



## 15DMWE4\_D1.5 Series

15W - Single Output - Wide Input - Isolated & Regulated  
 1" x 1" DC-DC Converter

## DC-DC Converter

## 15 Watt

- ⊕ Wide 4:1 input voltage range
- ⊕ High efficiency up to 90%
- ⊕ Short circuit protection (SCP)
- ⊕ Isolation voltage: 1.5K VDC
- ⊕ Over-current, over-voltage, under-voltage protection
- ⊕ RoHS compliant
- ⊕ Operating temperature range: -40°C to +105°C
- ⊕ Meet CISPR32/EN55032 CLASS A, no external components
- ⊕ International standard pin-out
- ⊕ Wiring and rail mounting products featuring anti-reverse connection for input
- ⊕ Meets EN62368 standards (pending)

The 15DMWE4\_1.5 series are isolated 15W DC/DC converters with 2:1 input voltage. They feature efficiency up to 91%, 1500VDC isolation, operating temperature of -40°C to +105°C, input under-voltage protection, output over-voltage, output over-current, output short circuit protection and EMI meets CISPR32/EN55032 CLASS A.

They are widely applied in industrial control, electric power, instruments and communication fields. Extension packages with wiring mounting and rail mounting also enable them with reverse voltage protection.



### Common specifications

|                              |   |
|------------------------------|---|
| Short circuit protection:    | Continuous, self-recovery                     |
| Cooling:                     | Free air convection                           |
| Operation temperature range: | -40°C~+105°C (see temperature derating curve) |
| Storage temperature range:   | -55°C~+125°C                                  |
| Storage humidity range:      | 95% MAX                                       |
| Lead temperature:            | 300°C MAX, 1.5mm from case for 10 sec         |
| Vibration:                   | 10-150Hz, 5G, 0.75mm. along X, Y and Z        |
| Case material:               | Aluminium alloy                               |
| MTBF (MIL-HDBK-217F @25°C):  | 1,000,000 hours                               |
| Weight:                      | 15g / 35g (wiring) / 55g (rail)               |

### Output specifications

| Item                         | Test condition  | Min | Typ  | Max   | Units |
|------------------------------|---|-----|------|-------|-------|
| Voltage accuracy*            | 5%-100% load  |     | ±1   | ±3    | %     |
| Line regulation              | Full load, low to high<br>• positive output<br>• negative output              |     | ±0.2 | ±0.5  | %     |
|                              |   |     | ±0.4 | ±1    | %     |
| Load regulation              | 5% load to full load  |     | ±0.5 | ±1    | %     |
| Cross regulation             | Dual output, main circuit with 50% load, auxiliary circuit with 10%-100% load |     |      | ±5    | %     |
| Transient recovery time      | 25% load step change  |     | 300  | 500   | µs    |
| Transient response deviation | 25% load step change<br>• 5V output<br>• Others                               |     | ±3   | ±8    | %     |
|                              |   |     | ±3   | ±5    | %     |
| Temperature drift            | Full load   |     |      | ±0.03 | %/°C  |
| Ripple and noise*            | 20MHz Bandwidth   |     | 100  | 200   | mVp-p |
| Over current protection      | Input voltage range   | 110 | 200  | 270   | %Io   |
| Over voltage protection      | Input voltage range   | 110 |      | 160   | %Vo   |

\* At 0%-5% load, the Max. output voltage accuracy converter is ±5%.

\*\* 0%-5% load ripple&noise is no more than 5%Vo.

Ripple and noise are measured by "parallel cable" method.

