EOL-Last Buy Date is July 31, 2024
Not recommended for new applications.

Type MRF

Fast Acting Radial Lead Micro Fuse Series

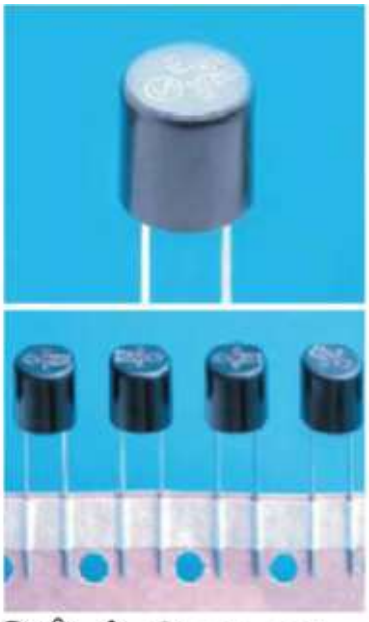
HF Pb MRF Series — RoHS Compliant

Description

Sub-miniature, fast-acting type, 250V rated fuses designed, approved and complied with IEC 60127-3, standard sheet 3.

Features

- Fast Acting (250V AC@50A)
- Meet IEC standard 60127-3, sheet 3
- Wide operating temperature range
- Bulk and Tape & Reel packing available
- AEC-Q Compliant
- Full compliance with EU Directive 2011/65/EU and amending directive 2015/863
- Halogen Free
- Lead Free
- Meets Bel automotive qualification*
  * - Largely based on internal AEC-Q test plan



AEC-Q Compliant

Applications

Provide individual protection for components or internal circuits.
- Power supplies
- Battery chargers
- Consumer electronics
- Adapter
- Industrial controllers

LEAD FREE = Pb
HALOGEN FREE = HF

Physical Specifications

Materials	Base and Cover : Black thermoplastic, UL 94-V0
	Pins : 100% Matte Tin Plated Copper
Marking	On Fuse :
	"bel", "F" ,"Current Rating", "250V" & "Appropriate Safety Logos"
	On Label :
	"bel", "MRF", "Current Rating", "Voltage Rating", "Interrupting Rating", "Appropriate Safety Logos" and " ", " " (China RoHS compliant).

Electrical Characteristics (IEC-127-3 STANDARD SHEET 3)

Rated Current	1.5In	2.1In	2.75In		4In		10In
	Min	Max	Min	Max	Min	Max	Max
50mA to 6.3A inclusive	1 hour	30 min.	10 ms	3 sec	3 ms	300 ms	20 ms

In clause 9.2, the test voltage for MRF ratings from 80mA to 6.3A is 64VDC.

Safety Agency Approvals

Safety Agency	Safety Agency Certificate	Ampere Rating/ Voltage Rating	Ampere Range / Volt @ I.R. ability*
	SE-S-2100235	50mA-6.3A/ 250V ac	50mA - 5A / 250V AC @ 35A or 10 In whichever is greater
	40017420		
	40028500		6.3A/250V ac @ 63A
	LR39772		50mA-6.3 /250V AC @ 50A
	E20624		50mA-6.3A/350V AC @ 100A

*I.R.= Interrupting Rating = Short Circuit Rating(Amps)

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Environmental Specifications

Shock Resistance	MIL-STD-202G, Method 213B, Test Condition 1 (100 G's peak for 6 milliseconds; Sawtooth waveform)
Vibration Resistance	MIL-STD-202G, Method 201A (10-55 Hz X 3 axis / no load).
Salt Spray Resistance	MIL-STD-202G, Method 101E, Test Condition B (48 hrs.).
Solderability	MIL-STD-202G, Method 208H
Resistance to solder Heat	MIL-STD-202G, Method 210F, Test Condition C. Top Side. (260°C,20 sec)
Moisture Resistance	MIL-STD-202G, Method 202G, Method 106G
Operating Temperature	-55°C to +125°C

High temperature storage	MIL-STD-202 Method 108
Temperature cycling	JESD22 Method JA-104,Test Condition B
Biased humidity	MIL-STD-202 Method 103, 85C/85% RH with 10% operating power for 1000 hrs.
Operational life	MIL-STD-202 Method 108, Test Condition D
Resistance to solvents	MIL-STD-202 Method 215
Mechanical shock	MIL-STD-202 Method 213,Test Condition C
Vibration	MIL-STD-202 Method 204
Resistance to soldering heat	MIL-STD-202 Method 210,Test condition B
Thermal shock	MIL-STD-202 Method 107
Solderability	J-STD-002
Board flex(SMD)	AEC-Q200-005
Terminal strength	AEC-Q200-006
Electrical characterization	3 temperature electrical

