2 W DC-DC Converter P2A-Series

PHI-CON

- 4 Pin SIL
- Low ripple and noise
- 1000 V_{DC} isolation
- Optional 3000 V_{DC} isolation
- Output voltage not regulated

CE

Model guide

Type	Input voltage		Input current		Output voltage [V_{DC}]	Output current [mA] max.	Efficiency [%] typ.	Capacitive load [µF] max.
	nominal [V_{DC}]	range [V_{DC}]	no load [mA] typ.	full load [mA] typ.				
P2A053R3S	5.0	4.5 … 5.5	25	340	3.3	400	78	470
P2A0505S	5.0	4.5 … 5.5	25	495	5.0	400	81	470
P2A057R2S	5.0	4.5 … 5.5	35	500	7.2	278	80	470
P2A0509S	5.0	4.5 … 5.5	25	480	9.0	222	83	470
P2A0512S	5.0	4.5 … 5.5	30	475	12.0	167	84	470
P2A0515S	5.0	4.5 … 5.5	30	470	15.0	133	85	470
P2A0524S	5.0	4.5 … 5.5	30	465	24.0	83	86	470
P2A123R3S	12	10.8 … 13.2	20	150	3.3	400	72	470
P2A1205S	12	10.8 … 13.2	20	205	5.0	400	81	470
P2A127R2S	12	10.8 … 13.2	15	210	7.2	278	80	470
P2A1209S	12	10.8 … 13.2	15	195	9.0	222	85	470
P2A1212S	12	10.8 … 13.2	15	195	12.0	167	85	470
P2A1215S	12	10.8 … 13.2	15	195	15.0	133	85	470
P2A1224S	12	10.8 … 13.2	25	195	24.0	83	85	470
P2A153R3S	15	13.5 … 16.5	15	115	3.3	400	76	470
P2A1505S	15	13.5 … 16.5	15	165	5.0	400	81	470
P2A157R2S	15	13.5 … 16.5	15	160	7.2	278	83	470
P2A1509S	15	13.5 … 16.5	15	165	9.0	222	80	470
P2A1512S	15	13.5 … 16.5	15	160	12.0	167	84	470
P2A1515S	15	13.5 … 16.5	13	155	15.0	133	86	470
P2A1524S	15	13.5 … 16.5	17	160	24.0	83	84	470
P2A243R3S	24	21.6 … 26.4	7	68	3.3	400	81	470
P2A2405S	24	21.6 … 26.4	8	100	5.0	400	83	470
P2A247R2S	24	21.6 … 26.4	10	100	7.2	278	82	470
P2A2409S	24	21.6 … 26.4	6	98	9.0	222	85	470
P2A2412S	24	21.6 … 26.4	8	97	12.0	167	86	470
P2A2415S	24	21.6 … 26.4	8	97	15.0	133	86	470
P2A2424S	24	21.6 … 26.4	8	95	24.0	83	88	470

Specifications

Input	
Voltage range	± 10%
Filter	Capacitors
Reflected ripple current	20 mAp-p (see Figu re 1)
Absolute maximum ratings	
P2A05xxS-Series	Vin: ≤ 7 V_{DC}, ≤ 100 ms
P2A12xxS-Series	Vin: ≤ 15 V_{DC}, ≤ 100 ms
P2A15xxS-Series	Vin: ≤ 18 V_{DC}, ≤ 100 ms
P2A24xxS-Series	Vin: ≤ 28 V_{DC} , ≤ 100 ms
I/O-Isolation:	
DC-Isolation voltage input/output	Standard, suffix blanc: 1 kV Suffix "H": 3 kV
Resistance	≥ 10^9 Ω
Capacitance	60 pF, typ.
Output	
Voltage tolerance	≤ ± 3 %
Ripple and noise @ 20 MHz BW	≤ 150 mVp-p (see Figure 2)
Short circuit protection	No
Line voltage deviation @ 1% Vin change	≤ ± 1.2 %
Voltage stability at load change 20...100 %	± 10 % ± 20 % @ only P2Axx3R3x types
Temperature drift	± 0.02 %/°C
General	
Switching frequency	~ 80 kHz
Reliability calculated MTBF (MIL-HDBK-217 F)	1.12 Mio. h

