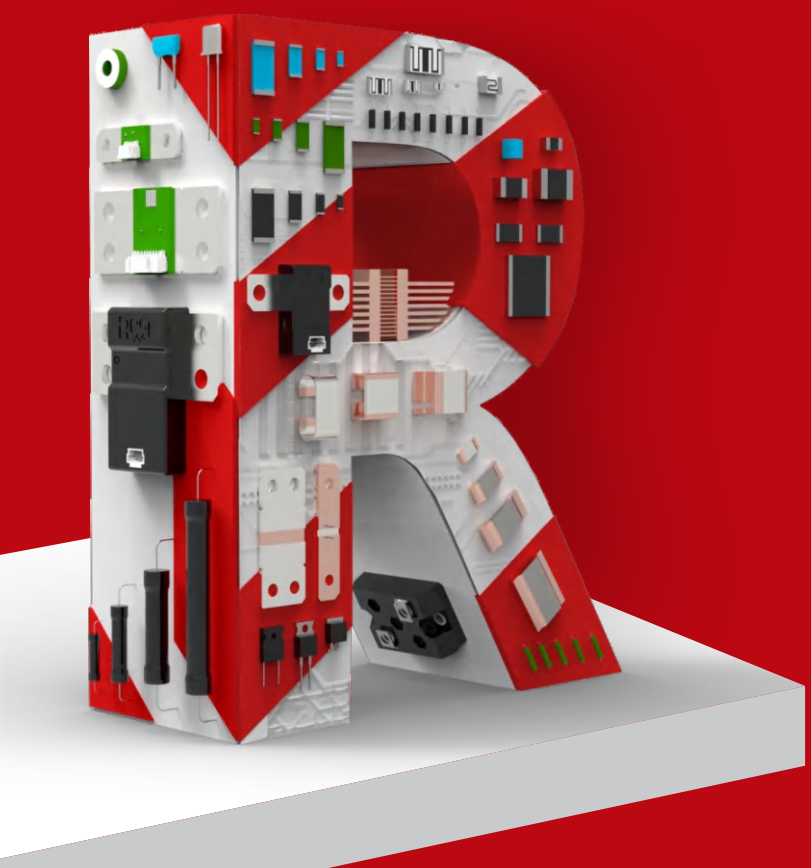
DataSheet No: E13017
Version: V0
Date: 2025/1/1

MFCR

Low resistance thin film resistors

Resistance	10mΩ～10Ω
Tolerance	±0.25%
TCR	±50~±150ppm/°C
Rated Power	0.2W~3W



Applications

Power supply

Power tools

Instrument

Medical Equipment

Better Solution for Sustainable High End Manufacturing

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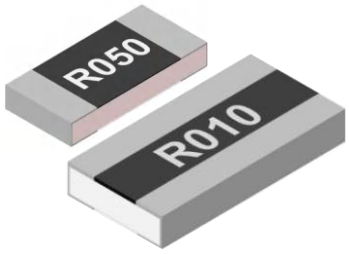
MFCR

Low resistance thin film resistors

High stability, Low TCR, Wide resistance range, Provide short side or long side terminal



RoHS

车规认证 AEC-Q200

3D

Introduction

The long-term stability of film resistors is very important, and high precision without stability is meaningless. The long-term stability of resistors is related to three factors: time, load, and temperature. The higher the load, the higher the temperature, and the longer the time, the greater the change in resistance of the resistor. The MFCR series low resistance thin film current sense resistors use special thin film technology, which ensures low TCR in rated power. This series offers two options, short side and long side terminals, with a minimum size of 0201 and a maximum rated power of 3W. This series is suitable for applications such as power tools, power supplies, instruments, medical equipment, etc.