Electrical Specifications

Catalog Number	Ampere Rating	Typical Cold Resistance (ohms)	Volt-drop @100% In (Volt) max.	Voltage and Interrupting Ratings	Melting I²T <10 mSec (A² Sec)	Melting I²T @10 In (A² Sec)	Maximum Power Dissipation (W)	Agency Approvals				
MRF 50	50mA	13.0	0.98	See Table of Safety Approvals on Page 1 for Voltage and associated Interrupting Ratings	0.0005	0.0005	0.05	Y	Y	Y	Y	
MRF 63	63mA	8.5	0.66		0.001	0.001	0.10	Y	Y	Y	Y	
MRF 80	80mA	6.3	0.64		0.002	0.002	0.11	Y	Y	Y	Y	
MRF 100	100mA	4.0	0.49		0.003	0.003	0.11	Y	Y	Y	Y	
MRF 125	125mA	3.1	0.50		0.007	0.007	0.13	Y	Y	Y	Y	
MRF 160	160mA	2.3	0.46		0.016	0.016	0.21	Y	Y	Y	Y	
MRF 200	200mA	1.7	0.41		0.027	0.027	0.19	Y	Y	Y	Y	
MRF 250	250mA	0.42	0.17		0.023	0.023	0.23	Y	Y	Y	Y	
MRF 315	315mA	0.29	0.15		0.044	0.044	0.22	Y	Y	Y	Y	
MRF 400	400mA	0.21	0.14		0.073	0.072	0.28	Y	Y	Y	Y	
MRF 500	500mA	0.17	0.15		0.20	0.18	0.42	Y	Y	Y	Y	
MRF 630	630mA	0.10	0.08		0.15	0.14	0.16	Y	Y	Y	Y	
MRF 800	800mA	0.071	0.08		0.4	0.4	0.20	Y	Y	Y	Y	
MRF 1	1A	0.057	0.08		0.7	0.6	0.38	Y	Y	Y	Y	
MRF 1.25	1.25A	0.047	0.081		1.3	1.2	0.69	Y	Y	Y	Y	
MRF 1.6	1.6A	0.035	0.077		1.4	1.3	0.62	Y	Y	Y	Y	
MRF 2	2A	0.028	0.075		2.1	2.0	0.72	Y	Y	Y	Y	
MRF 2.5	2.5A	0.022	0.071		4	3	0.92	Y	Y	Y	Y	
MRF 3.15	3.15A	0.016	0.064		6	4	0.82	Y	Y	Y	Y	
MRF 4	4A	0.011	0.059		8	6	0.65	Y	Y	Y	Y	
MRF 5	5A	0.010	0.056		15	11.8	0.91	Y	Y	Y	Y	
MRF 6.3	6.3A	0.008	0.054		25	19.8	1.05	Y	Y			Y

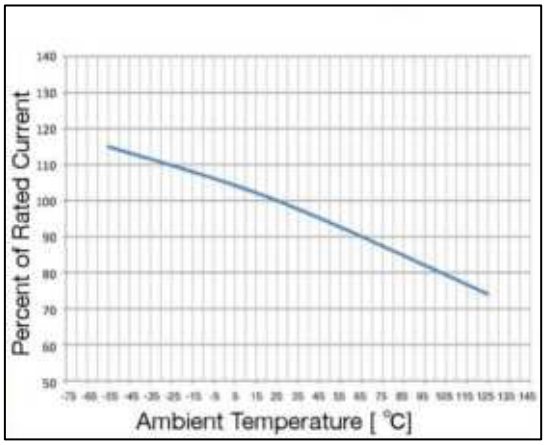
Consult manufacturer for other ratings

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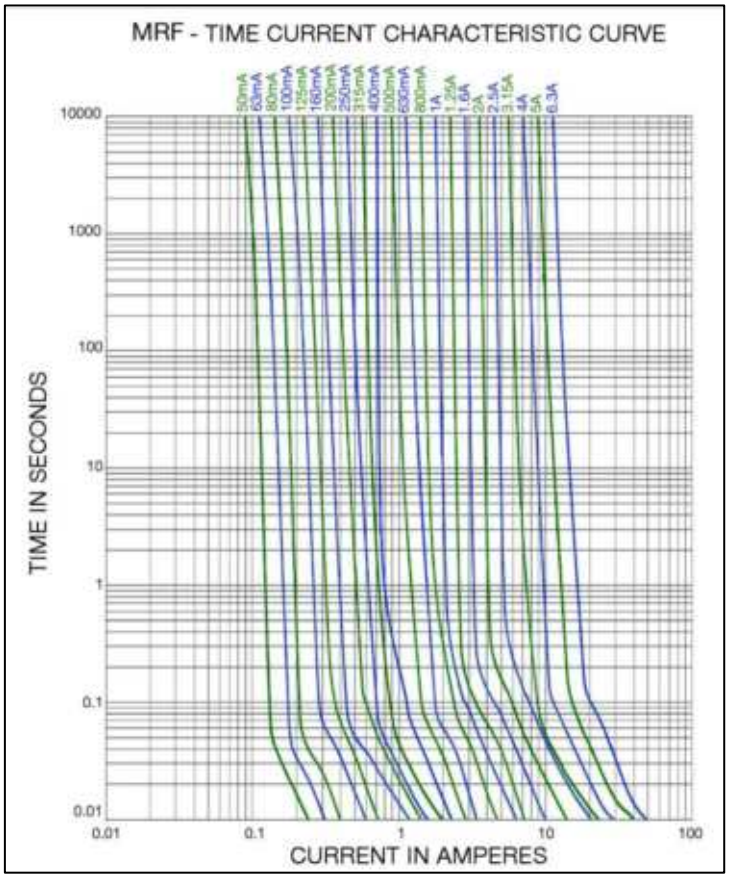
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Temperature Derating Curve

