

PHxxYG-xxxxE/Z2:1(H30)LF PHxxYG-xxxxE/Z4:1(H30)LF



PHK-SERIES

Rev.11-2009

- ✓ 18 - 30 Watt
- ✓ 2:1 / 4:1 (Ultra) Wide Input
- ✓ Reg. Single, Dual Output
- ✓ 1.6" x 2" Case
- ✓ 1.5 up to 3 kV DC I/O Isolation
- ✓ Over Voltage / SC Protection
- ✓ Soft Start and Remote Ctrl.

The PHK series is a family of cost effective 18 - 30 W, single and dual output DC/DC converters with a wide 2:1 or 4:1 Input. These converters are encapsulated in nickel coated copper 1.6"x2" case with high performance technology like 1.5 up to 3 kV I/O isolation, high efficiency operation, remote on/off control, short circuit protection, thermal shutdown, UVLO/OVLO shutdown, soft start and output voltage accuracy of ± 2 .

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

Input Specifications

Voltage Range	2:1 / 4:1 (Ultra) Wide Input (see table)
Input Filter	PI Type

Output Specifications

Voltage Accuracy	$\pm 2\%$
Short Circuit Protection	Continuous (Automatic Recovery)
Over Load Protection	$\geq 110\%$ of Full Load
Line Regulation	$\pm 0.5\%$
Load Regulation (25% - 100%)	$\pm 0.5\%$ (Single), $\pm 2\%$ (Dual)
Ripple and Noise (20Mhz bandwidth)	80 mV pk-pk (3.3V, 5V); 1% of Vout (others)
Temperature Coefficient	$\pm 0.05\%$ / °C
Transient Response Recovery Time	280us, max. (50% Load Step Change)

General Specifications

Efficiency	See Table
I/O Isolation Voltage (3 sec.)	1500 VDC (3000 VDC optional*)
I/O Isolation Resistance	≥ 1000 M Ohm (500 VDC)
Switching Frequency	250 kHz, typ.
Humidity	95% rel H
Reliability Calculated MTBF (MIL-HDBK-217F)	> 0.6 Mhrs

Physical Specifications

Case Material	Nickel Coated Copper
Potting Material	Epoxy (UL94V-0 rated)
Weight	~ 50g, typ.

Environment Specifications

Operating Temperature	- 40 to +71 °C (ambient, max.)
Maximum Case Temperature	95 °C
Thermal Shutdown	+105 to +115 °C
Storage Temperature	- 55 to +115 °C
Cooling	Free Air Convection
RoHS Conform	Soldering 260 °C, max. (1.5mm from case 10s.)

Selection Guide

2:1 Input / Single and Dual Output

Order #	Power (Watt)	Input Voltage (VDC)	Output Voltage (VDC)	Output Current (mA)	Efficiency (%)
<u>SINGLE OUTPUT 2:1</u>					
PH18YG-123R3E2:1LF	18	9 - 18	3.3	6000	80
PH25YG-1205E2:1LF	25	9 - 18	5	5000	81
PH30YG-1212E2:1LF	30	9 - 18	12	2500	84
PH30YG-1215E2:1LF	30	9 - 18	15	2000	83
PH30YG-1224E2:1LF	30	9 - 18	24	1250	82
PH18YG-243R3E2:1LF	18	18 - 36	3.3	6000	80
PH25YG-2405E2:1LF	25	18 - 36	5	5000	80
PH30YG-2412E2:1LF	30	18 - 36	12	2500	84
PH30YG-2415E2:1LF	30	18 - 36	15	2000	83
PH30YG-2424E2:1LF	30	18 - 36	24	1250	83
PH18YG-483R3E2:1LF	18	36 - 72	3.3	5400	77
PH25YG-4805E2:1LF	25	36 - 72	5	5000	82
PH30YG-4812E2:1LF	30	36 - 72	12	2500	84
PH30YG-4815E2:1LF	30	36 - 72	15	2000	85
PH30YG-4824E2:1LF	30	36 - 72	24	1250	85

<u>DUAL OUTPUT 2:1</u>					
PH25YG-1205Z2:1LF	25	9 - 18	± 5	± 2500	81
PH30YG-1205Z2:1LF	30	9 - 18	± 5	± 3000	81
PH30YG-1212Z2:1LF	30	9 - 18	± 12	± 1250	83
PH30YG-1215Z2:1LF	30	9 - 18	± 15	± 1000	83
PH25YG-2405Z2:1LF	25	18 - 36	± 5	± 2500	83
PH30YG-2405Z2:1LF	30	18 - 36	± 5	± 3000	83
PH30YG-2412Z2:1LF	30	18 - 36	± 12	± 1250	85
PH30YG-2415Z2:1LF	30	18 - 36	± 15	± 1000	85
PH25YG-4805Z2:1LF	25	36 - 72	± 5	± 2500	84
PH30YG-4805Z2:1LF	30	36 - 72	± 5	± 3000	84
PH30YG-4812Z2:1LF	30	36 - 72	± 12	± 1250	85
PH30YG-4815Z2:1LF	30	36 - 72	± 15	± 1000	85

If you need other specifications, please enquire.

