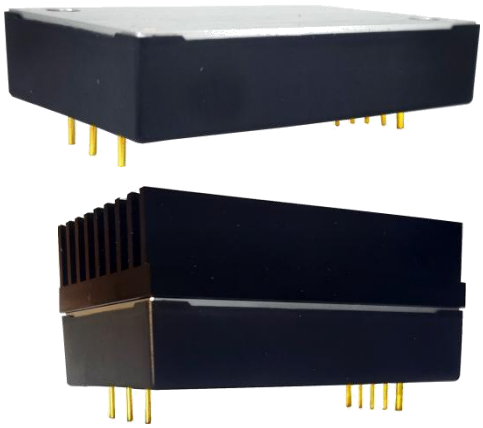
# CD100-110S05 Series
# DC/DC Converter 1/4 Brick



## Typical Features

- ◆Wide input voltage range 4:1
- ◆High efficiency up to 88%
- ◆Low no-load power consumption
- ◆Operating Temperature:-40℃ to +105℃
- ◆High isolation voltage, input-output 3000VAC, input-case 2100VAC
- ◆Protection: input under voltage, output over current, over voltage, short circuit, over temp
- ◆Standard 1/4 brick

**CD100-110S05** high efficiency 1/4 brick dc-dc converter, rated input voltage 110VDC, output 5V/100W, no minimum load, wide input voltage 43-160VDC, regulated single output, high isolation insulation voltage, allowing operating temperature up to 105 ℃, with input under-voltage protection, output over-current protection, over-voltage protection, over-temperature protection, short-circuit protection, remote control and remote compensation, output voltage regulation and other functions.

## Typical Product List

| Part No | Input voltage range (VDC) | Output power (W) | Output voltage (VDC) | Output current (A) | Ripple & Noise (mV) | Full load efficiency(%) Min/Typ. | Note |
|---|---|---|---|---|---|---|---|
| CD100-110S05C | 43-160 | 100 | 5 | 20 | 100 | 86/88 | Standard positive logic |
| CD100-110S05N | | | | | | | Standard negative logic |
| CD100-110S05C-H | | | | | | | Heatsink positive logic |
| CD100-110S05-H | | | | | | | Heatsink negative logic |

## Input Specification

| Item | Operating conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|
| Max input current | 43V input voltage, full load output | -- | -- | 3 | A |
| No load input current | Rated input voltage | -- | -- | 30 | mA |
| Input surge voltage (1sec. max.) | Inputs above this range may cause permanent damage | -0.7 | -- | 185 | VDC |
| Start up voltage | | -- | -- | 43 | |
| Input under voltage protection | No-load test, full-load test will have overcurrent protection in advance | -- | -- | 32 | |
| Control Pin(CNT) | Positive logic: CNT is suspended or connected to 3.5-15V to turn on, connected to 0-1.2V to turn off | | | | Reference voltage-VIN |
| | Negative logic: CNT is suspended or connected to 3.5-15V to turn off, connected to 0-1.2V to turn on | | | | |

## Output Specification

| Item | Working conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|
| Output Voltage Accuracy | Nominal input voltage, 0%-100% load | -- | ±0.2 | ±1.0 | |

| | | | | | |
|---|---|---|---|---|---|
| Line Regulation | Full load, input voltage from low to high | -- | ±0.1 | ±0.2 | |
| Load Regulation | Nominal input voltage, 10%-100% load | -- | ±0.1 | ±0.2 | |
| Transient recovery time | 25% load step change (step rate 1A/50uS) | -- | 200 | 250 | uS |
| Transient Response Deviation | | -5 | -- | 5 | % |
| Temperature Drift Coefficient | Full load | -0.02 | -- | +0.02 | %/℃ |
| Ripple & Noise | 20M bandwidth, external capacitor above 220uF | -- | 50 | 100 | mVp-p |
| Output voltage adjustment (TRIM) | | -20 | -- | +10 | % |
| Output voltage remote compensation (Sense) | | -- | -- | 105 | % |
| Over temp protection | Maximum temperature of product metal substrate surface | 105 | 115 | 125 | ℃ |
| Output overvoltage protection | | 125 | -- | 150 | % |
| Output overcurrent protection | | 21 | -- | 28 | A |
| Output short circuit protection | | Hiccup, continuous, self-recovery | | | |

