



## 15DMW4\_1.5 series

15W - Single/Dual 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 88%
- ⊕ Remote On/Off
- ⊕ Input/output isolation voltage: 1.5kVDC
- ⊕ Short Circuit Protection (SCP)
- ⊕ Operating temperature range: -40°C to +85°C
- ⊕ 100% burned in
- ⊕ 15W DIP package
- ⊕ RoHS compliant
- ⊕ Customer design available

The 15DMW4\_1.5 series are isolated 15W DC-DC converters. Designed with high efficiency, they allow the operating temperature range of these units to be -40°C to +85°C (with derating) in a 6 pin DIP package with industry-standard footprint. Further features include wide 4:1 input voltage range, remote on/off control, trimmable output, short-circuit protection and over voltage protection.

These converters are well suitable for battery operated equipment, measurement equipment, telecom, wireless network, Industry control system, everywhere where isolated, tightly regulated voltages and compact size are required.



| Common specifications        |  |
|------------------------------|--|
| Short circuit protection:    | Hiccup, continuous, automatic recovery |
| Cooling:                     | Free air convection                    |
| Operation temperature range: | -40°C~+85°C (with derating)            |
| Storage temperature range:   | -55°C~+125°C                           |
| Maximum case temperature:    | 105°C MAX                              |
| Switching frequency (fixed): | 400kHz TYP                             |
| Storage humidity range:      | 95% MAX                                |
| Case material:               | Nickel-coated copper (six-sided)       |
| Base material:               | Non-conductive FR4                     |
| Potting material:            | Epoxy (UL94V-0)                        |
| MTBF (MIL-HDBK-217F @25°C):  | 560,000 hours                          |
| Weight:                      | 16.5g                                  |

| Isolation specifications |                 |      |      |      |       |
|--------------------------|-----------------|------|------|------|-------|
| Item                     | Test condition  | Min  | Typ  | Max  | Units |
| Isolation voltage        | Input to output |      |      | 1500 | VDC   |
| Isolation resistance     | Test at 500VDC  | 1000 |      |      | MΩ    |
| Isolation capacitance    |                 |      | 1000 |      | pF    |

#### Example:

#### 15DMW4\_2415S1.5

15 = 15Watt; D = DIP; M =series; W4 = wide input (4:1) 9-36Vin;  
15Vout; S = single output; 1.5 = 1500VDC

#### 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.

| Input specifications           |  |     |     |   |       |           |
|--------------------------------|--|-----|-----|---|-------|-----------|
| Item                           | Test condition   | Min | Typ | Max   | Units |           |
| Input filter                   | Pi Type  |     |     |   |       |           |
| Protection                     | Fuse recommended   |     |     |   |       |           |
| Starting voltage               | • 24VDC input<br>• 48VDC input                                 | 8.7 | 9   | 16.9  | 18    | VDC       |
| Under-voltage turn-off         | • 24VDC input<br>• 48VDC input                                 | 8.3 | 9   | 16.2  | 18    | VDC       |
| Surge voltage (100msec. max.)  | • 24VDC input<br>• 48VDC input                                 |     |     | 50  | 100   | V         |
| Remote ON/OFF                  | • Converter: ON<br>• Converter: OFF<br><br>• Off idle current  |     |     | Open or 3.0V<Vr<15V<br>Short circuit pin 6 and pin 2<br>or 0V<Vr<1.2V |       | 2.5<br>mA |
| Reflected input ripple current |  |     | 30  |   |       | mA        |
| Conducted noise (input)        | EN 55022 level A, FCC part 15, level A with external capacitor |     |     |   |       |           |

