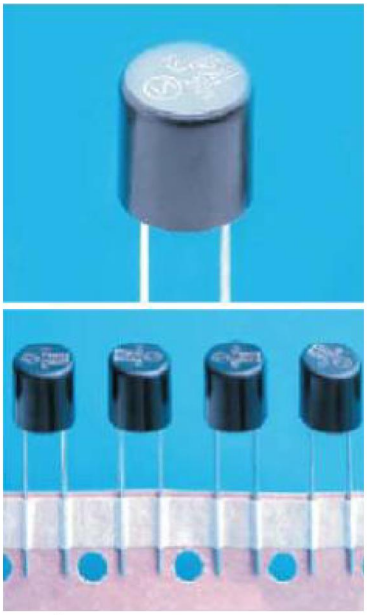
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Not recommended for new applications.

Type MRF

Fast Acting Radial Lead Micro Fuse Series

HF Pb MRF Series — RoHS Compliant



AEC-Q 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

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 " RoHS ", " e " (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	30	10	3	3	300	20
	hour	min.	ms	sec	ms	ms	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*
S	SE-S-2100235	50mA-6.3A/ 250V ac	50mA - 5A / 250V AC @ 35A or 10 In whichever is greater
DVE	40017420		
VDE	40028500		6.3A/250V ac @ 63A
SP	LR39772		50mA-6.3 /250V AC @ 50A
cULus	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℃,20 sec)
Moisture Resistance	MIL-STD-202G, Method 202G, Method 106G
Operating Temperature	-55℃ to +125℃

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				
								cULus	CSA			VDE
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

Bel Fuse Inc.
300 Executive Drive, Suite 300,
West Orange, NJ 07052 USA

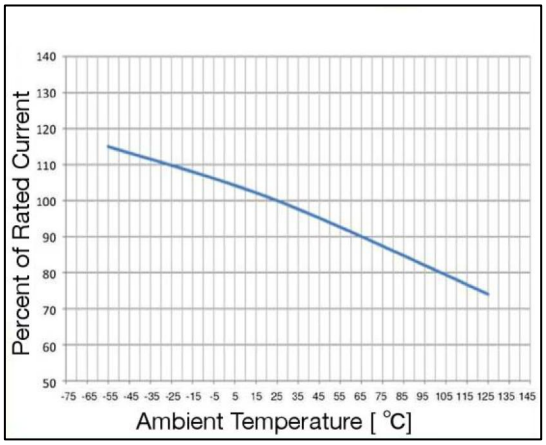
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Bel.US.CS@belf.com
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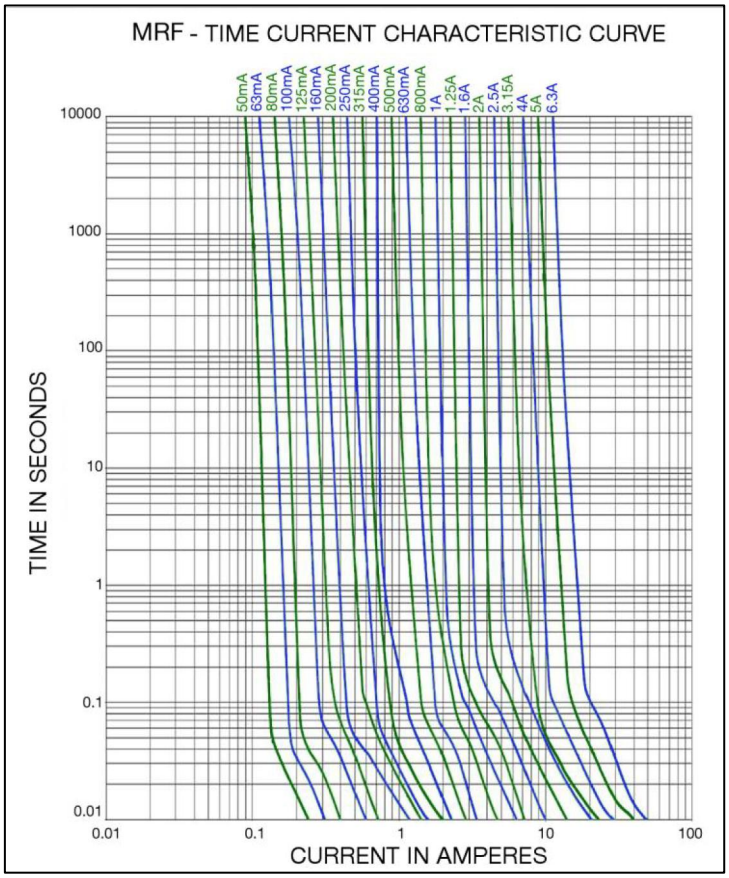
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Temperature Derating Curve

