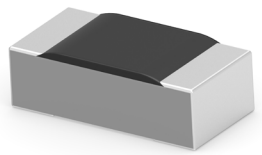
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THICK FILM PRECISION RESISTORS

TYPE RT73 AEC-Q200 QUALIFIED SERIES

INTRODUCTION

TE Connectivity (TE) brings you it's metal-glaze high precision thick film resistor range, type RT73 series, available in four different packages with standard resistance values offered in E96 and E24 series. The resistance tolerance specifications are from 1% to 0.1% with low temperature co-efficient of resistance (T.C.R.) making the RT73 series suitable for use in automotive, measuring equipment and industrial measurement applications.



FEATURES

- Metal glaze
- High precision
- Resistance tolerances ~0.1%
- AEC-Q200 qualified
- MSL1 moisture sensitivity level

Note: *SMD (Surface mount devices) resistors and inductors should be kept in their original packaging to protect them from ESD (Electrostatic Discharge). The full reels can be broken into smaller quantities, without exposing them to ESD, as long as the components are still in the plastic or paper tape. These resistors and inductors should not be removed from the plastic or paper tape unless they are in an ESD protected environment.*

APPLICATIONS

- Car electronics
- Industrial equipment
- Industrial measurement

ELECTRICAL CHARACTERISTICS

		RT73 1E				RT73 1J				RT73 2A				RT73 2B			
Power rating		0.125 W				0.2 W				0.25 W				0.33 W			
Resistance range (Ω)	Min.	300	300	300	300	10	10	10	10	10	10	10	10	10	10	10	10
	Max.	100K	1M	1M	1M	1M	1M	1M	1M	3M	6.8M	10M	10M	1M	1M	10M	10M
Tolerance %		0.1	0.25	0.5	1.0	0.1	0.25	0.5	1.0	0.1	0.25	0.5	1.0	0.1	0.25	0.5	1.0
Code letter		B	C	D	E	B	C	D	E	B	C	D	E	B	C	D	E
TCR (PPM)		25/50															
Selection series		E96 E24															
Max. operating voltage		75 V				100 V				150 V				200 V			
Max. overload voltage		100 V				150 V				300 V				400 V			
Rated ambient temperature		85 °C															
Rated terminal part temperature		125 °C															
Operating temperature range		-55 °C ~ +150 °C															
Thermal resistance R_{th} (K/W)		160				102				70				55			

Thick Film Precision Resistors

Type RT73 AEC-Q200 Qualified Series

ENVIRONMENTAL CHARACTERISTICS

Characteristics	Condition	Test Methods (JIS-C-5201-1)
Resistance	Within specified tolerance	25 °C
T.C.R	Within specified T.C.R	+25 °C/ -55 °C and +25 °C/ 125 °C
Overload (short term)	ΔR (±0.2% 0.05 Ω)	*Rated voltage X 2.5 for 5s
Resistance to soldering	ΔR (±0.2% 0.05 Ω)	260 °C ±5 °C, 10 s ±1 s
Moisture resistance	ΔR (±0.2% 0.05 Ω) : 1E(300 Ω ≤ R ≤ 20 kΩ) 1J (10 Ω ≤ R ≤ 200 kΩ) 2A, 2B (10 Ω ≤ R ≤ 1 MΩ)	40 °C ±2 °C, 90% ~ 95% RH, 1000 h 1.5 h ON/ 0.5 h OFF cycle
Endurance at 85°C or rated terminal part temperature	ΔR (±0.2% 0.05 Ω) : 1E(300 Ω ≤ R ≤ 20 kΩ) 1J (10 Ω ≤ R ≤ 200 kΩ) 2A, 2B(10 Ω ≤ R ≤ 1MΩ)	85 °C ±2 °C or rated terminal part temperature ±2 °C 1000 h 1.5 ON/ 0.5 OFF cycle
High temperature exposure	ΔR (±0.2 % 0.05 Ω) : 1E(300 Ω ≤ R ≤ 10 kΩ) 1J (10 Ω ≤ R ≤ 200 kΩ) 2A, 2B (10 Ω ≤ R ≤ 100 kΩ)	+155 °C, 1000 h
Withstanding voltage	ΔR (±0.2%0.05Ω)	60 +10/ -0 (applied voltage) RT73 1E, 1J DC100V RT73 2A, 2B DC500V

*Overload voltage is rated X 2.5 or maximum overload voltage, whichever is lower.

