



PHI-CON

6 W DC-DC Converter P6G-Series

- 8 Pin SIL
- Wide 4:1 input range
- 1500 V_{DC} and optional 3000 V_{DC} isolation
- Continuous short circuit protection
- ON/OFF Remote control input



Model guide

Type	Input voltage		Input current		Output voltage [V _{DC}]	Output current		Efficiency typ. [%]	Capacitive load (see note 1) [μF] max.
	nominal [V _{DC}]	range [V _{DC}]	no load [mA] typ.	full load [mA] typ.		[mA] max.	[mA] min.		
Single Output									
P6G243R3S	24	9...36	6	260	3.3	0	1500	79	4700
P6G2405S	24	9...36	6	300	5.0	0	1200	84	2200
P6G2409S	24	9...36	6	290	9.0	0	665	86	1000
P6G2412S	24	9...36	6	290	12.0	0	500	87	470
P6G2415S	24	9...36	6	290	15.0	0	400	87	220
P6G2424S	24	9...36	6	290	24.0	0	250	87	100
P6G483R3S	48	18...75	6	130	3.3	0	1500	79	4700
P6G4805S	48	18...75	6	150	5.0	0	1200	83	2200
P6G4809S	48	18...75	6	145	9.0	0	665	85	1000
P6G4812S	48	18...75	6	145	12.0	0	500	87	470
P6G4815S	48	18...75	6	145	15.0	0	400	87	220
P6G4824S	48	18...75	6	145	24.0	0	250	87	100
Dual Output									
P6G2405D	24	9...36	6	300	±5.0	0	± 600	84	2 x 330
P6G2412D	24	9...36	6	290	±12.0	0	± 250	86	2 x 220
P6G2415D	24	9...36	6	290	±15.0	0	± 200	87	2 x 100
P6G4805D	48	18...75	6	150	±5.0	0	± 600	82	2 x 330
P6G4812D	48	18...75	6	145	±12.0	0	± 250	85	2 x 220
P6G4815D	48	18...75	6	145	±15.0	0	± 200	86	2 x 100

Specifications

Input	
Filter	Capacitor
Input reflected ripple current	P6G24xxx: 20 mA _{p-p} , typ. P6G48xxx: 40 mA _{p-p} , typ. (see Figure 1)
ON / OFF remote control pin 3	ON: open / high impedance OFF: 3.3 / 5 V via series resistor 1 kΩ (see Figure 3)
Off state control current	2 ... 4 mA
Off state current consumption	2.5 mA, typ.
Isolation:	
I/O isolation voltage (tested for 60 s)	P6Gxxxx: 1500 V _{DC} P6GxxxxH: 3000 V _{DC}
Resistance	≥ 10 ⁹ Ω
Capacitance	50 pF, typ.
Output	
Voltage tolerance	≥ ± 1 %
Line regulation	≥ ± 0.2 %
Load deviation	≥ ± 1 %
Dual output cross deviation	± 5 % @ 75% load difference
Short circuit protection	Continuous, automatic restart
Start up time @ Vin nom & R-load	30 ms, typ
Ripple & noise (20 MHz BW)	≤ 125 mV _{p-p} (see Figure 2)
Temperature coefficient	± 0.02 % / °C
Transient recovery time	250 μs, typ., at 25 % load change steps
Transient response deviation	P6Gxx3R3x, P6Gxx5x: ≤ ± 5 % All others: ≤ ± 3 % at 25 % load change steps