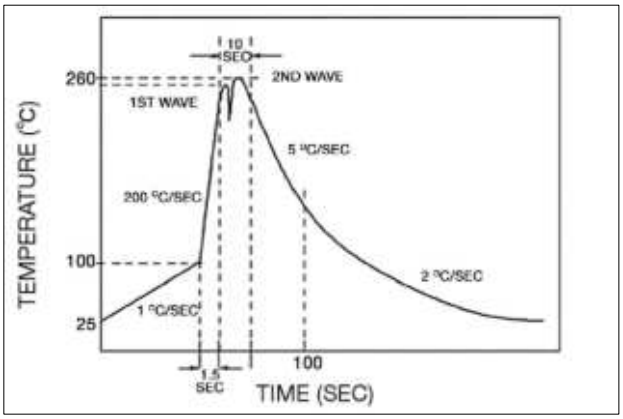


Average Time Current Curve



Soldering Parameters

Lead-free Wave Soldering Profile	
Wave Soldering Parameter	
Average ramp-up rate	200℃ / second
Heating rate during preheat	typical 1 - 2℃ / second Max 4℃ / second
Final preheat temperature	within 125℃ of soldering temperature
Peak temperature Tp	260℃
Time within +0℃ / -5℃ of actual peak temperature	10 seconds
Ramp-down rate	5℃ / second max.



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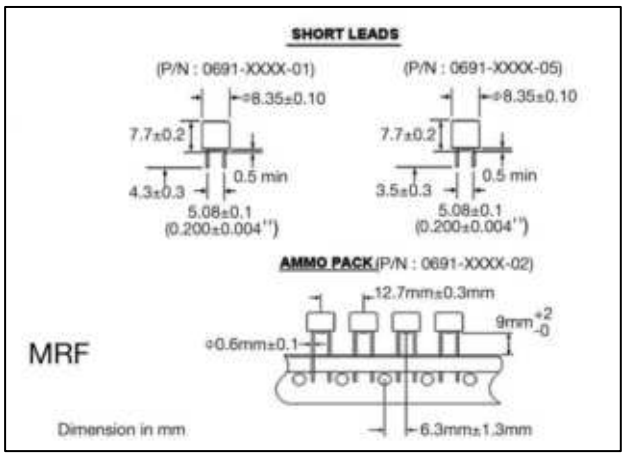
Type MRF

Fuse FGNO Explanation
0691 - [XXXX] X XX
0691=MRF; [XXXX]=Ampere Rating; XX=See Ordering Information as below

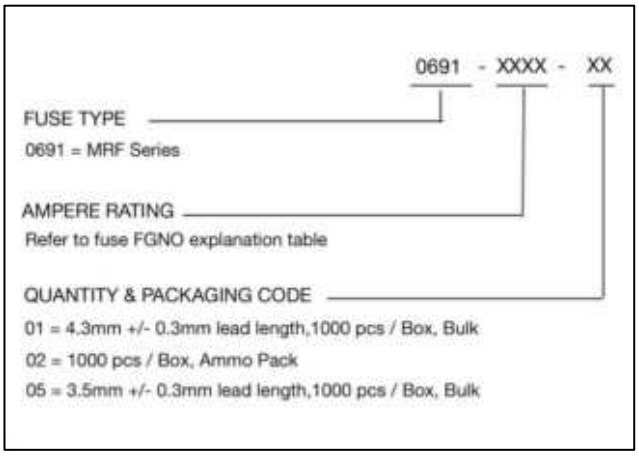
Fraction	Decimal	Milliamps	Bel FGNO[XXXX]
1/20	0.050	50	0050
1/16	.063	63	0063
8/100	.080	80	0080
1/10	.100	100	0100
1/8	.125	125	0125
	.160	160	0160
2/10	.200	200	0200
1/4	.250	250	0250
	.315	315	0315
4/10	.400	400	0400
1/2	.500	500	0500
	.630	630	0630
8/10	.800	800	0800

Fraction	Decimal	Amps	Bel FGNO[XXXX]
	1.0	1	1000
1-1/4	1.25	1.25	1250
	1.6	1.6	1600
	2.0	2	2000
2-1/2	2.5	2.5	2500
	3.15	3.15	3150
	4.0	4	4000
	5.0	5	5000
	6.3	6.3	6300

Mechanical Dimensions



Ordering Information



Packaging

Packaging Option	Packaging Specification	Quantity	Packaging Code
Bulk / bag, 1000 / box	N/A	1000	01 , 05
12.7 mm pitch, On Tape / box	IEC-286-2	1000	02

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