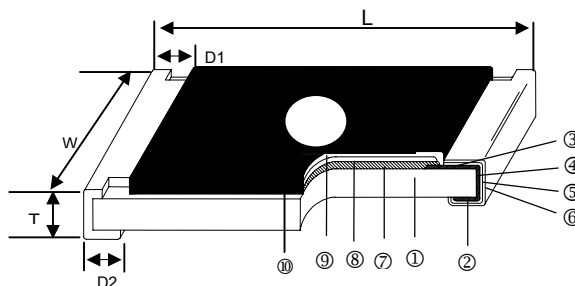
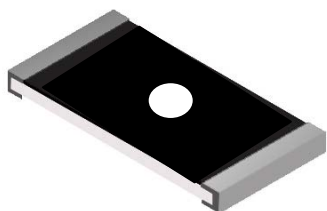


Non-magnetic Thick Film Chip Resistor—NMP Series

Construction



①	Alumina Substrate	④	Edge Electrode (Ag)	⑦	Resistor Layer (RuO ₂ /Ag)
②	Bottom Electrode (Ag)	⑤	Barrier Layer (Cu)	⑧	Primary Overcoat (Glass)
③	Top Electrode (Ag-Pd)	⑥	External Electrode (Sn)	⑨	Secondary Overcoat (Epoxy)
⑩	Marking (Epoxy)				

Features

- Cu/Sn Terminations
- Suitable for Soldering
- Non-magnetic

Applications

- Medical and military equipment
- MRI coil industries
- Computer tomography (CT)

Dimensions

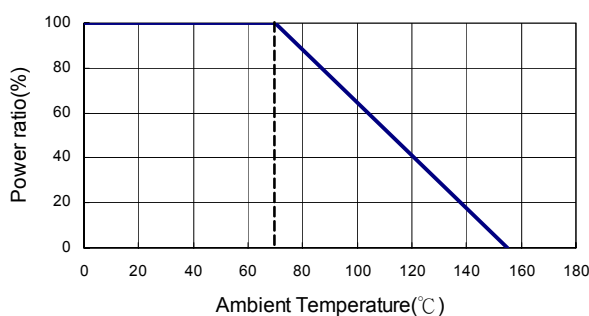
Unit: mm

Type	Size (Inch)	L	W	T	D1	D2	Weight (g) (1000pcs)
NMP02	0402	1.00±0.05	0.50±0.05	0.35±0.05	0.20±0.10	0.20±0.10	0.620
NMP03	0603	1.60±0.10	0.80±0.10	0.45±0.10	0.30±0.20	0.30±0.20	2.042
NMP05	0805	2.00±0.10	1.25±0.10	0.50±0.10	0.35±0.20	0.40±0.20	4.368
NMP06	1206	3.10±0.10	1.55±0.10	0.55±0.10	0.50±0.25	0.50±0.20	8.947
NMP10	1210	3.10±0.10	2.60±0.15	0.55±0.10	0.50±0.25	0.50±0.20	15.959
NMP0A	2010	5.00±0.10	2.50±0.15	0.55±0.10	0.60±0.25	0.50±0.20	24.241
NMP12	2512	6.35±0.10	3.10±0.15	0.55±0.10	0.60±0.25	0.50±0.20	39.448

Part Numbering

NMP	03	J	L	7	---10K
Product Type	Dimensions	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%	
NMP02 (0402)	1/16W	-55 ~ +155°C	50V	100V	1Ω - 9.76Ω 10Ω - 1MΩ 1.02MΩ - 10MΩ		±200 ±100 ±200
Jumper	1A				0Ω (<50mΩ)		-
NMP03 (0603)	1/10W	-55 ~ +155°C	50V	100V	1Ω - 9.76Ω 10Ω - 1MΩ 1.02MΩ - 10MΩ		±200 ±100 ±200
Jumper	1A				0Ω (<50mΩ)		-
NMP05 (0805)	1/8W	-55 ~ +155°C	150V	300V	1Ω - 9.76Ω 10Ω - 1MΩ 1.02MΩ - 10MΩ		±200 ±100 ±200
NMP06 (1206)	1/4W		200V	400V	1Ω - 9.76Ω 10Ω - 1MΩ 1.02MΩ - 10MΩ		±200 ±100 ±200
Jumper	2A				0Ω (<50mΩ)		-
NMP10 (1210)	1/3W	-55 ~ +155°C	200V	400V	1Ω - 9.76Ω 10Ω - 1MΩ 1.02MΩ - 10MΩ		±200 ±100 ±200
Jumper	2.5A				0Ω (<50mΩ)		-
NMP0A (2010)	3/4W	-55 ~ +155°C	200V	400V	1Ω - 9.76Ω 10Ω - 1MΩ 1.02MΩ - 10MΩ		±200 ±100 ±200
Jumper	3.5A				0Ω (<50mΩ)		-
NMP12 (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.