### Input specifications

| Item   | Test condition                    | Min  | Typ    | Max  | Units   |
|--|-----------------------------------|------|--------|------|---|
| Input current* (full load/no load)                                 | • 24VDC                           |      | 958/10 | -/20 | mA  |
|  | • 48VDC                           |      | 969/5  | -/11 | mA  |
| Reflected ripple current   | Nominal input series              |      | 30     |      | mA  |
| Surge voltage  | • 24VDC input                     | -0.7 |        | 50   | VDC   |
|  | • 48VDC input                     | -0.7 |        | 100  | VDC   |
| Starting voltage   | • 24VDC input                     |      |        | 9    | VDC   |
|  | • 48VDC input                     |      |        | 18   | VDC   |
| Input under-voltage protection                                     | • 24VDC input                     | 5.5  | 6.5    |      | VDC   |
|  | • 48VDC input                     | 12   | 15.5   |      | VDC   |
| Starting time  |                                   |      | 10     |      | ms  |
| Input filter   | Pi Type                           |      |        |      |   |
| Hot plug   | Unavailable                       |      |        |      |   |
| Switching frequency  | PWM mode                          |      | 270    |      | KHz   |
| Ctrl<br><br>(The voltage of Ctrl pin is relative to input pin GND) | • Module switch on                |      |        |      | Ctrl suspended or connected to TTL high level (3.5-12VDC) |
|  | • Module switch off               |      |        |      | Ctrl pin connected to GND or low level (0-1.2VDC)         |
|  | • Input current when switched off |      | 2      | 7    | mA  |

\* Nominal input series, nominal input voltage

### Isolation specifications

| Item                  | Test condition                             | Min  | Typ  | Max | Units |
|-----------------------|--|------|------|-----|-------|
| Isolation voltage     | Input to output                            | 1500 |      |     | VDC   |
| Isolation voltage     | Input to output, respectively on the shell | 1000 |      |     | VDC   |
| Isolation resistance  | Test at 500VDC                             | 1000 |      |     | MΩ    |
| Isolation capacitance | Input-output, 100KHz/0.1V                  |      | 2000 |     | pF    |

### Example:

15DMWE4\_2415D1.5

15= 15Watt; D= DIP; M= series; W4= wide input (4:1); E= cost effective; 9-36Vin; ±15Vout; D= dual output; 1.5= 1500VDC

## 15DMWE4\_D1.5 Series

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| EMC specifications |       |                 |  |                  |
|--------------------|-------|-----------------|--|------------------|
| EMI                | CE    | CISPR32/EN55032 | CLASS A (without external components)<br>CLASS B (see EMC solution recommended circuit, ②) |                  |
| EMI                | RE    | CISPR32/EN55032 | CLASS A (without external components)<br>CLASS B (see EMC solution recommended circuit, ②) |                  |
| EMS                | ESD   | IEC/EN61000-4-2 | Contact ±4KV   | perf. Criteria B |
| EMS                | RS    | IEC/EN61000-4-3 | 10V/m  | perf. Criteria A |
| EMS                | EFT   | IEC/EN61000-4-4 | ±2KV (see EMC solution recommended circuit, ③)   | perf. Criteria B |
| EMS                | Surge | IEC/EN61000-4-5 | line to line ±2KV (see EMC solution recommended circuit, ①)                                | perf. Criteria B |
| EMS                | CS    | IEC/EN61000-4-6 | 3 Vr.m.s   | perf. Criteria A |

| Part Number      | Input Voltage [VDC] |        |       | Output Voltage [VDC] | Output Current [mA]<br>Full load | Efficiency [%, Typ.]*** | Capacitive load [µF, Max.] |
|------------------|---------------------|--------|-------|----------------------|----------------------------------|-------------------------|----------------------------|
|                  | Nominal             | Range* | Max** |                      |                                  |                         |                            |
| 15DMWE4_2405D1.5 | 24                  | 9-36   | 40    | ±5                   | ±1500                            | 87                      | 1500                       |
| 15DMWE4_2412D1.5 | 24                  | 9-36   | 40    | ±12                  | ±625                             | 90                      | 470                        |
| 15DMWE4_2415D1.5 | 24                  | 9-36   | 40    | ±15                  | ±500                             | 90                      | 330                        |
| 15DMWE4_2424D1.5 | 24                  | 9-36   | 40    | ±24                  | ±312                             | 89                      | 200                        |
| 15DMWE4_4805D1.5 | 48                  | 18-75  | 80    | ±5                   | ±1500                            | 86                      | 1500                       |
| 15DMWE4_4812D1.5 | 48                  | 18-75  | 80    | ±12                  | ±625                             | 90                      | 470                        |
| 15DMWE4_4815D1.5 | 48                  | 18-75  | 80    | ±15                  | ±500                             | 90                      | 330                        |
| 15DMWE4_4824D1.5 | 48                  | 18-75  | 80    | ±24                  | ±312                             | 90                      | 200                        |

