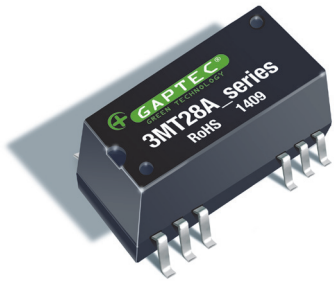
GAPTEC®
GREEN TECHNOLOGY

# 3MT28A_1.5 Series

3W - Single Output DC-DC Converter - Fixed Input - Isolated & Unregulated




## DC-DC Converter 3 Watt

- **Miniature SMD package**
- **Operating temperature range: -40°C to +85°C**
- **1.5KVDC isolation**
- **Low temperature rise**
- **Internal SMD construction**
- **Industry standard pinout**
- **Short circuit protection (SCP)**

The 3T14W_1.5 Series is designed for application where isolated output is required from a distributed power system.

These products apply to:
1) Input voltage range ±10%Vin;
2) 1.5KVDC input and output isolation;
3) Regulated and low ripple noise is not required.

Such as: digital circuits and low frequency analog circuits and relay drive circuit.







### Common specifications

| | |
|---|---|
| Short circuit protection: | Continuous, automatic recovery |
| Temperature rise at full load: | 25°C TYP |
| Cooling: | Free air convection |
| Operation temperature range: | -40°C~+85°C<br>Power derating above 71°C |
| Storage temperature range: | -55°C ~+125°C |
| Lead temperature range: | 300°C MAX, 1.5mm from case for 10 sec |
| Storage humidity range: | < 95% |
| Case material: | Epoxy Resin [UL94-V0] |
| MTBF (MIL-HDBK-217F@25°C): | >3,500,000 hours |
| Weight: | 2.0g |

### Isolation specifications

| Item | Test condition | Min | Typ | Max | Units |
|---|---|---|---|---|---|
| Isolation voltage | Tested for 1 minute, leakage current less than 1 mA | 1500 | | | VDC |
| Isolation resistance | Test at 500VDC | 1000 | | | MΩ |
| Isolation capacitance | Input/Output, 100KHz/1V | | 17 | | pF |

### EMC specifications

| | | |
|---|---|---|
| EMI | CE | CISPR22/EN55022<br>CLASS B (External Circuit Refer to EMC recommended circuit) |
| EMS | ESD | IEC/EN61000-4-2 Contact ±8KV<br>perf. Criteria B |

**Note:**
1. Operation under minimum load will not damage the converter; However, they may not meet all specifications.
2. Max. Capacitive Load is tested at nominal input voltage and full load.
3. Unless otherwise noted, All specifications are measured at Ta=25°C, humidity<75%, nominal input voltage and rated output load.
4. In this datasheet, all test methods are based on our corporate standards.
5. All characteristics are for listed models, and non-standard models may perform differently. Please contact our technical support for more detail.
6. Please contact our technical support for any specific requirement.
7. Specifications of this product are subject to changes without prior notice.

### Output specifications

| Item | Test condition | Min | Typ | Max | Units |
|---|---|---|---|---|---|
| Line regulation | For Vin change of ±1% | | | ±1.2 | % |
| Load regulation | 10% to 100% load | | 10 | 15 | % |
| Output voltage accuracy | See tolerance envelope curve | | | | |
| Temperature coefficient | 100% load | | | ±0.03 | %/°C |
| Ripple & Noise* | 20MHz Bandwidth | | 100 | | mVp-p |
| Switching frequency | 100% Full load, nominal input | | 100 | 300 | KHz |

* Ripple and noise tested with „parallel cable“ method. See detailed operation instructions at DC-DC application notes.

### Input specifications

| Item | Test condition | Min | Typ | Max | Units |
|---|---|---|---|---|---|
| Input filter | Capacitor | | | | |
| Input surge voltage (1 sec. max.) | | -0.7 | | 9 | VDC |

**Model selection:**
**WCTP**_xxyyN##O**
**W=** Watt; **C=** Case; **T=** Type; **P=** Pinning; ****=** Voltage Variation (omitted ± 10%); **xx=** Vin; **yy=** Vout; **N=** Numbers of Output; **##=** Isolation (kVDC); **O=** output regulation