■ Viking is capable of manufacturing the optional spec based on customer's requirement.

■ Environmental Characteristics

Item	Requirement			Test Method
	±1%	±5%	Jumper	
Temperature Coefficient of Resistance (T.C.R.)	As Spec.			-55°C~+125°C, 25°C is the reference temperature
Short Time Overload	±(1.0%+0.05Ω)	±(2.0%+0.05Ω)	<50mΩ	2.5 times RCWV or Max. overload voltage for 5 seconds
Insulation Resistance	≥ 10G			Max. overload voltage for 1 minute
Endurance	±(2.0%+0.10Ω)	±(3.0%+0.10Ω)	<100mΩ	70±2°C, Max. working voltage for 1000 hrs with 1.5 hrs "ON" and 0.5 hrs "OFF"
Damp Heat with Load	±(2.0%+0.10Ω)	±(3.0%+0.10Ω)	<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	±(1.0%+0.05Ω)	±(1.5%+0.10Ω)	<50mΩ	at +155°C for 1000 hrs
Bending Strength	±(1.0%+0.05Ω)	±(1.0%+0.05Ω)	<50mΩ	Bending once for 5 seconds 2010, 2512 sizes: 2mm Other sizes: 3mm
Solderability	95% min. coverage			245±5°C for 3 seconds
Resistance to Soldering Heat	±(0.5%+0.05Ω)	±(1.0%+0.05Ω)	<50mΩ	260±5°C for 10 seconds
Voltage Proof	No breakdown or flashover			1.42 times RCWV (RMS) for 1 minute
Leaching	Individual leaching area ≤ 5% Total leaching area ≤ 10%			260±5°C for 30 seconds
Rapid Change of Temperature	±(0.5%+0.05Ω)	±(1.0%+0.05Ω)	<50mΩ	-55°C to +155°C, 5 cycles

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

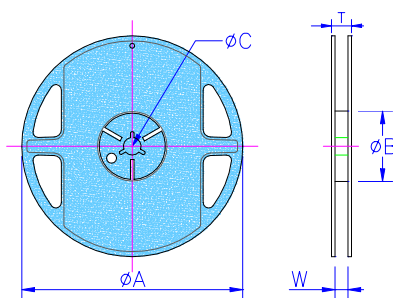
■ Storage Temperature: 25±3°C; Humidity < 80%RH

Packaging

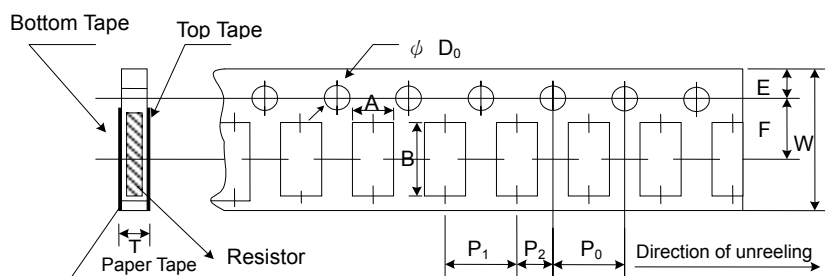
Reel Specifications & Packaging Quantity

Unit: mm

Type	Packaging Quantity		Tape Width	Reel Diameter	ΦA	ΦB	ΦC	W	T
NMP02	Paper	10K	8mm	7 inch	178.5±1.5	60 ^{+1/-0}	13.0±0.2	9.0±0.5	12.5±0.5
		20K							
		40K							
NMP03	Paper	5K		10 inch	254±1.0	100±0.5	13.0±0.2	9.5±0.5	13.5±0.5
NMP05		13 inch		330±1.0	100±0.5	13.0±0.2	9.5±0.5	13.5±0.5	
NMP06									
NMP10									
NMP0A	Embossed	4K	12mm	7 inch	178.5±1.5	60 ^{+1/-0}	13.0±0.5	13.0±0.5	15.5±0.5
NMP12		8K		10 inch	250±1.0	62±0.5	13.0±0.5	12.5±0.5	16.5±0.5



