3W SMD DC-DC Converter P3DS-Series

PHI-CON

- SMD Package
- Single / Dual output
- Regulated output voltage
- Up to 1500 V_{DC} isolation
- MTBF > 1 Mio. hours at 25°C
- -40...85°C operating temperature range
- Efficiency up to 79 %

Model guide

Type	Input voltage range [V_{DC}]	Output voltage [V_{DC}]	Output current min. [mA]	Output current max. [mA]	Efficiency typ. [%]	Capacitive load max. [µF]
Single output						
P3DS0505S	4.5...9	5.0	60	600	72	1000
P3DS0512S	4.5...9	12.0	25	250	74	470
P3DS0515S	4.5...9	15.0	20	200	75	330
P3DS1205S	9...18	5.0	60	600	74	1000
P3DS1212S	9...18	12.0	25	250	78	470
P3DS1215S	9...18	15.0	20	200	79	330
P3DS2405S	18...36	5.0	60	600	74	1000
P3DS2412S	18...36	12.0	25	250	79	470
P3DS2415S	18...36	15.0	20	200	79	330
P3DS4805S	36…72	5.0	60	600	76	1000
P3DS4812S	36…72	12.0	25	250	79	470
P3DS4815S	36…72	15.0	20	200	79	330
Dual output						
P3DS0505D	4.5...9	±5.0	±30	±300	72	2 x 680
P3DS0512D	4.5...9	±12.0	±13	±125	74	2 x 330
P3DS0515D	4.5...9	±15.0	±10	±100	75	2 x 220
P3DS1205D	9...18	±5.0	±30	±300	76	2 x 680
P3DS1212D	9…18	±12.0	±13	±125	79	2 x 330
P3DS1215D	9…18	±15.0	±10	±100	79	2 x 220
P3DS2405D	18...36	±5.0	±30	±300	76	2 x 680
P3DS2412D	18...36	±12.0	±13	±125	79	2 x 330
P3DS2415D	18...36	±15.0	±10	±100	79	2 x 220
P3DS4805D	36...72	±5.0	±30	±300	76	2 x 680
P3DS4812D	36...72	±12.0	±13	±125	79	2 x 330
P3DS4815D	36...72	±15.0	±10	±100	79	2 x 220

Specifications

Input	
Filter	Capacitors
Input / output:	
DC-Isolation voltage tested for 60 sec. @ leakage < 1mA	1.5 kV_{DC}
Isolation Resistance @ 500 V_{DC}	10^9 Ω, min.
Capacitance	1000 pF, typ.
Output	
Positive voltage tolerance	± 3 % max.
Negative voltage tolerance	± 5 % max.
Line regulation @ full input range	± 0.5 % max.
Load regulation @ 10…100 % load change	± 1 % max. @ single output ± 5 % max. @ dual output
Output voltage drift @ 10 % to 100 % load change	
Temperature coefficient	0.03 % / °C, max., at full load
Short circuit protection	Continuous, automatic recovery
Ripple & noise	100 mVp-p
General	
Switching frequency	~ 300 kHz

Environmental	
EMI CE, with external filter circuit	CISPR22 / EN55022 CLASS A
EMS, ESD	IEC-,EN61000-4-2, contact ± 8 kV perf.criteria B
Operating temperature (ambient)	-40 °C to +85 °C
Storage temperature	-55 °C to +125 °C
Case temperature	95 °C, max.
Case temperature rise at full load	15 °C
Humidity	Up to 95 %, non-condensing
Cooling	Free air convection
Physical	
Package material	Epoxy resin (UL94-V0)
Weight	5.2 g
Reliability, MTBF (MIL-HDBK-217 @ 25 °C)	1 Mio. hours
Absolute maximum ratings	
P3DS05xxx types	-0.7 ~ 11 V_{DC}, max. 1 s
P3DS12xxx types	-0.7 ~ 22 V_{DC}, max. 1 s
P3DS24xxx types	-0.7 ~ 40 V_{DC}, max. 1 s
P3DS48xxx types	-0.7 ~ 80 V_{DC}, max. 1 s
Lead soldering temperature 1.5 mm distance from body	300 °C max. 10 s

