

Precision Thin Film Chip Resistors

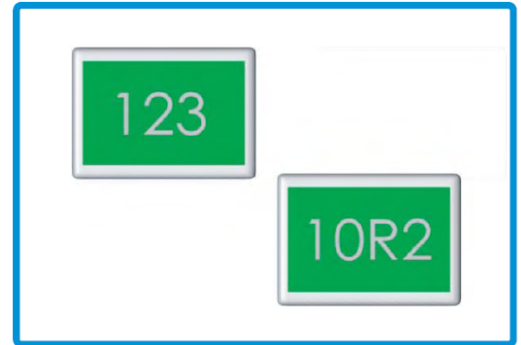


RN73 Series

MERITEK

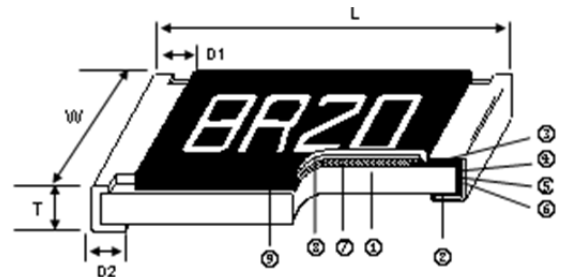
Feature

- 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



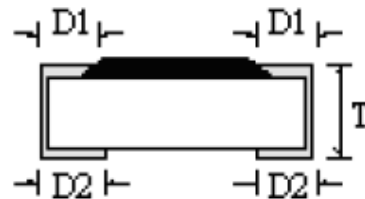
PART NUMBERING SYSTEM

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	—					±25
										±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.
- Lower Resistance: 1~10Ω

Special Electrical Specifications

Type \ Item	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%	±0.25%	±0.5%	±1%	
1E (0402)	1/16W	-55 ~ +155°C	25V	50V	49.9Ω - 4.99KΩ						±5
					49.9Ω - 12KΩ						±10
					49.9Ω - 12KΩ		49.9Ω -69.8KΩ				±15
1J (0603)	1/16W	-55 ~ +155°C	50V	100V	24.9Ω - 15KΩ						±5
					24.9Ω - 100KΩ	4.7Ω - 332KΩ					±10 ±15
2A (0805)	1/10W	-55 ~ +155°C	100V	200V	24.9Ω - 30KΩ						±5
					24.9Ω - 200KΩ	4.7Ω - 511KΩ					±10 ±15
2B (1206)	1/8W	-55 ~ +155°C	150V	300V	24.9Ω - 49.9KΩ						±5
					24.9Ω - 499KΩ	4.7Ω - 1MΩ					±10 ±15
2E (1210)	1/ 4W	-55 ~ +155°C	150V	300V	24.9Ω - 49.9KΩ						±5
					24.9Ω - 499KΩ	4.7Ω - 1MΩ					±10 ±15
2H (2010)	1/4W	-55 ~ +155°C	150V	300V	24.9Ω - 100KΩ						±5
					24.9Ω - 499KΩ	4.7Ω - 1MΩ					±10 ±15
3A (2512)	1/2W	-55 ~ +155°C	150V	300V	24.9Ω - 100KΩ						±5
					24.9Ω - 499KΩ	4.7Ω - 1MΩ					±10 ±15

- 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.

