

# MDP

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



Photo is representative

### Product features

- High voltage ceramic tube time delay fuse
- 500 Vac/250 Vdc, 0.25 A to 30 A
- Compact 3AB footprint:  
1/4" x 1 1/4" (6.3 x 32 mm)
- Ideal for high energy, high power applications
- Cartridge and axial lead versions available
- Very high interrupting ratings, up to 3 kA, to help protect against dangerous high available fault currents
- Fuse accessories (cartridge version):  
[HVP Panel mount fuse holder \(480V\)](#)  
[HVI In-line fuse holder \(600V\)](#)  
[S-8000 Panel mount fuse block \(600V\)](#)  
[1Axxxx \(up to 600V\) fuse clips](#)

### Agency information

UL listed file number: E19180, Guide JDYX for cartridge and axial lead version



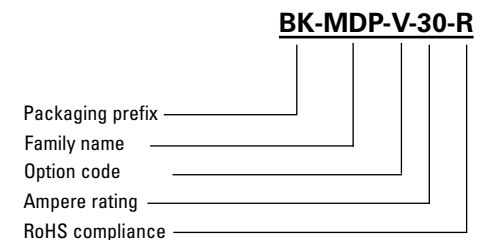
### Applications

- Industrial control panels; UL508A panels
- Motor controllers and variable frequency drives
- Control transformer protection
- Uninterruptible power supplies (UPS)
- Power conversion equipment
- Smaller form factor which can replace traditional 10 mm x 38 mm fuses

### Environmental compliance



### Ordering part number



### Packaging prefix

#### Blank-

MDP-XXX-R: 5 pieces in tin tray.  
MDP-V-XXX-R: 4 pieces in tin tray.

#### BK-

MDP-XXX-R, MDP-V-XXX-R, MDP-V2-XXX-R:  
100 pieces in a box.

#### BK1-

MDP-XXX-R: 1000 pieces in a polybag.

#### TR-

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

### Option code

#### -V

Axial leads with 1.5" (38.1 mm) length – copper tinned wire with nickel plated brass over caps.

#### -V2

Axial leads with 2" (50.8 mm) length – copper tinned wire with nickel plated brass over caps.



Powering Business Worldwide

**Electrical characteristics**

Rating	1.0 In minimum	1.35 In maximum	2.0 In maximum	10 In minimum
MDP- (250 mA to 1 A)	4 hours	60 minutes	2 minutes	5 ms
MDP- (1.25 A to 30 A)	4 hours	60 minutes	2 minutes	8 ms

**Product specifications**

Part number	Current rating (A)	Voltage rating (Vac) (Vdc)		Interrupting rating @ rated voltage <sup>1</sup>	Typical resistance <sup>2</sup> (mΩ)	Typical voltage drop <sup>3</sup> (mV)	Typical melting I <sup>2</sup> t (A <sup>2</sup> sec)
MDP-250-R	0.25	500/250	250	1500 A @ 500 Vac, 3000 A @ 250 Vac 2000 A @ 250 Vdc	9100	2900	0.28
MDP-500-R	0.50	500/250	250	1500 A @ 500 Vac, 3000 A @ 250 Vac 2000 A @ 250 Vdc	2580	1650	1.20
MDP-750-R	0.75	500/250	250	1500 A @ 500 Vac, 3000 A @ 250 Vac 2000 A @ 250 Vdc	520	495	0.42
MDP-1-R	1.0	500/250	250	1500 A @ 500 Vac, 3000 A @ 250 Vac 2000 A @ 250 Vdc	375	470	0.90
MDP-1-25-R	1.25	500/250	250	1500 A @ 500 Vac, 3000 A @ 250 Vac 2000 A @ 250 Vdc	285	463	1.50
MDP-1-5-R	1.5	500/250	250	1500 A @ 500 Vac, 3000 A @ 250 Vac 2000 A @ 250 Vdc	192	370	3.40
MDP-2-R	2.0	500/250	250	1500 A @ 500 Vac, 3000 A @ 250 Vac 2000 A @ 250 Vdc	115	295	8.80
MDP-2-5-R	2.5	500/250	250	1500 A @ 500 Vac, 3000 A @ 250 Vac 2000 A @ 250 Vdc	66.4	246	7.20
MDP-3-R	3.0	500/250	250	1500 A @ 500 Vac, 3000 A @ 250 Vac 2000 A @ 250 Vdc	48.5	215	16
MDP-3-2-R	3.2	500/250	250	1500 A @ 500 Vac, 3000 A @ 250 Vac 2000 A @ 250 Vdc	45.1	206	17.5
MDP-4-R	4.0	500/250	250	1500 A @ 500 Vac, 3000 A @ 250 Vac 2000 A @ 250 Vdc	31	176	37.2
MDP-5-R	5.0	500/250	250	1500 A @ 500 Vac, 3000 A @ 250 Vac 2000 A @ 250 Vdc	23.1	173	65
MDP-6-R	6.0	500/250	250	1500 A @ 500 Vac, 3000 A @ 250 Vac 2000 A @ 250 Vdc	24.5	215	53
MDP-6-25-R	6.25	500/250	250	1500 A @ 500 Vac, 3000 A @ 250 Vac 2000 A @ 250 Vdc	22.5	210	64
MDP-7-R	7.0	500/250	250	1500 A @ 500 Vac, 3000 A @ 250 Vac 2000 A @ 250 Vdc	19.4	203	87
MDP-8-R	8.0	500/250	250	1500 A @ 500 Vac, 3000 A @ 250 Vac 2000 A @ 250 Vdc	16.1	194	125
MDP-10-R	10	500/250	250	1500 A @ 500 Vac, 3000 A @ 250 Vac 2000 A @ 250 Vdc	11.5	170	250
MDP-12-R	12	500/250	250	1500 A @ 500 Vac, 3000 A @ 250 Vac 2000 A @ 250 Vdc	9.4	140	360
MDP-15-R	15	500/250	250	1000 A @ 500 Vac, 3000 A @ 250 Vac 2000 A @ 250 Vdc	5.3	110	300
MDP-20-R	20	500/250	250	1000 A @ 500 Vac, 3000 A @ 250 Vac 2000 A @ 250 Vdc	3.5	110	375
MDP-25-R	25	500/250	250	1000 A @ 500 Vac, 3000 A @ 250 Vac 2000 A @ 250 Vdc	2.9	110	622
MDP-30-R	30	500/250	250	1000 A @ 500 Vac, 3000 A @ 250 Vac 2000 A @ 250 Vdc	2.3	110	980

