

**SERIES:** PQS075-S | **DESCRIPTION:** DC-DC CONVERTER

**FEATURES**

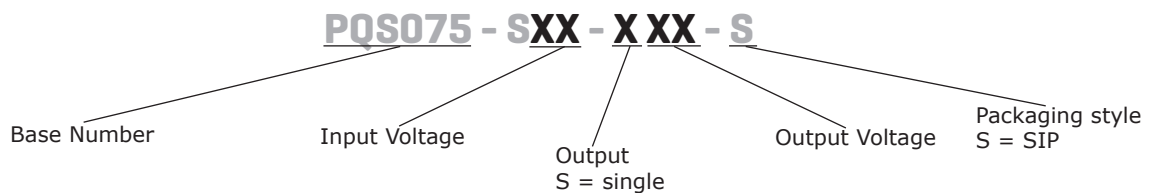
- 0.75W isolated output
- single regulated output
- high efficiency up to 74%
- continuous short circuit protection
- 1500 Vdc isolation
- EN 62368 approved
- meets UL 62368 standards



| MODEL            | input voltage |             | output voltage | output current |          | output power | ripple & noise <sup>1</sup> | efficiency |
|------------------|---------------|-------------|----------------|----------------|----------|--------------|-----------------------------|------------|
|                  | typ (Vdc)     | range (Vdc) | (Vdc)          | min (mA)       | max (mA) | max (W)      | max (mVp-p)                 | typ (%)    |
| PQS075-S5-S3-S   | 5             | 4.75~5.25   | 3.3            | 20             | 200      | 0.66         | 75                          | 68         |
| PQS075-S5-S5-S   | 5             | 4.75~5.25   | 5.0            | 15             | 150      | 0.75         | 75                          | 72         |
| PQS075-S5-S9-S   | 5             | 4.75~5.25   | 9.0            | 9              | 83       | 0.75         | 75                          | 72         |
| PQS075-S5-S12-S  | 5             | 4.75~5.25   | 12.0           | 7              | 62       | 0.74         | 75                          | 73         |
| PQS075-S5-S15-S  | 5             | 4.75~5.25   | 15.0           | 5              | 50       | 0.75         | 75                          | 74         |
| PQS075-S12-S3-S  | 12            | 11.4~12.6   | 3.3            | 20             | 200      | 0.75         | 100                         | 68         |
| PQS075-S12-S5-S  | 12            | 11.4~12.6   | 5              | 15             | 150      | 0.75         | 100                         | 72         |
| PQS075-S12-S12-S | 12            | 11.4~12.6   | 12             | 7              | 62       | 0.75         | 100                         | 73         |
| PQS075-S12-S15-S | 12            | 11.4~12.6   | 15             | 5              | 50       | 0.75         | 150                         | 74         |
| PQS075-S24-S3-S  | 24            | 22.8~25.2   | 3.3            | 20             | 200      | 0.75         | 100                         | 68         |
| PQS075-S24-S5-S  | 24            | 22.8~25.2   | 5              | 15             | 150      | 0.75         | 100                         | 72         |
| PQS075-S24-S12-S | 24            | 22.8~25.2   | 12             | 7              | 62       | 0.75         | 100                         | 73         |
| PQS075-S24-S15-S | 24            | 22.8~25.2   | 15             | 5              | 50       | 0.75         | 150                         | 74         |

Notes: 1. Ripple and noise are measured at 20 MHz BW by "parallel cable" method.

