# MCB 300 Power Thick Film Resistor

Catalogue

# MCB 300 Power Thick Film Resistor

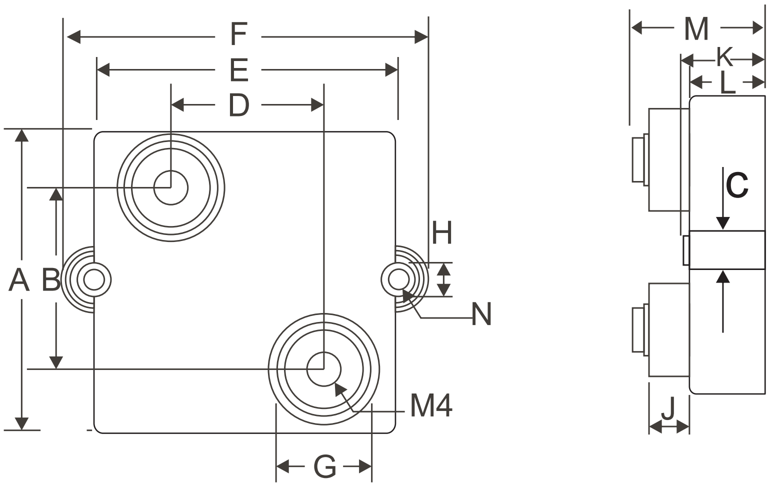

## Feature

Ⅰ Non-inductive, wide resistance range
Ⅱ High power(the temp of floor center less than 85℃, the power is 300W)
Ⅲ Resistance range: from 0.5Ω to 1MΩ
Ⅳ Small volume, easy mounting
Ⅴ Insulation resistance to high pressure 6 kv
Ⅵ Insulated case to Ul94 -V0
Ⅶ The thermal resistance 0.115℃/W

## Application

Wind power generation, power transmission, robot, frequency converter, switching power supply and so on.

## Dimensions




| Dimensions | |
|---|---|
| A | 60.3±1.0 |
| B | 36.0±0. 5 |
| C | 13.7±0. 5 |
| D | 33.5±0. 5 |
| E | 57.0±0. 5 |
| F | 67.0±0. 5 |
| G | 19.5±0. 5 |
| H | 7. 50±0. 5 |
| J | 9.00±0. 5 |
| K | 15.0±0. 5 |
| L | 13.0±0. 5 |
| M | 26.4±0. 5 |
| N | 4. 30±0. 5 |

## Ordering Information

Example:

| MCB | 300 | J | R100 | C |
|---|---|---|---|---|
| (1) | (2) | (3) | (4) | (5) |
| Series Name | Power Rating | Resistance Tolerance | Resistance | T.C.R |

(1)Type: MCB SERIES
(2)Power Rating 300=300W
(3)Tolerance: J=±5%,K=±10%
(4)Resistance Value:R100=0.1Ω
(5)T.C.R:C=150PPM/℃

## Reference Standards

JIS C 5201-1

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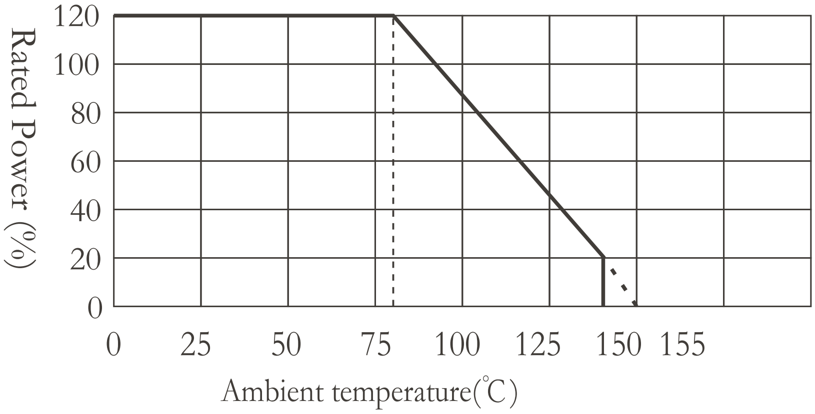
## Derating Curve




## Applications And Ratings

| Type | Rating Power (85℃) | Resistance Range (Ω) | TCR | Precision | Max working Voltage | Working temperature |
|---|---|---|---|---|---|---|
| MCB | 300W | 0.5Ω—100Ω | ±150PPM/℃ | J±5%<br>K±10% | 5KV | -55℃~+155℃ |

