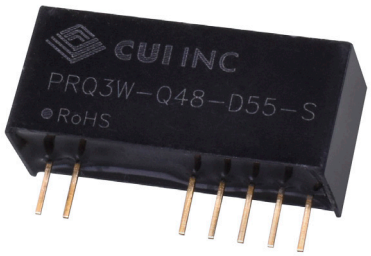
SERIES: PRQ3W-S | **DESCRIPTION:** DC-DC CONVERTER

FEATURES

- ultra-wide 4:1 input range
- dual positive output with asymmetrical options
- 3000 Vdc isolation
- input under-voltage protection
- output short circuit and over current protection
- wide operating temp: -40°C to +85°C
- EN 62368 approved

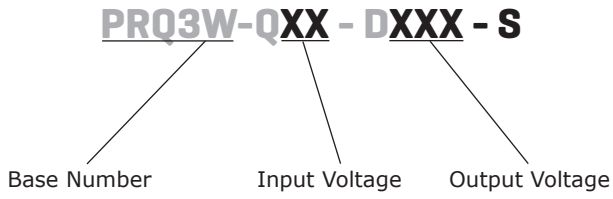


MODEL

MODEL	input voltage range (Vdc)	output voltage Vo1/Vo2 (Vdc)	output current max Vo1/Vo2 (mA)	output power max (W)	ripple and noise[1] max Vo1/Vo2 (mVp-p)	efficiency[2] min (%)	efficiency[2] typ (%)
PRQ3W-Q48-D55-S	18~75	5/5	300/300	3	150/150	76	78
PRQ3W-Q48-D512-S	18~75	5/12	300/125	3	150/150	76	78
PRQ3W-Q48-D524-S	18~75	5/24	300/63	3	150/150	76	78

Notes: 1. 20MHz bandwidth, nominal input, full load
2. Efficiency is measured In nominal input voltage and rated output load.

PART NUMBER KEY



INPUT

parameter	conditions/description	min	typ	max	units
input voltage		18	48	80	Vdc
filter	capacitance filter				
current	full load/no load			83/12	mA

OUTPUT

parameter	conditions/description	min	typ	max	units
output capacitance	5V outputs 12V outputs 24V outputs			680 330 220	µF µF µF
line regulation	low line to high line Vo1 Vo2		 ±0.2 ±0.5	 ±0.5 ±1.0	 %
load regulation	10~100% load Vo1 Vo2		 ±0.5 ±1.1	 ±1.0 ±2.0	 %
set-point accuracy	Vo1 / Vo2 10~100% load 5~10% load		 ±1/ ±3 ±2/ ±4	 ±3/±5 ±4/ ±6	 % %
start-up time	nominal input and constant resistance load		10		ms
switching frequency			300		kHz
transient response				±8 500	% Vout µs
temperature coefficient	full load			±0.03	%/°C

PROTECTIONS

parameter	conditions/description	min	typ	max	units
over current protection		110		250	%Io
short circuit protection	output shutdown, auto recovery				

SAFETY AND COMPLIANCE

parameter	conditions/description	min	typ	max	units
isolation voltage	input to output output to output	3000 1500			Vdc Vdc
isolation resistance	input-output resistance at 500 Vdc	1000			MΩ
isolation capacitance	input-output capacitance at 100 KHz/0.1 V		1000		pF
safety approvals	EN/IEC 62368				
EMI/EMC	EN 55032: 2015 Class B (see recommended circuit)				
ESD	IEC/EN61000-4-2, Contact ±4KV, perf. Criteria B				
radiated immunity	IEC/EN61000-4-3, 10 v/m, perf. Criteria A				
EFT/burst	IEC/EN61000-4-4, ±2KV (see recommended circuit), perf. Criteria B				
surge	IEC/EN61000-4-5, line to line ±2KV (see recommended circuit), perf. Criteria B				
conducted immunity	IEC/EN61000-4-6, 3 Vr.m.s, perf. Criteria A				
RoHS	yes				
MTBF	MIL-HDBK-217@25°C	1000			kHours

ENVIRONMENTAL

parameter	conditions/description	min	typ	max	units
operating temperature		-40		85	°C
storage temperature		-55		125	°C
humidity	non-condensing	5		95	%
shock/vibration	10-150Hz, 5G, 0.75mm. along X, Y and Z				

MECHANICAL

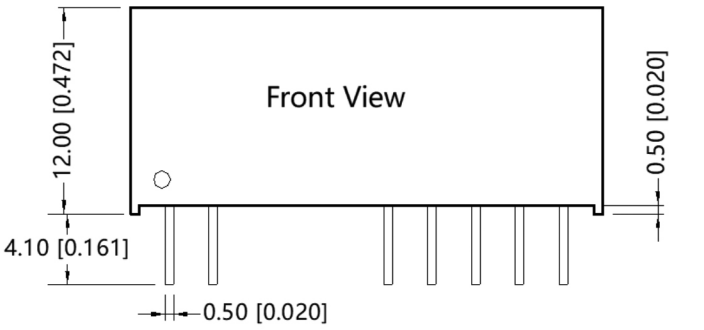
parameter	conditions/description	min	typ	max	units
dimensions	27.40 x 9.50 x 12.00				mm
case material	Black flame-retardant and heat-resistant plastic (UL94 V-0)				
weight			5.4		g

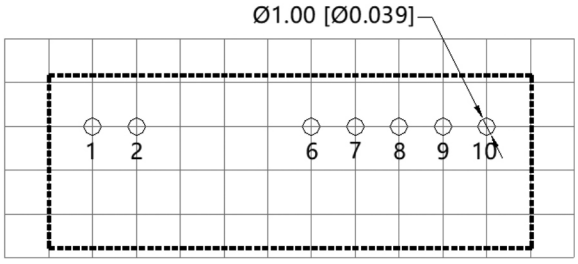
MECHANICAL DRAWING

units: mm [inches]
tolerance: ± 0.50 [±0.020]

