

# 1W, DC/DC Power Converter

## SDM01D

**SUMMIT**  
ELECTRONICS



### Introduction

The SDM01D series are DIP14 package DC/DC converters with unregulated single or dual output, and 1.5KVDC isolation. These converters feature high efficiency, low ripple and noise, continuous short circuit protection, and wide operating temperature range. They are widely used in distributed power system in industrial applications where isolation and voltage converting is needed.

### Features

- Rated power: 1W Max
- Input voltage range  $\pm 10\%$
- Unregulated single or dual output
- High efficiency, up to 89%
- Small no load input current
- Isolation voltage 1.5KVDC
- Operating temperature range:  $-40 \sim +105^{\circ}\text{C}$  ambient
- RoHS compliant
- Standard DIP14 package
- Continuous short circuit protection
- Designed to meet UL/EN/IEC 62368-1
- 3 year warranty

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## SDM01D



### Part numbers

| Model Number | Input Voltage [VDC] $\pm 10\%$ | Output Voltage (VDC) | Output Current (mA) Max | Output Current (mA) Min | Efficiency (%) Typ. | Capacitive Load (uF) Max. |
|--------------|--------------------------------|----------------------|-------------------------|-------------------------|---------------------|---------------------------|
| SDM01D0303   | 3.3                            | 3.3                  | 303                     | 30                      | 82                  | 4000                      |
| SDM01D0305   | 3.3                            | 5                    | 200                     | 20                      | 83                  | 4000                      |
| SDM01D0309   | 3.3                            | 9                    | 111                     | 11                      | 84                  | 2000                      |
| SDM01D0312   | 3.3                            | 12                   | 84                      | 8                       | 85                  | 1000                      |
| SDM01D0503   | 5                              | 3.3                  | 303                     | 30                      | 83                  | 4000                      |
| SDM01D0505   | 5                              | 5                    | 200                     | 20                      | 86                  | 4000                      |
| SDM01D0509   | 5                              | 9                    | 111                     | 12                      | 86                  | 2000                      |
| SDM01D0512   | 5                              | 12                   | 84                      | 9                       | 88                  | 1000                      |
| SDM01D0515   | 5                              | 15                   | 67                      | 7                       | 88                  | 680                       |
| SDM01D0524   | 5                              | 24                   | 42                      | 4                       | 89                  | 560                       |
| SDM01D1203   | 12                             | 3.3                  | 303                     | 30                      | 84                  | 4000                      |
| SDM01D1205   | 12                             | 5                    | 200                     | 20                      | 86                  | 4000                      |
| SDM01D1209   | 12                             | 9                    | 111                     | 12                      | 87                  | 2000                      |
| SDM01D1212   | 12                             | 12                   | 84                      | 9                       | 87                  | 1000                      |
| SDM01D1215   | 12                             | 15                   | 67                      | 7                       | 88                  | 680                       |
| SDM01D1224   | 12                             | 24                   | 42                      | 4                       | 89                  | 560                       |
| SDM01D1505   | 3.3                            | 3.3                  | 303                     | 30                      | 82                  | 4000                      |
| SDM01D1509   | 3.3                            | 5                    | 200                     | 20                      | 83                  | 4000                      |
| SDM01D1512   | 3.3                            | 9                    | 111                     | 11                      | 84                  | 2000                      |
| SDM01D1515   | 3.3                            | 12                   | 84                      | 8                       | 85                  | 1000                      |
| SDM01D2403   | 5                              | 3.3                  | 303                     | 30                      | 83                  | 4000                      |
| SDM01D2405   | 5                              | 5                    | 200                     | 20                      | 86                  | 4000                      |
| SDM01D2409   | 5                              | 9                    | 111                     | 12                      | 86                  | 2000                      |