Electrical Parameters

Size Short Side Terminal	Operating Temperature	Rated Power (at 70℃)	Max. Rated Current	Max. Overload Current	Resistance Ω	TCR ppm/℃	Tolerance %
MFCR0201	-55℃~+155℃	0.2W	2A	4.47A	50mΩ≤R＜100mΩ	±100	±0.5、±1、±2、±5
					100mΩ≤R≤10Ω	±50	±0.5、±1、±2、±5
MFCR0402	-55℃~+155℃	0.25W	2.24A	5A	50mΩ≤R＜100mΩ	±100	±0.5、±1、±2、±5
					100mΩ≤R≤10Ω	±50	±0.5、±1、±2、±5
MFCR0603	-55℃~+155℃	0.4W	2.83A	6.32A	50mΩ≤R＜100mΩ	±100	±0.5、±1、±2、±5
					100mΩ≤R≤10Ω	±50	±0.5、±1、±2、±5
MFCR0805	-55℃~+155℃	0.25W	2.53A	5.66A	39mΩ≤R＜50mΩ	±150	±0.5、±1、±2、±5
					50mΩ≤R＜100mΩ	±100	±0.5、±1、±2、±5
		0.5W(H=High Power)	3.58A	8A	100mΩ≤R≤10Ω	±50	±0.5、±1、±2、±5
MFCR1206	-55℃~+155℃	0.5W	3.58A	8A	39mΩ≤R＜50mΩ	±150	±0.5、±1、±2、±5
					50mΩ≤R＜100mΩ	±100	±0.5、±1、±2、±5
					100mΩ≤R＜470mΩ	±50	±0.5、±1、±2、±5
		1W(H=High Power)	5.06A	11.32A	470mΩ≤R≤10Ω	±50	±0.25、±0.5、±1、±2、±5
MFCR1210	-55℃~+155℃	1W	5.06A	11.32A	39mΩ≤R＜50mΩ	±150	±0.5、±1、±2、±5
					50mΩ≤R＜100mΩ	±100	±0.5、±1、±2、±5
					100mΩ≤R＜470mΩ	±50	±0.5、±1、±2、±5
					470mΩ≤R≤10Ω	±50	±0.25、±0.5、±1、±2、±5
MFCR2010	-55℃~+155℃	0.75W	2.74A	6.85A	100mΩ≤R＜470mΩ	±50	±0.5、±1、±2、±5
		1.5W(H=High Power)	3.87A	8.66A	470mΩ≤R≤10Ω	±50	±0.25、±0.5、±1、±2、±5
MFCR2512	-55℃~+155℃	2W	4.47A	10A	100mΩ≤R＜470mΩ	±50	±0.5、±1、±2、±5
		3W(H=High Power)	5.48A	12.25A	470mΩ≤R≤10Ω	±50	±0.25、±0.5、±1、±2、±5

Size Long Side Terminal	Operating Temperature	Rated Power (at 70℃)	Max. Rated Current	Max. Overload Current	Resistance Ω	TCR ppm/℃	Tolerance %
MFCR0508	-55℃~+155℃	1W	10A	22.36A	10mΩ≤R＜20mΩ	±150	±1、±2、±5
					20mΩ≤R＜100mΩ	±100	±1、±2、±5
					100mΩ≤R≤2Ω	±100	±0.5、±1、±2、±5

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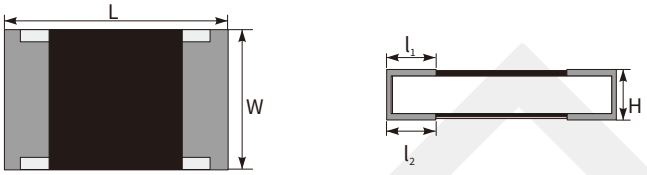
Electrical Parameters

Size Long Side Terminal	Operating Temperature	Rated Power (at 70℃)	Max. Rated Current	Max. Overload Current	Resistance Ω	TCR ppm/℃	Tolerance %
MFCR0612	-55℃~+155℃	1W	10A	22.36A	10mΩ≤R＜20mΩ	±150	±1、±2、±5
					20mΩ≤R＜100mΩ	±100	±1、±2、±5
					100mΩ≤R≤2Ω	±100	±0.5、±1、±2、±5
MFCR1020	-55℃~+155℃	2W	14.14A	31.62A	10mΩ≤R＜20mΩ	±150	±1、±2、±5
					20mΩ≤R＜100mΩ	±100	±1、±2、±5
					100mΩ≤R≤2Ω	±100	±0.5、±1、±2、±5
MFCR1225	-55℃~+155℃	3W	17.32A	38.73A	10mΩ≤R＜20mΩ	±150	±1、±2、±5
					20mΩ≤R＜100mΩ	±100	±1、±2、±5
					100mΩ≤R≤2Ω	±100	±0.5、±1、±2、±5

