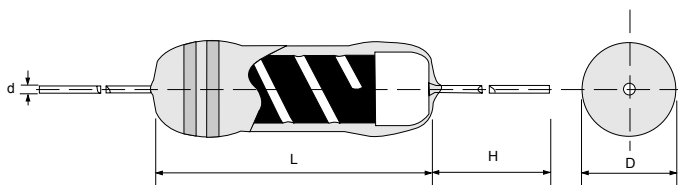


R-Series Carbon Film Fixed Resistor

Quality • Reliability
Cost-Down via Technology

R-Series



Specifications Per

- IEC 60115-1, IEC 60115-4
- MIL-R-10509

Features

- Conformal multi-layer coating (flame proof coating available)
- Color code per MIL & EIA standards
- Special tin-plated electrolytic copper lead wire
- Non-flammable coating option available
- Products meet RoHS requirements and do not contain substances of very high concern identified by European Chemicals Agency

DIMENSIONS

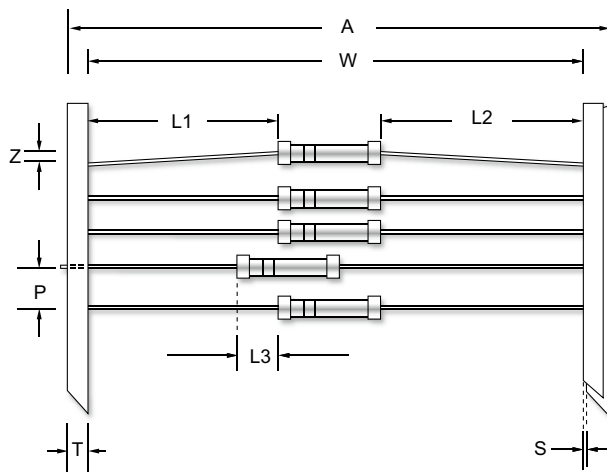
Type	Body Length (L, mm)	Body Diameter (D, mm)	Lead Wire Length (H, mm)	Lead Wire Diameter (d, mm)	Net Weight Per 1000 Pcs
R16	3.20 ± 1.0	1.9 ± 0.2	28 ± 3.0	0.45 ± 0.02	145 Grams
R20	3.20 ± 1.0	1.9 ± 0.2	28 ± 3.0	0.45 ± 0.02	145 Grams
R25	6.50 ± 1.0	2.4 ± 0.2	26 ± 3.0	0.55 ± 0.03	220 Grams
R51	8.80 ± 1.0	3.2 ± 0.2	26 ± 3.0	0.60 ± 0.03	340 Grams
R52	6.50 ± 1.0	2.6 ± 0.3	26 ± 3.0	0.55 ± 0.03	300 Grams
R100	11.0 ± 1.0	4.5 ± 0.5	26 ± 3.0	0.70 ± 0.03	600 Grams
R200	15.5 ± 1.0	5.5 ± 0.5	26 ± 3.0	0.80 ± 0.03	1200 Grams

GENERAL SPECIFICATIONS

Type	Power Rating (at 70°C)	Maximum Working Voltage	Maximum Overload Voltage	Minimum Resistance	Maximum Resistance	Resistance Tolerance	Available Resistance Values
R16	1/6W	200V	400V	1Ω	1MΩ	±5%	E-24
R20	1/4W	250V	500V	1Ω	1MΩ	±5%	E-24
R25	1/3W	250V	500V	1Ω	10MΩ	±5%	E-24
R51	1/2W	350V	650V	1Ω	10MΩ	±5%	E-24
R52	1/2W	350V	500V	1Ω	4.7MΩ	±5%	E-24
R100	1W	500V	1000V	1Ω	1MΩ	±5%	E-24
R200	2W	500V	1000V	1Ω	1MΩ	±5%	E-24

Special sizes, values, and specifications not listed available on special order.

