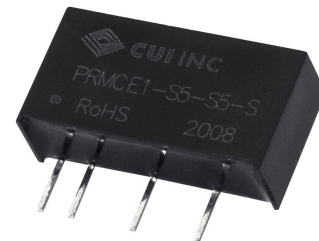


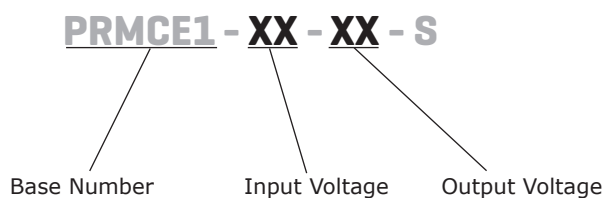
SERIES: PRMCE1-S | **DESCRIPTION:** DC-DC CONVERTER

FEATURES

- 1W isolated output
- 3000 Vdc isolation
- compact SIP package
- continuous short circuit protection
- no-load input current as low as 5mA
- wide temperature range: -40°C to +85°C
- high efficiency up to 73%
- UL 62368, EN 62368, IEC 62368 approval



MODEL	Certifications	input voltage typ (Vdc)	output voltage (Vdc)	output current max (mA)	output power max (W)	ripple and noise max (mVp-p)	efficiency typ (%)
PRMCE1-S5-S3-S	-	5	3.3	250	1	75	67
PRMCE1-S5-S5-S	UL/CE/CB	5	5	200	1	75	70
PRMCE1-S5-S9-S	UL/CE/CB	5	9	110	1	75	71
PRMCE1-S5-S12-S	UL/CE/CB	5	12	84	1	75	72
PRMCE1-S5-S15-S	UL/CE/CB	5	15	67	1	75	73
PRMCE1-S5-S24-S	CE	5	24	41	1	100	73
PRMCE1-S12-S5-S	CE	12	5	200	1	100	73
PRMCE1-S12-S9-S	CE	12	9	111	1	100	73
PRMCE1-S12-S12-S	CE	12	12	83	1	100	73
PRMCE1-S12-S15-S	CE	12	15	67	1	150	75
PRMCE1-S15-S5-S	CE	15	5	200	1	100	73
PRMCE1-S15-S15-S	CE	15	15	67	1	150	75
PRMCE1-S24-S3-S	CE	24	3.3	250	1	100	71
PRMCE1-S24-S5-S	CE	24	5	200	1	100	73
PRMCE1-S24-S9-S	CE	24	9	111	1	100	73
PRMCE1-S24-S12-S	CE	24	12	83	1	100	73
PRMCE1-S24-S15-S	CE	24	15	67	1	150	73

PART NUMBER KEY


INPUT

parameter	conditions/description	min	typ	max	units	
input voltage		4.75	5	5.25	Vdc	
		11.4	12	12.6	Vdc	
		14.25	15	15.75	Vdc	
		22.8	24	25.2	Vdc	
filter	capacitance filter					
current	5 Vdc input model	3.3,5 Vdc output model		286/5	303/10	mA
		9,12 Vdc output model		282/12	299/20	mA
		15,24 Vdc output model		274/18	290/30	mA
	12 Vdc input model	5,9,12 Vdc output model		115/8	121/-	mA
		15 Vdc output model		112/8	118/-	mA
	15 Vdc input model	5 Vdc output model		92/8	97/-	mA
		15 Vdc output model		89/8	94/-	mA
	24 Vdc input model	3.3 Vdc output model		59/8	65/-	mA
5,9,12,15 Vdc output model		58/8	63/-	mA		

OUTPUT

parameter	conditions/description	min	typ	max	units
output capacitance	3.3 Vdc output models			2400	μF
	5 Vdc output models			2400	μF
	9 Vdc output models			1000	μF
	12 Vdc output models			560	μF
	15 Vdc output models			560	μF
	24 Vdc output models			100	μF
line regulation	input voltage change: ±1%			±0.25	%
load regulation	3.3 Vdc output, 10%-100% load			±3	%
	all other output models, 10%-100% load			±2	%
switching frequency	100% load, nominal input voltage		270		kHz
temperature coefficient	100% load		±0.02		%/°C

PROTECTIONS

parameter	conditions/description	min	typ	max	units
short circuit protection	continuous, self-recovery				

