



**THE DATASHEET OF  
PDM2-S12-S15-S**



**SERIES:** PDM2-S | **DESCRIPTION:** DC-DC CONVERTER**FEATURES**

- 2 W isolated output
- smaller package
- single/dual unregulated output
- 1,500 Vdc isolation
- short circuit protection
- extended temperature range (-40~105°C)
- antistatic protection up to 8kV
- high efficiency at light load
- efficiency up to 86%



MODEL	input voltage		output voltage	output current		output power	ripple and noise <sup>2</sup>	efficiency
	typ (Vdc)	range (Vdc)	(Vdc)	min (mA)	max (mA)	max (W)	typ (mVp-p)	typ (%)
PDM2-S5-S3-S*	5	4.5~5.5	3.3	40	400	1.32	75	79
PDM2-S5-S5-S <sup>1,*</sup>	5	4.5~5.5	5	40	400	2	75	84
PDM2-S5-S12-S <sup>1,*</sup>	5	4.5~5.5	12	17	167	2	75	84
PDM2-S5-S15-S <sup>1</sup>	5	4.5~5.5	15	13	133	2	75	84
PDM2-S5-S24-S <sup>1,*</sup>	5	4.5~5.5	24	8	83	2	75	84
PDM2-S5-D3-S*	5	4.5~5.5	±3.3	±30	±303	2	75	71
PDM2-S5-D5-S <sup>1,*</sup>	5	4.5~5.5	±5	±20	±200	2	75	80
PDM2-S5-D12-S <sup>1,*</sup>	5	4.5~5.5	±12	±8	±83	2	75	84
PDM2-S5-D15-S <sup>1,*</sup>	5	4.5~5.5	±15	±7	±67	2	75	82
PDM2-S5-D24-S <sup>1,*</sup>	5	4.5~5.5	±24	±4	±42	2	75	84
PDM2-S12-S3-S*	12	10.8~13.2	3.3	40	400	1.32	75	79
PDM2-S12-S5-S <sup>1,*</sup>	12	10.8~13.2	5	40	400	2	75	82
PDM2-S12-S12-S <sup>1,*</sup>	12	10.8~13.2	12	17	167	2	75	84
PDM2-S12-S15-S <sup>1,*</sup>	12	10.8~13.2	15	13	133	2	75	85
PDM2-S12-D3-S*	12	10.8~13.2	±3.3	±20	±200	1.32	75	80
PDM2-S12-D5-S <sup>1,*</sup>	12	10.8~13.2	±5	±20	±200	2	75	80
PDM2-S12-D12-S <sup>1,*</sup>	12	10.8~13.2	±12	±8	±83	2	75	84
PDM2-S12-D15-S <sup>1,*</sup>	12	10.8~13.2	±15	±7	±67	2	75	84
PDM2-S15-D15-S*	15	13.5~16.5	±15	±7	±67	2	75	84
PDM2-S24-S3-S*	24	21.6~26.4	3.3	40	400	1.32	75	79
PDM2-S24-S5-S <sup>1,*</sup>	24	21.6~26.4	5	40	400	2	75	80
PDM2-S24-S12-S <sup>1,*</sup>	24	21.6~26.4	12	17	167	2	75	84
PDM2-S24-S15-S <sup>1,*</sup>	24	21.6~26.4	15	13	133	2	75	86
PDM2-S24-S24-S <sup>1,*</sup>	24	21.6~26.4	24	8	83	2	75	86
PDM2-S24-D3-S	24	21.6~26.4	±3.3	±30	±303	1.32	75	80

Notes: 1. UL approved  
 2. Ripple and noise are measured at 20 MHz BW by "parallel cable" method with 1 µF ceramic and 10 µF electrolytic capacitors on the output.  
 3. \* Discontinued model.



