

## Wirewound Resistor, Ultra Precision, Epoxy Molded, Axial Lead



### FEATURES

- Resistance values up to 6 M $\Omega$
- Resistance tolerances down to  $\pm 0.005$  %
- Tighter tolerances and lower resistance values available, please contact factory
- Temperature coefficients down to  $\pm 2$  ppm/ $^{\circ}$ C, and up to 6000 ppm/ $^{\circ}$ C
- Matched resistance sets available in tolerances down to  $\pm 0.001$  %, and in temperature coefficients down to  $\pm 0.5$  ppm/ $^{\circ}$ C, please contact factory
- Custom design capability available, please contact factory
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



**RoHS**  
COMPLIANT  
**HALOGEN**  
**FREE**  
**GREEN**  
(5-2008)

### STANDARD ELECTRICAL SPECIFICATIONS

GLOBAL MODEL	POWER RATING W <sup>(1)</sup>	RESISTANCE RANGE $\Omega$ $\pm 0.1$ %, $\pm 0.25$ %, $\pm 0.5$ %, $\pm 1$ %	RESISTANCE RANGE $\Omega$ $\pm 0.05$ %, $\pm 0.1$ %, $\pm 0.25$ %, $\pm 0.5$ %, $\pm 1$ %	RESISTANCE RANGE $\Omega$ $\pm 0.01$ %, $\pm 0.05$ %, $\pm 0.1$ %, $\pm 0.25$ %, $\pm 0.5$ %, $\pm 1$ %	RESISTANCE RANGE $\Omega$ $\pm 0.005$ %, $\pm 0.01$ %, $\pm 0.05$ %, $\pm 0.1$ %, $\pm 0.25$ %, $\pm 0.5$ %, $\pm 1$ %	MAXIMUM WORKING VOLTAGE V <sup>(2)</sup>
MR9352	0.750	1 to 6.0M	5 to 6.0M	50 to 6.0M	1K to 6.0M	600
MR9353	0.500	1 to 3.8M	5 to 3.8M	50 to 3.8M	1K to 3.8M	400
MR9354	0.330	1 to 2.5M	5 to 2.5M	50 to 2.5M	1K to 2.5M	400
MR9355	0.250	1 to 1.2M	5 to 1.2M	50 to 1.2M	1K to 1.2M	300
MR9356	0.200	1 to 1.0M	5 to 1.0M	50 to 1.0M	1K to 1.0M	200
MR9357	1.000	1 to 6.0M	5 to 6.0M	50 to 6.0M	1K to 6.0M	800
MR9358	1.500	1 to 6.0M	5 to 6.0M	50 to 6.0M	1K to 6.0M	900
MR9359	2.000	1 to 6.0M	5 to 6.0M	50 to 6.0M	1K to 6.0M	1000

#### Notes

- (1) Power rating is based on tolerance, please see derating chart.
- (2) The maximum working voltage is the highest voltage that can be applied to the resistor. Below this value, the maximum voltage that can continuously be applied is given by  $(P \times R)^{1/2}$ .

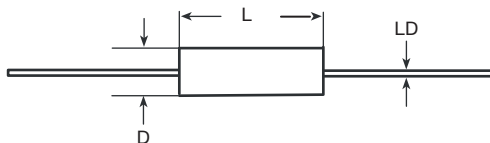
### GLOBAL PART NUMBER INFORMATION

Global Part Numbering example: **MR9355500K00AAE66** (visit [www.vishay.net](http://www.vishay.net) SAP parts manual for all options)

M	R	9	3	5	5	5	0	0	K	0	0	A	A	E	6	6	
GLOBAL MODEL (6 digits)  (see Standard Electrical Specifications Global Model column for options)				VALUE (6 digits)  R = decimal K = thousand M = million 15R000 = 15 Ω 1K5000 = 1.5 kΩ 1M0000 = 1 MΩ			TOLERANCE (1 digit)  S = ± 0.005 % T = ± 0.01 % Q = ± 0.02 % A = ± 0.05 % B = ± 0.1 % C = ± 0.25 % D = ± 0.5 % F = ± 1.0 %			TC (1 digits)  A = standard, 10 to 30 (W) B = 3900 (Q) C = 4500 (M) D = 6000 (N) E = 3500 (P) Y = 10 (≥ 1 Ω) G = 5 (≥ 10 Ω) J = 2 (≥ 100 Ω)			PACKAGING CODE (3 digits)  E66 = lead (Pb)-free bulk pack			SPECIAL (1 digits)  (dash number) from 1 to 9 as applicable	