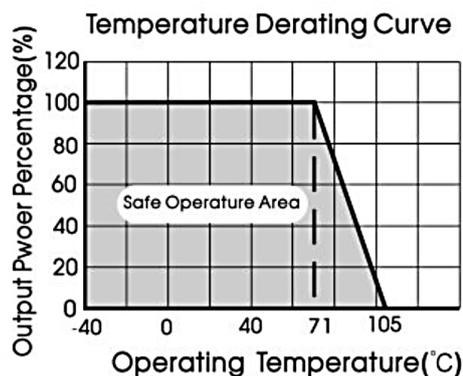
Add suffix CM for chassis mounting, f.ex. 15DMWE4\_1203D1.5CM, or suffix RM for rail mounting, f.ex. 15DMWE4\_1203D1.5RM.

\* The minimum input voltage and starting voltage of wiring or rail models are 1VDC higher than those of DIP package due to input reverse polarity protection function.

\*\* Absolute maximum rating without damage on the converter, but it isn't recommended.

\*\*\* Efficiency is measured in nominal input voltage and rated output load; for wiring and rail mounting models, due to input reverse polarity protection, a minimum efficiency greater than Min.-2 is qualified.

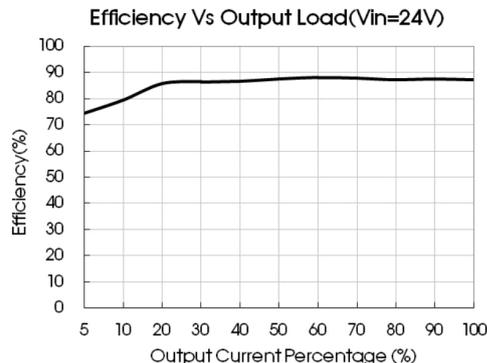
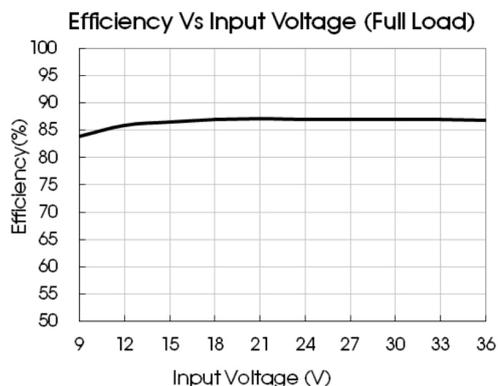
## Typical characteristics



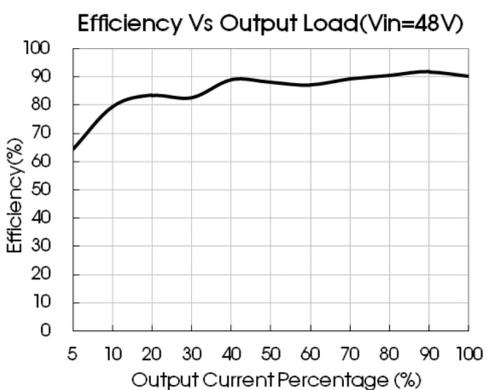
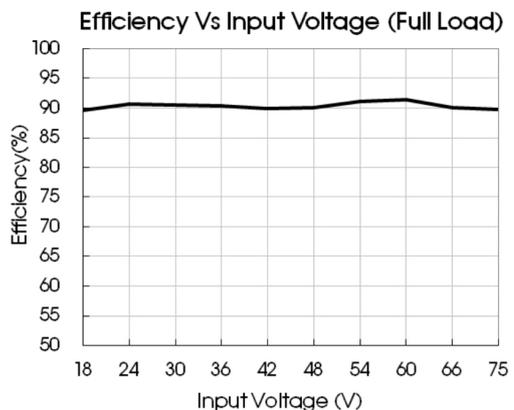
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### Efficiency



15DMWE4\_2405D1.5



15DMWE4\_2415D1.5

### Typical application

All the DC/DC converters of this series are tested according to the recommended circuit before delivery.

