

# 1145HVA

## Automotive high voltage fast-acting brick fuse



### Product features

- Automotive grade qualified\*
- 11 x 5.0 x 5.0 mm surface mount package
- High voltage fast-acting brick fuse
- 500 Vdc voltage rating
- Ceramic tube, silver plated cap construction
- Moisture sensitivity level (MSL): 1

\*Meets Eaton's internal AEC-Q200 test plan

### Applications

Primary and secondary circuit protection:

- Stationary and on-board electric vehicle battery systems
- Electric vehicle power distribution units (Sensing lines)
- xEV powertrains
- Server & telecom systems, including 380 Vdc distribution
- Single phase and 3-phase UPS
- 380 Vdc DC-DC converters
- High voltage DC-DC conversion
- Power factor correction
- Capacitor output protection

### Agency information

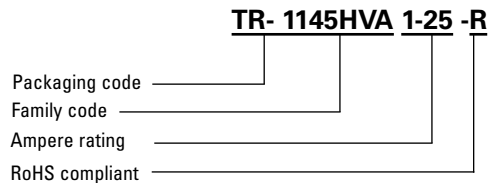
cURus Recognition file number:  
E19180, Guide JDYX2



### Environmental compliance



### Ordering part number



### Packaging prefix

TR- (1000 parts on a 13" diameter tape and reel)

**Electrical characteristics**

Amp Rating	125% In minimum	200% In maximum	1000% In maximum
1 A ~ 5 A	1 hour	120 seconds	1 second

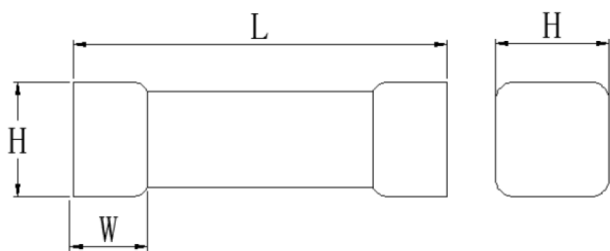
**Product specifications**

Part number	Current rating (A)	Voltage rating		Interrupting rating @ rated voltage <sup>1</sup>		Typical resistance <sup>2</sup> (mΩ)	Typical voltage drop (mV)	Typical pre-arcing <sup>3</sup> I <sup>2</sup> t (A <sup>2</sup> s)	Part marking
		(Vac)	(Vdc)	(A) Vac	(A) Vdc				
1145HVA1-R	1	350	500 350	100	100 A @ 500 Vdc 1500 A @ 350 Vdc	200	220	0.50	1
1145HVA1-25-R	1.25	350	500 350	100	100 A @ 500 Vdc 1500 A @ 350 Vdc	160	210	0.95	1.25
1145HVA1-6-R	1.6	350	500 350	100	100 A @ 500 Vdc 1500 A @ 350 Vdc	100	190	2.3	1.6
1145HVA2-R	2	350	500 350	100	100 A @ 500 Vdc 1500 A @ 350 Vdc	80	185	4.1	2
1145HVA2-5-R	2.5	350	500 350	100	100 A @ 500 Vdc 1500 A @ 350 Vdc	40	120	2.6	2.5
1145HVA3-15-R	3.15	350	500 350	100	100 A @ 500 Vdc 1500 A @ 350 Vdc	31.5	140	3.3	3.15
1145HVA4-R	4	350	450 125	100	100 A @ 450 Vdc 1500 A @ 125 Vdc	24.5	140	5.5	4
1145HVA5-R	5	350	450 125	100	100 A @ 450 Vdc 1500 A @ 125 Vdc	17.5	130	11.5	5

1. AC Interrupting Rating (measured at designated voltage, 100% power factor); DC Interrupting Rating (measured at designated voltage, time constant of less than 50 microseconds, battery source)  
 2. DC Cold Resistance are measured at <10% of rated current in ambient temperature of +25 °C  
 3. Typical Pre-arcing I<sup>2</sup>t are measured at 10In Current, DC battery bank