TAPING/PACKING SPECIFICATIONS

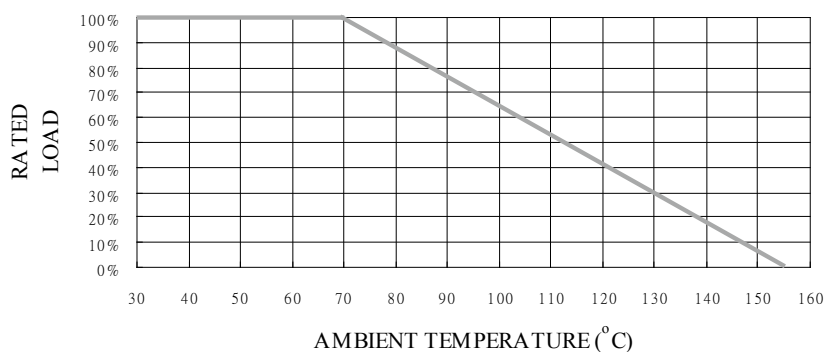


Unit (mm)

Type	A (Max.)	L1-L2 (Max.)	L3 (Max.)	P ±0.5	S (Max.)	T ±0.5	W ±1.5	Z (Max.)
R16	65	±1.0	0.5	5.0	0.8	6.0	52.5	1.2
R20	65	±1.0	0.5	5.0	0.8	6.0	52.5	1.2
R25	65	±1.0	0.5	5.0	0.8	6.0	52.5	1.2
R51	65	±1.0	0.5	5.0	0.8	6.0	52.5	1.2
R52	65	±1.0	0.5	5.0	0.8	6.0	52.5	1.2
R100	65	±1.0	0.5	5.0	0.8	6.0	52.5	1.2
R200	76	±1.5	1.0	10.0	0.8	6.0	63.5	1.2

Type	Packing Type	R16	R20	R25	R51	R52	R100	R200
Minimum Packing QTY (pcs)	Ammo pack	5000	5000	5000	2000	2000	1000	500

POWER DERATING CURVE



R-Series Carbon Film Fixed Resistor

Quality • Reliability
Cost-Down via Technology

R-Series

■ PART NUMBER

Example: R16J10K0TKZTB5K0

R16	J	10K0	TKZ	TB5K0
Type	Tolerance	Resistance	TCR	Packaging
	J (5%)	10KΩ 4-character code containing - 3 significant digits 1 letter multiplier <u>MULTIPLIER</u> R = 1 K = 10 ³ M = 10 ⁶ G = 10 ⁹	3-character code TKZ = Default Product Temperature Coefficient. Information of typical product temperature coefficient can be found in the Technical Summary section of the datasheet.*	5-character code TB = Tape Box (pieces per box) <u>R16/R20/R25</u> 5K0 = 5,000 <u>R51/R52</u> 2K0 = 2,000 <u>R100</u> 1K0 = 1,000 <u>R200</u> 500 = 500

* For the availabilities of non-default temperature coefficient, please check with us. Reference for TCR letter codes can be found in section (4) of Part Number Construction in the Appendices.

■ TECHNICAL SUMMARY

Characteristics	Limits			
Dielectric Withstanding Voltage, VAC or DC	R16/R20: 300 R25/R52: 500 R51: 700 R100/R200: 1000			
Temperature Coefficient	PPM/°C	R16/R20	R25/R51/R52	R100/R200
	±300	≤ 33K	≤ 33K	≤ 56K
	- 500	36K~330K	36K~330K	68K~470K
	- 700	130K~470K	360K~470K	510K~1M
	-1000	510K~910K	510K~1M	>1M
	-1500	>910K	>1M	
Operating Temperature Range, °C	-55 ~ +155			
Insulation Resistance, MΩ	>10 ⁴			