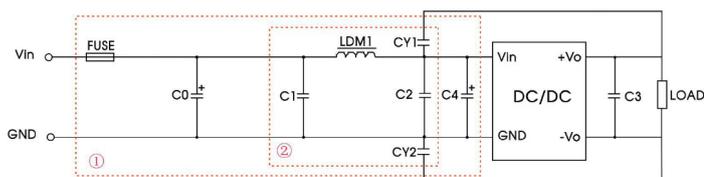
If it is required to further reduce input and output ripple, properly increase the input & output of additional capacitors  $C_{in}$  and  $C_{out}$  or select capacitors of low equivalent impedance provided that the capacitance is no larger than the max. capacitive load of the product.

#### Dual Output



|      |             |                        |
|------|-------------|------------------------|
| Vin  | 24V         | 48V                    |
| Cin1 | 100 $\mu$ F | 10 $\mu$ F -47 $\mu$ F |
| Cout |             | 10 $\mu$ F             |

### EMC solution-recommended circuit



Notes: Part ① in the Fig. 3 is used for EMC test and part ② for EMI filtering; selected based on needs.

#### Parameter description:

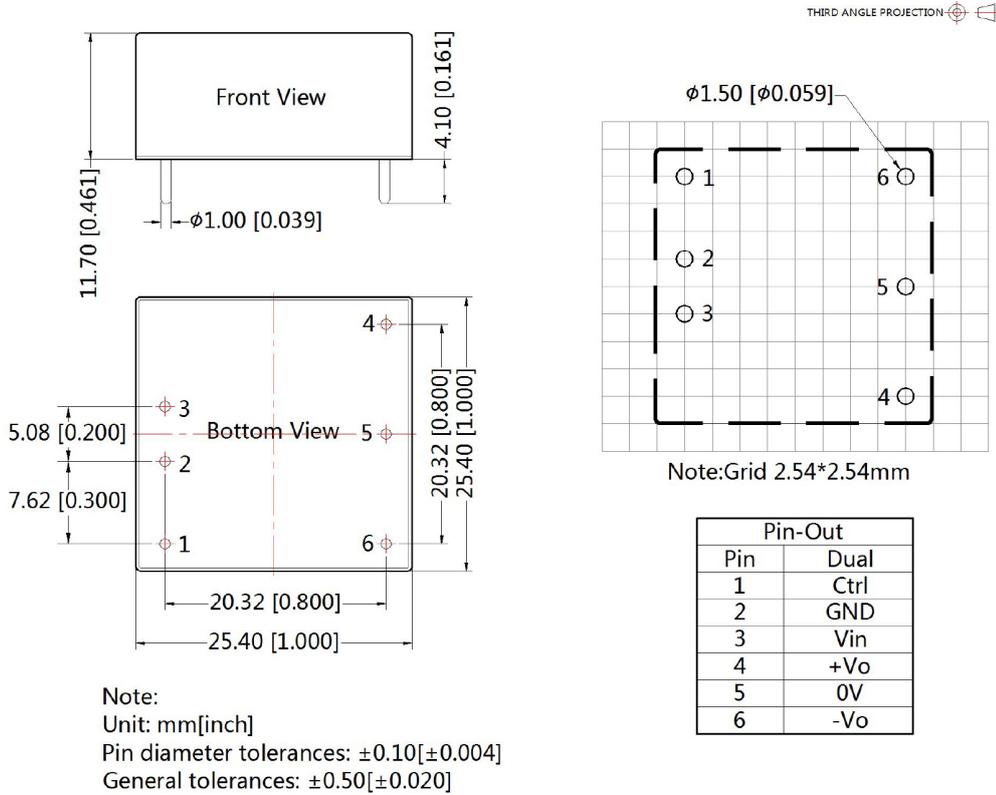
| Model    | Vin:24V                                  | Vin:48V          |
|----------|--|------------------|
| FUSE     | Choose according to actual input current |                  |
| C0, C4   | 330 $\mu$ F/50V                          | 330 $\mu$ F/100V |
| C1, C2   | 4.7 $\mu$ F/50V                          | 4.7 $\mu$ F/100V |
| C3       | Refer to the Cout in typical application |                  |
| LDM1     | 4.7 $\mu$ H                              |                  |
| CY1, CY2 | 1nF/2KV                                  |                  |

It is not allowed to connect modules output in parallel to enlarge the power.

