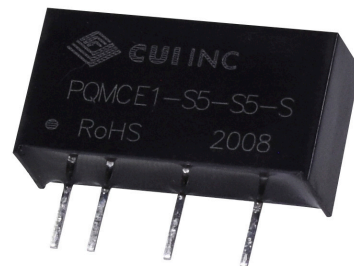
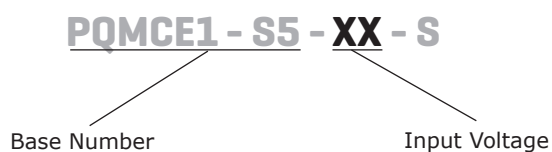


SERIES: PQMCE1-S | **DESCRIPTION:** DC-DC CONVERTER
FEATURES

- 1W isolated output
- 1500 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 approval



| MODEL | input voltage typ (Vdc) | output voltage (Vdc) | output current max (mA) | output power max (W) | ripple and noise max (mVp-p) | efficiency typ (%) |
|-----------------|--|---------------------------------|--|-------------------------------------|---|-----------------------------------|
| PQMCE1-S5-S3-S | 5 | 3.3 | 250 | .83 | 75 | 67 |
| PQMCE1-S5-S5-S | 5 | 5 | 200 | 1 | 75 | 70 |
| PQMCE1-S5-S9-S | 5 | 9 | 110 | 1 | 75 | 71 |
| PQMCE1-S5-S12-S | 5 | 12 | 84 | 1 | 75 | 72 |
| PQMCE1-S5-S15-S | 5 | 15 | 67 | 1 | 75 | 73 |
| PQMCE1-S5-S24-S | 5 | 24 | 41 | 1 | 100 | 73 |

PART NUMBER KEY

INPUT

| parameter | conditions/description | min | typ | max | units |
|---------------|------------------------|------|--------|--------|-------|
| input voltage | | 4.75 | 5 | 5.25 | Vdc |
| filter | capacitance filter | | | | |
| current | (full load / no-load) | | | | |
| | 3.3 Vdc / 5 Vdc output | | 286/5 | 303/10 | mA |
| | 9 Vdc / 12 Vdc output | | 282/12 | 299/20 | mA |
| | 15 Vdc / 24 Vdc output | | 274/18 | 290/30 | 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 | % |
| | others, 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 to output electric strength test for 1 minute with a leakage current of 1mA max | 1500 | | | Vdc |
| isolation resistance | input to output resistance at 500 Vdc | 1000 | | | MΩ |
| isolation capacitance | input to output capacitance at 100 KHz / 0.1 V | | 20 | | pF |
| safety approvals | certified to 62368: UL designed to meet 62368: EN, BS EN | | | | |
| 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 @ 25°C | 3500 | | | k Hours |

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 |

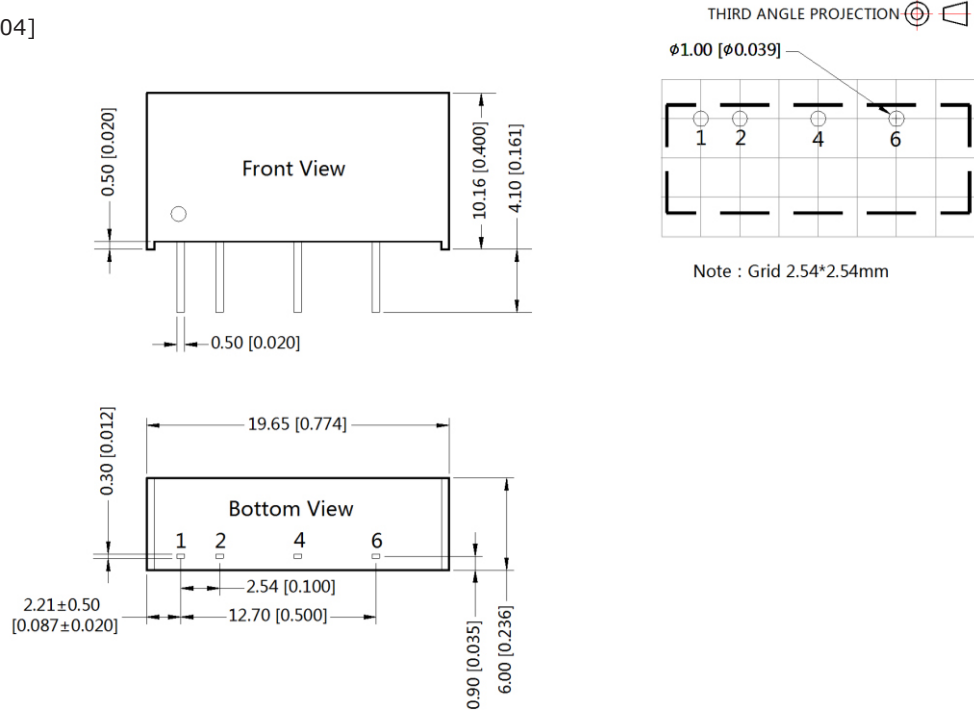
MECHANICAL DRAWING

units: mm [inches]

tolerance: ± 0.25 [± 0.010]