**PART NUMBER KEY**



**INPUT**

| parameter               | conditions/description              | min                   | typ           | max    | units  |      |    |
|-------------------------|-------------------------------------|-----------------------|---------------|--------|--------|------|----|
| operating input voltage |                                     | 4.75                  | 5.0           | 5.25   | Vdc    |      |    |
|                         |                                     | 11.4                  | 12            | 12.6   | Vdc    |      |    |
|                         |                                     | 22.8                  | 24            | 25.2   | Vdc    |      |    |
| current                 | 5 Vdc input<br>full load / no load  | 3.3 Vdc, 5 Vdc output |               | 209/5  | 221/10 | mA   |    |
|                         |                                     | 9 Vdc, 12 Vdc output  |               | 208/12 | 221/20 | mA   |    |
|                         |                                     | 15 Vdc output         |               | 202/18 | 215/30 | mA   |    |
|                         | 12 Vdc input<br>full load / no load | 3.3 Vdc output        |               | 92/8   | 98/-   | mA   |    |
|                         |                                     | 5 Vdc output          |               | 87/8   | 92/-   | mA   |    |
|                         |                                     | 12 Vdc output         |               | 86/8   | 91/-   | mA   |    |
|                         | 24 Vdc input<br>full load / no load | 15 Vdc output         |               | 85/8   | 90/-   | mA   |    |
|                         |                                     | 3.3 Vdc output        |               | 46/8   | 51/-   | mA   |    |
|                         |                                     | 5 Vdc output          |               | 44/8   | 48/-   | mA   |    |
|                         | filter                              | capacitance filter    | 12 Vdc output |        | 43/8   | 47/- | mA |
|                         |                                     |                       | 15 Vdc output |        | 43/8   | 46-  | mA |

**OUTPUT**

| parameter               | conditions/description              | min | typ   | max   | units |
|-------------------------|-------------------------------------|-----|-------|-------|-------|
| maximum capacitive load | 3.3 Vdc output                      |     |       | 2,400 | μF    |
|                         | 5 Vdc output                        |     |       | 2,400 | μF    |
|                         | 9 Vdc output                        |     |       | 1,000 | μF    |
|                         | 12 Vdc output                       |     |       | 560   | μF    |
|                         | 15 Vdc output                       |     |       | 560   | μF    |
| voltage accuracy        |                                     |     |       | ±3    | %     |
| line regulation         |                                     |     |       | ±0.25 | %     |
| load regulation         | 10%~100% load                       |     |       | ±3    | %     |
|                         | 3.3 Vdc output<br>other outputs     |     |       | ±2    | %     |
| switching frequency     | at full load, nominal input voltage |     | 270   |       | kHz   |
| temperature coefficient | at full load                        |     | ±0.02 |       | %/°C  |

## PROTECTIONS

| parameter                | conditions/description    | min | typ | max | units |
|--------------------------|---------------------------|-----|-----|-----|-------|
| 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                          |       | 20  |     | pF      |
| safety approvals      | EN/IEC 62368  |       |     |     |         |
| EMI/EMC               | CISPR32/EN 55032 Class B (see recommended circuit)        |       |     |     |         |
| ESD                   | IEC/EN 61000-4-2 Air ±8kV, Contact ±4kV, perf. Criteria B |       |     |     |         |
| MTBF                  | as per MIL-HDBK-217F, 25°C                                | 3,500 |     |     | 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                         | 0   |     | 95  | %     |
| vibration             | 10-155Hz, 5G, 30 min. along X, Y and Z |     |     |     |       |