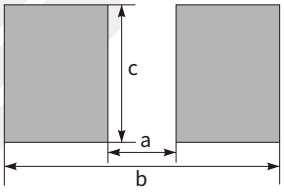
Dimensions

Unit: mm

Resistor



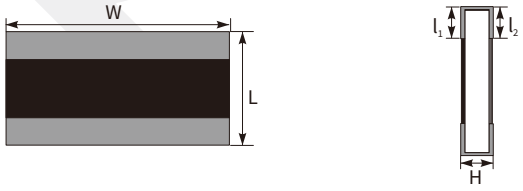
Land Pattern



Short Side Terminal

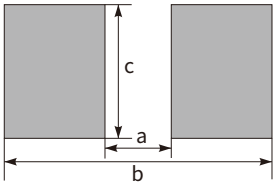
Size	L	W	H	l_1	l_2	a	b	c	Packaging	Quantity Per reel
MFCR0201	0.60±0.03	0.30±0.03	0.26±0.05	0.15±0.05	0.15±0.05	0.25	0.85	0.35	Tape & Reel	10000pcs
MFCR0402	1.00±0.10	0.50±0.05	0.35±0.05	0.20±0.10	0.25±0.10	0.50	1.60	0.70	Tape & Reel	10000pcs
MFCR0603	1.60±0.10	0.80±0.10	0.45±0.10	0.25±0.15	0.30±0.15	0.80	2.40	1.00	Tape & Reel	5000pcs
MFCR0805	2.00±0.10	1.25±0.10	0.55±0.10	0.35±0.20	0.40±0.20	1.30	2.90	1.45	Tape & Reel	5000pcs
MFCR1206	3.10±0.10	1.60±0.10	0.55±0.10	0.40±0.20	0.45±0.20	2.20	4.20	1.80	Tape & Reel	5000pcs
MFCR1210	3.10±0.10	2.50±0.15	0.55±0.10	0.50±0.20	0.50±0.20	2.00	4.40	2.70	Tape & Reel	5000pcs
MFCR2010	5.00±0.20	2.50±0.15	0.55±0.10	0.60±0.25	0.60±0.25	3.80	6.60	2.70	Tape & Reel	4000pcs
MFCR2512(2W)	6.30±0.20	3.20±0.20	0.55±0.10	0.65±0.25	0.65±0.25	4.90	8.10	3.40	Tape & Reel	4000pcs
MFCR2512(3W)	6.30±0.20	3.20±0.20	0.70±0.15	0.65±0.25	0.65±0.25	4.90	8.10	3.40	Tape & Reel	4000pcs

Resistor



Land Pattern

Unit: mm



Long Side Terminal

Size	L	W	H	l_1	l_2	a	b	c	Packaging	Quantity Per reel
MFCR0508	1.25±0.10	2.00±0.10	0.55±0.15	0.25±0.15	0.35±0.15	0.40	1.80	2.00	Tape & Reel	5000pcs
MFCR0612	1.60±0.15	3.20±0.20	0.55±0.15	0.30±0.20	0.50±0.20	0.50	2.60	3.20	Tape & Reel	5000pcs
MFCR1020	2.50±0.15	5.00±0.15	0.55±0.15	0.40±0.20	0.50±0.20	1.00	4.05	5.50	Tape & Reel	4000pcs
MFCR1225	3.20±0.20	6.30±0.20	0.55±0.15	0.60±0.25	0.80±0.25	1.20	5.20	7.00	Tape & Reel	4000pcs

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MFCR

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Part Number Information

Example: MFCR1206FR100K9R (MFCR 1206 ±1% 100mΩ ±100ppm/°C 0.5W Tape & Reel)

M	F	C	R	1	2	0	6	F	R	1	0	0	K	9	R

Series	Size		Tolerance	Resistance	TCR	Code	Packaging
MFCR	0201	1210	C=±0.25%	R039=39mΩ	Q=±50ppm/°C	9=Standard power	R=Tape & Reel
	0402	2010	D=±0.5%	R050=50mΩ	K=±100ppm/°C	H=High power	
	0603	2512	F=±1%	R100=100mΩ	R=±150ppm/°C		
	0805	0508	G=±2%	R470=470mΩ			
	1206	0612	J=±5%	2R00=2Ω			
	0805	1020		10R0=10Ω			
	1206	1225					

For higher or lower resistance values, higher precision, higher power, lower temperature coefficients, or larger sizes, please contact us for confirmation.

