

## E\_T-1W & F\_T-1W Series

1W, FIXED INPUT, ISOLATED & UNREGULATED  
DUAL/SINGLE OUTPUT DC-DC CONVERTER

multi-country patent protection **RoHS** **UL**

### FEATURES

Small Footprint  
SMD Package Style  
3KVDC Isolation  
Temperature Range: -40°C to +85°C  
No Heat sink Required  
Industry Standard Pinout  
Internal SMD construction  
No External Component Required  
RoHS Compliance

### APPLICATIONS

The E\_T-1W&F\_T-1W Series are specially designed for applications where a group of polar power supplies are isolated from the input power supply in a distributed power supply system on a circuit board.

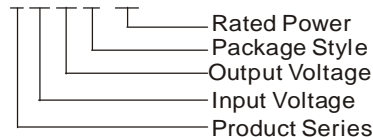
These products apply to:

- 1) Where the voltage of the input power supply is fixed (voltage variation  $\leq \pm 10\%$ );
- 2) Where isolation is necessary between input and output (isolation voltage  $\leq 3000\text{VDC}$ );
- 3) Where the regulation of the output voltage and the output ripple noise are not demanding.

Such as: purely digital circuits, ordinary low frequency analog circuits, and IGBT power device driving circuits.

### MODEL SELECTION

F0505T-1W



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### PRODUCT PROGRAM

| Part Number | Input         |           | Output        |              |          | Efficiency (% , Typ.) | Certificate |    |    |
|-------------|---------------|-----------|---------------|--------------|----------|-----------------------|-------------|----|----|
|             | Voltage (VDC) |           | Voltage (VDC) | Current (mA) |          |                       |             |    |    |
|             | Nominal       | Range     |               | Max          | Min      |                       |             |    |    |
| F0303T-1W   | 3.3           | 3.0-3.6   | 3.3           | 304          | 30       | 73                    |             |    |    |
| F0305T-1W   |               |           | 5             | 200          | 20       | 75                    |             |    |    |
| F0505T-1W   | 5             | 4.5-5.5   | 5             | 200          | 20       | 70                    | UL          |    |    |
| F0509T-1W   |               |           | 9             | 110          | 11       | 76                    | UL          |    |    |
| F0512T-1W   |               |           | 12            | 84           | 9        | 78                    | UL          |    |    |
| F0515T-1W   |               |           | 15            | 66           | 7        | 79                    | UL          |    |    |
| E0505T-1W   |               |           | $\pm 5$       | $\pm 100$    | $\pm 10$ | 71                    | UL          |    |    |
| E0509T-1W   |               |           | $\pm 9$       | $\pm 55$     | $\pm 6$  | 77                    | UL          |    |    |
| E0512T-1W   |               |           | $\pm 12$      | $\pm 42$     | $\pm 5$  | 78                    | UL          |    |    |
| E0515T-1W   |               |           | $\pm 15$      | $\pm 33$     | $\pm 4$  | 79                    | UL          |    |    |
| F1205T-1W   |               |           | 12            | 10.8-13.2    | 5        | 200                   | 20          | 69 | UL |
| F1209T-1W   |               |           |               |              | 9        | 110                   | 11          | 73 | UL |
| F1212T-1W   | 12            | 84        |               |              | 9        | 73                    | UL          |    |    |
| F1215T-1W   | 15            | 66        |               |              | 7        | 74                    | UL          |    |    |
| E1205T-1W   | $\pm 5$       | $\pm 100$ |               |              | $\pm 10$ | 71                    | UL          |    |    |
| E1209T-1W   | $\pm 9$       | $\pm 55$  |               |              | $\pm 6$  | 73                    | UL          |    |    |
| E1212T-1W   | $\pm 12$      | $\pm 42$  |               |              | $\pm 5$  | 74                    | UL          |    |    |
| E1215T-1W   | $\pm 15$      | $\pm 33$  |               |              | $\pm 4$  | 75                    | UL          |    |    |

Note: The E\_T-W2/F\_T-W2 series also are available in our company.

