# P15VG-xxxxE/Z2:1LF

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The world of DC/DC converters
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PMN-SERIES Rev. 05-2013

- ✓ 15 Watt
- ✓ **2:1** Input
- ✓ **1" x 1"** Case
- ✓ **1.6 kV** DC I/O Isolation
- ✓ **Reg. Single** and **Dual** Output
- ✓ Remote ON/OFF Control
- ✓ Continuous Short Circuit Prot.

The PMN series is a family of high performance 15W single & dual output DC-DC converters. These are encapsulated in nickel coated copper 1" x 1" case with non conductive base.

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

| | |
|---|---|
| **Input Specifications** | |
| Voltage Range | 2:1 Input (see table) |
| Input Filter | Pi-Type |
| Input Reflected Ripple Current[1] | 20mA pk-pk |
| Start up Time | 20mS |
| **Output Specifications** | |
| Voltage Accuracy | ± 1% |
| Short Circuit Protection | Indefinite (hiccup, automatic recovery) |
| Output Voltage Adjustable (trim) | ± 10%, max. (only single output) |
| Cross Regulation[2] (dual output) | ± 5% |
| Line Regulation | ± 0.2%, max. |
| Load Regulation (0% - 100%) | ± 0.5%, max. (single) ± 1%, max. (dual) |
| Ripple and Noise (20Mhz bandwidth) [3] | 100 mV pk-pk, max. |
| Over Current Protection | 150% of FL |
| Transient Recovery[4] | 250 us, typ. |
| Transient Response Deviation[4] | ± 3%, max. |
| Temperature Coefficient | ± 0.02% / ℃ |
| **General Specifications** | |
| Efficiency | See Table |
| I/O Isolation Voltage (3 sec.) | 1600 VDC |
| Isolation Resistance | 1000 MOhm, min. |
| Isolation Capacity | 1200 pF, max. |
| Switching Frequency | 375 kHz, typ. |
| Humidity | 95% rel H |
| Reliability Calculated MTBF (MIL-HDBK-217F) | > 560 khrs |
| **Physical Specifications** | |
| Case Material | Nickel Coated Copper |
| Weight | ~ 18 g, typ. |
| **Environment Specifications** | |
| Operating Temperature | -40 to +66℃ (for 100%) |
| Maximum Case Temperature | 105℃ |
| Storage Temperature | -40 to +125℃ |
| Cooling | Free Air Convection (10 mm distance required) |
| RoHS Conform | Soldering 260℃, max. (1.5mm from case 10s.) |

# Selection Guide

## Single and Dual Output (If you need other specifications, please enquire)

| 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 (uF)5 |
|---|---|---|---|---|---|---|---|---|
| **SINGLE OUTPUT** | | | | | | | | |
| P15VG-123R3E2:1LF | 9-18 | 20 | 1310 | 3.3 | 0 | 4000 | 85 | 1000 |
| P15VG-1205E2:1LF | 9-18 | 20 | 1471 | 5 | 0 | 3000 | 86 | 1000 |
| P15VG-1212E2:1LF | 9-18 | 20 | 1494 | 12 | 0 | 1300 | 88 | 330 |
| P15VG-1215E2:1LF | 9-18 | 20 | 1420 | 15 | 0 | 1000 | 89 | 220 |
| P15VG-243R3E2:1LF | 18-36 | 15 | 647 | 3.3 | 0 | 4000 | 86 | 1000 |
| P15VG-2405E2:1LF | 18-36 | 15 | 727 | 5 | 0 | 3000 | 87 | 1000 |
| P15VG-2412E2:1LF | 18-36 | 15 | 747 | 12 | 0 | 1300 | 88 | 330 |
| P15VG-2415E2:1LF | 18-36 | 15 | 710 | 15 | 0 | 1000 | 89 | 220 |
| P15VG-483R3E2:1LF | 36-75 | 10 | 327 | 3.3 | 0 | 4000 | 85 | 1000 |
| P15VG-4805E2:1LF | 36-75 | 10 | 368 | 5 | 0 | 3000 | 86 | 1000 |
| P15VG-4812E2:1LF | 36-75 | 10 | 374 | 12 | 0 | 1300 | 88 | 330 |
| P15VG-4815E2:1LF | 36-75 | 10 | 359 | 15 | 0 | 1000 | 88 | 220 |
| **DUAL OUTPUT** | | | | | | | | |
| P15VG-1205Z2:1LF | 9-18 | 20 | 1488 | ± 5 | 0 | ± 1500 | 85 | ± 470 |
| P15VG-1212Z2:1LF | 9-18 | 20 | 1420 | ± 12 | 0 | ± 625 | 89 | ± 220 |
| P15VG-1215Z2:1LF | 9-18 | 20 | 1437 | ± 15 | 0 | ± 500 | 89 | ± 100 |
| P15VG-2405Z2:1LF | 18-36 | 15 | 744 | ± 5 | 0 | ± 1500 | 85 | ± 470 |
| P15VG-2412Z2:1LF | 18-36 | 15 | 718 | ± 12 | 0 | ± 625 | 88 | ± 220 |
| P15VG-2415Z2:1LF | 18-36 | 15 | 710 | ± 15 | 0 | ± 500 | 89 | ± 100 |
| P15VG-4805Z2:1LF | 36-75 | 10 | 377 | ± 5 | 0 | ± 1500 | 84 | ± 470 |
| P15VG-4812Z2:1LF | 36-75 | 10 | 363 | ± 12 | 0 | ± 625 | 87 | ± 220 |
| P15VG-4815Z2:1LF | 36-75 | 10 | 359 | ± 15 | 0 | ± 500 | 88 | ± 100 |

