Towards Excellence in *Quality, Service & Innovation*

ASJ

DATA SHEET

Metal Alloy 0mΩ (Jumper) Resistor

CLS Series

±5%

SIZE: 0402

RoHS-Compliant

Product Specification – June 14, 2023 V.2

1. SCOPE

1.1. This specification is applicable to Lead-free and Halogen-free for CLS10 zero milli-ohm resistor (Jumper) metal alloy product only.

1.2. The product is for general purpose.

2. PART NUMBERING SYSTEM

Part Numbering is made in accordance with the following system:

CLS	10	H	-	RXXX	-	J	K
Type	Size (Inch / mm)	Power Rating		Nominal Resistance		Resistance Tolerance	Packaging
Metal Alloy Low-Resistance Resistors	10(0402)	H = 0.2 W		EX: R000 = Below 0.50mΩ		J = ±5%	K = 10,000 pcs

3. RATING

3.1. Rated Power

3.1.1 Resistor Rated Power

Type	# of Terminals	Rating Power	Max. Loading Current
CLS10	2	0.2 W	20A

3.2 Power Derating Curve

Operating Temperature Range: - 55 ~+150 ℃

For resistors operated in ambient temperatures 70°C, power rating must be derated in accordance with the curve below:

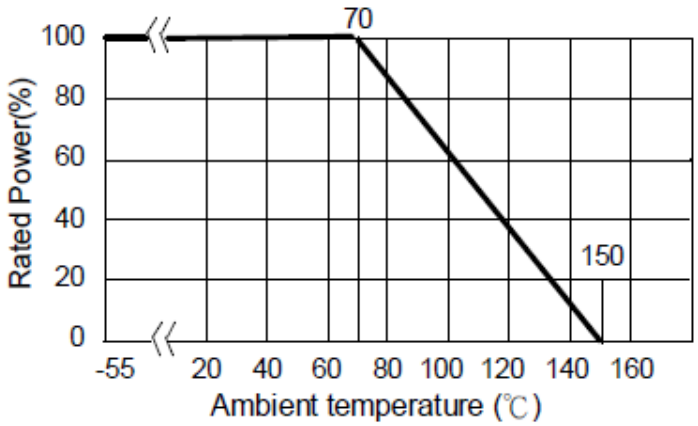


Fig.1 Power Derating Characteristics

3.3 Standard Atmospheric Condition

Unless otherwise specified, the standard range of atmospheric conditions for making measurements and tests is as follows:

Ambient Temperature = +5°C to +35°C

Relative Humidity = < 85% RH

Air Pressure = 86 to 106kPa

If there may be any doubt about the results, measurement shall be made within the following limits :

Ambient Temperature = 20± 2°C

Relative Humidity = 60 to 70% RH

Air Pressure = 86 to 106kPa

3.4 Operating Temperature Range -55°C to +150°C

3.5 Storage Temperature Range -5°C to +40°C / < 85% RH

3.6 Flammability Rating Tested in accordance to UL-94, V-0

3.7 Moisture Sensitivity Level Rating: Level 1

3.8 Product Assurance
ASJ resistor shall warranty 24 months from manufacturing date with control conditions.

3.9 ASJ resistors are RoHS-compliant in accordance to RoHS Directive.

3.10 Resistance, Resistance Tolerance and Temperature Coefficient of Resistance

Type	# of Terminals	Rating Power	Max. Loading Current	Resistance Range (mΩ)	Operating Temperature Range
CLS10	2	0.2 W	20A	<0.50	-55~+150°C

3.11 Rated Current:
The following equation may be used to determine the DC (Direct Current) or AC (Alternating Current) currents (RMS, root mean square value) of normal rated power. However, if the result value exceeds the highest current of regulated standards, the highest normal rated power is to be used.

