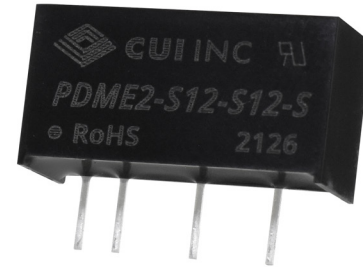


**SERIES:** PDME2-S | **DESCRIPTION:** DC-DC CONVERTER

**FEATURES**

- 2 W isolated output
- single/dual unregulated output
- 1500 Vdc isolation
- continuous short circuit protection
- extended temperature range (-40~105°C)
- no-load input current as low as 8mA
- efficiency up to 86%
- UL 62368-1 certified
- designed to meet EN/BS EN 62368

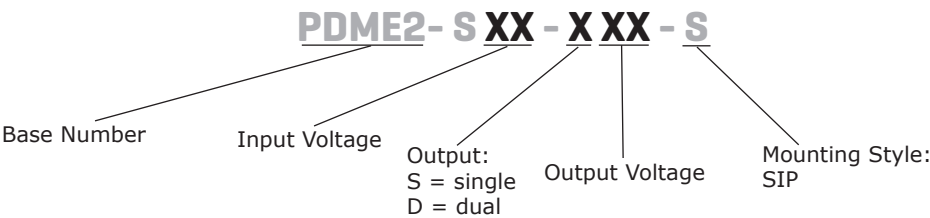

**MODEL**

|                              | input voltage |             | output voltage | output current |          | output power max | ripple & noise <sup>1</sup> max | efficiency <sup>2</sup> typ |
|------------------------------|---------------|-------------|----------------|----------------|----------|------------------|---------------------------------|-----------------------------|
|                              | typ (Vdc)     | range (Vdc) |                | min (mA)       | max (mA) |                  |                                 |                             |
| PDME2-S5-D3-S <sup>4</sup>   | 5             | 4.5~5.5     | ±3.3           | ±30            | ±303     | 2                | 200                             | 75                          |
| PDME2-S5-D5-S                | 5             | 4.5~5.5     | ±5             | ±20            | ±200     | 2                | 200                             | 84                          |
| PDME2-S5-D9-S                | 5             | 4.5~5.5     | ±9             | ±11            | ±111     | 2                | 200                             | 85                          |
| PDME2-S5-D12-S               | 5             | 4.5~5.5     | ±12            | ±8             | ±83      | 2                | 200                             | 85                          |
| PDME2-S5-D15-S               | 5             | 4.5~5.5     | ±15            | ±7             | ±67      | 2                | 200                             | 86                          |
| PDME2-S5-D24-S               | 5             | 4.5~5.5     | ±24            | ±4             | ±42      | 2                | 200                             | 86                          |
| PDME2-S5-S3-S <sup>4</sup>   | 5             | 4.5~5.5     | 3.3            | 40             | 400      | 1.32             | 200                             | 78                          |
| PDME2-S5-S5-S                | 5             | 4.5~5.5     | 5              | 40             | 400      | 2                | 200                             | 84                          |
| PDME2-S5-S7-S <sup>4</sup>   | 5             | 4.5~5.5     | 7.2            | 28             | 278      | 2                | 200                             | 84                          |
| PDME2-S5-S9-S                | 5             | 4.5~5.5     | 9              | 22             | 222      | 2                | 200                             | 85                          |
| PDME2-S5-S12-S               | 5             | 4.5~5.5     | 12             | 17             | 167      | 2                | 200                             | 85                          |
| PDME2-S5-S15-S               | 5             | 4.5~5.5     | 15             | 13             | 133      | 2                | 200                             | 86                          |
| PDME2-S5-S24-S               | 5             | 4.5~5.5     | 24             | 8              | 83       | 2                | 200                             | 86                          |
| PDME2-S12-D3-S               | 12            | 10.8~13.2   | ±3.3           | ±30            | ±303     | 2                | 180                             | 75                          |
| PDME2-S12-D5-S               | 12            | 10.8~13.2   | ±5             | ±20            | ±200     | 2                | 180                             | 80                          |
| PDME2-S12-D9-S <sup>4</sup>  | 12            | 10.8~13.2   | ±9             | ±11            | ±111     | 2                | 180                             | 82                          |
| PDME2-S12-D12-S              | 12            | 10.8~13.2   | ±12            | ±8             | ±83      | 2                | 180                             | 83                          |
| PDME2-S12-D15-S              | 12            | 10.8~13.2   | ±15            | ±7             | ±67      | 2                | 180                             | 83                          |
| PDME2-S12-D24-S <sup>4</sup> | 12            | 10.8~13.2   | ±24            | ±4             | ±42      | 2                | 180                             | 83                          |
| PDME2-S12-S5-S               | 12            | 10.8~13.2   | 5              | 40             | 400      | 2                | 180                             | 82                          |
| PDME2-S12-S9-S <sup>4</sup>  | 12            | 10.8~13.2   | 9              | 22             | 222      | 2                | 180                             | 82                          |
| PDME2-S12-S12-S              | 12            | 10.8~13.2   | 12             | 17             | 167      | 2                | 180                             | 84                          |
| PDME2-S12-S15-S              | 12            | 10.8~13.2   | 15             | 13             | 133      | 2                | 180                             | 85                          |
| PDME2-S12-S24-S              | 12            | 10.8~13.2   | 24             | 8              | 83       | 2                | 180                             | 86                          |
| PDME2-S15-D5-S <sup>4</sup>  | 15            | 13.5~16.5   | ±5             | ±20            | ±200     | 2                | 180                             | 80                          |
| PDME2-S15-D15-S <sup>4</sup> | 15            | 13.5~16.5   | ±15            | ±7             | ±67      | 2                | 180                             | 82                          |
| PDME2-S15-S5-S <sup>4</sup>  | 15            | 13.5~16.5   | 5              | 40             | 400      | 2                | 180                             | 80                          |

