

12 W DC-DC Converter P12C-Series

- 2:1 Wide Input Range
- 1600 V_{DC} Isolation
- MTBF >1 Mio. h
- Continuous Short Circuit Protection
- Efficiency up to 91%
- Soft Start
- On/Off remote Control
- Wide Operation Temperature Range -40...85°C



Model guide

Model guide								
Type	Input voltage		Input current		Output voltage [V _{DC}]	Output current [mA]	Efficiency typ. [%]	Capacitor load [μF] max.
	Nominal [V _{DC}]	Range [V _{DC}]	No load [mA]	Full load [mA]				
Single output								
P12C122R5S	12	9...18	15	890	2.5	0...3500	85	2000
P12C123R3S	12	9...18	15	1145	3.3	0...3500	87	2000
P12C1205S	12	9...18	15	1165	5.0	0...2400	89	2000
P12C1212S	12	9...18	15	1150	12.0	0...1000	90	430
P12C1215S	12	9...18	15	1150	15.0	0...800	90	300
P12C242R5S	24	18...36	15	445	2.5	0...3500	85	2000
P12C243R3S	24	18...36	15	575	3.3	0...3500	87	2000
P12C2405S	24	18...36	15	580	5.0	0...2400	89	2000
P12C2412S	24	18...36	15	575	12.0	0...1000	90	430
P12C2415S	24	18...36	15	575	15.0	0...800	90	300
P12C482R5S	48	36...75	15	225	2.5	0...3500	84	2000
P12C483R3S	48	36...75	15	285	3.3	0...3500	88	2000
P12C4805S	48	36...75	15	290	5.0	0...2400	89	2000
P12C4812S	48	36...75	15	295	12.0	0...1000	88	430
P12C4815S	48	36...75	15	290	15.0	0...800	89	300
Dual output								
P12C1212D	12	9...18	15	1150	±12.0	± 0...500	90	2 x 200
P12C1215D	12	9...18	15	1135	±15.0	± 0...400	91	2 x 120
P12C2412D	24	18...36	15	575	±12.0	± 0...500	90	2 x 200
P12C2415D	24	18...36	15	560	±15.0	± 0...400	91	2 x 120
P12C4812D	48	36...75	15	295	±12.0	± 0...500	88	2 x 200
P12C4815D	48	36...75	15	290	±15.0	± 0...400	89	2 x 120

Specifications

Input	
Filter	Pi Network
Reflected input current	20 mA _{p-p} (see figure 1)
Start up time with R-load	20 ms typ.
Remote CTRL on/off, Pin1 (See figure 4)	On: 3...12 V or open input Off: 0...1.2 V Standby idle current 5 mA typ.
Isolation:	
Rated voltage (for 60 s)	Input to output: 1600 V _{DC} Case to input/output: 1600 V _{DC}
Resistance	10 ⁹ Ω
Capacitance	1200 pF, typ.
Output	
Voltage accuracy	± 1.2 %, max.
Line regulation	± 0.5 %, max.
Load regulation 0...100% load	P30CxxxS: ± 0.5 %, max. P30CxxxD: ± 1 %, max.
Cross regulation	± 5 %
Ripple and noise (at 20 MHz BW)	85 mV _{p-p} , max. (See figure 2)
Over current limiting	150 % of I _{out} max.
Temperature coefficient	± 0.02 % / °C
Short circuit protection	Indefinite, hiccup, automatic restart
Transient recovery time @ 25 % load change steps	250 μs typ.
Transient response drift @ 25 % load change steps	3 %, max.
Over voltage protection	
P12Cxx2V5S, P12Cxx3R3S	3.9 V Z-diode clamping
P12Cxx05S	6.2 V Z-diode clamping
P12Cxx12x	15 V Z-diode clamping
P12Cxx15x	18 V Z-diode clamping

General	
Switching frequency	330 kHz, typ.
Safety Standard	IEC 60950-1
Reliability calculated MTBF (MIL-HDBK-217F)	> 1 Mio. h
EMC Characteristics	
Radiated Emissions (See figure 3)	EN55032 class A
Conducted Emissions (See figure 3)	EN55032 class A
ESD	EN61000-4-2 Crit. B
RS	EN61000-4-3 Crit. A
EFT	EN61000-4-4 Crit. A
Surge (See figure 3)	EN61000-4-5 Crit. A
CS (See figure 3)	EN61000-4-6 Crit. A
PFMF	EN61000-4-8 Crit. A
Environmental	
Operating ambient temperature	-40 ... 85 °C (see derating)
Storage temperature	-40 ... 125 °C
Case temperature	100 °C max.
Derating	see diagram
Storage humidity	Up to 95 %, non condensing
Cooling	Free air convection 16...33 cm/s
Physical	
Dimensions	31.75 x 20.32 x 10.16 mm
Weight	18 g
Case material	Nickel coated copper
Potting material	Epoxy (UL94V-0 rated)
Absolute maximum conditions	
Soldering temperature	< 260 °C for <10 s, > 1.5 mm distance from body
Input surge voltage for < 1 s	P12C12xxx: 36 V _{DC} , max.
	P12C24xxx: 50 V _{DC} , max.
	P12C48xxx: 100 V _{DC} , max.