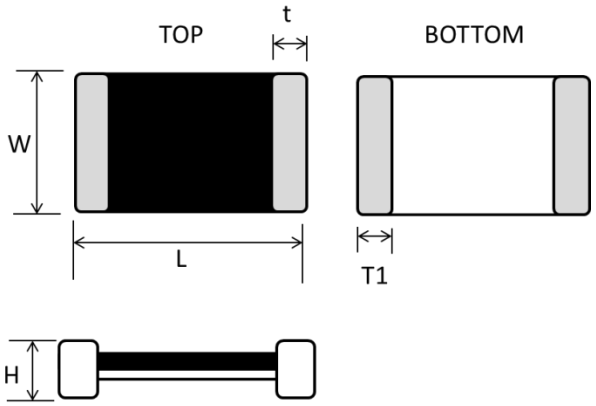
$$I = \sqrt{P/R}$$

I=Rating Current(A)
P= Rating Power(W)
R=Resistance(Ω)

4. MARKING ON PRODUCT

No Marking on CLS10 0Ω Jumper

5. DIMENSION



Type	Maximum Power Rating (Watts)	Resistance Range (mΩ)	Dimensions - in inches (millimeters)				
			L	W	H	T1	t
CLS10	0.2	<0.50	0.039±0.004 (1.00±0.100)	0.020±0.004 (0.50±0.100)	0.012±0.004 (0.30±0.100)	0.010±0.004 (0.25±0.100)	0.010±0.004 (0.25±0.100)

5.1 Plating Thickness

Ni: ≥ 2 µm

Sn(Tin): ≥ 3 µm

Sn(Tin): Matte Sn

6. RELIABILITY PERFORMANCE

6.1 Electrical Performance Test

Test Item	Conditions of Test	Test Limits
Short Time Overload	Applied Overload for 5 seconds and release the load for about 30 minutes, then measure its resistance variance rate. (Overload condition refer to below): Type / Power (W) / # of rated power LR0402 / 0.2 / 4 times Refer to JIS C 5201-1 4.13	≦0.5 mΩ No evidence of mechanical damage
Insulation Resistance	Put the resistor in the fixture, add 100 VDC in + ,- terminal for 60secs then measured the insulation resistance between electrodes and insulating enclosure or between electrodes and base material. Refer to JIS-C5201-1 4.6	≧10^9Ω
Dielectric Withstanding Voltage	Applied 500VAC for 1 minute, and Limit surge current 50 mA (max.) Refer to JIS-C5201-1 4.7	No short or burned on the appearance.

6.2 Mechanical Performance Test

Test Item	Conditions of Test	Test Limits
Resistance to Solder Heat	The tested resistor be immersed 25 mm/sec into molten solder of 260±5℃ for 10±1secs. Then the resistor is left in the room for 1 hour, and measured its resistance variance rate. Refer to JIS-C5201-1 4.18	≦0.5 mΩ No evidence of mechanical damage
Solderability	Add flux into tested resistors, immersion into solder bath in temperature 245±5℃ for 3±0.5secs. Refer to JIS-C5201-1 4.17	Solder coverage over 95%
Vibration	The resistor shall be mounted by its terminal leads to the supporting terminals on the solid table. The entire frequency range :from 10 Hz to 55 Hz and return to 10 Hz, shall be transferred in 1 min. Amplitude : 1.5mm This motion shall be applied for a period of 4 hours in each 3 mutually perpendicular directions (a total of 12hrs) Refer to JIS-C5201-1 4.22	≦0.5 mΩ No evidence of mechanical damage
Resistance to solvent	The tested resistor be immersed into isopropyl alcohol of 20~25℃ for 60secs, then the resistor is left in the room for 48 hrs. Refer to JIS-C5201-1 4.29	≦0.5 mΩ No evidence of mechanical damage

