



PHI-CON

6 W DC-DC Converter P6A-Series

- Wide 2:1 input range
- 1500 V_{DC} isolation
- 3500 V_{DC} isolation optional
- MTBF >1.121 Mio. h
- Continuous short circuit protection
- Plastic package optional



Metal package



Plastic package

Model guide

Type	Input voltage		Input current		Output voltage [V _{DC}] nom.	Output current		Efficiency [%] typ.	Capacitor load (see 1) [mA] max.
	Nominal [V _{DC}]	Range [V _{DC}]	No load [mA] max.	Full load [mA] typ.		[mA] min.	[mA] max.		
Single output									
P6A123R3S	12	9...18	30	525	3.3	0	1400	73	1000
P6A1205S	12	9...18	30	650	5.0	0	1200	77	1000
P6A127R2S	12	9...18	30	640	7.2	0	833	78	680
P6A1209S	12	9...18	30	640	9.0	0	666	78	680
P6A1212S	12	9...18	30	620	12.0	0	500	81	330
P6A1215S	12	9...18	30	625	15.0	0	400	80	220
P6A1218S	12	9...18	30	625	18.0	0	333	80	68
P6A1224S	12	9...18	30	625	24.0	0	250	80	68
P6A243R3S	24	18...36	20	255	3.3	0	1400	75	1000
P6A2405S	24	18...36	20	315	5.0	0	1200	80	1000
P6A247R2S	24	18...36	20	305	7.2	0	833	82	680
P6A2409S	24	18...36	20	305	9.0	0	666	82	680
P6A2412S	24	18...36	20	315	12.0	0	500	80	330
P6A2415S	24	18...36	20	305	15.0	0	400	82	220
P6A2418S	24	18...36	20	305	18.0	0	333	82	68
P6A2424S	24	18...36	20	305	24.0	0	250	82	68
P6A483R3S	48	36...72	12	130	3.3	0	1400	75	1000
P6A4805S	48	36...72	12	155	5.0	0	1200	80	1000
P6A487R2S	48	36...72	12	150	7.2	0	833	82	680
P6A4809S	48	36...72	12	150	9.0	0	666	82	680
P6A4812S	48	36...72	12	155	12.0	0	500	80	330
P6A4815S	48	36...72	12	150	15.0	0	400	83	220
P6A4818S	48	36...72	12	150	18.0	0	333	83	68
P6A4824S	48	36...72	12	150	24.0	0	250	83	68
Dual output									
P6A123R3D	12	9...18	30	525	±3.3	0	±909	73	2 x 680
P6A1205D	12	9...18	30	650	±5.0	0	±600	77	2 x 330
P6A127R2D	12	9...18	30	625	±7.2	0	±416	80	2 x 220
P6A1209D	12	9...18	30	625	±9.0	0	±333	80	2 x 220
P6A1212D	12	9...18	30	625	±12.0	0	±250	80	2 x 100
P6A1215D	12	9...18	30	630	±15.0	0	±200	79	2 x 47
P6A1218D	12	9...18	30	625	±18.0	0	±166	80	2 x 33
P6A1224D	12	9...18	30	625	±24.0	0	±125	80	2 x 33
P6A243R3D	24	18...36	20	335	±3.3	0	±909	75	2 x 680
P6A2405D	24	18...36	20	320	±5.0	0	±600	78	2 x 330
P6A247R2D	24	18...36	20	300	±7.2	0	±416	83	2 x 220
P6A2409D	24	18...36	20	300	±9.0	0	±333	83	2 x 220
P6A2412D	24	18...36	20	310	±12.0	0	±250	80	2 x 100
P6A2415D	24	18...36	20	310	±15.0	0	±200	80	2 x 47
P6A2418D	24	18...36	20	310	±18.0	0	±166	80	2 x 33
P6A2424D	24	18...36	20	310	±24.0	0	±125	80	2 x 33
P6A483R3D	48	36...72	12	170	±3.3	0	±909	73	2 x 680
P6A4805D	48	36...72	12	160	±5.0	0	±600	79	2 x 330
P6A487R2D	48	36...72	12	160	±7.2	0	±416	79	2 x 220
P6A4809D	48	36...72	12	160	±9.0	0	±333	79	2 x 220
P6A4812D	48	36...72	12	155	±12.0	0	±250	80	2 x 100
P6A4815D	48	36...72	12	155	±15.0	0	±200	80	2 x 47
P6A4818D	48	36...72	12	155	±18.0	0	±166	80	2 x 33
P6A4824D	48	36...72	12	155	±24.0	0	±125	80	2 x 33