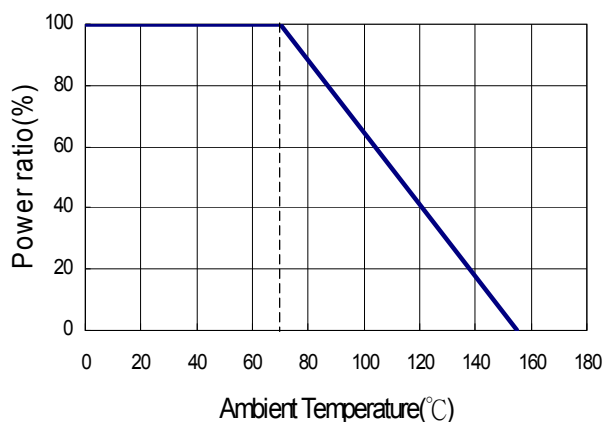


Environmental Characteristics

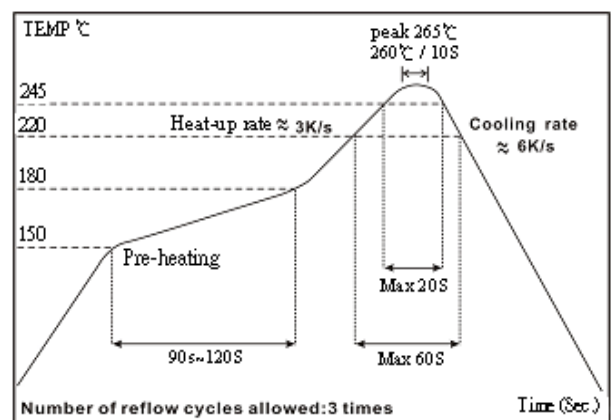
Item	Requirement		Test Method
	Tol. ≤ 0.05%	Tol. > 0.05%	
Temperature Coefficient of Resistance (T.C.R.)	As Spec.		MIL-STD-202F Method 304 +25/-55/+25/+125/+25°C
Short Time Overload	ΔR±0.05%	ΔR±0.2%	JIS-C-5201-1 5.5 RCWV*2.5 or Max. overload voltage for 5 seconds
	ΔR±0.2% for high power rating		
Insulation 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 $\pm 3^\circ\text{C}$; Humidity < 80%RH

Derating Curve



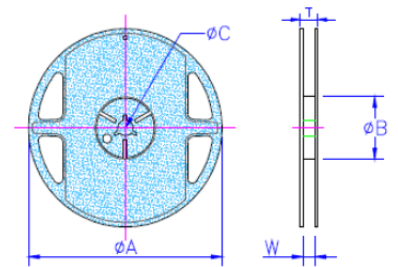
Reflow



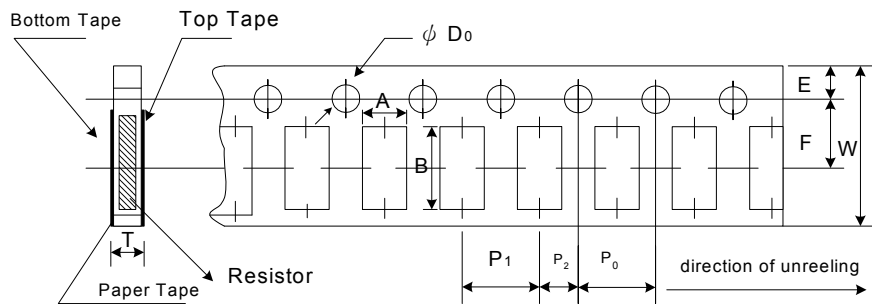
Packaging

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



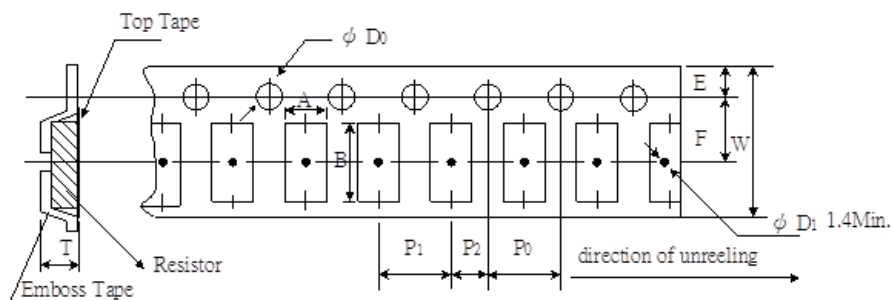
Paper Tape Specifications



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



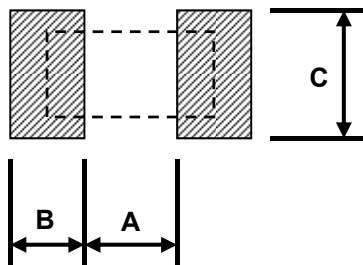
Unit: mm

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