

# P6LU-xxxxE/Z(Hxx)LF



## PM1-SERIES

Rev.02-2009

- ✓ 1 Watt
- ✓ Unregulated
- ✓ **Single** and **Dual** Output
- ✓ **SIP7** Case
- ✓ **3 - 6 kV** DC I/O Isolation
- ✓ Low Ripple and Noise

The PM1 series P6LU-xxxxE/Z(Hxx)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: 3000VDC up to 6000 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 <sup>1</sup>	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	~ 2.3g, 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 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) <sup>2</sup>
<b>SINGLE OUTPUT</b>							
P6LU-053R3ELF	5	30	267	3.3	303	75	220
P6LU-0505ELF	5	30	256	5	200	78	220
P6LU-057R2ELF	5	30	270	7.2	138.9	74	220
P6LU-0509ELF	5	30	267	9	111.1	75	220
P6LU-0512ELF	5	30	263	12	83.3	76	220
P6LU-0515ELF	5	30	263	15	66.7	76	220
P6LU-0518ELF	5	30	267	18	55.6	75	220
P6LU-0524ELF	5	30	278	24	41.7	72	220
P6LU-123R3ELF	12	20	113	3.3	303	74	220
P6LU-1205ELF	12	20	113	5	200	74	220
P6LU-127R2ELF	12	20	113	7.2	138.9	74	220
P6LU-1209ELF	12	20	111	9	111.1	75	220
P6LU-1212ELF	12	20	108	12	83.3	77	220
P6LU-1215ELF	12	20	106	15	66.7	78	220
P6LU-1218ELF	12	20	106	18	55.6	78	220
P6LU-1224ELF	12	20	113	24	41.7	75	220
P6LU-243R3ELF	24	10	56	3.3	303	75	220
P6LU-2405ELF	24	10	54	5	200	77	220
P6LU-247R2ELF	24	10	56	7.2	138.9	75	220
P6LU-2409ELF	24	10	56	9	111.1	75	220
P6LU-2412ELF	24	10	53	12	83.3	78	220
P6LU-2415ELF	24	10	53	15	66.7	78	220
P6LU-2418ELF	24	10	53	18	55.6	78	220
P6LU-2424ELF	24	10	53	24	41.7	78	220
P6LU-483R3ELF	48	6	29	3.3	303	72	220
P6LU-4805ELF	48	6	29	5	200	72	220
P6LU-487R2ELF	48	6	29	7.2	138.9	72	220
P6LU-4809ELF	48	6	28	9	111.1	74	220
P6LU-4812ELF	48	6	28	12	83.3	74	220
P6LU-4815ELF	48	6	28	15	66.7	75	220
P6LU-4818ELF	48	6	29	18	55.6	72	220
P6LU-4824ELF	48	6	30	24	41.7	70	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 (P6LU-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 (uF) <sup>2</sup>
<b>DUAL OUTPUT</b>							
P6LU-053R3ZLF	5	30	307	± 3.3	± 151.5	65	± 100
P6LU-0505ZLF	5	30	270	± 5	± 100	74	± 100
P6LU-057R2ZLF	5	30	259	± 7.2	± 69.44	77	± 100
P6LU-0509ZLF	5	30	256	± 9	± 55.55	78	± 100
P6LU-0512ZLF	5	30	256	± 12	± 41.67	78	± 100
P6LU-0515ZLF	5	30	250	± 15	± 33.33	80	± 100
P6LU-0518ZLF	5	30	253	± 18	± 27.77	79	± 100
P6LU-0524ZLF	5	30	250	± 24	± 20.83	80	± 100
P6LU-123R3ZLF	12	20	126	± 3.3	± 151.5	66	± 100
P6LU-1205ZLF	12	20	111	± 5	± 100	75	± 100
P6LU-127R2ZLF	12	20	109	± 7.2	± 69.44	76	± 100
P6LU-1209ZLF	12	20	109	± 9	± 55.55	76	± 100
P6LU-1212ZLF	12	20	106	± 12	± 41.67	78	± 100
P6LU-1215ZLF	12	20	104	± 15	± 33.33	80	± 100
P6LU-1218ZLF	12	20	104	± 18	± 27.77	80	± 100
P6LU-1224ZLF	12	20	109	± 24	± 20.83	76	± 100
P6LU-243R3ZLF	24	10	61	± 3.3	± 151.5	68	± 100
P6LU-2405ZLF	24	10	56	± 5	± 100	74	± 100
P6LU-247R2ZLF	24	10	54	± 7.2	± 69.44	76	± 100
P6LU-2409ZLF	24	10	54	± 9	± 55.55	76	± 100
P6LU-2412ZLF	24	10	53	± 12	± 41.67	78	± 100
P6LU-2415ZLF	24	10	53	± 15	± 33.33	78	± 100
P6LU-2418ZLF	24	10	53	± 18	± 27.77	78	± 100
P6LU-2424ZLF	24	10	53	± 24	± 20.83	78	± 100
P6LU-483R3ZLF	48	6	34	± 3.3	± 151.5	60	± 100
P6LU-4805ZLF	48	6	30	± 5	± 100	70	± 100
P6LU-487R2ZLF	48	6	30	± 7.2	± 69.44	70	± 100
P6LU-4809ZLF	48	6	29	± 9	± 55.55	72	± 100
P6LU-4812ZLF	48	6	28	± 12	± 41.67	74	± 100
P6LU-4815ZLF	48	6	28	± 15	± 33.33	74	± 100
P6LU-4818ZLF	48	6	29	± 18	± 27.77	72	± 100
P6LU-4824ZLF	48	6	30	± 24	± 20.83	70	± 100