SAFETY AND COMPLIANCE

parameter	conditions/description	min	typ	max	units
isolation voltage	input-output electric strength test for 1 minute with a leakage current of 1mA max	3,000			Vdc
isolation resistance	input-output resistance at 500 Vdc	1,000			MΩ
isolation capacitance	input-output capacitance at 100 KHz / 0.1 V		20		pF
safety approvals	UL62368/EN62368/IEC62368 Approval (the 3.3V is not included; and 24V only EN62368)				
EMI /EMC	CISPR32/EN55032 Class B (see recommended circuit)				
ESD	IEC/EN61000-4-2 Air ±8kV, Contact ±4kV perf. Criteria B				
RoHS	yes				
MTBF	as per MIL-HDBK-217F at 25°C	3,500			kHours

ENVIRONMENTAL

parameter	conditions/description	min	typ	max	units
operating temperature	derating when operating temperature up to 71°C	-40		85	°C
storage temperature		-55		125	°C
humidity	non-condensing			95	%
shock/vibration	10-150Hz, 5G, 30 Min. along X, Y and Z				

MECHANICAL

parameter	conditions/description	min	typ	max	units
dimensions	19.65 x 6.00 x 10.16				mm
case material	black plastic; flame-retardant and heat-resistant (UL94 V-0)				
weight			2.1		g

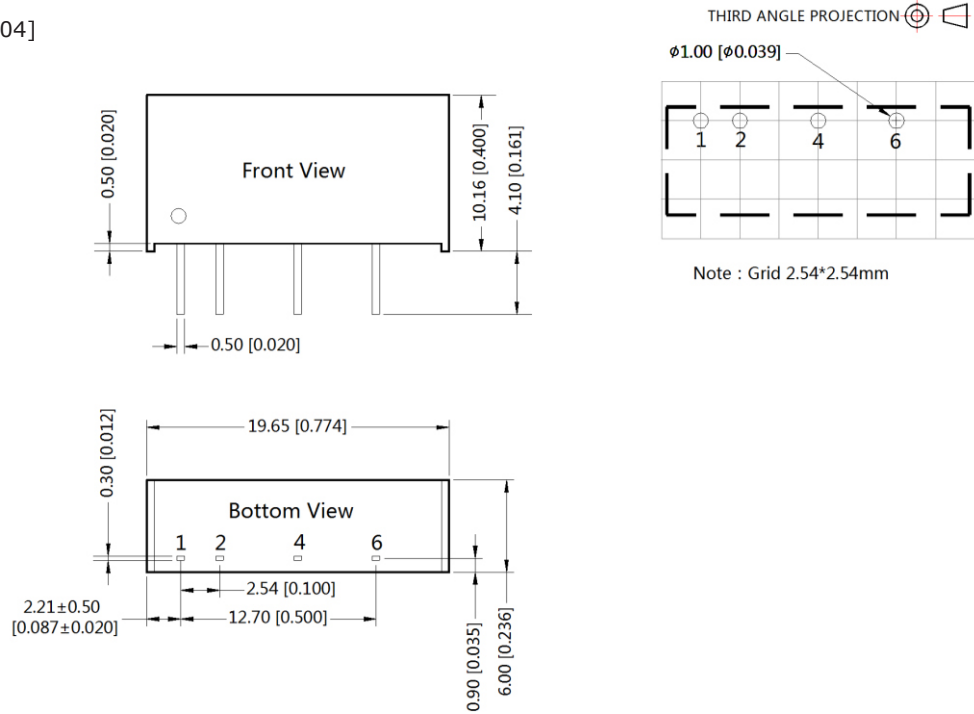
MECHANICAL DRAWING

units: mm [inches]

tolerance: ± 0.25 [±0.010]

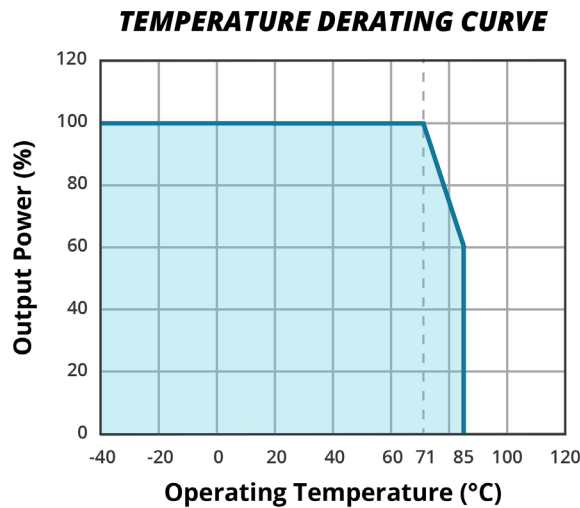
pin section tolerances: ± 0.10 [±0.004]

PIN-OUT	
PIN	FUNCTION
1	Vin
2	GND
4	0V
6	+Vo



DERATING CURVE

Figure 1



APPLICATION CIRCUIT

Input and/or output ripple can be further reduced, by connecting a filter capacitor from the input and/or output terminals to ground as shown in Fig.2.

