

# ANTREX Electronics

Electronic Components Sourcing Information

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## Product Reference Information

**Part Number:** MRF 1.6-AMMO  
**Manufacturer:** Bel Fuse Inc.  
**Package:** Tape & Box (TB)  
**Availability:** Please confirm with sales

### Product Page:

<https://antrexco.com/product/details/bel-fuse-inc/mrf-1-6-ammo.html>

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## Quality & Trust

New & Original Components

Supplier verification and packaging condition review

CoC / RoHS / REACH documents available on request

Secure sourcing support for OEM / EMS projects

### Note:

This PDF includes an ANTREX product reference cover page.

The original manufacturer datasheet follows from the next page.

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# Type MRF

## Fast Acting Radial Lead Micro Fuse Series

HF  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

### Applications

Provide individual protection for components or internal circuits.

- Power supplies
- Battery chargers
- Consumer electronics
- Adapter
- Industrial controllers

LEAD FREE =   
HALOGEN FREE = 



AEC-Q Compliant

### 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",<br>"Appropriate Safety Logos" and "  ", "  "(China RoHS compliant). |

### Electrical Characteristics (IEC-127-3 STANDARD SHEET 3) Safety Agency Approvals

| Rated Current          | 1.5In |      | 2.1In |     | 2.75In |     | 4In |     | 10In |
|------------------------|-------|------|-------|-----|--------|-----|-----|-----|------|
|                        | Min   | Max  | Min   | Max | Min    | Max | Min | 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                                                                       | Safety Agency Certificate | Ampere Rating/ Voltage Rating | Ampere Range / Volt @ I.R. ability*                     |
|-------------------------------------------------------------------------------------|---------------------------|-------------------------------|---------------------------------------------------------|
|  | SE-S-2100235              | 50mA-6.3A/<br>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)                             |                           |                               |                                                         |

# Type MRF

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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 I <sup>2</sup> T <10 mSec (A <sup>2</sup> Sec) | Melting I <sup>2</sup> T @10 In (A <sup>2</sup> 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



Specifications subject to change without notice

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# Type MRF

Temperature Derating Curve



Average Time Current Curve



Soldering Parameters

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



# 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             |