

Data Sheet

Customer:

Product: Metal Film Flame-Proof Resistors — FMR Series

Sizes.: 0623/0932/1145/1550

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Metal Film Flame-Proof Resistors



■ Features

- Low Noise
- Low TCR from $\pm 15 \sim 100 \text{PPM}/^\circ\text{C}$
- High Precision from $\pm 0.1\% \sim 1\%$
- Complete Flameproof Construction UL-1412 .
- Coating meets UL94V-0

■ Applications

- Automotive
- Telecommunication
- Medical Equipment
- Consumer Product

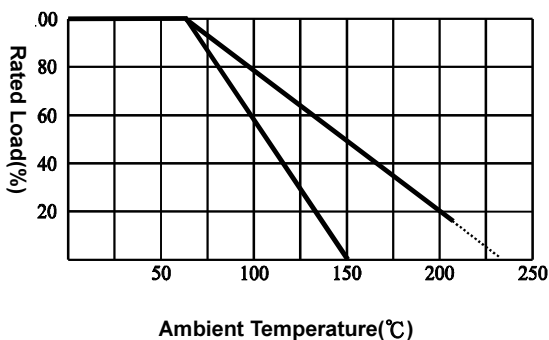
■ Dimensions



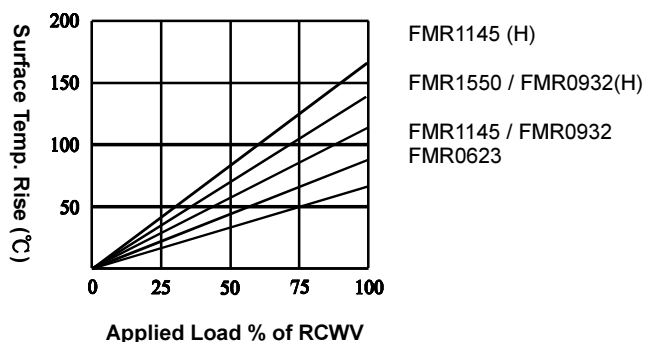
Unit: mm

Type	L	D	H	d
FMR0623	6.3±0.5	2.3±0.3	28±2.0	0.55±0.03
FMR0932	9.0±0.5	3.2±0.5	26±2.0	0.65±0.03
FMR1145	11.5±1.0	4.5±0.5	35±2.0	0.78±0.03
FMR1550	15.5±1.0	5.0±0.5	32±2.0	0.78±0.03

■ Derating Curve



■ Hot-spot Temperature



Metal Film Flame-Proof Resistors

Part Numbering

FMR	0318	B	T	N	W	1001	
Product Type	Dimensions (LxD)	Resistance Tolerance	Packaging Code	TCR (PPM/°C)	Power Rating	Resistance	Special
	0623: 6.3x2.3 0932: 9.0x3.2 1145: 11.5x4.5 1550: 15.5x5.0	B: ±0.1% C: ±0.25% D: ±0.5% F: ±1%	A: Ammo B: Bulk T: Taping Reel	N: ±15 C: ±25 D: ±50 E: ±100	R: 3W S: 2W T: 1W U: 1/2W V: 1/4W	R100: 0.1Ω 0010: 1Ω 1000: 100Ω 2201: 2200Ω 1001: 1KΩ 1004: 1MΩ	: Standard MA: MA-type MB: MB-type MC: MC-type FA: FA-type FB: FB-type FC: FC-type FD: FD-type

Standard Electrical Specifications

Item Type	Power Rating at 70°C	Operating Temp. Range	Max. Working Voltage	Max. Overload Voltage	Dielectric Withstanding Voltage	Resistance Range ≤0.25% E192	Resistance Range ≥0.50% E96	TCR (±PPM/°C)
0623	1/4W	-55 ~ +155°C	250V	500V	400V	100Ω 100KΩ	10Ω 1MΩ	±15 ±25 ±50 ±100
0932	1/2W		350V	700V	500V			
1145	1W		450V	1000V	750V			
1550	2W		500V	1000V	750V			

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 ≤0.25% E192	Resistance Range ≥0.50% E96	TCR (±PPM/°C)
0623	1/2W	-55 ~ +155°C	300V	500V	400V	100Ω 100KΩ	10Ω 1MΩ	±15 ±25 ±50 ±100
0932	1W		400V	800V	600V			
1145	2W		500V	1000V	750V			
1550	3W		500V	1000V	750V			

Operating Voltage= $\sqrt{P \cdot R}$ or Max. operating voltage listed above, whichever is lower.
Overload Voltage= $2.5 \cdot \sqrt{P \cdot R}$ or Max. overload voltage listed above, whichever is lower.

