6 W DC-DC Converter P6P-Series

PHI-CON

- Wide 4:1 input range
- -40...85 °C operation temperature range
- Isolation up to 3000 V_{DC}
- Continuous short circuit protection
- Under voltage protection
- Efficiency up to 85 %
- DIL24 plastic case

Model guide

Type	Input voltage		Input current		Output voltage [V_{DC}]	Output current [mA] max.	Efficiency [%] typ.	Capacitive load (note 1) [µF] max.
	nominal [V_{DC}]	range [V_{DC}]	No load [mA] typ.	Full load [mA] typ.				
Single output								
P6P243R3S	24	9...36	10	260	3.3	0...1400	75	470
P6P2405S	24	9...36	10	315	5.0	0...1200	80	470
P6P2412S	24	9...36	10	300	12.0	0...500	84	100
P6P2415S	24	9...36	10	300	15.0	0...400	84	100
P6P2424S	24	9...36	10	300	24.0	0...250	84	47
P6P483R3S	48	18...75	7	130	3.3	0...1400	76	470
P6P4805S	48	18...75	7	155	5.0	0...1200	82	470
P6P4812S	48	18...75	7	150	12.0	0...500	84	100
P6P4815S	48	18...75	7	150	15.0	0...400	85	100
P6P4824S	48	18...75	7	150	24.0	0...250	85	47
Dual output								
P6P243R3D	24	9...36	10	325	±3.3	0...±910	78	2 x 220
P6P2405D	24	9...36	10	310	±5.0	0...±600	82	2 x 220
P6P2412D	24	9...36	10	300	±12.0	0...±250	84	2 x 100
P6P2415D	24	9...36	15	300	±15.0	0...±200	84	2 x 100
P6P2424D	24	9...36	20	310	±24.0	0...±125	82	2 x 47
P6P483R3D	48	18...75	7	160	±3.3	0...±910	79	2 x 220
P6P4805D	48	18...75	7	155	±5.0	0...±600	82	2 x 220
P6P4812D	48	18...75	7	150	±12.0	0...±250	84	2 x 100
P6P4815D	48	18...75	7	150	±15.0	0...±200	84	2 x 100
P6P4824D	48	18...75	10	155	±24.0	0...±125	81	2 x 47

Add suffix “H” for 3 kV isolation voltage

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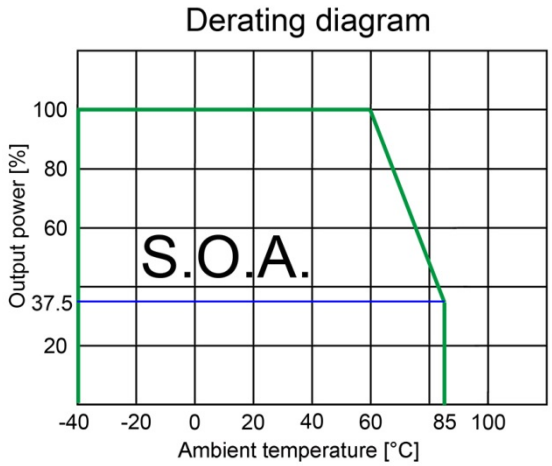
Specifications

Input :	
Filter	Pi Network
Input reflected ripple current	20 mAp-p, typ. (see Fig. 1)
Start up time @ Vin nominal & R-load	20 ms
Under voltage shut down P6P24xxx P6P48xxx	Typical values ! lock on 8.5 V, lock out 7 V lock on 16.5 V, lock out 14.5V
Isolation:	
Rated voltage Input / output 60 sec.	Standard. 1500 V_{DC} Suffix "H": 3000 V_{DC}
Resistance input to output	10^9 Ω
Capacitance	1 nF, typ.
Output:	
Voltage tolerance	± 2 %, max.
Voltage balance @ dual outp.	± 2 %, max.
Cross deviation @ 75 % load difference between outputs	± 5 %, max.
Line voltage regulation	± 0.5 %, max.
Load voltage regulation	± 1.2 %, max.
Temperature coefficient	± 0.02 % / °C
Ripple and noise (at 20 MHz BW)	<80 mVp-p, (see fig 2) <100 mVp-p, only P6Pxx24D
Over load protection	160 % of specified current
Short circuit protection	Continuous, automatic restart
Transient recovery time @ 25 % load steps	300 µs, typ.
Transient response deviation @ 25 % load steps	± 3 %, ± 5 % only P6Pxx3R3x

