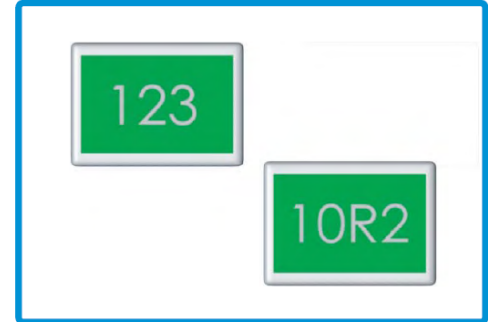




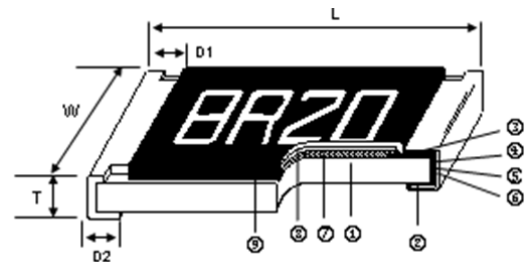
Feature

- Advanced thin film technology
- Very tight tolerance down to $\pm 0.01\%$
- Extremely low TCR down to $\pm 5 \text{ PPM}/^\circ\text{C}$
- Wide resistance range 1 ohm ~ 3M ohm
- Miniature size 0201 available



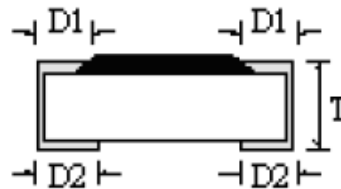
PART NUMBERING SYSTEM

Precision Thin Film Chip Resistors						RN73	F	2A	TD	1001	C
Code		B	C	D	F	G					
TCR(PPM/°C)		±5	±10	±15	±25	±50					
Code	1H	1E	1J	2A	2B	2E	2H	3A			
Size	0201	0402	0603	0805	1206	1210	2010	2512			
-----		Bulk									
TD		Paper Tape(Reel) (1H,1E,1J,2A,2B,2E)									
TE		Plastic Tape(Reel) (2H,3A)									
TP		Paper Tape(1E)									
Resistance Value											
1% - 4 digits, First 3 are significant, Forth is multiplier (10 ^x)											
Resistance Tolerance											
Code	A	B	C	D	F						
Value	± 0.05%	± 0.1%	± 0.25%	± 0.5%	± 1%						



① Alumina Substrate	⑦ Resistor Layer (NiCr)
② Bottom Electrode (Ag)	⑧ Overcoat (Epoxy)
③ Top Electrode (Ag-Pd)	⑨ Marking
④ Edge Electrode (NiCr)	
⑤ Barrier Layer (Ni)	
⑥ External Electrode (Sn)	

Dimensions



Type	Size (Inch)	L	W	T	D1	D2	Weight (g) (1000pcs)
1H	0201	0.58 $\pm$ 0.05	0.29 $\pm$ 0.05	0.23 $\pm$ 0.05	0.12 $\pm$ 0.05	0.15 $\pm$ 0.05	0.14
1E	0402	1.00 $\pm$ 0.05	0.50 $\pm$ 0.05	0.30 $\pm$ 0.05	0.20 $\pm$ 0.10	0.20 $\pm$ 0.10	0.54
1J	0603	1.55 $\pm$ 0.10	0.80 $\pm$ 0.10	0.45 $\pm$ 0.10	0.30 $\pm$ 0.20	0.30 $\pm$ 0.20	1.83
2A	0805	2.00 $\pm$ 0.15	1.25 $\pm$ 0.15	0.55 $\pm$ 0.10	0.30 $\pm$ 0.20	0.40 $\pm$ 0.20	4.71
2B	1206	3.05 $\pm$ 0.15	1.55 $\pm$ 0.15	0.55 $\pm$ 0.10	0.42 $\pm$ 0.20	0.35 $\pm$ 0.25	9.02
2E	1210	3.10 $\pm$ 0.15	2.40 $\pm$ 0.15	0.55 $\pm$ 0.10	0.40 $\pm$ 0.20	0.55 $\pm$ 0.25	10
2H	2010	4.90 $\pm$ 0.15	2.40 $\pm$ 0.15	0.55 $\pm$ 0.10	0.60 $\pm$ 0.30	0.50 $\pm$ 0.25	23.61
3A	2512	6.30 $\pm$ 0.15	3.10 $\pm$ 0.15	0.55 $\pm$ 0.10	0.60 $\pm$ 0.30	0.50 $\pm$ 0.25	38.06



