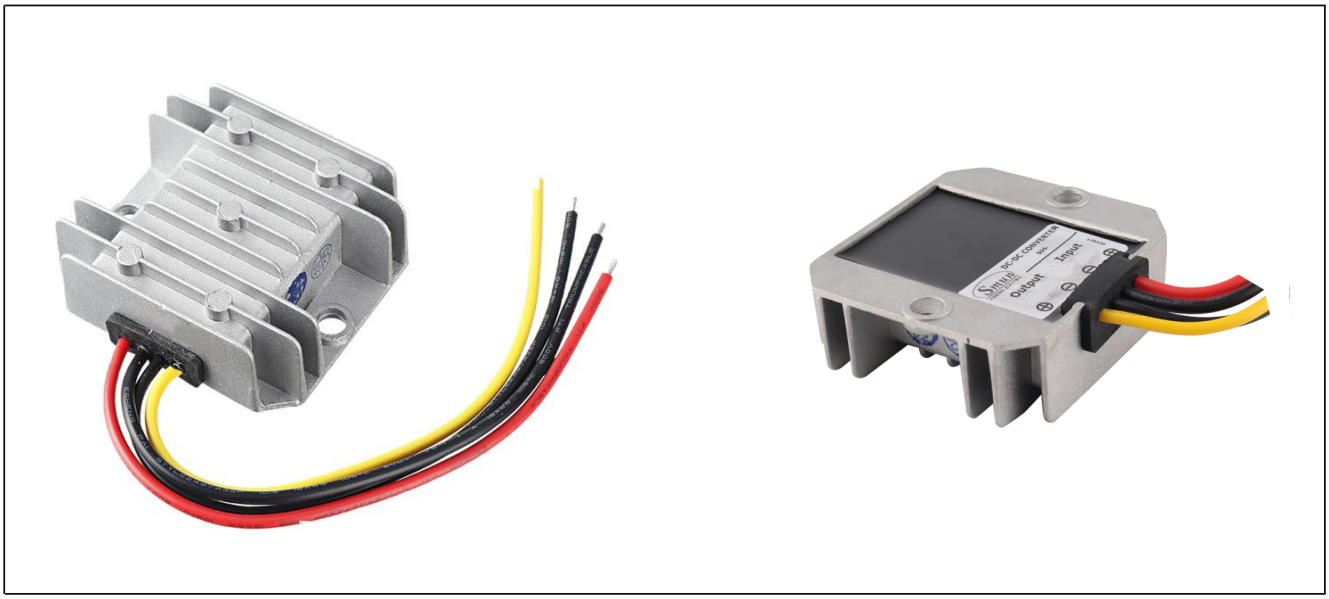
# Non-Isolated DC/DC Converter Specification

Model No.: SDJ-48S2405

Version No. 1.0

| Input voltage | Output voltage | Output current | Output power | Efficiency | Size |
|---|---|---|---|---|---|
| 30-60V DC | 24V DC | 5 Amps | 120 Watts | 95.2% | 64*57*22mm |



The SDJ-48S2405 is a Non-isolated DC-DC converter that uses a synchronous rectification technology, and features high efficiency and power density. It has the dimensions of 64mm x 57mm x 22mm (2.52 in. x 2.24 in. x 0.87 in) and provides the rated output voltage of 24V and the maximum output current of 5A.

## Features

- Design meeting RoHS / CE
- High efficiency: 95.2% (@ 48Vin, 25℃)
- Non-isolated between input and output
- Small size, high reliability
- Support -40 °C environment
- 100% full load burn-in test
- Short circuit, Over load, Low-voltage protections
- Waterproof level IP68
- 1 Year warranty

## Applications

- Industrial
- Alternative Energy
- Golf Cart
- Cars & Forklift
- Electromotor
- Telecommunications
- Boat & Yacht
- Medical
- LED Marketplaces and so on.

