



ITM14_3UP series

1W - Single Output DC-DC Converter - Fixed Input - Isolated - Unregulated

DC-DC Converter

1 Watt

- ⊕ Small footprint, ultra-thin package
- ⊕ 3kVDC isolation
- ⊕ Temperature range: -40°C to +125°C
- ⊕ High efficiency up to 85%
- ⊕ IEC62368, UL62368, EN62368 approved
- ⊕ International Standard Pinout
- ⊕ Short circuit protection (SCP)
- ⊕ RoHS Compliance
- ⊕ AEC-Q100 approved

The ITM14_3UP series is specially designed for use in distributed power supply systems and especially suitable in applications such as digital circuits, low frequency analog circuits, relay-driven circuits and data switching circuits.



| 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~+125°C |
| Storage temperature range: | -55°C ~+125°C |
| Lead temperature: | 250°C max, 1.5mm from case for 10 sec |
| Reflow soldering temperature: | Peak temp. ≤245°C 60sec. max. over 217°C |
| Vibration: | 10-150Hz, 0.75mm, 5G, 90Min. along X, Y and Z |
| Storage humidity range: | < 95% |
| Package material: | Epoxy Resin [UL94-V0] |
| MTBF: | >7,500 khours |
| Dimensions: | 9.00 x 7.00 x 3.10mm |
| Weight: | 0.5g |
| MSL (Moisture sensitivity level): | J-STD-020D standard - Level 3 |

| Input specifications | | | | | |
|-------------------------------------|--------------------|------|-------|--------|-------|
| Item | Test condition | Min | Typ | Max | Units |
| Input current (no load / full load) | | | 7/235 | 15/247 | mA |
| Surge voltage | | -0.7 | | 9 | VDC |
| Reflected ripple current | | | 10 | | mA |
| Input filter | Capacitance filter | | | | |
| Hot plug | Unavailable | | | | |

| Isolation specifications | | | | | |
|--------------------------|---------------------------------|------|-----|------|------------|
| Item | Test condition | Min | Typ | Max | Units |
| Isolation voltage | Tested for 1 minute and 1mA max | 3000 | | 1500 | VDC VAC |
| Isolation resistance | Test at 500VDC | 1000 | | | MΩ |
| Isolation Capacitance | Input-output, 100KHz/0.1V | | 8 | | pF |

| Output specifications | | | | | |
|-------------------------|--------------------------------|-----|-----|-------|-------|
| Item | Test condition | Min | Typ | Max | Units |
| Output voltage accuracy | See tolerance envelope graph | | | | |
| Line regulation | For Vin change of 1% | | | 1.2 | % |
| Load regulation | 10% to 100% load | | 8 | 15 | % |
| Temperature drift | 100% full load | | | ±0.02 | %/°C |
| Ripple & Noise* | 20MHz Bandwidth, nominal input | | 30 | 75 | mVp-p |
| Switching frequency | Full load, nominal input | | 300 | | KHz |

* Test ripple and noise by "parallel cable" method. See detailed operation instructions at Testing of Power Converter section, application notes.

| EMC specifications | | | | | |
|--------------------|-----|-----------------|--------------|-------------------------------|--|
| EMI | CE | CISPR32/EN55032 | CLASS B | (see EMC recommended circuit) | |
| EMI | RE | CISPR32/EN55032 | CLASS B | (see EMC recommended circuit) | |
| EMS | ESD | IEC/EN61000-4-2 | Contact ±8KV | perf. Criteria B | |
| EMS | RS | IEC/EN61000-4-3 | 10V/m | perf. Criteria A | |
| EMS | CS | IEC/EN61000-4-6 | 3V.r.m.s | perf. Criteria A | |

Example:

ITM14A_0505S3UP

1 = 1Watt; T14 = SMT14; M = series, A = Pinning; 5Vin; 5Vout;
S = Single Output; 3 = 3kVDC isolation; U = Unregulated Output;
P = Short Circuit Protection (SCP)

Note:

- If the product is not operated within the required load range, the product performance cannot be guaranteed to comply with all parameters in the datasheet;
- The maximum capacitive load offered were tested at input voltage range and full load;
- Unless otherwise specified, parameters in this datasheet were measured under the conditions of Ta = 25°C, humidity <75%RH with nominal input voltage and rated output load;
- All index testing methods in this datasheet are based on our company corporate standards;
- We can provide product customization service, please contact our technicians directly for specific information;
- Products are related to laws and regulations: see „Features“ and „EMC“;
- Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units.

