



**THE DATASHEET OF**  
**23J680E**



# 20 Series



## Vitreous Enamel Conformal Axial Terminal Wirewound, 5% Tolerance Std.



The 20 Series axial terminal resistors are both durable and economical. They have all the electrical attributes of the more expensive 90 Series resistors, including all-welded construction.

They offer the durability of a lead free conformal vitreous enamel coating and are ideal for computer, communications and industrial applications in which cost, quality, and reliability are key considerations.

### FEATURES

- Rugged vitreous enamel coating withstands high humidity and temperature cycling.
- Durable construction, recommended for industrial applications where reliability is paramount.
- All-welded construction.
- Flame resistant lead free vitreous enamel coating.
- RoHS compliant; Add "E" suffix to part number to specify.

### SERIES SPECIFICATIONS

Series	Wattage	Ohms	Max. Voltage*
21	1	1.0-3.0K	75
22	2	1.0-3.0K	65
23	3	0.1-10K	135
25	5	0.1-28K	330
27	7	0.1-25K	450
20	10	0.1-100K	720

12.5 watt size available on special order

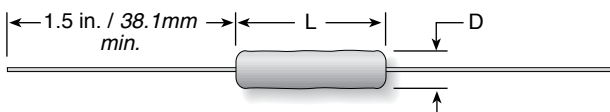
\*Maximum Voltage is based on Ohm's Law  $[V=\sqrt{P \cdot R}]$  as limited by the resistance value of specified product

### CHARACTERISTICS

<b>Coating</b>	Conformal lead free vitreous enamel
<b>Core</b>	Ceramic.
<b>Terminals</b>	Solder-coated axial. RoHS solder composition is 96% Sn, 3.5% Ag, 0.5% Cu
<b>Derating</b>	Linearly from 100% @ +25°C to 0% @ +350°C
<b>Tolerance</b>	±5% standard; other tolerances available
<b>Power rating</b>	Based on 25°C free air rating (other wattages available)
<b>Overload</b>	Under 7 watts: 5 times rated wattage for 5 seconds; 7 watts and over: 10 times rated wattage for 5 seconds
<b>Temperature coefficient</b>	1 to 9.99 ohms: ±50 ppm/°C; 10 ohms and over: ±30 ppm/°C

### DIMENSIONS

(in./mm max.)



Series	Wattage	Length* (max.)	Diam.* (max.)	Lead ga.
21	1	0.421 / 10.7	0.156 / 4.0	24
22	2	0.421 / 10.7	0.219 / 5.6	20
23	3	0.515 / 13.1	0.220 / 5.6	20
25	5	1.015 / 25.8	0.276 / 7.0	20
27	7	1.265 / 32.1	0.394 / 10.0	20
20	10	1.859 / 47.2	0.394 / 10.0	20

\*For units below 1Ω, add 15% to body diameter, 10% to body length.

(continued)

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## Vitreous Enamel Conformal Axial Terminal Wirewound, 5% Tolerance Std.