R-Series Carbon Film Fixed Resistor

Quality • Reliability
Cost-Down via Technology

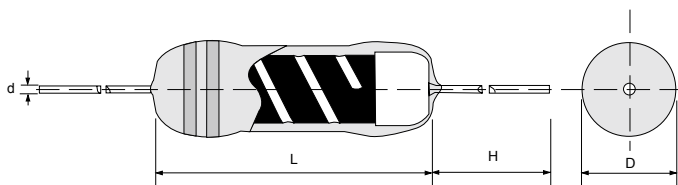
■ PERFORMANCE SPECIFICATIONS

Characteristics	Test Conditions	Limits
Short Time Over Load	IEC 60115-1 4.13 5 seconds 2.5x rated voltage (not over max. overload voltage)	±1%
Load Life In Humidity	IEC 60115-1 4.24 56 days rated load at (40±2)°C and (93±3)% relative humidity	±5%
Load Life 1,000 hours	IEC 60115-1 4.25.1 Rated load with 1.5 hours ON, 0.5 hours OFF, at (70±2)°C	±5%
Resistance To Soldering Heat	IEC 60115-1 4.18.2 Leads immersed till 3mm from the body in (260±5)°C solder for 10±1 seconds	±1%
Solderability	IEC 60115-1 4.17.2 Solder area covered after (235±3)°C/(2±0.2) seconds with flux applied	95% Min.
Vibration	IEC 60115-1 4.22 Six hours in each parallel and axial direction with a simple harmonic motion having an amplitude of 1.52mm and 10 to 2,000 Hz.	±1%
Thermal Endurance	IEC 60115-1 4.25.3 1000 hours at 155°C without load	±1%
Thermal Shock	IEC 60115-1 4.19 -55°C 30minutes, +155°C 30minutes, 5 cycles	±2%

R-Series MINIATURE SIZE Carbon Film Fixed Power Resistor

Quality • Reliability
Cost-Down via Technology

R-Series



Specifications Per

- IEC 60115-1, IEC 60115-4
- MIL-R-10509

Features

- Conformal multi-layer coating
- Color code per MIL & EIA standards
- Special tin-plated electrolytic copper lead wire
- Non-flammable coating option available
- Products meet RoHS requirements and do not contain substances of very high concern identified by European Chemicals Agency

DIMENSIONS

Type	Body Length (L, mm)	Body Diameter (D, mm)	Lead Wire Length (H, mm)	Lead Wire Diameter (d, mm)	Net Weight Per 1000 Pcs
R100S	8.80 ± 1.0	3.2 ± 0.2	26 ± 3.0	0.60 ± 0.03	340 Grams
R200S	12.0 ± 1.0	4.5 ± 0.5	26 ± 3.0	0.70 ± 0.03	600 Grams
R300S	15.5 ± 1.0	5.5 ± 0.5	26 ± 3.0	0.80 ± 0.03	1200 Grams

GENERAL SPECIFICATIONS

Type	Power Rating (at 70°C)	Maximum Working Voltage	Maximum Overload Voltage	Minimum Resistance	Maximum Resistance	Resistance Tolerance	Available Resistance Values
R100S	1W	350V	650V	1Ω	10MΩ	±5%	E-24
R200S	2W	500V	1000V	1Ω	1MΩ	±5%	E-24
R300S	3W	500V	1000V	1Ω	1MΩ	±5%	E-24

Special sizes, values, and specifications not listed available on special order.

