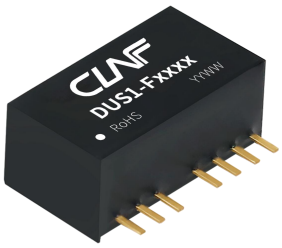
## Descriptions

1W isolated, DC-DC Converter




RoHS

CE Report EN62368-1

UKCA Report BS EN62368-1

## Features

- Ultra-wide input voltage range (8:1)
- High efficiency up to 74%
- No-load power consumption as low as 0.12W
- I/O isolation test voltage 3k VDC
- Operating ambient temperature range: -40℃ to +105℃
- Input under-voltage protection, output short-circuit, over-current protection
- Industry standard pin-out

## Applications

- Industrial control
- Medical care
- Industrial control
- Electric power
- Instruments
- Communication

## Selection Guide

| Certification | Part No. | Input Voltage (VDC) | | Output | | Full Load Efficiency② (%) Min./Typ. | Capacitive Load (μF)Max. |
|---|---|---|---|---|---|---|---|
| | | Nominal (Range) | Max.① | Voltage(VDC) | Current(mA) Max. | | |
| EN/BS EN | DUS1-F1205 | 12 (4.5-36) | 40 | 5 | 200 | 69/71 | 470 |
| | DUS1-F1209 | | | 9 | 111 | 69/72 | 220 |
| | DUS1-F1212 | | | 12 | 83 | 72/74 | 330 |
| | DUS1-F1215 | | | 15 | 67 | 72/74 | 220 |

Note:
①Exceeding the maximum input voltage may cause permanent damage;
②Efficiency is measured at nominal input voltage and rated output load;
③Product images are for reference only; the actual product shall prevail.

## Specifications

| Product Specifications | Item | Operating Conditions | | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|---|
| Input Specifications | Input Current (full load / no-load) | 5V output | | -- | 117/10 | 121/15 | mA |
| | | Others | | -- | 116/10 | 121/15 | |
| | Reflected Ripple Current | | | -- | 50 | -- | |
| | Surge Voltage (1sec. max.) | | | -0.7 | -- | 50 | VDC |
| | Start-up Voltage | | | -- | -- | 4.5 | |
| | Input Under-voltage Protection | | | 2.5 | 3.5 | -- | |
| | Input Filter | | | Capacitance Filter | | | |
| | Hot Plug | | | Unavailable | | | |
| Output Specifications | Output Voltage Accuracy | 0% -100% load | | -- | ±1 | ±3 | % |
| | Line Regulation | Full load, the input voltage is from low to high | | -- | -- | ±0.5 | |
| | Load Regulation | 5% -100% load | | -- | -- | ±1 | |
| | Transient Recovery Time | 25% load step change, nominal input voltage | | -- | 300 | 500 | μs |
| | Transient Response Deviation | 25% load step change, nominal input voltage | 5V output | -- | ±5 | ±8 | % |
| | | | Others | -- | ±3 | ±5 | |
| | Temperature Coefficient | Full load | | -- | -- | ±0.03 | %/℃ |
| | Ripple & Noise① | 20MHz bandwidth, 5% -100% load | | -- | 60 | 100 | mVp-p |
| | Over-current Protection | Input voltage range | | 110 | -- | 300 | %Io |
| | Short-circuit Protection | | | Continuous, self-recovery | | | |
| General Specifications | Isolation | Input-output Electric Strength test for 1 minute with a leakage current of 1mA max. | | 3000 | -- | -- | VDC |
| | Insulation Resistance | Input-output insulation at 500VDC | | 1000 | -- | -- | MΩ |
| | Isolation Capacitance | Input-output capacitance at 100kHz/0.1V | | -- | 40 | -- | pF |
| | Operating Temperature | See Fig. 1 | | -40 | -- | +105 | ℃ |
| | Storage Humidity | Without condensation | | 5 | -- | 95 | %RH |
| | Storage Temperature | | | -55 | -- | +125 | ℃ |
| | Pin Soldering Resistance Temperature② | Soldering spot is 1.5mm away from the case, 10 seconds max. | | -- | -- | +300 | |
| | | Wave soldering, maximum 10 seconds | | 255 | 260 | 265 | |
| | Vibration | | | 10-150Hz, 5G, 0.75mm. along X, Y and Z | | | |
| | Switching Frequency③ | PWM mode | | -- | 300 | -- | kHz |
| | MTBF | MIL-HDBK-217F@25℃ | | 1000 | -- | -- | k hours |
| Physical Specifications | Case Material | Black plastic; flame-retardant and heat-resistant (UL94-V0) | | | | | |
| | Package Dimensions | 22.00 × 9.50 ×12.00 mm | | | | | |
| | Weight | 4.6g (Typ.) | | | | | |
| | Cooling Method | Free air convection | | | | | |