*** For optional 3kV I/O Isolation, please add “H30” before “LF”
For example: “PH30YG-1212Z2:1H30LF” for 3kV I/O Isolation**

Selection Guide

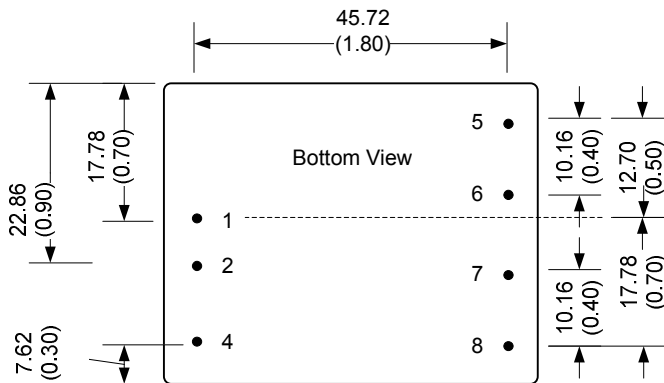
4:1 Input / Single and Dual Output

Order #	Power (Watt)	Input Voltage (VDC)	Output Voltage (VDC)	Output Current (mA)	Efficiency (%)
<u>SINGLE OUTPUT 4:1</u>					
PH20YG-243R3E4:1LF	20	9 - 36	3.3	6000	78
PH25YG-2405E4:1LF	25	9 - 36	5	5000	78
PH30YG-2405E4:1LF	30	9 - 36	5	6000	81
PH25YG-2412E4:1LF	25	9 - 36	12	2000	83
PH30YG-2412E4:1LF	30	9 - 36	12	2500	84
PH30YG-2415E4:1LF	30	9 - 36	15	2000	82
PH30YG-2424E4:1LF	30	9 - 36	24	1250	82
PH20YG-483R3E4:1LF	20	18 - 72	3.3	6000	78
PH25YG-4805E4:1LF	25	18 - 72	5	5000	80
PH30YG-4805E4:1LF	30	18 - 72	5	6000	80
PH25YG-4812E4:1LF	25	18 - 72	12	2000	83
PH30YG-4812E4:1LF	30	18 - 72	12	2500	83
PH30YG-4815E4:1LF	30	18 - 72	15	2000	83
PH30YG-4824E4:1LF	30	18 - 72	24	1250	83
<u>DUAL OUTPUT 4:1</u>					
PH30YG-2405Z4:1LF	30	9 - 36	± 5	± 3000	81
PH30YG-2412Z4:1LF	30	9 - 36	± 12	± 1250	82
PH30YG-2415Z4:1LF	30	9 - 36	± 15	± 1000	83
PH30YG-4805Z4:1LF	30	18 - 72	± 5	± 3000	83
PH30YG-4812Z4:1LF	30	18 - 72	± 12	± 1250	85
PH30YG-4815Z4:1LF	30	18 - 72	± 15	± 1000	85

If you need other specifications, please enquire.

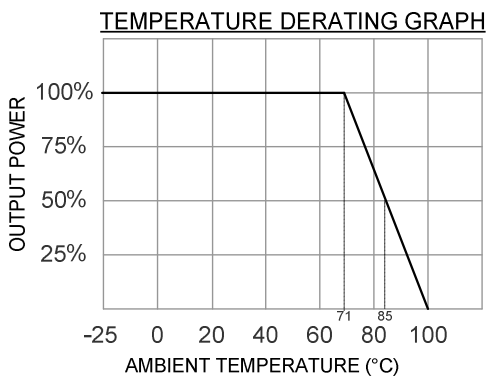
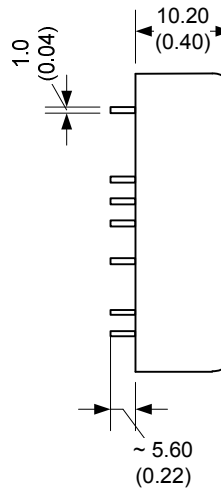
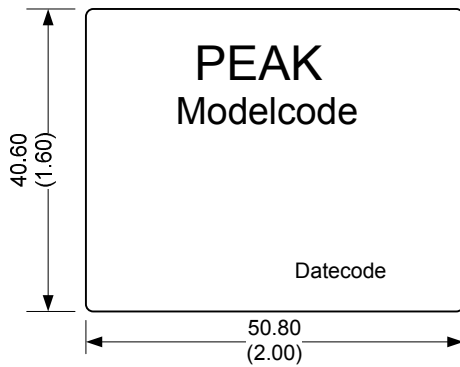
*** For optional 3kV I/O Isolation, please add "H30" before "LF"
For example: "PH30YG-2412Z4:1H30LF" for 3kV I/O Isolation**

