



SERIES: PQME1-M | **DESCRIPTION:** DC-DC CONVERTER

FEATURES

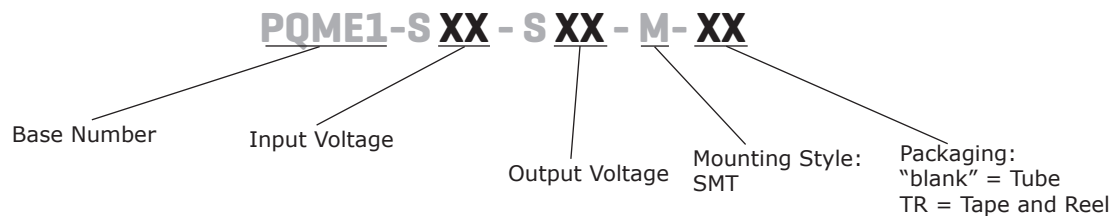
- 0.75 W isolated output
- regulated output
- compact SMT package
- single output models
- continuous short circuit protection
- -40~85 °C temperature range
- 1500 Vdc isolation
- no load input current as low as 5 mA
- industry standard pin-out
- efficiency up to 74%



| MODEL | input voltage | | output voltage (Vdc) | output current | | output power max (W) | ripple & noise ¹ max (mVp-p) | efficiency ² typ (%) |
|-----------------|---------------|----------------|-------------------------|----------------|-------------|----------------------------|---|---------------------------------------|
| | typ (Vdc) | range (Vdc) | | min (mA) | max (mA) | | | |
| PQME1-S5-S3-M | 5 | 4.75~5.25 | 3.3 | 20 | 200 | 0.66 | 75 | 68 |
| PQME1-S5-S5-M | 5 | 4.75~5.25 | 5 | 15 | 150 | 0.75 | 75 | 72 |
| PQME1-S5-S9-M | 5 | 4.75~5.25 | 9 | 9 | 83 | 0.75 | 75 | 72 |
| PQME1-S5-S12-M | 5 | 4.75~5.25 | 12 | 7 | 62 | 0.75 | 75 | 73 |
| PQME1-S5-S15-M | 5 | 4.75~5.25 | 15 | 5 | 50 | 0.75 | 75 | 74 |
| PQME1-S12-S5-M | 12 | 11.4~12.6 | 5 | 15 | 150 | 0.75 | 75 | 72 |
| PQME1-S12-S12-M | 12 | 11.4~12.6 | 12 | 7 | 62 | 0.75 | 75 | 73 |
| PQME1-S12-S15-M | 12 | 11.4~12.6 | 15 | 5 | 50 | 0.75 | 75 | 74 |

Notes: 1. Measured at nominal input, 20 MHz bandwidth oscilloscope, with 10 µF tantalum and 1 µF ceramic capacitors on the output.
 2. Measured at nominal input voltage, full load.
 3. All specifications are measured at Ta=25°C, humidity < 75%, nominal input voltage, and rated output load unless otherwise specified.

PART NUMBER KEY



INPUT

| parameter | conditions/description | min | typ | max | units |
|-------------------------|------------------------|-------------------------|-----|------|-------|
| operating input voltage | 5 Vdc input model | 4.75 | 5 | 5.25 | Vdc |
| | 12 Vdc input model | 11.4 | 12 | 12.6 | Vdc |
| current | 5 Vdc input model | 3.3, 5 Vdc output model | | 234 | mA |
| | | 9, 12 Vdc output model | | 221 | mA |
| | | 15 Vdc output models | | 215 | mA |
| | 12 Vdc input model | 5 Vdc output model | | 92 | mA |
| | | 12 Vdc output model | | 91 | mA |
| | | 15 Vdc output model | | 90 | mA |
| filter | filter capacitor | | | | |

OUTPUT

| parameter | conditions/description | min | typ | max | units |
|--------------------------------------|---|-----|-------|-------|-------|
| maximum capacitive load ⁴ | 3.3, 5 Vdc output models | | | 2,400 | μF |
| | 9 Vdc output models | | | 1,000 | μF |
| | 12, 15 Vdc output models | | | 560 | μF |
| voltage accuracy | | | | ±3 | % |
| line regulation | for Vin change of 1% | | | ±0.25 | % |
| load regulation | from 10% to full load | | | ±3 | % |
| | 3.3 Vdc output models all other models | | | ±2 | % |
| switching frequency | 100% load, nominal input voltage | | 270 | | kHz |
| temperature coefficient | at full load | | ±0.02 | | %/°C |

Note: 4. Tested at input voltage range and full load.