## General Specification

| Item | Operating conditions | | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| Isolation Voltage | I/P-O/P | Test 1min, leakage current < 3mA | 3000 | -- | -- | VAC |
| | I/P-Case | Test 1min, leakage current < 3mA | 2100 | -- | -- | VAC |
| | O/P-Case | Test 1min, leakage current < 3mA | 500 | -- | -- | VAC |
| Insulation resistance | I/P-O/P | Insulation voltage 500VDC | 100 | -- | -- | MΩ |
| Switching frequency | | | | 250 | -- | KHz |
| MTBF | | | 150 | | -- | K hours |

## Environmental Characteristics

| Item | Operating conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|
| Operating Temperature | See temperature derating curve | -40 | -- | +105 | ℃ |
| Storage Humidity | No condensing | 5 | -- | 95 | %RH |
| Storage Temperature | | -40 | -- | +125 | ℃ |
| Soldering resistance of pins | The solder joint is 1.5mm away from the shell, and the soldering time< 1.5S | -- | -- | +350 | |
| Cooling requirements | | EN60068-2-1 | | | |
| Dry heat requirement | | EN60068-2-2 | | | |
| Damp heat requirement | | EN60068-2-30 | | | |
| Shock and vibration | | IEC/EN 61373 Body 1 Class B | | | |

## EMC Characteristics（EN50155）

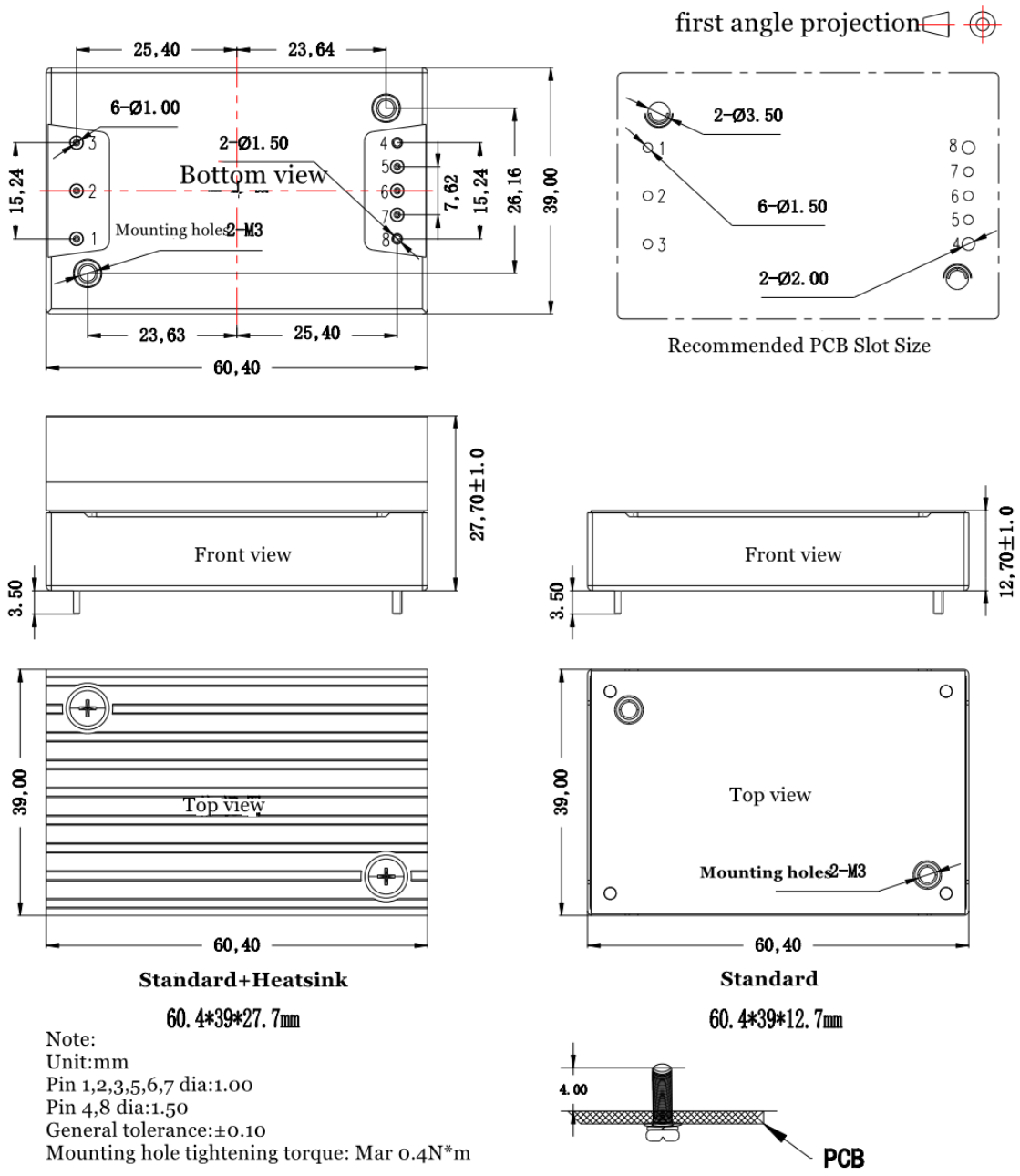
| | | | | |
|---|---|---|---|---|
| **EMI** | CE | EN50121-3-2 | 150kHz-500kHz 79dBuV | |
| | | EN55016-2-1 | 500kHz-30MHz 73dBuV | |
| | RE | EN50121-3-2 | 30MHz-230MHz 40dBuV/m at 10m | |
| | | EN55016-2-1 | 230MHz-1GHz 47dBuV/m at 10m | |
| **EMS** | ESD | EN50121-3-2 | Contact ±6KV/Air ±8KV | perf. Criteria A |
| | RS | EN50121-3-2 | 10V/m | perf. Criteria A |
| | EFT | EN50121-3-2 | ±2kV 5/50ns 5kHz | perf. Criteria A |

