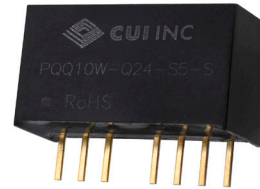


**SERIES:** PQQ10W-S | **DESCRIPTION:** DC-DC CONVERTER

**FEATURES**

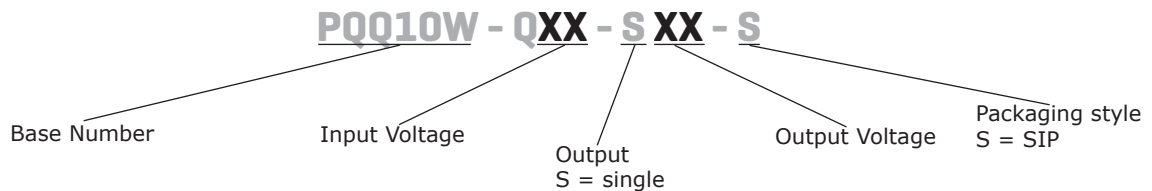
- 10W isolated output
- ultra wide 4:1 input range
- single regulated output
- high efficiency up to 88%
- short circuit and over-current protection
- 1500 Vdc isolation
- operating temperature -40°C ~ 85°C
- EN62368 approved
- control pin



| MODEL            | input voltage |             | output voltage | output current |          | output power | ripple & noise <sup>1</sup> | efficiency <sup>2</sup> |
|------------------|---------------|-------------|----------------|----------------|----------|--------------|-----------------------------|-------------------------|
|                  | typ (Vdc)     | range (Vdc) | (Vdc)          | min (mA)       | max (mA) | max (W)      | max (mVp-p)                 | typ (%)                 |
| PQQ10W-Q24-S3-S  | 24            | 9~36        | 3.3            | 0              | 2,400    | 8            | 120                         | 85                      |
| PQQ10W-Q24-S5-S  | 24            | 9~36        | 5.0            | 0              | 2,000    | 10           | 120                         | 88                      |
| PQQ10W-Q24-S9-S  | 24            | 9~36        | 9.0            | 0              | 1,111    | 10           | 150                         | 88                      |
| PQQ10W-Q24-S12-S | 24            | 9~36        | 12.0           | 0              | 833      | 10           | 150                         | 88                      |
| PQQ10W-Q24-S15-S | 24            | 9~36        | 15.0           | 0              | 667      | 10           | 150                         | 88                      |
| PQQ10W-Q24-S24-S | 24            | 9~36        | 24.0           | 0              | 417      | 10           | 150                         | 88                      |

Notes: 1. Ripple and noise are measured at 20 MHz BW by "parallel cable" method. See figure 3.  
2. At nominal input voltage.

**PART NUMBER KEY**



**INPUT**

| parameter               | conditions/description   | min  | typ    | max    | units |
|-------------------------|--|------|--------|--------|-------|
| operating input voltage |  | 9    | 24     | 40     | Vdc   |
| start-up voltage        |  |      |        | 9      | Vdc   |
| surge voltage           | for maximum of 1 second  | -0.7 |        | 50     | Vdc   |
| current                 | full load / no load  |      |        |        |       |
|                         | 3.3 Vdc output   |      | 389/25 | 398/45 | mA    |
|                         | 5 Vdc output   |      | 474/25 | 485/45 | mA    |
|                         | other outputs  |      | 474/9  | 485/18 | mA    |
| filter                  | capacitance filter   |      |        |        |       |
| CTRL                    | module on: CTRL pin open or pulled high (3.5-12 Vdc)<br>module off: CTRL pin pulled low to GND (0-1.2 Vdc) |      |        |        |       |