AEC-Q200 TEST DATA

Characteristics	Condition	Test Methods (JIS-C-5201-1)
High temperature exposure	ΔR ±0.5%	**MIL-STD-202 Method** 108 ±155 °C, 1000 h
Temperature cycling	ΔR ±0.2%	**JESD22 Method JA-104** -55 °C/ 125 °C each 30 min. 1000 cycles
Biased humidity	ΔR ±0.2%	**MIL-STD-202 method 103** 85 °C RH rated wattage/ 10 1.5 hr-ON/ 0.5 hr- OFF 1000 hrs
Operational life	ΔR ±0.5%	**MIL-STD-202 method 108** 125 °C derating wattage 1.5 hr-ON/ 0.5 hr-OFF 2000 hrs
External visual	-	**MIL-STD-883 method 2009** Visual check
Physical dimension	-	**JESD22 method JB-100** Delivery specification
Resistance to solvents	ΔR ±1.0%	**MIL-STD-202 method 215** Solvent a/c: 25 °C 3min. solvent d: 63 °C~ 70 °C 3min.
Mechanical shock	ΔR ±1.0%	**MIL-STD-202 method 213 Test Condition C** 100G 6 ms.(half sine wave) X, Y, Z each direction ±3 shocks total 18 shocks
Vibration	ΔR ±1.0%	**MIL-STD-202 method 204** 10 Hz~2000 Hz~10 Hz/ 20 min. 1.5 mm double amplitude (5G max.) X, Y, Z each direction 4 hrs. total 12 hrs.
Resistance to soldering heat	ΔR ±0.2%	**MIL-STD-202 method 210 Test Condition B** 260 °C 10 sec. dipping
ESD (HBM)	ΔR ±1.0% RT73 1E, 1J Class 1B RT73 2A, 2B Class 2	**AEC-Q200-002** 150 pF 2k Ω ±1 discharge
Solderability	95% min. coverage	**J-STD-002** a) Method B 4 hrs. @ 155 °C, dry heat @ 235 °C b) Method B @ 215 °C, category 3 c) Method D @ 260 °C, category 3

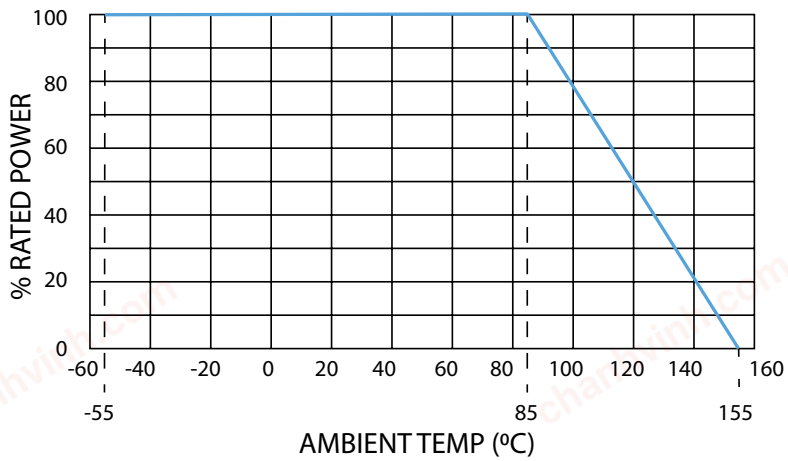
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Thick Film Precision Resistors