Standard Electrical Specifications

Item Type	Power Rating at 70°C	Operating Temp. Range	Max. Operating Voltage	Max. Overload Voltage	Resistance Range					TCR (PPM/°C)
					±0.05%	±0.1%	±0.25%	±0.5%	±1%	
1H (0201)	1/32W	-55 ~ +155°C	15V	30V	—				49.9Ω - 5KΩ	±25
									49.9Ω - 33KΩ	±50
1E (0402)	1/16W	-55 ~ +155°C	25V	50V	—					±25
					10Ω - 205KΩ					±50
1J (0603)	1/16W	-55 ~ +155°C	50V	100V	4.7Ω -332KΩ	4.7Ω - 1MΩ	2Ω - 1MΩ			±25
							1Ω - 1MΩ			±50
2A (0805)	1/10W	-55 ~ +155°C	100V	200V	4.7Ω -511KΩ	4.7Ω - 2MΩ	1Ω - 2MΩ			±25 ±50
2B (1206)	1/8W	-55 ~ +155°C	150V	300V	4.7Ω - 1MΩ	4.7Ω - 2.5MΩ	1Ω - 2.5MΩ			±25 ±50
2E (1210)	1/4W									
2H (2010)	1/4W	-55 ~ +155°C	150V	300V	4.7Ω - 1MΩ	4.7Ω - 3MΩ	1Ω - 3MΩ			±25 ±50
3A (2512)	1/2W									

- 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.
- Lower Resistance: 1~10Ω

Special Electrical Specifications

Item Type	Power Rating at 70°C	Operating Temp. Range	Max. Operating Voltage	Max. Overload Voltage	Resistance Range			TCR (PPM/°C)
					±0.01%	±0.05%	±0.1%	
1E (0402)	1/16W	-55 ~ +155°C	25V	50V	49.9Ω - 5KΩ			±5
					49.9Ω - 12KΩ			±10
					49.9Ω - 12KΩ		49.9Ω - 70KΩ	±15
1J (0603)	1/16W	-55 ~ +155°C	50V	100V	24.9Ω - 15KΩ			±5
					24.9Ω - 100KΩ	4.7Ω - 332KΩ		±10 ±15
					24.9Ω - 30KΩ			±5
2A (0805)	1/10W	-55 ~ +155°C	100V	200V	24.9Ω - 200KΩ	4.7Ω - 511KΩ		±10 ±15
					24.9Ω - 50KΩ			±5
2B (1206)	1/8W	-55 ~ +155°C	150V	300V	24.9Ω - 500KΩ	4.7Ω - 1MΩ		±10 ±15
					24.9Ω - 50KΩ			±5
2E (1210)	1/ 4W	-55 ~ +155°C	150V	300V	24.9Ω - 500KΩ	4.7Ω - 1MΩ		±10 ±15
					24.9Ω - 100KΩ			±5
2H (2010)	1/4W	-55 ~ +155°C	150V	300V	24.9Ω - 500KΩ	4.7Ω - 1MΩ		±10 ±15
					24.9Ω - 100KΩ			±5
3A (2512)	1/2W	-55 ~ +155°C	150V	300V	24.9Ω - 500KΩ	4.7Ω - 1MΩ		±10 ±15
					24.9Ω - 100KΩ			±5

- 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.