# 1W, DC/DC Power Converter

## SDM01D



|             |     |     |     |    |    |      |
|-------------|-----|-----|-----|----|----|------|
| SDM01D2412  | 5   | 12  | 84  | 9  | 88 | 1000 |
| SDM01D2415  | 5   | 15  | 67  | 7  | 88 | 680  |
| SDM01D2424  | 5   | 24  | 42  | 4  | 89 | 560  |
| SDM01D0505D | 12  | 3.3 | 303 | 30 | 84 | 4000 |
| SDM01D0509D | 12  | 5   | 200 | 20 | 86 | 4000 |
| SDM01D0512D | 12  | 9   | 111 | 12 | 87 | 2000 |
| SDM01D0515D | 12  | 12  | 84  | 9  | 87 | 1000 |
| SDM01D1203D | 12  | 15  | 67  | 7  | 88 | 680  |
| SDM01D1205D | 12  | 24  | 42  | 4  | 89 | 560  |
| SDM01D1209D | 3.3 | 3.3 | 303 | 30 | 82 | 4000 |
| SDM01D1212D | 3.3 | 5   | 200 | 20 | 83 | 4000 |
| SDM01D1215D | 3.3 | 9   | 111 | 11 | 84 | 2000 |
| SDM01D1505D | 3.3 | 12  | 84  | 8  | 85 | 1000 |
| SDM01D1512D | 5   | 3.3 | 303 | 30 | 83 | 4000 |
| SDM01D1515D | 5   | 5   | 200 | 20 | 86 | 4000 |
| SDM01D2405D | 5   | 9   | 111 | 12 | 86 | 2000 |
| SDM01D2409D | 5   | 12  | 84  | 9  | 88 | 1000 |
| SDM01D2412D | 5   | 15  | 67  | 7  | 88 | 680  |
| SDM01D2415D | 5   | 24  | 42  | 4  | 89 | 560  |

\* Only typical models are listed. Other models may be available upon request.

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## SDM01D



### Electrical characteristics

Unless otherwise indicated, specifications are measured at  $T_A=25^{\circ}\text{C}$ , nominal input voltage, full load after warm up.

| Parameter                                                                | Condition             | Min.                                                | Type       | Max. | Unit                  | Note |
|--------------------------------------------------------------------------|-----------------------|-----------------------------------------------------|------------|------|-----------------------|------|
| <b>Input current</b><br>Full load                                        | $V_{IN}=3.3\text{V}$  | -                                                   | 370        | -    | mA                    |      |
|                                                                          | $V_{IN}=5\text{V}$    |                                                     | 230        |      |                       |      |
|                                                                          | $V_{IN}=12\text{V}$   |                                                     | 99         |      |                       |      |
|                                                                          | $V_{IN}=15\text{V}$   |                                                     | 78         |      |                       |      |
|                                                                          | $V_{IN}=24\text{V}$   |                                                     | 51         |      |                       |      |
| <b>Input current</b>                                                     | No load               | -                                                   | 3          | 15   | mA                    |      |
| <b>Reflected Ripple Current</b>                                          |                       | -                                                   | 15         | -    | mA                    |      |
| <b>Surge voltage</b><br>1 second max                                     | $V_{IN}=3.3\text{V}$  | -0.7                                                | -          | 5    | VDC                   |      |
|                                                                          | $V_{IN}=5\text{V}$    | -0.7                                                |            | 9    |                       |      |
|                                                                          | $V_{IN}=12\text{V}$   | -0.7                                                |            | 18   |                       |      |
|                                                                          | $V_{IN}=15\text{V}$   | -0.7                                                |            | 21   |                       |      |
|                                                                          | $V_{IN}=24\text{V}$   | -0.7                                                |            | 30   |                       |      |
| <b>Output voltage accuracy</b>                                           |                       | Refer to graphic in "Characteristic Curves" section |            |      |                       |      |
| <b>Line regulation</b><br>For $V_{IN}$ change of $\pm 1\%$               | $V_{OUT}=3.3\text{V}$ | -                                                   | $\pm 1.5$  | -    | %                     |      |
|                                                                          | Other Output          |                                                     | $\pm 1.2$  |      |                       |      |
| <b>Load regulation</b><br>$I_{OUT}=10\%$ to $100\%$ of $I_{OUT}$ , rated | $V_{OUT}=3.3\text{V}$ | -                                                   | 10         | -    | %                     |      |
|                                                                          | $V_{OUT}=5\text{V}$   |                                                     | 8          |      |                       |      |
|                                                                          | $V_{OUT}=9\text{V}$   |                                                     | 8          |      |                       |      |
|                                                                          | $V_{OUT}=12\text{V}$  |                                                     | 7          |      |                       |      |
|                                                                          | $V_{OUT}=15\text{V}$  |                                                     | 6          |      |                       |      |
|                                                                          | $V_{OUT}=24\text{V}$  |                                                     | 6          |      |                       |      |
| <b>Output ripple and noise</b>                                           | 20MHz bandwidth       | -                                                   | 45         | 100  | mVp-p                 |      |
| <b>Temperature coefficient</b>                                           | Full load             | -                                                   | $\pm 0.03$ | -    | $\%/^{\circ}\text{C}$ |      |
| <b>Output short circuit protection</b>                                   |                       | Continuous, automatic recovery                      |            |      |                       |      |

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## SDM01D



|              |  |           |
|--------------|--|-----------|
| Input filter |  | Capacitor |
| Hot plug     |  | None      |

\* Operating with less than 10% of rated load will not cause permanent damage to the converters, but the performances data may not fall into the specifications, and reliable operating is not assured.