Note:
①Under 0% -5% load conditions, ripple & noise does not exceed 5%Vo. The "parallel cable" method is used for ripple and noise test;
②The pin soldering temperature tolerance is not the actual temperature set by the soldering iron but the temperature required for proper solder joints. The actual temperature set by the customer should be determined comprehensively based on factors such as PCB thickness, copper coverage, soldering iron power, and

soldering iron tip selection;
③Switching frequency is measured at full load. The module reduces the switching frequency for light load (below 50%) efficiency improvement.

## Electromagnetic Compatibility (EMC)

| | | | | |
|---|---|---|---|---|
| Emissions (EMI) | CE | CISPR32/EN55032 | CLASS B (see Fig.3-② for recommended circuit) | |
| | RE | CISPR32/EN55032 | CLASS B (see Fig.3-② for recommended circuit) | |
| Immunity (EMS) | ESD | IEC/EN61000-4-2 | Contact ±6kV | perf. Criteria B |
| | RS | IEC/EN61000-4-3 | 10V/m | perf. Criteria A |
| | EFT | IEC/EN61000-4-4 | ±2kV (see Fig.3-① for recommended circuit) | perf. Criteria B |
| | Surge | IEC/EN61000-4-5 | line to line ±2kV (see Fig.3-①for recommended circuit) | perf. Criteria B |
| | CS | IEC/EN61000-4-6 | 3 Vr.m.s | perf. Criteria A |

## Characteristic Curve

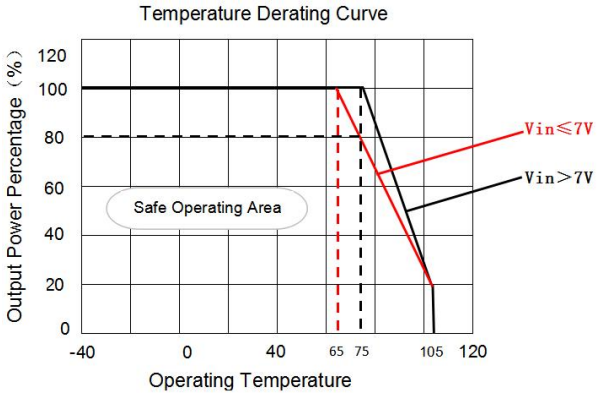



Fig. 1

## Design Reference

### 1. Typical application

①All the DC/DC converters of this series are tested according to the recommended circuit (see Fig. 2) before delivery.
②If it is required to further reduce input and output ripple, properly increase the input & output of additional capacitors Cin and Cout or select capacitors of low equivalent impedance provided that the capacitance is no larger than the max. capacitive load of the product.




Fig. 2

Parameter description:

| Vout (VDC) | Cout | Cin |
|---|---|---|
| 5/9/12/15 | 22μF/25V | 100μF/50V |

### 2. EMC compliance circuit

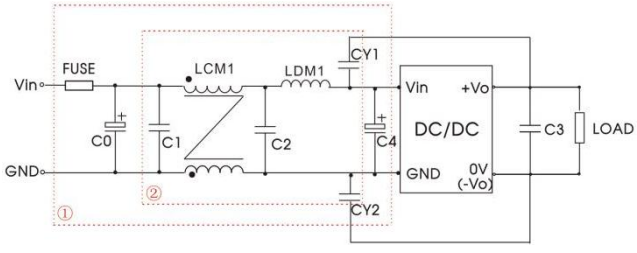



Fig. 3

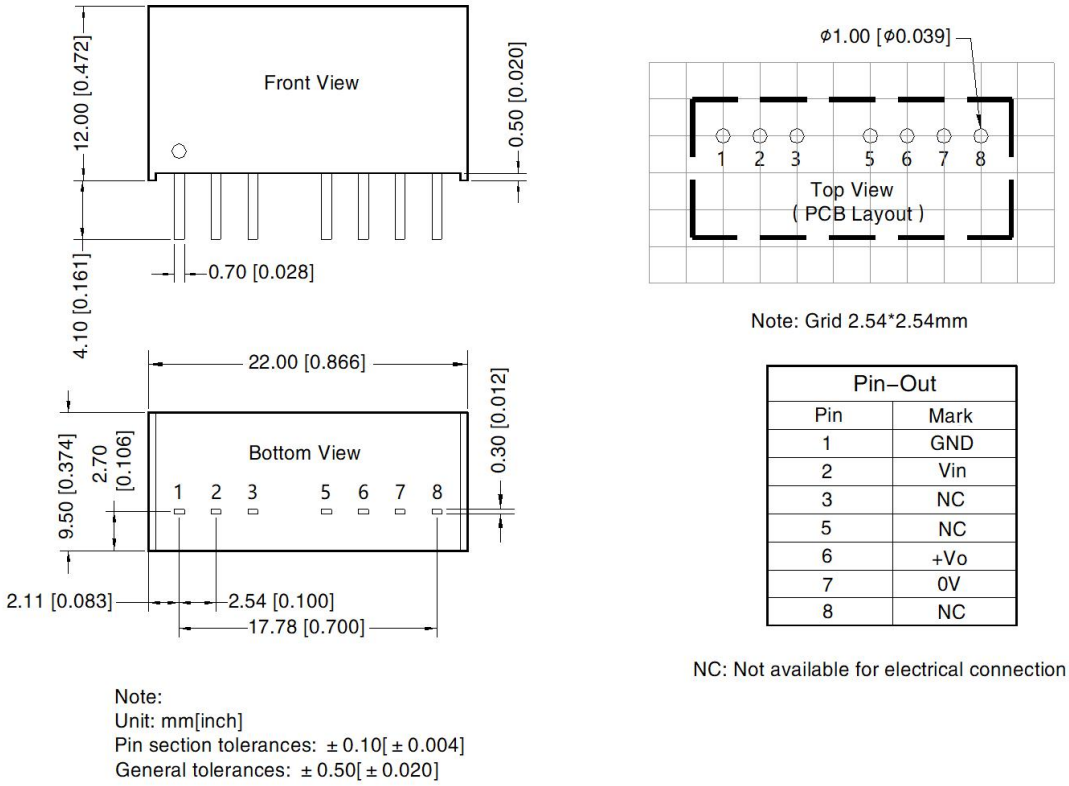
Notes: For EMC tests we use Part ① in Fig. 3 for immunity and part ② for emissions test. Selecting based on needs.

Parameter description:

| Model | Vin: 12VDC |
|---|---|
| FUSE | Select fuse value according to actual input current |
| C0 | 1000μF/50V |
| C4 | 100μF/50V |
| C1/C2 | 4.7μF/50V |
| C3 | 22μF/50V |
| LCM1 | 2.2mH |
| LDM2 | 4.7μH |
| CY1/CY2 | 1nF/3kV |

3. The products do not support parallel connection of their output

## Dimensions and Recommended




Note: Grid 2.54*2.54mm

| Pin–Out | |
|---|---|
| Pin | Mark |
| 1 | GND |
| 2 | Vin |
| 3 | NC |
| 5 | NC |
| 6 | +Vo |
| 7 | 0V |
| 8 | NC |

NC: Not available for electrical connection

Note:
Unit: mm[inch]
Pin section tolerances: ± 0.10[ ± 0.004]
General tolerances: ± 0.50[ ± 0.020]

Note:

1. The maximum capacitive load offered were tested at input voltage range and full load;
2. Unless otherwise specified, parameters in this datasheet were measured under the conditions of Ta=25℃, humidity<75%RH with nominal input voltage and rated output load;
3. All index testing methods in this datasheet are based on company corporate standards;
4. Products are related to laws and regulations: see "Features" and "EMC";
5. Our products shall be classified according to ISO14001 and related environmental laws and regulations, and shall be handled by qualified units;
6. The image certification marks are for reference only; please refer to the selection table for actual specifications. Certification is based on the physical mark or packaging label.