Safety standard, designed to meet		EN-, IEC-, UL 60950-1 EN-, IEC-, UL 62368-1
EMC		
RE	EN 55032	Class B (see Figure 3)
CE	EN 55032	Class B (see Figure 3)
ESD	EN-, IEC 61000-4-2	Perf. criteria A
RS	EN-, IEC 61000-4-3	Perf. criteria A
EFT	EN-, IEC 61000-4-4	Perf. criteria A (see Figure 3)
Surge	EN-, IEC 61000-4-5	Perf. criteria A (see Figure 3)
CS	EN-, IEC 61000-4-6	Perf. criteria A
PFMF	EN-, IEC 61000-4-8	Perf. criteria A
Environmental		
Operating temperature (ambient)		-40 … 85 °C
Case temperature		≤ 100 °C
Storage temperature		-40 … 125 °C
Derating		None required
Humidity		Up to 95 %, non condensing
Cooling		Free air convection 35…60 LFM
Physical		
Weight		1.9 g
Case material		Non conductive black plastic (UL94V-0 rated)
Potting material		Epoxy (UL94V-0 rated)
Pin soldering temperature		≤ 260 °C duration ≤ 10 s, ≥ 1.5 mm distance from body

Note:

1. Specifications at 25 °C, nominal input voltage and full load unless otherwise specified.
2. Capacitive load is specified by minimal Vin and constant resistive load.
3. Not usable for high voltage IGBT- and MOSFET- driver applications.
4. Operation under no load conditions will not damage the converter, however they may not meet all listed specification

HY-LINE Power Components Vertriebs GmbH
Inselkammerstraße 10
D-82008 Unterhaching
Tel.: 089 614 503-10
E-Mail: power@hy-line.de

HY-LINE AG
Hochstrasse 355
CH-8200 Schaffhausen
Tel.: 052 647 42 00
E-Mail: info@hy-line.ch

2 W DC-DC Converter P2A-Series

PHI-CON

Ordering information									
Output power	Series	Input voltage		Output voltage		Outputs		Primary / secondary isolation	
P2	A	05		05		S		H	
2 Watt		05	5 V	3R3	3.3 V	S	single	blanc	1 kVDC
		12	12 V	05	5 V			H	3 kVDC
		15	15 V	7R2	7.2 V				
		24	24 V	09	9 V				
				12	12 V				
				15	15 V				
				24	24 V				

Figure 1 Measure circuit for input ripple current

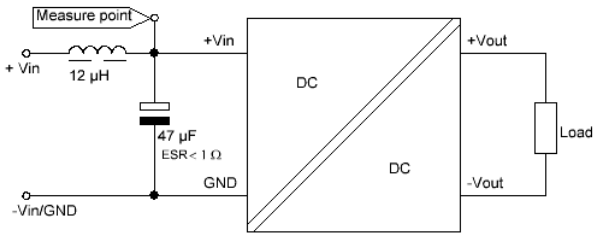


Figure 2 Measure circuit for output ripple & noise (Oscilloscope BW 20 MHz)

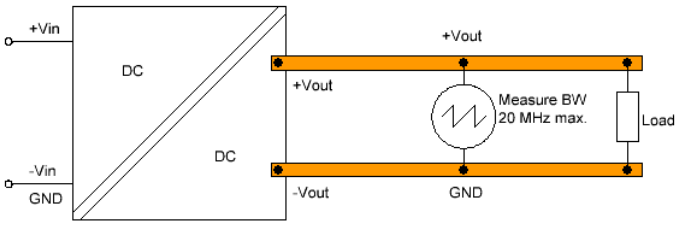


Figure 3 Application circuit to meet EFT EN 61000-4-4 and Surge EN 61000-4-5 and EMI class B

