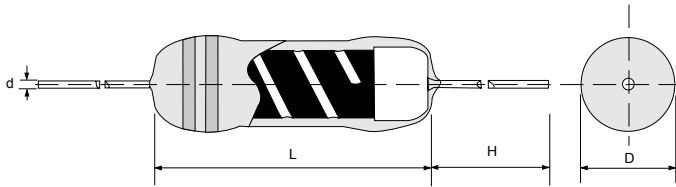


R-Series Carbon Film Fixed Resistor

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

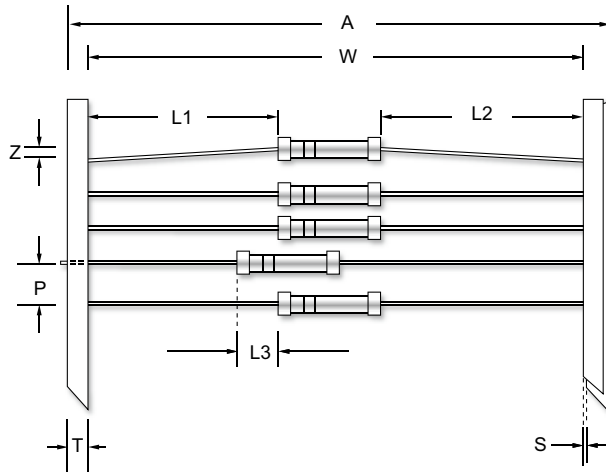
Type	Body Length (L, mm)	Body Diameter (D, mm)	Lead Wire Length (H, mm)	Lead Wire Diameter (d, mm)	Net Weight Per 1000 Pcs
R16	3.20 ± 1.0	1.9 ± 0.2	28 ± 3.0	0.45 ± 0.02	145 Grams
R20	3.20 ± 1.0	1.9 ± 0.2	28 ± 3.0	0.45 ± 0.02	145 Grams
R25	6.50 ± 1.0	2.4 ± 0.2	26 ± 3.0	0.55 ± 0.03	220 Grams
R51	8.80 ± 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

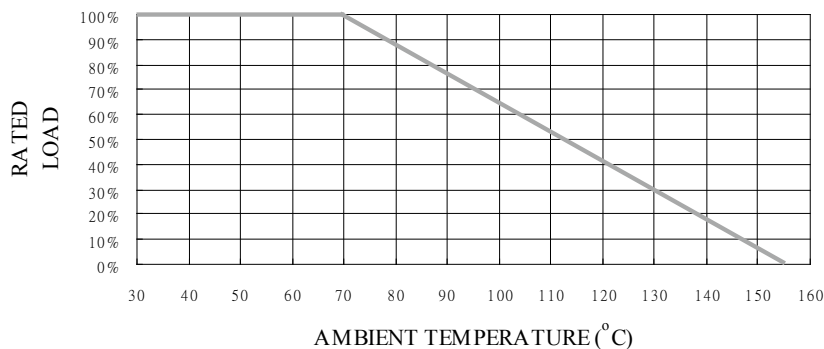


Unit (mm)

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

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■ 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			
Temperature Coefficient	R51: 700			
	R100/R200: 1000			
	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			

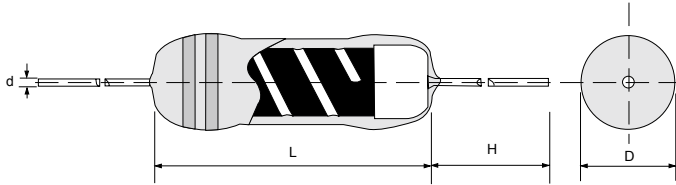
■ PERFORMANCE SPECIFICATIONS

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
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R-Series

■ 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) R100S 2K0 = 2,000 R200S 1K0 = 1,000 R300S 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.

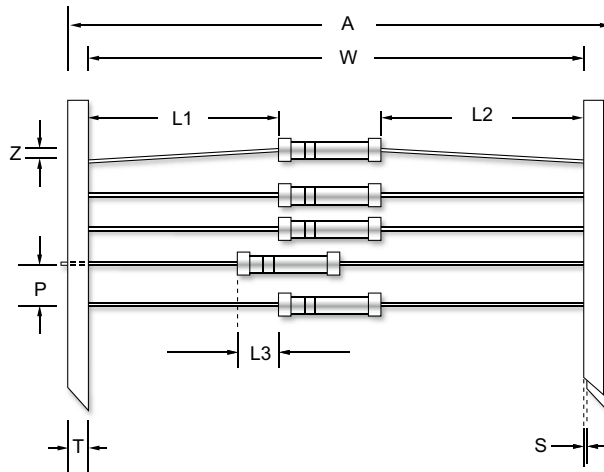
■ TECHNICAL SUMMARY

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
Operating Temperature Range, °C	-55~+155		
Insulation Resistance, MΩ	10 ⁴		
Power Derating, Linear	100% at 70°C, down to zero at 155°C		

Quality • Reliability
Cost-Down via Technology

R-Series

■ 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%