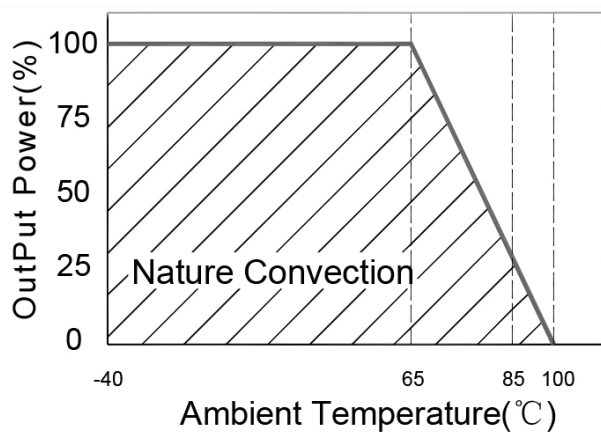
| Output specifications           |  |     |     |                                    |       |      |
|---------------------------------|--|-----|-----|------------------------------------|-------|------|
| Item                            | Test condition   | Min | Typ | Max                                | Units |      |
| Voltage tolerance               |  |     |     | ±2                                 | %     |      |
| Line regulation                 | Vmin - Vmax  |     |     | 0.5                                | %     |      |
| Load regulation                 | • 25% load to full load<br>• Balanced load (dual)            |     |     | ±0.5                               | ±1    | %    |
| Load variation                  | Dual models<br>unbalanced load                               |     |     | 5                                  | %     |      |
| Output voltage adjustment range | only for single output models                                |     |     | ±10                                | %     |      |
| Temperature drift               | Vout   |     |     | ±0.02                              | %/°C  |      |
| Ripple and noise                | 20MHz Bandwidth  |     |     | 100                                | mVp-p |      |
| Output current limitation       | at 150 % typ.of Iout max., constant current                  |     |     |                                    |       |      |
| Transient response setting time | 25% load step change   |     | 300 |                                    | μs    |      |
| Transient response over shoot   | di/dt=0.8A/μs  |     |     | ≤ ±5% of Vo<br>(≤ ±6% for 3.3Vout) |       |      |
| Start-up time                   | Nominal Vin and constant resistive load                      |     | 450 |                                    | ms    |      |
| Over load protection            | % of full load at nominal input                              | 110 |     |                                    | %     |      |
| Over voltage protection         | • 3.3V output<br>• 5V output<br>• 12V output<br>• 15V output | 3.7 | 5.6 | 13.5                               | 19.6  | 20.5 |
|                                 |  |     |     |                                    |       | VDC  |

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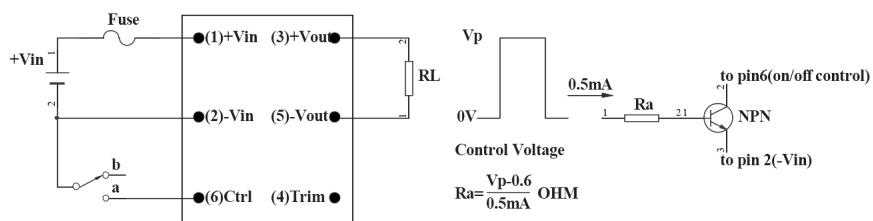
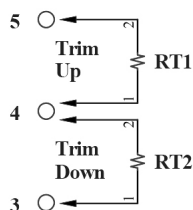
| Part Number     | Input Voltage [VDC] |       | Output Voltage [VDC] | Output Current [mA]<br>Full load | Input Current [mA] |           | Efficiency [% , Typ.] | Capacitive load [μF, Max.] |
|-----------------|---------------------|-------|----------------------|----------------------------------|--------------------|-----------|-----------------------|----------------------------|
|                 | Nominal             | Range |                      |                                  | No load            | Full load |                       |                            |
| 15DMW4_2403S1.5 | 24                  | 9-36  | 3.3                  | 4000                             | 50                 | 639       | 86                    | 1000                       |
| 15DMW4_2405S1.5 | 24                  | 9-36  | 5                    | 3000                             | 40                 | 718       | 87                    | 1000                       |
| 15DMW4_2412S1.5 | 24                  | 9-36  | 12                   | 1250                             | 20                 | 710       | 88                    | 330                        |
| 15DMW4_2415S1.5 | 24                  | 9-36  | 15                   | 1000                             | 20                 | 710       | 88                    | 220                        |
| 15DMW4_4803S1.5 | 48                  | 18-75 | 3.3                  | 4000                             | 30                 | 319       | 86                    | 1000                       |
| 15DMW4_4805S1.5 | 48                  | 18-75 | 5                    | 3000                             | 40                 | 359       | 87                    | 1000                       |
| 15DMW4_4812S1.5 | 48                  | 18-75 | 12                   | 1250                             | 10                 | 355       | 88                    | 330                        |
| 15DMW4_4815S1.5 | 48                  | 18-75 | 15                   | 1000                             | 10                 | 355       | 88                    | 220                        |
| 15DMW4_2412D1.5 | 24                  | 9-36  | ±12                  | ±625                             | 20                 | 710       | 88                    | ±150                       |
| 15DMW4_2415D1.5 | 24                  | 9-36  | ±15                  | ±500                             | 20                 | 710       | 88                    | ±100                       |
| 15DMW4_4812D1.5 | 48                  | 18-75 | ±12                  | ±625                             | 10                 | 355       | 88                    | ±150                       |
| 15DMW4_4815D1.5 | 48                  | 18-75 | ±15                  | ±500                             | 10                 | 355       | 88                    | ±100                       |

## Typical characteristics



## Output voltage adjustment      Control pin suggest circuit

Output can be externally trimmed by using the method shown below.