Package / Pinning / Derating



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

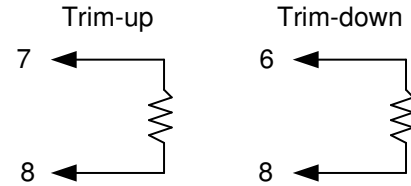
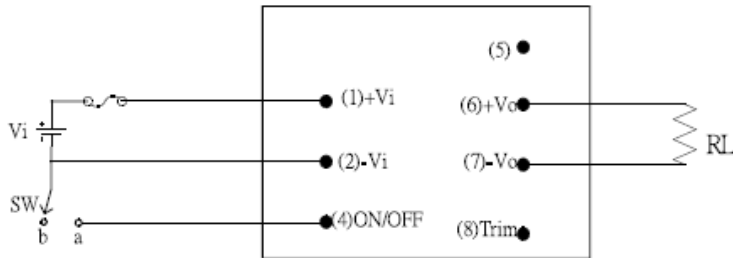
1.6" x 2.0" – METAL CASE



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

App Notes

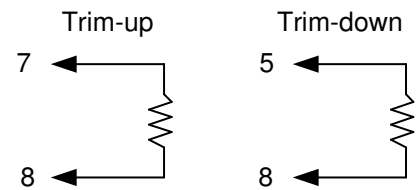
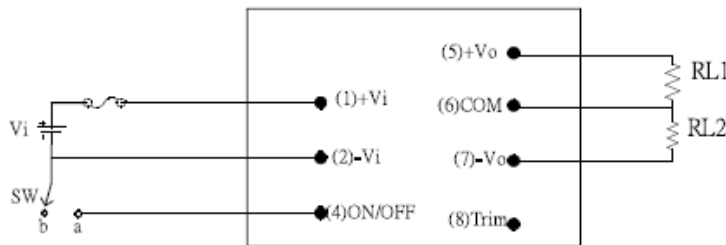
Single Output:



External Output Trimming

Output can be externally trimmed.
(Resistor between Pin 7and8 / 6and8)

Dual Output:



External Output Trimming

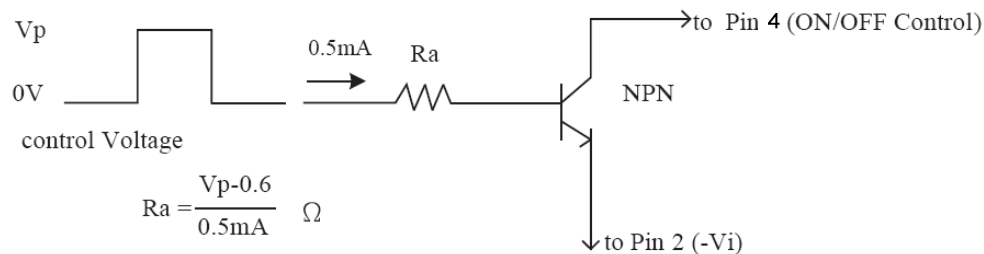
Output can be externally trimmed.
(Resistor between Pin 7and8 / 5and8)

Remote Control (ON/OFF)

You can switch OFF the converter by connecting SW to position “a”.

The converter operates when SW is connected to position “b”

The SW can be replaced by a NPN transistor:

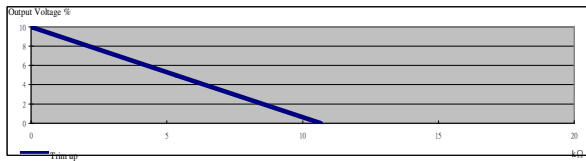


Note: The control voltage is referenced to negative input (-Vi)