1TM14_3UP series

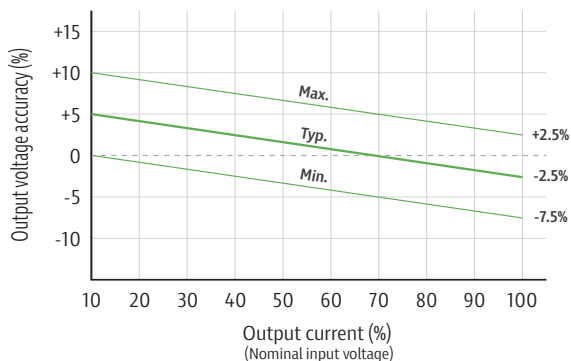
1W- Single Output DC-DC Converter - Fixed Input - Isolated & Regulated

Product Selection Guide

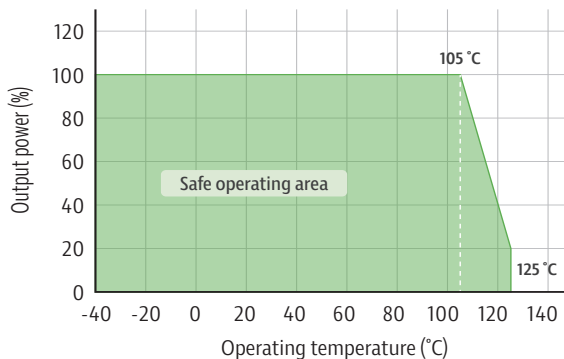
| Part Number | Input Voltage [V] | Output Voltage [VDC] | Output Current [mA, min/max] | Efficiency [%, min/typ] | Capacitive load [μ F, max] |
|----------------|-------------------|----------------------|------------------------------|-------------------------|---------------------------------|
| 1TM14_0505S3UP | 5 | 5 | 20/200 | 81/85 | 2400 |

Typical characteristics

Output regulation curve

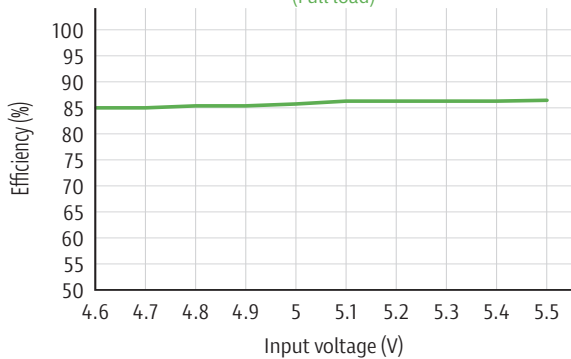


Temperature derating graph

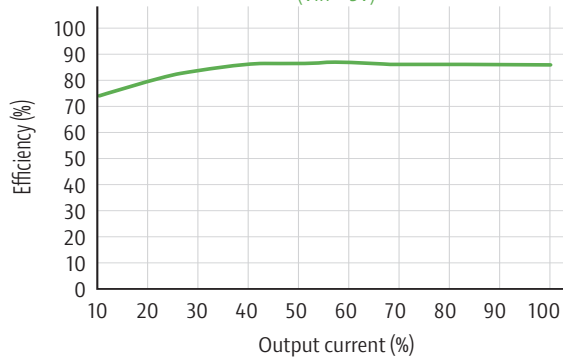


Efficiency

Efficiency vs input voltage (Full load)



Efficiency vs output load (Vin = 5V)



Typical application

Input and/or output ripple can be further reduced, by connecting a filter capacitor from the input and/or output terminals to ground as shown on the right.

Choosing suitable filter capacitor values is very important for a smooth operation of the modules. For recommended input and output capacitor values refer to Table 1.



Table 1: Recommended input and output capacitor values

| V_{in} (VDC) | C_{in} (μ F) | V_o (VDC) | C_{out} (μ F) |
|----------------|---------------------|-------------|----------------------|
| 5 | 4.7 | 5 | 10 |

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EMC recommended circuit

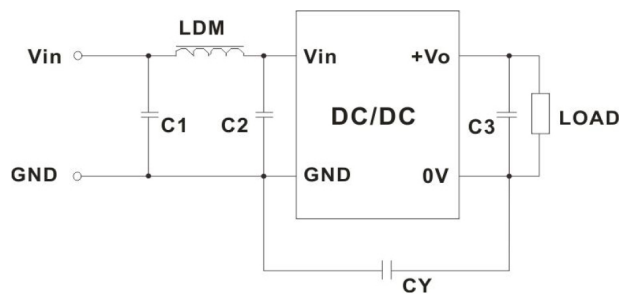
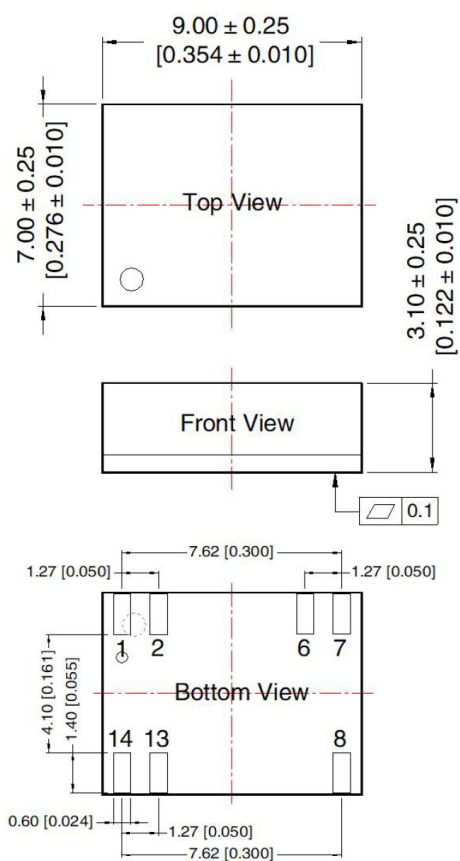


