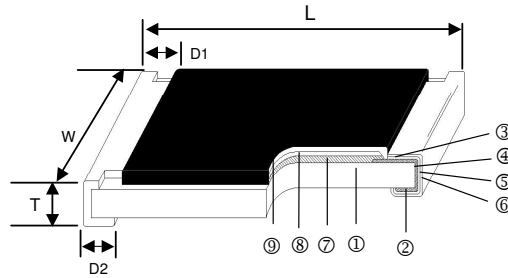
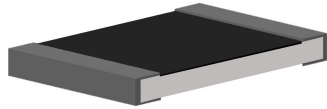


Non-magnetic Thick Film Chip Resistor—NMR Series

Construction



① Alumina Substrate	⑤ Resistor Layer (RuO ₂ /Ag)
② Bottom Electrode (AgPd)	⑥ Primary Overcoat (Glass)
③ Top Electrode (Ag)	⑦ Secondary Overcoat (Epoxy)
④ Edge Electrode (AgPd)	

Features

- AgPd Terminations
- Suitable for soldering
- Non-magnetic

Applications

- Medical and Military Equipment
- MRI Coil Industries
- Computer Tomography (CT)

Dimensions

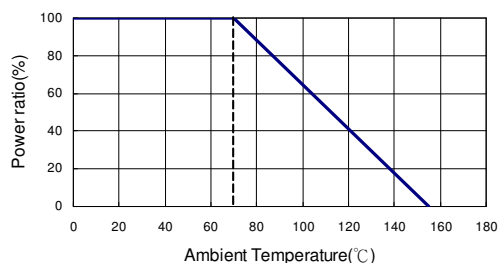
Unit: mm

Type	Size (Inch)	L	W	T	D1	D2	Weight (g) (1000pcs)
NMR02	0402	1.00±0.05	0.50±0.05	0.35±0.05	0.20±0.10	0.20±0.10	0.620
NMR03	0603	1.60±0.10	0.80±0.10	0.45±0.10	0.30±0.20	0.30±0.20	2.042
NMR05	0805	2.00±0.10	1.25±0.10	0.50±0.10	0.35±0.20	0.40±0.20	4.368
NMR06	1206	3.10±0.10	1.55±0.10	0.55±0.10	0.50±0.25	0.50±0.20	8.947
NMR10	1210	3.20±0.20	2.60±0.15	0.55±0.10	0.50±0.25	0.50±0.20	15.959
NMR0A	2010	5.00±0.20	2.50±0.15	0.55±0.10	0.60±0.25	0.50±0.20	24.241
NMR12	2512	6.35±0.20	3.20±0.15	0.55±0.10	0.60±0.25	0.50±0.20	39.448

Part Numbering

NMR	03	F	L	7	--10K
Product Type	Dimensions (L×W)	Resistance Tolerance	Function Code	Packaging Code	Resistance
	02: 0402 03: 0603 05: 0805 06: 1206 10: 1210 0A: 2010 12: 2512	F: ±1% J: ±5%	L: Standard	4: 7" Reel 4Kpcs 6: 7" Reel 10Kpcs 7: 7" Reel 5Kpcs 9: 10" Reel 8Kpcs A: 10" Reel 10Kpcs B: 10" Reel 20Kpcs C: 13" Reel 40Kpcs D: 13" Reel 20Kpcs	--- 1R2: 1.2Ω --- 3K3: 3.3KΩ --- 10K: 10KΩ -- 100K: 100KΩ "-" to fill up 6 spaces