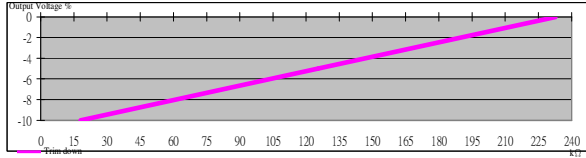
App Notes

Single 3.3Vout

Trim up

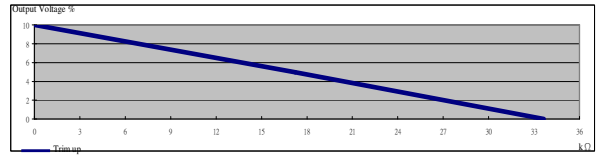


Trim down

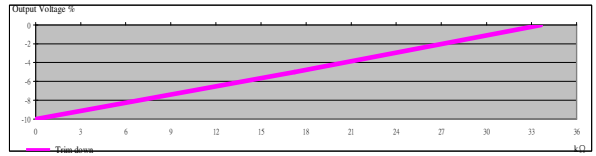


Single 5V

Trim up

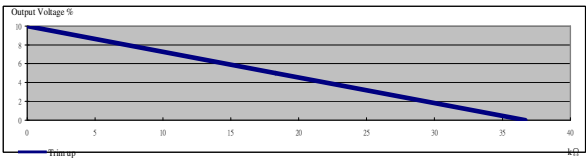


Trim down

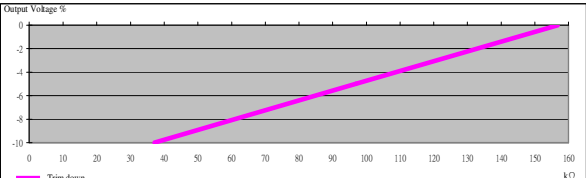


Single 12V

Trim up

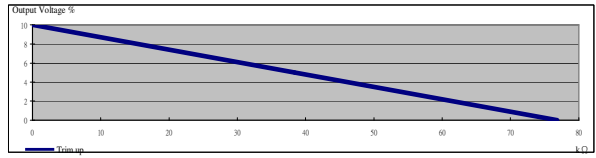


Trim down

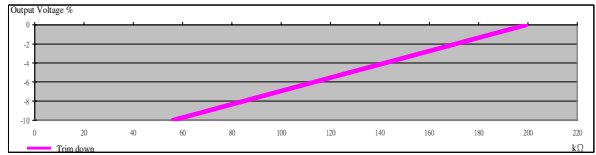


Single 15V

Trim up

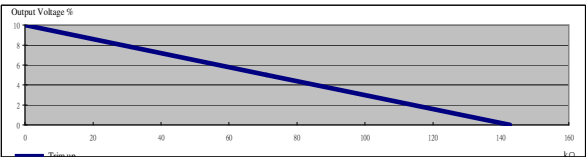


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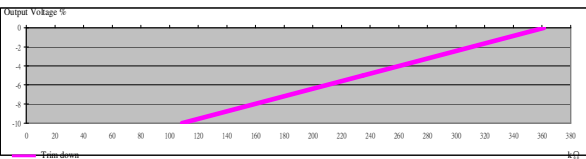


Single 24V

Trim up

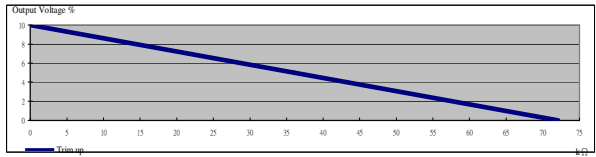


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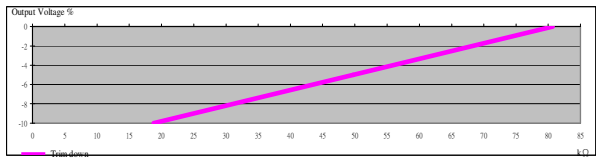


Dual 5Vout

Trim up

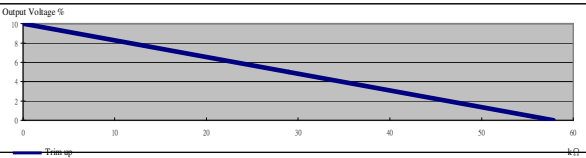


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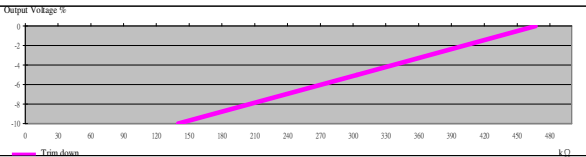


Dual 12Vout

Trim up

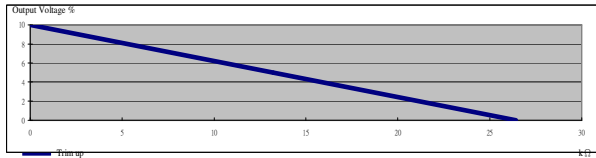


Trim down



Dual 15Vout

Trim up



Trim down