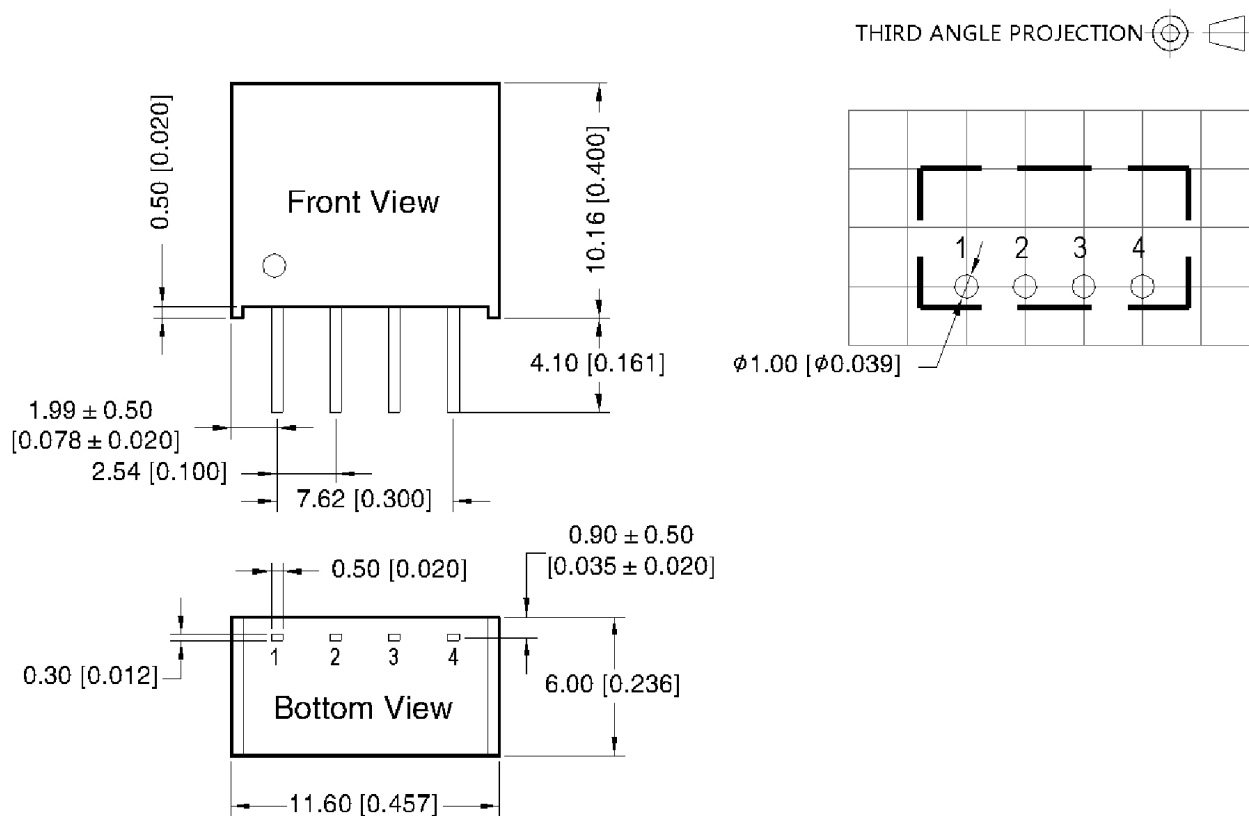
## MECHANICAL

| parameter     | conditions/description                          | min | typ | max | units |
|---------------|---|-----|-----|-----|-------|
| dimensions    | 11.60 x 6.00 x 10.16 [0.457 x 0.236 x 0.4 inch] |     |     |     | mm    |
| case material | black plastic                                   |     |     |     |       |
| weight        |   |     | 1.3 |     | g     |

## MECHANICAL DRAWING

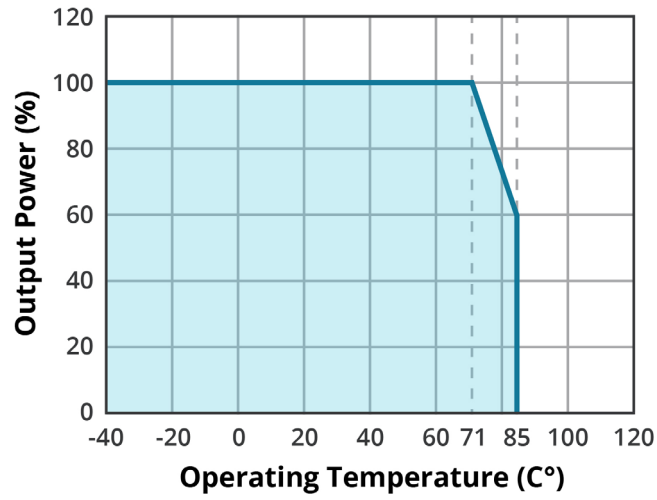
units: mm [inch]  
 pin section tolerance:  $\pm 0.10[\pm 0.004]$   
 general tolerance:  $\pm 0.25[\pm 0.010]$

| PIN Out |          |
|---------|----------|
| PIN     | Function |
| 1       | GND      |
| 2       | Vin      |
| 3       | 0V       |
| 4       | +Vo      |