General		
Switching frequency	580 kHz, typ.	
Reliability calculated MTBF (MIL-HDBK-217F @ 25°C)	800 000 h	
Safety standard	EN 60950-1, IEC 60950-1 EN 62368-1, IEC 62368-1	
Safety approval	UL 62368-1, cUL 62368-1	
Environmental		
Operating ambient temperature	-40 ... 71 °C (see derating curve)	
Storage temperature	-55 ... 125 °C	
Case temperature	≤ 100 °C	
Humidity	Up to 95 %, non condensing	
Cooling,	Free air convection 30...65 LFM	
Physical		
Dimensions	21.9 x 9.2 x 11.1 mm	
Weight	4.5 g	
Case material	Black plastic, UL94V-0 rated	
Potting material	Epoxy, UL94V-0 rated	
EMC Specifications		
RE	EN 55032	Class A (see Figure 4)
CE	EN 55032	Class A (see Figure 4)
ESD	IEC 61000-4-2	Pref. criteria A
RS	IEC 61000-4-3	Pref. criteria A
EFT	IEC 61000-4-4	Pref. criteria A (see Figure 4)
Surge	IEC 61000-4-5	Pref. criteria A (see Figure 4)
CS	IEC 61000-4-6	Pref. criteria A
PFMF	IEC 61000-4-8	Pref. criteria A
Absolute maximum ratings		
P6G24xxx	Vin: ≤ 50 V _{DC} , duration ≤ 100 ms	
P6G48xxx	Vin: ≤ 100 V _{DC} , duration ≤ 100 ms	
Soldering Temperature	≤ 260 °C, duration ≤ 10 s, ≥ 1.5 mm package distance	

Notes:

1. The maximum capacitive load is specified by minimal Vin and constant resistive load.
2. All specifications are typical at 25 °C, nominal input voltage and full load unless otherwise noted.

6 W DC-DC Converter P6G-Series

Figure 1 Measure circuit for input reflected ripple current

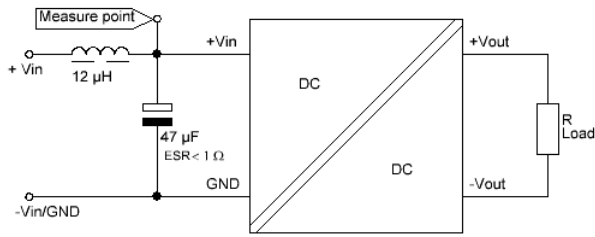


Figure 2 Measure circuit for output ripple & noise (BW 20 MHz)

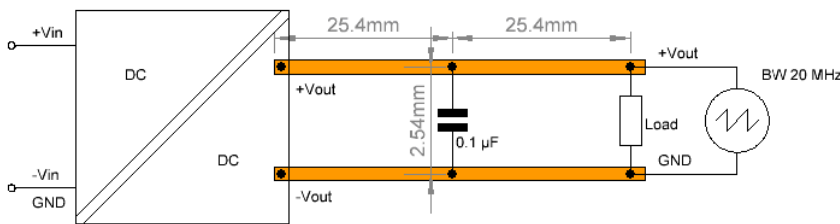


Figure 3 Application circuit for remote control function

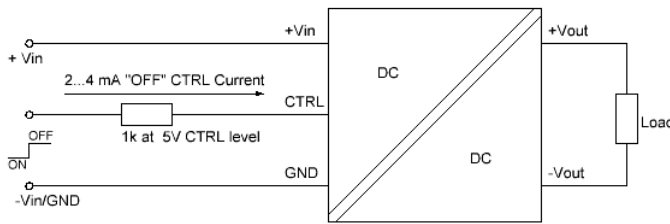
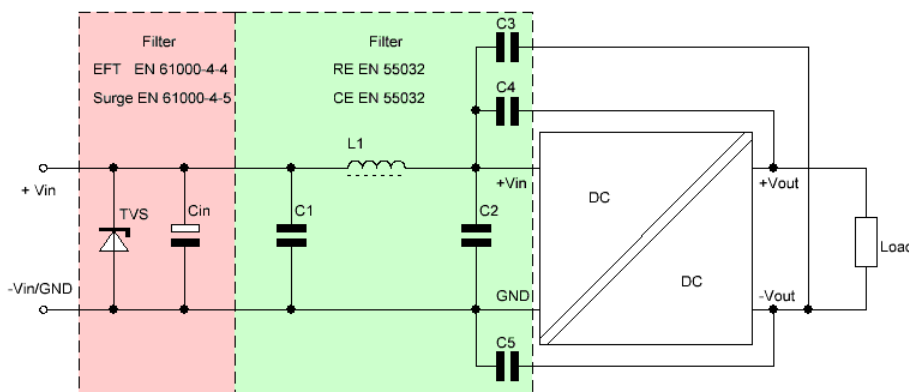


Figure 4 Application circuit to meet EN 61000-4-4 performance. criteria A, EN 61000-4-5 performance. criteria A and EN 55032 class A