Performance

Test	Test Method	Standards	Test Results
Short Time Overload	5 times rated power in 5 seconds.	IEC 60115-1 4.13	△R≤±(1.0%+0.001Ω)
Insulation Resistance	Apply 100VDC for 1 minute.	IEC 60115-1 4.6	≥10GΩ
Dielectric Withstanding Voltage	0805/0508 and above applied 500VAC for 1 minute. 0201/0402/0603 applied 300VAC for 1 minute	JIS-C5201-1 4.7	No short or burned on the appearance.
Solderability	245±5°C for 3 seconds	IEC 60115-1 4.17	>95% Coverage No Visual damage
Resistance to Soldering Heat	260±5°C for 10 seconds.	IEC 60115-1 4.18	△R≤±(1.0%+0.001Ω) No Visual damage
Rapid Change of Temperature	-55°C to+155°C, 300 cycles	IEC 60115-1 4.19	△R≤±(1.0%+0.001Ω) No Visual damage
Damp Heat with Load	40±2°C, 90~95%R.H.RCW or Max. working currentwhichever is less for 1000 hrs with 1.5 hrs ON"and 0.5 hr "OFF"	IEC 60115-1 4.24	△R≤±(1.0%+0.001Ω)
Biased Humidity	1,000 hours; 85C/85%RH, 10%of operating power. Measurement at 24±4 hoursafter test conclusion.	MIL-STD-202 Method 103	△R≤±(0.5%+0.05Ω)
Load Life (Endurance)	70±2°C,Rated power,or Max.working current whichever is less for 1000 hrswith 1.5 hrs "ON" and 0.5hr "OFF"	IEC 60115-1 4.25.1	△R≤±(1.0%+0.001Ω)
High Temperature Exposure	At 155±5°C for 1000 hours.	IEC 60068-1 2-2	△R≤±(1.0%+0.001Ω)
Resistance to Solvent	The tested resistor be immersed into isopropyl alcohol of 20~25°C for 60 secS. Then the resistor is left in the room for 48 hrs	JIS-C5201-1 4.29	△R≤±(1.0%+0.001Ω) No Visual damage
Body Strength	Pressurizng force for 10 seconds 0201/0402/0603:8N;0805/0508 and above: 17.7N	IEC 60115-1 4.6	≥10GΩ
Bending Strength	0201/0402/0603/0805=5mm, 1206/1210/0508/0612=3mm, 2010/2512/1020/1225=2mm, 5s	IEC 60115-1 4.33	△R≤±(1.0%+0.001Ω) No Visual damage

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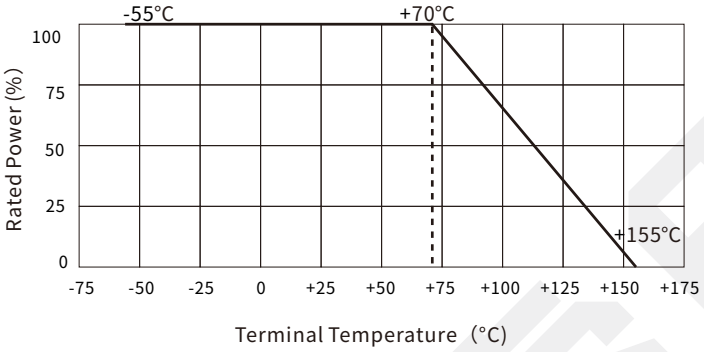
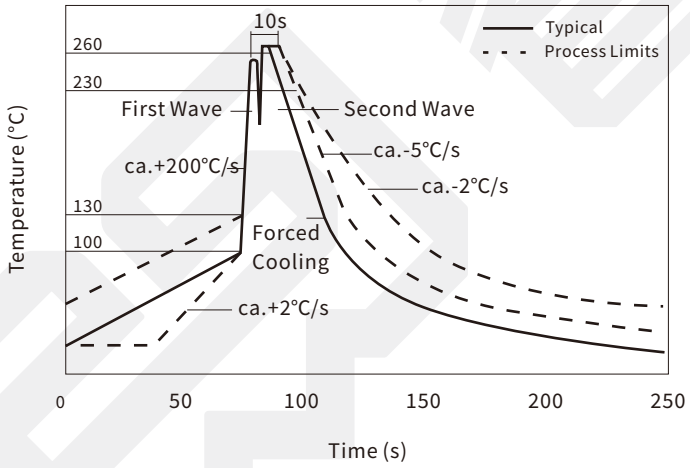
Derating Curve