PROTECTIONS

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

SAFETY AND COMPLIANCE

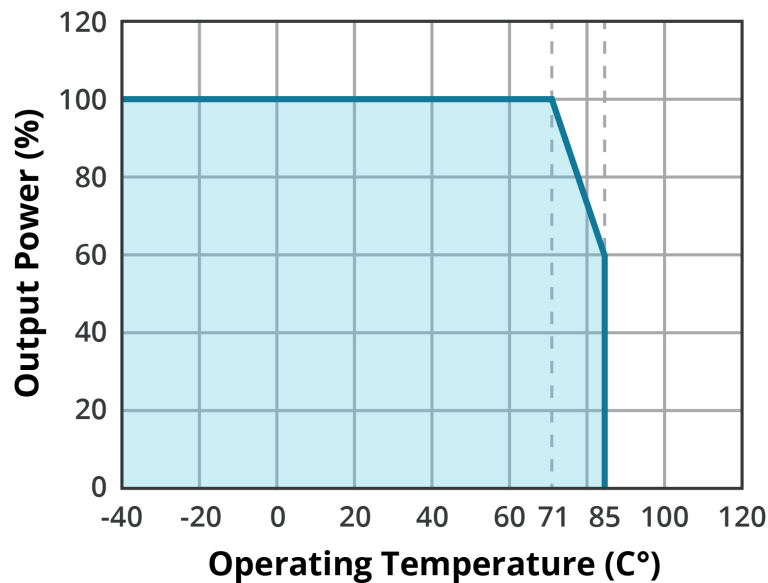
| parameter | conditions/description | min | typ | max | units |
|-----------------------|--|-----------|-----|-----|-------|
| isolation voltage | input to output for 1 minute at 1 mA | 1,500 | | | Vdc |
| | input to output for 1 second at 1 mA | 3,000 | | | Vdc |
| isolation resistance | input to output at 500 Vdc | 1,000 | | | MΩ |
| isolation capacitance | input to output, 100 kHz / 0.1 V | | 20 | | pF |
| safety approvals | designed to meet 62368-1: EN, BS EN | | | | |
| conducted emissions | CISPR32/EN55032, class B (external circuit required, see Figure 2) | | | | |
| radiated emissions | CISPR32/EN55032, class B (external circuit required, see Figure 2) | | | | |
| ESD | IEC/EN61000-4-2, air ± 8 kV; contact ± 4 kV, class B | | | | |
| MTBF | as per MIL-HDBK-217F, 25°C | 3,500,000 | | | hours |
| RoHS | yes | | | | |

ENVIRONMENTAL

| parameter | conditions/description | min | typ | max | units |
|-----------------------|------------------------------|-----|-----|-----|-------|
| operating temperature | see derating curves | -40 | | 85 | °C |
| storage temperature | | -55 | | 125 | °C |
| storage humidity | non-condensing | | | 95 | % |
| case temperature rise | 3.3 Vdc output model at 25°C | | 30 | | °C |
| | all other models at 25°C | | 25 | | °C |

DERATING CURVE

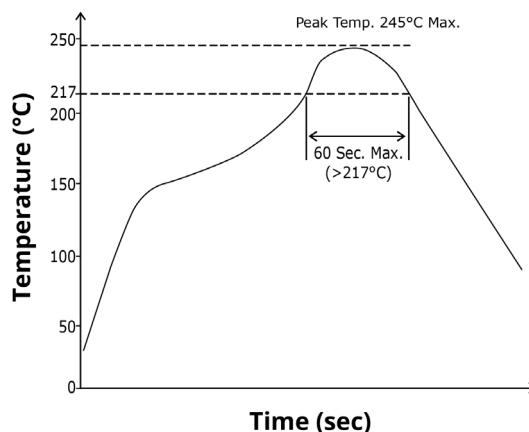
TEMPERATURE DERATING CURVE



SOLDERABILITY

| parameter | conditions/description | min | typ | max | units |
|------------------|---|-----|-----|-----|-------|
| reflow soldering | see reflow soldering profile Maximum duration >217°C is 60 seconds. For actual application, refer to IPC/JEDEC J-STD-020D.1 | | | 245 | °C |