Derating Curve



Standard Electrical Specifications

Type \ Item	Power Rating at 70°C	Operating Temp. Range	Max. Operating Voltage	Max. Overload Voltage	Resistance Range		TCR (PPM/°C)
					±1%	±5%	
NMR02 (0402)	1/16W	-55 ~ +155°C	50V	100V	1Ω - 9.76Ω 10Ω - 1MΩ 1.02MΩ - 10MΩ		±200 ±100 ±200
Jumper	1A				0Ω (<50mΩ)		-
NMR03 (0603)	1/10W	-55 ~ +155°C	50V	100V	1Ω - 9.76Ω 10Ω - 1MΩ 1.02MΩ - 10MΩ		±200 ±100 ±200
Jumper	1A				0Ω (<50mΩ)		-
NMR05 (0805)	1/8W	-55 ~ +155°C	150V	300V	1Ω - 9.76Ω 10Ω - 1MΩ 1.02MΩ - 10MΩ		±200 ±100 ±200
NMR06 (1206)	1/4W		200V	400V	1Ω - 9.76Ω 10Ω - 1MΩ 1.02MΩ - 10MΩ		±200 ±100 ±200
Jumper	2A		0Ω (<50mΩ)		-		
NMR10 (1210)	1/3W	-55 ~ +155°C	200V	400V	1Ω - 9.76Ω 10Ω - 1MΩ 1.02MΩ - 10MΩ		±200 ±100 ±200
Jumper	2.5A				0Ω (<50mΩ)		-
NMR0A (2010)	3/4W	-55 ~ +155°C	200V	400V	1Ω - 9.76Ω 10Ω - 1MΩ 1.02MΩ - 10MΩ		±200 ±100 ±200
Jumper	3.5A				0Ω (<50mΩ)		-
NMR12 (2512)	1W	-55 ~ +155°C	250V	500V	1Ω - 9.76Ω 10Ω - 1MΩ 1.02MΩ - 10MΩ		±200 ±100 ±200
Jumper	4A				0Ω (<50mΩ)		-

Operating Voltage= $\sqrt{P \cdot R}$ or Max. operating voltage listed above, whichever is lower.

Overload Voltage= $2.5 \cdot \sqrt{P \cdot R}$ or Max. overload voltage listed above, whichever is lower.

Environmental Characteristics

Item	Requirement			Test Method
	1%	5%	Jumper	
Temperature Coefficient of Resistance (T.C.R.)	As Spec.			-55°C~+155°C, 25°C is the reference temperature
Short Time Overload	$\pm(1.0\%+0.05\Omega)$	$\pm(2.0\%+0.05\Omega)$	<50mΩ	2.5 times RCWV / Max. overload voltage for 5 seconds
Insulation Resistance	$\geq 10G$			Max. overload voltage for 1 minute
Endurance	$\pm(2.0+0.10\Omega)$	$\pm(3.0\%+0.10\Omega)$	<100mΩ	70±2°C, Max. working voltage for 1000 hrs with 1.5 hrs "ON" and 0.5 hrs "OFF"
Damp Heat with Load	$\pm(2.0\%+0.10\Omega)$	$\pm(3.0\%+0.10\Omega)$	<100mΩ	40±2°C, 90~95% R.H., Max. working voltage for 1000 hrs with 1.5 hrs "ON" and 0.5 hrs "OFF"
Dry Heat	$\pm(1.0\%+0.05\Omega)$	$\pm(1.5\%+0.10\Omega)$	<50mΩ	at +155°C for 1000 hrs
Voltage Proof	No breakdown or flashover			1.42 times RCWV (RMS) for 1 minute
Rapid Change of Temperature	$\pm(0.5\%+0.05\Omega)$	$\pm(1.0\%+0.05\Omega)$	<50mΩ	-55°C to +155°C, 5 cycles

Reference Standards: IEC 60115-1; JIS-C 5201-1

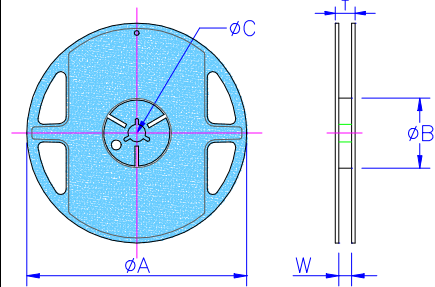
Storage Temperature: 25±3°C; Humidity < 80%RH

■ Packaging

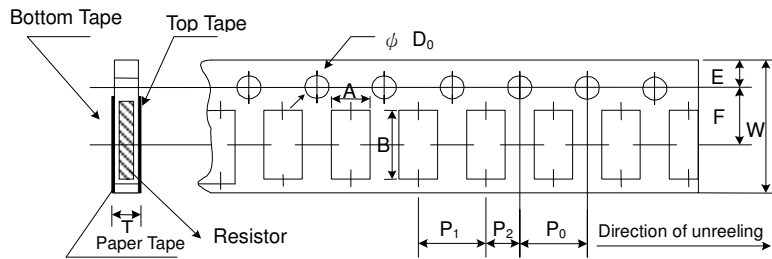
Reel Specifications & Packaging Quantity