| MODEL (CONTINUED)            | input voltage |             | output voltage | output current |          | output power | ripple & noise <sup>1</sup> | efficiency <sup>2</sup> |
|------------------------------|---------------|-------------|----------------|----------------|----------|--------------|-----------------------------|-------------------------|
|                              | typ (Vdc)     | range (Vdc) |                | min (mA)       | max (mA) |              | max (mVp-p)                 | typ (%)                 |
| PDME2-S15-S15-S <sup>4</sup> | 15            | 13.5~16.5   | 15             | 13             | 133      | 2            | 180                         | 81                      |
| PDME2-S15-S24-S <sup>4</sup> | 15            | 13.5~16.5   | 24             | 8              | 83       | 2            | 180                         | 81                      |
| PDME2-S24-D3-S <sup>4</sup>  | 24            | 21.6~26.4   | ±3.3           | ±30            | ±300     | 2            | 180                         | 76                      |
| PDME2-S24-D5-S               | 24            | 21.6~26.4   | ±5             | ±20            | ±200     | 2            | 180                         | 80                      |
| PDME2-S24-D9-S <sup>4</sup>  | 24            | 21.6~26.4   | ±9             | ±11            | ±111     | 2            | 180                         | 81                      |
| PDME2-S24-D12-S              | 24            | 21.6~26.4   | ±12            | ±8             | ±83      | 2            | 180                         | 83                      |
| PDME2-S24-D15-S              | 24            | 21.6~26.4   | ±15            | ±7             | ±67      | 2            | 180                         | 83                      |
| PDME2-S24-D24-S <sup>4</sup> | 24            | 21.6~26.4   | ±24            | ±4             | ±42      | 2            | 180                         | 83                      |
| PDME2-S24-S3-S <sup>4</sup>  | 24            | 21.6~26.4   | 3.3            | 40             | 400      | 1.32         | 180                         | 76                      |
| PDME2-S24-S5-S               | 24            | 21.6~26.4   | 5              | 40             | 400      | 2            | 180                         | 80                      |
| PDME2-S24-S9-S <sup>4</sup>  | 24            | 21.6~26.4   | 9              | 22             | 222      | 2            | 180                         | 81                      |
| PDME2-S24-S12-S              | 24            | 21.6~26.4   | 12             | 17             | 167      | 2            | 180                         | 84                      |
| PDME2-S24-S15-S              | 24            | 21.6~26.4   | 15             | 13             | 133      | 2            | 180                         | 86                      |
| PDME2-S24-S24-S              | 24            | 21.6~26.4   | 24             | 8              | 83       | 2            | 180                         | 86                      |

- 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.
  - 4. Model is not UL certified.