\* Dual output models need to operate with balanced load. The load difference between two outputs over 10% may cause unstable operating of the converter.

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## SDM01D



### General Specifications

| Parameters                                                         | Condition       | Min.                                  | Typ. | Max. | Unit  |
|--------------------------------------------------------------------|-----------------|---------------------------------------|------|------|-------|
| <b>Isolation voltage</b><br>1 minute, leakage current 1mA max      | Input to Output | 1500                                  | -    | -    | VDC   |
| <b>Isolation resistance</b><br>Tested at 500VDC                    | Input to Output | 1000                                  | -    | -    | M ohm |
| <b>Isolation capacitance</b><br>100KHz, 0.1V                       | Input to Output | -                                     | 20   | -    | pF    |
| <b>Operating temperature</b>                                       | No derating     | -40                                   | -    | +105 | °C    |
| <b>Storage temperature</b>                                         |                 | -55                                   | -    | +125 | °C    |
| <b>Temperature rise at case</b>                                    | Full load       | -                                     | 25   | -    | °C    |
| <b>Storage humidity</b>                                            | Non-condensing  | -                                     | -    | 95   | %RH   |
| <b>Switching frequency</b>                                         | Full load       | -                                     | 220  | -    | KHz   |
| <b>Pin soldering resistance</b><br>1.5mm away from case for 10 sec |                 | -                                     | -    | 300  | °C    |
| <b>Vibration</b>                                                   |                 | 10-150Hz, 5G, 0.75mm along X, Y and Z |      |      |       |
| <b>Case material</b>                                               |                 | Black plastic UL94-V0                 |      |      |       |
| <b>Cooling method</b>                                              |                 | Free air convection                   |      |      |       |
| <b>Design based on standards</b>                                   |                 | UL/EN/IEC 62368-1                     |      |      |       |
| <b>Safety certifications</b>                                       |                 | EN/IEC 62368-1                        |      |      |       |
| <b>EMC</b>                                                         | Emissions       | CISPR32, EN55032 Class B*             |      |      |       |
|                                                                    | Immunity        | IEC/EN61000-4-2                       |      |      |       |

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|               |               |                                        |
|---------------|---------------|----------------------------------------|
| MTBF          | MIL-HDBK-217F | >3,500,000 Hours, T <sub>A</sub> =25°C |
| Size & Weight |               | 19.5 x 9.8 x 7.9 mm                    |
| Weight        |               | 2.4g Typ.                              |

\*External circuit is required in order to meet Class B, refer to Figure 2 in Recommended External Circuit.

