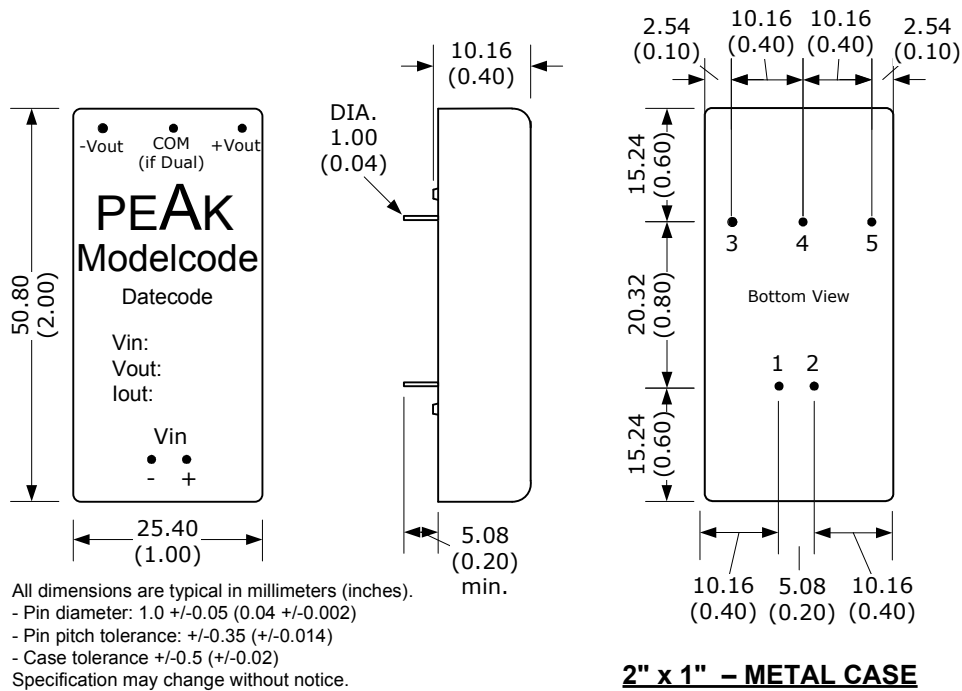
If you need other specifications, please enquire.

* For optional 3.5kV DC I/O Isolation, please add “H35” before LF!

→ Example: P47WG-2409Z2:1H35LF for 3.5kV

Notes:

Package / Pinning / Derating



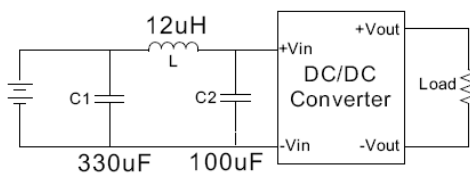
| PIN CONNECTIONS | | |
|-----------------|---------|--------|
| # | SINGLE | DUAL |
| 1 | +Vin | +Vin |
| 2 | - Vin | - Vin |
| 3 | +Vout | +Vout |
| 4 | Omitted | Common |
| 5 | - Vout | - Vout |

same Pinning for 3.5 kV Isolation

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.
- Suggest adding input external filter (C1 , C2 , L) to meet conducted emissions (En55022 class A).



| EMC SPECIFICATIONS | | |
|--------------------|---------------------------------|--------------------|
| Radiated Emissions | EN 55022 FCC 47CFR Part 15/A | CLASS A CLASS A |
| ESD | IEC 61000-4-2 | Perf. Criteria B |
| RS | IEC 61000-4-3 | Perf. Criteria A |