| | | | | |
|---|---|---|---|---|
| | Surge | EN50121-3-2 | line to line ± 1KV (42Ω, 0.5μF) | perf. Criteria A |
| | CE | EN50121-3-2 | 0.15MHz-80MHz 10 Vr.m.s | perf. Criteria A |

## Physical Characteristics

| | |
|---|---|
| Case Materials | Metal bottom shell + black flame retardant material shell (UL94 V-0) |
| Heat sink | Dimension 60.4*39.0*15mm, weight 52g, aluminum alloy, anodized black |
| Cooling method H | Conduction cooling or forced air cooling |
| Product Weight | Standard 72g, with heatsink 125g |

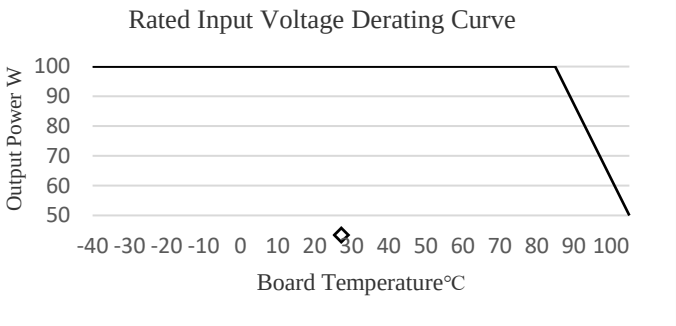
## Dimension and Pin-Out

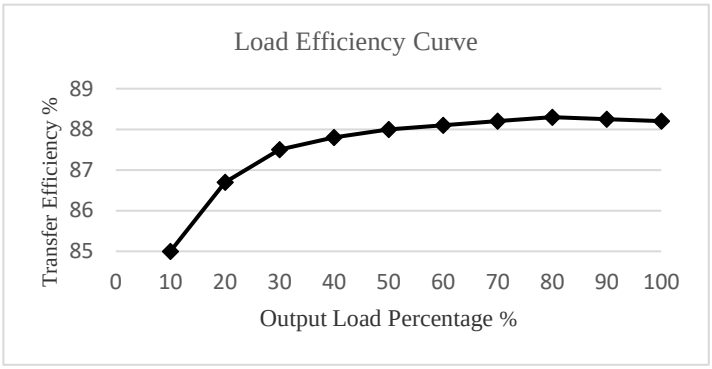


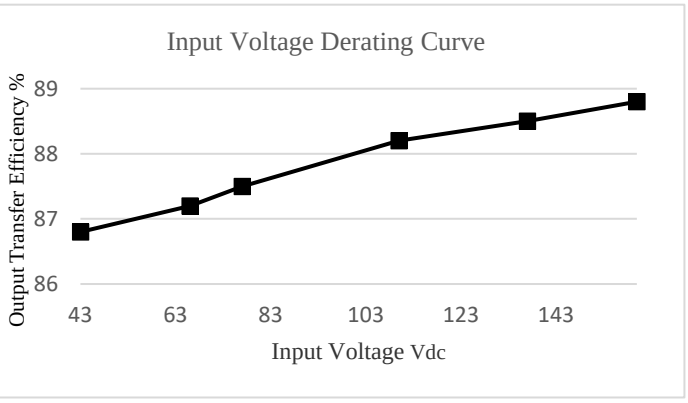

Note:
Unit:mm
Pin 1,2,3,5,6,7 dia:1.00
Pin 4,8 dia:1.50
General tolerance:±0.10
Mounting hole tightening torque: Mar 0.4N*m

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| Pin-Out | Vin+ | CNT | Vin- | Vout- | -S | TRIM | +S | Vout+ |

## Product Characteristic Curve



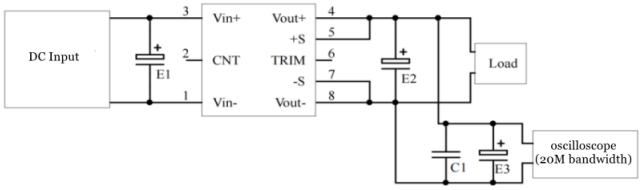




Note:
1. Both the temperature derating curve and the efficiency curve are tested with typical values;
