

D_S-2W Series

**2W, FIXED INPUT ISOLATED & UNREGULATED
TWIN OUTPUT DC-DC CONVERTER**



FEATURES

- High Efficiency up to 85%
- Minute extension
- Good temperature characteristic
- 1KVDC Isolation
- Temperature Range: -40°C to +85°C
- Internal surface mounted design
- No External Component Required
- Industry Standard Pinout
- RoHS Compliance
- Meet UL60950

PRODUCT PROGRAM

| Part Number | Input | | Output | | | Efficiency (% Typ) | Certificate |
|-------------|---------------|-----------|---------------|--------------|-----|--------------------|-------------|
| | Voltage (VDC) | | Voltage (VDC) | Current (mA) | | | |
| | Nominal | Range | | Max | Min | | |
| D050505S-2W | 5 | 4.5-5.5 | 5 | 200 | 20 | 80 | UL |
| D120505S-2W | 12 | 10.8-13.2 | 5 | 200 | 20 | 80 | UL |
| D120909S-2W | | | 9 | 111 | 12 | 83 | UL |
| D121212S-2W | | | 12 | 83 | 9 | 85 | UL |
| D240505S-2W | | | 24 | 21.6-26.4 | 5 | 200 | 20 |
| D241212S-2W | 12 | 83 | | | 9 | 84 | UL |

APPLICATIONS

The D_S-2W 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 $\leq 1000\text{VDC}$);
- 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.

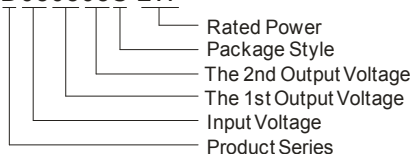
COMMON SPECIFICATIONS

| 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 | -- | -- | 300 | |
| Short circuit protection* | | -- | -- | 1 | s |
| Cooling | | Free air convection | | | |
| Case material | | Plastic (UL94-V0) | | | |
| MTBF | | 3500 | -- | -- | K hours |
| Weight | | -- | 2.8 | -- | g |

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

MODEL SELECTION

D050505S-2W



ISOLATION SPECIFICATIONS

| Item | Test conditions | Min | Typ | Max | Units |
|-----------------------|---|------|-----|-----|-------|
| Isolation voltage | Tested for 1 minute and 1mA max(Vin/Vout) | 1000 | -- | -- | VDC |
| | Tested for 1 minute and 1mA max(Vo1/Vo2) | 1000 | -- | -- | |
| Isolation resistance | Test at 500VDC (Vin/Vout) | 1000 | -- | -- | MΩ |
| | Test at 500VDC (Vo1/Vo2) | 1000 | -- | -- | |
| Isolation capacitance | (Vin/Vout) | -- | 90 | -- | pF |
| | (Vo1/Vo2) | -- | 90 | -- | |

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OUTPUT SPECIFICATIONS

| Item | Test conditions | Min | Typ | Max | Units |
|-------------------------|------------------------------|------------------------------|------|-------|-------|
| Line regulation | For Vin change of 1% | -- | -- | ±1.2 | -- |
| Load regulation | 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 | |
| Output voltage accuracy | | See tolerance envelope graph | | | |
| Temperature drift | 100% full load | -- | -- | ±0.03 | %/°C |
| Output ripple & Noise* | 20MHz Bandwidth | -- | 100 | -- | mVp-p |
| Switching frequency | Full load, nominal input | -- | 70 | -- | KHz |

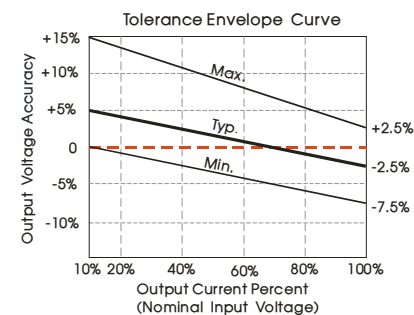
*Test ripple and noise by "parallel cable" method. See detailed operation instructions at Testing of Power Converter section, application notes.