6.3 Environmental Test

Test Item	Conditions of Test	Test Limits
Low Temperature Exposure (Storage)	Put the tested resistor in chamber under temperature -55±2℃ for 1,000 hours. Then leaving the tested resistor in room temperature for 60 minutes, and measure its resistance variance rate. Refer to JIS-C5201-1 4.23.4	≦0.5 mΩ No evidence of mechanical damage
High Temperature Exposure (Storage)	Put tested resistor in chamber under temperature 150±5℃ for 1,000 hours. Then leaving the tested resistor in room temperature for 60 minutes , and measure its resistance variance rate. Refer to JIS-C5201-1 4.23.2	≦0.5 mΩ No evidence of mechanical damage
Temperature Cycling (Rapid Temperature Change)	Put the tested resistor in the chamber under the temperature cycling which shown in the following table shall be repeated 1,000 times consecutively. Then leaving the tested resistor in the room temperature for 60 minutes, and measure its resistance variance rate. Testing Condition: Lowest Temperature -55 +0/-10℃; Highest Temperature 150 +10/-0℃ Refer to JIS-C5201-1 4.19	≦0.5 mΩ No evidence of mechanical damage
Moisture Resistance (Climatic Sequence)	Put the tested resistor in chamber and subject to 10 cycles of damp heat and without power. Each one of which consists of the steps 1 to 7 (Figure 1). Then leaving the tested resistor in room temperature for 24 hr, and measure its resistance variance rate. Refer to MIL-STD 202 Method 106	≦0.5 mΩ No evidence of mechanical damage
Bias Humidity	Put the tested resistor in chamber under 85± 5℃and 85± 5%RH with 10% bias and load the rated voltage for 90 minutes on, 30 minutes off, total 1,000 hours. Then leaving the tested resistor in room temperature for 60 minutes, and measure its resistance variance rate. Refer to JIS-C5201-1 4.24	≦0.5 mΩ No evidence of mechanical damage

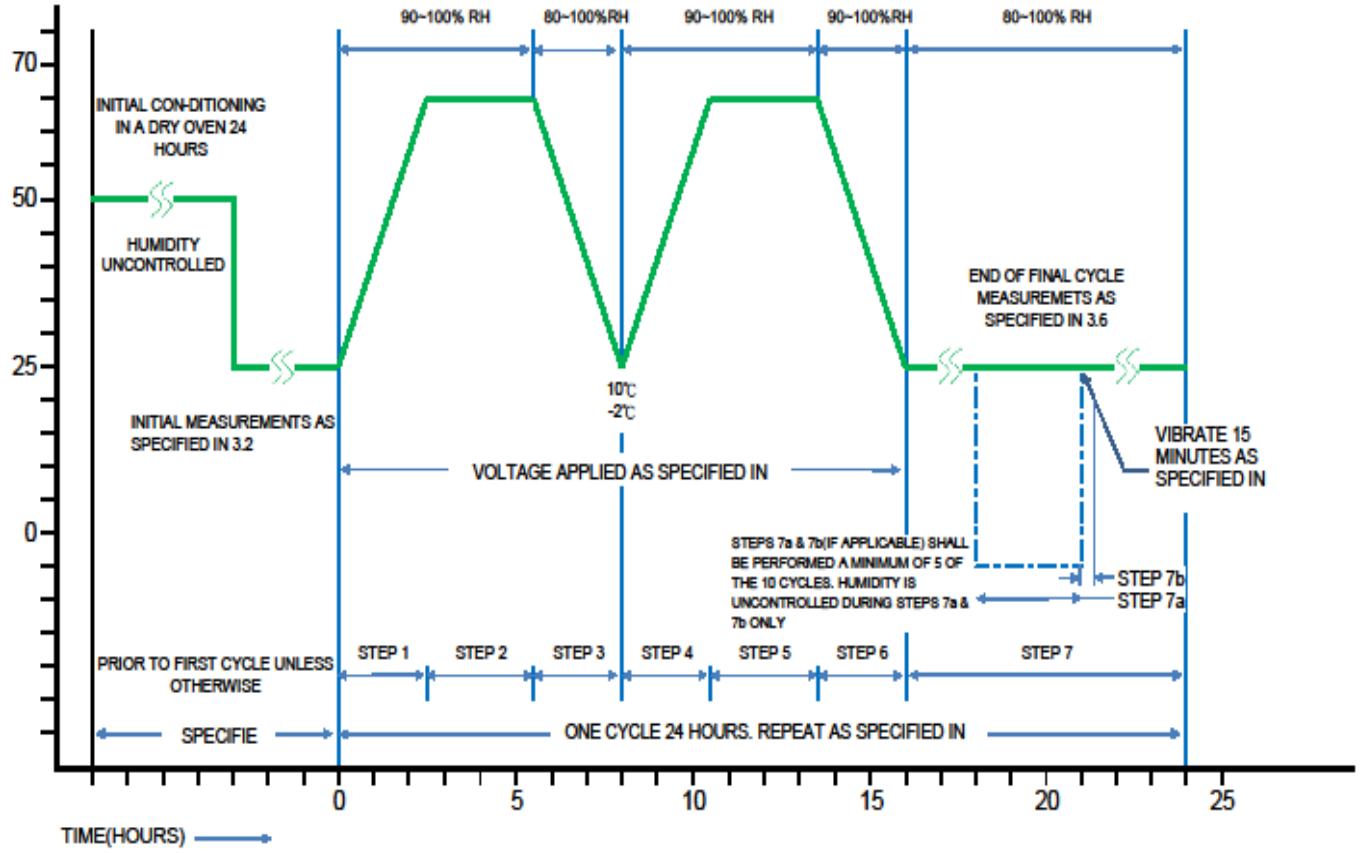
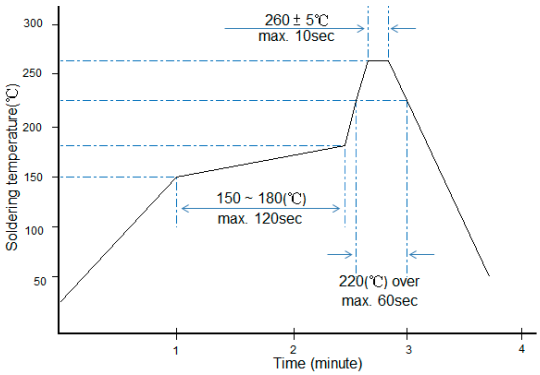


