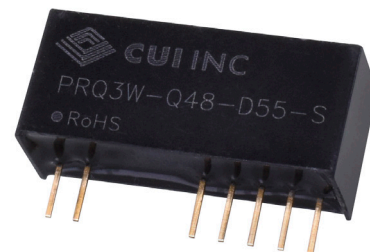


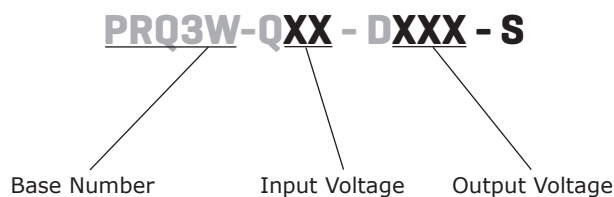
SERIES: PRQ3W-S | DESCRIPTION: DC-DC CONVERTER
FEATURES

- 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
- EN62368 approved



| MODEL | input voltage range (Vdc) | output voltage Vo1/Vo2 (Vdc) | output current max Vo1/Vo2 (A) | output power max (W) | ripple and noise ¹ max Vo1/Vo2 (mVp-p) | efficiency ² | |
|------------------|------------------------------|------------------------------------|--------------------------------------|-------------------------|--|-------------------------|---------|
| | | | | | | min (%) | 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 | | | 680 | μ F |
| | 12V outputs | | | 330 | μ F |
| | 24V outputs | | | 220 | μ F |
| 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 | | $\pm 1/ \pm 3$ | $\pm 3/ \pm 5$ | % |
| | 5~10% load | | $\pm 2/ \pm 4$ | $\pm 4/ \pm 6$ | % |
| start-up time | nominal input and constant resistance load | | 10 | | ms |
| switching frequency | | | 300 | | kHz |
| transient response | | | | ± 8 500 | % Vout μ s |
| 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 | 3000 | | | Vdc |
| | output to output | 1500 | | | 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

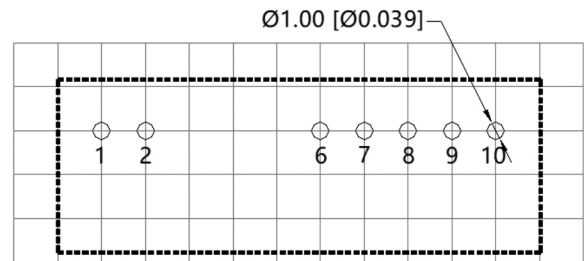
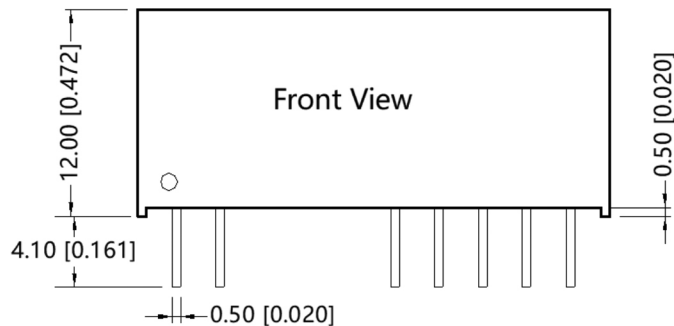
| parameter | conditions/description | min | typ | max | units |
|---------------|---|-----|-----|-----|-------|
| dimensions | 27.40 x 9.50 x 12.00 | | | | mm |
| case material | Black flame-retardant and heat-resistant plastic (UL94 V-0) | | | | |
| weight | | | 5.4 | | g |

MECHANICAL DRAWING

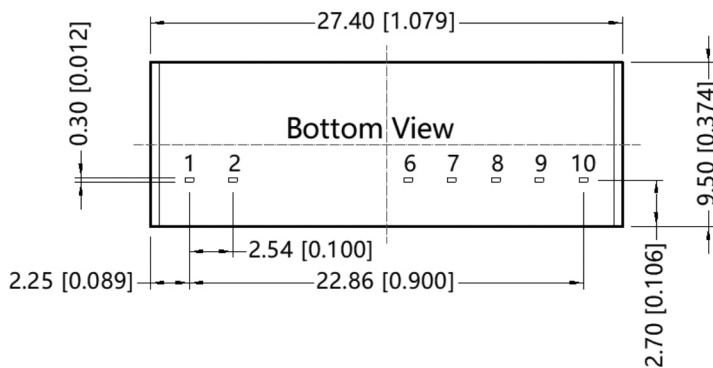
units: mm [inches]
 tolerance: ± 0.50 [±0.020]