Type	TVS	Cin KY-Serie Nippon Chemicon	C1, C2 MLCC-Type	L	C3, C4 MLCC-Type	C5 MLCC-Type
P6G24xxxx	75 V, 3 kW	330 µF, 100 V	10 µF, 35 V	12 µH	470 pF / 3 kV	----
P6G48xxxx	130 V, 3 kW	470 µF, 100 V	2.2 µF, 100 V	12 µH	1 nF / 3 kV	1 nF / 3 kV

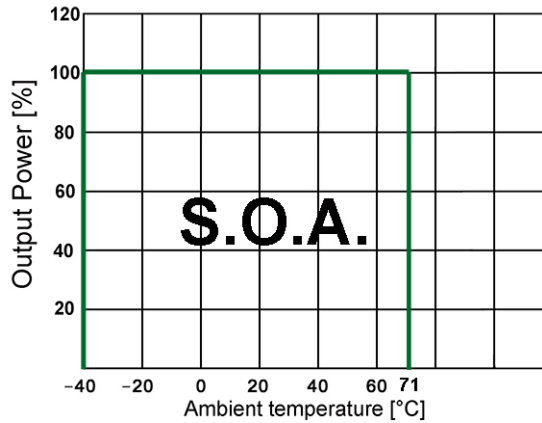
These components should be closed mounted as possible to the module. All leads should be minimized to decrease radiated noise.



PHI-CON

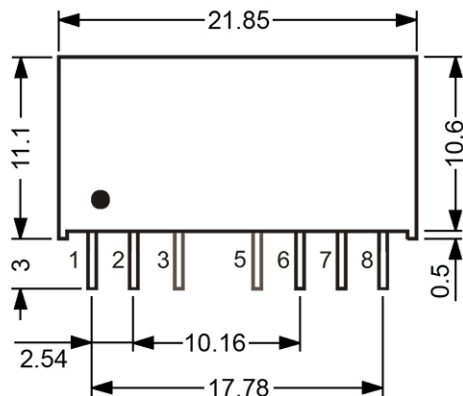
6 W DC-DC Converter P6G-Series

Derating Curve



Part number structure									
Output power	Series	Input voltage		Output voltage		Outputs		I/O Isolation	
P6	G	24		3R3		S		-	
6 Watt		24	9..36 V	3R3	3.3 V	S	single	blank	1.5 kV _{DC}
		48	18..75 V	05	5 V	D	dual	H	3 kV _{DC}
				09	9 V				
				12	12 V				
				15	15 V				
				24	24 V				

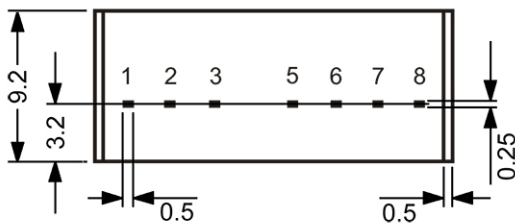
Mechanical dimensions



Note:

All dimensions in mm

1. Pin diameter tolerance: ± 0.05 mm
2. Pin pitch tolerance: ± 0.35 mm
3. Pin length tolerance: ± 0.35 mm
4. Pin to case tolerance: ± 0.5 mm
5. Stand off tolerance ± 0.1 mm



Pin assignment				
Pin	P6GxxxxS	P6GxxxxD	P6GxxxxSH	P6GxxxxDH
1	-V Input	-V Input	-V Input	-V Input
2	+V Input	+V Input	+V Input	+V Input
3	Rem. Ctrl.	Rem. Ctrl.	Rem. Ctrl.	Rem. Ctrl.
4	No pin	No pin	No pin	No pin
5	N.C.	N.C.	No pin	No pin
6	+V Output	+V Output	+V Output	+V Output
7	-V Output	Common	-V Output	Common
8	N.C.	-V Output	N.C.	-V Output

PHI-CON is a trademark of HY-LINE Holding GmbH.

Only for professional use by professionals! Not for resale or distribution to the general public in any way! Read the instructions carefully before using!

Life Support Policy: HY-LINE does not authorize the use of any of its products for use in life support devices or systems without the express written approval of an officer of the Company. Life support systems are devices which support or sustain life, and whose failure to perform, when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in significant injury to the user.

Rev: 20210205 f