## SAFETY AND COMPLIANCE (CONTINUED)

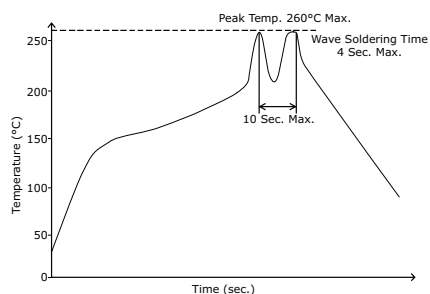
parameter	conditions/description	min	typ	max	units
conducted emissions	CISPR22/EN55022 class B (external circuit required, see Figure 1)				
radiated emissions	CISPR22/EN55022 class B (external circuit required, see Figure 1)				
ESD	IEC/EN61000-4-2, class B, contact ± 8kV for single outputs IEC/EN61000-4-2, class B, contact ± 6kV for dual outputs				
MTBF	as per MIL-HDBK-217F at 25°C	3,500,000			hours
RoHS	2011/65/EU				

## ENVIRONMENTAL

parameter	conditions/description	min	typ	max	units
operating temperature	see derating curve	-40		105	°C
storage temperature		-55		125	°C
storage humidity	non-condensing			95	%
temperature rise	at nominal input, full load, Ta = 25°C		25		°C

## SOLDERABILITY

parameter	conditions/description	min	typ	max	units
hand soldering	1.5 mm from case for 10 seconds			300	°C
wave soldering	see wave soldering profile			260	°C



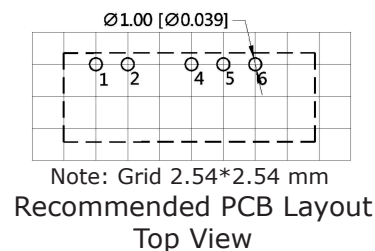
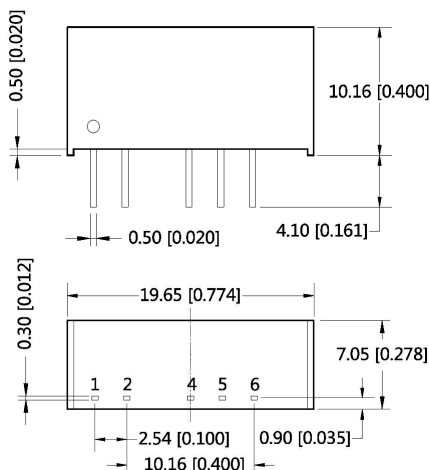
## MECHANICAL

parameter	conditions/description	min	typ	max	units
dimensions	19.65 x 7.05 x 10.16 (0.774 x 0.278 x 0.400 inch)				mm
case material	plastic (UL94-V0)				
weight			2.4		g