PART NUMBER KEY



## INPUT

| parameter               | conditions/description  | min  | typ | max  | units |
|-------------------------|-------------------------|------|-----|------|-------|
| operating input voltage | 5 Vdc input models      | 4.5  | 5   | 5.5  | Vdc   |
|                         | 12 Vdc input models     | 10.8 | 12  | 13.2 | Vdc   |
|                         | 15 Vdc input models     | 13.5 | 15  | 16.5 | Vdc   |
|                         | 24 Vdc input models     | 21.6 | 24  | 26.4 | Vdc   |
| surge voltage           | for maximum of 1 second |      |     |      |       |
|                         | 5 Vdc input models      | -0.7 |     | 9    | Vdc   |
|                         | 12 Vdc input models     | -0.7 |     | 18   | Vdc   |
|                         | 15 Vdc input models     | -0.7 |     | 21   | Vdc   |
| current                 | 24 Vdc input models     | -0.7 |     | 30   | Vdc   |
|                         | 3.3 Vdc output          |      |     | 564  | mA    |
|                         | 5 Vdc input models      |      |     | 500  | mA    |
|                         | 5 & 7.2 Vdc output      |      |     | 494  | mA    |
|                         | 9 & 12 Vdc output       |      |     | 488  | mA    |
|                         | 15 & 24 Vdc output      |      |     |      |       |
|                         | 12 Vdc input models     |      |     | 208  | mA    |
|                         | 15 Vdc input models     |      |     | 167  | mA    |
|                         | 24 Vdc input models     |      |     | 104  | mA    |
| filter                  | filter capacitor        |      |     |      |       |

## OUTPUT

| parameter                            | conditions/description           | min | typ   | max   | units |
|--------------------------------------|----------------------------------|-----|-------|-------|-------|
| maximum capacitive load <sup>5</sup> | 3.3, 5 Vdc output models         |     |       | 2,400 | μF    |
|                                      | ±3.3, ±5 Vdc output models       |     |       | 1,200 | μF    |
|                                      | 9 Vdc output models              |     |       | 1,000 | μF    |
|                                      | 12, 15 Vdc output models         |     |       | 560   | μF    |
|                                      | 24, ±12, ±15 Vdc output models   |     |       | 220   | μF    |
|                                      | ±9 Vdc output models             |     |       | 470   | μF    |
|                                      | ±24 Vdc output models            |     |       | 100   | μF    |
| voltage accuracy                     | see output regulation curves     |     |       |       |       |
| line regulation                      | for Vin change of 1%             |     |       |       |       |
|                                      | 3.3 Vdc output models            |     |       | ±1.5  | %     |
|                                      | all other output models          |     |       | ±1.2  | %     |
| load regulation                      | from 10% to full load            |     |       |       |       |
|                                      | 3.3 Vdc output models            |     | 10    |       | %     |
|                                      | 5 Vdc output models              |     | 8     |       | %     |
|                                      | 9, 12 & 15 Vdc output models     |     | 7     |       | %     |
|                                      | 24 Vdc output models             |     | 5     |       | %     |
|                                      | from 10% to full load            |     |       |       |       |
|                                      | 3.3 Vdc output models            |     | 15    |       | %     |
|                                      | 5 Vdc output models              |     | 7     |       | %     |
|                                      | 9, 12 Vdc output models          |     | 5     |       | %     |
|                                      | 15 Vdc output models             |     | 4     |       | %     |
|                                      | 24 Vdc output models             |     | 3     |       | %     |
| switching frequency                  | 100% load, nominal input voltage |     |       |       |       |
|                                      | 5 Vdc input models               |     | 220   |       | kHz   |
|                                      | all other input models           |     | 260   |       | kHz   |
| temperature coefficient              | at full load                     |     | ±0.02 |       | %/°C  |

Note: 5. Tested at input voltage range and full load.