General:		
Switching frequency		330 kHz, typ.
Safety Standart complay with		IEC, EN, UL, cUL 60950-1
Reliability calc. MTBF MIL-HDBK-217 F @ 25 °C		>800000 h
Environmental:		
Operating ambient temperature range		-40…85 °C, see SOA -40…60 °C, without derating
Storage temperature range		-55…125 °C
Case temperature max.		100 °C
Humidity		95 %, max., not condensing
Cooling		Free air convection
Physical :		
Dimensions		31.75 x 20.32 x 10.16 mm
Weight		13 g
Case material		Black plastic, UL94V-0 rated
Potting material		Epoxy resin, UL94V-0 rated
EMC in accordance with		
Radiated emissions		EN55022 class A
Conducted emissions		EN55022 class A
ESD		IEC61000-4-2 perf. criteria A
RS		IEC61000-4-3 perf. criteria A
EFT		IEC61000-4-4 perf. criteria A
Surge (see Fig. 3)		IEC61000-4-5 perf. criteria A
CS		IEC61000-4-6 perf. criteria A
PFMF		IEC61000-4-8 perf. criteria A
Absolute maximum ratings		
Input voltage	P6P24xxx P6P48xxx	-0.7...+50 Vp, 0.1 s, max. -0.7...+100 Vp, 0.1 s, max.
Soldering temperature		260 °C for 10 s distance 1.5 mm from case

Note:
All parameters are specified at Ta 25 °C, nominal input voltage and full load unless otherwise specified!
*1 Specified by nominal input voltage and constant resistive load



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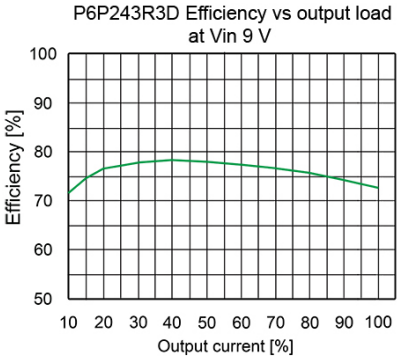