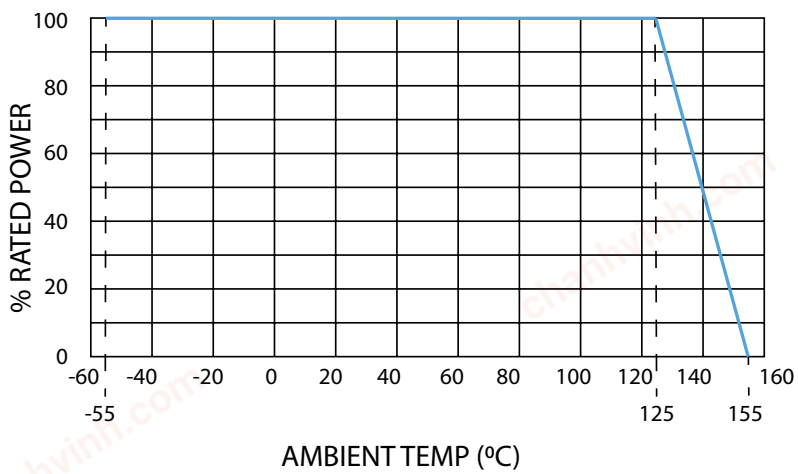
Type RT73 AEC-Q200 Qualified Series

Characteristics	Condition	Test Methods (JIS-C-5201-1)
Electrical characterisation	-	Delivery Specification Temperature coefficient of resistance -55 °C/ 125 °C (25 °C basis)
Board flex	ΔR ±0.2%	**AEC-Q200-005** Bend 2 mm 60 sec.
Terminal strength	ΔR ±1.0%	**AEC-Q200-006** Shear stress 17.7 N 60 sec.
Flame retardance	-	**AEC-Q200-001** 9.0 VDC ~ 32.0 VDC each 1 hr.
Tin whisker	<45 µm (temperature cycling) <40 µm (ambient temperature/ humidity storage)	**AEC-Q005** • Condition 1: Temperature cycling -55 °C/ 85°C 3 cycs/hr • Condition 2: Ambient temperature/ humidity storage (30°C 60%RH) • Condition 3: Ambient temperature/ humidity storage (60°C 87%RH)

DERATING CURVE



Note: For resistors operated at an ambient temperature of 85°C or higher, the power shall be derated in accordance with the above derating curve.

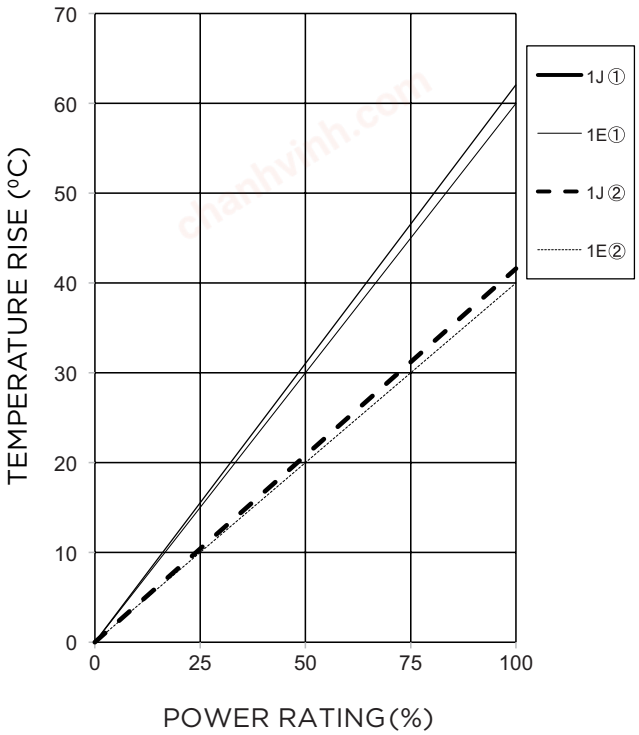


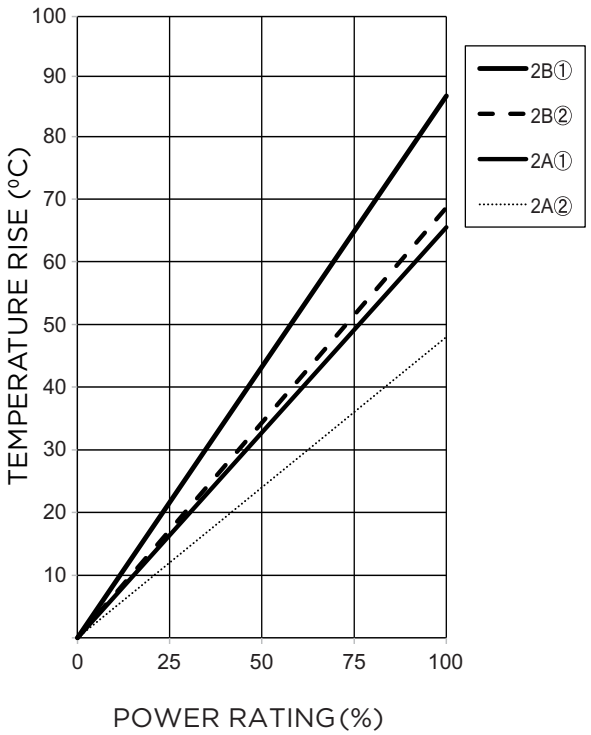
Note: When the terminal part temperature of the resistor exceeds the rated terminal part temperature shown above, the power shall be derated according to the derating curve.