R-Series MINIATURE SIZE Carbon Film Fixed Power Resistor

Quality • Reliability
Cost-Down via Technology

■ PART NUMBER

Example: R100SJ10K0TKZTB2K0

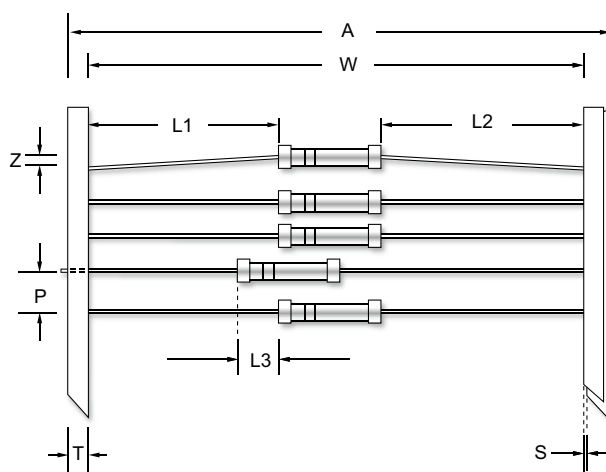
R100S	J	10K0	TKZ	TB2K0
Type	Tolerance	Resistance	TCR	Packaging
	J (5%)	10KΩ 4-character code containing - 3 significant digits 1 letter multiplier <u>MULTIPLIER</u> R = 1 K = 10 ³ M = 10 ⁶ G = 10 ⁹	3-character code TKZ = Default Product Temperature Coefficient. Information of typical product temperature coefficient can be found in the Technical Summary section of the datasheet.*	5-character code TB = Tape Box (pieces per box) <u>R100S</u> 2K0 = 2,000 <u>R200S</u> 1K0 = 1,000 <u>R300S</u> 500 = 500

* For the availabilities of non-default temperature coefficient, please check with us. Reference for TCR letter codes can be found in section (4) of Part Number Construction in the Appendices.

■ TECHNICAL SUMMARY

Characteristics	Limits		
Dielectric Withstanding Voltage, VAC or DC	R100S R200S/R300S	700 1000	
Temperature Coefficient	R100S	R200S/R300S	PPM/°C
	≤33K	≤56K	±300
	36K~330K	68K~470K	- 500
	360K~470K	510K~1M	- 700
	510K~1M	>1M	-1000
	>1M		-1500
Operating Temperature Range, °C	-55~+155		
Insulation Resistance, MΩ	10 ⁴		
Power Derating, Linear	100% at 70°C, down to zero at 155°C		

TAPING/PACKING SPECIFICATIONS



Unit (mm)

Type	A (Max.)	L1-L2 (Max.)	L3 (Max.)	P ±0.5	S (Max.)	T ±0.5	W ±1.5	Z (Max.)
R100S	65	±1.0	0.5	5.0	0.8	6.0	52.5	1.2
R200S	65	±1.0	0.5	5.0	0.8	6.0	52.5	1.2
R300S	76	±1.5	1.0	10.0	0.8	6.0	63.5	1.2

Type	Packing Type	R100S	R200S	R300S
Minimum Packing QTY (pcs)	Ammo pack	2000	1000	500

■ PERFORMANCE SPECIFICATIONS

Characteristics	Test Conditions	Limits
Short Time Over Load	IEC 60115-1 4.13 5 seconds 2.5x rated voltage (not over max. overload voltage)	±2%
Load Life In Humidity	IEC 60115-1 4.24 56 days rated load at (40±2)°C and (93±3)% relative humidity	±5%
Load Life 1,000 hours	IEC 60115-1 4.25.1 Rated load with 1.5 hours ON, 0.5 hours OFF, at (70±2)°C	±5%
Resistance To Soldering Heat	IEC 60115-1 4.18 Leads immersed till 3mm from the body in (260±5)°C solder for 10±1 seconds	±1%
Solderability	IEC 60115-1 4.17.2 Solder area covered after (235±3)°C/(2±0.2) seconds with flux applied	95% Min.
Vibration	IEC 60115-1 4.22 Six hours in each parallel and axial direction with a simple harmonic motion having an amplitude of 1.52mm and 10 to 2,000 Hz.	±1%
Terminal Endurance	IEC 60115-1 4.25.3 1000 hours at 155°C without load	±2%
Thermal Shock	IEC 60115-1 4.19 -55°C 30minutes, +155°C 30minutes, 5 cycles	±2%