

P48WG-xxxxE/Z4:1LF

PM9-SERIES

Rev.01-2009

- ✓ 20 Watt
- ✓ 4:1 Ultra Wide Input
- ✓ Regulated Output
- ✓ Single and Dual Output
- ✓ 1.5 kV DC I/O Isolation
- ✓ 2" x 1" Case
- ✓ Over Voltage Protection



The PM9 series is a family of cost effective 20 W, single & dual output DC/DC converters with a ultra wide 4:1 Input. These converters are encapsulated in nickel coated copper 2"x1" case with high performance technology like active clamp, high efficiency operation and output voltage accuracy of $\pm 1\%$ maximum. Precise controlled design provides tight line / load regulation

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

Input Specifications

Voltage Range	4:1 Ultra Wide Input (See Table)
Input Filter	PI Type
Input Reflected Ripple Current ¹	20 mA pk-pk
Start up Time (Nom. V_{in} and constant resistive load)	20mS, typ.

Output Specifications

Voltage Accuracy	$\pm 1\%$
Adjustability (Trim) (Only Single-out Models)	$\pm 10\%$, max
Short Circuit Protection	Indefinite (hiccup; Automatic Recovery)
Over Current Protection	120% of FL, typ.
Line Regulation	$\pm 0.5\%$
Load Regulation (0% - 100%)	$\pm 0.5\%$ (Single-out) $\pm 1.0\%$ (Dual-out)
Cross Regulation ² (dual output)	$\pm 5\%$
Ripple and Noise (20Mhz bandwidth)	75 mV pk-pk
Temperature Coefficient	$\pm 0.02\%$ / $^\circ\text{C}$
Transient Recovery Time ³	250us, typ.
Transient Response Deviation ³	$\pm 3\%$, max.

General Specifications

I/O Isolation Voltage (3 sec.)	1500 VDC
I/O Isolation Capacitance	1200 pF, typ.
I/O Isolation Resistance	1000 MOhm
Switching Frequency	330 kHz, typ.
Humidity	95% rel H
Reliability Calculated MTBF (MIL-HDBK-217F)	> 560 khrs

Physical Specifications

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

Environment Specifications

Operating Temperature	-40 to +66 $^\circ\text{C}$ (ambient)
Maximum Case Temperature	105 $^\circ\text{C}$
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 and Dual Output

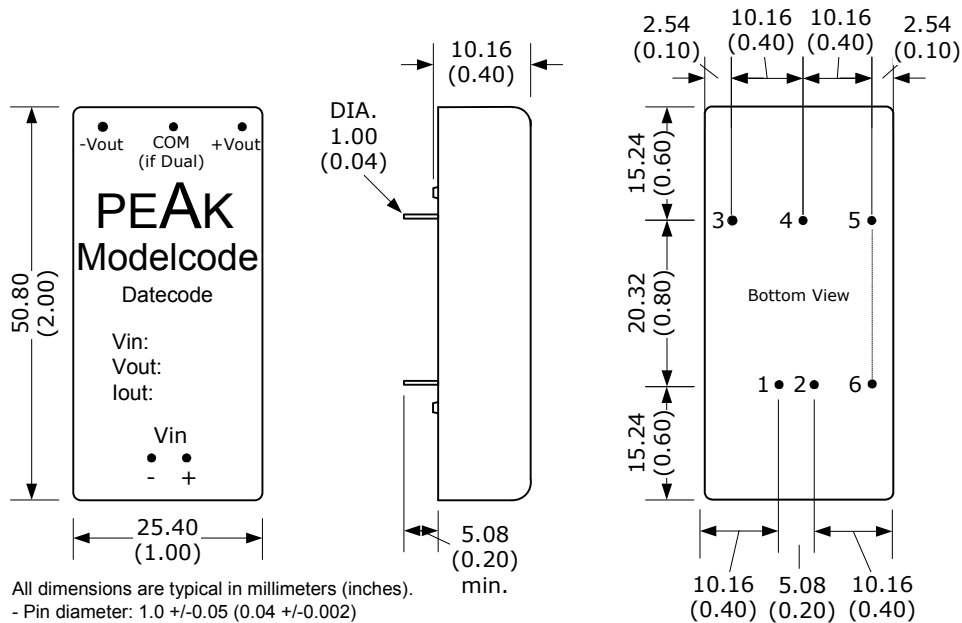
Order #	Input Voltage (VDC)	Input Current No Load (mA)	Input Current Full Load (mA)	Output Voltage (VDC)	Output Current Min. Load (mA)	Output Current Full Load (mA)	Efficiency (%)	Capacitor Load (uF) [†]
SINGLE OUTPUT								
P48WG-243R3E4:1LF	9-36	50	879	3.3	0	5500	89	10000
P48WG-2405E4:1LF	9-36	50	957	5	0	4000	91	6800
P48WG-2412E4:1LF	9-36	22	980	12	0	1670	89	1000
P48WG-2415E4:1LF	9-36	22	968	15	0	1330	89	680
P48WG-483R3E4:1LF	18-75	30	440	3.3	0	5500	89	10000
P48WG-4805E4:1LF	18-75	30	473	5	0	4000	91	6800
P48WG-4812E4:1LF	18-75	15	484	12	0	1670	89	1000
P48WG-4815E4:1LF	18-75	15	484	15	0	1330	89	680