2. The temperature derating curve is tested according to our laboratory test conditions. If the actual environmental conditions used by customers are inconsistent, it is necessary to ensure that the temperature of the aluminum casing of the product does not exceed 105 °C, and it can be used within any rated load range.

## Design Reference

### 1. Ripple & Noise

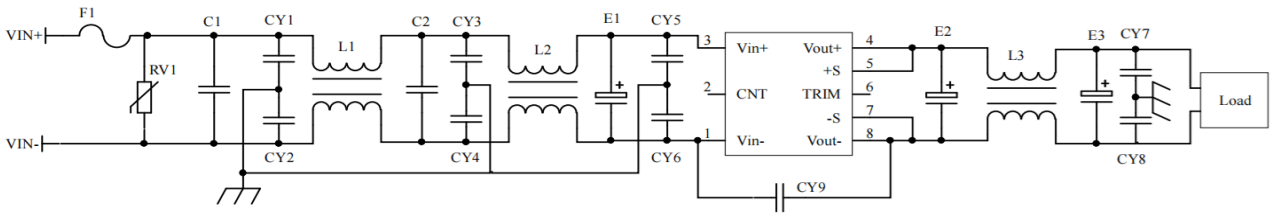
All DC/DC converters of this series are tested according to the test circuit recommended in the following figure before leaving the factory.




| Output voltage \ capacitor value | E1 (μF) | E2 (μF) | C1 (μF) | E3 (μF) |
|---|---|---|---|---|
| 3.3VDC | 100 | 1000 | 1 | 10 |
| 5VDC | | 680 | | |
| 12VDC | | 220 | | |
| ..... | | | | |
| 48VDC | | | | |
| ..... | 68 | 68 | | |
| 110VDC | | | | |

### 2. Recommended application circuit

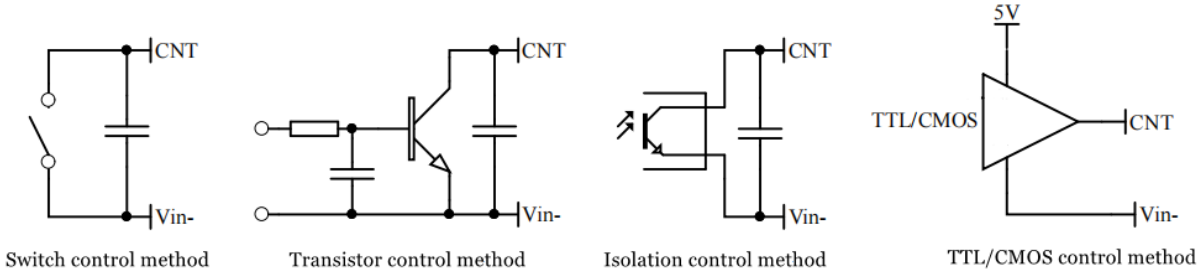
If customer does not use the circuit recommended by our company, please be sure to connect an electrolytic capacitor of at least 47 μF in parallel at the input end to suppress the possible surge voltage at the input end.