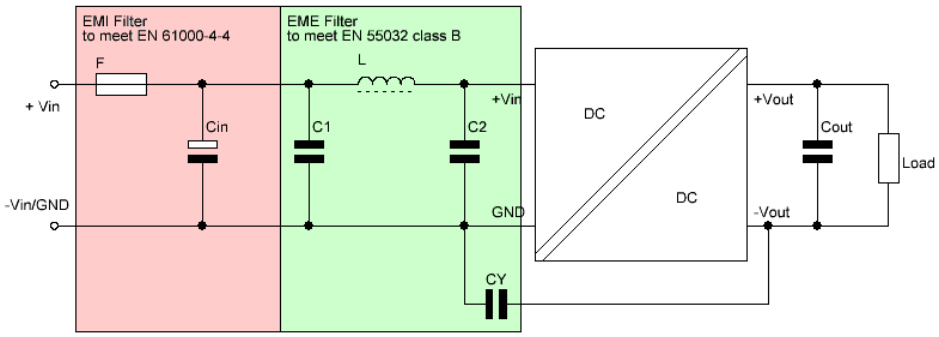


Table to Figure 3				
Type	Fuse time delayed type [mA]	C1, C2	L	CY
P2A05xxx	500	2.2 µF, 100 V, ceramic chip	18 µH	-
P2A12xxx	300	2.2 µF, 100 V, ceramic chip	18 µH	-
P2A15xxx	300	2.2 µF, 100 V, ceramic chip	18 µH	-
P2A24xxx	300	2.2 µF, 100 V, ceramic chip	18 µH	470 pF, 2 kV ceramic chip

The EMI filter components are to meet the contucted emissions requirement of the converter. These components should be as near as possible mounted to the converter. All leads should be as short as possible to minimize the radiation.

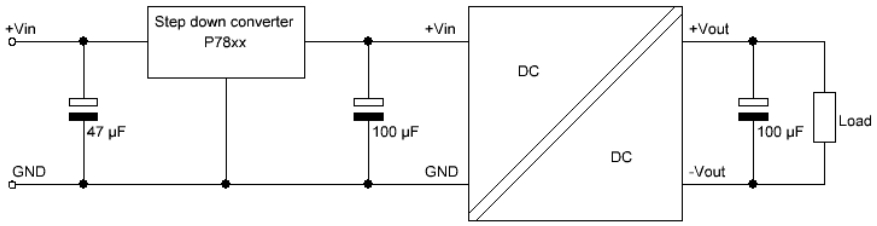
HY-LINE Power Components Vertriebs GmbH
Inselkammerstraße 10
D-82008 Unterhaching
Tel.: 089 614 503-10
E-Mail: power@hy-line.de

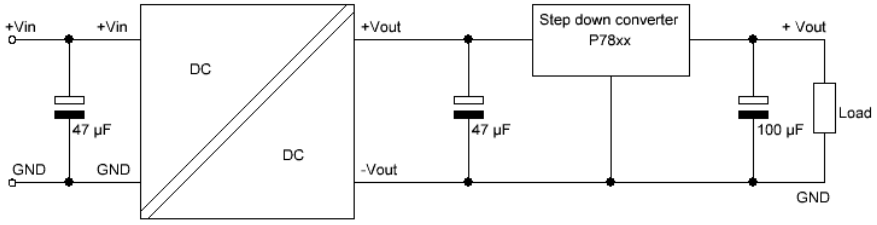
HY-LINE AG
Hochstrasse 355
CH-8200 Schaffhausen
Tel.: 052 647 42 00
E-Mail: info@hy-line.ch