HY-LINE® POWER COMPONENTS

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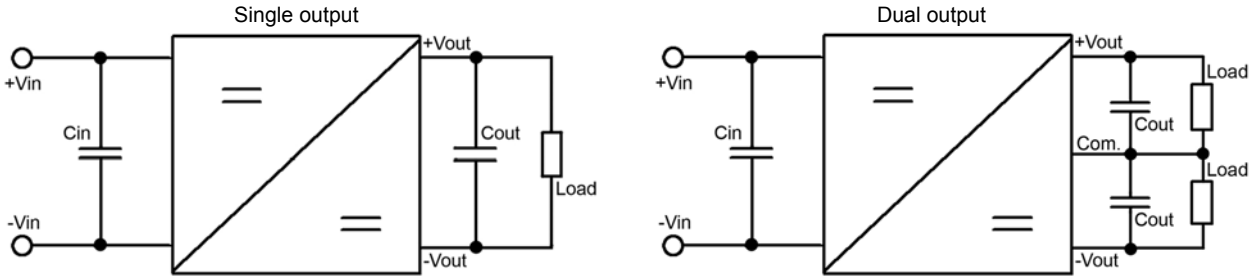
Requirement on output load
For a stable and efficiently function of the DC/DC-converter, the minimal load must be also considered in addition to maximum load. Make sure, that the specified input voltage range is not exceeded and the minimum output load no less than 10 % load If the actual load is less than the specified minimum load, the output ripple may increase extremely while its efficiency and reliability will reduce greatly. If the actual output power is less 10 %, please add an appropriate resistor as extra loading, or contact our company for other lower output power products.

Figure 1, Recommended circuits



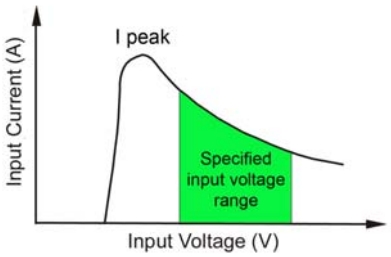
The P3DS series have been tested according to the following recommended testing circuit before leaving factory. This series should be tested under load. (See Figure 1).

Table 1 External capacitor recommendation

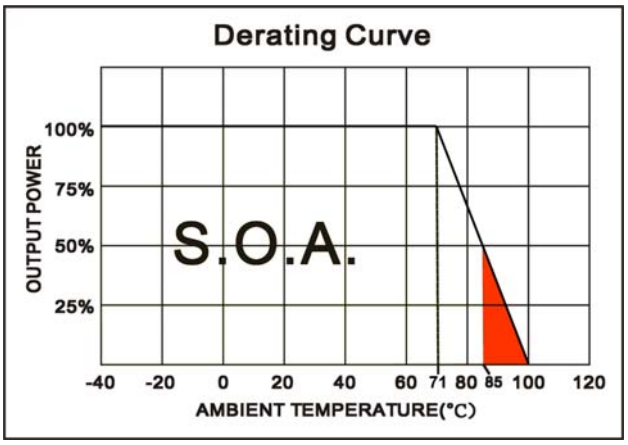
Series	Cin	Cout
P3DS05xxS	100 µF	0.1µF / mA
P3DS12xxS	100 µF	0.1µF / mA
P3DS24xxS	10…47 µF	0.1µF / mA
P3DS48xxS	10…47 µF	0.1µF / mA