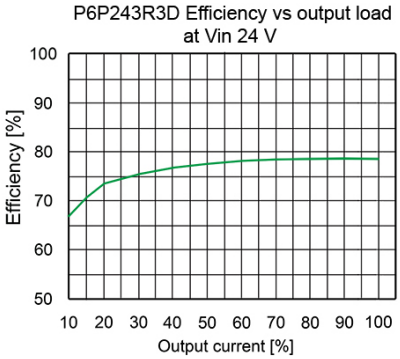

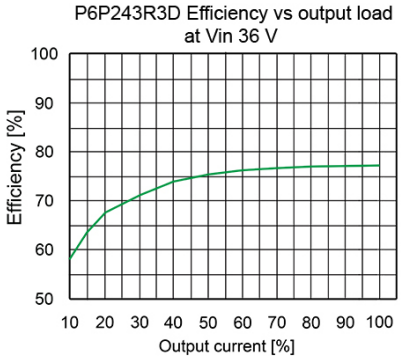

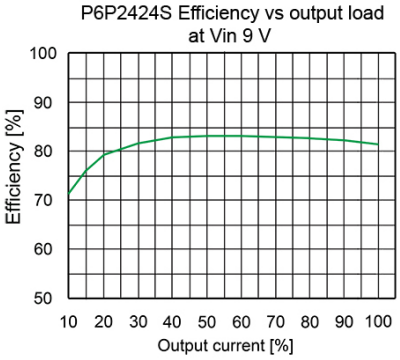

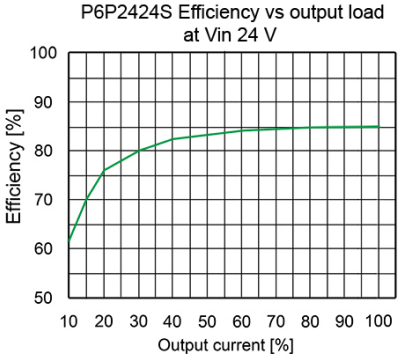

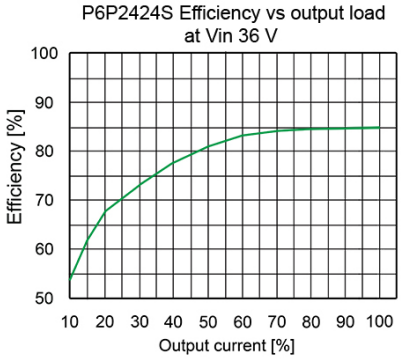

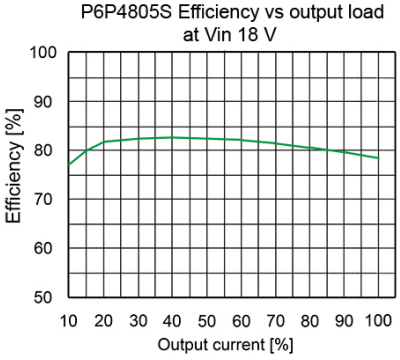

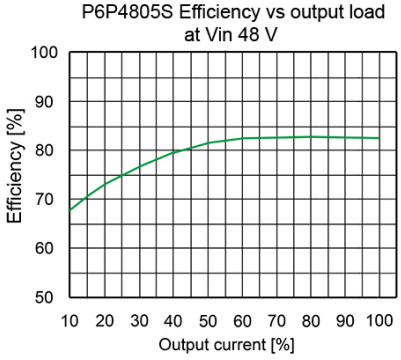

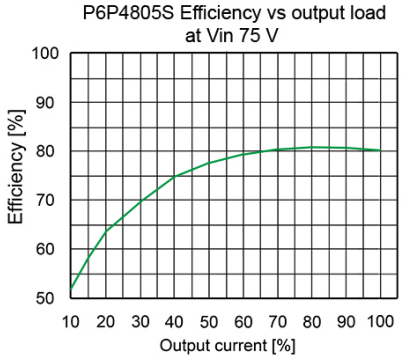

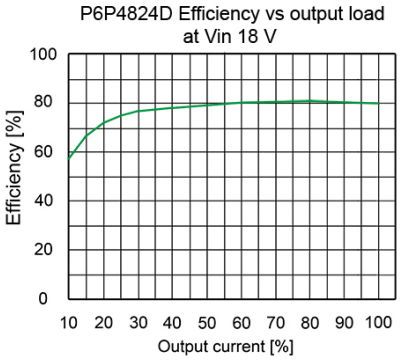

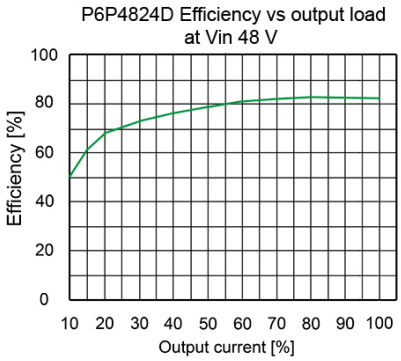

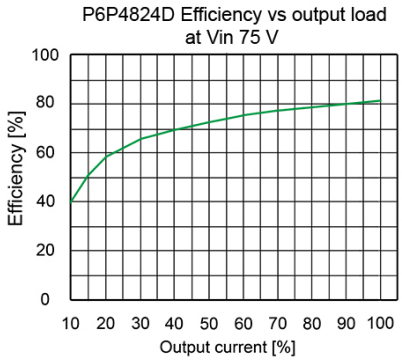

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Fig.1 Measure circuit for reflected input ripple current