**OUTPUT**

| parameter                    | conditions/description | min | typ | max   | units |
|------------------------------|------------------------|-----|-----|-------|-------|
| maximum capacitive load      | 3.3 & 5 Vdc output     |     |     | 2,200 | μF    |
|                              | 9 Vdc output           |     |     | 680   | μF    |
|                              | 12 Vdc output          |     |     | 470   | μF    |
|                              | 15 Vdc output          |     |     | 330   | μF    |
|                              | 24 Vdc output          |     |     | 220   | μF    |
| voltage accuracy             |                        |     |     | ±2    | %     |
| line regulation              |                        |     |     | ±0.5  | %     |
| load regulation              | 5%~100% load           |     |     | ±1    | %     |
| switching frequency          | PWM mode               |     | 500 |       | kHz   |
| transient recovery time      | 25% load step change   |     | 300 | 500   | μS    |
| transient response deviation | nominal input voltage  |     |     |       |       |
|                              | 3.3 & 5 Vdc output     |     | ±5  | ±8    | %     |
|                              | other outputs          |     | ±3  | ±5    | %     |
| temperature coefficient      | at full load           |     |     | ±0.03 | %/°C  |

## PROTECTIONS

| parameter                | conditions/description    | min | typ | max | units |
|--------------------------|---------------------------|-----|-----|-----|-------|
| over current protection  |                           | 110 |     | 230 | %     |
| short circuit protection | continuous, auto recovery |     |     |     |       |

## SAFETY AND COMPLIANCE

| parameter             | conditions/description  | min   | typ   | max | units   |
|-----------------------|---|-------|-------|-----|---------|
| isolation voltage     | input to output, for 1 minute with 1 mA max                                   | 1,500 |       |     | Vdc     |
| isolation resistance  | input to output at 500 Vdc  | 1,000 |       |     | MΩ      |
| isolation capacitance | input to output, 100 kHz / 0.1 V  |       | 1,000 |     | pF      |
| safety approvals      | certified to 62368-1: EN  |       |       |     |         |
| EMI/EMC               | CISPR32/EN 55032 Class B (see recommended circuit)                            |       |       |     |         |
| ESD                   | IEC/EN61000-4-2 Contact ±6KV, perf. Criteria B                                |       |       |     |         |
| radiated immunity     | IEC/EN61000-4-3 10V/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                                    |       |       |     |         |
| MTBF                  | as per MIL-HDBK-217F, 25°C  | 1,000 |       |     | K hours |
| RoHS                  | yes   |       |       |     |         |

## ENVIRONMENTAL

| parameter             | conditions/description                        | min | typ | max | units |
|-----------------------|---|-----|-----|-----|-------|
| operating temperature | see derating curve                            | -40 |     | 85  | °C    |
| storage temperature   |   | -55 |     | 125 | °C    |
| storage humidity      | non-condensing                                | 5   |     | 95  | %     |
| vibration             | 10-150Hz, 0.75mm, 5G, 90min. along X, Y and Z |     |     |     |       |

## MECHANICAL

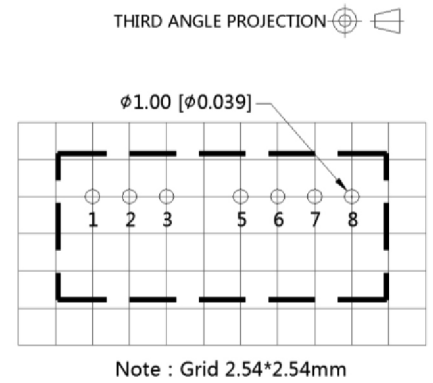
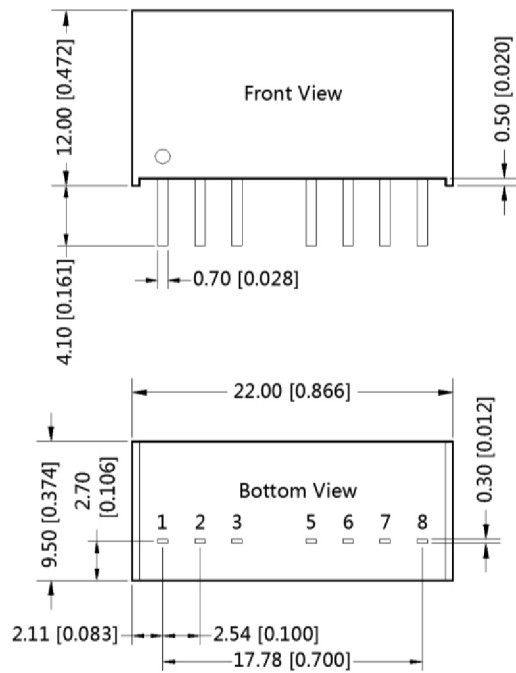
| parameter     | conditions/description                            | min | typ | max | units |
|---------------|---|-----|-----|-----|-------|
| dimensions    | 22.00 × 9.50 × 12.00 [0.866 × 0.374 × 0.472 inch] |     |     |     | mm    |
| case material | black plastic                                     |     |     |     |       |
| weight        |   |     | 5.5 |     | g     |