## PROTECTIONS

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

## SAFETY AND COMPLIANCE

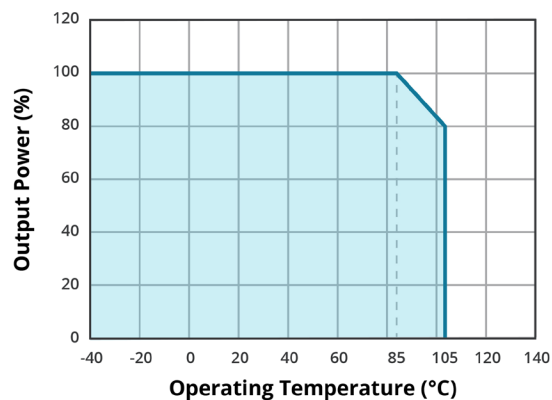
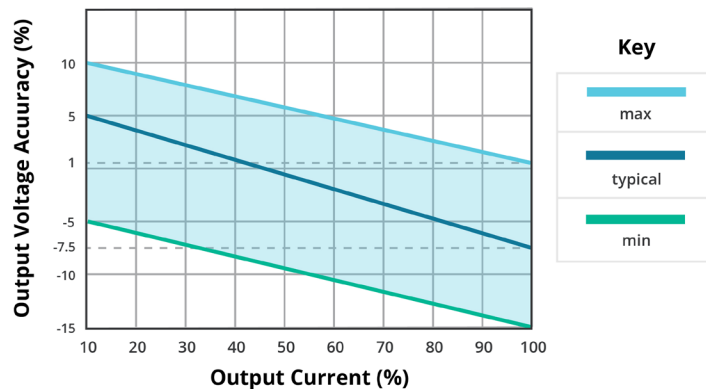
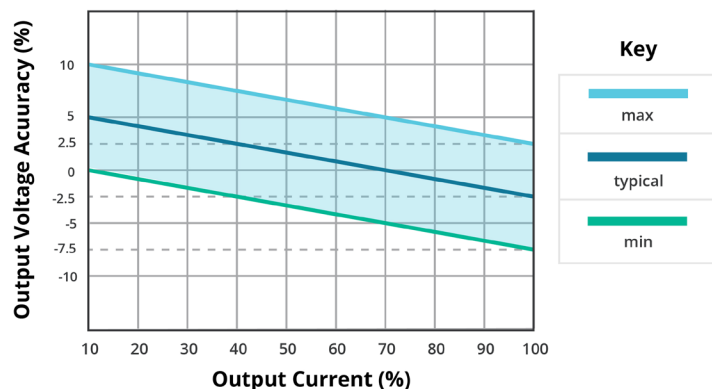
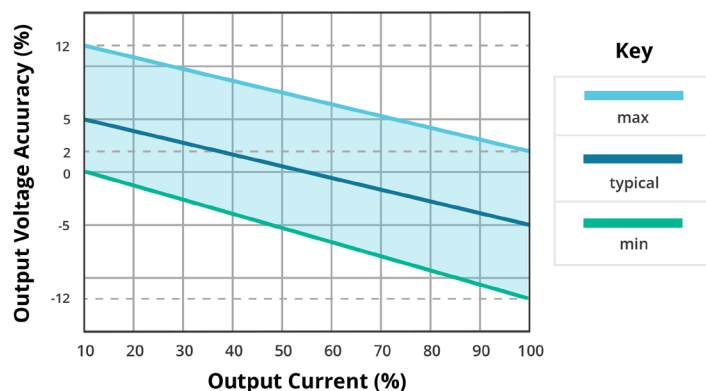
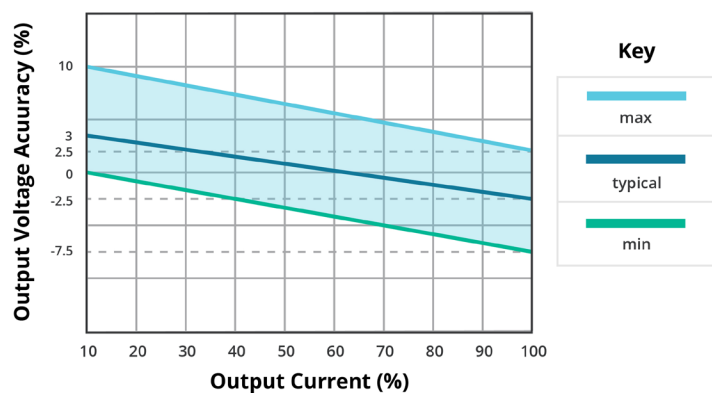
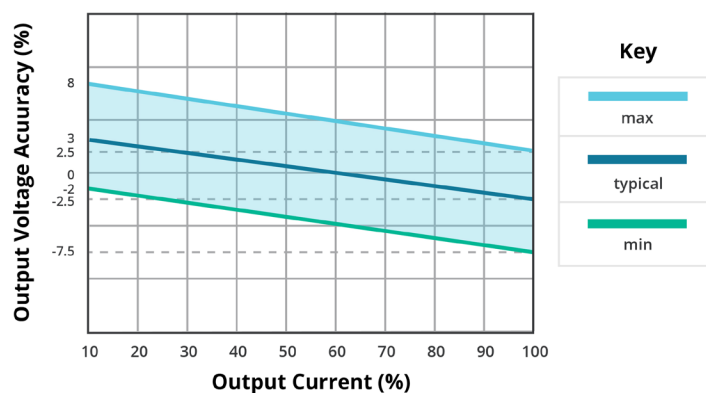
| parameter                     | conditions/description                                     | min       | typ | max | units |
|-------------------------------|------------------------------------------------------------|-----------|-----|-----|-------|
| isolation voltage             | input to output for 1 minute at 1 mA                       | 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 <sup>6</sup> | certified to 62368: UL<br>designed to meet 62368: EN/BS EN |           |     |     |       |
| conducted emissions           | CISPR 32/EN 55032 Class B                                  |           |     |     |       |
| radiated emissions            | CISPR 32/EN 55032 Class B                                  |           |     |     |       |
| ESD                           | IEC/EN 61000-4-2 Air ±8kV, Contact ±6kV                    |           |     |     |       |
| MTBF                          | as per MIL-HDBK-217F, 25°C                                 | 3,500,000 |     |     | hours |
| RoHS                          | yes                                                        |           |     |     |       |