Thick Film Precision Resistors

Type RT73 AEC-Q200 Qualified Series

TEMPERATURE RISE



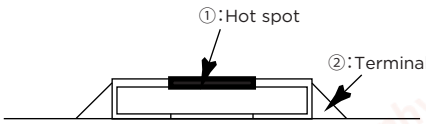


Measurement condition:

Room temperature: 25 °C

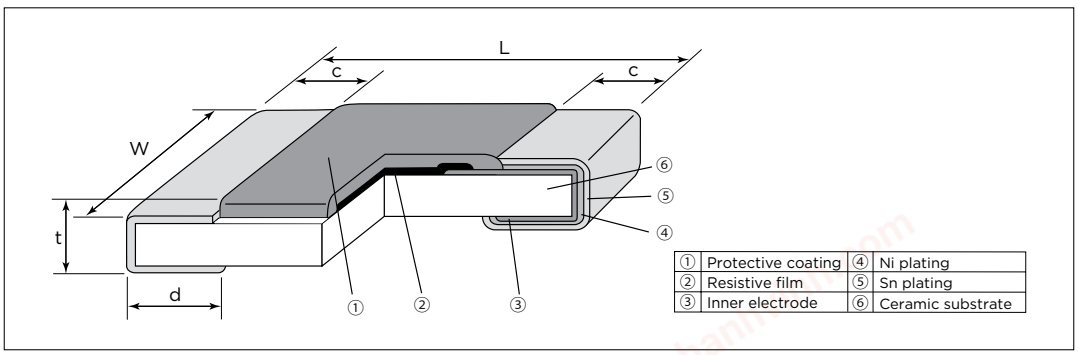
PCB: FR-4t = 1.6mm

Cu foil thickness: 35µm



Note: For guidance only. Testing was carried out in controlled laboratory conditions. We recommend testing in the intended application.

CONSTRUCTION AND DIMENSIONS



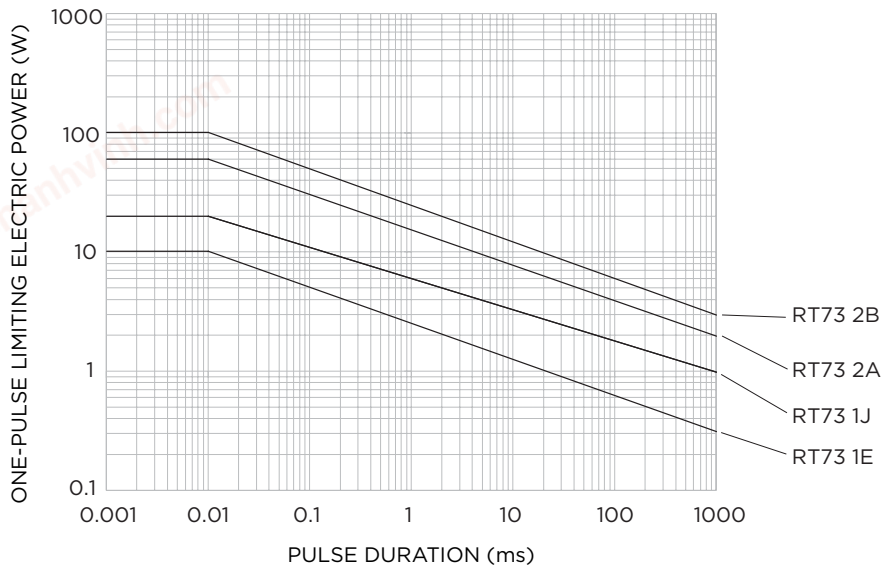
Type	L (mm)	W (mm)	c (mm)	d (mm)	t (mm)	Weight (mg)
RT73 1E	1.0 +0.1/ -0.05	0.5 ±0.05	0.2 ±0.1	0.25 +0.05/ -0.1	0.35 ±0.05	0.68
RT73 1J	1.6 ±0.2	0.8 ±0.1	0.2 ±0.1	0.3 ±0.1	0.45 ±0.1	2.14
RT73 2A	2.0 ±0.2	1.25 ±0.1	0.25 ±0.15	0.3 +0.2/ -0.1	0.5 ±0.1	4.54
RT73 2B	3.2 ±0.2	1.6 ±0.2	0.35 ±0.15	0.4 +0.2/ -0.1	0.6 ±0.1	9.14