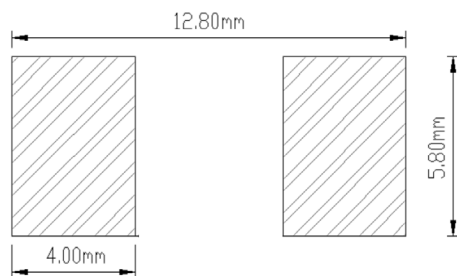
**Dimensions- mm**

Drawing not to scale



Rating	L	W	H
1 A ~ 5 A	11.2 ± 0.50	2.8 ± 0.50	5.05 ± 0.50

**Recommended pad layout**



Recommended trace thickness is 35 um;  
 the minimum trace width is 5 mm  
 Recommended stencil thickness is 0.15 mm

1145HVA is also compatible with Littelfuse LF885 pad layout; pad size 7.23 mm x 5.26 mm

**General specifications**

Operating temperature: -55 °C to +125 °C with proper derating factor applied

Automotive grade qualified\*

Temperature cycling: MIL-STD-202 method 107, -55 °C/+125 °C, number of cycles 1000, maximum transfer time 20 seconds, dwell time 15 minutes air-air.

Humidity bias: MIL-STD-202 method 103, 1000 hours +85 °C/85%RH, 10% of operating power

High temperature operating life: MIL-STD-202 method 108, condition D steady state TA=+125 °C at 50% rated current

Mechanical shock: MIL-STD-202 method 213, Figure 1 of Method 213, condition C 100 g, 6 ms

Vibration: MIL-STD-202 method 204, 20 g's for 20 minutes, 12 cycles each of 3 orientations. test from 10-2000 Hz

Solderability test: J-STD-002, method B1, steam aging 1 hour, solder temperature +255±5 °C, solder immersion time 5s

Board flex: AEC-Q200-005, appendix 2 note: 2 mm (min)

Terminal strength (SMD): AEC-Q200-006, appendix 1, force of 1.8 kg for 60 seconds

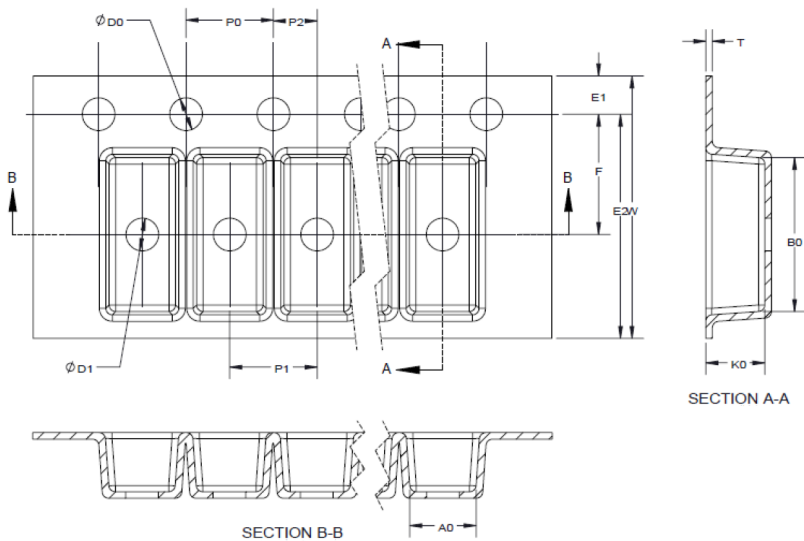
High temperature exposure: MIL-STD-202, method 108, +125 °C without power, 1000 hours