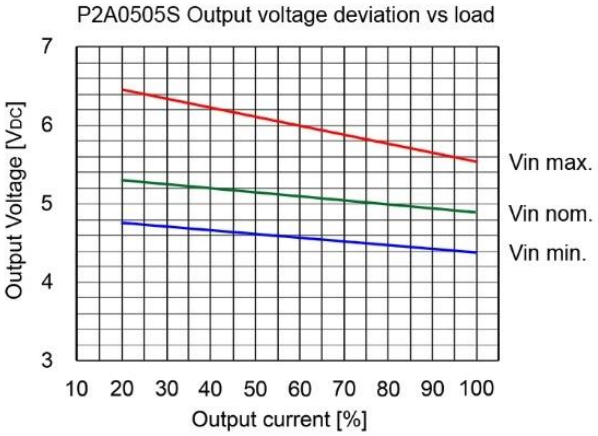
2 W DC-DC Converter P2A-Series

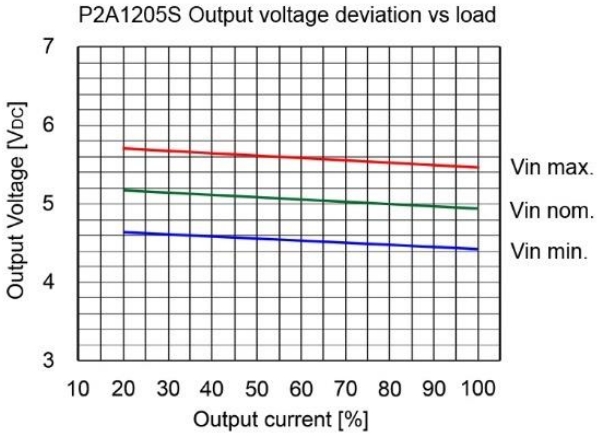
PHI-CON

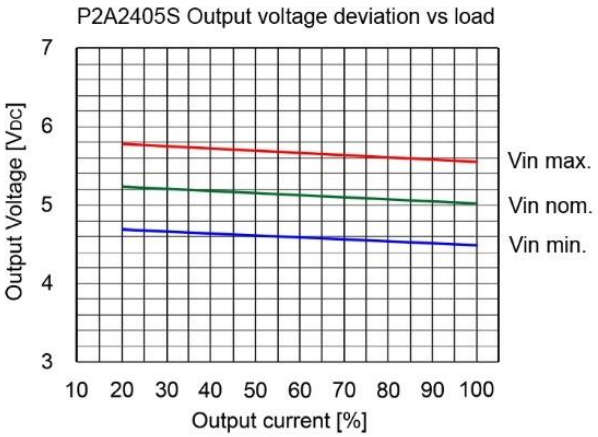
Application example with low drop out linear voltage regulator for input or output stabilisation

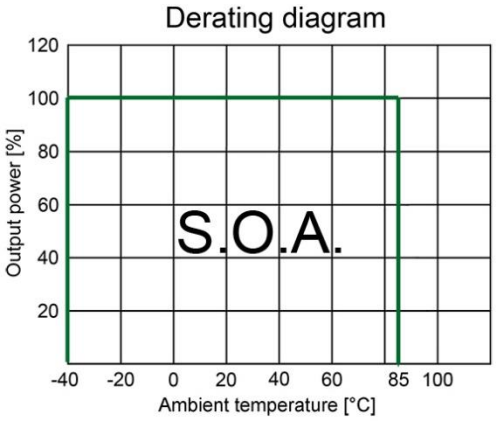












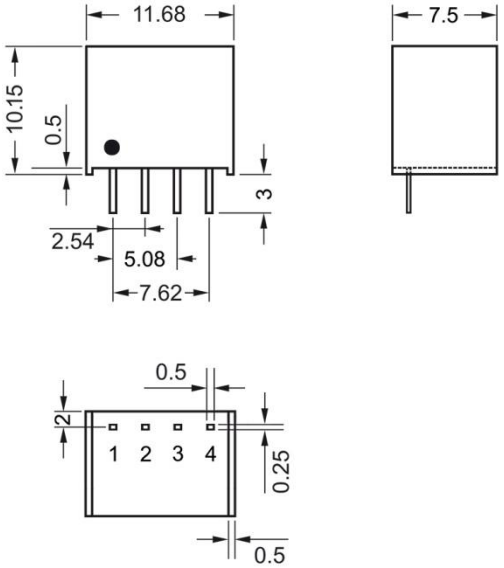
HY-LINE Power Components Vertriebs GmbH
Inselkammerstraße 10
D-82008 Unterhaching
Tel.: 089 614 503-10
E-Mail: power@hy-line.de

HY-LINE AG
Hochstrasse 355
CH-8200 Schaffhausen
Tel.: 052 647 42 00
E-Mail: info@hy-line.ch

2 W DC-DC Converter P2A-Series

PHI-CON

Mechanical dimensions



Pin assignment	
1	-V Input
2	+V Input
3	-V Output
4	+V Output

All dimensions in mm
1. Pin cross sectiontolerance ± 0.02 mm
2. Pin length tolerance ± 0.35 mm
3. Pin pitch tolerance ± 0.35 mm
4. Case tolerance ± 0.5 mm

Rev: 20210826 f

HY-LINE Power Components Vertriebs GmbH
Inselkammerstraße 10
D-82008 Unterhaching
Tel.: 089 614 503-10
E-Mail: power@hy-line.de

HY-LINE AG
Hochstrasse 355
CH-8200 Schaffhausen
Tel.: 052 647 42 00
E-Mail: info@hy-line.ch