### ORDERING INFORMATION

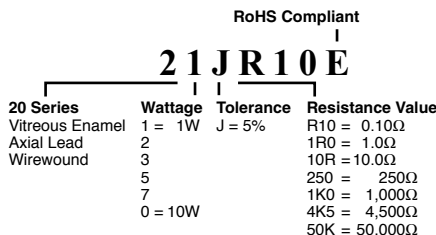
#### Standard part numbers

Ohmic value	Part No. Prefix Suffix	Wattage						Ohmic value	Part No. Prefix Suffix	Wattage						Ohmic value	Part No. Prefix Suffix	Wattage					
		1	2	3	5	7	10			1	2	3	5	7	10			1	2	3	5	7	10
0.10	R10			✓	✓		✓	62	62R	✦	✦	✓	✓	✦	✓	1,800	1K8	✓	✓	✓	✦	✦	✦
0.13	R13			✓	✓		✓	68	68R	✓	✓	✓	✓	✦	✓	2,000	2K0	✦	✓	✓	✓	✦	✓
0.15	R15			✓	✓		✓	75	75R	✓	✓	✓	✓	✦	✓	2,200	2K2	✓	✓	✓	✓	✦	✓
0.20	R20			✓	✓		✓	82	82R	✓	✓	✓	✓	✦	✓	2,500	2K5	✓	✓	✓	✓	✦	✓
0.25	R25			✓	✓		✓	100	100	✓	✦	✓	✓	✓	✓	2,700	2K7	✓	✓	✓	✦	✦	✓
0.30	R30			✓	✓		✓	120	120	✓	✓	✓	✓	✦	✓	3,000	3K0	✓	✓	✓	✓	✦	✓
0.33	R33			✓	✓		✓	125	125	✦	✦	✓	✓	✓	✓	3,300	3K3					✦	✓
0.50	R50			✓	✓		✓	150	150	✓	✓	✓	✓	✦	✓	3,500	3K5					✦	✓
0.75	R75			✓	✓		✓	180	180	✓	✓	✓	✓	✦	✓	3,900	3K9					✦	✓
1	1R0	✓	✓	✓	✓		✓	200	200	✓	✓	✓	✓	✓	✓	4,000	4K0					✦	✓
1.5	1R5	✓	✓	✓	✓		✓	220	220	✓	✓	✓	✓	✦	✓	4,500	4K5					✦	✓
2	2R0	✓	✓	✓	✓		✦	225	225	✦	✦	✦	✦	✦	✓	4,700	4K7					✦	✓
2.2	2R2	✓	✓	✓	✓		✓	250	250	✓	✓	✓	✓	✦	✓	5,000	5K0					✦	✓
3	3R0	✓	✓	✓	✓		✓	270	270	✓	✓	✓	✓	✦	✓	6,000	6K0					✦	✓
4	4R0	✓	✦	✓	✓		✓	300	300	✓	✓	✓	✓	✦	✓	6,800	6K8					✦	✓
5	5R0	✓	✓	✓	✓		✓	330	330	✓	✓	✓	✓	✦	✓	7,000	7K0					✦	✓
7.5	7R5	✓	✓	✓	✓		✓	350	350	✦	✓	✦	✓	✦	✓	7,500	7K5					✦	✓
10	10R	✓	✓	✓	✓		✓	390	390	✓	✦	✦	✦	✦	✓	8,000	8K0					✦	✓
12	12R	✦	✦	✓	✓		✓	400	400	✦	✦	✓	✓	✦	✓	9,000	9K0					✦	✓
15	15R	✓	✦	✓	✦		✓	450	450	✦	✦	✦	✓	✦	✓	10,000	10K					✦	✓
18	18R	✓	✦	✓	✓		✓	470	470	✓	✓	✓	✓	✦	✓	12,000	12K					✦	✓
20	20R	✓	✓	✓	✓		✓	500	500	✓	✓	✓	✓	✓	✓	13,000	13K					✦	✓
22	22R	✓	✓	✓	✓		✓	560	560	✓	✓	✓	✓	✦	✓	15,000	15K					✦	✓
25	25R	✦	✓	✓	✓		✓	600	600	✓	✓	✓	✓	✦	✓	17,000	17K					✦	✓
27	27R	✓	✓	✓	✓		✓	680	680	✓	✦	✓	✓	✦	✓	20,000	20K					✦	✓
30	30R	✓	✓	✓	✓		✓	750	750	✓	✓	✓	✓	✦	✓	22,000	22K					✦	✓
33	33R	✓	✓	✓	✓		✓	800	800	✓	✦	✓	✓	✦	✓	25,000	25K					✦	✓
35	35R	✦	✦	✦	✦		✓	820	820	✓	✓	✓	✓	✦	✓	30,000	30K					✦	✓
39	39R	✓	✓	✓	✓		✓	900	900	✦	✓	✓	✓	✦	✓	33,000	33K					✦	✓
40	40R	✓	✦	✓	✓		✓	1,000	1K0	✓	✓	✓	✓	✓	✓	35,000	35K					✦	✓
47	47R	✓	✓	✓	✓		✓	1,100	1K1	✦	✦	✓	✓	✦	✓	40,000	40K					✓	✓
50	50R	✓	✓	✓	✓		✓	1,200	1K2	✓	✓	✓	✓	✦	✓	50,000	50K					✓	✓
56	56R	✦	✓	✓	✓		✦	1,500	1K5	✓	✓	✓	✓	✓	✓							✓	✓

✓ = Standard values

✦ = Non-standard values subject to minimum handling charge per item

Shaded values involve very fine resistance wire and should not be used in critical applications without burn-in and/or thermal cycling.



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