# 1W, DC/DC Power Converter

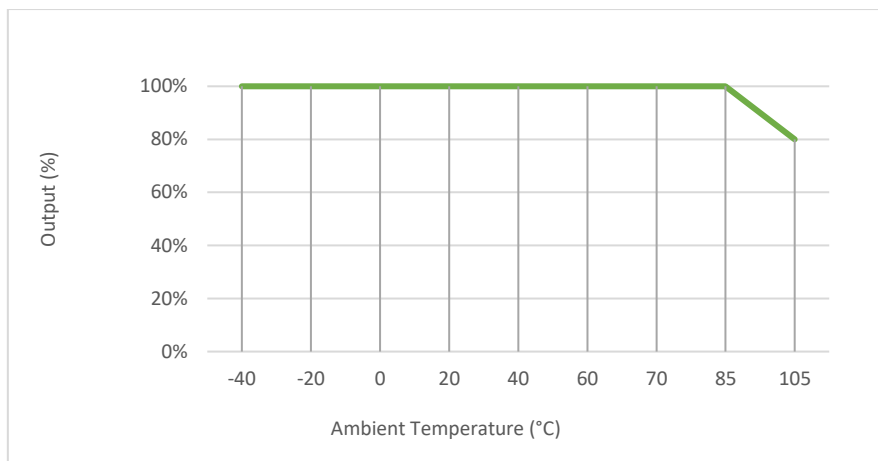
## SDM01D



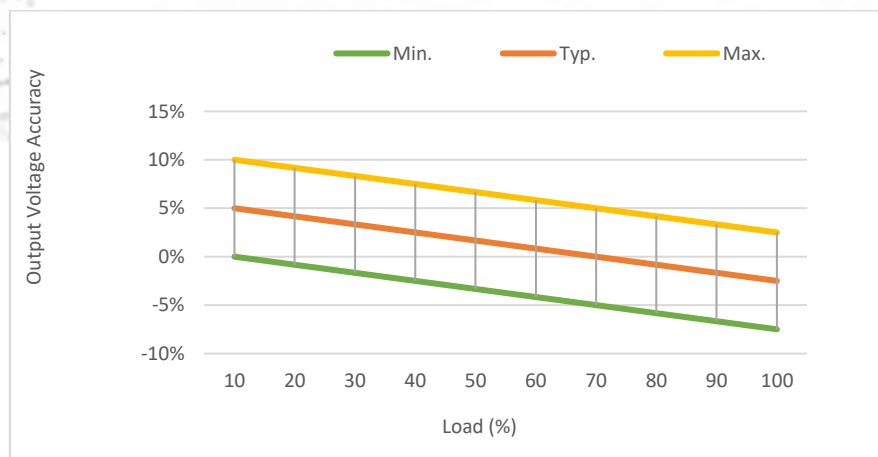
### Characteristics Curves

#### Derating Curve

#### Output vs Ambient Temperature



#### Output Voltage Accuracy vs Load



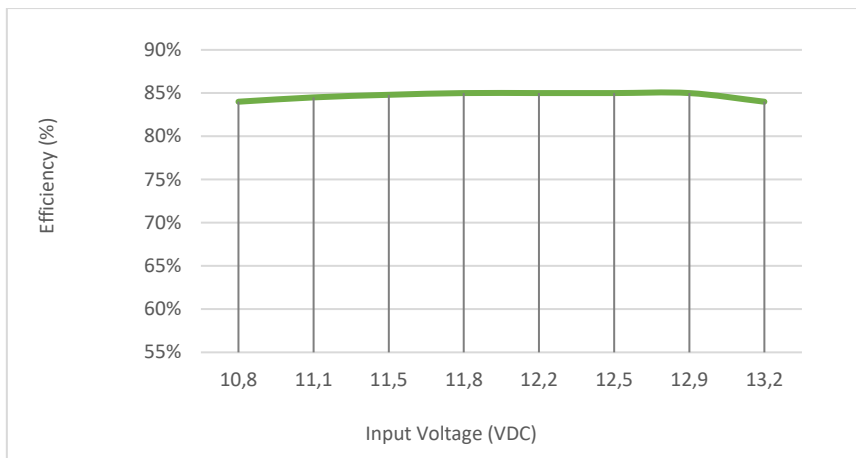
# 1W, DC/DC Power Converter

## SDM01D



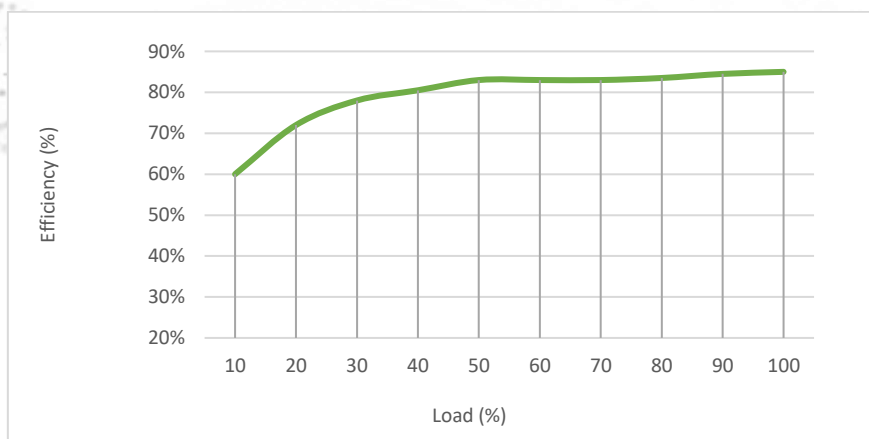
### Efficiency Curves

#### Efficiency vs Input Voltage



SDM01D, with full Load

#### Efficiency vs Load



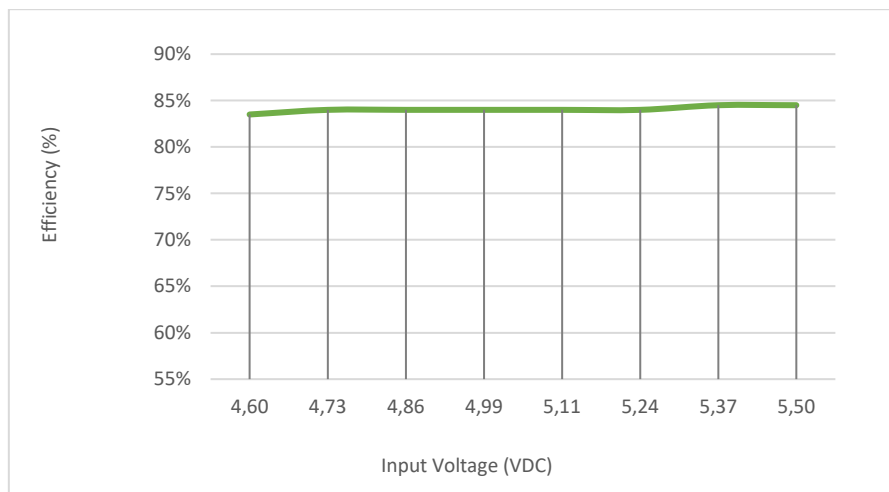
SDM01D, with nominal input voltage

# 1W, DC/DC Power Converter

## SDM01D

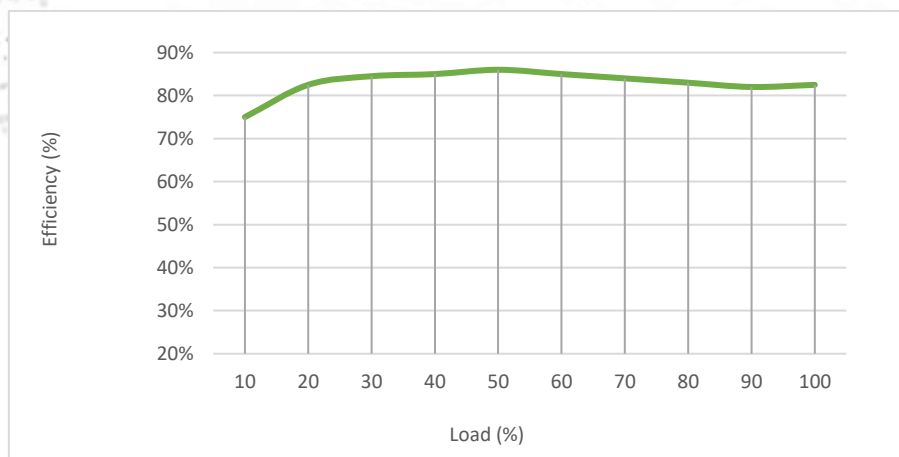


### Efficiency vs Input Voltage



SDM01D-D, with full Load

### Efficiency vs Load



SDM01D-D, with nominal input voltage

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## SDM01D