DUAL OUTPUT								
P48WG-2405Z4:1LF	9-36	65	969	± 5	0	± 2000	89	± 2200
P48WG-2412Z4:1LF	9-36	25	980	± 12	0	± 835	88	± 470
P48WG-2415Z4:1LF	9-36	25	980	± 15	0	± 665	89	± 330
P48WG-4805Z4:1LF	18-75	40	484	± 5	0	± 2000	89	± 2200
P48WG-4812Z4:1LF	18-75	15	490	± 12	0	± 835	88	± 470
P48WG-4815Z4:1LF	18-75	15	490	± 15	0	± 665	89	± 330

If you need other specifications, please enquire.

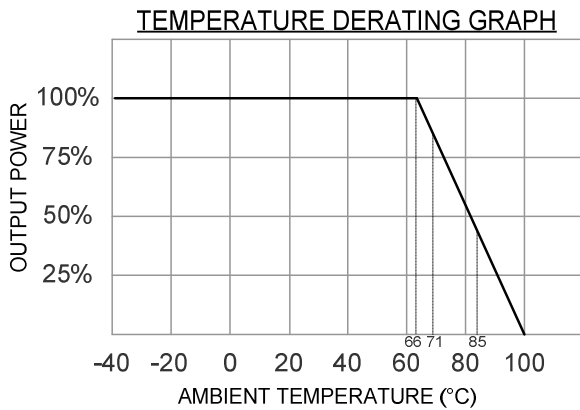
Notes:

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.

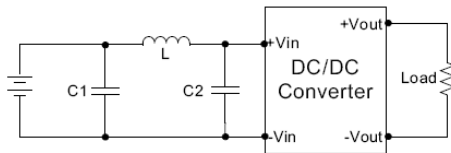
2" x 1" – METAL CASE



PIN CONNECTIONS		
#	SINGLE	DUAL
1	+Vin	+Vin
2	- Vin	- Vin
3	+Vout	+Vout
4	Trim	Common
5	- Vout	- Vout
6	Ctrl.	Ctrl.

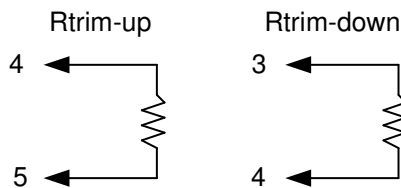
App Notes

- 1 = Measured Input reflected ripple current with a simulated source inductance of 12uH.
- 2 = One load is 25% to 100% load, the other load is 100% load, the output voltage variable rate is within ±5%.
- 3 = Tested by nominal Vin and 25% load step change (75% - 50% - 25% of Io)
- 4 = Tested by minimal Vin and constant resistive load.
- 5 = 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.
- 6 = An external filter capacitor is required if the module has to meet EN61000-4-4 and EN61000-4-5



Part #	C1 / C2	L
P48WG-24xx	1210, 2.2uF/100V	12uH
P48WG-48xx	1210, 2.2uF/100V	12uH

EMC SPECIFICATIONS		
Radiated Emissions	EN 55022	CLASS A
Conducted Emissions ⁵	EN 55022	CLASS A
ESD	EN 61000-4-2	Perf. Criteria B
RS	EN 61000-4-3	Perf. Criteria A
EFT ⁶	EN 61000-4-4	Perf. Criteria B
Surge ⁶	EN 61000-4-5	Perf. Criteria B
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 (Zener 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.)	
24 Vin Models	Module ON/OFF 8.6V / 7.9V
48 Vin Models	Module ON/OFF 17.8V / 16V

Remote ON/OFF Control	
ON:	3 -12 VDC or open circuit
OFF:	0 – 1.2 VDC or short circuit PIN2 and PIN6
OFF idle current:	5mA, typ.

Notes: