0.75 W SMD DC-DC Converter P07GS-Series

PHI-CON

- Regulated output voltage
- 1500 V_{DC} isolation
- MTBF > 3.5 Mio. h at 25 °C
- -40...85 °C Operating temperature range
- Efficiency up to 74 %
- Continuous short circuit protection

CE

Model guide

Type	Input voltage		Output voltage	Input current		Output current		Efficiency	Capacitive load
	Nominal [V_{DC}]	Range [V_{DC}]	[V_{DC}]	no load [mA] max.	full load [mA] max.	[mA] min.	[mA] max.	[%] typ.	[µF] max.
P07GS053R3S	5.0	4.75..5.25	3.3	10	235	20	200	68	2400
P07GS0505S	5.0	4.75..5.25	5.0	10	235	15	150	72	2400
P07GS0509S	5.0	4.75..5.25	9.0	20	220	9	83	72	1000
P07GS0512S	5.0	4.75..5.25	12.0	20	220	7	62	73	560
P07GS0515S	5.0	4.75..5.25	15.0	30	215	5	50	74	560

Specifications

Input	
Voltage range	± 5 %
Filter	Capacitor
Reflected input ripple current	15 mA, typ. (see Figure 1)
Input / output:	
Isolation voltage tested for 60 sec. @ leakage current < 1 mA	1.5 kV_{DC}
Isolation Resistance @ 500 V_{DC}	10^9 Ω, min.
Capacitance @ 100 mV, 100 kHz	20 pF, typ.
Output	
Output voltage tolerance	± 3 %, max.
Voltage deviation vs V_{in} change	± 0.25 %, max. @ 1 % V_{in} change
Voltage deviation vs load @ 10..100% load change	P07GS053R3S: ± 3 %, max. All others: ± 2 %, max.
Temperature coefficient	0.02 % / °C, max., at full load
Ripple & noise (BW 20 MHz)	75 mVp-p, max., (see Figure 2)
Short circuit protection	Continuous, auto restart
Temperature coefficient at 100 % load	± 0.02 % / °C
General	
Safety standard	UL 62368-1, EN 62368-1
Switching frequency	~ 270 kHz

Environmental		
CE	CISPR32 / EN 55032	Class B (see Figure 3)
RE	CISPR32 / EN 55032	Class B (see Figure 3)
ESD	IEC-, EN 61000-4-2	Air ± 8 kV perf. criteria B Contact ± 4 kV perf. criteria B
Operating ambient temperature		-40 .. 85 °C, see derating diagram
Storage temperature		-55 .. 125 °C
Case temperature rise at full load		P07GS053R3S: 30 °C, typ. All others: 25 °C, typ.
Storage humidity		≤ 95 %, non condensing
Cooling		Free air convection
Physical		
Package material		Plastic (UL94V-0)
Weight		1.4 g
Dimensions		13.2 x 11.4 x 7.25 mm
Reliability, MTBF (MIL-HDBK-217 @ 25 °C)		3.5 Mio. h
Absolute maximum ratings		
P07GS05xxS		Vin -0.7 ~ 9 V_{DC}, max. 1 s
Soldering temperature		≤217 °C for ≤60 s, ≤245 °C peak
Moisture sensitivity level IPC/JEDEC J-STD-020D.1		MSL 1

Part designation structure

PHI-CON & output power		Series designation	Mounting technology		Input voltage		Output voltage		Output configuration		Packing	
P07	0.75 W	G	S	SMD	05	5 V	3R3	3.3V	S	Single	blank	Tube
							05	5 V			TR	Reel
							09	9 V				
							12	12 V				
							15	15 V				

Figure 1 Measure circuit for Input reflected ripple current

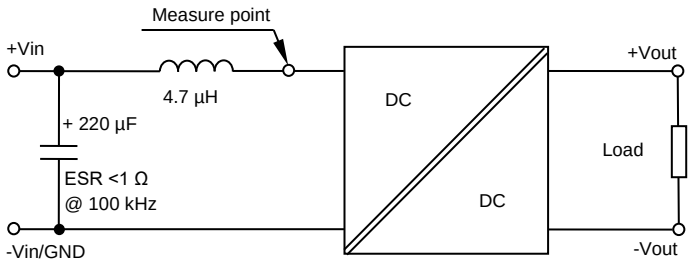

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Figure 2 Measure circuit for output ripple & noise (measure BW 20 MHz)

