



IB_LT-1W Series

1W, FIXED INPUT, ISOLATED & REGULATED SINGLE OUTPUT SMD DC-DC CONVERTER

multi-country patent protection **RoHS**

FEATURES

- Small Footprint
- SMD Package
- 1KVDC Isolation
- Temperature Range: -40°C to +85°C
- Internal SMD Construction
- Short Circuit Protection
- No Heatsink Required
- No External Component Required
- Industry Standard Pinout
- RoHS Compliance

APPLICATIONS

The IB_LT-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 $\leq \pm 5\%$);
- 2) Where isolation is necessary between input and output (isolation voltage $\leq 1000\text{VDC}$);
- 3) Where the regulation of the output voltage and the output ripple noise are not demanding.

PRODUCT PROGRAM

| Part Number | Input | | Output | | | Efficiency (% Typ) |
|----------------|---------------|-------------|---------------|--------------|-----|--------------------|
| | Voltage (VDC) | | Voltage (VDC) | Current (mA) | | |
| | Nominal | Range | | Max | Min | |
| IB0505LT-W75 | 5 | 4.75-5.25 | 5 | 150 | 15 | 69 |
| IB0509LT-1W | | | 9 | 111 | 12 | 70 |
| IB0512LT-1W | | | 12 | 83 | 9 | 71 |
| IB0515LT-1W * | | | 15 | 67 | 7 | 72 |
| IB1205LT-W75 | 12 | 11.4-12.6 | 5 | 150 | 15 | 69 |
| IB1209LT-1W | | | 9 | 111 | 12 | 70 |
| IB1212LT-1W | | | 12 | 83 | 9 | 71 |
| IB1215LT-1W | | | 15 | 67 | 7 | 72 |
| IB1505LT-W75 * | 15 | 14.25-15.75 | 5 | 150 | 15 | 69 |
| IB1509LT-1W * | | | 9 | 111 | 12 | 70 |
| IB1512LT-1W * | | | 12 | 83 | 9 | 71 |
| IB1515LT-1W * | | | 15 | 67 | 7 | 72 |
| IB2405LT-W75 | 24 | 22.8-25.2 | 5 | 150 | 15 | 69 |
| IB2409LT-1W * | | | 9 | 111 | 12 | 70 |
| IB2412LT-1W * | | | 12 | 83 | 9 | 71 |
| IB2415LT-1W * | | | 15 | 67 | 7 | 72 |

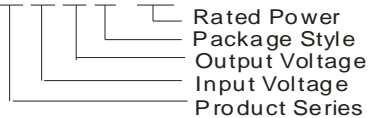
*Designing

ISOLATION SPECIFICATIONS

| Item | Test Conditions | Min | Typ | Max | Units |
|-----------------------|---------------------------------|------|-----|-----|-------|
| Isolation voltage | Tested for 1 minute and 1mA max | 1000 | | | VDC |
| Isolation resistance | Test at 500VDC | 1000 | | | MΩ |
| Isolation capacitance | | | 70 | | pF |

MODEL SELECTION

IB0512LT-1W



OUTPUT SPECIFICATIONS

| Item | Test Conditions | Min | Typ | Max | Units |
|-------------------------|-----------------------------|-----|-----|-----------|-------|
| Output power | | 0.1 | | 1 | W |
| Line regulation | For Vin change of $\pm 5\%$ | | | ± 0.3 | % |
| Load regulation | 10% to 100% load | | | ± 1 | |
| Output voltage accuracy | 100% load | | | ± 3 | |
| Temperature drift | 100% full load | | | 0.03 | %/°C |
| Ripple* | 20MHz Bandwidth | | 10 | 20 | mVp-p |
| Noise* | 20MHz Bandwidth | | 50 | 100 | |
| Switching frequency | Full load, nominal input | | 100 | | KHz |

Note:

1. All specifications measured at TA=25°C, humidity<75%, nominal input voltage and rated output load unless otherwise specified.
2. See below recommended circuits for more details.

