

Data sheet

Title: METAL-PLATE CHIP RESISTOR; LOW OHM

Style: MLP63C

AEC-Q200 qualified

RoHS COMPLIANCE ITEM

Halogen and Antimony Free

Note: •Stock conditions

Temperature: +5°C ~ +35°C

Relative humidity: 25% ~ 75%

The period of guarantee: Within 2 year from shipment by the company.

Solderability shall be satisfied.

- Product specification contained in this data sheet are subject to change at any time without notice
- If you have any questions or a Purchasing Specification for any quality agreement is necessary, please contact our sales staff.



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MLP63C

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1. Scope

1.1 This data sheet covers the detail requirements for metal-plate chip resistor ; low ohm, style of MLP63C.

1.2 Applicable documents

JIS C 5201-1: 2011, IEC60115-1: 2008, AEC-Q200 Rev.D

2. Classification

Type designation shall be the following form.

(Example)

RLP	63C	K	R010	F	TE
1	2	3	4	5	6

Style

1 Metal - plate chip resistor; low ohm

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 Style

2 Size

MLP63C	6332 size
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3 Temperature coefficient of resistance

N	$\pm 70 \times 10^{-6} / ^\circ\text{C}$
K	$\pm 100 \times 10^{-6} / ^\circ\text{C}$

4 Rated resistance

1L50	1.5m Ω
R002	2m Ω

5 Tolerance on rated resistance

F	$\pm 1\%$
J	$\pm 5\%$

6 Packaging form

TE	Embossed taping:
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3. Rating

3.1 The ratings shall be in accordance with Table-1.

Table-1						
Style	Rated dissipation (W)	Rated current (A)	Temperature coefficient of resistance (10 ⁻⁶ / °C)		Rated resistance (mΩ)	Tolerance on rated resistance
MLP63C	3.0	54.7	K	100	1	F(±1%) J(±5%)
			N	±70		
		44.7	K	100	1.5	
			N	±70		
		38.7	K	100	2	
			N	±70		
		34.6	K	100	2.5	
			N	±70		
		31.6	K	100	3	
			N	±70		
		27.3	K	100	4	
			N	±70		
		24.4	K	100	5	
			N	±70		
		22.3	K	100	6	
			N	±70		
		20.7	K	100	7	
			N	±70		
		19.3	K	100	8	
			N	±70		
		18.2	K	100	9	
			N	±70		
		17.3	K	100	10	
			N	±70		

Style	Insulation voltage (V)	Category temperature range (°C)
MLP63C	100	-55~+170

3.2 Derating

The derated values of dissipation at temperature in excess of 70 °C shall be as indicated by the following curve.

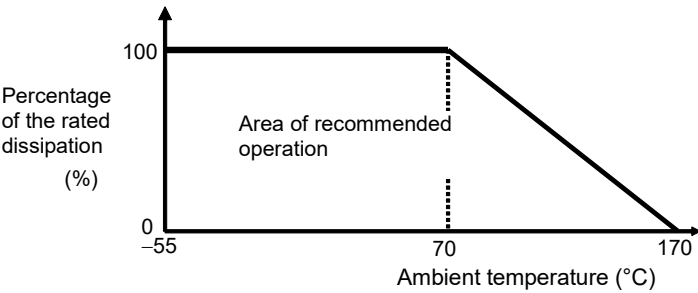


Figure-1 Derating curve

3.3 Rated voltage

d.c. or a.c. r.m.s. voltage calculated from the square root of the product of the rated resistance and the rated dissipation.

$$E = \sqrt{P \cdot R}$$

E: Rated voltage (V)

P: Rated dissipation (W)

R: Rated resistance (Ω)

3.4 Rated current

The rated current calculated from the square root of the quotient of the rated resistance and the rated dissipation.

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

I: Rated current (A)

P: Rated dissipation (W)

R: Rated resistance (Ω)

The rated current shall be corresponding to rated voltage.

