

# MDA

## 1/4" x 1-1/4" time delay ceramic fuse



Photo is representative

### Product features

- Ceramic tube time delay fuse
- 250 Vac/125 Vdc, 0.25 A to 30 A
- Compact 3AB footprint:  
1/4" x 1 1/4" (6.3 x 32 mm)
- Cartridge and axial lead versions available
- Fuse accessories (cartridge version):

|               |               |            |               |
|---------------|---------------|------------|---------------|
| <u>1Axxxx</u> | <u>HBH-I/</u> |            |               |
|               | <u>HBV-I</u>  | <u>HTB</u> | <u>HK</u>     |
| <u>HKP</u>    | <u>HMR</u>    | <u>HGA</u> | <u>HTJ</u>    |
| <u>HRK</u>    | <u>HHB</u>    | <u>HFA</u> | <u>HHK</u>    |
| <u>HHN</u>    | <u>HFB</u>    | <u>HHJ</u> | <u>S-4000</u> |

### Agency information

- UL Listed Card: MDA 1/4 A - 20 A (Guide JDYX, File E19180)
- UL Recognized Card: MDA 25 A - 30 A (Guide JDYX2, File E19180)
- CSA Certification Card: MDA 1/4 A - 20 A (Class No. 1422-01)
- CSA Component Acceptance: MDA 25 A - 30 A (Class No. 1422-30)



### Applications

Primary circuit protection:

- LED and general lighting
- LED/LCD televisions
- Appliances and white goods
- Printers and peripherals
- Test equipment
- Uninterruptible power supplies (UPS)

### Environmental compliance



### Ordering part number

**BK-MDA-BV-30-R**

Packaging prefix \_\_\_\_\_

Family name \_\_\_\_\_

Option code \_\_\_\_\_

Ampere rating \_\_\_\_\_

RoHS compliance \_\_\_\_\_

### Packaging prefix

#### Blank-

MDA-XXX-R: 5 pieces in tin tray.  
MDA-V-XXX-R, MDA-BV-XXX-R : 4 pieces in tin tray.

#### BK-

MDA-XXX-R, MDA-V-XXX-R, MDA-BV-XXX-R:  
100 pieces in a box.

#### TR-

MDA-V-XXX-R: 500 pieces on reel.

### Option code

#### -B

Board washable

#### -V

Axial leads



Powering Business Worldwide

## Electrical characteristics

| Rating         | % Amp rating | Opening time        |
|----------------|--------------|---------------------|
| 250 mA to 30 A | 100%         | 4 hours             |
| 250 mA to 30 A | 135%         | 60 minutes maximum  |
| 250 mA to 30 A | 200%         | 120 seconds maximum |