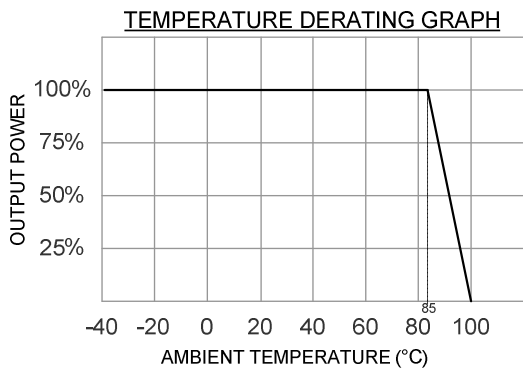
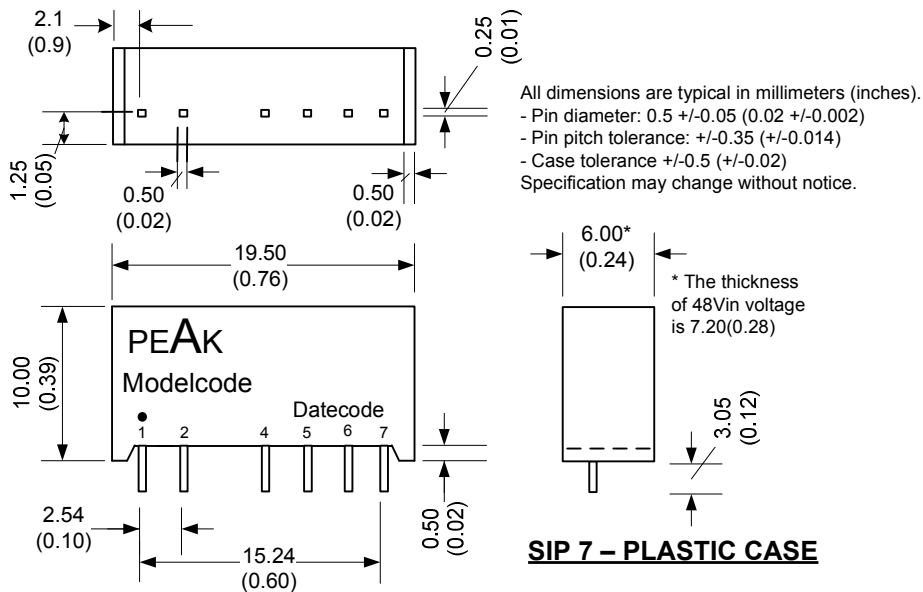
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(P6LU-2412ZH60LF for 6KV)

# Package / Pinning / Derating

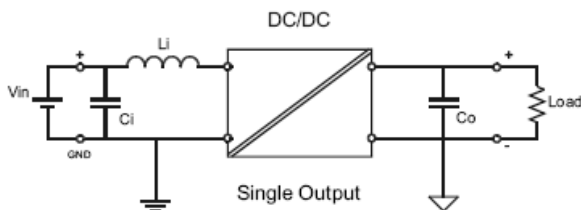


PIN CONNECTIONS		
#	SINGLE ≥3KV	DUAL ≥3KV
1	+Vin	+Vin
2	- Vin	- Vin
4	Omitted	Omitted
5	- Vout	- Vout
6	Omitted	Common
7	+Vout	+Vout

## App Notes:

- <sup>1</sup> = Measured Input reflected ripple current with a simulated source inductance of 12uH.
- <sup>2</sup> = 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~100μF(±4.7μF~±68μF 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.



Radiated Emissions  
ESD  
RS

## EMC SPECIFICATIONS

EN 55022  
FCC 47CFR Part 15/A  
IEC 61000-4-2  
IEC 61000-4-3

CLASS B  
CLASS B  
Perf. Criteria B  
Perf. Criteria A