Table 2: Recommended EMC filter values

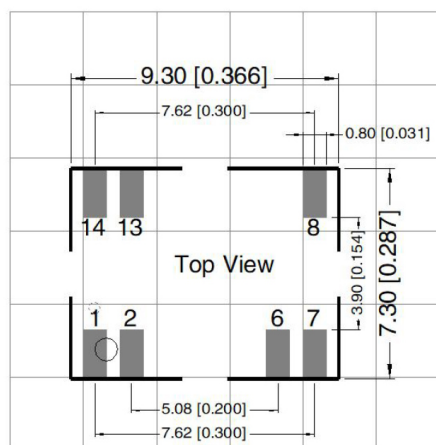
| Input voltage 5VDC | Output voltage(VDC) | | 5 |
|-----------------------|---------------------|------------------------------|------------|
| | Emissions | C1/C2 | 4.7µF /25V |
| CY | | 47pF/4KVDC | |
| C3 | | Refer to the Cout in table 1 | |
| LDM | | 6.8µH | |

Mechanical dimensions



Note:
Unit :mm[inch]
Pin diameter tolerances : ± 0.10 [± 0.004]

THIRD ANGLE PROJECTION



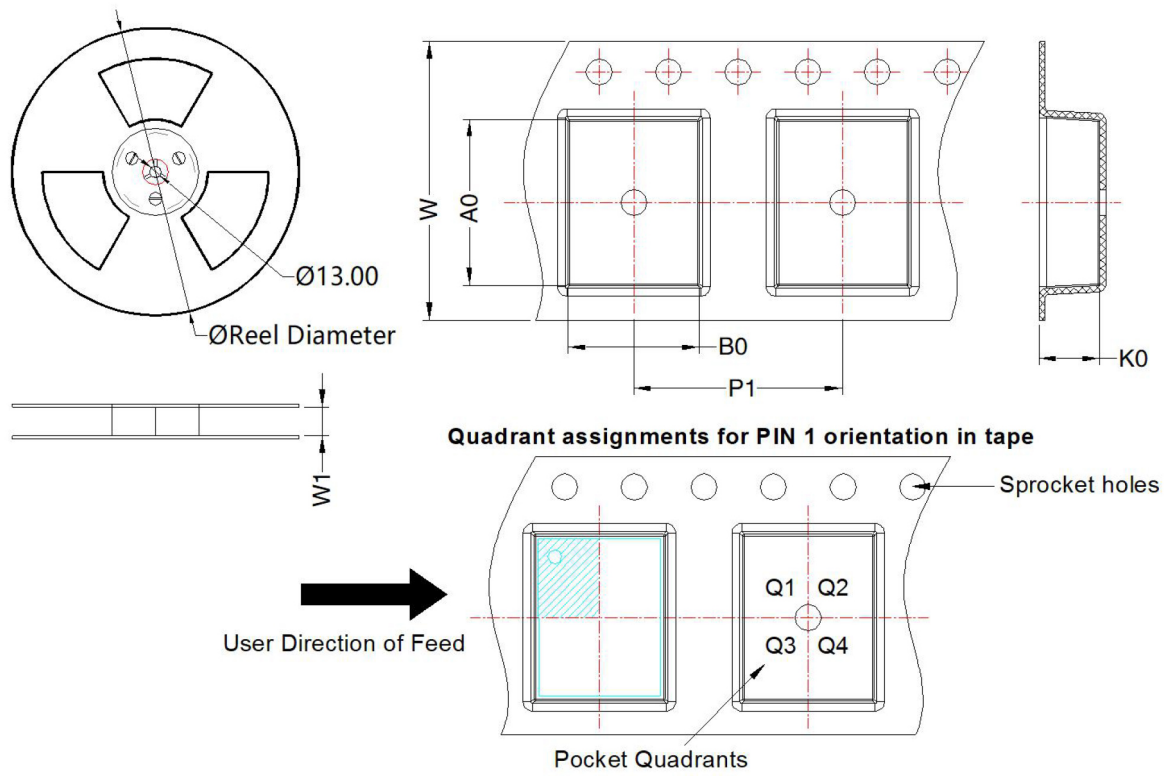
Note: Grid 2.54*2.54mm

| Pin-Out | |
|---------|----------|
| Pin | Function |
| 1,2 | GND |
| 6,7 | 0V |
| 8 | +Vo |
| 13,14 | Vin |

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Mechanical dimensions



| Device | Pin | MPQ | Reel Diameter (mm) | Reel Width W1 (mm) | A0 (mm) | B0 (mm) | K0 (mm) | P1 (mm) | W (mm) | Pin1 Quadrant |
|----------------|-----|------|--------------------|--------------------|---------|---------|---------|---------|--------|---------------|
| 1TM14_0505S3UP | 7 | 1200 | 330.0 | 12.4 | 9.56 | 7.56 | 3.5 | 12.0 | 16.0 | Q1 |