## Product specifications

| Part number | Current rating (A) | Voltage rating (Vac) | Voltage rating (Vdc) | Interrupting rating @ rated voltage <sup>1</sup>         | Typical resistance <sup>2</sup> (mΩ) | Typical voltage drop <sup>3</sup> (mV) | Typical melting <sup>4</sup> I <sup>2</sup> t (A <sup>2</sup> sec) |
|-------------|--------------------|----------------------|----------------------|----------------------------------------------------------|--------------------------------------|----------------------------------------|--------------------------------------------------------------------|
| MDA-1/4-R   | 0.25               | 250                  | -                    | 200 A @ 250 Vac, 10000 A @ 125 Vac                       | 9100                                 | 2900                                   | 0.28                                                               |
| MDA-1/2-R   | 0.50               | 250                  | -                    | 200 A @ 250 Vac, 10000 A @ 125 Vac                       | 2600                                 | 1650                                   | 1.2                                                                |
| MDA-3/4-R   | 0.75               | 250                  | -                    | 200 A @ 250 Vac, 10000 A @ 125 Vac                       | 520                                  | 495                                    | 0.42                                                               |
| MDA-1-R     | 1.0                | 250                  | -                    | 200 A @ 250 Vac, 10000 A @ 125 Vac                       | 380                                  | 470                                    | 0.90                                                               |
| MDA-1-1/2-R | 1.5                | 250                  | -                    | 200 A @ 250 Vac, 10000 A @ 125 Vac                       | 190                                  | 370                                    | 3.4                                                                |
| MDA-2-R     | 2.0                | 250                  | -                    | 200 A @ 250 Vac, 10000 A @ 125 Vac                       | 120                                  | 295                                    | 8.8                                                                |
| MDA-2-1/2-R | 2.5                | 250                  | 125                  | 200 A @ 250 Vac, 10000 A @ 125 Vac<br>10000 A @ 125 Vdc  | 66                                   | 246                                    | 7.2                                                                |
| MDA-3-R     | 3.0                | 250                  | 125                  | 200 A @ 250 Vac, 10000 A @ 125 Vac<br>10000 A @ 125 Vdc  | 48                                   | 215                                    | 15.9                                                               |
| MDA-4-R     | 4.0                | 250                  | 125                  | 200 A @ 250 Vac, 10000 A @ 125 Vac<br>10000 A @ 125 Vdc  | 31                                   | 176                                    | 37.2                                                               |
| MDA-5-R     | 5.0                | 250                  | 125                  | 200 A @ 250 Vac, 10000 A @ 125 Vac<br>10000 A @ 125 Vdc  | 23                                   | 173                                    | 65                                                                 |
| MDA-6-R     | 6.0                | 250                  | 125                  | 200 A @ 250 Vac, 10000 A @ 125 Vac<br>10000 A @ 125 Vdc  | 18                                   | 166                                    | 98.1                                                               |
| MDA-7-R     | 7.0                | 250                  | 125                  | 200 A @ 250 Vac, 10000 A @ 125 Vac<br>10000 A @ 125 Vdc  | 15                                   | 158                                    | 135                                                                |
| MDA-8-R     | 8.0                | 250                  | 125                  | 200 A @ 250 Vac, 10000 A @ 125 Vac<br>10000 A @ 125 Vdc  | 13                                   | 162                                    | 188                                                                |
| MDA-10-R    | 10                 | 250                  | 125                  | 200 A @ 250 Vac, 10000 A @ 125 Vac<br>10000 A @ 125 Vdc  | 9.5                                  | 142                                    | 332                                                                |
| MDA-12-R    | 12                 | 250                  | 125                  | 750 A @ 250 Vac, 10000 A @ 125 Vac<br>10000 A @ 125 Vdc  | 7.6                                  | 128                                    | 125.2                                                              |
| MDA-15-R    | 15                 | 250                  | 125                  | 750 A @ 250 Vac, 10000 A @ 125 Vac<br>10000 A @ 125 Vdc  | 5.7                                  | 107                                    | 336.8                                                              |
| MDA-20-R    | 20                 | 250                  | 125                  | 1500 A @ 250 Vac, 10000 A @ 125 Vac<br>10000 A @ 125 Vdc | 4.1                                  | 95                                     | 483.5                                                              |
| MDA-25-R    | 25                 | 250                  | 125                  | 1500 A @ 250 Vac, 10000 A @ 125 Vac<br>10000 A @ 125 Vdc | 3.1                                  | 105                                    | 734.7                                                              |
| MDA-30-R    | 30                 | 250                  | 125                  | 1500 A @ 250 Vac, 10000 A @ 125 Vac<br>10000 A @ 125 Vdc | 2.5                                  | 110                                    | 1096.7                                                             |

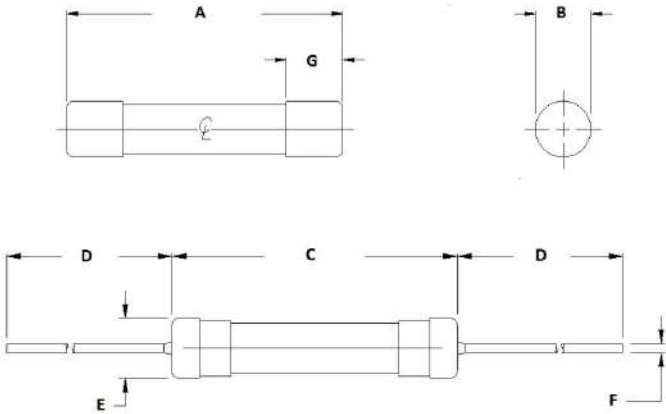
1. Interrupting ratings measured at 70% ~ 80% power factor on AC, (20 A and 30 A, 90% - 100% power factor on AC).