Resistor body color : Grey

Metal Film Flame-Proof Resistors

■Environmental Characteristics

Item	Specification	Test Method
Short Time Overload	$\pm(0.25\%+0.05\Omega)$	JIS-C-5202-5.5 RCWV*2.5 or Max. overload voltage whichever is lower for 5 seconds
Temperature Coefficient	By Type	Resistance value at room temperature and room temperature+100°C
Dielectric Withstanding Voltage	By Type	JIS-C-5202-5.7 In V-Block for 60 seconds
Pulse Overload	$\pm(0.75\%+0.05\Omega)$	JIS -C5202 5.8 4 times RCWV for 10000cycles (1sec.on · 25secs.off)
Insulation Resistance	> 1000MΩ	JIS -C5202 5.6 In V-Block for 60 seconds
Load Life	$\pm(1.5\%+0.05\Omega)$	JIS -C5202 7.10 RCWV · 70°C · 1.5 hours ON · 0.5 hours OFF, total 1000 hours
Humidity (Steady State)	$\pm(1.5\%+0.05\Omega)$	JIS -C5202 7.9 40±2°C , 90~95%RH,RCWV 1.5 hours ON,0.5 hours OFF, total 1000 hours
Solderability	95% Min. Coverage	JIS -C5202 6.5 235°C±5°C , 2±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: $\geq 2.5\text{kg}$	Direct Load for 10 sec. In the direction off the terminal leads.
Shelf Life	$\Delta R = \pm 0.1\%$	12 months at room temperature 25±3°C ,80%RH Max

RCWV(Rated continuous working voltage)= $\sqrt{P \cdot R}$ or Max. Operating voltage whichever is lower

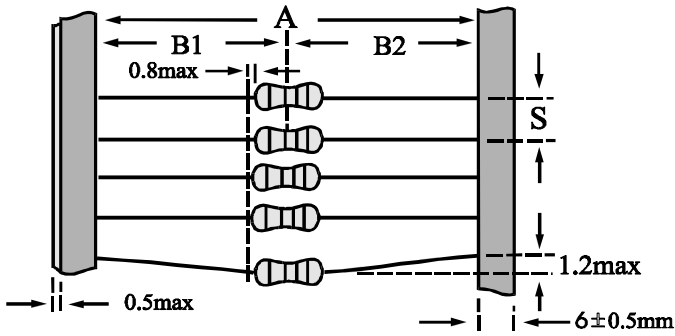
■Storage Temperature: 25±3°C; Humidity < 80%RH

Metal Film Flame-Proof Resistors

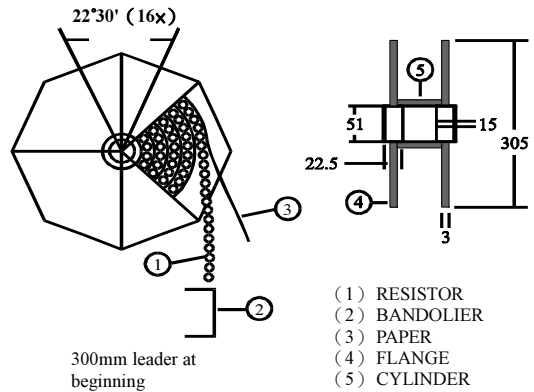
■ Taping/Packing Specifications

1. Standard Type (Reel & Ammo)

Packing Methods



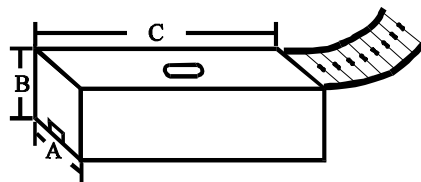
Reel Packing



Unit: mm

Packaging Type	Packing Methods			Reel Packing	
	A	B1-B2	S	Across Flange (A)	Qty
0623	52+1/-0	1.2	5	72	5,000
	26+1/-0	1.0			
0932	52+1/-0	1.2	5	72	2,500
1145	52+1/-0	1.5	5	95	2,000
	73+1/-0				
1550	52+1/-0	1.5	10	95	1,000
	73+1/-0				