WAVE SOLDERING PROFILE



MECHANICAL

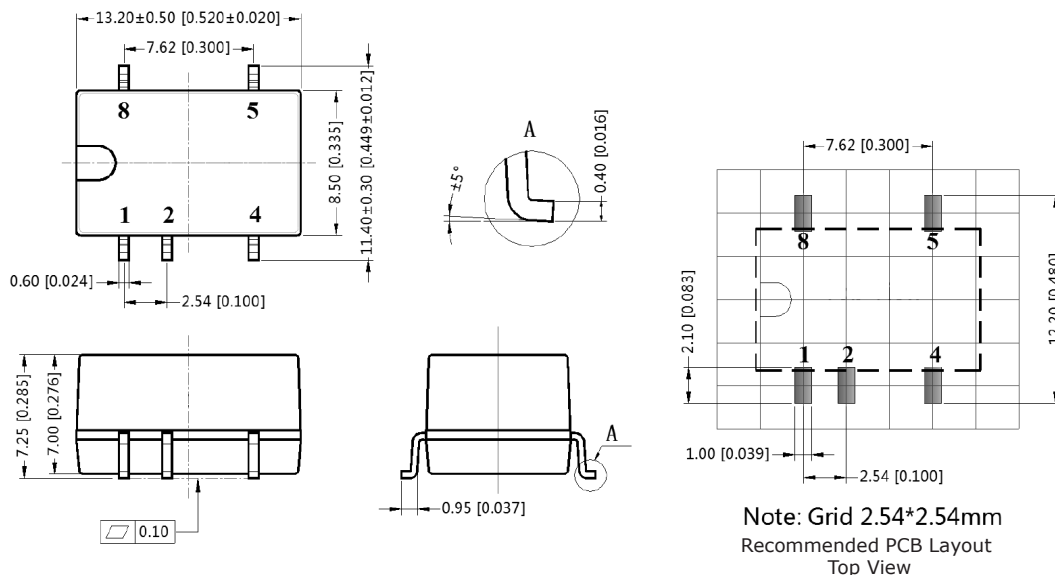
| parameter | conditions/description | min | typ | max | units |
|---------------|--|-----|-----|-----|-------|
| dimensions | 13.20 x 8.50 x 7.25 [0.520 x 0.335 x 0.285 inch] | | | | mm |
| case material | black flame-retardant and heat-resistant plastic (UL94V-0) | | | | |
| weight | | | 1.4 | | g |

MECHANICAL DRAWING

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

| PIN CONNECTIONS | |
|-----------------|----------|
| PIN | Function |
| 1 | GND |
| 2 | Vin |
| 4 | 0V |
| 5 | +Vout |
| 8 | NC |

NC = No connect



APPLICATION CIRCUIT

If you want to further reduce the input and output ripple, a filter capacitor may be connected to the input and output terminals (Figure 1) provided that the capacitance is less than the maximum capacitive load of the model, otherwise start-up problems may be caused if the capacitance is too large.

Figure 1

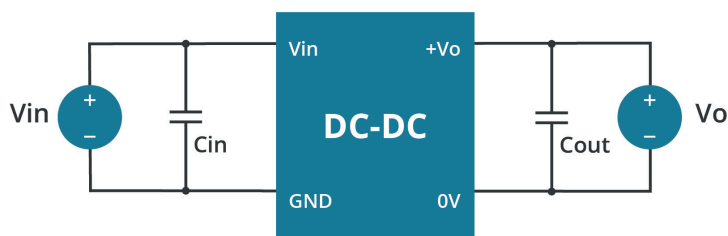


Table 1

| Vin (Vdc) | Cin (μF) | Vo (Vdc) | Cout (μF) |
|-----------|----------|----------|-----------|
| 5 | 4.7 | 3.3, 5 | 10 |
| | | 9, 12 | 2.2 |
| | | 15 | 1 |

EMC RECOMMENDED CIRCUIT

Figure 2

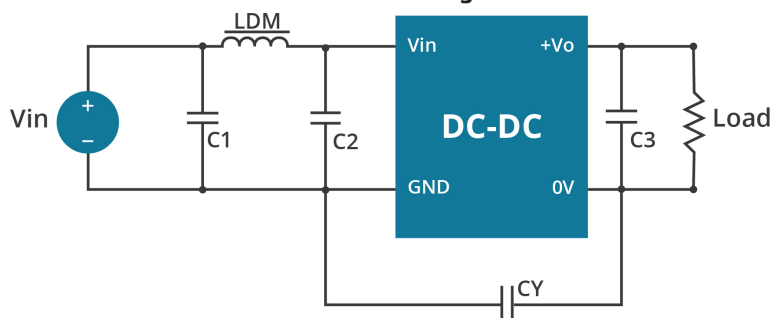


Table 2

| Recommended External Circuit Components | | |
|---|------------------------------|---------------|
| Vo (Vdc) | 3.3, 5, 9 | 12, 15 |
| CY | -- | 1 nF / 2 kVdc |
| C3 | refer to the Cout in Table 1 | |
| C1, C2 | 4.7 μF / 25 V | 4.7 μF / 25 V |
| LDM | 6.8 μH | 6.8 μH |

REVISION HISTORY

| rev. | description | date |
|------|---|------------|
| 1.0 | initial release | 05/10/2019 |
| 1.01 | safeties updated in features and safety line, packaging removed | 01/14/2021 |
| 1.02 | model table updated | 03/29/2021 |
| 1.03 | product image updated | 04/20/2021 |
| 1.04 | derating curve and circuits updated | 06/29/2021 |
| 1.05 | CE removed | 11/16/2022 |

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



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