### ISOLATION SPECIFICATIONS

| Item                 | Test Conditions                 | Min  | Typ | Max | Units |
|----------------------|---------------------------------|------|-----|-----|-------|
| Isolation voltage    | Tested for 1 minute and 1mA max | 3000 |     |     | VDC   |
| Isolation resistance | Test at 500VDC                  | 1000 |     |     | MΩ    |

### OUTPUT SPECIFICATIONS

| Item                    | Test Conditions                     | Min                          | Typ. | Max       | Units |
|-------------------------|-------------------------------------|------------------------------|------|-----------|-------|
| Output power            |                                     | 0.1                          |      | 1         | W     |
| Line regulation         | For Vin change of 1%(3.3V output)   |                              |      | $\pm 1.5$ | %     |
|                         | For Vin change of 1%(Others output) |                              |      | $\pm 1.2$ |       |
| Load regulation         | 10% to 100% load 3.3V output        |                              | 15   | 20        |       |
|                         | 10% to 100% load 5V output          |                              | 12.8 | 15        |       |
|                         | 10% to 100% load 9V output          |                              | 8.3  | 10        |       |
|                         | 10% to 100% load 12V output         |                              | 6.8  | 10        |       |
|                         | 10% to 100% load 15V output         |                              | 6.3  | 10        |       |
| Output voltage accuracy |                                     | See tolerance envelope graph |      |           |       |
| Temperature drift       | 100% full load                      |                              |      | 0.03      | %/°C  |
| Output ripple & Noise*  | 20MHz Bandwidth                     | E_T-1W series                | 50   | 75        | mVp-p |
|                         |                                     | F_T-1W series                | 75   | 100       |       |
| Switching frequency     | Full load, nominal input            |                              | 100  |           | KHz   |

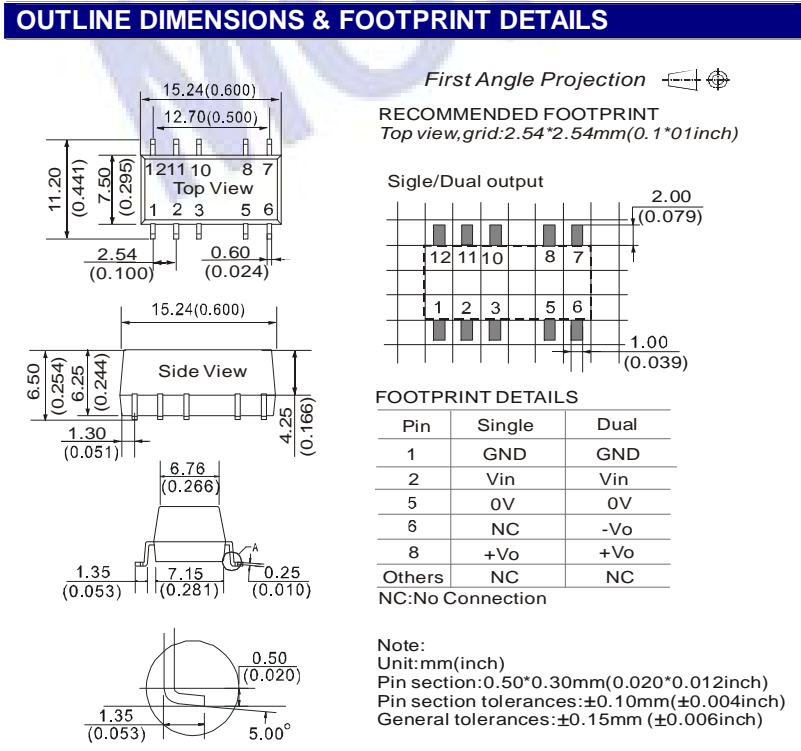
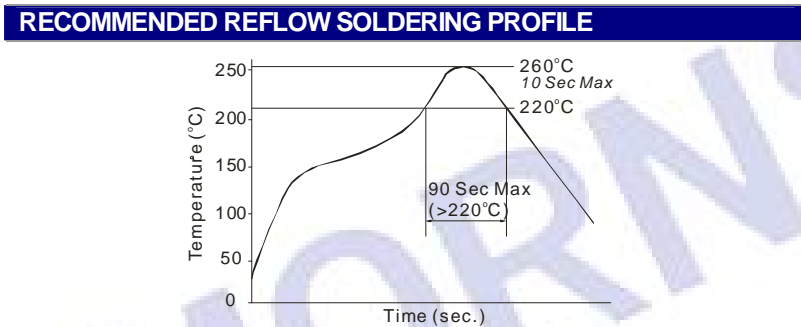
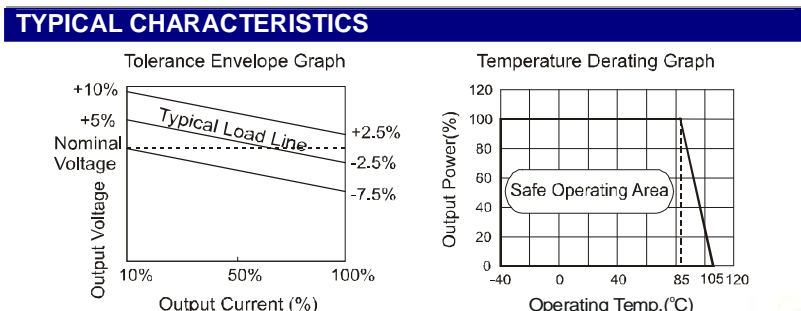
\*Test ripple and noise by "parallel cable" method. See detailed operation instructions at Testing of Power Converter section, application notes.