## Performance

| Test Items | Specifications | Test Methods(JIS C 5201-1) |
|---|---|---|
| Moisture resistance | ΔR≤±(0.25%R + 0.001Ω). | 56 days/40℃,RH≥95% |
| Thermal cycling | ΔR≤±(0.2%R + 0.001Ω). | -55° C/+125° C(0.5h each), 5 cycles |
| Vibration, high frequency | ΔR ≤±(0.2%R+ 0.001Ω). | MIL – Std – 202, method 204, Cond.D |
| Load life | ΔR≤±(0.4%R+ 0.001Ω). | 1,000 hours at rated power, BCT=85℃ |
| Short time overload | ΔR≤±(0.4%R + 0.001 Ω). | 1000W,70° C,10 S |
| Peak current | up to 1500Amp. Depending on pulse length and frequency. | |
| Dielectric strength | 6KVrms,50Hz,1min,12KVrms on request. | |
| Partial discharge | 3KVrms,<10pC;5KVrms on request. | |
| Insulation resistance | 10GΩ, Min at 500V. | |
| Creeping distance: | 42mm, Min. | |
| Air distance | 14mm, Min. | |
| Inductance | ≤80nH | |
| Capacitance /Mass | ≤110pF | |
| Capacitance /Parallel | ≤40pF | |
| Contact terminal | M5 screw, Max torque 2Nm | |
| Resistor installation | M4 screw, Max torque 1.8Nm | |

## Resistor Assembly

a.You need to use the thermal conductive silicone between the bottom of the resistor and radiator mounted part, so that it can increase the contact surface, increase the heat dissipation effect.
b.Thermal conductivity silica gel in the preservation will produce precipitation, you muststir well before every usage, and glue roller (market available) it over and over again.
c.You need ensure that no grainy surface impurities. Such as resistor reinstall, must clean the old glue.
d.Before the resistor cover fastening screws, you had better press the positive of the resistor, by rubbing repeatedly several times, make the thermal conductive silicone evenlydistributed, then tighten the screw

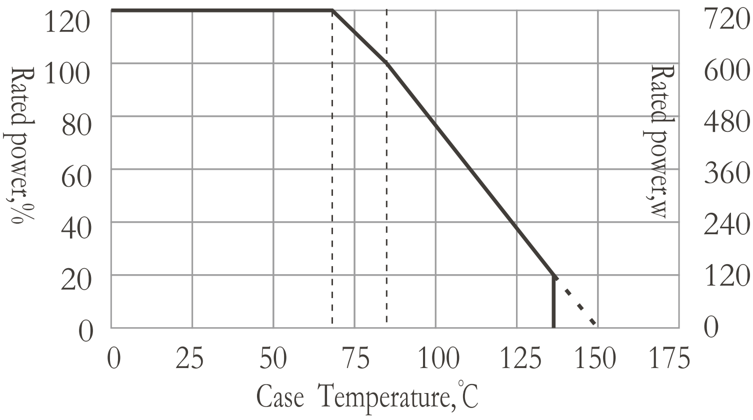
## Notes

1.Power above 300W can be used in water cooling:
2.Power above 200W can be used in forced air cooling
3. Installation of all the powers of resistors should use thermally conductive silicone rubber on the binding site. The plate of system radiator should be smooth surface.Take MCB300 for example. surface finish should be above 0.05mm, rough surface should be above 6.4um.
All the specifications of high voltage resisto r is based on the principle of reduced power curve, X axle is the ambient temperature.

## Requirements For System Heat Dissipation

For different kinds of power resistors, a common design is that they all have a cooling plate on the bottom of the shape, users use spare screw to fix on the system radiator, so that it can peel off the heat which is produced in the process of the working of resistors and then the heat can achieve a balance. Balance temperature (TO) of the centre of the electric heater plate is determined by the thermal performance of the system. Higher the thermal performance, Lower the TO.

Power resistors only have the design of fix assembly (cooling plate, fixed screw) , system radiator is designed by the users self. Generally manufacturers can not provide the detail requirements of the system radiator. Because it is a multiple parameters, such as environment (temperature, ventilation), the shape of radiator, wind speed (or water carrying capacity , water temperature), whether the radiator can work together with other power components, so we can not provide. Users themselves can not only depend on the parameters of the resistors to predict the temperature rise when working either. Because they are depended on the working situation of the users, the only thing manufacturer can provide is the "reduced power curve" Take MCB300 for example as below picture.




Y axle: the rated power allowed.
X axle: the balance temperature of the corresponding centre position of the bottom plate of the resistor,
The curve is the result of the design of a comprehensive confirmation curve (or binding curve). Rather than referring to the relationship between the temperature and power of the resistor under any specific work condition. But it is very useful, practical work process is:
1: Users can install according to the experience and practical situation to design the radiator.
2: Users can add the expected power load to the resistor.
3: The temperature of the centre position of the bottom plate of the resistor after thermal equilibrium, if this temperature is comply to "temperature⩽ corresponding curve X Coordinates numerical (Y axle is the power added practically), it means this system is suited to install, you can improve the cooling situation or low down the actually power.
We provide "Reduced power slope and Thermal resistance" behind the Reduced power curve, Take MCB300 for example as below::
1. Reduced power slope: 8.73W/℃ which is the rectilinear slope of the curve from 85℃ to 140℃(480W/55℃) .
2. Thermal resistance: 0.115℃/W is the reciprocal of the slope as descript above.Noted:
The thermal resistance could not be understood for the Inherent characteristic parameters of the resistors under free conditions (without external radiator)It isfrom "Reduced power slope" and it is only the description of reduced power. As for the comprehensive nature of the reduced power itself, so the thermal resistance we talked above is not a description of relationship between temperature and power under any conditions.