2. Typical resistance measured at <10% of rated current at +25 °C

3. Typical voltage drop measured at +25 °C and rated current

4. Typical melting: (< 10 A, I<sup>2</sup>t measured at 10 x rated current), (> 12 A, I<sup>2</sup>t measured at interrupting rating and rated voltage)

Dimensions- mm  
Drawing not to scale



| Cartridge  |                                                       |
|------------|-------------------------------------------------------|
| Dimensions | Size                                                  |
| A          | 31.75 ± 0.79                                          |
| B          | 6.35 ± 0.1                                            |
| G          | 4.8 ref for 10 A and below<br>6.48 ref for above 10 A |

| Axial lead |                                                                  |
|------------|------------------------------------------------------------------|
| Dimensions | Size                                                             |
| C          | 32.82 ± 0.79                                                     |
| D          | 38.1mm ref                                                       |
| E          | 6.76 ref                                                         |
| F          | 0.81 ± 0.05 for 15 A and below<br>1.02 ± 0.05 for 20 A and above |

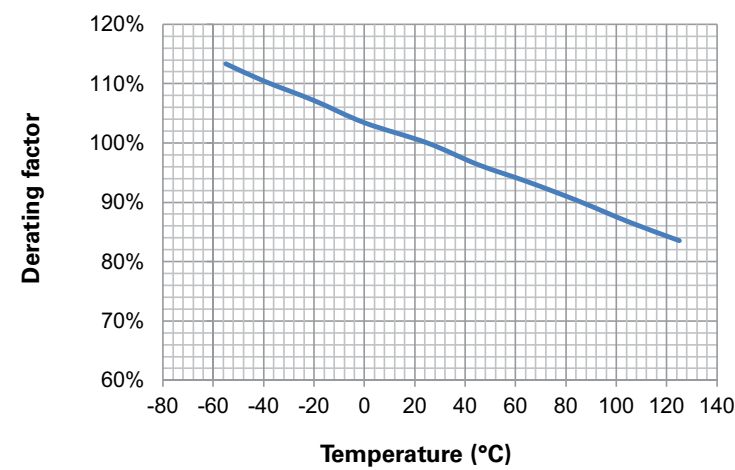
General specifications

|                                                                               |
|-------------------------------------------------------------------------------|
| Operating temperature: -55 °C to +125 °C with proper derating factor applied. |
| Mechanical shock test 1/4 A to 10 A: MIL-STD 202 method 213. Condition C      |
| Mechanical shock test 12 A to 30 A: MIL-STD 202G method 213. Condition J      |
| Vibration test 1/4 A to 30 A: MIL-STD-202 method 204, test condition C        |