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Thick Film Precision Resistors

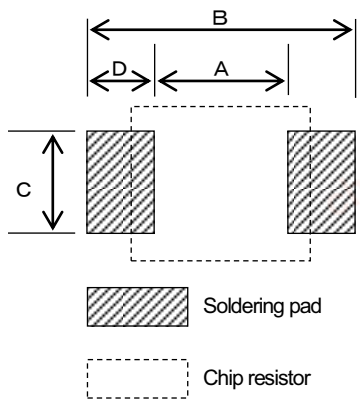
Type RT73 AEC-Q200 Qualified Series

SINGLE PULSE



Note: For guidance only. The maximum applicable voltage is equal to the max. overload voltage. The pulse endurance values are not assured values, and it is recommended testing in the intended application.

RECOMMENDED LAND PATTERN



Type	A (mm)	B (mm)	C (mm)	D (mm)
RT73 1E	0.5	1.3	0.3	0.4
RT73 1J	1.0	2.0	0.6	0.5
RT73 2A	1.3	2.5	1.05	0.6
RT73 2B	2.2	4.0	1.4	0.9

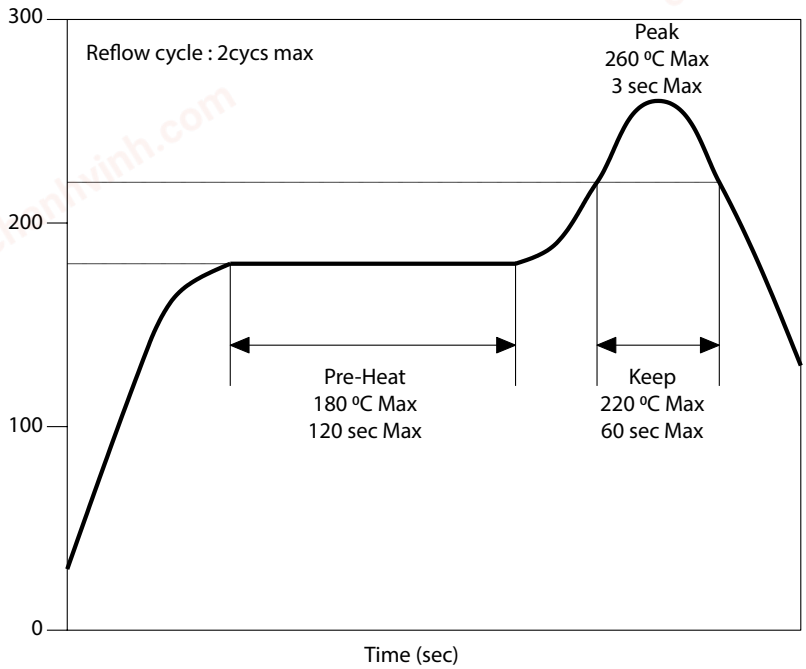
COATING COLOUR AND MARKING

Type	Coating Colour	Marking
RT73 1E	Black	No Marking
RT73 1J		
RT73 2A		
RT73 2B		

Thick Film Precision Resistors

Type RT73 AEC-Q200 Qualified Series

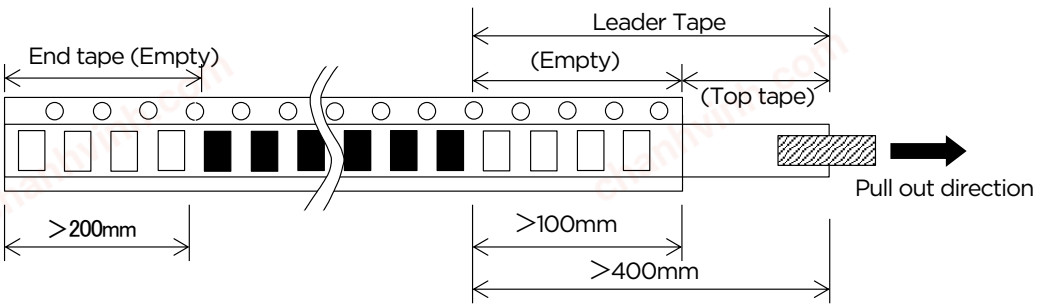
SOLDERING REFLOW PROFILE



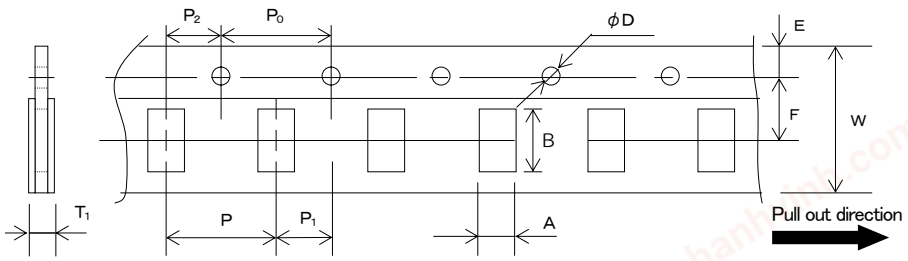
PACKAGING

Paper Tape

Leader and end tape



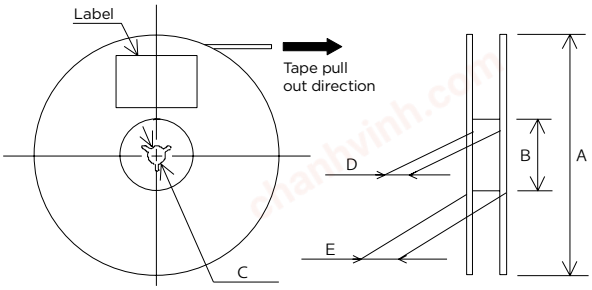
Paper Tape Dimensions (mm)



Type	A (mm)	B (mm)	D (mm)	E (mm)	F (mm)	P (mm)	P0 (mm)	P1 (mm)	P2 (mm)	T1 (mm)	W (mm)