Ammo Packing

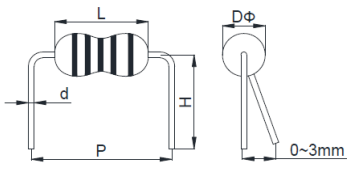


Unit: mm

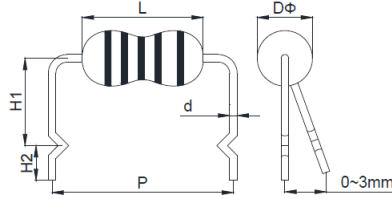
Packaging Type	Packing Methods			Ammo Packing			
	A	B1-B2	S	A	B	C	Qty
0623	52+1/-0	1.2	5	80	105	264	5,000
	26+1/-0	1.0					
0932	52+1/-0	1.2	5	80	46	264	1,000
1145	52+1/-0	1.5	5	103	82	265	1,000
	73+1/-0						
1550	52+1/-0	1.5	10	103	96	265	1,000
	73+1/-0						

Metal Film Flame-Proof Resistors

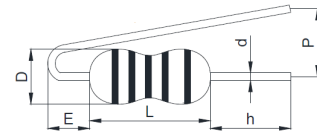
2. Special Type (Bulk)



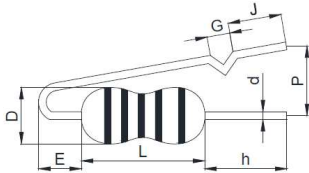
MA Type



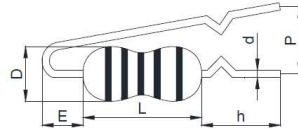
MC Type



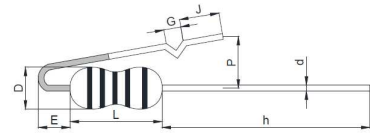
FA Type



FB Type



FC Type



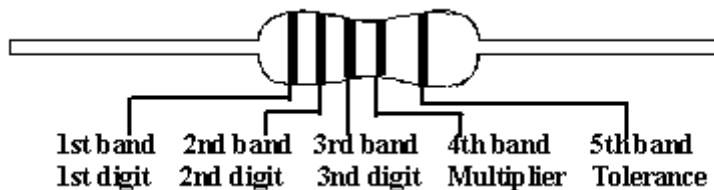
FD Type

Unit: mm

Codes	Type	P	H /H1/h	H2/G	J	D	L	d	E
0623	MA	10±1	10.0±1	-	-	2.3±0.3	6.3±0.5	0.55±0.03	-
	MC	10±1	5.0±1	6.0±2	-	2.3±0.3	6.3±0.5	0.55±0.03	-
	FA	5~15	5.0±2	-	-	2.3±0.3	6.3±0.5	0.55±0.03	3±1
	FB	5~15	4.0±2	3.0±0.5	-	2.3±0.3	6.3±0.5	0.55±0.03	3±1
	FD	5~15	27.0±2	3.0±0.5	3±1	2.3±0.3	6.3±0.5	0.55±0.03	3±1
0932	MA	12.5±1	10.0±1	-	-	3.2±0.5	9.0±0.5	0.65±0.03	-
	MC	12.5±1	5.0±1	4.0±2	-	3.2±0.5	9.0±0.5	0.65±0.03	-
	FA	5~15	5.0±2	-	-	3.2±0.5	9.0±0.5	0.65±0.03	3±1
	FB	5~15	4.0±2	3.0±0.5	3±1	3.2±0.5	9.0±0.5	0.65±0.03	3±1
	FC	5~15	10.0±3	-	-	3.2±0.5	9.0±0.5	0.65±0.03	-
1145	MA	15±1	12.5±1	-	-	4.5±0.5	11.5±1.0	0.78±0.03	-
	MC	15±1	8.0±1	6.0±1.0	-	4.5±0.5	11.5±1.0	0.78±0.03	-
	FA	5~15	5.0±2	-	-	4.5±0.5	11.5±1.0	0.78±0.03	3±1
	FB	5~15	4.0±2	3.0±0.5	3±1	4.5±0.5	11.5±1.0	0.78±0.03	3±1
	FC	5~15	10.0±3	-	-	4.5±0.5	11.5±1.0	0.78±0.03	-
1550	MA	20±1	15.0±1	-	-	5.0±0.5	15.5±1.0	0.78±0.03	-
	MC	20±1	12.0±1	5.0±1.0	-	5.0±0.5	15.5±1.0	0.78±0.03	-
	FA	5~15	5.0±2	-	-	5.0±0.5	15.5±1.0	0.78±0.03	3±1
	FB	5~15	4.0±2	3.0±0.5	3±1	5.0±0.5	15.5±1.0	0.78±0.03	3±1
	FC	5~15	10.0±3	-	-	5.0±0.5	15.5±1.0	0.78±0.03	-