ESD: AEC-Q200-002 or ISO/DIS10605, Per AEC-Q200-002 or ISO/DIS10605

\* Meets Eaton's internal AEC-Q200 test plan

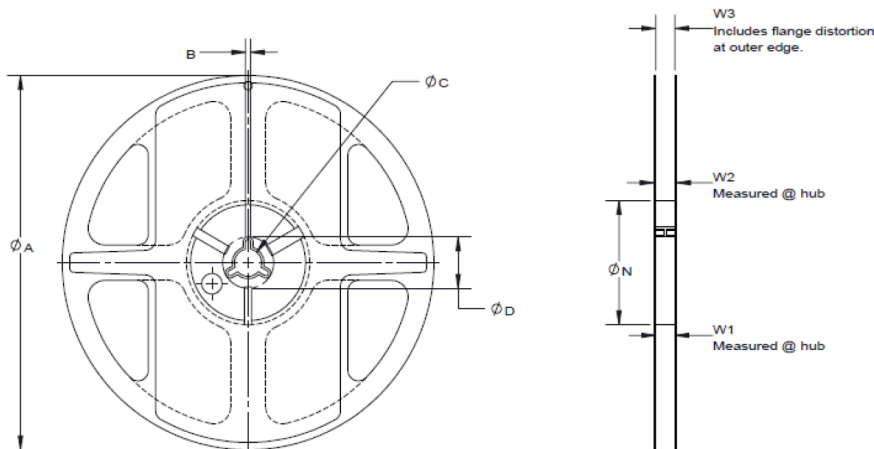
**Packaging information - mm**

1000 parts per 13" diameter reel (EIA-481 compliant)



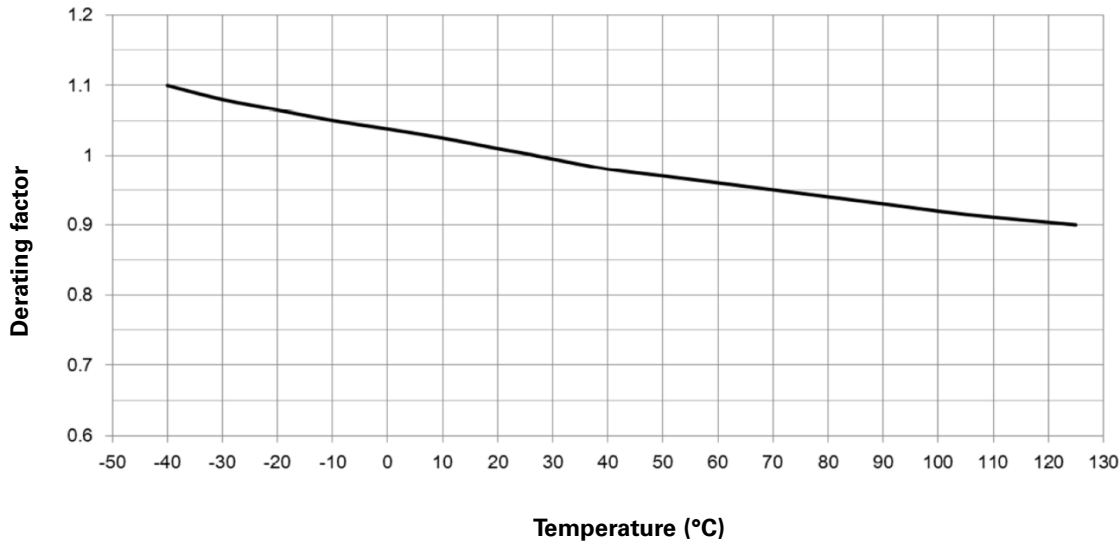
Dimension	millimeter
W	24.00
F	11.50
E1	1.75
E2	N/A
P0	4.00
P1	8.00
P2	2.00
DO	1.50
D1	1.50
A0	4.85
B0	12.75
K0	4.90
T	0.40