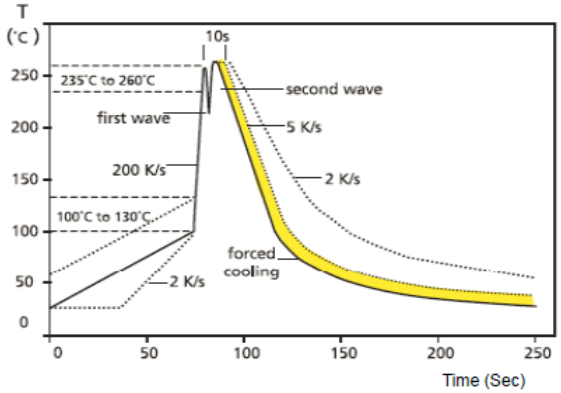
Figure 1

6.4 Technical Notes: (This is for recommendation, customer please perform adjustment according to actual application)
Recommended Soldering Method

6.4.1 Surface mount components are tested for solderability at a temperature of 245˚C For 3 seconds, Typical examples of soldering processes that provide reliable joints Without any damage are given in below:



Recommended IR Reflow Soldering Profile
MEET J-STD-020D



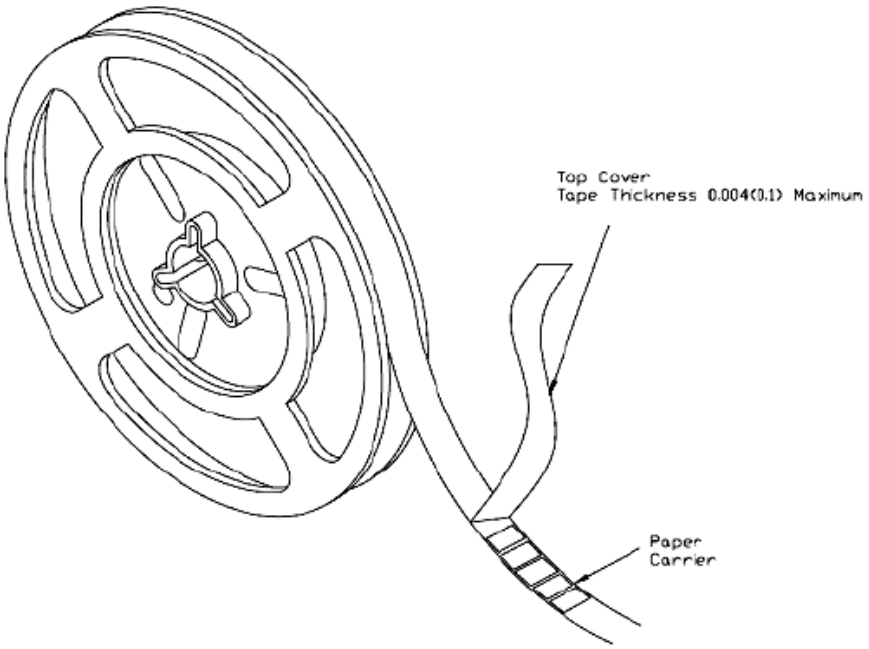
Recommended double-wave Soldering Profile
Typical Values (solid line)
Process limits (dotted line)

7. TAPING

7.1 Structure of Taping

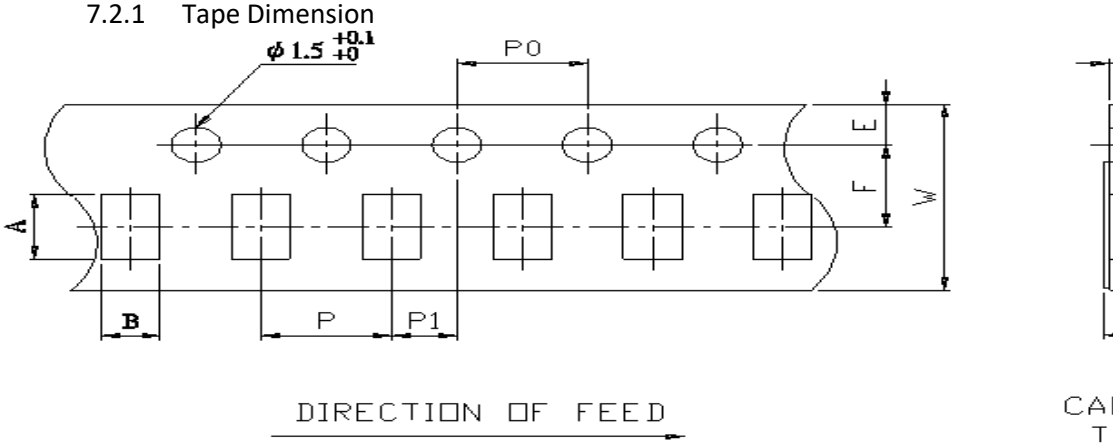
Embossed Plastic Carrier

Paper Carrier



7.2 Tape Dimension

7.2.1 Tape Dimension



Unit: mm

DIM / Item	A	B	W	E	F	T1	T2	P	P0	10*P0	P1
CLS10	1.15±0.05	0.65±0.05	8.0±0.20	1.75±0.10	3.5±0.05	0.42+0.2/-0	0.42±0.05	2.0±0.10	4.0±0.05	40±0.20	2.0±0.05