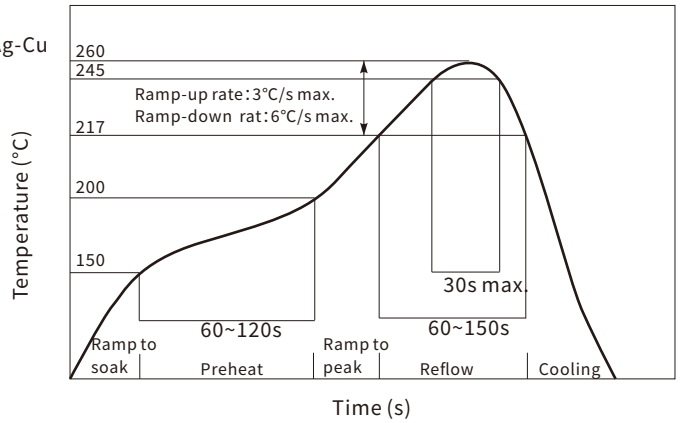
Flow Soldering Profile

Resistor surface temperature.
Peak temperature: +260°C, 10sec.
Solder type: Sn-Ag-Cu solder

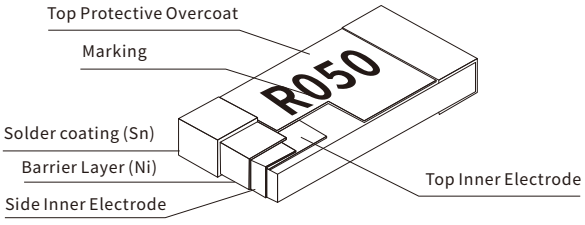


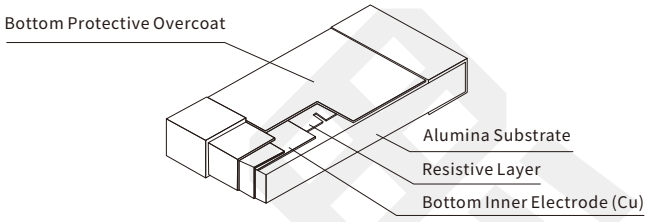
Reflow Soldering Profile

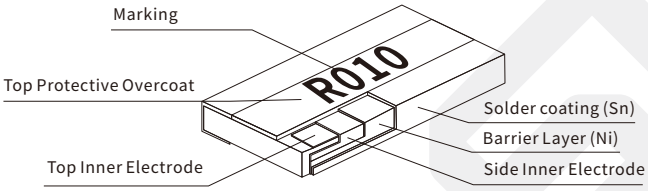
Resistor Surface Temperature .
Pre-Heat: +150°C~+200°C,60~120sec.
Reflow: Above +217°C,60~150sec.
Applicable Solder Composition: Sn-Ag-Cu

