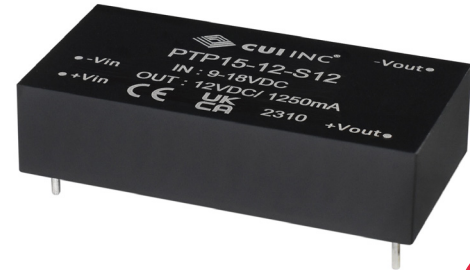


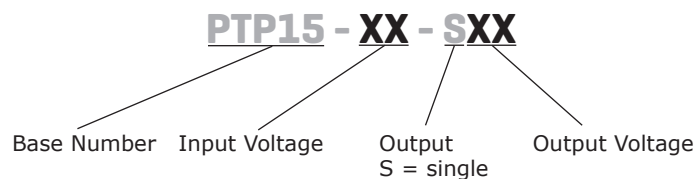
**SERIES:** PTP15 | **DESCRIPTION:** DC-DC CONVERTER**FEATURES**

- up to 15W continuous power
- 2:1 input range (9~18, 18~36 and 36~75 Vdc)
- 5,600 Vdc isolation
- regulated single outputs
- certified to IEC/EN 60601-1
- EN 55011 Class A without external components
- -40 to +100 C operating temperature
- output over current, short circuit and over voltage protections

**MODEL**

| MODEL        | input voltage |                | output voltage<br>(Vdc) | output current<br>max<br>(mA) | output power<br>max<br>(W) | ripple and noise <sup>1</sup><br>max<br>(mVp-p) | efficiency <sup>2</sup><br>typ<br>(%) |
|--------------|---------------|----------------|-------------------------|-------------------------------|----------------------------|---|---------------------------------------|
|              | typ<br>(Vdc)  | range<br>(Vdc) |                         |                               |                            |   |                                       |
| PTP15-12-S5  | 12            | 9~18           | 5                       | 3,000                         | 15                         | 60  | 85                                    |
| PTP15-12-S12 | 12            | 9~18           | 12                      | 1,250                         | 15                         | 60  | 88                                    |
| PTP15-12-S15 | 12            | 9~18           | 15                      | 1,000                         | 15                         | 60  | 87                                    |
| PTP15-12-S24 | 12            | 9~18           | 24                      | 625                           | 15                         | 120   | 85                                    |
| PTP15-24-S5  | 24            | 18~36          | 5                       | 3,000                         | 15                         | 60  | 87                                    |
| PTP15-24-S12 | 24            | 18~36          | 12                      | 1,250                         | 15                         | 60  | 87                                    |
| PTP15-24-S15 | 24            | 18~36          | 15                      | 1,000                         | 15                         | 60  | 87                                    |
| PTP15-24-S24 | 24            | 18~36          | 24                      | 625                           | 15                         | 120   | 87                                    |
| PTP15-48-S5  | 48            | 36~75          | 5                       | 3,000                         | 15                         | 60  | 87                                    |
| PTP15-48-S12 | 48            | 36~75          | 12                      | 1,250                         | 15                         | 60  | 88                                    |
| PTP15-48-S15 | 48            | 36~75          | 15                      | 1,000                         | 15                         | 60  | 87                                    |
| PTP15-48-S24 | 48            | 36~75          | 24                      | 625                           | 15                         | 120   | 88                                    |

Note: 1. Measured at 20 MHz bandwidth with 0.1  $\mu$ F capacitor.  
 2. The efficiency is test by nominal input and max full load at 25°C, the tolerance for the efficiency measurement is plus and minus 2%~3%.  
 3. All specifications are measured at Ta=25°C, nominal input voltage and full output load unless otherwise specified.