### Recommended External Circuit

#### Typical Application Circuit

\*Typical application circuit is to further lower the input and output ripple. It is not required for general use.

\*Recommended component specifications are typical values. Excessive external capacitive load may cause startup problem.

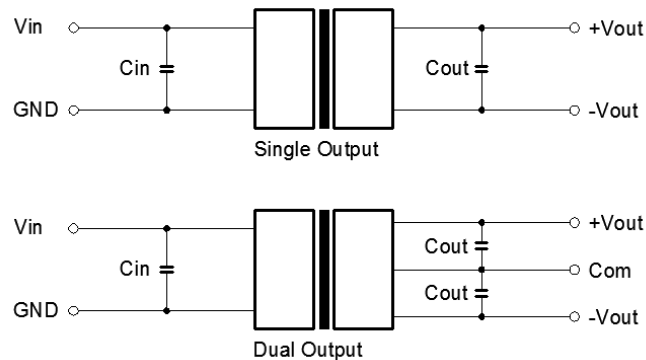


Figure 1: Typical External circuit

#### Recommended component spec

| Input voltage   | 3.3, 5V    | 12V        | 15V        | 24V        |
|-----------------|------------|------------|------------|------------|
| C <sub>IN</sub> | 4.7uF, 16V | 2.2uF, 25V | 2.2uF, 25V | 1.0uF, 50V |

#### Recommended component spec

| Output voltage   | 3.3, 5V   | 9V         | 12V        | 15V      | 24V         |
|------------------|-----------|------------|------------|----------|-------------|
| C <sub>OUT</sub> | 10uF, 16V | 4.7uF, 16V | 2.2uF, 25V | 1uF, 25V | 0.47uF, 50V |

#### Circuit for EMC Enhancement

\*Use this application circuit to meet Class B EMC performance.