## MECHANICAL DRAWING

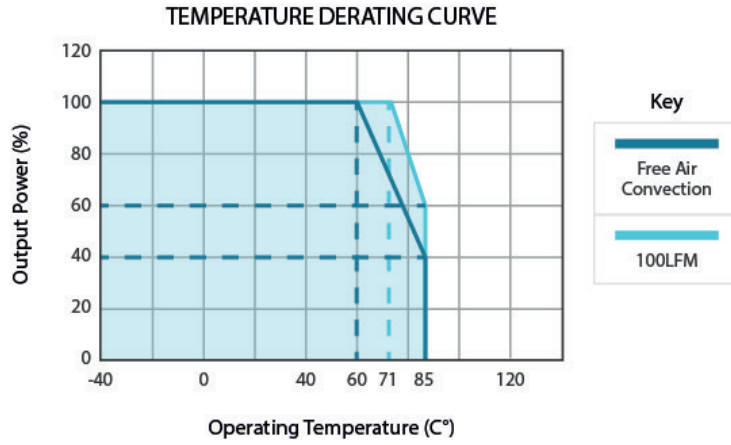
units: mm [inch]  
 pin section tolerance: ±0.10[±0.004]  
 general tolerance: ±0.50[±0.020]

| PIN Out |          |
|---------|----------|
| PIN     | Function |
| 1       | GND      |
| 2       | Vin      |
| 3       | Ctrl     |
| 5       | NC       |
| 6       | +Vo      |
| 7       | 0V       |
| 8       | NC       |

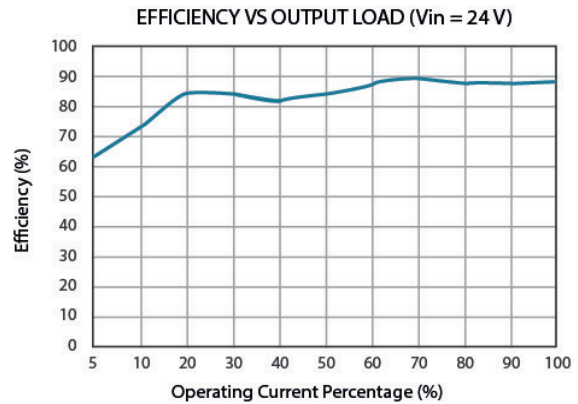
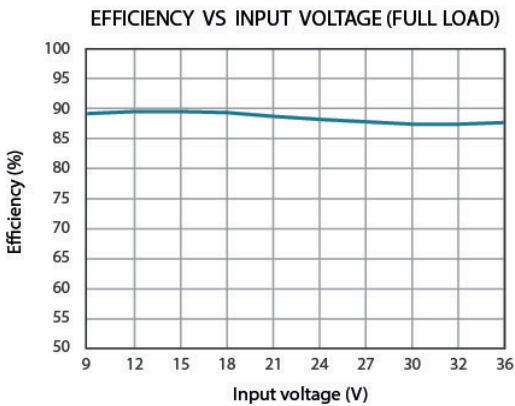
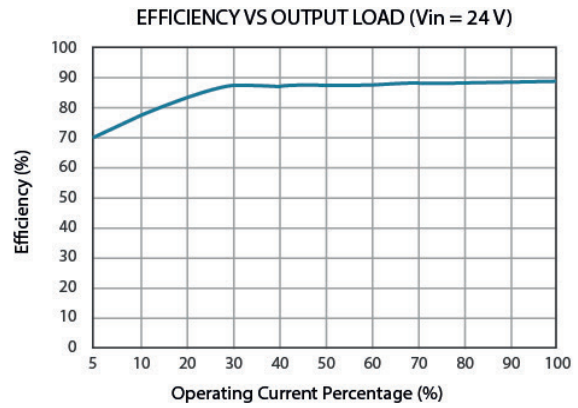
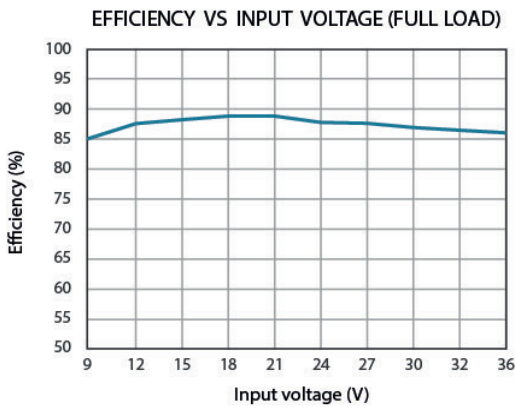
NC: Pin to be isolated from circuitry.