Note: 6. See the model table.

## ENVIRONMENTAL

| parameter             | conditions/description | min | typ | max | units |
|-----------------------|------------------------|-----|-----|-----|-------|
| operating temperature | see derating curves    | -40 |     | 105 | °C    |
| storage temperature   |                        | -55 |     | 125 | °C    |
| storage humidity      | non-condensing         | 5   |     | 95  | %     |
| case temperature rise | at 25°C                |     | 15  |     | °C    |

## DERATING CURVES

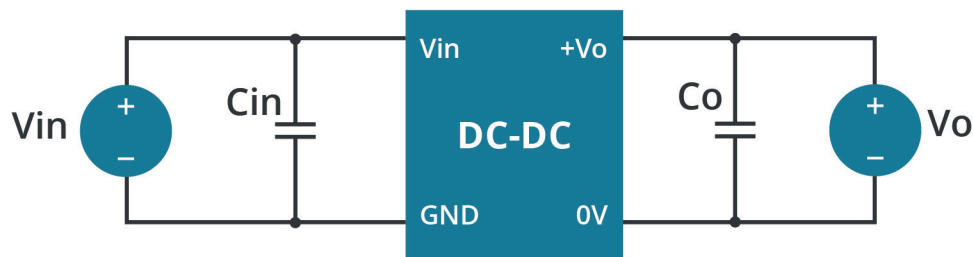
**TEMPERATURE DERATING CURVE****OUTPUT REGULATION CURVE**  
**5 Vdc input / 3.3 Vdc output**  
**(nominal input)****OUTPUT REGULATION CURVE**  
**5 Vdc input / all other output models**  
**(nominal input)****OUTPUT REGULATION CURVE**  
**all other input models / 3.3 Vdc output models**  
**(nominal input)****OUTPUT REGULATION CURVE**  
**all other input models / 5 Vdc output models**  
**(nominal input)****OUTPUT REGULATION CURVE**  
**all other input models / all other output models**  
**(nominal input)**



## 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 (Figures 1 & 2) 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.

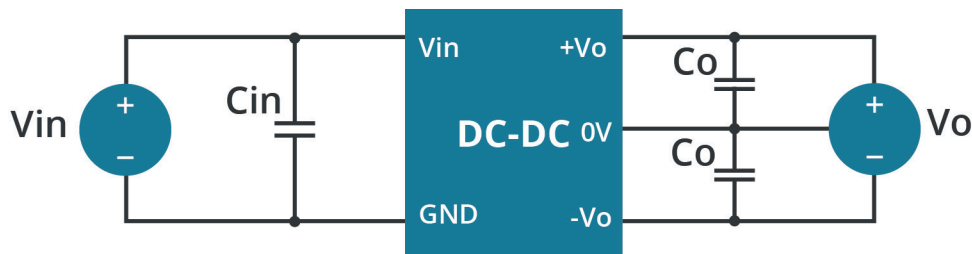
**Figure 1**  
Single Output Models



**Table 1**

| Vin (Vdc) | Cin (μF / V) | Vo (Vdc) | Co (μF / V) |
|-----------|--------------|----------|-------------|
| 5         | 10 / 16      | 3.3      | 10 / 16     |
| --        | --           | 5        | 10 / 16     |
| --        | --           | 7.2      | 10 / 16     |
| --        | --           | 9        | 2.2 / 25    |
| --        | --           | 12       | 2.2 / 25    |
| --        | --           | 15       | 1 / 25      |
| --        | --           | 24       | 1 / 50      |
| 12        | 2.2 / 25     | 3.3      | 10 / 16     |
| 15        | 2.2 / 25     | 5        | 10 / 16     |
| 24        | 1 / 50       | 9        | 2.2 / 25    |
| --        | --           | 12       | 2.2 / 25    |
| --        | --           | 15       | 1 / 25      |
| --        | --           | 24       | 1 / 50      |