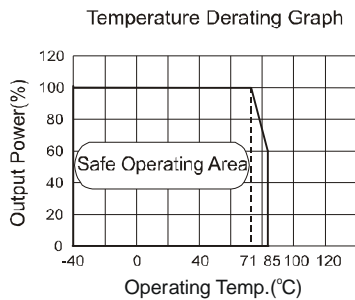
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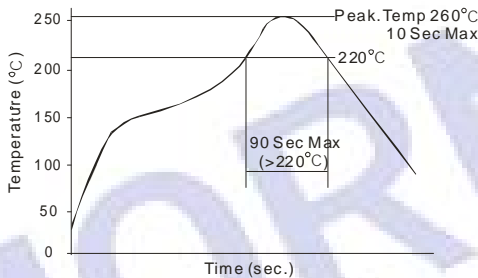
COMMON SPECIFICATION

| Item | Test Conditions | Min | Typ | Max | Units |
|--------------------------|--------------------------------|----------------------|-----|-----|---------|
| Storage humidity | | | | 95 | % |
| Operating temperature | | -40 | | 85 | °C |
| Storage temperature | | -55 | | 125 | |
| Lead temperature | | | 15 | 25 | |
| Temp. rise at full load | 1.5mm from case for 10 seconds | | | 260 | |
| Cooling | | Free air convection | | | |
| Short circuit protection | | continuous | | | |
| Package material | | Epoxy Resin(UL94-V0) | | | |
| MTBF | | 3500 | | | K hours |
| Weight | | | 2.9 | | g |

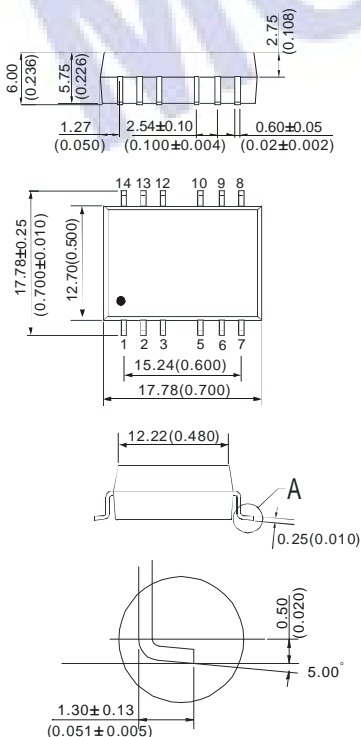
TYPICAL CHARACTERISTICS



RECOMMENDED REFLOW SOLDERING PROFILE



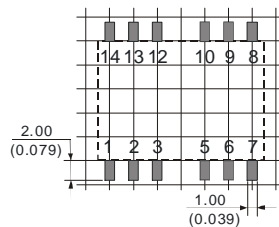
OUTLINE DIMENSIONS & PIN CONNECTIONS



First Angle Projection

RECOMMENDED FOOTPRINT
Top view, grid: 2.54mm (0.1inch)

Single Output



FOOTPRINT DETAILS

| Pin | Function |
|--------|----------|
| 1 | GND |
| 2 | Vin |
| 6 | 0V |
| 7 | +Vo |
| Others | NC |

NC: No Connection

Note:
Unit: mm (inch)
Pin section: 0.60*0.25mm (0.024*0.010inch)
Pin section tolerances: ±0.10mm (±0.004inch)
General tolerances: ±0.25mm (±0.010inch)

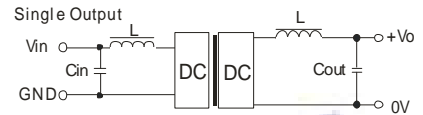
APPLICATION NOTE

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

Recommended 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) |
|-----------|----------|-------------------|-----------|
| 5 | 4.7 | 5 | 4.7 |
| 12 | 2.2 | 9 | 2.2 |
| 15 | 1 | 12 | 2.2 |
| 24 | 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 over-current. The simplest method is to connect a self-recovery fuse in series at the input end or add a circuit breaker to the circuit.

Input Over-voltage Protection Circuit

The simplest device for input over-voltage protection is a linear voltage regulator with overheat protection that is connected to the input end in series (Figure 2).



(Figure 2)

No parallel connection or plug and play.