## DERATING CURVES



## EFFICIENCY CURVES



## APPLICATION CIRCUIT

Figure 1

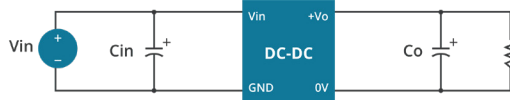
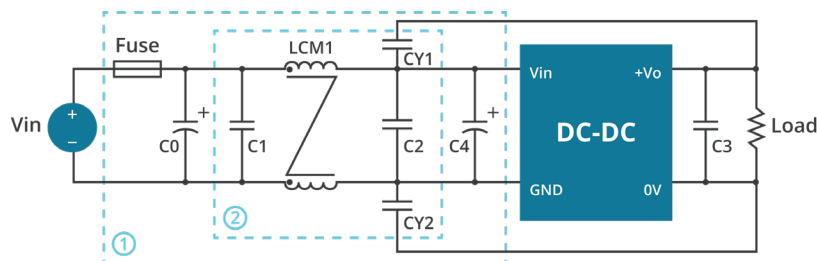


Table 1

| Cin (μF) | Co (μF) |
|----------|---------|
| 47       | 22      |

## EMC RECOMMENDED CIRCUIT

Figure 2



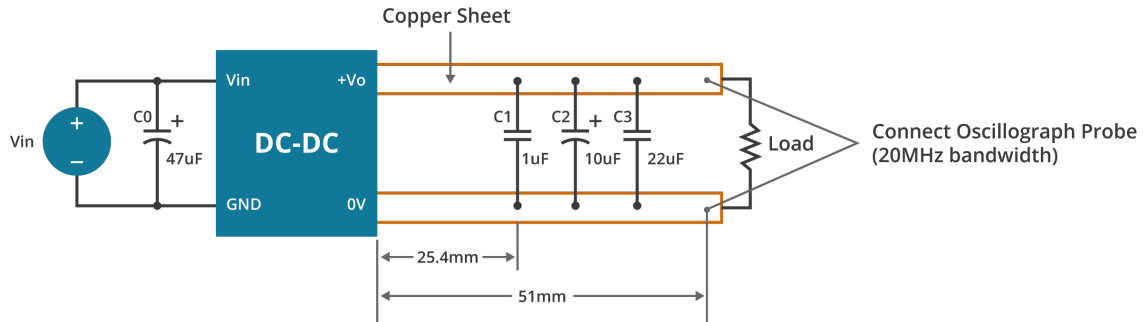
Note: For EMC tests part①was used for immunity and part②for emissions test.

Table 2

| Model    | Vin:24V                                  |
|----------|--|
| FUSE     | Choose according to actual input current |
| C0, C4   | 330μF/50V                                |
| C1, C2   | 10μF/50V                                 |
| C3       | 22μF/50V                                 |
| LCM1     | 1.4-1.7mH<br>(TN150-RH12.7*12.7*7.9)     |
| CY1, CY2 | 1nF/2000Vac                              |

## RIPPLE AND NOISE

Figure 3



## REVISION HISTORY

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| rev. | description     | date       |
|------|-----------------|------------|
| 1.0  | initial release | 09/29/2020 |

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



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