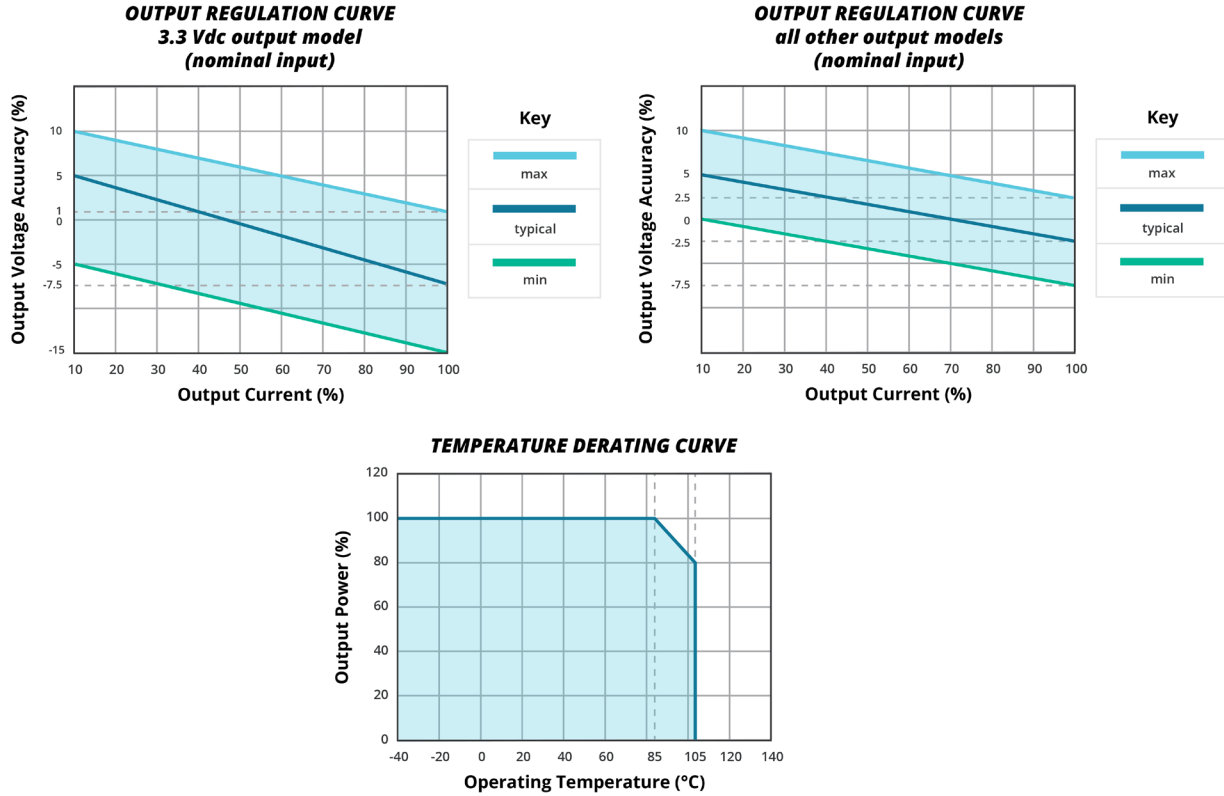
## MECHANICAL DRAWING

units: mm[inch]  
tolerance: ±0.25[±0.010]  
pin section tolerance: ±0.10[±0.004]

PIN CONNECTIONS		
PIN	Single Output	Dual Output
1	Vin	Vin
2	GND	GND
4	0V	-Vo
5	No Pin	0V
6	+Vo	+Vo



## DERATING CURVES



## EMC RECOMMENDED CIRCUIT

Figure 1

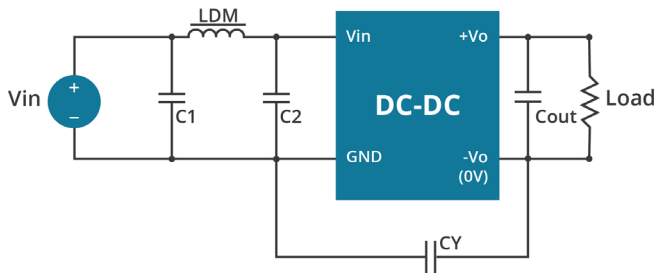


Table 1

Recommended external circuit components			
Vin (Vdc)	C1, C2	CY	LDM
5	4.7µF/50V	--	6.8µH
12	4.7µF/50V	--	6.8µH
15	4.7µF/50V	--	6.8µH
24	4.7µF/50V	1nF/2kV	6.8µH

Note: 1. See Table 3 for Cout values.

## TEST CONFIGURATION

Figure 2

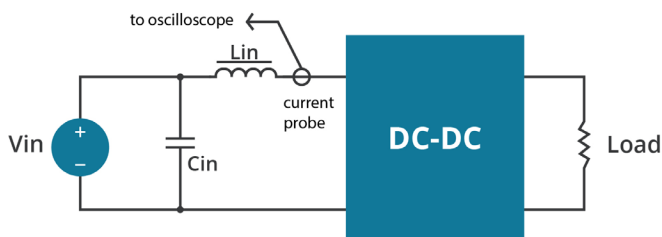


Table 2

External components	
Lin	4.7µH
Cin	220µF, ESR < 1.0Ω at 100 kHz

Note: 1. Input reflected-ripple current is measured with an inductor Lin and capacitor Cin to simulate source impedance.

