TY-OHM

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TY-OHM ELECTRONIC WORKS CO.,LTD.

PRECISION CURRENT SENSE RESISTORS, CSR

RESISTOR SPECIFICATION

Version : 2020.A

APPROVED BY

APPROVED	REVIEWED	PREPARED
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1. Applicable Scope:

This CSR resistor is designed for current sensing that use in electric meter, power supply, feed back circuit, control instruments...etc.

2. Part Number:

It is composed by Type, Rated Wattage, Nominal Resistance and Tolerance e.g.

CSR	1W	10mR	F
Type	Rated Wattage	Nominal Resistance	Tolerance

2.1 Type :

Precision Current Sense Resistors are called "CSR".

2.2 Rated Wattage:

Shown by "W", such as 1W, 3W, 5W.

2.3 Nominal Resistance:

mΩ is its unit, which be in accordance with JIS-C6409 article 6 (EIA RS-196A) series.

Letter "10mR" indicates resistance value 10mΩ .

2.4 Tolerance:

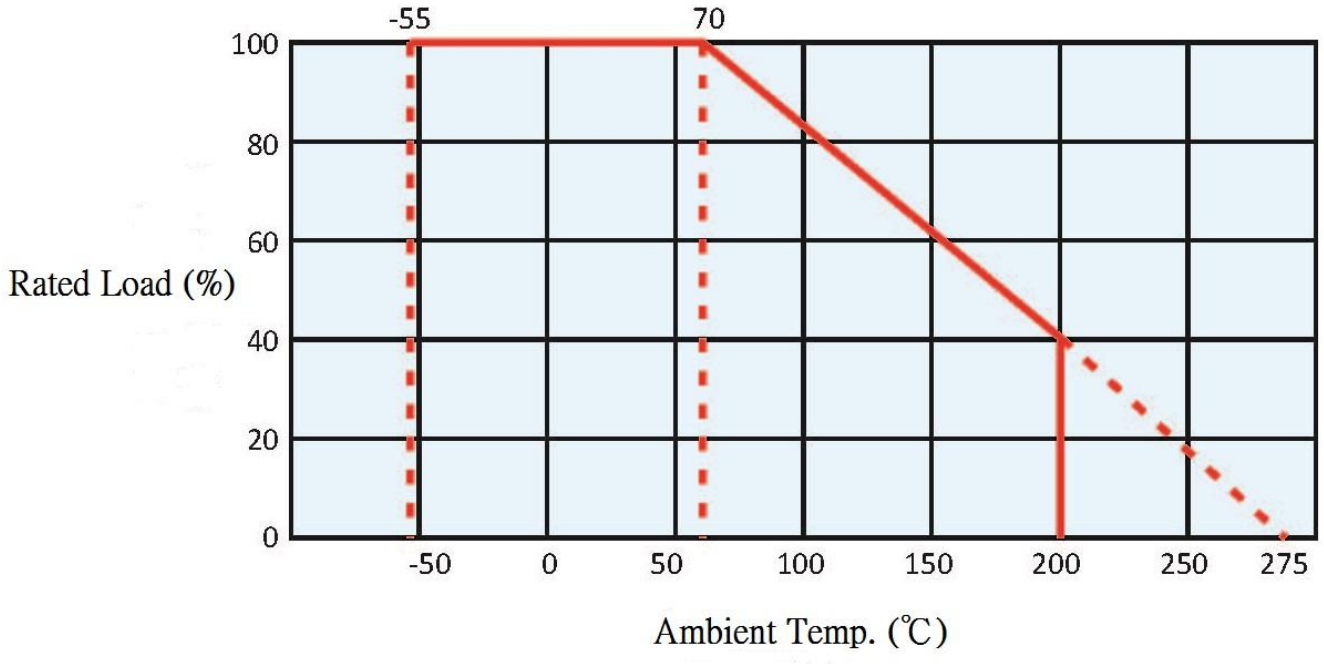
It is measured by Bridge-method at room temperature and expressed by a capital letter.

F＝±1%, G＝±2%, J＝±5%.

Remark : CSR Series Resistors are RoHS & Halogen Free Compliant.

3. Rated Power:

Rated power is the value of Max load power specified at the ambient temperature of 70℃, and shall meet the functions of electrical and mechanical performance. When the ambient temperature surpasses above mentioned temperature, the value declines as per following DERATING CURVE.



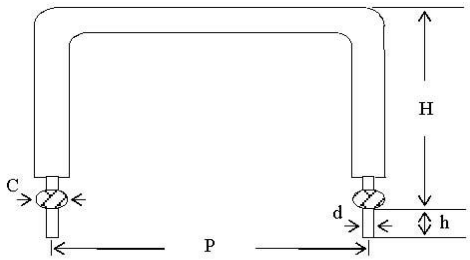
3.1 Rated Voltage:

It is calculated through the following formula:

$$E = \sqrt{PXR}$$

where E: rated voltage (V)
P: rated power (W)
R: total nominal resistance (Ω)

4. Dimension:



Unit: mm

TYPE / CSR	H (max)	h ± 0.3	C ± 0.2	d ± 0.05	P ± 0.5	Resistance Range (mΩ)
1W	25	3.2	1.6	1.0	12	5 ~ 25
3W	25	3.2	1.6	1.0	15	5 ~ 25
5W	30	3.2	1.6	1.0	20	10 ~ 25

◎ Notes: Too low or too high ohm value can be supplied only case by case.

5. Operating Temperature Range: -55℃～200℃

6. Electrical Performance:

6.1 Resistance Temperature Coefficient:

It shall be within ±100ppm/℃

T.C (ppm/℃) = 〔(R2－R1) ÷R1〕 ×〔1 ÷(T2－T1)〕 $\times 10^6$

where R1: resistance value at reference temperature
R2: resistance value at test temp.
T1: reference temp.
T2: test temp.

6.2 Temperature Cycle:

Following temp. cycles are to be made 5 times and then put at room temp. for one hour, the resistance value change rate between pre-and-post test shall be within ±1%.

Steps	Temperature(℃)	Time (minutes)
1st step	-55±3	30
2nd step	Room temp.	3
3rd step	200±3	30
4th step	Room temp.	3

6.3 Load Life:

The resistors arrayed are sent into the 70℃ oven, applying rated voltage at the cycle of 1.5 hours ON, 0.5 hour OFF for 1000^{+48}_{-0} hours in total. Then, after removing the voltage, take the resistors out of the oven and left under normal temp. for one hour cooling. The resistance value change rate between pre-and-post test shall be within ±1%.

6.4 Moisture-proof Load Life:

The resistors arrayed are placed into a constant temp./humidity oven at the temp. of 40±2℃ and the humidity of 90～95% for 1000^{+48}_{-0} hours in total. Then taking the resistors out of the oven and leaving them at room temp. for one hour. The resistance value change rate between pre-and-post test shall be within ±1%. There also shall be no evidence of remarkable change on appearance.

6.5 Solder-ability:

The leads with flux are dipped in a melted solder of 235±5℃ for 2 seconds, more than 95% of the circumference of the lead wires shall be covered with solder.

6.6 Resistance to Soldering Heat:

Two leads are together dipped in a melted solder of 270±5℃ for 10±1 seconds, or 350±10℃ for 3.5 ±0.5 seconds, Then remove the resistors and leaving them at room temp. for one hour. The resistance value change rate between pre-and-post test shall be within ±1%.

6.7 Inductance:

It shall be less than 10 nanohenries.

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