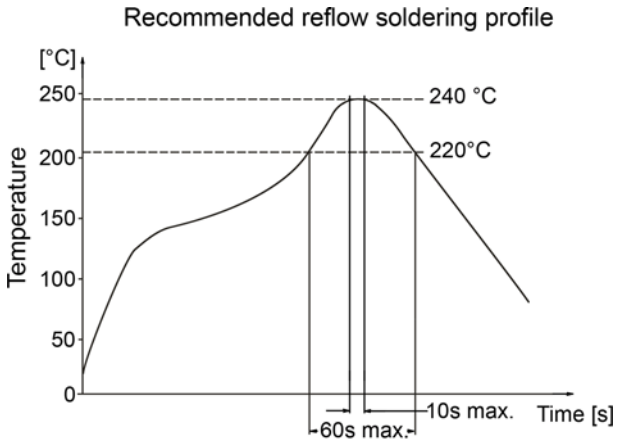
If you want to further decrease the input / output ripple, you can increase capacitance properly or choose capacitors with low ESR. However, the capacitance of the output filter capacitor must be proper. Too large capacitance caused a start up problem. For every channel of output, provided the safe and reliable operation is ensured, the greatest capacitance of its filter capacitor sees Table 1.

Input Current
When it is used in unregulated power supply, be sure that the fluctuating range of the power supply and the rippled voltage do not exceed the module standard. Input current of power supply should afford the flash startup current of this kind of DC/DC module (Figure 2).
General: $I_p \leq 1.4 * I_{in}$-max:



(Figure 2)





This curve applies only to hot air reflow soldering.

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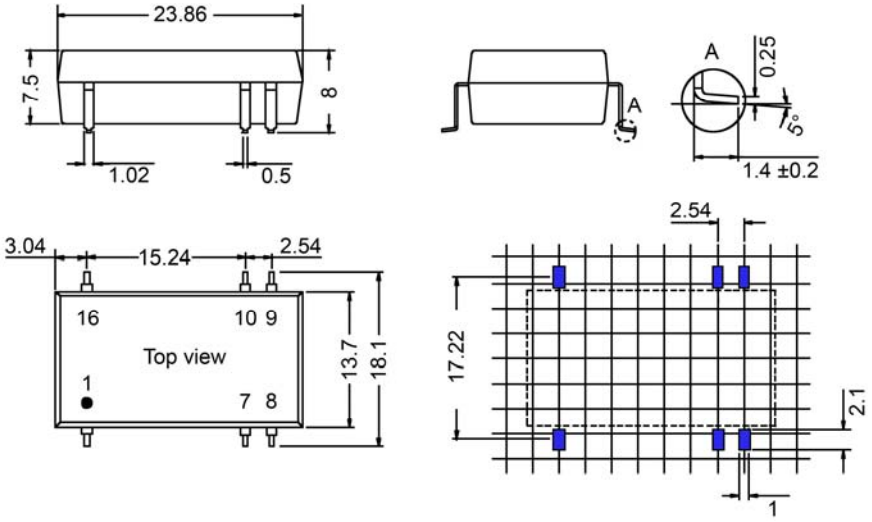
Note:
1. The load should not be less than 10 %, otherwise ripple will increase dramatically.
2. Operation under 10 % load will not damage the converter; However, they may not meet all specification listed.
3. Capacitive max. load tested at input voltage range and full load.
4. All specifications measured at Ta 25 °C, humidity <75 %, nominal input voltage and rated output load unless otherwise specified.
5. Only typical models listed, other models may be different, please contact our technical person for more details.
6. In this datasheet, all the test methods of indications are based on corporate standards.

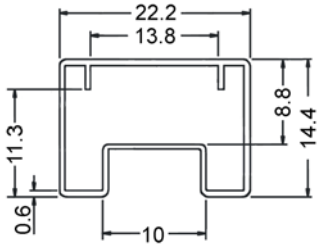
Dimensions & Footprint



Lead	Single output	Dual output
1	- Vinput	- Vinput
7	N.C.	N.C.
8	N.C.	Com. outp.
9	+ Voutput	+ Voutput
10	- Voutput	- Voutput
16	+ Vinput	+ Vinput

All untis in mm
Pin tolerances ±0.1 m
General tolerances ±0.25 mm

Tube side view



All untis in mm
General tolerances ±0.5 mm

Short tube length 220 mm, Qty 8 pcs
Long tube length 530 mm, Qty 21 pcs

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