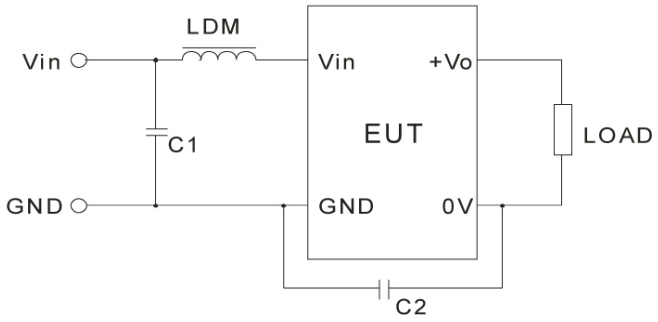
**Example:**
**3MT28A_0505S1.5UP**
**3= 3Watt; MT28= Micro SMT28; A= Pinning; 5Vin; 5Vout; S= Single Output; 1.5= 1.5kVDC; U= Unregulated output; P= Short Curcuit Protection**

| Part Number | Input Voltage [VDC] Nominal | Range | Output Voltage [VDC] | Output Current [mA] Max | Min | Capacitive load [µF, max.] | Input Current [mA] Max | Min | Reflected ripple current [mA, Typ.] | Efficiency [%, Typ.] |
|---|---|---|---|---|---|---|---|---|---|---|
| 3MT28A_0505S1.5UP | 5 | 4.5-5.5 | 5 | 600 | 60 | 220 | 709 | 30 | 25 | 85 |


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# EMC recommended circuit

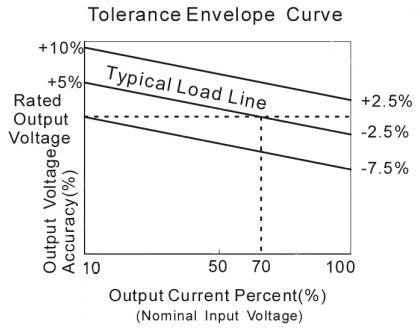
EMI Typical Recommended Circuit

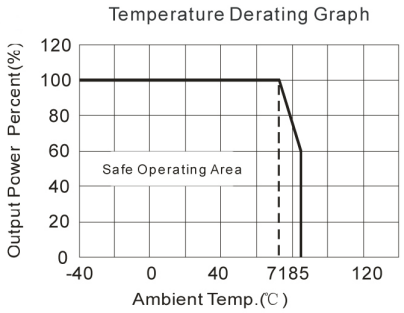


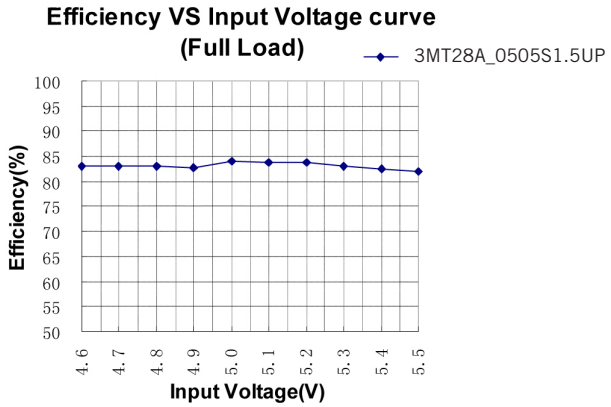

**Recommended typical circuit parameters:**

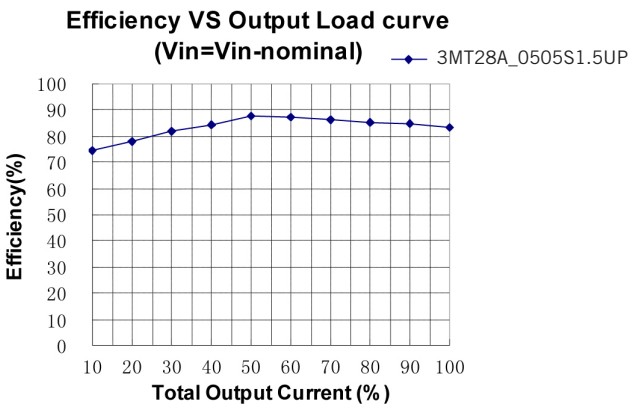
| Model | Vin: 5V |
|---|---|
| C1 | 4.7μF /50V |
| C2 | 470pF/2KV |
| LDM | 6.8μH |