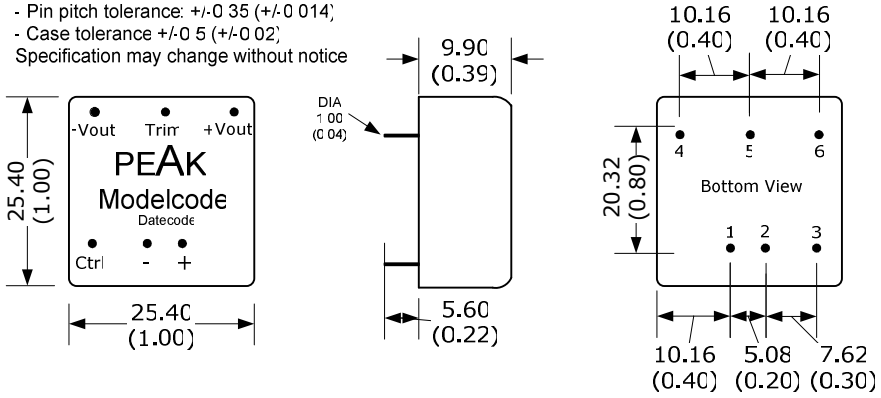
Notes:

# Package / Pinning / Derating

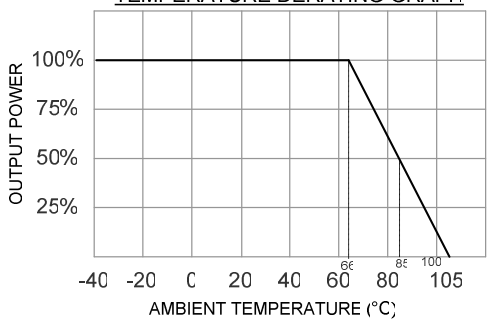
All dimensions are typical in millimeters (inches)
- Pin diameter ´ 0 +/-0 05 (0 04 +/-0 002)
- Pin pitch tolerance: +/-0 35 (+/-0 014)
- Case tolerance +/-0 5 (+/-0 02)

Specification may change without notice

**1" x 1" – METAL CASE**




TEMPERATURE DERATING GRAPH

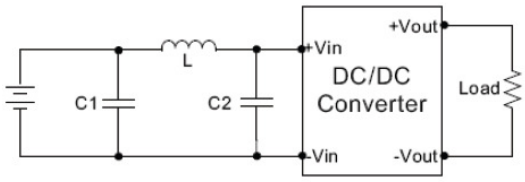



| PIN CONNECTION | | |
|---|---|---|
| # | SINGLE | DUAL |
| 1 | +Vin | +Vin |
| 2 | - Vin | - Vin |
| 3 | CTRL | CTRL |
| 4 | +Vout | +Vout |
| 5 | Trim | Common |
| 6 | - Vout | - Vout |

Notes:

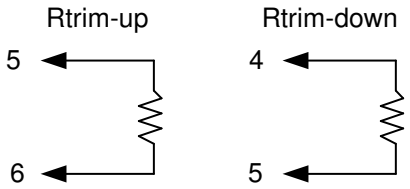
# App Notes

1 = Measured Input reflected ripple current with a simulated source inductance of 12 uH
2 = One load is 25% to 100% load, the other load is 100% load, the output voltage variable rate is within ±5%
3 = Measured with a 1.0uF ceramic capacitor and 10uF tantalum capacitor
4 = Tested by normal Vin and 25% load step change (75% - 50% - 25% of Io)
5 = Tested by minimal Vin and constant resistive load
6 = Input filter components (C1, L, C2) are used to help meet conducted emissions requirement for the module. These components should be mounted as close as possible to the module; and all leads should be minimized to decrease radiated noise
7 = An external filter capacitor is required if the module has to meet EN61000-4-4 and EN61000-4-5
8 = The remote ON/OFF control pin is referenced to -Vin (pin2)




| | C1 | L | C2 |
|---|---|---|---|
| P15VG-12xx | 1210, 2.2uF/100V | 12uH | 1210, 2.2uF/100V |
| P15VG-24xx | | | |
| P15VG-48xx | | | |

| EMC SPECIFICATIONS | | |
|---|---|---|
| Radiated Emissions | EN 55022 | CLASS A |
| Conducted Emissions[6] | EN 55022 | CLASS A |
| ESD | EN 61000-4-2 | Perf. Criteria A |
| RS | EN 61000-4-3 | Perf. Criteria A |
| EFT[7] | EN 61000-4-4 | Perf. Criteria A |
| Surge[7] | EN 61000-4-5 | Perf. Criteria A |
| CS | EN 61000-4-6 | Perf. Criteria A |
| PFMF | EN 61000-4-8 | Perf. Criteria A |




External Output Trimming
Output can be externally trimmed.
(Single output models only!)

| Over Voltage Protection (Zender diode clamp) | |
|---|---|
| 3.3 Vout: | 3.9 V |
| 5 Vout | 6.2 V |
| 12 Vout | 15 V |
| 15 Vout | 18 V |
| ± 5 Vout | ± 6.2 V |
| ± 12 Vout | ± 15 V |
| ± 15 Vout | ± 18 V |

| Under Input Voltage Lockout (typ.) | |
|---|---|
| 12 Vin Models | Module ON/OFF 8.5V / 7V |
| 24 Vin Models | Module ON/OFF 17V / 15V |
| 48 Vin Models | Module ON/OFF 35V / 34V |

| Remote ON/OFF Control[8] | |
|---|---|
| ON: | 3 -12 VDC or open circuit |
| OFF: | 0 – 1.2 VDC or short circuit PIN2 and PIN3 |
| OFF idle current: | 5mA, typ. |