Metal Film Flame-Proof Resistors

■ Marking & Resistance Tolerance



Color	Digit	Multiplier	Tolerance	
Without	-	-	-	-
Silver	-	10 ⁻²	-	-
Gold	-	10 ⁻¹	-	-
Black	0	10 ⁰	-	-
Brown	1	10 ¹	±1.0%	F
Red	2	10 ²	-	-
Orange	3	10 ³	-	-
Yellow	4	10 ⁴	-	-
Green	5	10 ⁵	±0.50%	D
Blue	6	10 ⁶	±0.25%	C
Violet	7	10 ⁷	±0.10%	B
Grey	8	10 ⁸	-	-
White	9	10 ⁹	-	-

±1.00%	E-96	1.00	1.02	1.05	1.07	1.10	1.13	1.15	1.18	1.21	1.24	1.27	1.30	1.33	1.37	1.40	1.43	1.47	1.50	1.54	1.58	1.62	1.65	1.69	1.74
		1.78	1.82	1.87	1.91	1.96	2.00	2.05	2.10	2.15	2.21	2.26	2.32	2.37	2.43	2.49	2.55	2.61	2.67	2.74	2.80	2.87	2.94	3.01	3.09
		3.16	3.24	3.32	3.40	3.48	3.57	3.65	3.74	3.83	3.92	4.02	4.12	4.22	4.32	4.42	4.53	4.64	4.75	4.87	4.99	5.11	5.23	5.36	5.49
		5.62	5.76	5.90	6.04	6.19	6.34	6.49	6.65	6.81	6.98	7.15	7.32	7.50	7.68	7.87	8.06	8.25	8.45	8.66	8.87	9.09	9.31	9.53	9.76
±0.25%	E-192	10.0	10.1	10.2	10.4	10.5	10.6	10.7	10.9	11.0	11.1	11.3	11.4	11.5	11.7	11.8	12.0	12.1	12.3	12.4	12.6	12.7	12.9	13.0	13.2
		13.3	13.5	13.7	13.8	14.0	14.2	14.3	14.5	14.7	14.9	15.0	15.2	15.4	15.6	15.8	16.0	16.2	16.4	16.5	16.7	16.9	17.2	17.4	17.6
		17.8	18.0	18.2	18.4	18.7	18.9	19.1	19.3	19.6	19.8	20.0	20.3	20.5	20.8	21.0	21.3	21.5	21.8	22.1	22.3	22.6	22.9	23.2	23.4
		23.7	24.0	24.3	24.6	24.9	25.2	25.5	25.8	26.1	26.4	26.7	27.1	27.4	27.7	28.0	28.4	28.7	29.1	29.4	29.8	30.1	30.5	30.9	31.2
		31.6	32.0	32.4	32.8	33.2	33.6	34.0	34.4	34.8	35.2	35.7	36.1	36.5	37.0	37.4	37.9	38.3	38.8	39.2	39.7	40.2	40.7	41.2	41.7
		42.2	42.7	43.2	43.7	44.2	44.8	45.3	45.9	46.4	47.0	47.5	48.1	48.7	49.3	49.9	50.5	51.1	51.7	52.3	53.0	53.6	54.2	54.9	55.6
		56.2	56.9	57.6	58.3	59.0	59.7	60.4	61.2	61.9	62.6	63.4	64.2	64.9	65.7	66.5	67.3	68.1	69.0	69.8	70.6	71.5	72.3	73.2	74.1
		75.0	75.9	76.8	77.7	78.7	79.6	80.6	81.6	82.5	83.5	84.5	85.6	86.6	87.6	88.7	89.8	90.9	92.0	93.1	94.2	95.3	96.5	97.6	98.8