When pin6 short to pin2,D/D ON=>OFF  
When pin6 leave open,D/D => ON

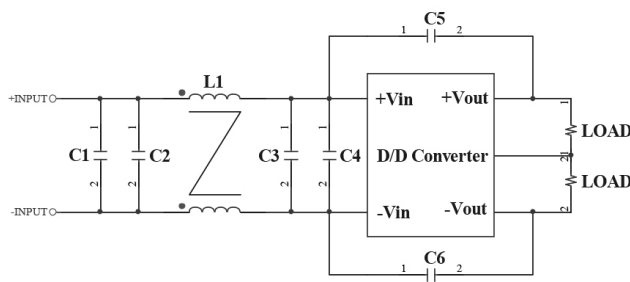
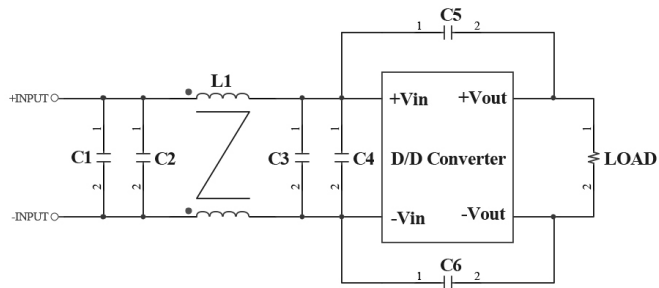
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## EMC considerations

Suggested Schematic to comply with EN55022 Conducted Noise emission Class

B



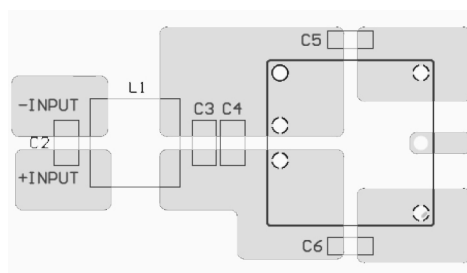
Following components are needed to comply with EN55022 Class B conducted noise:

15DMW4\_24xxS1.5

| Component | Value       | Voltage | Reference         |
|-----------|-------------|---------|-------------------|
| C2, C3    | 6.8 $\mu$ F | 50V     | 1812 MLCC         |
| C5, C6    | 1000pF      | 2KV     | 1206 MLCC         |
| L1        | 325 $\mu$ H |         | Common Mode Choke |

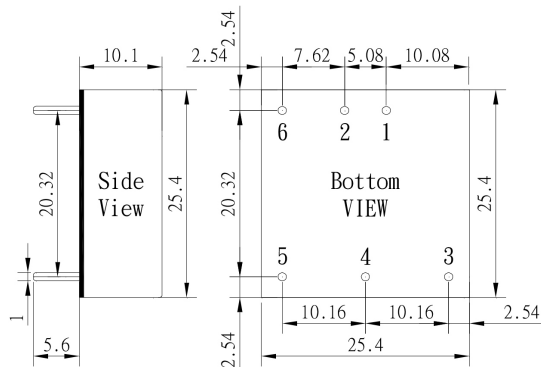
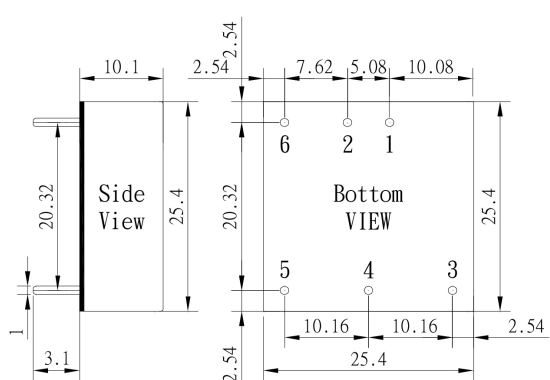
15DMW4\_48xxS1.5

| Component  | Value       | Voltage | Reference         |
|------------|-------------|---------|-------------------|
| C2, C3, C4 | 2.2 $\mu$ F | 100V    | 1812 MLCC         |
| C5, C6     | 1000pF      | 2KV     | 1206 MLCC         |
| L1         | 325 $\mu$ H |         | Common Mode Choke |



Recommended Layout with input Filter

## Mechanical dimensions



Special type: 15DMW4\_2412D1.5/PL3.1

Note:  
Unit: mm  
General tolerances:  $\pm 0.5$ mm  
Pin size tolerances:  $\pm 0.35$ mm

| Pin connection |      |      |       |      |       |             |
|----------------|------|------|-------|------|-------|-------------|
| Pin            | 1    | 2    | 3     | 4    | 5     | 6           |
| Single         | +Vin | -Vin | +Vout | Trim | -Vout | Ctrl On/Off |
| Dual           | +Vin | -Vin | +Vout | COM  | -Vout | Ctrl On/Off |