4. Packaging form

The standard packaging form shall be in accordance with Table-2.

Table-2

Symbol	Packaging form		Standard packaging quantity / units
TE	Embossed taping	12mm width, 4mm pitches	4,000 pcs.

5. Dimensions

5.1 The resistor shall be of the design and physical dimensions in accordance with Figure-2 and Table-3.

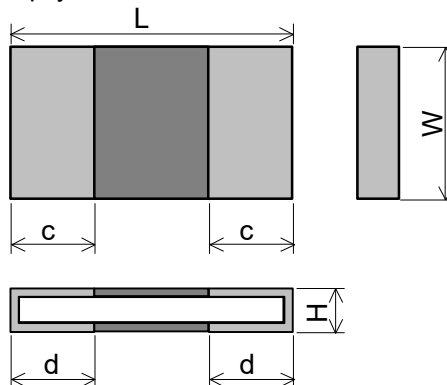


Figure-2

Table-3

Unit: mm

Style	Rated resistance (m Ω)	L	W	H	c	d
MLP63C	1	6.3 $\pm$ 0.25	3.1 $\pm$ 0.25	0.38 $\pm$ 0.15	2.2 $\pm$ 0.25	2.2 $\pm$ 0.25
	1.5			0.38 $\pm$ 0.15	1.5 $\pm$ 0.25	1.5 $\pm$ 0.25
	2			0.58 $\pm$ 0.15	2.2 $\pm$ 0.25	2.2 $\pm$ 0.25
	2.5			0.45 $\pm$ 0.15	2.4 $\pm$ 0.25	2.4 $\pm$ 0.25
	3			0.45 $\pm$ 0.15	2.2 $\pm$ 0.25	2.2 $\pm$ 0.25
	4			0.34 $\pm$ 0.15	2.2 $\pm$ 0.25	2.2 $\pm$ 0.25
	5			0.51 $\pm$ 0.15	1.1 $\pm$ 0.25	1.1 $\pm$ 0.25
	6			0.5 $\pm$ 0.15	1.1 $\pm$ 0.25	1.1 $\pm$ 0.25
	7			0.5 $\pm$ 0.15	0.6 $\pm$ 0.25	0.6 $\pm$ 0.25
	8			0.35 $\pm$ 0.15	1.1 $\pm$ 0.25	1.1 $\pm$ 0.25
	9			0.35 $\pm$ 0.15	0.8 $\pm$ 0.25	0.8 $\pm$ 0.25
	10			0.35 $\pm$ 0.15	0.5 $\pm$ 0.25	0.5 $\pm$ 0.25

5.2 Net weight (Reference)

Style	Rated resistance (mΩ)	Net weight (mg)
MLP63C	1	60
	1.5	
	2	
	2.5	
	3	
	4	
	5	
	6	
	7	
	8	
	9	
	10	

6. Marking

The rated resistance shall be marked in 4 characters consisting of 3 figures and a letter and marked on over coat side.

(Example) "R010" → 0.01 [Ω] → 10 [mΩ]

"1L50" → 0.0015 [Ω] → 1.5 [mΩ]

7. Performance

7.1 The standard condition for tests shall be in accordance with Sub-clause 4.2, JIS C 5201-1: 2011.

7.2 The performance shall be satisfied in Table-4.

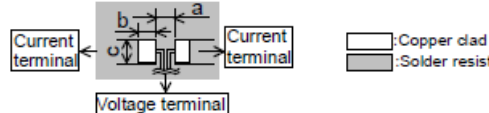
Table-4(1)