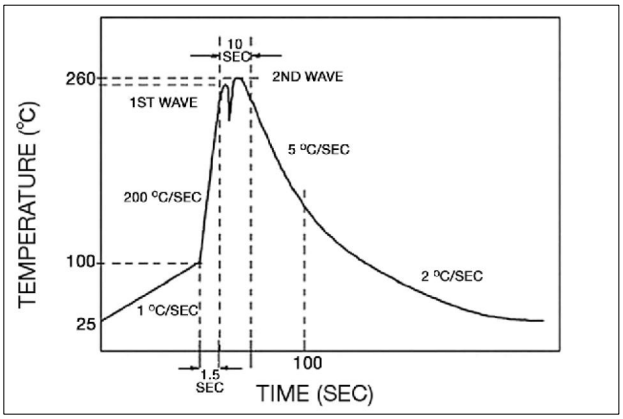


Average Time Current Curve



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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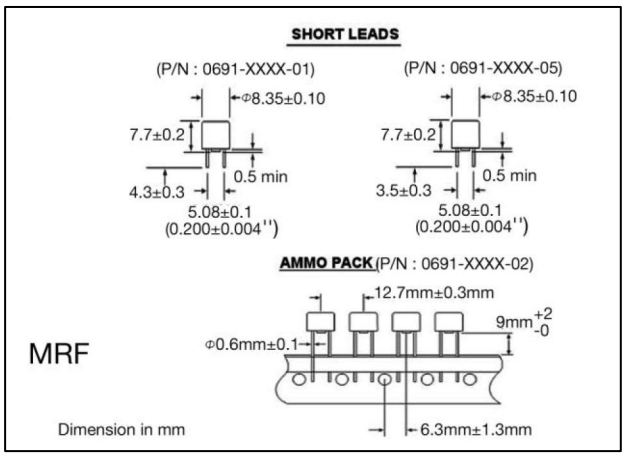
Type MRF

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

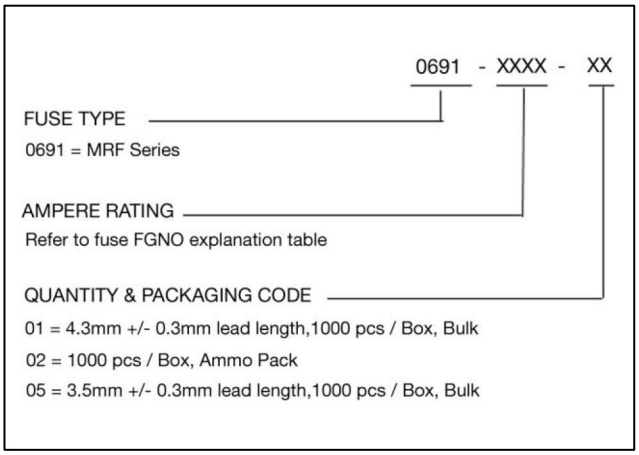
Fraction	Decimal	Milliamps	Bel FGNO[XXXX]
1/20	0.050	50	0050
1/16	.063	63	0063
8/100	.080	80	0080
1/10	.100	100	0100
1/8	.125	125	0125
	.160	160	0160
2/10	.200	200	0200
1/4	.250	250	0250
	.315	315	0315
4/10	.400	400	0400
1/2	.500	500	0500
	.630	630	0630
8/10	.800	800	0800

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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