Part number ordering information												
P	Output power	Series	Input voltage		Output voltage		Output		Isolation voltage		P	
PHI-CON	6 W	A	12	12 V	3R3	3.3 V	S	single	blanc	1.5 kV	blanc	metal
			24	24 V	05	5 V	D	dual ±	H	3.5 kV	P	plastic
			48	48 V	7R2	7.2 V						
					09	9 V						
					12	12 V						
					15	15 V						
					18	18 V						
					24	24 V						



PHI-CON

6 W DC-DC Converter P6A-Series

Specifications

Input	
Filter	Pi Network
Reflected input ripple current	35 mA _{p-p} (Figure 1)
Isolation:	
In / Out Rated voltage (60 s)	1500 V _{DC} , Standard 3500 V _{DC} , Suffix "H"
Input or output to metall case	1000 V _{DC}
Resistance	10 ³ Ω
Capacitance	500 pF, typ.
Output	
Voltage accuracy	± 1 %
Ripple and noise (at 20 MHz BW)	60 mV _{p-p} , max.
Short circuit protection	Continuous, hiccup automatic restart
Line regulation	± 0.5 %, max.
Load voltage regulation	± 1.5 % @ P6Axx3R3x ± 0.5 % all others
Temperature coefficient	± 0.02 % / °C
General	
Switching frequency	270 kHz, typ.
Safety standards	IEC, EN, UL, cUL 60950-1 IEC, EN, UL, cUL 62368-1
Reliability calc. MTBF @ Ta 25 °C (MIL-HDBK-217F)	1.12 Mio. h

EMC specifications	
Radiated emissions	EN 55032 Class A Only metal case version
Conducted emissions	EN 55032 Class A (see Figure 3)
ESD	IEC 61000-4-2 perf. criteria A
RS	IEC 61000-4-3 perf. criteria A
EFT (see Figure 3)	IEC 61000-4-4 perf. criteria A
Surge (see Figure 3)	IEC 61000-4-5 perf. criteria A
CS	IEC 61000-4-6 perf. criteria A
PFMF	IEC 61000-4-8 perf. criteria A
Environmental	
Operating ambient temperature	-40 ... 85 °C
Case temperature	100 °C, max.
Storage temperature	-40 ... 125 °C
Derating	None required
Humidity	95 % max., non condensing
Cooling	Free air convection 30 ... 65 LFM
Physical	
Weight	17 g metal case, standard 13.5 g plastic case, Suffix "P"
Potting material	Epoxy (UL94V-0 rated)
Case material	Metal: Nickel coated copper or Black Plastic (UL94V-0 rated)
Absolute maximum ratings	
Input voltage < 100 ms	
P6A12xxx	24 V _{DC} , max.
P6A24xxx	40 V _{DC} , max.
P6A48xxx	80 V _{DC} , max.
Lead soldering Temperature	≤ 260 °C for ≤ 10 s, distance from package ≥ 1.5 mm

1. Capacitor load is specified at nominal input voltage and constant resistive load.
2. Parallel operation of DC/DC-Converter outputs is not recommended.
3. The P6A-series is not usable in IGBT and MOSFET driver applications.
4. All parameter typical at Ta 25 °C, nominal input voltage and full load unless otherwise specified