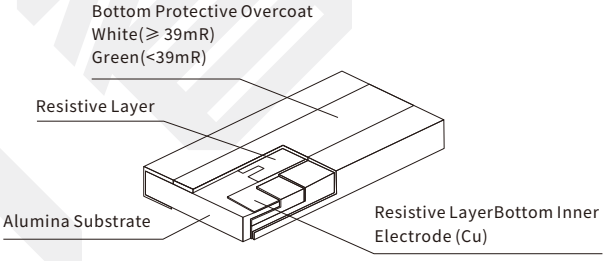


Construction







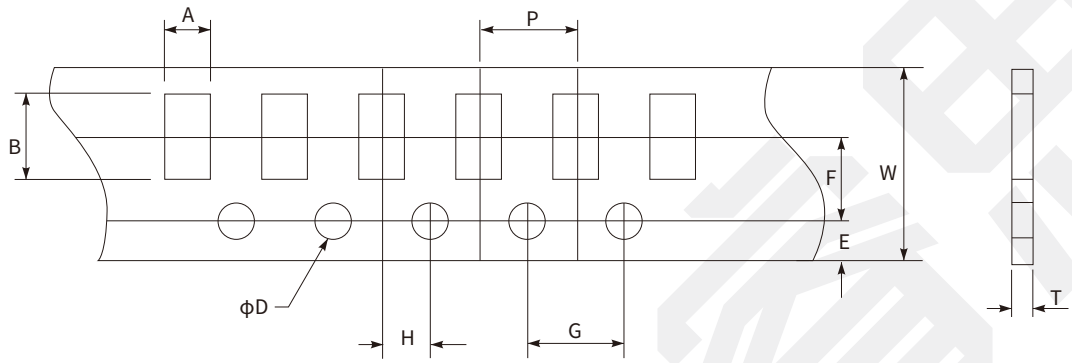


Packaging

Tapping specification (Paper)

Unit: mm

Tape and reel: 7″

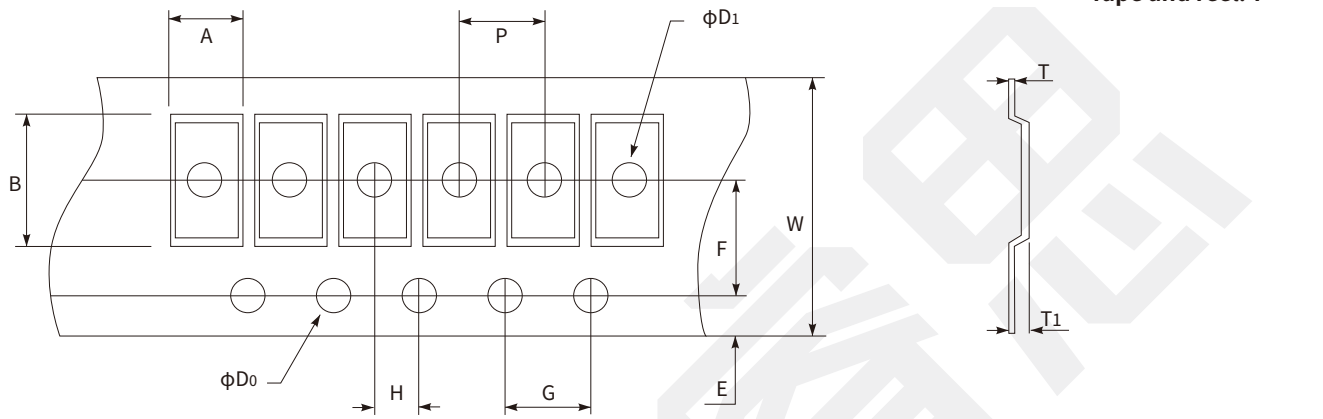


Size	A	B	W	E	F	G	H	T	ϕD	P
0201	0.45±0.1	0.75±0.1	8.0±0.2	1.75±0.1	3.5±0.05	4.0±0.1	2.0±0.05	0.35±0.1	1.50+0.10/-0	2.0±0.1
0402	0.70±0.1	1.20±0.1	8.0±0.2	1.75±0.1	3.5±0.05	4.0±0.1	2.0±0.05	0.45±0.1	1.50+0.10/-0	2.0±0.1
0603	1.05±0.2	1.80±0.2	8.0±0.2	1.75±0.1	3.5±0.05	4.0±0.1	2.0±0.05	0.60±0.1	1.50+0.10/-0	4.0±0.1
0805	1.55±0.2	2.30±0.2	8.0±0.2	1.75±0.1	3.5±0.05	4.0±0.1	2.0±0.05	0.75±0.1	1.50+0.10/-0	4.0±0.1
1206	1.90±0.2	3.05±0.2	8.0±0.2	1.75±0.1	3.5±0.05	4.0±0.1	2.0±0.05	0.75±0.1	1.50+0.10/-0	4.0±0.1
1210	2.85±0.2	3.05±0.2	8.0±0.2	1.75±0.1	3.5±0.05	4.0±0.1	2.0±0.05	0.75±0.1	1.50+0.10/-0	4.0±0.1
0508	1.50±0.15	2.25±0.15	8.0±0.2	1.75±0.1	3.5±0.05	4.0±0.1	2.0±0.05	0.75±0.1	1.50+0.10/-0	4.0±0.1
0612	2.85±0.2	3.05±0.2	8.0±0.2	1.75±0.1	3.5±0.05	4.0±0.1	2.0±0.05	0.75±0.1	1.50+0.10/-0	4.0±0.1