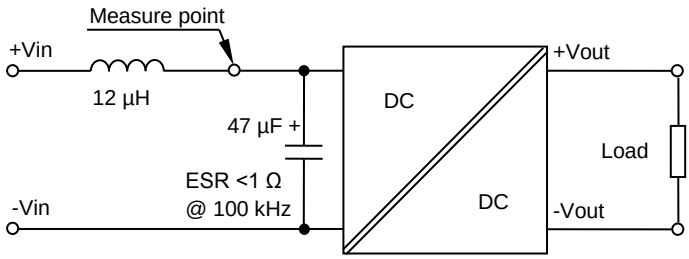


Fig.2 Measure circuit for output ripple and noise

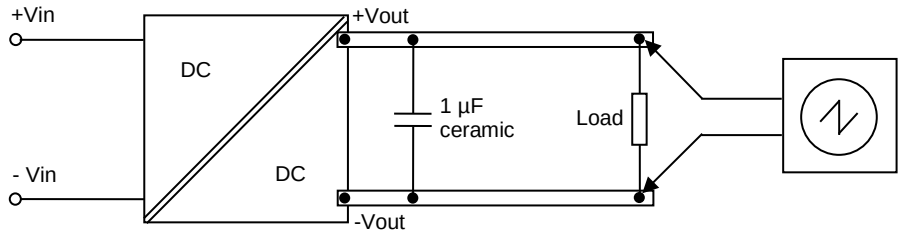
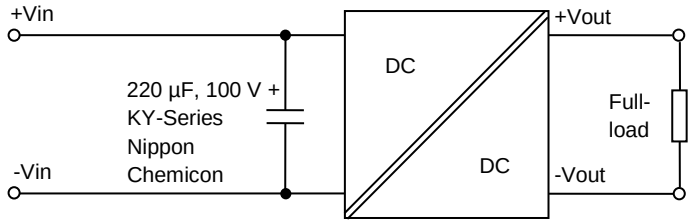


Fig.3 EMI filter circuit to comply IEC61000-4-5 performance criteria A



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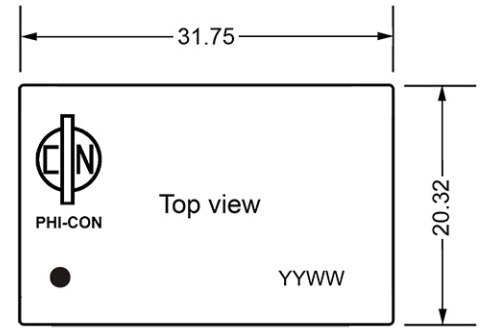
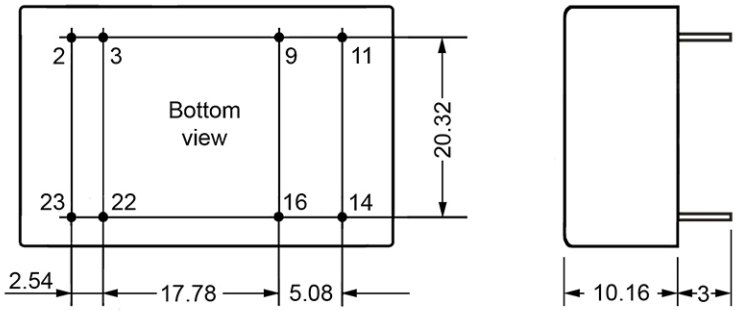
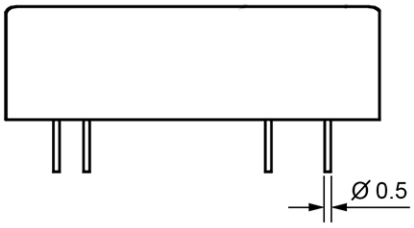
Dimensions



Pin assignment		
	Single	Dual
2	-V Input	-V Input
3	-V Input	-V Input
9	No pin	Common Output
11	Not connected.	-V Output
14	+V Output	+V Output
16	-V Output	Common Output
22	+V Input	+V Input
23	+V Input	+V Input





All units in mm
1. Pin tolerance ±0.05 mm
2. Pitch tolerance ±0.35 mm
3. Pin length tolerance ±0.35 mm
4. Case tolerance ±0.5 mm

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