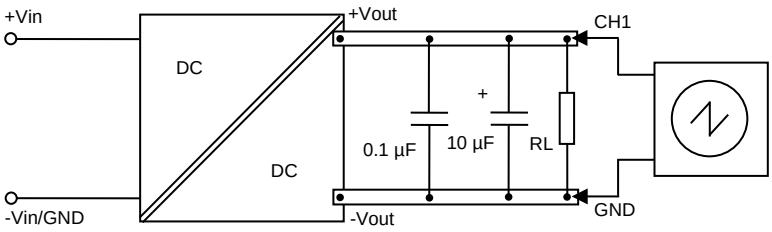

Figure 3 Typical circuit of external components for ripple & noise reduction

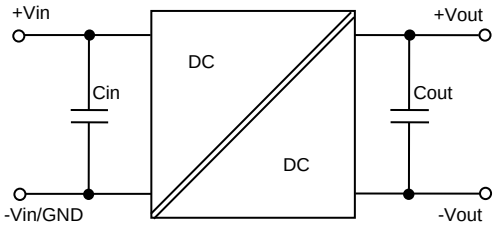

Table A External capacitor table for Figure 3			
Vin version	Cin	Vout version	Cout
P07GS05xxS	4.7 µF	P07GSxx3R3S	10 µF
		P07GSxx05S	10 µF
		P07GSxx09S	4.7 µF
		P07GSxx12S	2.2 µF
		P07GSxx15S	1 µF

If it is required to further reduce input and output ripple, a filter capacitor may be connected to the input and output terminals (see Figure 3). Moreover, choosing a suitable filter capacitor is very important, start up problems may be caused if the capacitance is too large. Under the condition of safe and reliable operation, the recommended capacitive load values are shown in (see table page 1).

Figure 4 EMI recommended external circuit

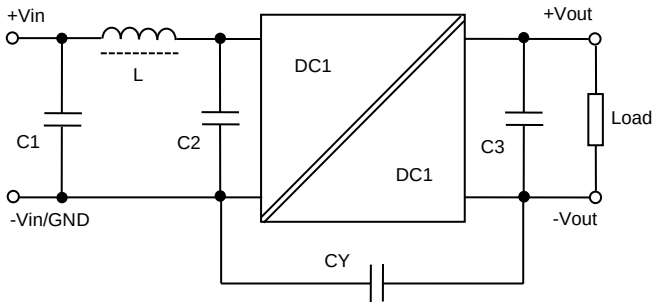

Table B to Figure 4 External components to meet IEC- / EN 55032, Class B					
Model series	C1, C2		L	CY	Cout
	[µF]	[V]	[µH]	[nF]	
P07GS3R3xxS	4.7	25	6.8	-	See Table A
P07GS05xxS	4.7	25	6.8	-	
P07GS09xxS	4.7	25	6.8	-	
P07GS12xxS	4.7	25	6.8	1	
P07GS15xxS	4.7	25	6.8	1	

In order to ensure the converter can work reliably with high efficiency, the minimum load should not less than 10 % rated load when it is used. If the needed power is indeed small, please parallel a resistor on t the output side. The sum of the efficient power and resistor consumption power should not by less than 10 %.

Note:
1. Operation under minimum load will not damage the converter. However, they may not meet all specifications.
2. Maximum capacitive load is tested at nominal input voltage and full load.
3. Unless otherwise noted, all specifications are measured at Ta 25 °C, humidity <75 %, nominal input voltage and rated output load.
4. Specifications of this product are subject to changes without prior notice.
5. P07GS series is not usable for IGBT driver applications.