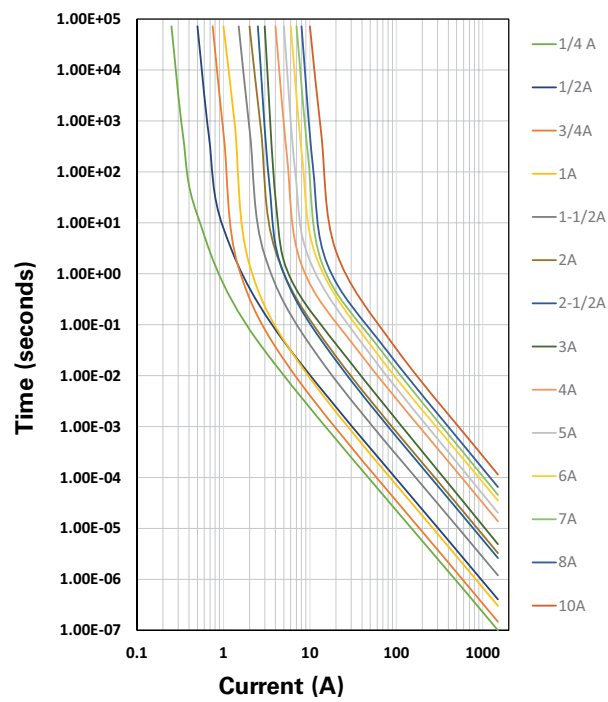
Packaging information

| Packaging prefix | Description                                                |
|------------------|------------------------------------------------------------|
| Blank            | MDA-XXX-R: 5 pieces in tin tray.                           |
|                  | MDA-V-XXX-R, MDA-BV-XXX-R: 4 pieces in tin tray.           |
| BK-              | MDA-XXX-R, MDA-V-XXX-R, MDP-BV-XXX-R: 100 pieces in a box. |
| TR-              | MDA-V-XXX-R: 500 pieces on reel.                           |