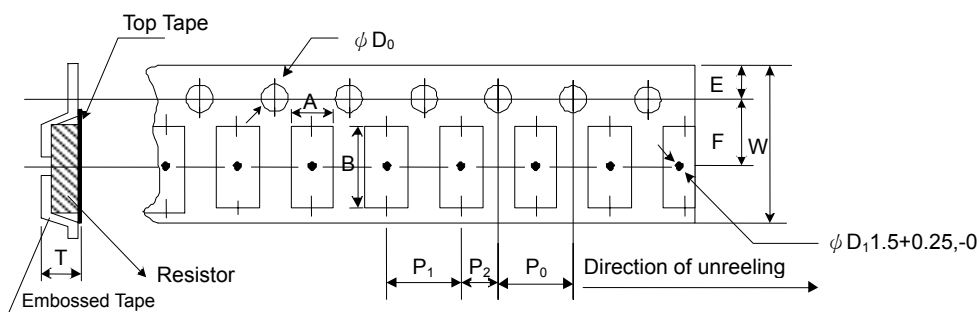
Paper Tape Specifications



Unit: mm

Type	A	B	W	E	F	P ₀	P ₁	P ₂	ΦD_0	T
NMP02	0.65 ± 0.10	1.15 ± 0.10	8.0 ± 0.20	1.75 ± 0.10	3.50 ± 0.05	4.00 ± 0.10	2.00 ± 0.05	2.00 ± 0.05	$1.50 \pm 0.1, -0$	0.45 ± 0.10
NMP03	1.10 ± 0.10	1.90 ± 0.10	8.0 ± 0.20	1.75 ± 0.10	3.50 ± 0.05	4.00 ± 0.10	4.00 ± 0.05	2.00 ± 0.05	$1.50 \pm 0.1, -0$	0.70 ± 0.10
NMP05	1.60 ± 0.10	2.40 ± 0.20	8.0 ± 0.20	1.75 ± 0.10	3.50 ± 0.05	4.00 ± 0.10	4.00 ± 0.05	2.00 ± 0.05	$1.50 \pm 0.1, -0$	0.85 ± 0.10
NMP06	1.90 ± 0.10	3.50 ± 0.20	8.0 ± 0.20	1.75 ± 0.10	3.50 ± 0.05	4.00 ± 0.10	4.00 ± 0.05	2.00 ± 0.05	$1.50 \pm 0.1, -0$	0.85 ± 0.10
NMP10	2.90 ± 0.10	3.50 ± 0.20	8.0 ± 0.20	1.75 ± 0.10	3.50 ± 0.05	4.00 ± 0.10	4.00 ± 0.05	2.00 ± 0.05	$1.50 \pm 0.1, -0$	0.85 ± 0.10

Embossed Plastic Tape Specifications

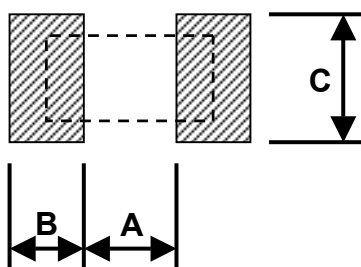


Unit: mm

Type	A	B	W	E	F	P ₀	P ₁	P ₂	ΦD_0	T
NMP0A	2.8 ± 0.10	5.5 ± 0.10	12.0 ± 0.30	1.75 ± 0.10	5.5 ± 0.05	4.00 ± 0.10	4.00 ± 0.10	2.00 ± 0.05	$1.50 \pm 0.1, -0$	1.2^{+0}
NMP12	3.5 ± 0.10	6.7 ± 0.10	12.0 ± 0.30	1.75 ± 0.10	5.5 ± 0.05	4.00 ± 0.10	4.00 ± 0.10	2.00 ± 0.05	$1.50 \pm 0.1, -0$	1.2^{+0}

Recommend Land Pattern

Unit: mm



Type	A	B	C
NMP02	0.50	0.45	0.60
NMP03	0.90	0.60	0.90
NMP05	1.20	0.70	1.30
NMP06	2.00	0.90	1.60
NMP10	2.00	0.90	2.80
NMP0A	3.80	0.90	2.80
NMP12	3.80	1.60	3.50