1. Interrupting ratings measured at 95% ~ 100% power factor on AC and resistive circuit on DC.

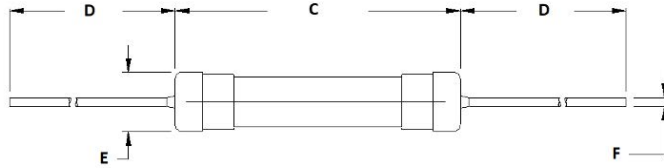
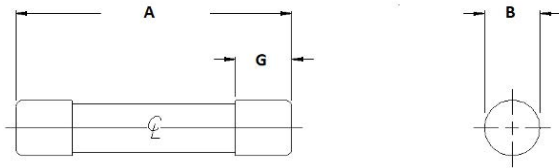
2. Typical resistance measured at <10% of rated current at +23 °C

3. Typical voltage drop measured at +23 °C and rated current

4. Typical melting I<sup>2</sup>t measured at 10x rated current)

**Dimensions- mm**

Drawing not to scale



**Cartridge**

Dimensions	Size
A	31.75 ± 0.8
B	6.35 ± 0.1
G	4.8 ref for 12 A and below 6.48 ref for above 12 A

**Axial lead**

Dimensions	Size
C	32.72 ± 0.8
D	38.1mm (REF) (MDP-V-XX-R) 38.1mm (REF) (BK-MDP-V-XX-R) 50.8mm (REF) (BK-MDP-V2-XX-R) 38.1 mm (REF) (TR-MDP-V-XX-R)
E	6.98 ± 0.3
F	0.81 ± 0.05 for 15 A and below 1.20 ± 0.05 for 20 A and above