| | |
|---|---|
| F1 | T6.3A/250V fusing |
| RV1 | 14D 200V Varistor |
| C1,C2 | 105/250V Polyester Film Capacitor |
| CY1,CY2,CY3,CY4,CY5,CY6 | 472/250Vac Safety Y2 capacitor |
| CY7,CY8 | 103/2KV ceramic capacitor |
| CY9 | 471/250Vac safety Y1 capacitor |
| E1 | 100μF/200V Electrolytic Capacitor |
| E2，E3 | 220μF/16V Electrolytic Capacitor |

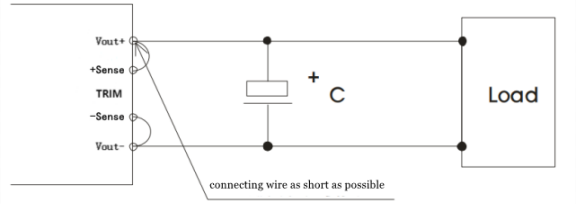
| | |
|---|---|
| L1,L2 | inductance is greater than 10mH, and the overcurrent 3A temperature rise is less than 25℃ |
| L3 | inductance is greater than 200uH, and the overcurrent 25A temperature rise is less than 25℃ |

## 3. Remote control terminal (CNT) control method application recommendation




## 4. sense usage and precautions

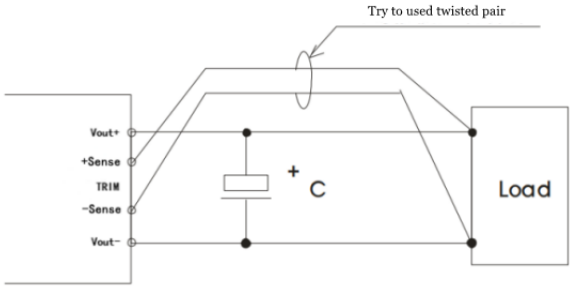
(1) Without far-end compensation:




Precautions:

1. Do not use remote compensation, make sure Vout+ and Sense+, Vout- and Sense- are short-circuited;
2. The connection between Vout+ and Sense+, Vout- and Sense- should be as short as possible and close to the pins, otherwise the module may become unstable.

(2) Using remote compensation

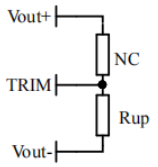



Precautions:

1. When the long-end compensation lead is used, the output voltage may be unstable;
2. If remote compensation is used, please use twisted pair or shielded wire, and keep the lead wire as short as possible;
3. Please use wide PCB leads or thick wires between the power module and the load, and keep the line voltage drop below 0.3V to ensure that the power output voltage remains within the specified range;
4. The impedance of the leads may cause the output voltage to oscillate or have larger ripples. Please verify it before use.

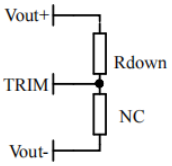
## 5. Use of TRIM and calculation of TRIM resistance

The relationship between output change voltage △U and resistance is as follows:




Voltage up regulation: add resistor Rup between Trim and output negative

Rup=3.75/△U-5.1 (KΩ)




Voltage Down: Add resistor Rdown between Trim and output positive

Rdown=3* (5-1.25-△U) /△U -5.1 (KΩ)

**6. This product does not support the use of direct parallel connection to increase the power. If you need to use it in parallel, please consult our technical staff.**

## Others

1 The warranty period of this product is two years. During the normal damage, it will be repaired free of charge. Damages caused by errors in the use method or manufacturing technology, a paid service is provided.

2. Our company can provide product customization and matching filter modules. For details, please contact our technical staff directly.