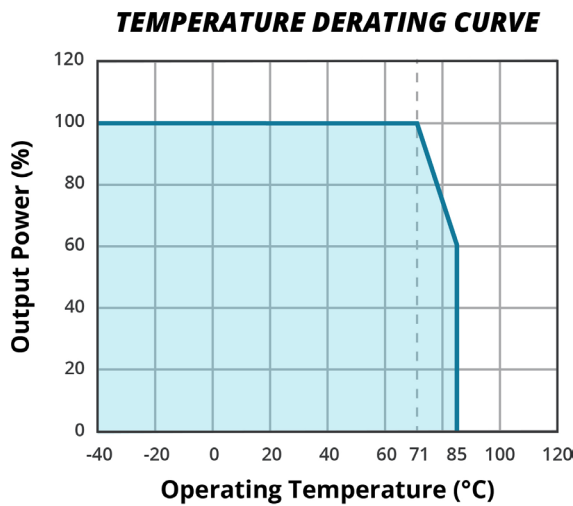
pin section tolerances: ± 0.10 [± 0.004]

| 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

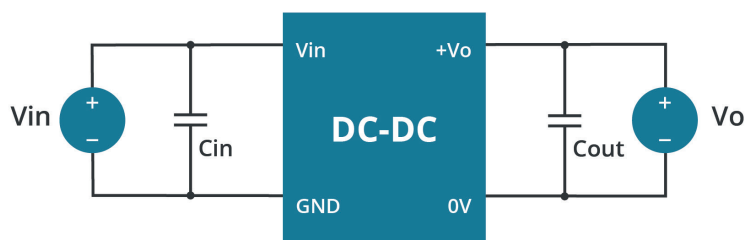


Table 1

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

EMC RECOMMENDED CIRCUITS

Figure 3

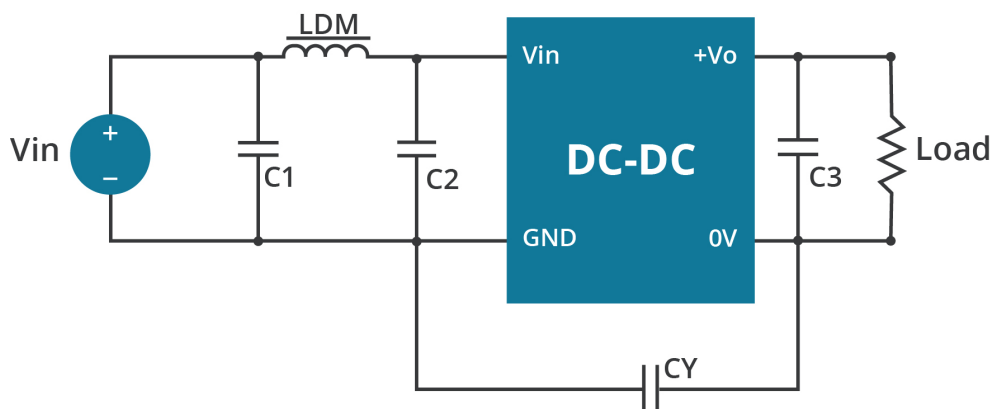


Table 2

| Recommended EMC Filter Values | | | | | |
|-------------------------------|------------|------------|-----------|---------------------|-------|
| Model | C1 | C2 | CY | C3 | LDM |
| PQMCE1-S5-S3-S | 4.7μF /25V | 4.7μF /25V | -- | see Cout in table 1 | 6.8μH |
| PQMCE1-S5-S5-S | 4.7μF /25V | 4.7μF /25V | -- | see Cout in table 1 | 6.8μH |
| PQMCE1-S5-S9-S | 4.7μF /25V | 4.7μF /25V | -- | see Cout in table 1 | 6.8μH |
| PQMCE1-S5-S12-S | 4.7μF /25V | 4.7μF /25V | 1nF/4KVdc | see Cout in table 1 | 6.8μH |
| PQMCE1-S5-S15-S | 4.7μF /25V | 4.7μF /25V | 1nF/4KVdc | see Cout in table 1 | 6.8μH |
| PQMCE1-S5-S24-S | 4.7μF /25V | 4.7μF /25V | 1nF/4KVdc | see Cout in table 1 | 6.8μH |

REVISION HISTORY

| rev. | description | date |
|------|--|------------|
| 1.0 | initial release | 03/09/2020 |
| 1.01 | datasheet update | 12/14/2020 |
| 1.03 | derating curve and circuit figures updated | 06/30/2021 |
| 1.04 | CE certification removed | 11/16/2022 |

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



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