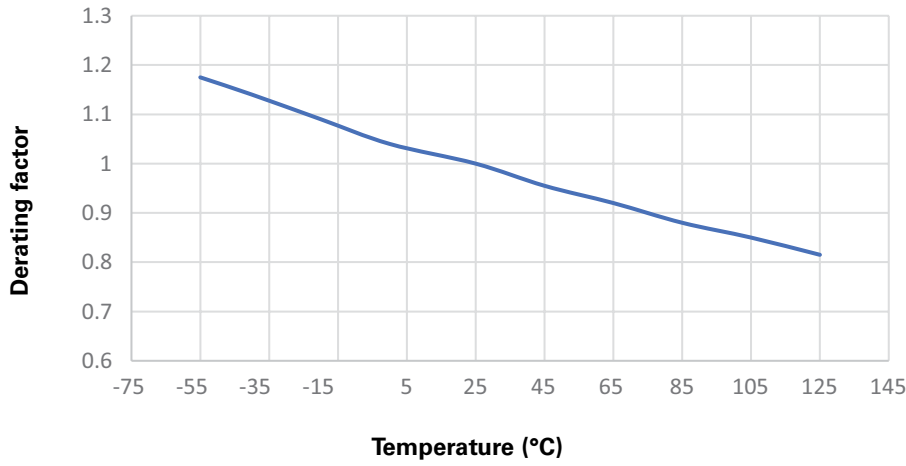
**General specifications**

Operating temperature: -55 °C to +125 °C with proper derating factor applied.
Local humidity test: MIL-STD-202, method 103B, test condition A. 85% + 2% relative humidity at +85 °C + 2 °C, 10% rated current for 240 hours.
Terminal strength: Mil-STD-202, method 211A, test condition A. Pull force test. The force applied to the terminal shall be 5-pound force.
Temperature cycling test: MIL-STD-202, method 107G. Condition B-1: -55 °C to +125 °C, 25 cycles.
Mechanical shock test: MIL-STD 202 method 213. Condition C: 100 g, 6 ms, half sine.
High frequency vibration test: MIL-STD-202 method 204; 5 g, 6 hours; 2 hours in each of three mutually perpendicular directions. Test from 10 Hz to 500 Hz.
Resistance to solder heat: MIL-STD-202 method 210 Condition B.

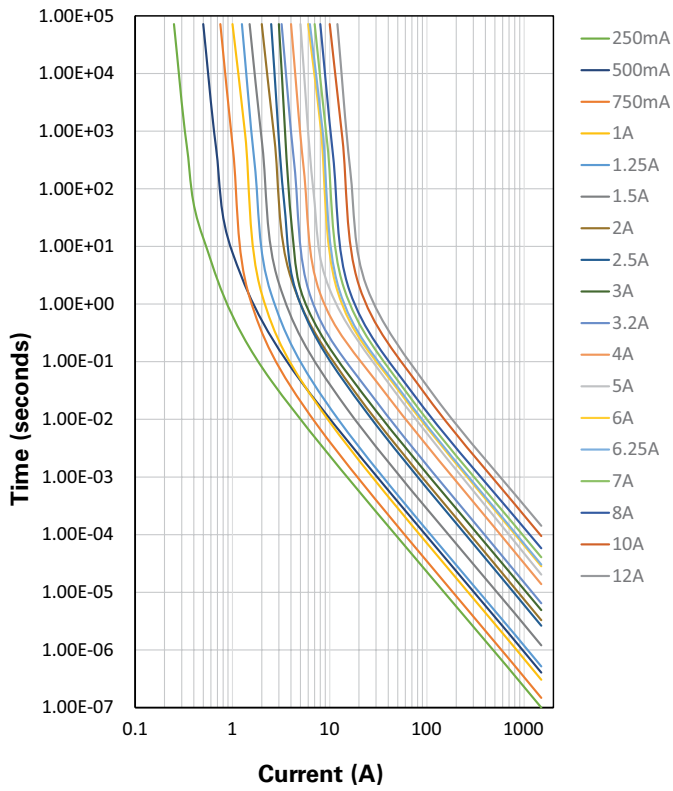
**Packaging information**

Packaging prefix	Description
Blank	MDP-XXX-R: 5 pieces in tin tray. MDP-V-XXX-R: 4 pieces in tin tray.
BK-	MDP-XXX-R, MDP-V-XXX-R, MDP-V2-XXX-R: 100 pieces in a box.
BK1-	MDP-XXX-R: 1000 pieces in a polybag.
TR-	MDP-V-XXX-R: 500 pieces on reel.

