

# Precision Thin Film Chip Resistors Ultra High Power Type

RU73 Series

**MERITEK**

## FEATURE

- Operating Temperature: -55 ~ +155°C
- Extremely Low TCR Down to  $\pm 1\text{PPM}/^\circ\text{C}$
- Very Tight Tolerance Down to  $\pm 0.01\%$
- Ultra High Power Rating
- Applications: Medical equipment, testing/ measurement equipment, printer equipment, automatic equipment controller, converters, communication device, cell phone, GPS, PDA



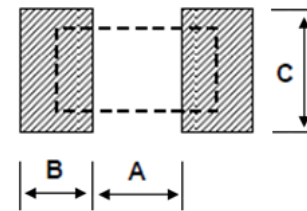
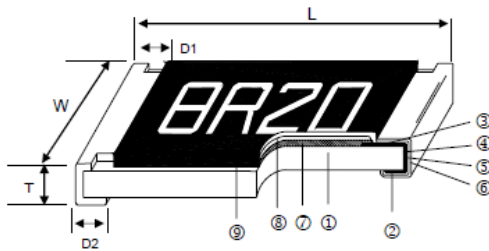
## PART NUMBERING SYSTEM



**RU73**   **F**   **1J**   **TD**   **4R70**   **A**  
(1)   (2)   (3)   (4)   (5)   (6)

No	Item	Code	Description	Series Reference
(1)	Meritek Series	RU73	Precision Thin Film Chip Resistor	Ultra High Power Type
(2)	TCR Code	F	F: $\pm 25\text{PPM}/^\circ\text{C}$	5: $\pm 1$ ; X: $\pm 2$ , O: $\pm 3$ , B: $\pm 5$ , C: $\pm 10$ , D: $\pm 15$ , G: $\pm 50$
(3)	Size Code	1J	1J: 0603	2A: 0805, 2B: 1206, 3A: 2512
(4)	Packaging	TD	TD: Paper Tape (Reel)	TE: Plastic Tape (Reel)
(5)	Resistance	4R70	4R70: $4.7\Omega$	First Three Digits: Significant, Fourth: Multiplier
(6)	Tolerance	A	A: $\pm 0.05\%$	T: $\pm 0.01\%$ , B: $\pm 0.1\%$ , C: $\pm 0.25\%$ , D: $\pm 0.5\%$ , F: $\pm 1\%$

## DIMENSIONS AND LAND PATTERN RECOMMENDATION



Size	L (mm)	W (mm)	T (mm)	D1 (mm)	D2 (mm)	A (mm)	B (mm)	C (mm)	Weight (g/1000pcs)
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	0.80	1.00	0.90 $\pm$ 0.2	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	1.00	1.00	1.35 $\pm$ 0.2	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	2.00	1.15	1.70 $\pm$ 0.2	9.02
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	3.60	1.40	2.50 $\pm$ 0.2	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	4.90	1.60	3.10 $\pm$ 0.2	38.06

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## ELECTRICAL CHARACTERISTICS

### Ultra High Power Rating Electrical Specification

Size	Power Rating at 70°C	Max Operating Voltage	Max Overload Voltage	Resistance						TCR (±PPM/°C)
				(Ω)						
				±0.01%	±0.05%	±0.1%	±0.25%	±0.5%	±1%	
<b>1J</b> (0603)	1/6W	100	150	-	10 ~ 332K		10 ~ 332K			25, 50
<b>2A</b> (0805)	1/4W	150	300	-	10 ~ 499K		10 ~ 499K			25, 50
<b>2B</b> (1206)	1/3W	200	400	-	10~1M		10~1M			25, 50
<b>2H</b> (2010)	1/2W	200	400	24.9~2K	4.7~1M		1~1M			10, 15, 25, 50
<b>3A</b> (2512)	1W	200	400	24.9~2K	4.7~1M		1~1M			10, 15, 25, 50

Notes:

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

## RELIABILITY TEST CONDITION AND REQUIREMENT

Test	Standard	Condition	Requirement	
			Tol. ≤ 0.05%	Tol. > 0.05%
Temperature Coefficient of Resistance (T.C.R.)	MIL-STD-202 Method 304	+25/-55/+25/+125/+25°C	As Specified	
Short Time Overload	JIS-C-5201-1 4.13	2.5XRCWV or Max. overload voltage whichever is lower for 5 seconds	ΔR±0.2%	
Insulation Resistance	MIL-STD-202 Method 302	Apply 100 V <sub>DC</sub> for 1 minute	>9999MΩ	
Endurance	MIL-STD-202 Method 108A	70±2°C, RCWV for 1000 hours with 1.5 hours "ON" and 0.5 hours "OFF".	ΔR±0.5%	
Damp Heat with Load	MIL-STD-202 Method 103B	40±2°C, 90~95% R.H. RCWV for 1000 hours with 1.5 hours "ON" and 0.5 hours "OFF".	ΔR±0.5%	
Bending Strength	JIS-C-5201-1 4.33	Bending amplitude 3 mm for 10 seconds 2010, 2512 sizes: 2 mm Other sizes: 3mm	ΔR±0.05%	ΔR±0.1%
Solderability	MIL-STD-202 Method 208H	245±5°C for 3 seconds	95% min. coverage	
Resistance to Soldering Heat	MIL-STD-202 Method 210E	260±5°C for 10 seconds	ΔR±0.05%	ΔR±0.1%
Dielectric Withstand Voltage	MIL-STD-202 Method 301	Max. overload voltage for 1 minute	By type	
Thermal Shock	MIL-STD-202 Method 107G	-55°C ~ +150°C, 100 cycles	ΔR±0.05%	ΔR±0.2%
Low Temperature Operation	JIS-C-5201-1 4.36	1 hour, -65°C followed by 45 minutes of RCWV	ΔR±0.5%	
High Temperature Exposure	MIL-STD-202 Method 108	+155°C for 1000 hours	ΔR±0.5%	

Note:

Storage Temperature: 15~28°C; Humidity <80% RH

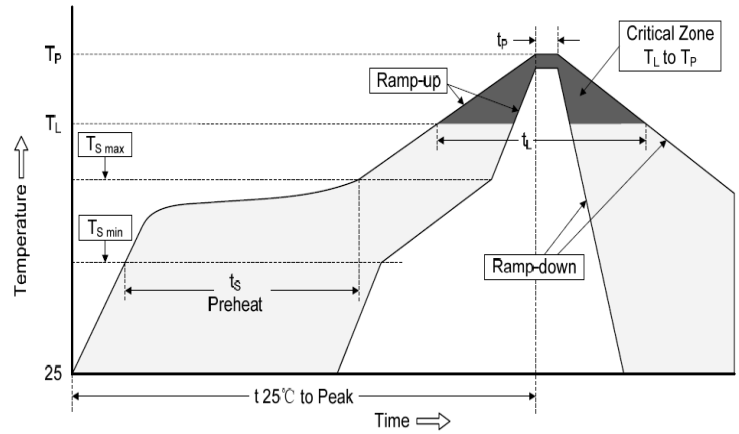
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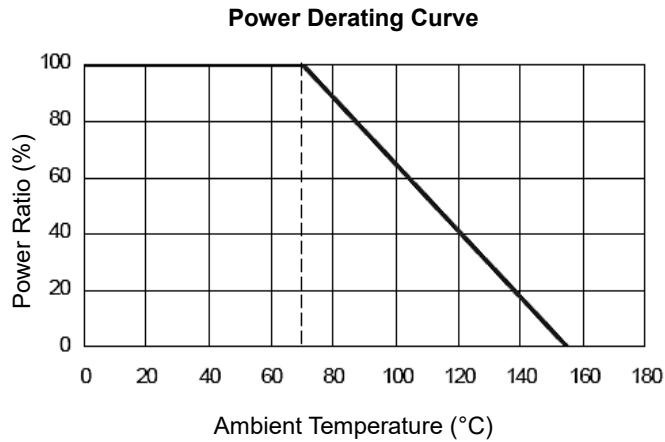
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## SOLDERING RECOMMENDATION

Reflow Condition		
Pre Heat	Temp. Min $T_{s(min)}$	150°C
	Temp. Max $T_{s(max)}$	180°C
	Time (min. to max.) ( $t_s$ )	90s ~ 120s
Average ramp up rate ( $T_L$ ) to peak		3°C/s
$T_{s(max)}$ to $T_L$ (Ramp-up rate)		3°C/s
Reflow	Temp. ( $T_L$ )	220°C
	Time (min. to max.) ( $t_L$ )	60s max.
Peak Temperature ( $T_P$ )		265°C
Time within 5°C of $T_P$ ( $t_p$ )		10s
Ramp-down Rate		6°C/s