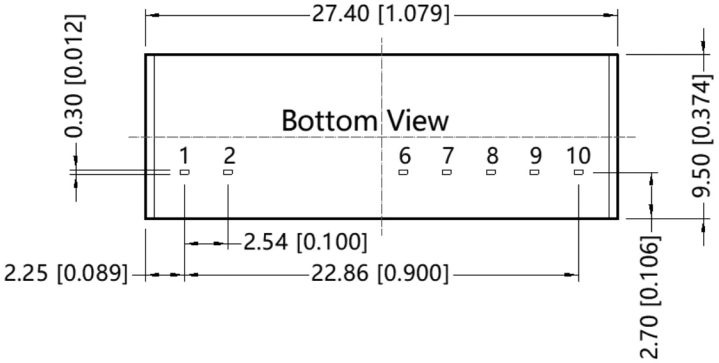
PIN CONNECTIONS	
PIN	FUNCTION
1	GND
2	Vin
6	+Vo1
7	-Vo1
8	CS*
9	-Vo2
10	+Vo2

* Connecting a low ESR capacitor between CS & pin 7 may reduce output ripple & noise. Maximum value = 47 µF



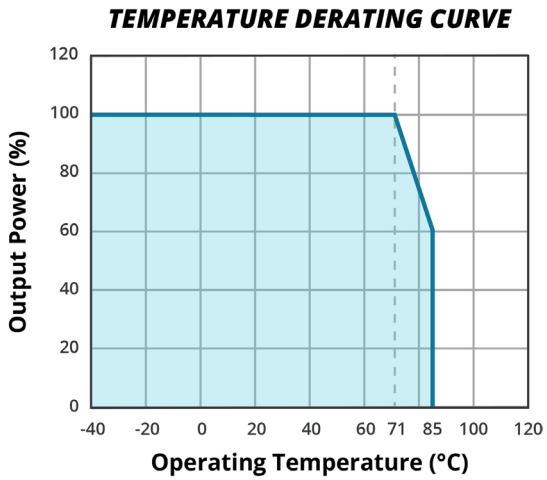


Note : Grid 2.54*2.54mm



DERATING CURVES

Figure 1



APPLICATION CIRCUIT

All the dc-dc converters of this series are tested before delivery using the recommended circuit shown in Fig. 2.

Input and/or output ripple can be further reduced by appropriately increasing the input & output capacitor values Cin and Cout and/or by selecting capacitors with a low ESR (equivalent series resistance). Also make sure that the capacitance is not exceeding the max. capacitive load value of the product.

Figure 2

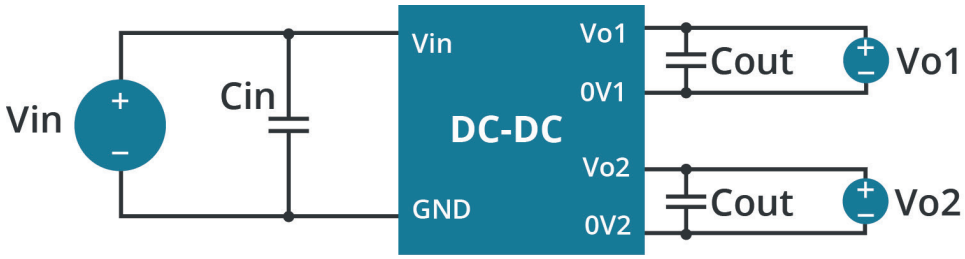


Table 1

output voltage (Vdc)	Cin (uF)	Cout (uF)
5	47	100
12	22	
24	22	

EMC RECOMMENDED CIRCUITS

Figure 3

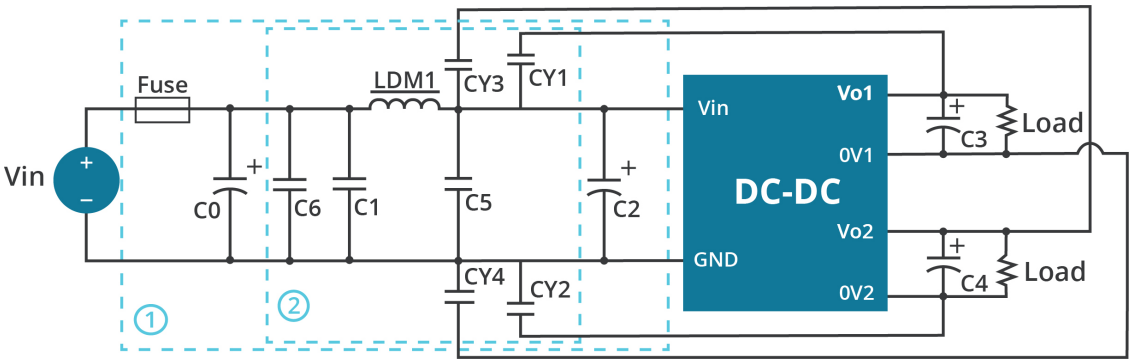


Table 2

List of Components	
Model	Vin:48V
FUSE	Choose according to actual input current
C0	680μF/100V
C1/C5/C6	4.7μF/100V
C2	330μF/100V
C3/C4	Refer to the Cout in Fig.2
LDM1	22μH/0.6A
CY1/CY2/CY4	1nF/3kV
CY3	2.2nF/3kV

REVISION HISTORY

rev.	description	date
1.0	initial release	05/26/2020
1.01	derating curve and circuit figures updated	07/15/2021
1.02	output current units & company address updated	01/22/2025

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

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