

# Leaded Metal Film Precision Resistor – MFR Series



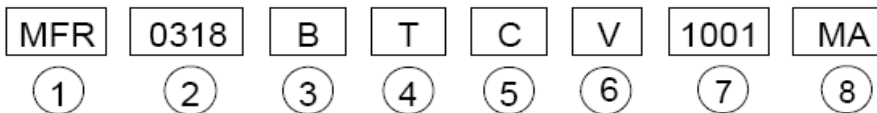
## Features

- Very Tight Tolerance from  $\pm 0.1\% \sim 1\%$
- Extremely Low TCR from  $\pm 15 \sim 100 \text{PPM}/^\circ\text{C}$
- Usually broad selection of Power Rating 1/8W, 1/4W, 1/2W, 1W, 2W, 3W at 70°C
- Lead (Pb)-free and RoHS compliant

## Applications

- Military
- Automotive
- Telecommunication
- Medical equipment.
- Avionics
- Space

## Part Numbering



### ① Product Type

Product Type	
MFR	Metal Film Resistor

### ② Dimensions (L×W)

Codes	Dimensions (L×W)
0318	3.30×1.80mm
0623	6.30×2.30mm
0932	9.00×3.20mm
1145	11.5×4.50mm
1550	15.5×5.00mm

### ③ Resistance Tolerance

Codes	Resistance Tolerance
B	$\pm 0.10\%$
C	$\pm 0.25\%$
D	$\pm 0.50\%$
F	$\pm 1.00\%$

### ④ Packaging

Codes	Type
A	Ammo
B	Bulk
T	Taping Reel

### ⑤ TCR

Codes	Type
N	$\pm 15 \text{PPM}/^\circ\text{C}$
C	$\pm 25 \text{PPM}/^\circ\text{C}$
D	$\pm 50 \text{PPM}/^\circ\text{C}$
E	$\pm 100 \text{PPM}/^\circ\text{C}$

### ⑥ Power Rating

Codes	Type
	Standard
R	3W
S	2W
T	1W
U	1/2W
V	1/4W
W	1/8W

### ⑦ Resistance

Codes	Type
R100	0.10Ω
0100	10.0Ω
2201	2200Ω
1002	10000Ω
4992	49900Ω
1003	100000Ω
1004	1000000Ω

### ⑧ Special

Codes	Type
	Standard
MA	MA-type
MB	MB-type
MC	MC-type
FA	FA-type
FB	FB-type
FC	FC-type
PA	PA-type
PB	PB-type
PC	PC-type

## Dimensions

Codes	L	D	H	D
0318	3.3±0.7/-0.2	1.8±0.3	29±2.0	0.45±0.03
0623	6.3±0.5	2.3±0.3	28±2.0	0.55±0.03
0932	9.0±0.5	3.2±0.5	26±2.0	0.65±0.03
1145	11.5±1.0	4.5±0.5	35±2.0	0.78±0.03
1550	15.5±1.0	5.0±0.5	32±2.0	0.78±0.03



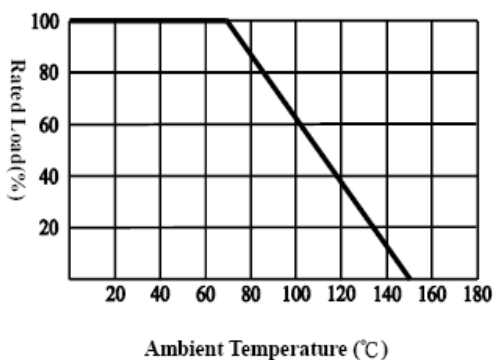
## Standard Electrical Specifications

Item Type	Power Rating at 70°C	Operating Temp. Range	Max. Working Voltage	Max. Overload Voltage	Dielectric Withstanding Voltage	Resistance Range $\leq 0.25\%$ E192	Resistance Range $\geq 0.50\%$ E96	TCR ( $\pm$ PPM/°C)
0318	1/8W	-55 ~ +155°C	200V	400V	300V	100Ω   100KΩ	10Ω   1MΩ	±15 ±25 ±50 ±100
0623	1/4W		250V	500V	500V			
0932	1/2W		350V	700V	500V			
1145	1W		450V	1000V	1000V			
1550	2W		500V	1000V	1000V			

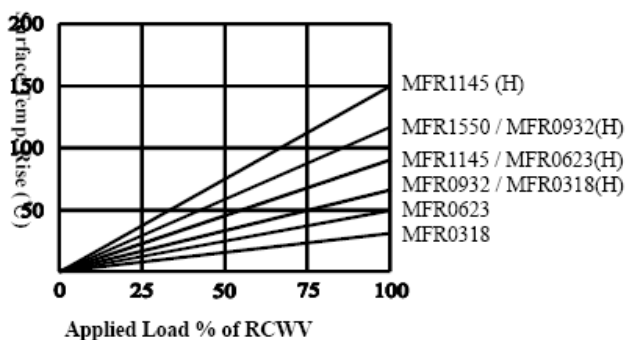
## High Power Rating Electrical Specifications

Item Type	Power Rating at 70°C	Operating Temp. Range	Max. Working Voltage	Max. Overload Voltage	Dielectric Withstanding Voltage	Resistance Range $\leq 0.25\%$ E192	Resistance Range $\geq 0.50\%$ E96	TCR ( $\pm$ PPM/°C)
0318	1/4W	-55 ~ +155°C	200V	400V	400V	100Ω   100KΩ	10Ω   1MΩ	±15 ±25 ±50 ±100
0623	1/2W		300V	600V	500V			
0932	1W		400V	800V	700V			
1145	2W		500V	1000V	1000V			
1550	3W		500V	1000V	1000V			

Power Graph



Hot-spot Temperature



## Environmental Characteristics

Item	Specification	Test Method
Short Time Overload	±0.25%	<b>JIS-C-5202-5.5</b> RCWV*2.5 or Max Overloading Voltage · 5 seconds
Temperature Coefficient	By Type	Resistance value at room temperature and room Temperature+100°C
Dielectric Withstanding Voltage	By Type	<b>MIL-STD-202F Method 301</b> Apply Max Overload Voltage for 1 minute
Pulse Overload	±0.75%	<b>JIS -C5202 5.8</b> 4 times RCWV for 10000cycles (1sec.on · 25secs.off)
Insulation Resistance	> 1000MΩ	<b>MIL-STD-202F Method 302</b> Apply 100V <sub>DC</sub> for 1 minute
Load Life	±1.5%	<b>MIL-STD-202F Method 108A</b> RCWV · 70°C · 1.5 hours ON · 0.5 hours OFF, total 1000~1048 hours
Humidity ( Steady State )	±1.5%	<b>MIL-STD-202F Method 103B</b> 40°C , 90~95%RH,RCWV 1.5 hours ON,0.5 hours OFF, total 1000~1048 hours
Solderability	95% Min. Coverage	<b>MIL-STD-202F Method 208H</b> 245°C ±5°C , 5±0.5 (sec)
Resistance To Solvent	No deterioration of coatings and markings	JIS -C5202 6.9 Trichroethane for 1 min. with ultrasonic
Terminal Strength	Tensile: ≥2.5kg	Direct Load for 10 sec. In the direction off the terminal leads.

\* Rated continuous Working Voltage (RCWV) =  $\sqrt{\text{Rower.Rating.} \times \text{Resisance.Value}}$

\* Storage Temperature :25±3°C; Humidity <80%RH