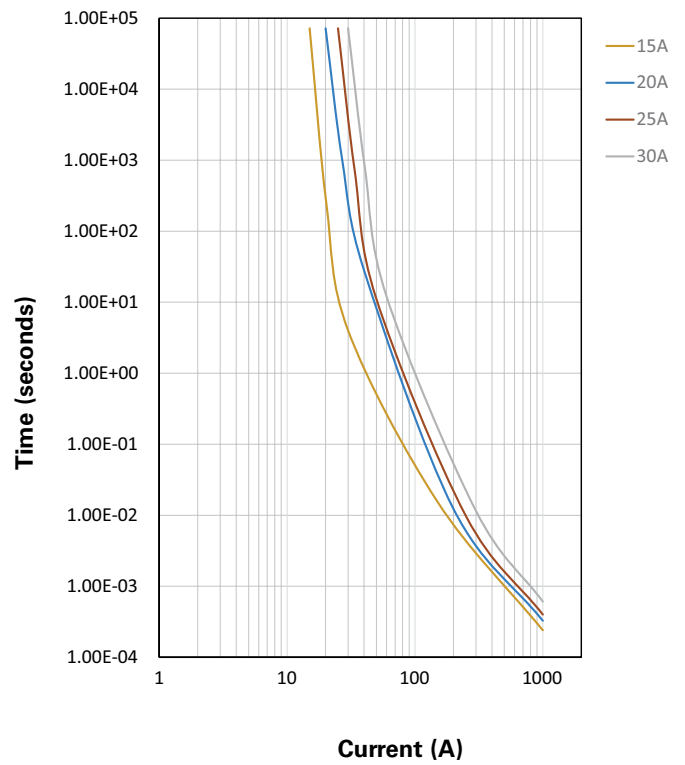
**Temperature derating curve**



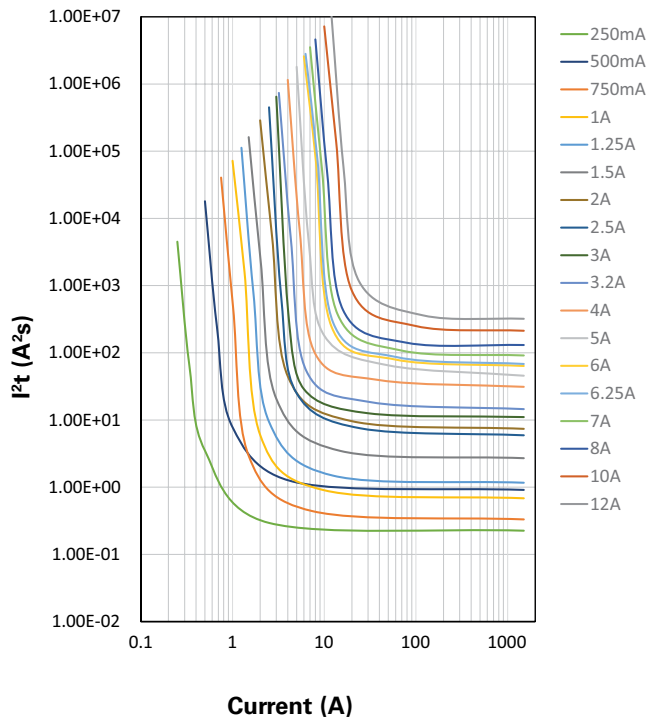
**Current vs. time curve**



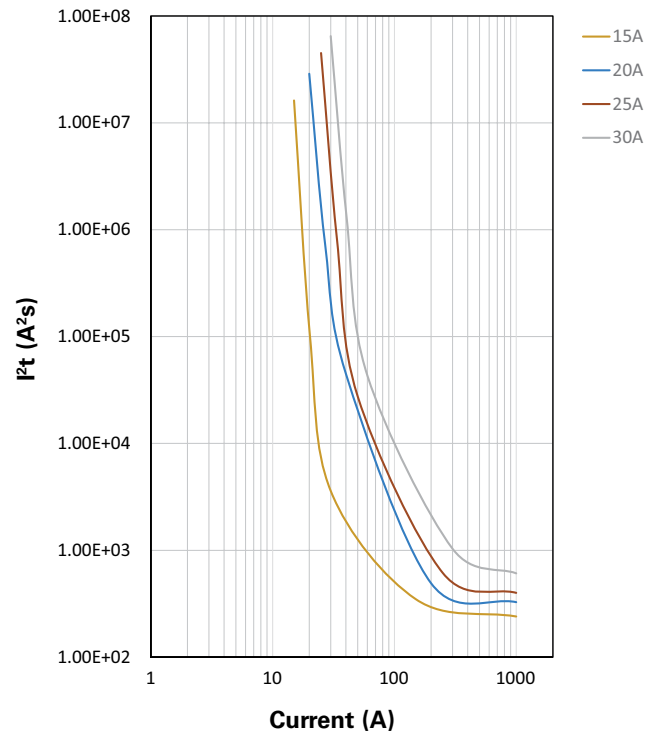
**Current vs. time curve**



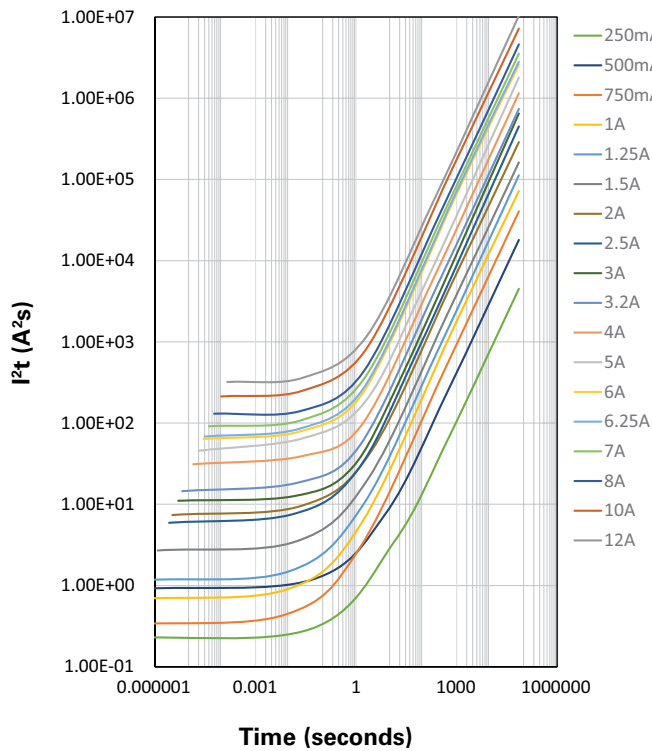
I<sup>2</sup>t vs. current curve



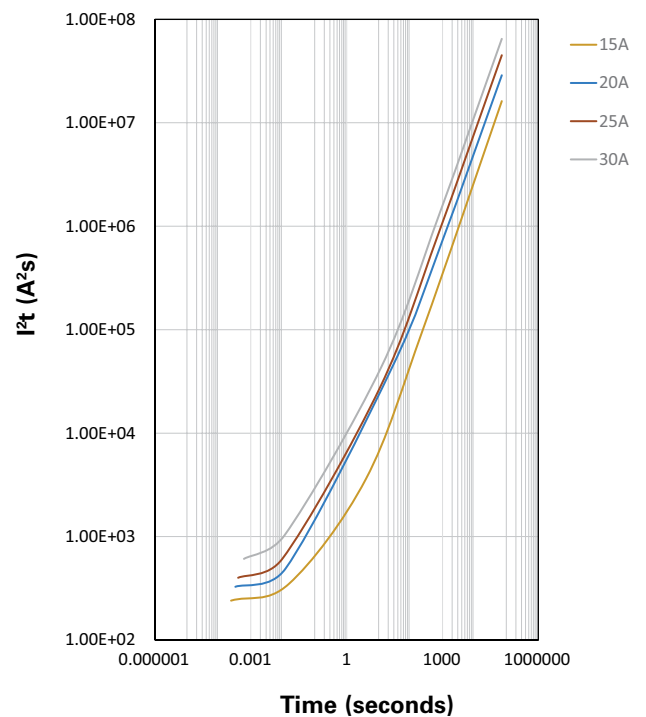
I<sup>2</sup>t vs current curve