## Model naming method

**SDJ-48S2405**

**SDJ**: Step down type

**48** : Input rated voltage

**S** : Single output type

**24** : Output voltage

**05** : Output current

## Electrical Specifications

Conditions: TA = 25 °C (77°F), Airflow = 1 m/s (200LFM), Vin =48V, Vout =24V, unless otherwise specified.

| Parameter | Min. | Typ. | Max. | Units | Remarks |
|---|---|---|---|---|---|
| **Absolute maximum ratings** | | | | | |
| Operating ambient temperature | -40 | - | +55 | °C | |
| Shell ambient temperature | -40 | - | 80 | °C | |
| Storage temperature | -55 | - | 100 | °C | |
| Operating humidity | 5 | - | 95 | % | Non-condensing |
| Atmospheric pressure | 62 | - | 106 | Kpa | |
| Altitude | - | - | 4000 | m | |
| Cooling way | - | - | - | | Natural cooling |
| **Input characteristics** | | | | | |
| Input voltage | 30 | 48 | 60 | V | - |
| Max. input voltage | - | - | 63 | V | 1 SEC |
| Undervoltage shutdown | 28 | 28.5 | 29 | V | Automatic recovery |
| Undervoltage recovery | 29 | 29.5 | 30 | V | Automatic recovery |
| Max. input current | - | - | 4.5 | A | Vin =30V; Iout =5A |
| No load current | - | 50 | 70 | mA | Vin =48V |
| Positive electrode cable | 18 | - | - | AWG | If the wire length is greater than 50cm, it is recommended to use a thicker wire diameter. |
| Negative electrode cable | 18 | - | - | AWG | |
| Enable PIN cable | - | NA | - | AWG | If the unit with this function |
| Fuse | - | 20 | - | A | Input positive has built-in fuse |
| **Output characteristics** | | | | | |
| Efficiency | - | 95.2 | - | % | Vin =48V; Iout =5A |
| Output voltage | 23.7 | 24 | 24.4 | V | Vin =48V; Iout =5A |
| Regulator accuracy | - | ±3 | - | % | |
| Voltage regulation | - | ±2 | - | % | |
| Load Regulation | - | ±2 | - | % | |
| Overvoltage protection | - | NA | - | V | |
| Output current | 0 | - | 5 | A | |
| Overcurrent protection | 6 | 9 | 12 | A | Vin=30-60V |
| External capacitance | - | NA | - | μF | DON'T NEED |
| Output ripple and noise | - | 154 | 300 | mVp-p | Vin =30-60V; Iout=5A<br>Oscilloscope bandwidth: 20 MHz; |
| Output voltage rise time | - | 98 | 130 | mS | |
| Boot delay time | - | 101 | 150 | mS | |
| Out voltage overshoot | - | - | 3 | % | Vin =48V |
| Over temperature protection | - | NA | - | °C | |
| Short circuit protection | - | YES | - | | Long-term (4 hours) short circuit is not damaged, Hiccup mode |
| Positive electrode cable | 18 | - | - | AWG | If the wire length is greater than 50cm, it is recommended to use a thicker wire diameter. |
| Negative electrode cable | 18 | - | - | AWG | |

| | | | | |
|---|---|---|---|---|
| **Safety and EMC features** | | | | |
| Anti-electric Strength | Input to Output | - | V | Leakage current ≤ 3.5mA, 1min, no breakdown, no arcing |
| | Input to Shell | ≥500 | V | |
| | Output to Shell | ≥500 | V | |
| Insulation resistance | Input to Output | ≥10 | MΩ | Test voltage = 500V |
| | Input to Shell | | | |
| | Output to Shell | | | |
| **Other characteristics** | | | | |
| Weight | ≤ 120 | | g | |
| Package | white box | | | |
| MTBF | ≥200,000 | | H | Vin= 48V; Iout= 5A |
| Switching frequency | 250±10 | | KHz | |

## Characteristic Curves

Conditions: TA = 25°C (77°F), Vin = 48V, Vout = 24V, unless otherwise specified.