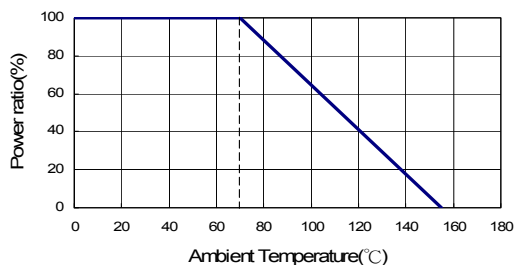


Environmental Characteristics

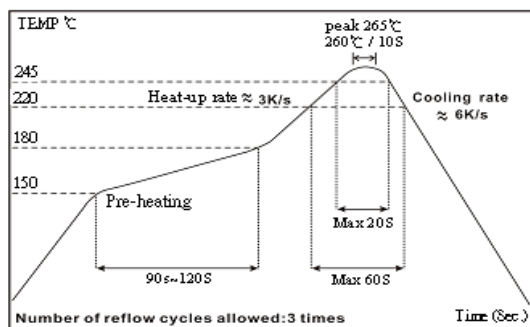
Item	Requirement		Test Method
	Tol. ≤ 0.05%	Tol. > 0.05%	
Temperature Coefficient of Resistance (T.C.R.)	As Spec.		MIL-STD-202F Method 304 +25/-55/+25/+125/+25°C
Short Time Overload	ΔR±0.05%	ΔR±0.2%	JIS-C-5201-1 5.5 RCWV*2.5 or Max. overload voltage for 5 seconds
	ΔR±0.2% for high power rating		
Insulation Resistance	>1000 MΩ		MIL-STD-202F Method 302 Apply 100VDC for 1 minute
Endurance	ΔR±0.05%	ΔR±0.2%	MIL-STD-202F Method 108A 70±2°C, Max. working voltage for 1000 hrs with 1.5 hrs “ON” and 0.5 hrs “OFF”
	>7kΩ ΔR±0.5%		
	ΔR±0.5% for high power rating		
Damp Heat with Load	ΔR±0.05%	ΔR±0.3%	MIL-STD-202F Method 103B 40±2°C, 90~95% R.H. Max. working voltage for 1000 hrs with 1.5 hrs “ON” and 0.5 hrs “OFF”
	ΔR±0.5% for high power rating		
Bending Strength	ΔR±0.05%	ΔR±0.2%	JIS-C-5201-1 6.1.4 Bending amplitude 3 mm for 10 seconds
Solderability	95% min. coverage		MIL-STD-202F Method 208H 245±5°C for 3 seconds
Resistance to Soldering Heat	ΔR±0.05%	ΔR±0.2%	MIL-STD-202F Method 210E 260±5°C for 10 seconds
Dielectric Withstand Voltage	By Type		MIL-STD-202F Method 301 Max. overload voltage for 1 minute
Thermal Shock	ΔR±0.05%	ΔR±0.25%	MIL-STD-202F Method 107G -55°C ~150°C, 100 cycles
Low Temperature Operation	ΔR±0.05%	ΔR±0.2%	JIS-C-5201-1 7.1 1 hour, -65°C, followed by 45 minutes of RCWV
	ΔR±0.5% for high power rating		