Packaging

Tapping specification (Plastic)

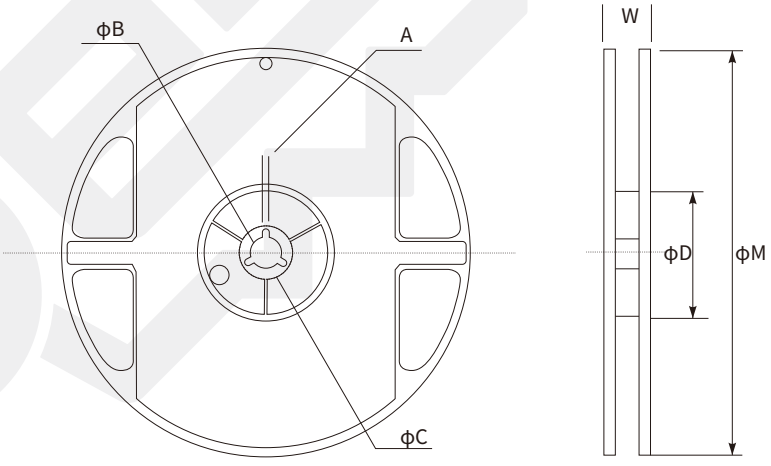
Unit: mm
Tape and reel: 7″



Size	A	B	W	E	F	G	H	T	ϕD0	ϕD1	T1	P
2010/1020	2.80±0.2	5.60±0.2	12±0.1	1.75±0.1	5.5±0.05	4±0.1	2.0±0.05	0.23±0.1	1.50+0.10/-0	1.50±0.1	0.85±0.15	4.0±0.1
2512/1225	3.40±0.2	6.70±0.2	12±0.1	1.75±0.1	5.5±0.05	4±0.1	2.0±0.05	0.23±0.1	1.50+0.10/-0	1.50±0.1	0.85±0.15	4.0±0.1

Reel Specifications

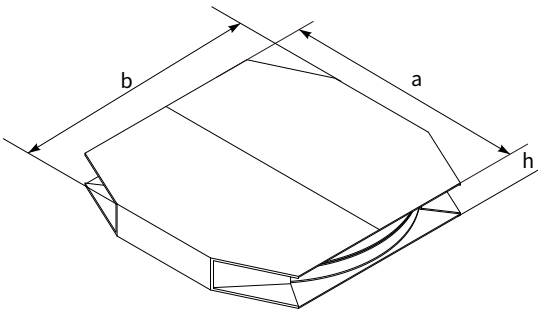
Unit: mm
Tape and reel: 7″



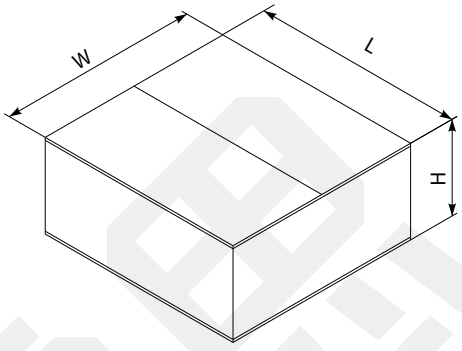
Size	A	ϕB	ϕC	ϕD	W	ϕM
0201/0402/0603/0805 1206/1210/0508/0612	2.0±0.5	13.5 ±1.0	21±1.0	60±1.0	11.5±2.0	178±2.0
2010/2512/1020/1225	2.0±0.5	13.5 ±1.0	21±1.0	60±1.0	16.0±2.0	178±2.0

Packing

Unit: mm



QTY (Reel)	a	b	h
1	180	180	13
2	180	180	24
3	180	180	36
5	180	180	60
10	180	180	113



QTY (pcs)	L	W	H
25K	180	180	60
50K	180	180	110
150K	430	200	200
300K	400	400	200

Revision

Version	Revised Content	Date	Approver
V0	Initial Issue	2025.1.1	CFD

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