**PART NUMBER KEY**

## INPUT

| parameter               | conditions/description          | min | typ | max | units |
|-------------------------|---------------------------------|-----|-----|-----|-------|
| operating input voltage | 12 Vdc input models             | 9   | 12  | 18  | Vdc   |
|                         | 24 Vdc input models             | 18  | 24  | 36  | Vdc   |
|                         | 48 Vdc input models             | 36  | 48  | 75  | Vdc   |
| current                 | 12 Vdc input models, at no load |     | 10  |     | mA    |
|                         | 24 Vdc input models, at no load |     | 7   |     | mA    |
|                         | 48 Vdc input models, at no load |     | 5   |     | mA    |
| under voltage lockout   | 12 Vdc input models             |     | 7.5 |     | Vdc   |
|                         | 24 Vdc input models             |     | 15  |     | Vdc   |
|                         | 48 Vdc input models             |     | 33  |     | Vdc   |
| surge voltage           | at 1 second max                 |     |     |     |       |
|                         | 12 Vdc input models             |     |     | 25  | Vdc   |
|                         | 24 Vdc input models             |     |     | 50  | Vdc   |
|                         | 48 Vdc input models             |     |     | 100 | Vdc   |
| filter                  | pi filter                       |     |     |     |       |

## OUTPUT

| parameter               | conditions/description                     | min | typ | max   | units |
|-------------------------|--|-----|-----|-------|-------|
| capacitive load         | 5 Vdc output models                        |     |     | 5,600 | μF    |
|                         | 12 Vdc output models                       |     |     | 1,000 | μF    |
|                         | 15 Vdc output models                       |     |     | 720   | μF    |
|                         | 24 Vdc output models                       |     |     | 220   | μF    |
| line regulation         | input voltage from low to high, full load  |     |     | ±0.5  | %     |
| load regulation         | 0% to full load                            |     |     | ±0.5  | %     |
| voltage accuracy        |  |     |     | ±1    | %     |
| start-up time           | at nominal input, full load                |     |     | 25    | ms    |
| switching frequency     | 24 & 48 Vdc input, 5 Vdc output models     |     | 210 |       | KHz   |
|                         | 12 & 24 Vdc input, all other output models |     | 300 |       | KHz   |
|                         | 48 Vdc input, all other output models      |     | 350 |       | KHz   |
| transient recovery time | 75%~100% load step change                  |     |     | 500   | μs    |

## PROTECTIONS

| parameter                | conditions/description          | min  | typ | max  | units |
|--------------------------|---------------------------------|------|-----|------|-------|
| over current protection  |                                 |      | 150 |      | %     |
| over voltage protection  | output clamped with zener diode |      |     |      |       |
|                          | 5 Vdc output models             | 5.6  |     | 8.0  | Vdc   |
|                          | 12 Vdc output models            | 13.4 |     | 19.2 | Vdc   |
|                          | 15 Vdc output models            | 16.8 |     | 24.0 | Vdc   |
|                          | 24 Vdc output models            | 26.9 |     | 38.4 | Vdc   |
| short circuit protection | auto recovery, continuous       |      |     |      |       |

## SAFETY AND COMPLIANCE

| parameter                   | conditions/description                                | min    | typ | max | units |
|-----------------------------|---|--------|-----|-----|-------|
| isolation voltage           |   | 4,000  |     |     | Vac   |
|                             |   | 5,600  |     |     | Vdc   |
| isolation capacitance       |   |        |     | 100 | pF    |
| isolation resistance        |   | 10,000 |     |     | MΩ    |
| safety approvals            | certified to 60601-1: IEC, EN                         |        |     |     |       |
| EMI <sup>4</sup>            | EN 55011 Class A                                      |        |     |     |       |
| ESD                         | EN 61000-4-2, Contact±8kV, Air±15kV, perf. Criteria A |        |     |     |       |
| radiated immunity           | EN 61000-4-3, 10V/m, perf. Criteria A                 |        |     |     |       |
| fast transient <sup>5</sup> | EN 61000-4-4, ±2kV, perf. Criteria A                  |        |     |     |       |

## SAFETY AND COMPLIANCE

| parameter               | conditions/description                     | min                 | typ | max | units          |
|-------------------------|--|---------------------|-----|-----|----------------|
| surge <sup>5</sup>      | EN 61000-4-5, ±2kV, perf. Criteria A       |                     |     |     |                |
| criteria immunity       | EN 61000-4-6, 10 Vrms, perf. Criteria A    |                     |     |     |                |
| magnetic field immunity | EN 61000-4-8, 10A/m, perf. Criteria A      |                     |     |     |                |
| MTBF                    | as per MIL-HDBK-217F<br>at 25°C<br>at 51°C | 1,060,000<br>84,000 |     |     | hours<br>hours |
| RoHS compliant          | yes  |                     |     |     |                |

Note: 4. EMI Class A without external circuit.  
5. Test with E-CAP 220µF/100V at input terminal.