7.3 Packaging

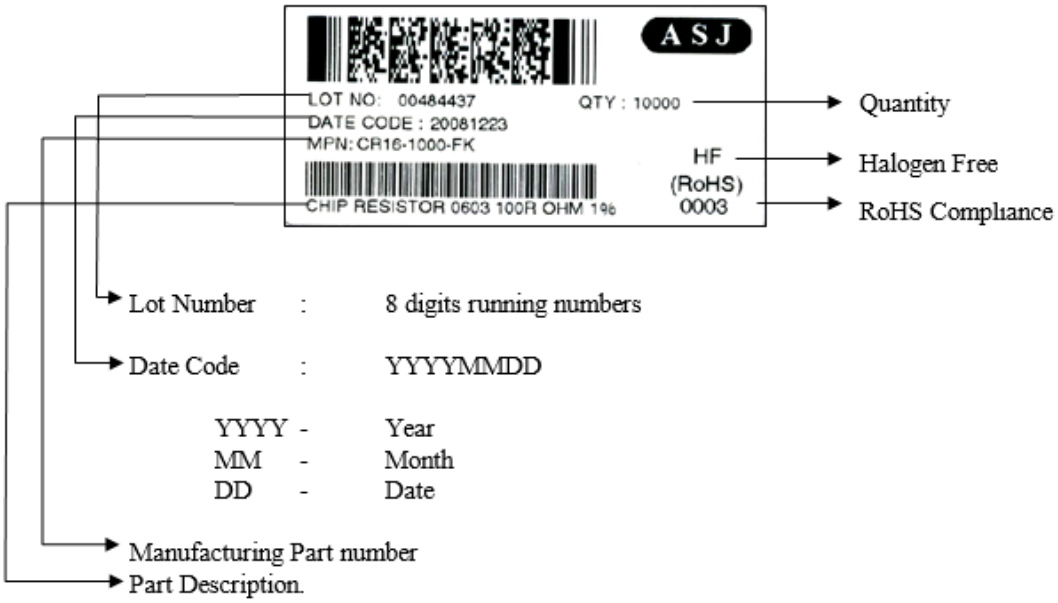
7.3.1 Taping

7.3.1.1 Quantity – Tape and Reels

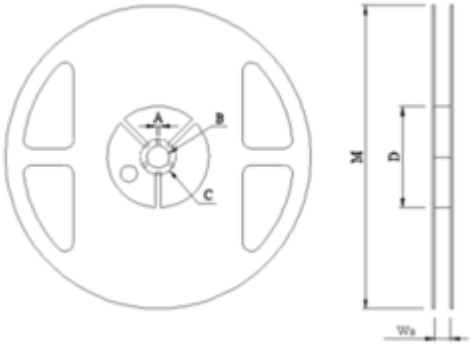
Type	Tape width	Max. Packaging Quantity (pcs/reel)
		2 mm pitch
CLS10	8 mm	10,000pcs

7.3.2 Identification

Production label that indicates the 8 digits lot number, product type, resistance value and tolerance shall be pasted on the surface of each reel.

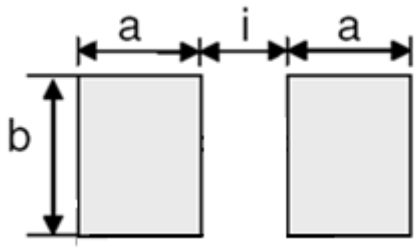


7.3.3 Reel Dimensions



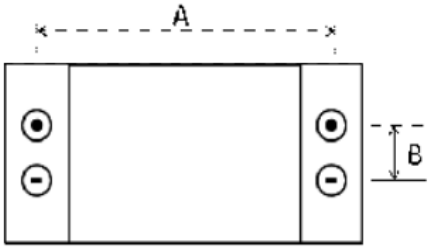
Reel Type / Tape	W	M	A	B	C	D
7" reel for 8 mm tape	9.0± 0.5	178 ± 2.0	2.0 ± 0.5	13.5 ± 0.5	21.0 ± 0.5	60.0 ± 1.0

8. RECOMMENDED LAND PATTERN



Type	Maximum Power Rating (Watts)	Resistance Range (mΩ)	Dimensions - in inches (millimeters)		
			a	b	i
CLS10	0.2	<0.50	0.65	0.50	0.50

9. MEASUREMENT POINT

Bottom electrode	Type	A	B
	CLS10	0.65±0.05	0.20±0.05
	Unit：mm		

10. REVISION HISTORY

REVISION	DATE	CHANGE NOTIFICATION	DESCRIPTION
Version.1	18.06.2020		Initial Release
Version 2	14.06.2023		Revise clause 3.8 Product Assurance