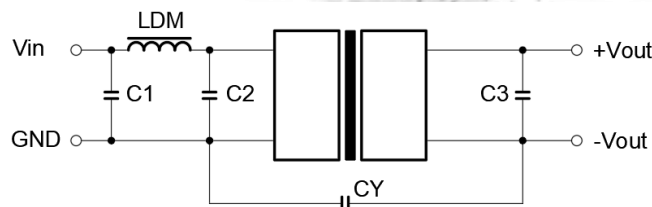


Figure 2: Circuit for EMC Enhancement

# 1W, DC/DC Power Converter

## SDM01D

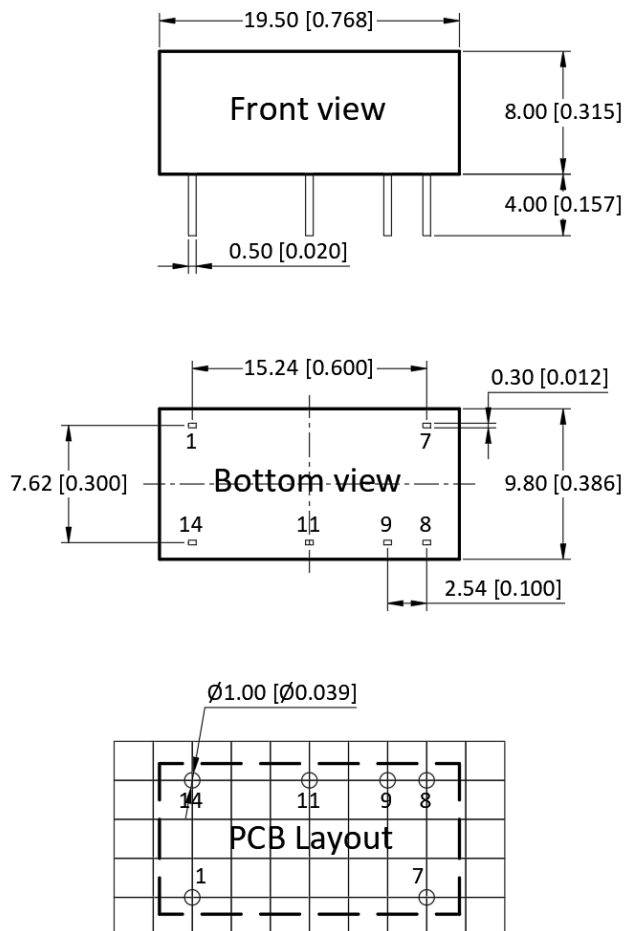


### Recommended component spec

| Component | LDM   | C1, C2     | CY       |
|-----------|-------|------------|----------|
| Spec      | 6.8uH | 4.7uF, 50V | 1nF, 2KV |

\*C3 refer to C<sub>OUT</sub> in

### Mechanical Specifications



### Pin Definition

| Pin # | Single Out        | Dual Out          |
|-------|-------------------|-------------------|
| 1     | GND               | GND               |
| 7     | NC                | NC                |
| 8     | -V <sub>OUT</sub> | 0V                |
| 9     | +V <sub>OUT</sub> | +V <sub>OUT</sub> |
| 11    | No Pin            | -V <sub>OUT</sub> |
| 14    | V <sub>IN</sub>   | V <sub>IN</sub>   |

\* Unless otherwise specified unit:  
mm [inch]

\* General tolerance:  $\pm 0.25$  [ $\pm 0.010$ ]

\* Pin thickness:  $\pm 0.10$  [ $\pm 0.004$ ]

\* Footprint grid 2.54 x 2.54 mm

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### Ordering information

Ordering can be done via [www.summit-electronics.com](http://www.summit-electronics.com) or via [info@summit-electronics.com](mailto:info@summit-electronics.com). Please contact us for more information. Customisation of the product is available on request.

### Technical support

For all product questions please contact us via [info@summit-electronics.com](mailto:info@summit-electronics.com)

### Document revision

| Rev      | Date       | Changes                 |
|----------|------------|-------------------------|
| 2025v0.1 | 27-08-2025 | First issue of document |