# Typical characteristics

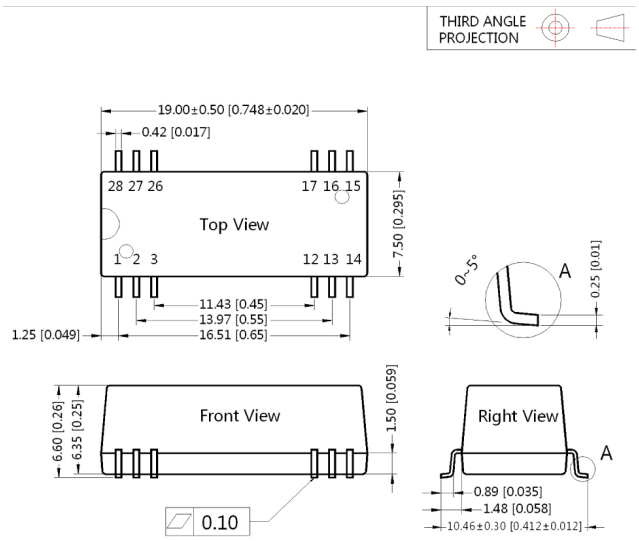


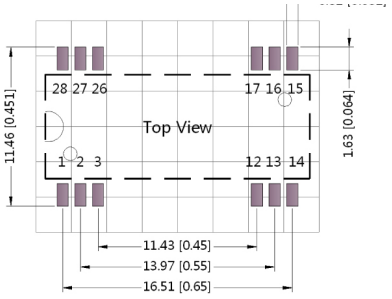



## Mechanical dimensions




**Note:**
Unit: mm[inch]
Pin section tolerances: ± 0.10mm[ ± 0.04inch]
General tolerances: ± 0.25mm[ ± 0.010inch]

## Recommended footprint

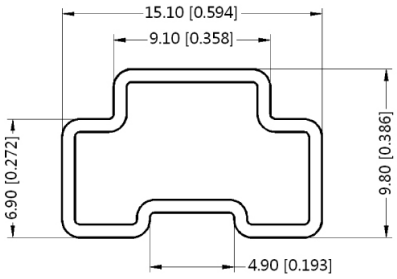



Note : Grid 2.54*2.54mm

| PIN CONNECTION | |
|---|---|
| Pin | Function |
| 1 | Vin |
| 2 | GND |
| 3 | GND |
| 12 | 0V |
| 13 | Vo |
| 14, 15, 16, 17 | NC |
| 26, 27, 28 | NC |

NC:No Connection

## Tube outline dimensions



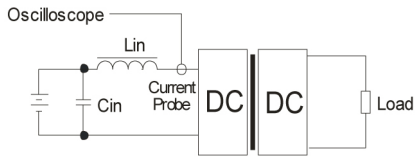

**Note:**
Unit: mm[inch]
General tolerances: ± 0.5mm[ ± 0.020inch]

L=530mm[20.866inch]
Devices per tube quantity: 26pcs

L=220mm[8.661inch]
Devices per tube quantity: 10pcs

## Test configurations

**Input Reflected-Ripple Current Test Setup**
Input reflected-ripple current is measured with an inductor Lin and Capacitor Cin to simulate the source impedance.




Lin(4.7μH) Cin(220μF, ESR < 1.0Ω at 100 KHz)

# Application note

**1) Requirement on output load**
To ensure this module operate efficiently and reliably, the minimum output load could not be less than 10% of the full load. If the actual output power is very small, please connect a resistor to the output in parallel to increase the load.

**2) Recommended circuit**
Recommended circuit
If you want to further decrease the input/output ripple, an capacitor filtering network may be connected to the input and output ends of the DC/DC converter, refer to Figure 1.

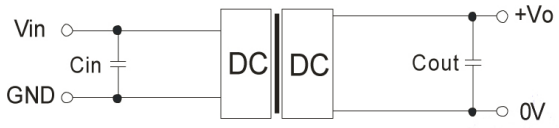



Figure 1

It should also be noted that the capacitance of the capacitor must be proper. If the capacitance is too large, a startup problem might arise.For ensuring every channel of output can provide a safe and reliable operation, the recommended capacitance of the capacitor refer to Table 1.

| Vin (VDC) | Cin (µF) | Vo (VDC) | Cout (µF) |
|---|---|---|---|
| 5 | 4.7 | 5 | 10 |

Table 1

It's not recommended to connect any external capacitor in the application field with less than 0.5 watt output.

**3) Overload protection**
Under normal operating conditions, the output circuit of these products have not overload protection. The simplest method is to add a breaker circuit in the circuit.

**4) Output Voltage Regulation and Over-voltage Protection Circuit**
The simplest device for output voltage regulation, over-voltage and over-current protection is a linear regulator with overheat protection which is connected to the input or output in series (Figure 4)and an capacitor filtering network.the recommended capacitance of the capacitor refer to Table 1, linear regulator based on the actual voltage and current to make a reasonable selection.

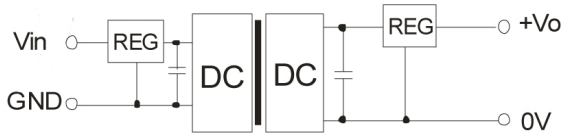



Figure 2

**5) It is not recommended to increase the output power capability by connecting two or more converters in parallel. The product is not hot-swappable**


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