| 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

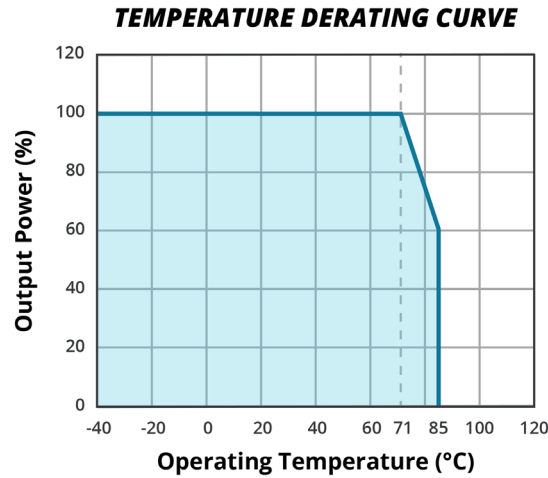


Note : Grid 2.54*2.54mm



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 C_{in} and C_{out} 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

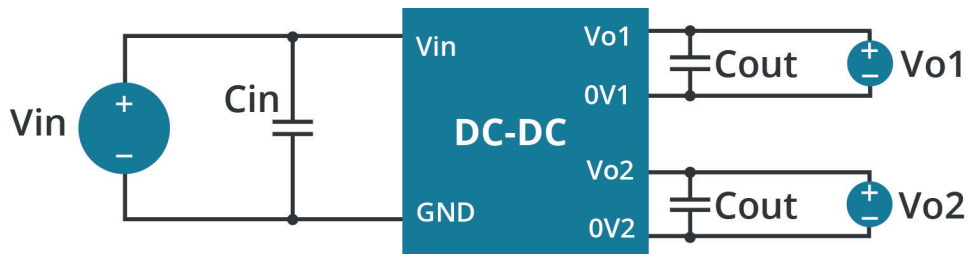


Table 1

| output voltage (Vdc) | C_{in} (uF) | C_{out} (uF) |
|----------------------|---------------|----------------|
| 5 | 47 | 100 |
| 12 | 22 | |
| 24 | 22 | |

EMC RECOMMENDED CIRCUITS

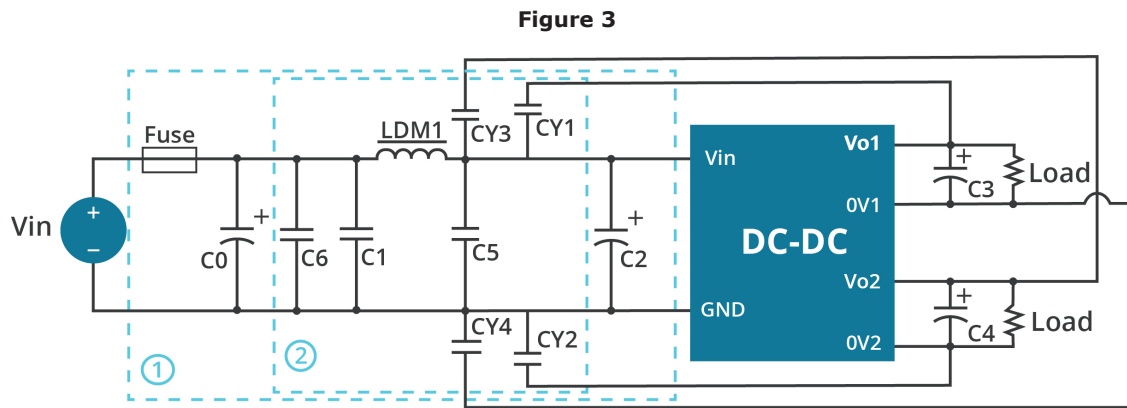


Table 2

| List of Components | |
|--------------------|--|
| Model | Vin:48V |
| FUSE | Choose according to actual input current |
| C0 | 680 μ F/100V |
| C1/C5/C6 | 4.7 μ F/100V |
| C2 | 330 μ F/100V |
| C3/C4 | Refer to the Cout in Fig.2 |
| LDM1 | 22 μ H/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 |

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



Headquarters
20050 SW 112th Ave.
Tualatin, OR 97062
800.275.4899

Fax 503.612.2383
cui.com
techsupport@cui.com

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