Choosing suitable filter capacitor values is very important for a smooth operation of the modules, particularly to avoid start-up problems caused by capacitor values that are too high. For recommended input and output capacitor values refer to Table 1.

Figure 2

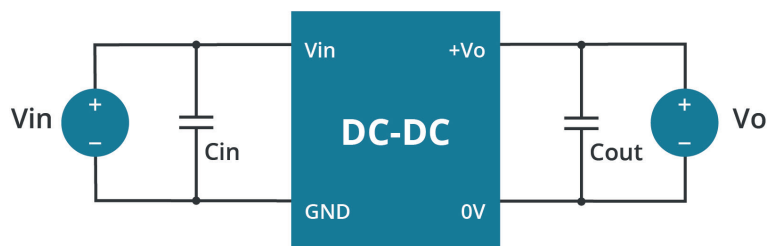


Table 1

Recommended Input & Output Capacitor Values			
Vin (Vdc)	Cin (μF / V)	Vo (Vdc)	Cout (μF / V)
5	4.7 / -	3.3/5	10
--	--	9/12	2.2
--	--	15	1
12	2.2 / 25	3.3	10 / 16
15	2.2 / 25	5	10 / 16
24	1 / 50	9	2.2 / 16
--	--	12	2.2 / 16
--	--	15	1 / 25

EMC RECOMMENDED CIRCUITS

Figure 3

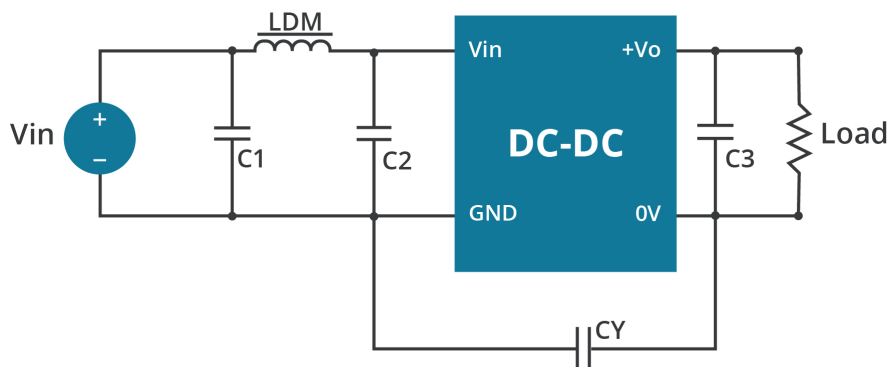


Table 1

Recommended EMC Filter Values					
Model	C1	C2	CY	C3	LDM
PRMCE1-S5-S3-S	4.7μF /25V	4.7μF /25V	--	see Cout in table 1	6.8μH
PRMCE1-S5-S5-S	4.7μF /25V	4.7μF /25V	--	see Cout in table 1	6.8μH
PRMCE1-S5-S9-S	4.7μF /25V	4.7μF /25V	--	see Cout in table 1	6.8μH
PRMCE1-S5-S12-S	4.7μF /25V	4.7μF /25V	1nF/4KVDC	see Cout in table 1	6.8μH
PRMCE1-S5-S15-S	4.7μF /25V	4.7μF /25V	1nF/4KVDC	see Cout in table 1	6.8μH
PRMCE1-S5-S24-S	4.7μF /25V	4.7μF /25V	1nF/4KVDC	see Cout in table 1	6.8μH
all other models	4.7μF /50V	4.7μF /50V	270pF/3KVDC	see Cout in table 1	6.8μH

REVISION HISTORY

rev.	description	date
1.0	initial release	03/09/2020
1.01	derating curve and circuit figures updated	07/06/2021
1.02	datasheet updated	09/16/2021
1.03	datasheet updated	10/06/2021

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



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