

IA_KP-*W Series

1W/2W/3W, FIXED INPUT, ISOLATED & REGULATED DUAL OUTPUT DC-DC CONVERTER

multi-country patent protection **RoHS**

FEATURES

- Low ripple
- Good dynamic feature
- 1KVDC Isolation
- DIP Package
- Temperature Range: -40°C to +85°C
- UL94-V0 Package
- No Heatsink Required
- No External Component Required
- Internal SMD construction
- RoHS Compliance

APPLICATIONS

The IA_KP-3W & IA_KP-2W & IA_KP-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 demanded.

PRODUCT PROGRAM

| Part Number | Input | | Output | | | Efficiency (% , Typ) |
|---------------|---------------|-----------|---------------|--------------|----------|----------------------|
| | Voltage (VDC) | | Voltage (VDC) | Current (mA) | | |
| | Nominal | Range | | Max | Min | |
| IA0512KP-1W | 5 | 4.75-5.25 | ± 12 | ± 42 | ± 5 | 64 |
| IA0515KP-1W | | | ± 15 | ± 33 | ± 4 | 65 |
| IA0509KP-2W * | | | ± 9 | ± 100 | ± 10 | 62 |
| IA0512KP-2W | | | ± 12 | ± 83 | ± 9 | 63 |
| IA0515KP-2W | | | ± 15 | ± 67 | ± 7 | 64 |
| IA0512KP-3W | | | ± 12 | ± 100 | ± 10 | 64 |
| IA0515KP-3W | | | ± 15 | ± 100 | ± 10 | 62 |
| IA1212KP-1W * | | | 12 | 11.4-12.6 | ± 12 | ± 42 |
| IA1215KP-1W * | ± 15 | ± 33 | | | ± 4 | 65 |
| IA1209KP-2W | ± 9 | ± 100 | | | ± 10 | 63 |
| IA1212KP-2W | ± 12 | ± 83 | | | ± 9 | 65 |
| IA1215KP-2W * | ± 15 | ± 67 | | | ± 7 | 66 |
| IA1212KP-3W * | ± 12 | ± 100 | | | ± 10 | 65 |
| IA1215KP-3W | ± 15 | ± 100 | | | ± 10 | 68 |
| IA2412KP-1W * | 24 | 22.8-25.2 | | | ± 12 | ± 42 |
| IA2415KP-1W | | | ± 15 | ± 33 | ± 4 | 65 |
| IA2409KP-2W * | | | ± 9 | ± 100 | ± 10 | 63 |
| IA2412KP-2W | | | ± 12 | ± 83 | ± 9 | 66 |
| IA2415KP-2W | | | ± 15 | ± 67 | ± 7 | 67 |
| IA2412KP-3W | | | ± 12 | ± 100 | ± 10 | 68 |
| IA2415KP-3W * | | | ± 15 | ± 100 | ± 10 | 69 |

* 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 |

OUTPUT SPECIFICATIONS

| Item | Test Conditions | Min | Typ | Max | Units |
|-------------------------|--|-----|-----|------------|-------|
| Line regulation | For V_{in} change of $\pm 5\%$ (1W&2W) | | | ± 0.25 | % |
| | For V_{in} change of $\pm 5\%$ (3W) | | | ± 0.3 | |
| | 10% to 100% full load | | | ± 1 | |
| Output voltage accuracy | 100% full load | | | ± 3 | |
| Temperature drift | 100% full load | | | 0.03 | %/°C |
| Output ripple* | 20MHz Bandwidth(1W) | | 10 | 20 | mVp-p |
| | 20MHz Bandwidth(2W & 3W) | | 20 | 40 | |
| Output Noise* | 20MHz Bandwidth(1W & 2W) | | 50 | 150 | |
| | 20MHz Bandwidth(3W) | | 150 | 300 | |
| Switching frequency | Full load, nominal input | | 75 | | KHz |

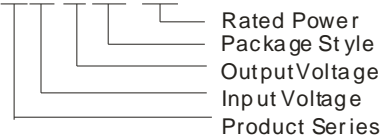
*Test ripple and noise by "parallel cable" method. See detailed operation instructions at Testing of Power Converter section, application notes.

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.

MODEL SELECTION

IA0512KP-3W



MORNSUN Science & Technology co., Ltd.

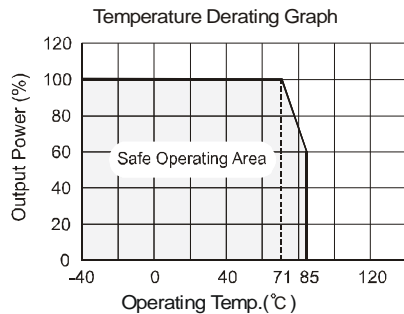
Address: 2th floor 6th building, Hangzhou Industrial District, Guangzhou, China
 Tel: 86-20-38601850
 Fax: 86-20-38601272
<http://www.mornsun-power.com>

COMMON SPECIFICATION

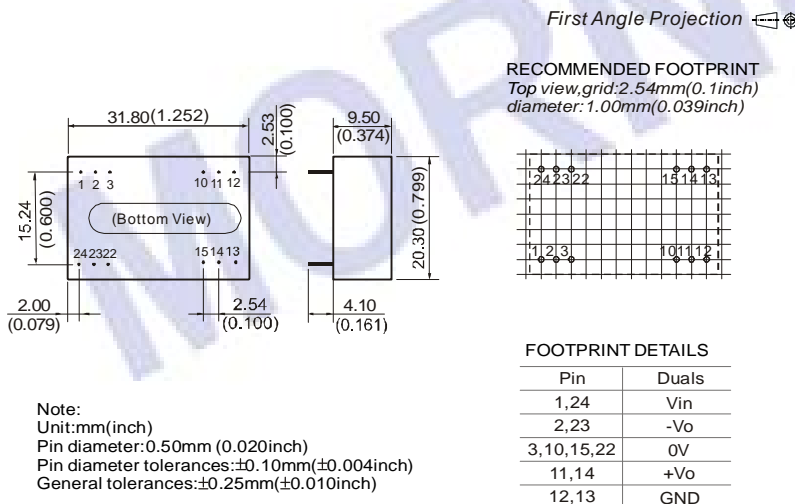
| Item | Test conditions | Min | Typ | Max | Units |
|---------------------------|--------------------------------|------|-----|-----|---------|
| Storage humidity | | | | 95 | % |
| Operating temperature | | -40 | | 85 | °C |
| Storage temperature | | -55 | | 125 | |
| Temp. rise at full load | | | 20 | 30 | |
| Lead temperature) | 1.5mm from case for 10 seconds | | | 300 | |
| Short circuit protection* | | | | 1 | s |
| Cooling | Free air convection | | | | |
| Case material | Plastic(UL94-V0) | | | | |
| MTBF | | 3500 | | | K hours |
| Weight | | | 11 | | g |

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

TYPICAL CHARACTERISTICS



OUTLINE DIMENSIONS & PIN CONNECTIONS



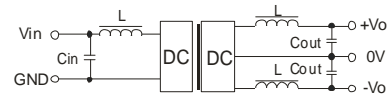
APPLICATION NOTE

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.

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) | Vout(VDC) | Cout(uF) |
|----------|---------|-----------|----------|
| 5 | 4.7 | ±5 | 4.7 |
| 12 | 2.2 | ±9 | 2.2 |
| 24 | 1 | ±12 | 1 |
| - | - | ±15 | 0.47 |

It's not recommended 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 and short-circuits. 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)

When the environment temperature is higher than 71°C, the product output power should be less than 60% of the rated power.

No parallel connection or plug and play.