## APPLICATION NOTES

### 1. Output load requirement

To ensure this module can operate efficiently and reliably, the minimum output load may not be less than 10% of the full load during operation. If the actual output power is low, connect a resistor at the output end in parallel to increase the load.

### 2. Overload Protection

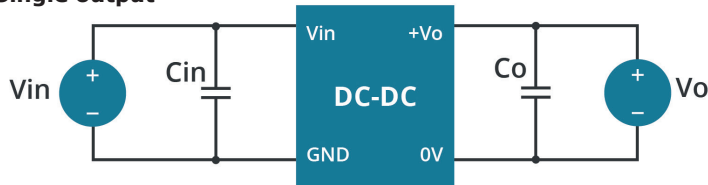
Under normal operating conditions, the output circuit of this product has no protection against overload. The simplest method to add this is to add a circuit breaker to the circuit.

### 3. Recommended circuit

If you want to further decrease the input/output ripple, you can increase the capacitance accordingly or choose capacitors with low ESR(see Figure 3 & Table 3). However, the capacitance of the output filter capacitor must be appropriate. If the capacitance is too high, a startup problem might arise. For every channel of the output, to ensure safe and reliable operation, the maximum capacitance must be less than the maximum capacitive load (see Table 4).

Figure 3

#### Single output



#### Dual output

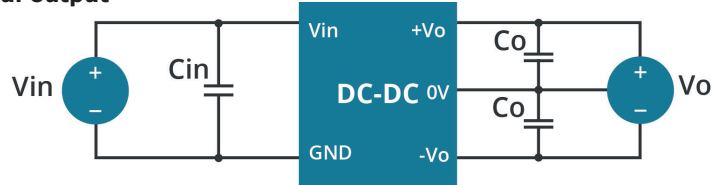


Table 3

Vin (Vdc)	Cin (μF)	Single Vo (Vdc)	Cout (μF)	Dual Vo (Vdc)	Cout (μF)
5	4.7	3.3	10	±3.3	4.7
12	2.2	5	10	±5	4.7
15	2.2	12	2.2	±12	1
24	1	15	1	±15	0.47
--	--	24	1	±24	0.47

Table 4

Single Vout (Vdc)	Max. Capacitive Load (μF)	Dual Vout (Vdc)	Max. Capacitive Load <sup>1</sup> (μF)
3.3	220	3.3	100
5	220	5	100
12	220	12	100
15	220	15	100
24	220	24	100

Note: 1. For each output.

Notes: 1. Operation under minimum load will not damage the converter; however, they may not meet all specifications listed.  
 2. Max. capacitive load tested at input voltage range and full load.  
 3. It is recommended to use either ceramic capacitors or electrolytic capacitors on the input and the output. Using tantalum capacitors may increase the risk of failure.  
 4. All specifications measured at: Ta=25°C, humidity<75%, nominal input voltage and rated output load, unless otherwise specified.

## REVISION HISTORY

rev.	description	date
1.0	initial release	03/18/2013
1.01	added models, added UL approval to some models	12/16/2014
1.02	updated tolerance envelope curves	02/04/2016
1.03	updated datasheet	10/12/2017
1.04	safeties updated in features and safety line	01/18/2021
1.05	CE removed, figure drawings updated	10/27/2022
1.06	safeties updated	04/04/2023
1.07	discontinued models	06/29/2023
1.08	discontinued models PDM2-S12-S5-S, PDM2-S24-D5-S PDM2-S24-S15-S, PDM2-S24-S24-S, PDM2-S24-S5-S, PDM2-S5-S5-S	01/11/2024
1.09	discontinued models PDM2-S12-S12-S, PDM2-S5-D15-S, PDM2-S5-S12-S & PDM2-S5-S24-S	04/05/2024

The revision history provided is for informational purposes only and is believed to be accurate.



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