Storage Temperature: 25 $\pm$ 3°C; Humidity < 80%RH

Derating Curve



Reflow

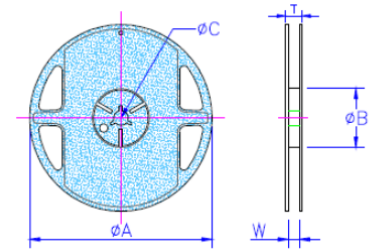




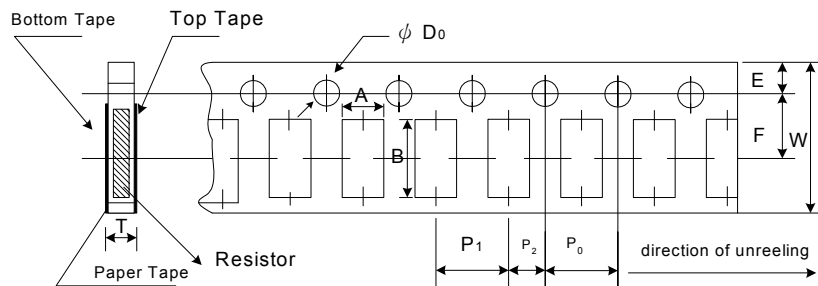
Packaging

Unit: mm

Type	ØA	ØB	ØC	W	T	Paper Tape (EA)	Emboss Plastic Tape (EA)
1H	178.0±1.0	60.0±1.0	13.5±0.7	9.5±1.0	11.5±1.0	10,000	-
1E	178.0±1.0	60.0±1.0	13.5±0.7	9.5±1.0	11.5±1.0	10,000	-
1J	178.0±1.0	60.0±1.0	13.5±0.7	9.5±1.0	11.5±1.0	5,000	-
2A	178.0±1.0	60.0±1.0	13.5±0.7	9.5±1.0	11.5±1.0	5,000	-
2B	178.0±1.0	60.0±1.0	13.5±0.7	9.5±1.0	11.5±1.0	5,000	-
2E	178.0±1.0	60.0±1.0	13.5±0.7	9.5±1.0	11.5±1.0	5,000	-
2H	178.0±1.0	60.0±1.0	13.5±0.7	13.5±1.0	15.5±1.0	-	4,000
3A	178.0±1.0	60.0±1.0	13.5±0.7	13.5±1.0	15.5±1.0	-	4,000



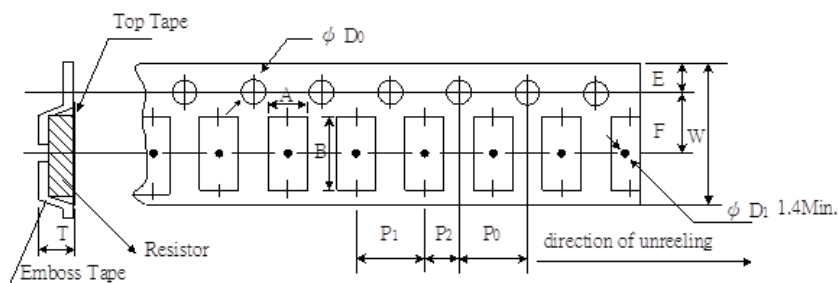
Paper Tape Specifications



Unit: mm

Type	A	B	W	E	F	P0	P1	P2	ØD0	T
1H	0.40±0.05	0.70±0.05	8.00±0.10	1.75±0.05	3.5±0.05	4.00±0.10	2.00±0.05	2.00±0.05	1.55±0.03	0.42±0.02
1E	0.70±0.05	1.16±0.05	8.00±0.10	1.75±0.05	3.5±0.05	4.00±0.10	2.00±0.05	2.00±0.05	1.55±0.05	0.40±0.03
1J	1.10±0.05	1.90±0.05	8.00±0.10	1.75±0.05	3.5±0.05	4.00±0.10	4.00±0.10	2.00±0.05	1.55±0.05	0.60±0.03
2A	1.60±0.05	2.37±0.05	8.00±0.10	1.75±0.05	3.5±0.05	4.00±0.10	4.00±0.10	2.00±0.05	1.55±0.05	0.75±0.05
2B	2.00±0.05	3.55±0.05	8.00±0.10	1.75±0.05	3.5±0.05	4.00±0.10	4.00±0.10	2.00±0.05	1.55±0.05	0.75±0.05
2E	2.75±0.05	3.40±0.05	8.00±0.10	1.75±0.05	3.5±0.05	4.00±0.05	4.00±0.10	2.00±0.05	1.60±0.10	0.75±0.05

Emboss Plastic Tape Specifications

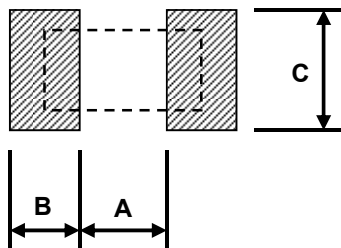


Unit: mm

Type	A	B	W	E	F	P0	P1	P2	ØD0	T
2B	2.85±0.10	5.45±0.10	12.0±0.10	1.75±0.10	5.5±0.05	4.00±0.05	4.00±0.10	2.00±0.05	1.50±0.10	1.00±0.20
3A	3.40±0.10	6.65±0.10	12.0±0.10	1.75±0.10	5.5±0.05	4.00±0.05	4.00±0.10	2.00±0.05	1.50±0.10	1.00±0.20



Recommend Land Pattern



Unit: mm

Type	A	B	C
1H	0.25	0.30	0.40±0.2
1E	0.50	0.50	0.60±0.2
1J	0.80	1.00	0.90±0.2
2A	1.00	1.00	1.35±0.2
2B	2.00	1.15	1.70±0.2
2E	2.00	1.15	2.50±0.2
2H	3.60	1.40	2.50±0.2
3A	4.90	1.60	3.10±0.2