Figure 1 Measure circuit input reflected ripple current

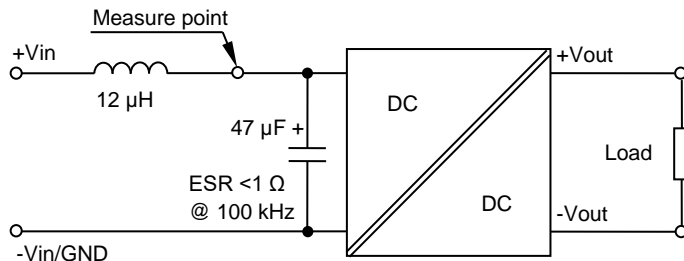
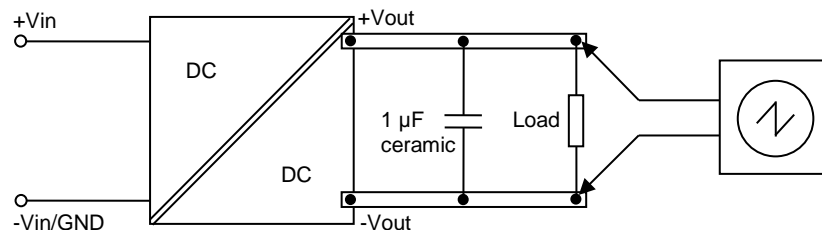
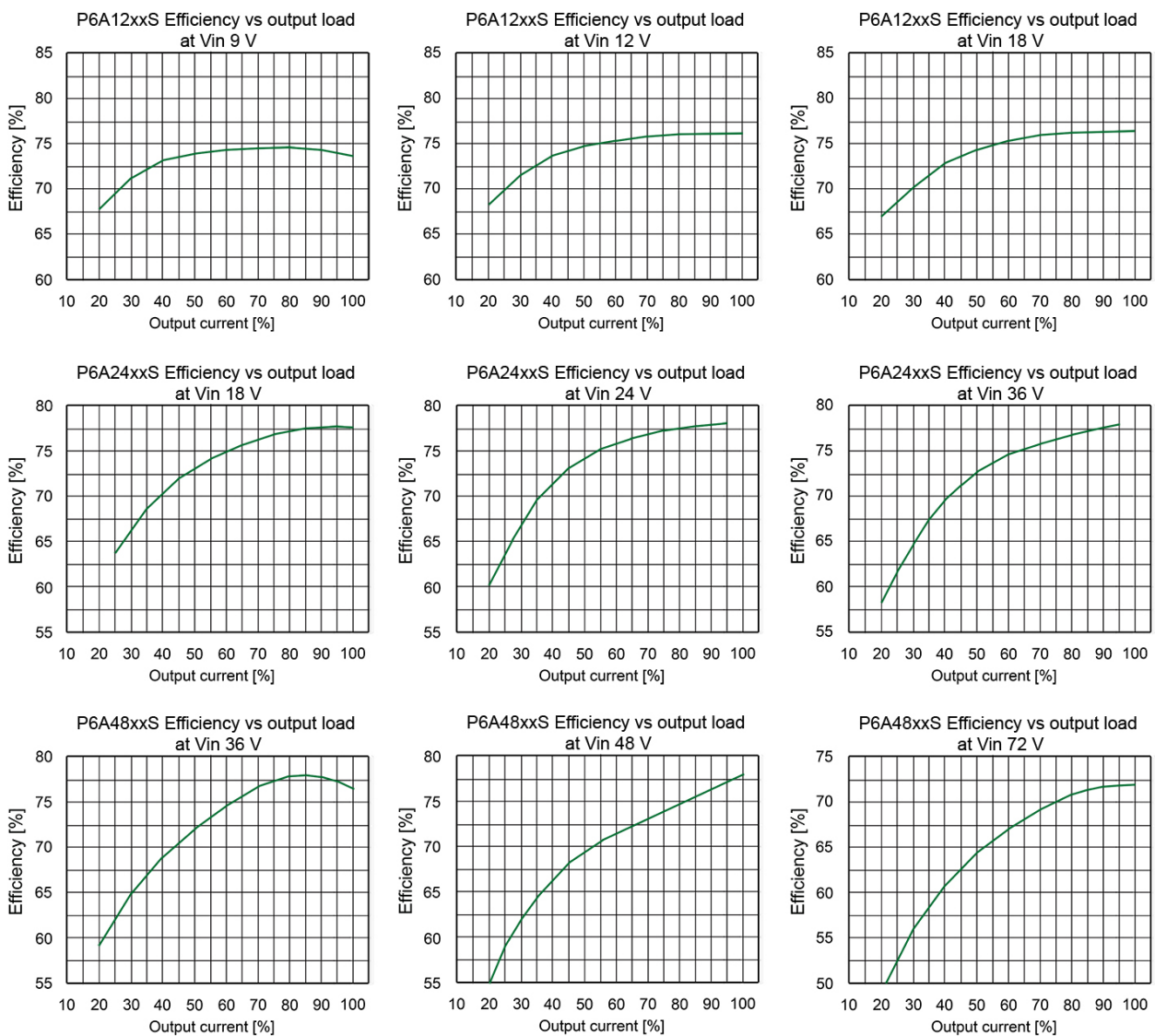
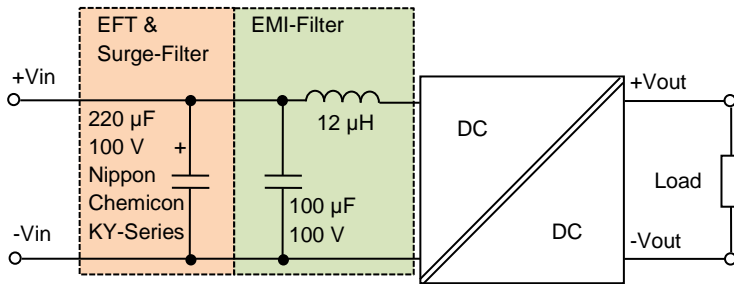