Note:

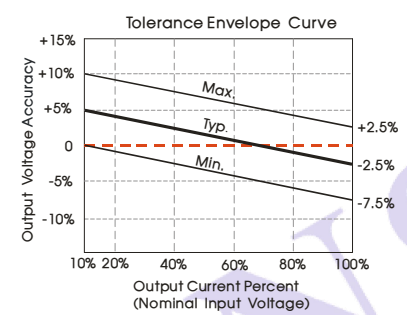
- All specifications measured at TA=25°C, humidity<75%, nominal input voltage and rated output load unless otherwise specified.
- See below recommended circuits for more details.
- Operation under minimum load will not damage the converter; However, they may not meet all specification listed, and that will reduce the life of product

TYPICAL CHARACTERISTICS

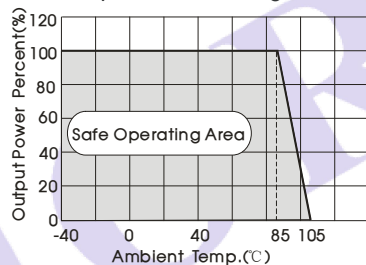
5VDC output



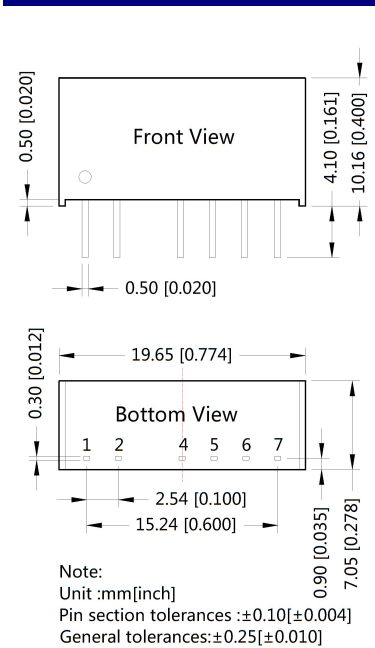
Other output



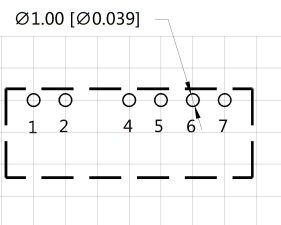
Temperature Derating Curve



OUTLINE DIMENSIONS & PIN CONNECTIONS



THIRD ANGLE PROJECTION



Note : Grid 2.54*2.54mm

| Pin | Function |
|-----|----------|
| 1 | Vin |
| 2 | GND |
| 4 | 0V1 |
| 5 | +Vo1 |
| 6 | 0V2 |
| 7 | +Vo2 |

APPLICATION NOTE

Requirement on output load

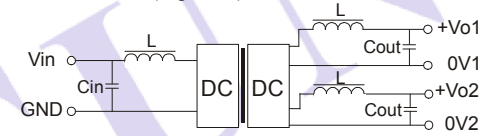
To ensure this module can operate efficiently and reliably, a minimum load is specified for this kind of DC/DC converter in addition to a maximum load (namely full load). During operation, make sure the specified range of input voltage is not exceeded, the minimum output load **could not be less than 10% of the full load**. If the actual output power is very small, please connect a resistor 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.

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.

Recommended and 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)

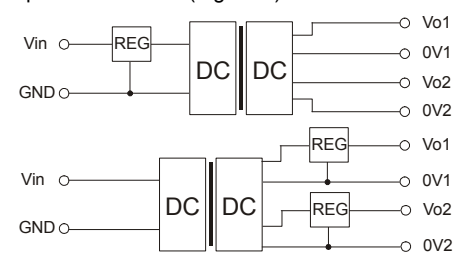
It should also be noted that the inductance and the frequency of the "LC" filtering network should be staggered with the DC/DC frequency to avoid mutual interference. However, the capacitance of the output filter capacitor must be proper. If the capacitance is too big, a startup problem might arise.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

EXTERNAL CAPACITOR TABLE (Table 1)

| Vin (VDC) | Cin (μF) | Vout (VDC) | Cou (μF) |
|-----------|----------|------------|----------|
| 5 | 4.7 | 5 | 4.7 |
| 12 | 2.2 | 9 | 2.2 |
| 24 | 1 | 12 | 1 |

Output Voltage Regulation and Over-voltage Protection Circuit

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



(Figure 2)

No parallel connection or plug and play.