No	Test items	Condition of test	Performance requirements
1	High temperature exposure AEC Q200 - No.3	MIL-STD-202 Method 108 Ambient temperature: 155±2°C, Condition: Without load, Duration: 1,000 ⁺⁴⁸ ₀ h Interval measurements: 250 h and 500 h	ΔR/R: Within ±3% No visible damage
2	Temperature cycling AEC Q200 - No.4	JESD22 Method JA-104 Temperature: -55±3°C / 125±2°C, Dwell time: 30min maximum at each temp. Transition time: 1 min. max. Number of cycles: 1,000 cycles. Interval measurements: 250 cy and 500 cy	ΔR/R: Within ±3% No visible damage
3	Bias humidity AEC Q200 – No.7	MIL-STD-202 Method 103 Condition: 85°C & 85% R.H. Test power: 10% of rated power shall be applied for continuously. Duration: 1,000 ⁺⁴⁸ ₀ h Interval measurements: 250 h and 500 h	ΔR/R: Within ±3% No visible damage
4	Operational life AEC Q200 – No.8	MIL-STD-202 Method 108 Ambient temperature: 125±2°C The applied voltage shall be the voltage to be calculated at 35% of rated dissipation or the limiting element voltage whichever is the smaller. Condition: The voltage shall be applied for continuously. Duration: 1,000 ⁺⁴⁸ ₀ h Interval measurements: 250 h and 500 h	ΔR/R: Within ±3% No visible damage
5	External Visual AEC Q200 – No.9	MIL-STD-883 Method 2009	Inspect device construction, marking and workmanship.
6	Dimensions AEC Q200 – No.10	JESD22 Method JB-100	As in Table-3
7	Resistance to Solvents AEC Q200 – No.12	MIL-STD-202 Method 215 Solvent: 2-propanol at 25 °C Immersion time: 3 min Brush: 10 times brushing Immersion and brush cycle: 3cycle	ΔR/R: Within ±1% No visible damage
8	Mechanical Shock AEC Q200 – No.13	MIL-STD-202 Method 213 Waveform: half sine, Peak value 100G, Normal duration 6ms Condition: XX'YY'ZZ', 18times total	ΔR/R: Within ±1% No visible damage

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Table-4(2)

No	Test items	Condition of test	Performance requirements													
9	Vibration AEC Q200 – No.14	MIL-STD-202 Method 204 Peak acceleration and Sweep time: 5 g's for 20 min , Frequency 10Hz to 2000Hz, Condition: 12 cycles each of 3 orientations	ΔR/R: Within ±1% No visible damage													
10	Resistance to soldering heat AEC Q200 - No.15	MIL-STD-202 Method 210 Test conditions:K Temperature: 250±5 °C Time: 30sec Temperature ramp: 1°C/s-4°C/s immersion and emersion rate : Time above 183°C, 90 s - 120 s The assembly shall be exposed to three heat cycles.	ΔR/R: Within ±3% No visible damage													
11	ESD test AEC Q200 – No.17	AEC-Q200-002 Human body model, 2 Kohm, 150 pF, Test voltage: 12kV	ΔR/R: Within ±5% No visible damage													
12	Solderability AEC Q200 – No.18	J-STD-002 B) Bake the sample for 155 °C dwell time 4h / solder dipping 235°C/ 5s. Solder: Sn96.5-Ag3-Cu0.5 B1) Bake the sample for 155 °C dwell time 4h / solder dipping 245°C/ 5s. Solder: Sn96.5-Ag3-Cu0.5 D) Category 3, Solder dipping 260°C/ 30s.	The surface of terminal immersed shall be min. of 95% covered with a new coating of solder.													
13	Electrical Characterization AEC Q200 - No.19	1. D.C. Resistance Conform to JIS C 5201-1 4.5 Mount it on our recommended 4-terminal test board and measure the resistance using the 4-terminal measurement method.  <table><tr><th>Style</th><th>Resistance value(mΩ)</th><th>a</th><th>b</th><th>c</th></tr><tr><td rowspan="2">MLP63C</td><td>1, 2 to 4</td><td>1.8</td><td>2.9</td><td rowspan="2">3.5</td></tr><tr><td>1.5, 5 to 10</td><td>4.0</td><td>1.8</td></tr></table> 2. Temperature Coefficient of Resistance -55 °C / +20°C +20 °C / +155°C	Style	Resistance value(mΩ)	a	b	c	MLP63C	1, 2 to 4	1.8	2.9	3.5	1.5, 5 to 10	4.0	1.8	1. The resistance value shall correspond with the rated resistance taking into account the specified tolerance. 2. As in Table-1
Style	Resistance value(mΩ)	a	b	c												
MLP63C	1, 2 to 4	1.8	2.9	3.5												
	1.5, 5 to 10	4.0	1.8													
14	Flammability AEC Q200 – No.20	UL-94	V-1 is acceptable													
15	Bending strength AEC Q200 – No.21	AEC-Q200-005 Bending value2mm Holding time: 60sec.	ΔR/R: Within ±1% No visible damage													
16	Adhesion AEC Q200 – No.22	AEC-Q200-006 Pressurizing force:17.7N Test time: 60±1s.	ΔR/R: Within ±1% No visible damage													