Note:

1. All specifications measured at  $T_A=25^\circ\text{C}$ , humidity<75%, nominal input voltage and rated output load unless otherwise specified.
2. See below recommended circuits for more details.

| COMMON SPECIFICATION      |                                |                      |     |      |         |
|---------------------------|--------------------------------|----------------------|-----|------|---------|
| Item                      | Test Conditions                | Min                  | Typ | Max  | Units   |
| Storage humidity          |                                |                      |     | 95   | %       |
| Operating temperature     |                                | -40                  |     | 85   | °C      |
| Storage temperature       |                                | -55                  |     | 125  |         |
| Temp. rise at full load   |                                |                      | 15  | 25   |         |
| Lead temperature          | 1.5mm from case for 10 seconds |                      |     | 260  |         |
| Cooling                   |                                | Free air convection  |     |      |         |
| Package material          |                                | Epoxy Resin(UL94-V0) |     |      |         |
| Short circuit protection* |                                |                      |     | 1    | Second  |
| MTBF                      |                                | 3500                 |     |      | K hours |
| Weight                    |                                |                      |     | 1.71 | g       |

\*Supply voltage must be discontinued at the end of short circuit duration.



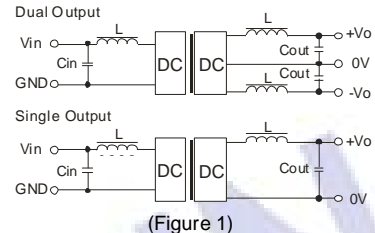
### APPLICATION NOTE

#### Requirement on output load

To ensure this module can operate efficiently and reliably, During operation, the minimum output load is **not less than 10%** of the full load, and that **this product should never be operated under no load!** If the actual output power is very small, please connect a resistor with proper resistance at the output end in parallel to increase the load, or use our company's products with a lower rated output power (E\_T-W2/F\_T-W2 Series).

#### Recommended testing circuit

If you want to further decrease the input/output ripple, an "LC" filtering network may be connected to the input and output ends of the DC/DC converter, see (Figure 1).



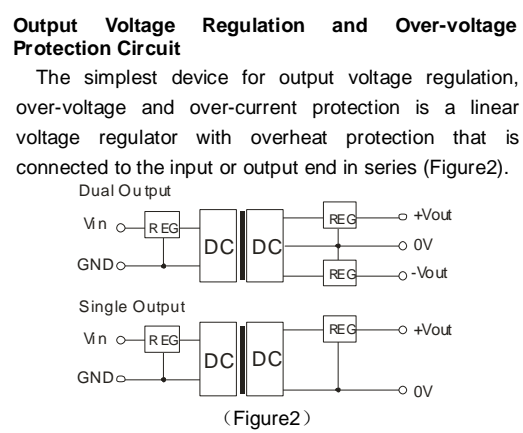
(Figure 1)

It should also be noted that the inductance and the frequency of the "LC" filtering network should be staggered with the DC/DC frequency to avoid mutual interference. However, the capacitance of the output filter capacitor must be proper. If the capacitance is too big, a startup problem might arise. For every channel of output, provided the safe and reliable operation is ensured, the greatest capacitance of its filter capacitor sees (Table 1).

#### EXTERNAL CAPACITOR TABLE (Table 1)

| Vin (VDC) | Cin (uF) | Single Vout (VDC) | Cout (uF) | Dual Vout (VDC) | Cout (uF) |
|-----------|----------|-------------------|-----------|-----------------|-----------|
| 3.3/5     | 4.7      | 5                 | 10        | ±3.3/5          | 4.7       |
| 12        | 2.2      | 9                 | 4.7       | ±9              | 2.2       |
| -         | -        | 12                | 2.2       | ±12             | 1         |
| -         | -        | 15                | 1         | ±15             | 1         |

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



#### Overload Protection

Under normal operating conditions, the output circuit of these products has no protection against overload. The simplest method is to connect a self-recovery fuse in series at the input end or add a circuit breaker to the circuit.

#### No parallel connection or plug and play.