**Figure 1, Efficiency**

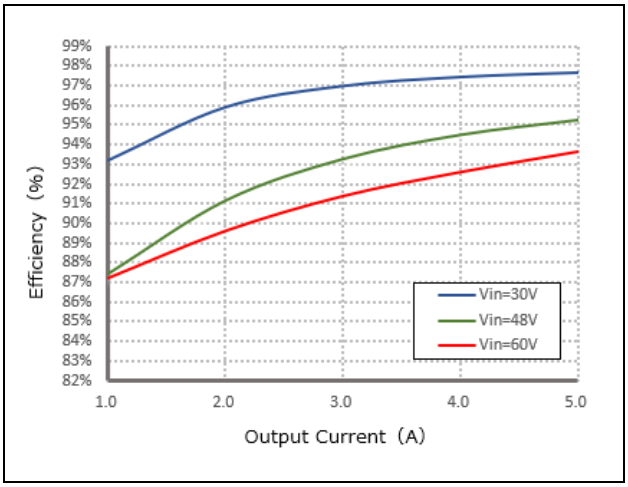



**Figure 2, Power dissipation**

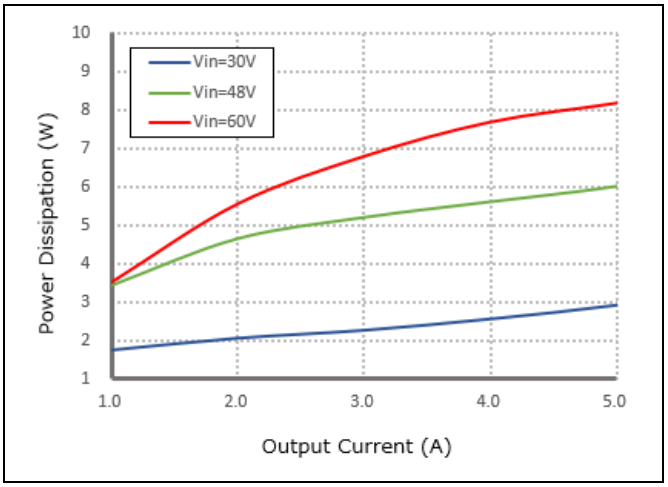
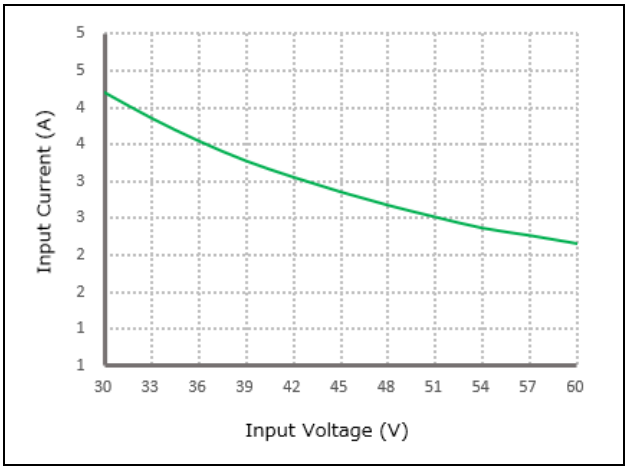



**Figure 3, Input V-I, Iout=5A**



## Typical Waveforms

Conditions: TA = 25° C (77° F), Vin = 48V, unless otherwise specified.