**Figure 2**  
Dual Output Models



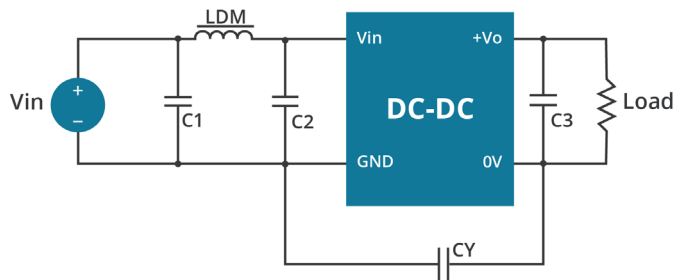
**Table 2**

| Vin (Vdc) | Cin (μF / V) | Vo (Vdc) | Co <sup>6</sup> (μF / V) |
|-----------|--------------|----------|--------------------------|
| 5         | 10 / 16      | ±3.3     | 4.7 / 16                 |
| --        | --           | ±5       | 4.7 / 16                 |
| --        | --           | ±9       | 1 / 25                   |
| --        | --           | ±12      | 1 / 25                   |
| --        | --           | ±15      | 0.47 / 25                |
| --        | --           | ±24      | 0.47 / 50                |
| 12        | 2.2 / 25     | ±3.3     | 4.7 / 16                 |
| 15        | 2.2 / 25     | ±5       | 4.7 / 16                 |
| 24        | 1 / 50       | ±9       | 2.2 / 25                 |
| --        | --           | ±12      | 1 / 25                   |
| --        | --           | ±15      | 1 / 25                   |
| --        | --           | ±24      | 0.47 / 50                |

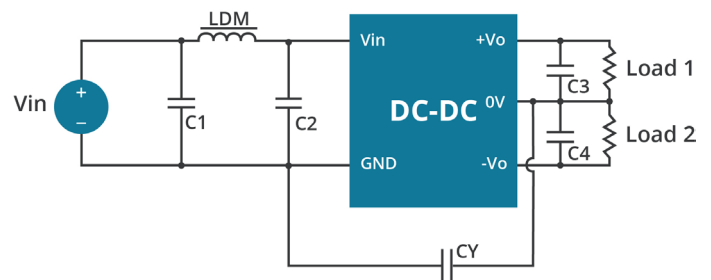
Note: 6. The capacitor value of the positive and the negative output is identical.

## EMC RECOMMENDED CIRCUIT

**Figure 3**  
**Single Output Models**



**Figure 4**  
**Dual Output Models**



**Table 3**

| Recommended External Circuit Components |                                |                    |                    |
|-----------------------------------------|--------------------------------|--------------------|--------------------|
| Vin (Vdc)                               | 5                              | 12, 15, 24         |                    |
| Vo (Vdc)                                | all output models              | 12, 15, 24         | ±12, ±15, ±24      |
| C1 / C2                                 | 4.7 $\mu$ F / 16 V             | 4.7 $\mu$ F / 50 V | 4.7 $\mu$ F / 50 V |
| CY                                      | 270 pF / 2 kV                  | 270 pF / 2 kV      | 270 pF / 2 kV      |
| C3 / C4                                 | refer to the Co in Tables 1, 2 |                    |                    |
| LDM                                     | 6.8 $\mu$ H                    | 6.8 $\mu$ H        | 6.8 $\mu$ H        |

## REVISION HISTORY

| rev. | description                                     | date       |
|------|-------------------------------------------------|------------|
| 1.0  | initial release                                 | 07/26/2021 |
| 1.01 | series expanded with 5 Vdc input models         | 05/24/2022 |
| 1.02 | CE removed                                      | 11/04/2022 |
| 1.03 | UL certification updated for 5 Vdc input models | 04/18/2024 |

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



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