RT73 1E	0.65 ±0.10	1.15 ±0.10	1.5 +0.1/ -0	1.75 ±0.1	3.5 ±0.05	-	4.0 ±0.1	2.0 ±0.05	2.0 ±0.05	0.42 +0.2/ -0	8.0 ±0.2
RT73 1J	1.10 ±0.10	1.90 ±0.10				4.0 ±0.1	4.0 ±0.1	-		0.6 +0.2/ -0	
RT73 2A	1.65 ±0.20	2.40 ±0.20				4.0 ±0.1	4.0 ±0.1	-		0.75 +0.2/ -0	
RT73 2B	2.00 ±0.20	3.50 ±0.20				4.0 ±0.1	4.0 ±0.1	-			

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REEL DIMENSIONS



Type	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	Qty
RT73 1E	180 +0/ -3	60 +1/ -0	13 ±0.2	8.4 +1.5/ -0	12.4 ±0.2	10,000
RT73 1J						5,000
RT73 2A						5,000
RT73 2B						5,000

ORDERING INFORMATION

Part Number
RT73 F 1E 10R B TH

Common Part

RT73	Standard

TCR

F	*25 PPM
G	50 PPM

Package Size

1E	0402
1J	0603
2A	0805
2B	1206

Packaging

TH	10,000 pcs
TD	5,000 pcs

Tolerance

B	*0.1%
C	0.25%
D	0.5%
F	1%

*Preferred TCR and tolerance, other options offered on demand

Resistance Value

10R	10 ohm (10Ω)
100R	100 ohm (100Ω)
1K0	1K ohm (1000Ω)
10K	10K ohm (10000Ω)
100K	100K ohm (100000Ω)
1M	1M ohm (1000000Ω)

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