8. Taping

8.1 Applicable documents JIS C 0806-3: 2014, EIAJ ET-7200C: 2010

8.2 Taping dimensions

Embossed taping (12mm width, 4mm pitches)

Taping dimensions shall be in accordance with Figure-3 and Table-5.

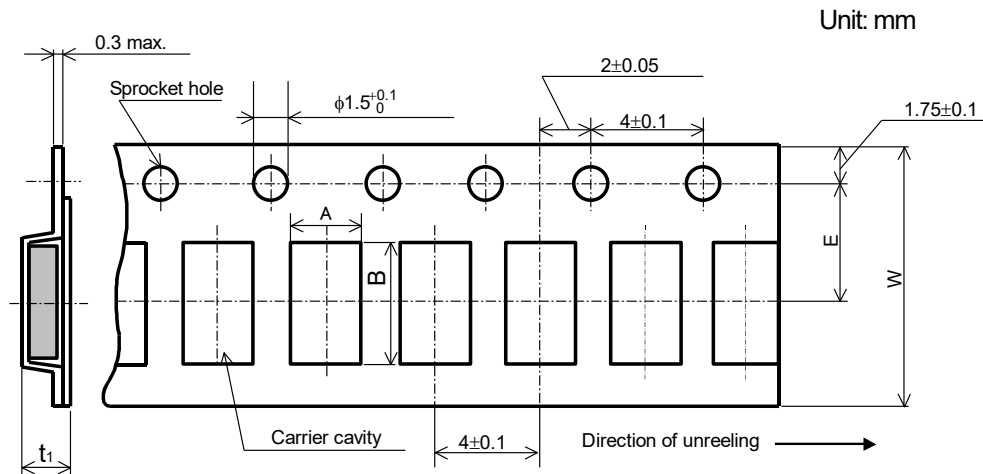


Figure-3

Table-5

Unit: mm

Style	A	B	W	E	t_1
MLP63C	3.6 ± 0.2	6.9 ± 0.2	12.0 ± 0.3	5.5 ± 0.05	1.1 ± 0.15

- 1). The cover tapes shall not cover the sprocket holes.
- 2). Tapes in adjacent layers shall not stick together in the packing.
- 3). Components shall not stick to the carrier tape or to the cover tape.
- 4). Pitch tolerance over any 10 pitches ± 0.2 mm.
- 5). The peel strength of the top cover tape shall be within 0.1N to 0.5N on the test method as shown in the following Figure-4.
- 6). When the tape is bent with the minimum radius for 30mm, the tape shall not be damaged and the components shall maintain their position and orientation in the tape.
- 7). In no case shall there be two or more consecutive components missing.

The maximum number of missing components shall be one or 0.1%, whichever is greater.