**Reel dimension- mm**

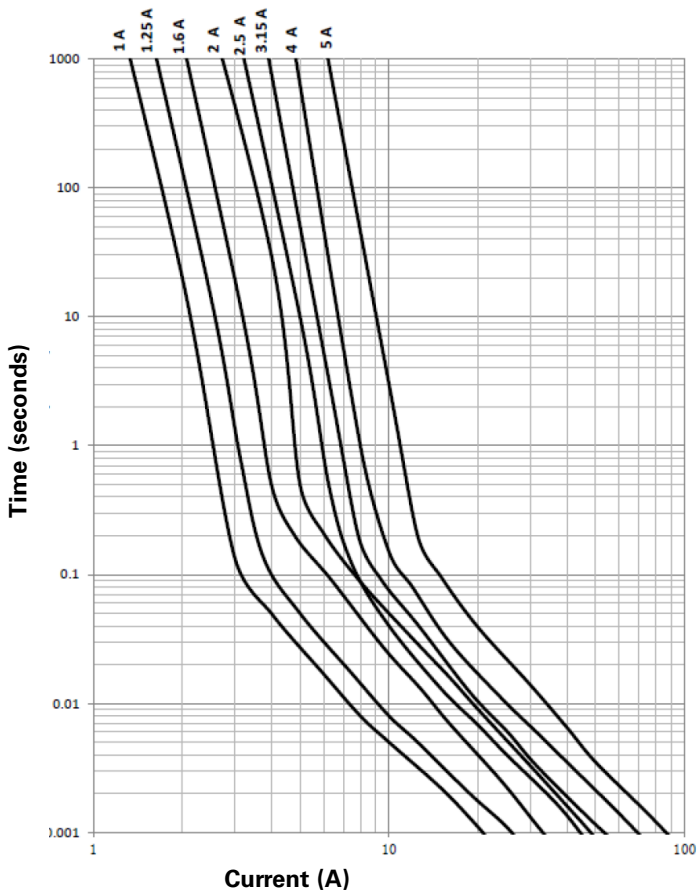


Dimension	millimeter
A	330 ± 1
B	2.5 ± 0.2
C	13.5 ± 0.2
D	N/A
N	100 ± 0.5
W1	24.8 ± 0.5
W2	30.4 max
W3	N/A