## POWER DERATING CURVE

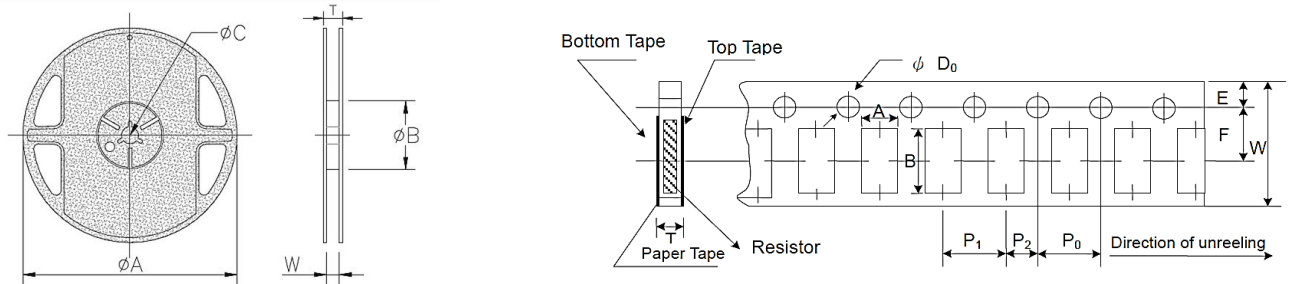


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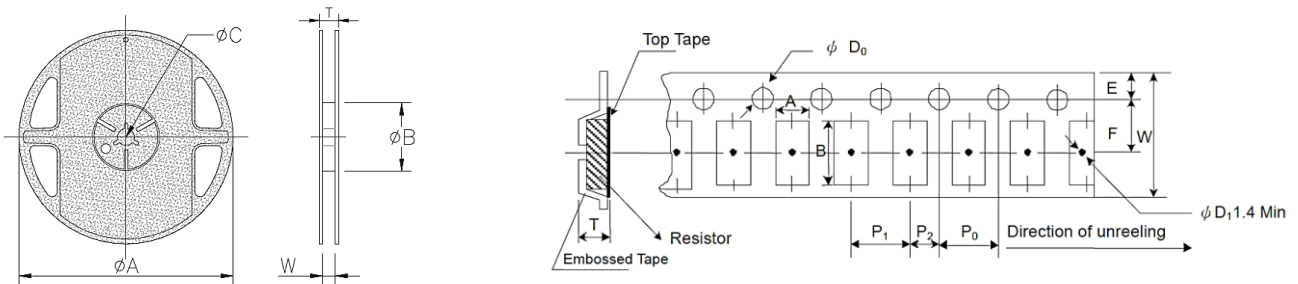
## PACKAGING SPECIFICATIONS



Size	Reel Dimension (mm)								
	Quantity	Type	Tape Width	Reel Diameter	$\phi A$	$\phi B$	$\phi C$	W	T
0603 0805 1206	5K	Paper	8mm	7"	178.0±1.0	60±1.0	13.5±0.7	9.5±1.0	11.5±1.0

Size	Paper Tape Dimension (mm)									
	A	B	W	E	F	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	$\Phi D_0$	T
0603	1.10±0.05	1.90±0.05	8±0.10	1.75±0.05	3.5±0.05	4±0.10	4±0.10	2±0.05	1.55±0.05	0.60±0.03
0805	1.60±0.05	2.37±0.05	8±0.10	1.75±0.05	3.5±0.05	4±0.10	4±0.10	2±0.05	1.55±0.05	0.75±0.05
1206	2.00±0.05	3.55±0.05	8±0.10	1.75±0.05	3.5±0.05	4±0.10	4±0.10	2±0.05	1.55±0.05	0.75±0.05

## PACKAGING SPECIFICATIONS



Size	Reel Dimension (mm)								
	Quantity	Type	Tape Width	Reel Diameter	$\phi A$	$\phi B$	$\phi C$	W	T
2010 2512	4K	Plastic	12mm	7"	178.0±1.0	60±1.0	13.5±0.7	13.5±1.0	15.5±1.0

Size	Plastic Tape Dimension (mm)									
	A	B	W	E	F	P <sub>0</sub>	P <sub>1</sub>	P <sub>2</sub>	$\Phi D_0$	T
2010	2.85±0.1	5.45±0.1	12.0±0.1	1.75±0.1	5.5±0.05	4.00±0.05	4.00±0.10	2.00±0.05	1.50±0.10	1.00±0.20
2512	3.40±0.1	6.65±0.1	12.0±0.1	1.75±0.1	5.5±0.05	4.00±0.05	4.00±0.10	2.00±0.05	1.50±0.10	1.00±0.20

Notes: Peel force of top cover tape, Peel speed:300mm/min ±5%, Peel force of top cover tape:between 8gf to 60gf, 20gf to 80gf (2010, 2512 only)

\*Specifications subject to change without notice.