## ENVIRONMENTAL

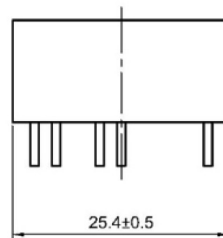
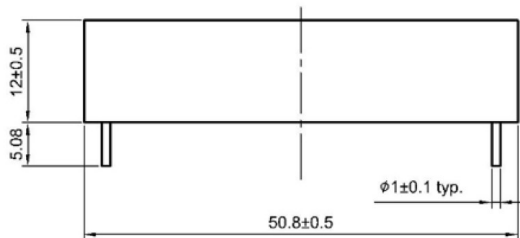
| parameter             | conditions/description | min | typ | max | units |
|-----------------------|------------------------|-----|-----|-----|-------|
| operating temperature | see derating curve     | -40 |     | 100 | °C    |
| storage temperature   |                        | -55 |     | 105 | °C    |
| storage humidity      | non-condensing         | 5   |     | 95  | %     |

## MECHANICAL

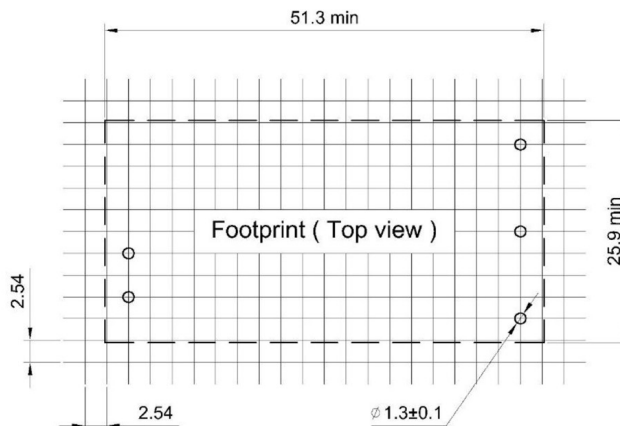
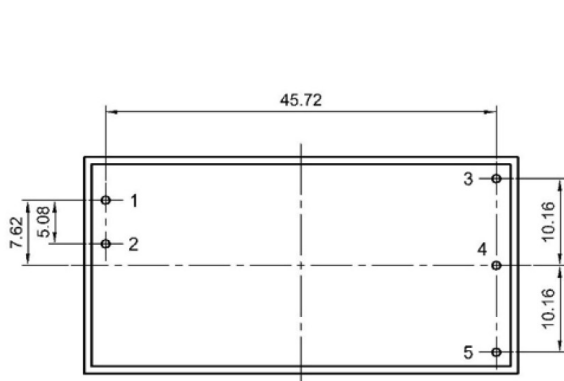
| parameter        | conditions/description | min | typ | max | units |
|------------------|------------------------|-----|-----|-----|-------|
| dimensions       | 50.8 x 25.4 x 12.0     |     |     |     | mm    |
| weight           |                        |     | 30  |     | g     |
| cooling method   | natural convection     |     |     |     |       |
| case material    | plastic case           |     |     |     |       |
| potting material | silicon                |     |     |     |       |