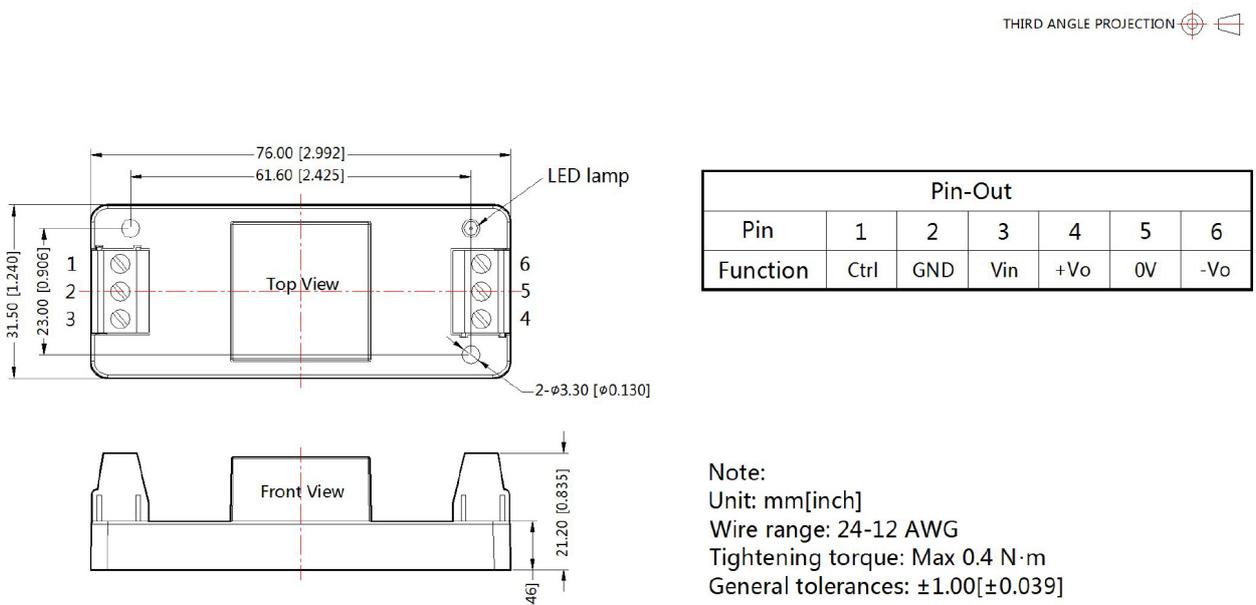
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1" x 1" DC-DC Converter

## Mechanical dimensions and footprint



## Wiring mounting

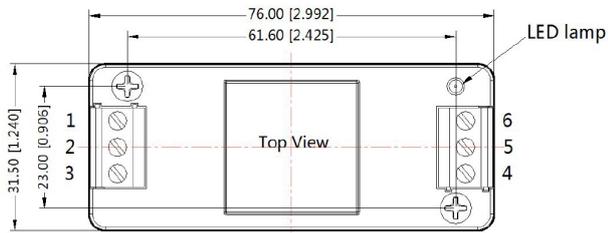


## 15DMWE4\_D1.5 Series

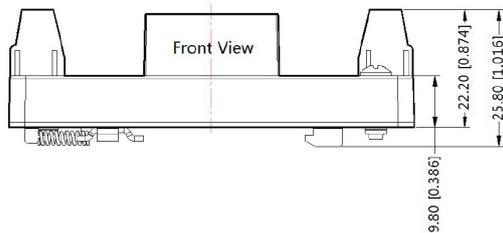
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1" x 1" DC-DC Converter

### Rail mounting

THIRD ANGLE PROJECTION 



| Pin-Out  |      |     |                 |                 |    |                 |
|----------|------|-----|-----------------|-----------------|----|-----------------|
| Pin      | 1    | 2   | 3               | 4               | 5  | 6               |
| Function | Ctrl | GND | V <sub>in</sub> | +V <sub>o</sub> | 0V | -V <sub>o</sub> |



**Note:**  
Unit: mm[inch]  
Mounting rail: TS35  
Wire range: 24-12 AWG  
Tightening torque: Max 0.4 N·m  
General tolerances:  $\pm 1.00[\pm 0.039]$

**Note:**

1. Only typical model listed. Non-standard models will be different from the above, please contact us for more details.
2. All specifications are measured at TA=25°C, humidity<75%, nominal input voltage and rated output load unless otherwise specified.
3. In this datasheet, all the test methods of indications are based on corporate standards.