HY-LINE®

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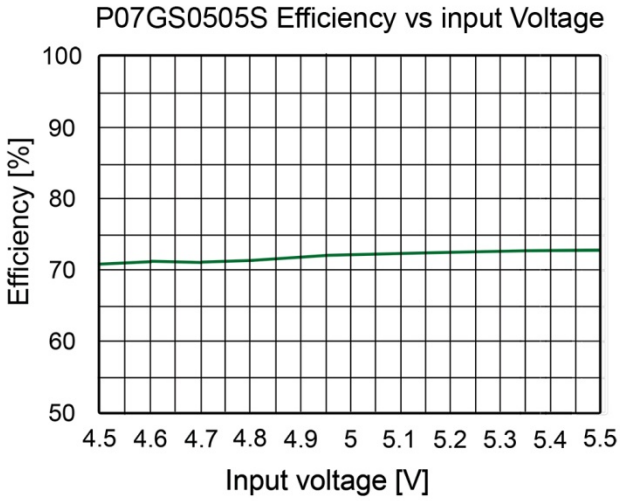
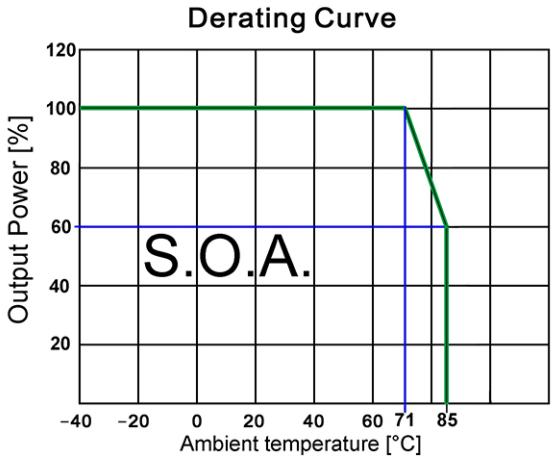
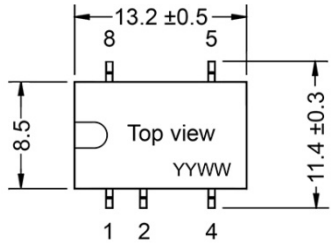
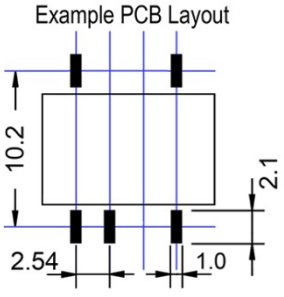
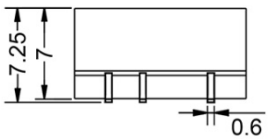


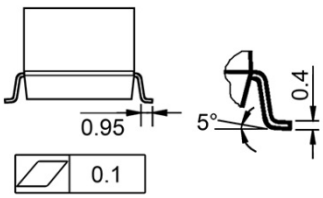


Meachnical dimensions and footprint layout









Notes:
All dimensions are in mm
General tolerances ±0.25 mm
Pin tolerances ±0.1 mm
Pitch 2.54 mm

Lead	Lead connection
1	- Vin / GND
2	+ Vinput
3	No lead
4	- Voutput
5	+ Voutput
6	No lead
7	No lead
8	Not connected

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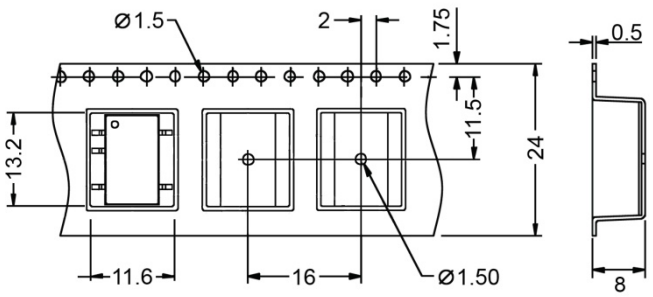
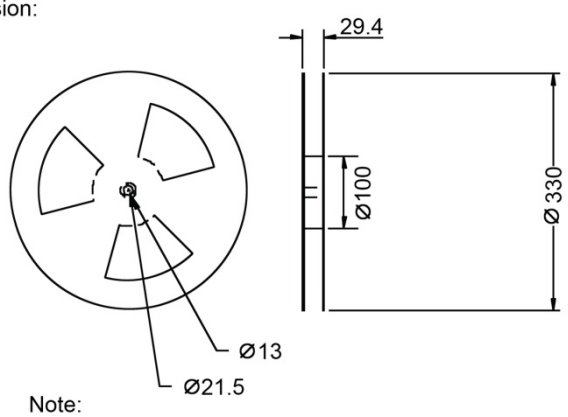
Tape dimension:

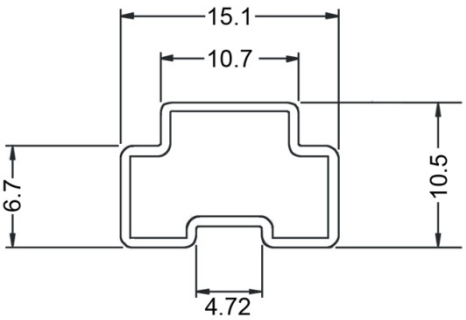


Reel dimension:



Note:
Unit: mm
General tolerances: 0.5 mm
Quantity per reel: 500 pieces

Dimensions tube packing



Note:
Unit: mm
General tolerances: ±0.5 mm

Short tube, quantity 15 pieces
Long tube, quantity 40 pieces

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