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Notes:

1. All parameter are typical specified at 25 °C ambient temperature, nominal input voltage and full load, unless otherwise noted.
2. Capacitive load tested by minimal input voltage and constant resistive load.
3. An external filter is required to meet EFT standard IEC 61000-4-4 and IEC 61000-4-5. (see Figure 3)

Figure 1 Measure circuit for reflected input ripple current

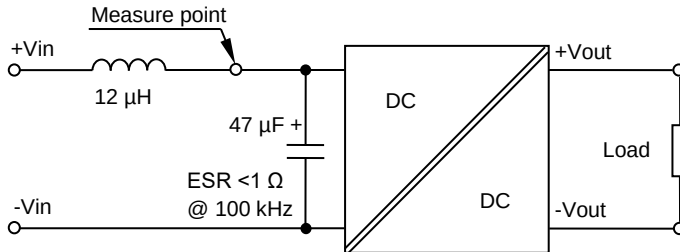


Figure 2 Measure circuit for output ripple and noise voltage

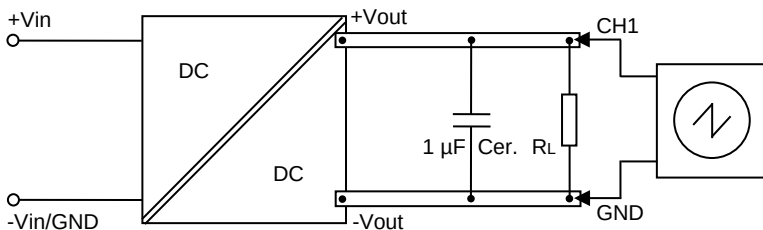
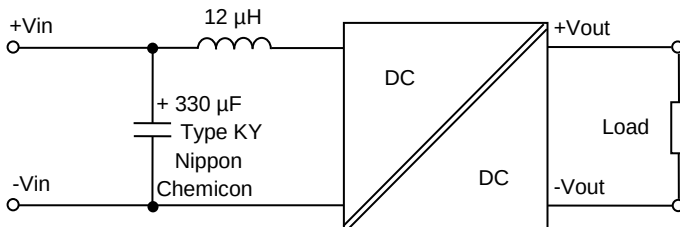
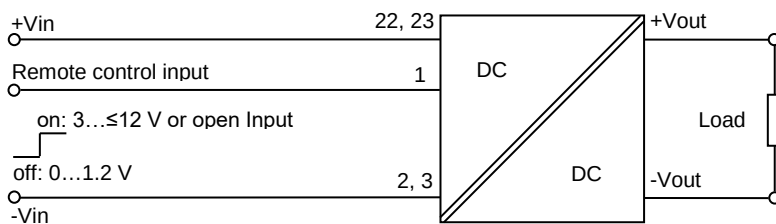


Figure 3 Input filter circuit to meet the class A specifications



The filter components should be mounted as near as possible and with shortest connections to the DC/DC-Converter.

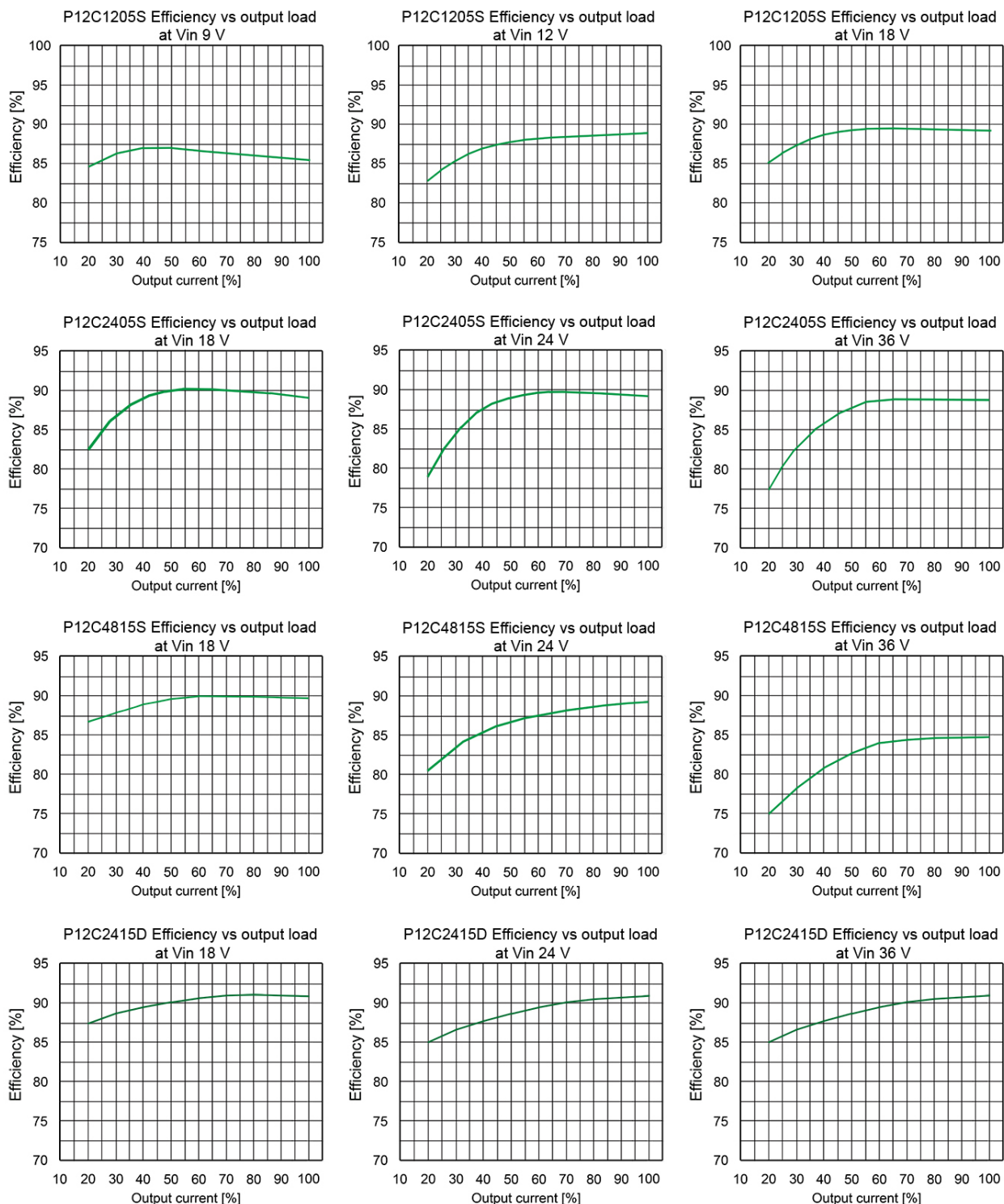
Figure 4 Remote control circuit for control voltage ≤ 12 V_{DC}