Unit: mm

Type	Packaging Quantity	Tape width	Reel Diameter	ΦA	ΦB	ΦC	W	T
NMR02	Paper 10K ---- 20K ---- 40K	8mm	7 inch	178.5±1.5	60 ^{+1/-0}	13.0±0.2	9.0±0.5	12.5±0.5
NMR03			10 inch	254±1	100±0.5	13.0±0.2	9.5±0.5	13.5±0.5
NMR05 NMR06 NMR10			13 inch	330±1	100±0.5	13.0±0.2	9.5±0.5	13.5±0.5
NMR0A NMR12	Embossed 4K ---- 8K	12mm	7 inch	178.5±1.5	60 ^{+1/-0}	13.0±0.5	13.0±0.5	15.5±0.5
			10 inch	250±1	62±0.5	13.0±0.5	12.5±0.5	16.5±0.5



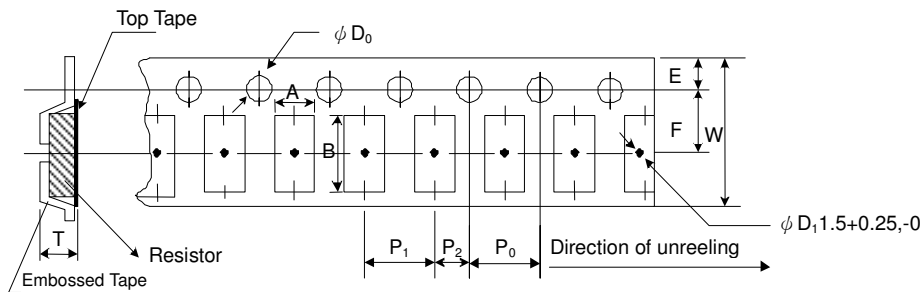
Paper Tape Specifications



Unit: mm

Type	A	B	W	E	F	P ₀	P ₁	P ₂	ΦD ₀	T
NMR02	0.65±0.10	1.15±0.1	8.0±0.2	1.75±0.1	3.50±0.05	4.00±0.10	2.00±0.05	2.00±0.05	1.50+0.1,-0	0.45±0.1
NMR03	1.10±0.10	1.90±0.1	8.0±0.2	1.75±0.1	3.50±0.05	4.00±0.10	4.00±0.05	2.00±0.05	1.50+0.1,-0	0.70±0.1
NMR05	1.60±0.10	2.40±0.2	8.0±0.2	1.75±0.1	3.50±0.05	4.00±0.10	4.00±0.05	2.00±0.05	1.50+0.1,-0	0.85±0.1
NMR06	1.90±0.10	3.50±0.2	8.0±0.2	1.75±0.1	3.50±0.05	4.00±0.10	4.00±0.05	2.00±0.05	1.50+0.1,-0	0.85±0.1
NMR10	2.80±0.10	3.50±0.2	8.0±0.2	1.75±0.1	3.50±0.05	4.00±0.10	4.00±0.05	2.00±0.05	1.50+0.1,-0	0.85±0.1

Embossed Plastic Tape Specifications

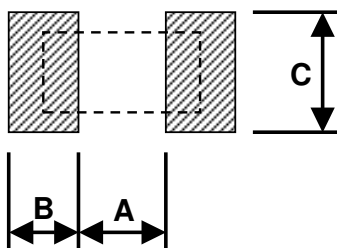


Unit: mm

Type	A	B	W	E	F	P ₀	P ₁	P ₂	ΦD ₀	T
NMR0A	2.8±0.20	5.5±0.20	12.0±0.3	1.75±0.1	5.5±0.05	4.00±0.10	4.00±0.1	2.00±0.05	1.50+0.1,-0	1.2 ⁺⁰
NMR12	3.5±0.20	6.7±0.20	12.0±0.3	1.75±0.1	5.5±0.05	4.00±0.10	4.00±0.1	2.00±0.05	1.50+0.1,-0	1.2 ⁺⁰

■ Recommend Land Pattern

Unit: mm



Type	A	B	C
NMR02	0.50	0.45	0.60
NMR03	0.90	0.60	0.90
NMR05	1.20	0.70	1.30
NMR06	2.00	0.90	1.60
NMR10	2.00	0.90	2.80
NMR0A	3.80	0.90	2.80
NMR12	3.80	1.60	3.50