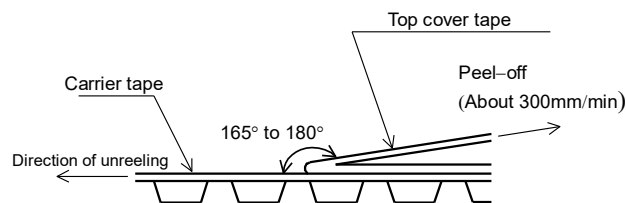


Figure-4

8.3 Reel dimension

Reel dimensions shall be in accordance with the following Figure-5 and Table-6.

Plastic reel (Based on EIAJ ET-7200C)

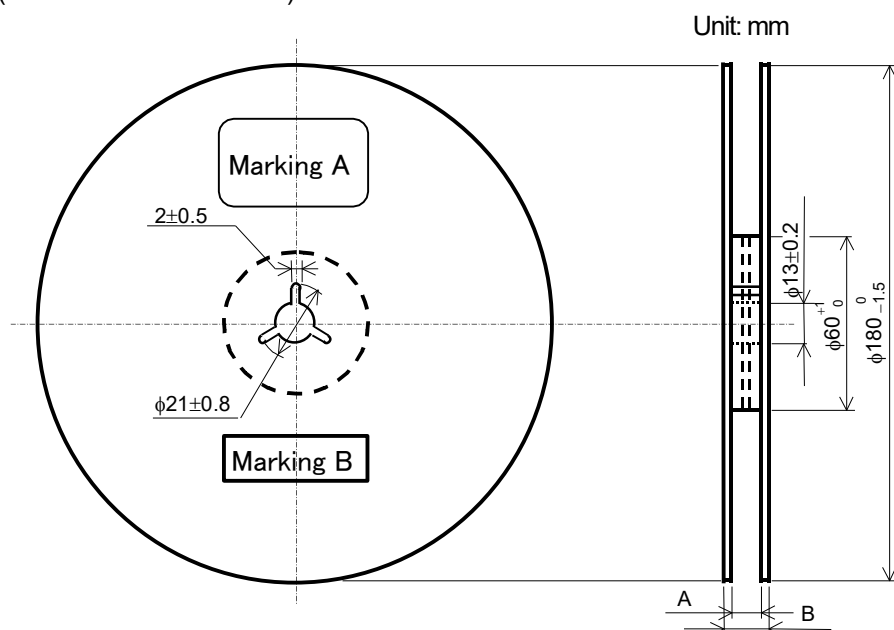


Figure-5

Table 6

Style	A	B	Note
MLP63C	13 ^{+1.0} ₀	17±1.0	Vacuum forming

Note : Marking label shall be marked on a place of Marking A or two place of Marking A and B.

8.4 Leader and trailer tape.

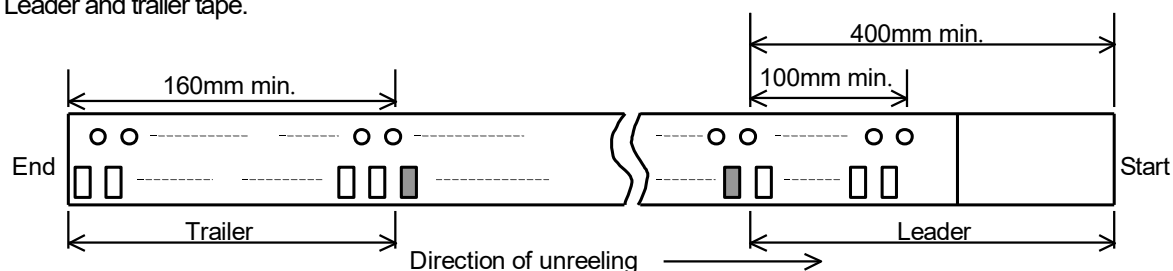


Figure-6

9. Marking on package

The label of a minimum package shall be legibly marked with follows.

9.1 Marking A

(1) Classification

(Style, Temperature coefficient of resistance, Rated resistance, Tolerance on rated resistance, Packaging form)

(2) Lot number (3) Quantity (4) Manufacturer's name or trade mark (5) Others

9.2 Marking B (KAMAYA Control label)