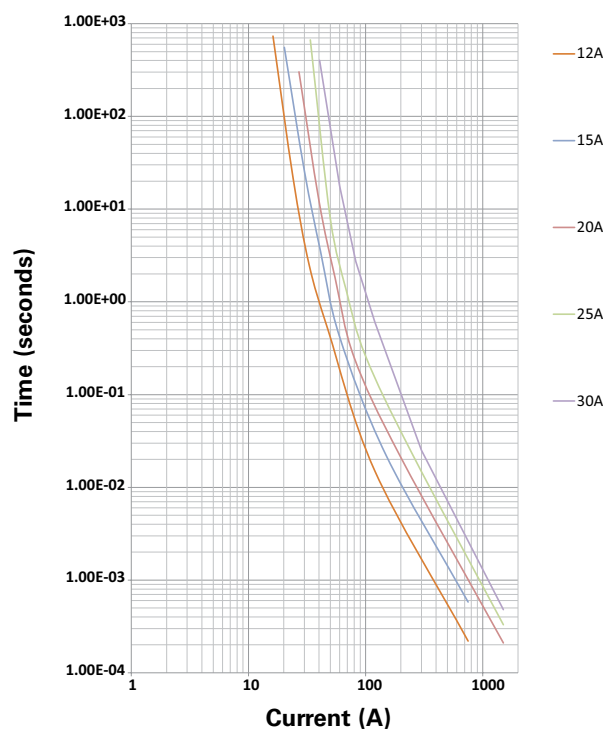
Temperature derating curve



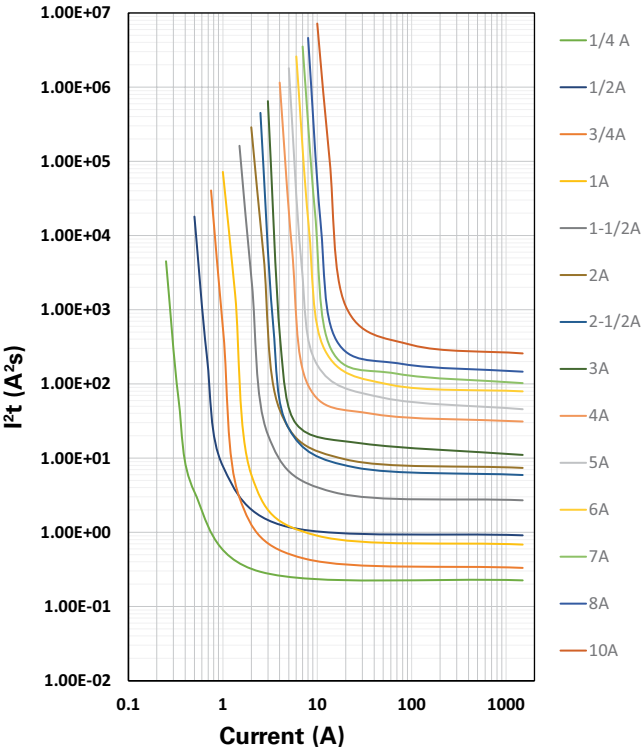
Current vs. time curve



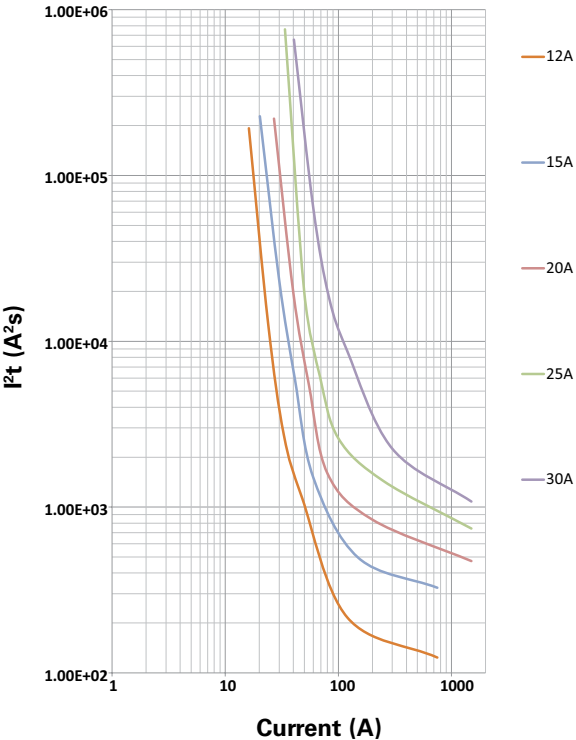
Current vs. time curve



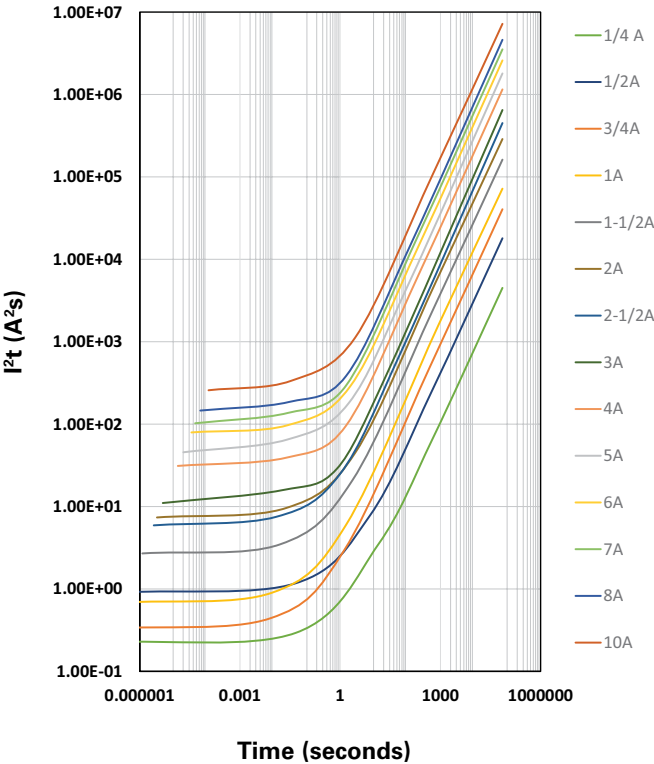
I<sup>2</sup>t vs. current curve



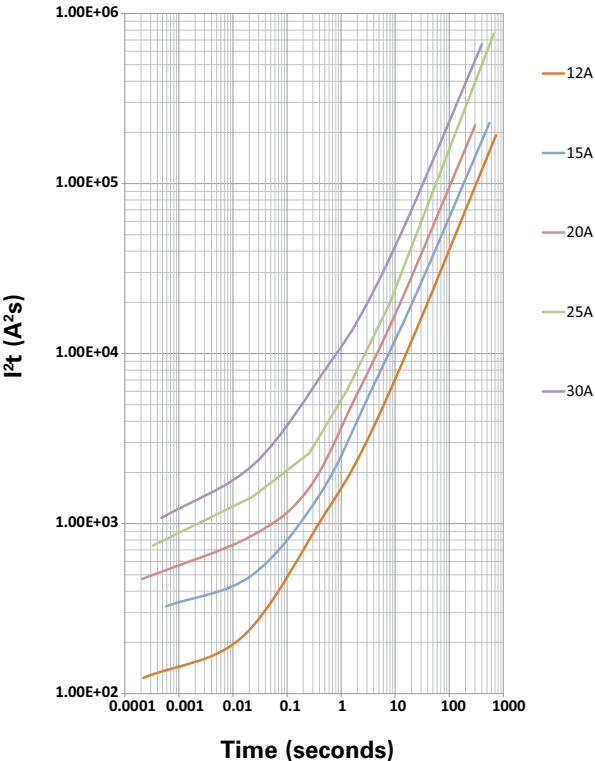
I<sup>2</sup>t vs current curve



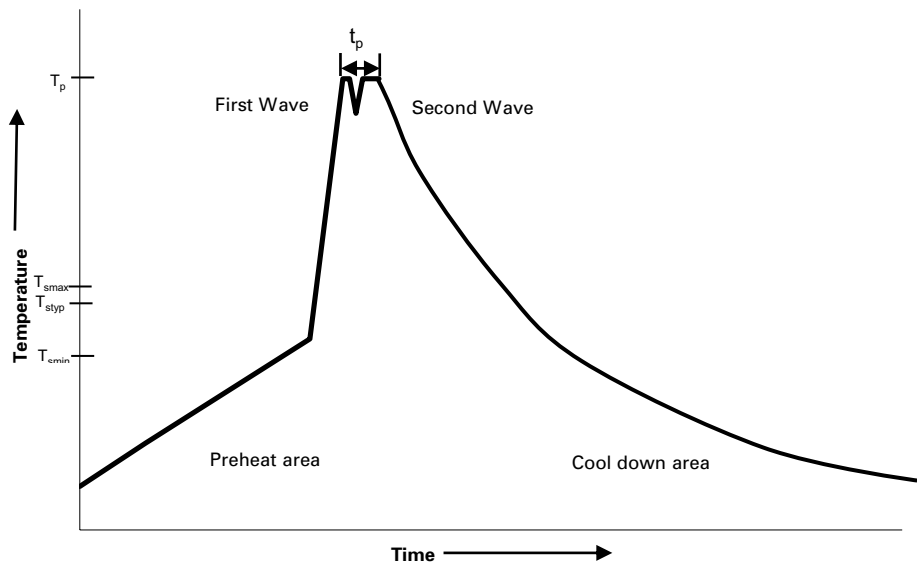
I<sup>2</sup>t vs. time curve



I<sup>2</sup>t vs time curve



Wave solder profile--(axial lead version only)



Reference EN 61760-1:2006

| Profile feature                     |                                               | Standard SnPb solder                      | Lead (Pb) free solder                     |
|-------------------------------------|-----------------------------------------------|-------------------------------------------|-------------------------------------------|
| Preheat                             | • Temperature min. ( $T_{smin}$ )             | 100 °C                                    | 100 °C                                    |
|                                     | • Temperature typ. ( $T_{styp}$ )             | 120 °C                                    | 120 °C                                    |
|                                     | • Temperature max. ( $T_{smax}$ )             | 130 °C                                    | 130 °C                                    |
|                                     | • Time ( $T_{smin}$ to $T_{smax}$ ) ( $t_s$ ) | 70 seconds                                | 70 seconds                                |
| $\Delta$ preheat to max Temperature |                                               | 150 °C max.                               | 150 °C max.                               |
| Peak temperature ( $T_p$ )*         |                                               | 235 °C – 260 °C                           | 250 °C – 260 °C                           |
| Time at peak temperature ( $t_p$ )  |                                               | 10 seconds max<br>5 seconds max each wave | 10 seconds max<br>5 seconds max each wave |
| Ramp-down rate                      |                                               | ~ 2 K/s min<br>~3.5 K/s typ<br>~5 K/s max | ~ 2 K/s min<br>~3.5 K/s typ<br>~5 K/s max |
| Time 25 °C to 25 °C                 |                                               | 4 minutes                                 | 4 minutes                                 |

Manual solder

+350 °C (4-5 seconds by soldering iron), generally manual/hand soldering is not recommended

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