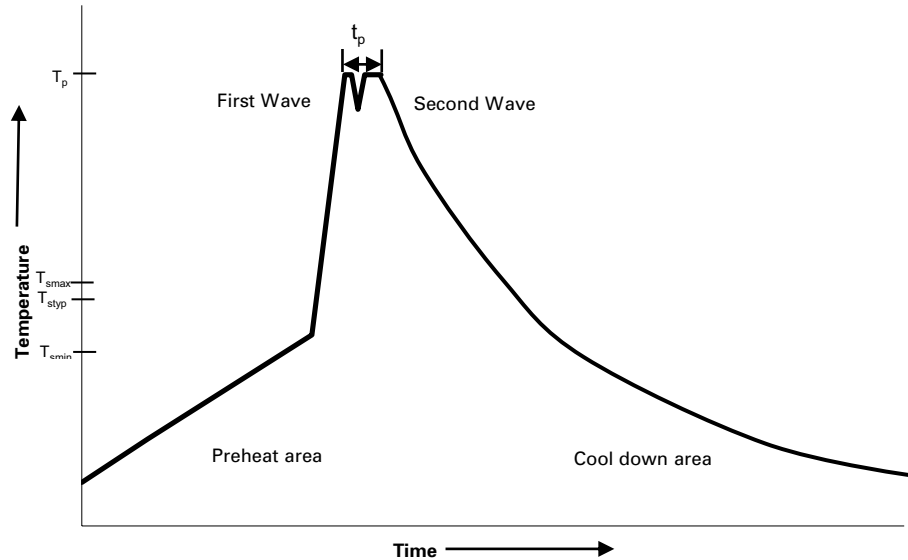
I<sup>2</sup>t vs. time curve



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 5 seconds max each wave	10 seconds max 5 seconds max each wave
Ramp-down rate	~ 2 K/s min ~3.5 K/s typ ~5 K/s max	~ 2 K/s min ~3.5 K/s typ ~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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