## MECHANICAL DRAWING

units: mm  
tolerance: ±0.25 mm

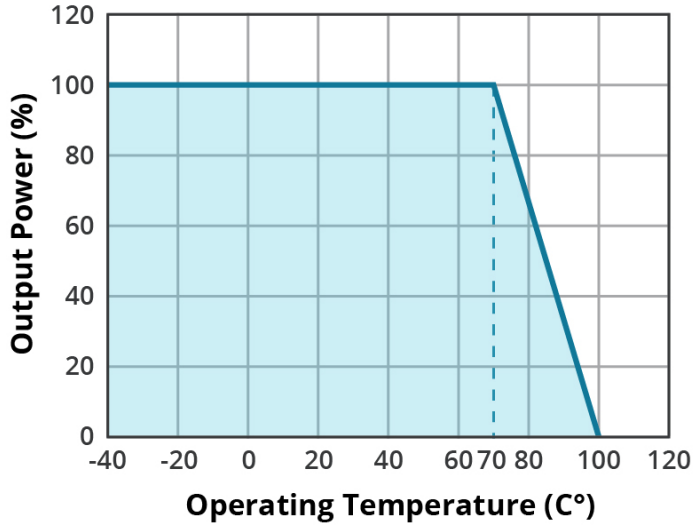


| PIN CONNECTIONS |          |
|-----------------|----------|
| PIN             | Function |
| 1               | +Vin     |
| 2               | -Vin     |
| 3               | +Vout    |
| 4               | no pin   |
| 5               | -Vout    |

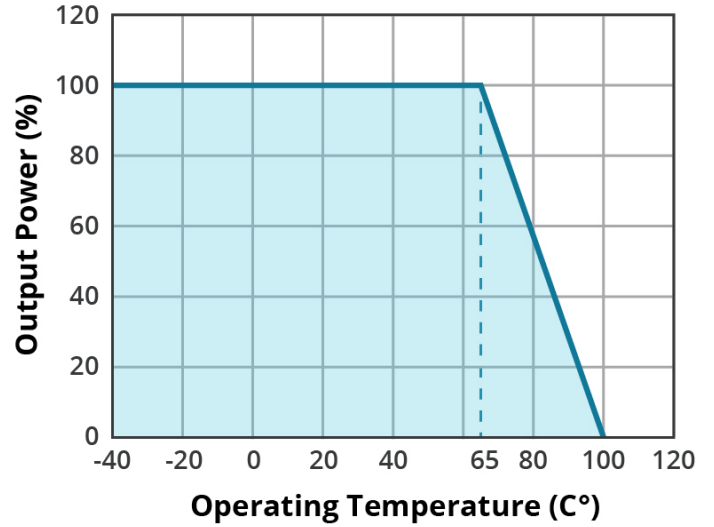


## DERATING CURVES

**TEMPERATURE DERATING CURVE  
(12 & 24 Vdc input models)**

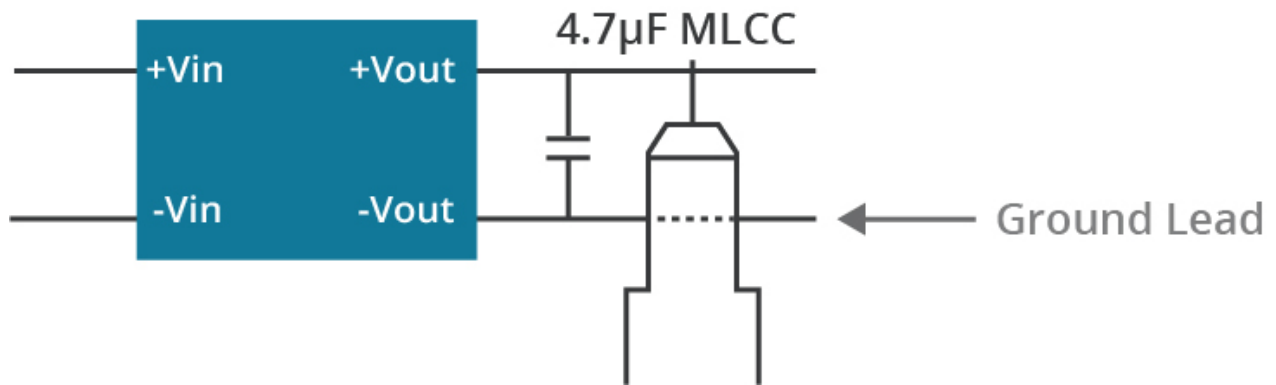


**TEMPERATURE DERATING CURVE  
(48 Vdc input models)**



## RIPPLE AND NOISE MEASURE

Figure 1



## REVISION HISTORY

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| rev. | description     | date       |
|------|-----------------|------------|
| 1.0  | initial release | 09/07/2023 |

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



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CUI offers a two (2) year limited warranty. Complete warranty information is listed on our website.

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