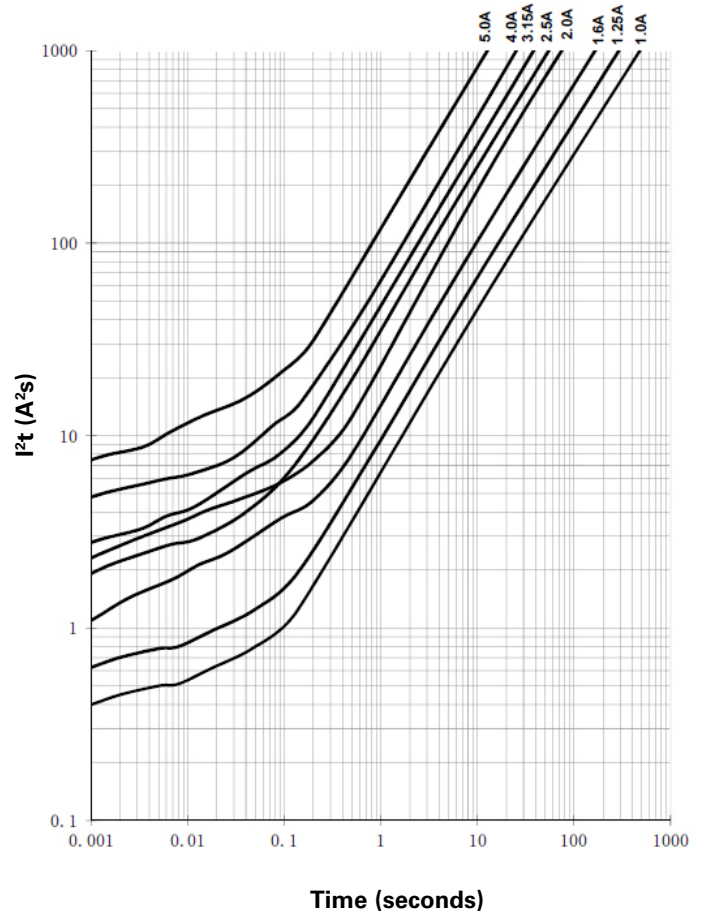
Temperature derating curve



Current vs. time curve



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



Solder reflow profile

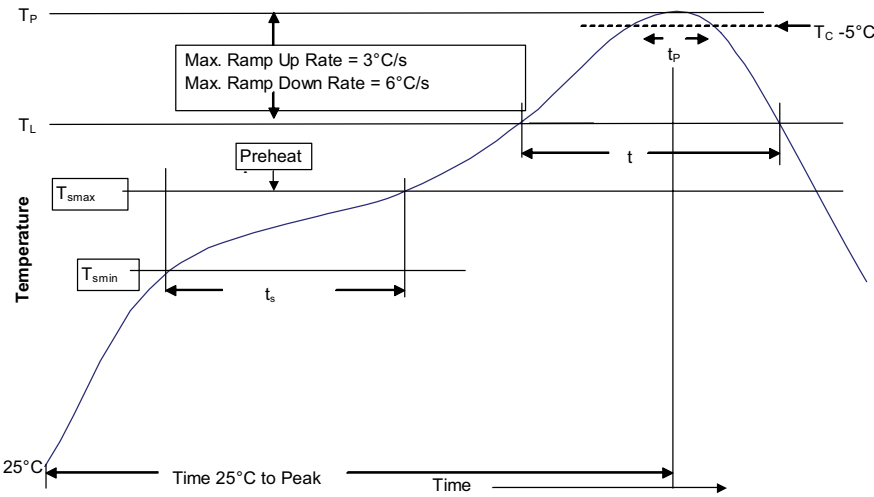


Table 1 - Standard SnPb solder ( $T_C$ )

Package thickness	Volume mm <sup>3</sup> <350	Volume mm <sup>3</sup> ≥350
<2.5 mm	235 °C	220 °C
≥2.5 mm	220 °C	220 °C

Table 2 - Lead (Pb) free solder ( $T_C$ )

Package thickness	Volume mm <sup>3</sup> <350	Volume mm <sup>3</sup> 350 - 2000	Volume mm <sup>3</sup> >2000
<1.6 mm	260 °C	260 °C	260 °C
1.6 – 2.5 mm	260 °C	250 °C	245 °C
>2.5 mm	250 °C	245 °C	245 °C

Reference J-STD-020

Profile feature	Standard SnPb solder	Lead (Pb) free solder
Preheat and soak	<ul style="list-style-type: none"> <li>Temperature min. (<math>T_{smin}</math>) 100 °C</li> <li>Temperature max. (<math>T_{smax}</math>) 150 °C</li> <li>Time (<math>T_{smin}</math> to <math>T_{smax}</math>) (<math>t_s</math>) 60-120 seconds</li> </ul>	<ul style="list-style-type: none"> <li>150 °C</li> <li>200 °C</li> <li>60-120 seconds</li> </ul>
Ramp up rate $T_L$ to $T_p$	3 °C/ second max.	3 °C/ second max.
Liquidous temperature ( $T_L$ )	183 °C	217 °C
Time ( $t_L$ ) maintained above $T_L$	60-150 seconds	60-150 seconds
Peak package body temperature ( $T_p$ )*	Table 1	Table 2
Time ( $t_p$ )* within 5 °C of the specified classification temperature ( $T_C$ )	20 seconds*	30 seconds*
Ramp-down rate ( $T_p$ to $T_L$ )	6 °C/ second max.	6 °C/ second max.
Time 25 °C to peak temperature	6 minutes max.	8 minutes max.

\* Tolerance for peak profile temperature ( $T_p$ ) is defined as a supplier minimum and a user maximum.

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