Historical Part Number example: **MR9355W500K0A**

<b>MR9355</b>	<b>W = STANDARD</b>	<b>500 k<math>\Omega</math></b>	<b>0.05 %</b>
HISTORICAL MODEL	TC	RESISTANCE VALUE	TOLERANCE

**DIMENSIONS** in inches [millimeters]

GLOBAL MODEL	DIMENSIONS in inches [millimeters]		
	L ± 0.025 [0.635]	D ± 0.005 [0.127]	LD ± 0.002 [0.051]
MR9352	1.000 [25.40]	0.375 [9.52]	0.032 [0.813]
MR9353	0.750 [19.05]	0.375 [9.52]	0.032 [0.813]
MR9354	0.750 [19.05]	0.250 [6.35]	0.032 [0.813]
MR9355	0.500 [12.70]	0.250 [6.35]	0.032 [0.813]
MR9356	0.375 [9.52]	0.250 [6.35]	0.032 [0.813]
MR9357	1.000 [25.40]	0.500 [12.70]	0.032 [0.813]
MR9358	1.500 [38.10]	0.500 [12.70]	0.032 [0.813]
MR9359	2.000 [50.80]	0.500 [12.70]	0.032 [0.813]

**MATERIAL SPECIFICATIONS**

**Element:** nickel-chrome alloy, other materials available depending on TC requirements

**Core:** molded epoxy

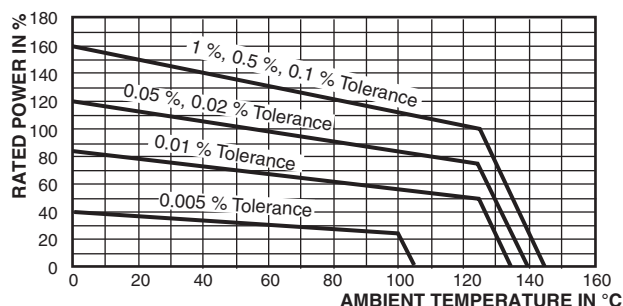
**Encapsulant:** epoxy

**Standard Terminals:** 100 % matte tinned copper

**Part Marking:** MILLS, model, value, tolerance, date code

**Note**

- Due to resistor size limitations some resistors will have minimal information marked on parts.

**DERATING****TECHNICAL SPECIFICATIONS**

PARAMETER	UNIT	MR93 RESISTOR CHARACTERISTICS
Temperature Coefficient	ppm/°C	± 10 for > 100 Ω; ± 20 for 10 Ω to 100 Ω; ± 30 for < 10 Ω
Terminal Strength	lb	4.5
Dielectric Withstanding Voltage	V <sub>AC</sub>	750
Operating Temperature Range	°C	-55 to +145 (see derating chart)

**PERFORMANCE**

TEST	CONDITIONS OF TEST	TEST LIMITS
Dielectric Withstanding Voltage	MIL-STD-202 Method 301, 750 V <sub>RMS</sub>	± (0.01 %) ΔR
High Frequency Vibration	MIL-STD-202 Method 204, condition D, frequency varied 10 Hz to 2000 Hz, 20 g peak	± (0.01 %) ΔR
High Temperature Exposure	MIL-STD-202 Method 108, 2000 h at 145 °C	± (0.01 %) ΔR
Load Life	MIL-STD-202 Method 108, 2000 h at 125 °C at rated power, 1.5 h "ON", 0.5 h "OFF"	± (0.1 % + 0.01 Ω) ΔR
Low Temperature Storage	-65 °C for 24 h	± (0.01 %) ΔR
Moisture Resistance	MIL-STD 202 Method 106	± (0.01 %) ΔR
Shock, Specified Pulse	MIL-STD-202 Method 213, condition I, 5 shocks in 3 directions	± (0.01 %) ΔR
Thermal Shock	MIL-STD-202 Method 107, condition B	± (0.05 %) ΔR
Short Time Overload	2x rated power for 10 min	± (0.01 %) ΔR
Terminal Strength	MIL-STD-202 Method 211, conditions A and D, 4.5 lb	± (0.01 %) ΔR



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