**Figure 4, 25% - 50% load dynamic**

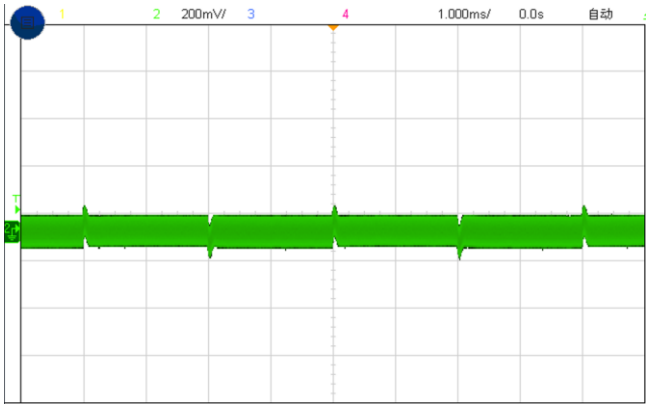



**Figure 5, 50% - 75% load dynamic**

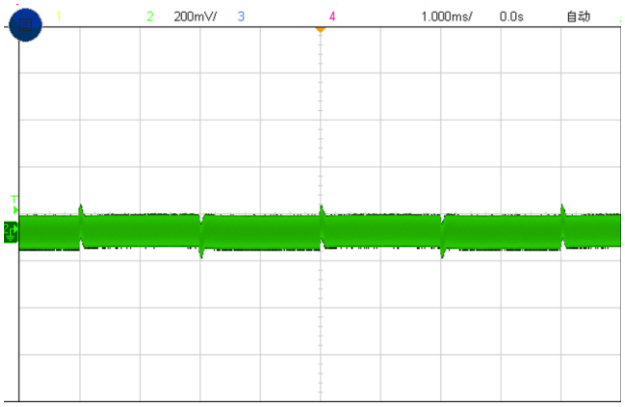



**Figure 6, Output voltage established (Iout = 5A)**

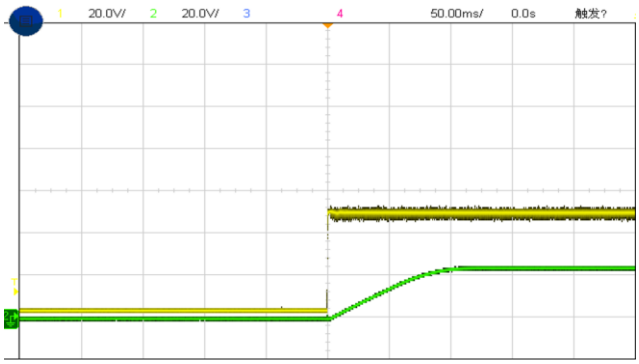
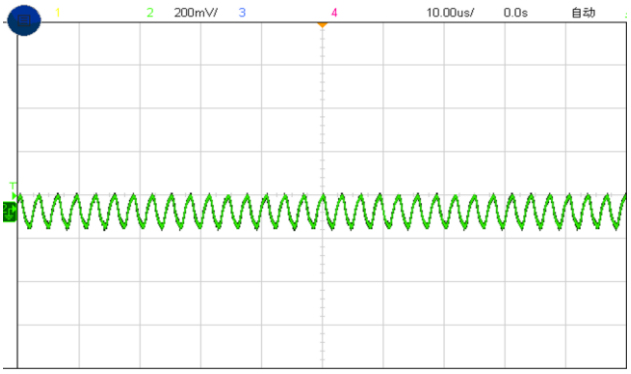



**Figure 7, Output ripple & noise (Iout = 5A)**

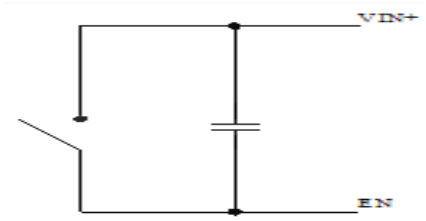


## Feature Description

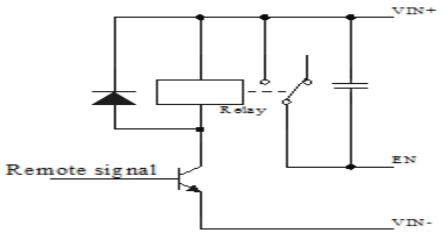
### Remote On/Off (EN) (Optional)

| Logic Enable | Low level (0 - 30Vdc) | High level (30-60Vdc) | Left open |
|---|---|---|---|
| Positive logic | Off | On | Off |

### Various circuits for driving the EN




Simple control




Transistor control

### Wiring Instructions

The input and output of this product is terminals. The user should ensure that the input and output wires and terminals are connected reliably, and pay attention to the wire diameter to meet the requirements of the power supply current. If the cable to be used is long, it needs Considering the voltage drop of the wire, if the voltage drop is too large, the voltage output at the load end may not meet the load demand. In this case, consider using a thicker wire diameter or reducing the length of the wire. Generally, if long wiring is required. Long line should be used on the side where the current is relatively small. For example, this product is a step-down product, so long lines should be used on the input side.

### Input Undervoltage Protection

The converter will shut down after the input voltage drops below the under-voltage protection threshold for shutdown. The converter will start to work again after the input voltage reaches the input under voltage protection threshold for startup. For the Hysteresis, see the Protection characteristics.

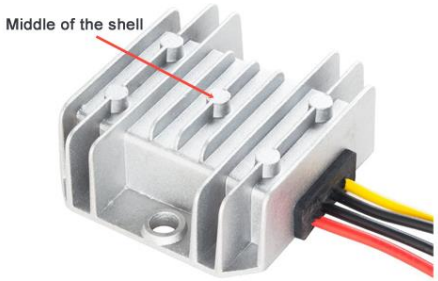
### Output Overcurrent Protection

The converter equipped with current limiting circuitry can provide protection from an output overload or short circuit condition. If the output current exceeds the output overcurrent protection set point, the converter enters hiccup mode. When the fault condition is removed, the converter will automatically restart.

## Thermal Consideration

Sufficient airflow should be provided to help ensure reliable operating of the SDJ-48S2405.

Therefore, thermal components are mounted on the top surface of the SDJ-48S2405 to dissipate heat to the surrounding environment by conduction, convection, and radiation. Proper airflow can be verified by measuring the temperature at the middle of the base plate.




## Dimension