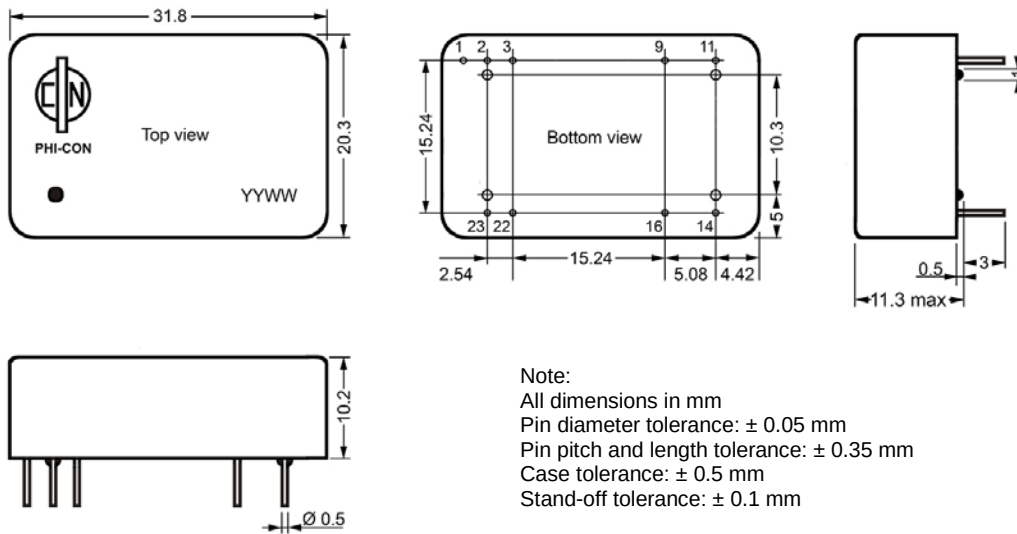
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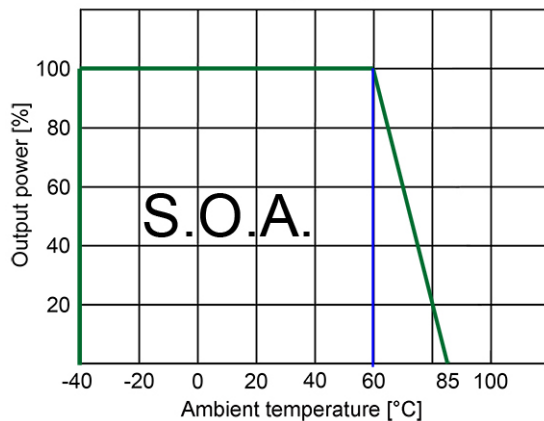
Dimensions



Note:

All dimensions in mm
Pin diameter tolerance: ± 0.05 mm
Pin pitch and length tolerance: ± 0.35 mm
Case tolerance: ± 0.5 mm
Stand-off tolerance: ± 0.1 mm

Derating diagram



Pin assignment		
Pin	Single output	Dual output
1	Remote contr.	Remote contr.
2	-V Input	-V Input
3	-V Input	-V Input
9	Omitted	Common
11	N.C.	-V Output
14	+V Output	+V Output
16	-V Output	Common
22	+V Input	+V Input
23	+V Input	+V Input

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