## DERATING CURVES

**TEMPERATURE DERATING CURVE**



## APPLICATION CIRCUIT

Figure 1

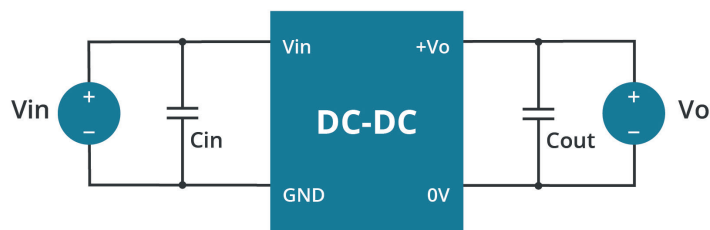


Table 1

| Vin (Vdc) | Cin (μF / V) | Vo (Vdc) | Cout (μF / V) |
|-----------|--------------|----------|---------------|
| 5         | 4.7μF        | 3.3/5    | 10μF          |
| --        | --           | 9/12     | 2.2           |
| --        | --           | 15       | 1             |
| 12        | 2.2μF /25    | 3.3/5    | 10μF/16V      |
| 24        | 1μF/50V      | 12       | 2.2μF/25V     |
| --        | --           | 15       | 1μF/25V       |

## EMC RECOMMENDED CIRCUIT

Figure 2

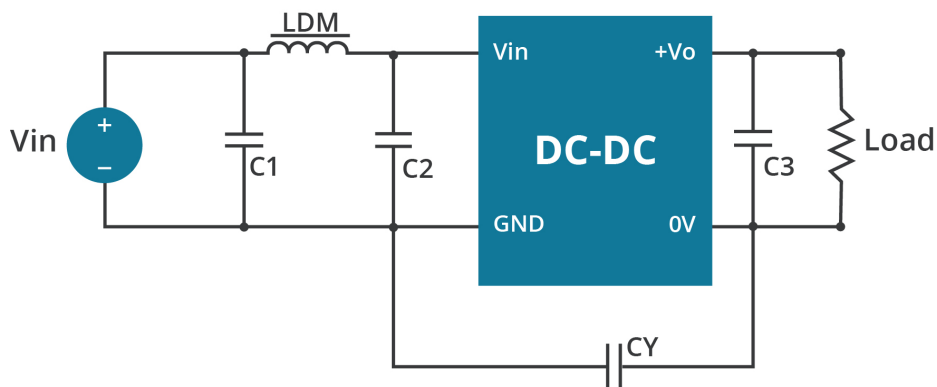


Table 2

| Input voltage (Vdc)         | Output voltage (Vdc) |  |
|-----------------------------|----------------------|--|
|                             | 3.3/5/9              | 12/15  |
| Input voltage<br>5 Vdc      | C1/C2                | 4.7μF/25V  |
|                             | CY                   | --<br>1nF/4KVdc<br>Vishay HGZ10102MBP<br>TDK CD45-E2GA102M-GKA |
|                             | C3                   | Refer to the Cout in table 1                                   |
|                             | LDM                  | 6.8μH  |
| Input voltage<br>12, 24 Vdc | C1/C2                | 4.7μF/50V  |
|                             | CY                   | 270pF/2kV  |
|                             | C3                   | Refer to the Cout in table 1                                   |
|                             | LDM                  | 6.8μH  |

## REVISION HISTORY

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| rev. | description                         | date       |
|------|-------------------------------------|------------|
| 1.0  | initial release                     | 08/17/2020 |
| 1.01 | mechanical tolerances updated       | 09/22/2020 |
| 1.02 | derating curve and circuits updated | 06/29/2021 |
| 1.03 | datasheet updated                   | 09/08/2021 |

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



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