Figure 2 Measure circuit output ripple & noise voltage, oscilloscope bandwidth 20 MHz

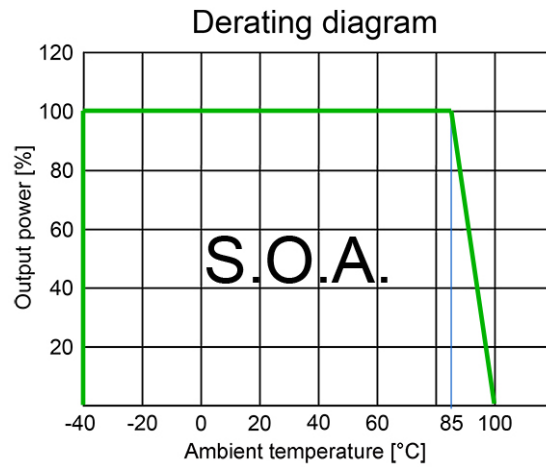


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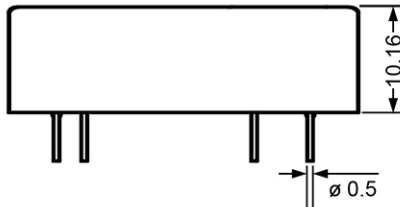
Figure 3 Application circuit to meet EFT IEC 61000-4-4 class A, surge IEC 61000-4-5 class A and EMI conducted emission EN 55032 class A



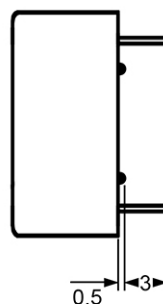
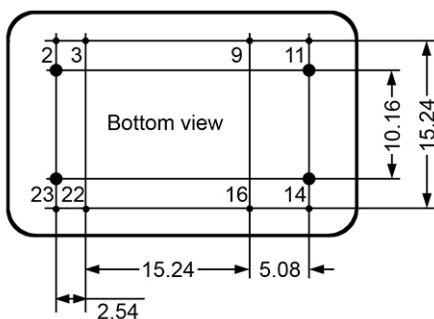
6 W DC-DC Converter P6A-Series



Dimensions metal case version



Pin	1.5 kV & 3.5 kV isolation version	
	Single output	Dual output
2	-V Input	-V Input
3	-V Input	-V Input
9	No Pin	Common
11	Not Connected.	-V Output
14	+V Output	+V Output
16	-V Output	Common
22	+V Input	+V Input
23	+V Input	+V Input

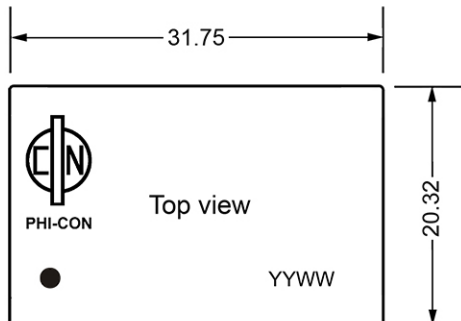


All units in mm

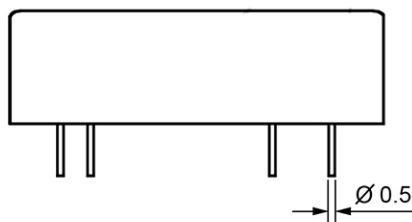
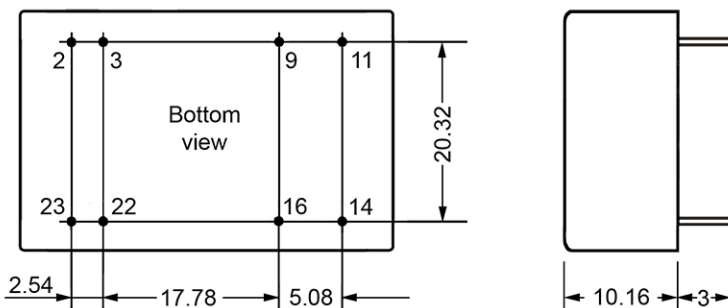
1. Pin tolerance ± 0.05 mm
2. Pitch tolerance ± 0.35 mm
3. Pin length tolerance ± 0.35 mm
4. Case tolerance ± 0.5 mm

6 W DC-DC Converter P6A-Series

Dimensions plastic case version



Pin assignment		
Pin	1.5 kV & 3.5 kV isolation version	
	Single output	Dual output
2	-V Input	-V Input
3	-V Input	-V Input
9	No Pin	Common
11	Not Connected.	-V Output
14	+V Output	+V Output
16	-V Output	Common
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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