

# 0603HV

## Fast-acting chip fuses



### Product features

- 0603 (1608 metric) compact design utilizes less board space
- Rapid interruption of excessive current
- Compatible with reflow and wave solder
- Rugged ceramic and glass construction
- Excellent environmental integrity
- One time positive disconnect
- High breaking capacity up to 63 V
- Moisture sensitivity level (MSL): 1

### Applications

Secondary circuit protection

- I/O Switch modules
- Printers
- Laptop, notebook, netbook
- Tablets, e-readers
- Flat panel displays
- High definition television (HDTV)
- Gaming console systems
- Handheld/portable equipment
- Mobile device chargers

### Agency information

- UL Recognized File: File E19180



### Environmental compliance



- Values less than 1 A are not lead free

### Ordering

- Use ordering codes (see page 3 for details)

### Packaging prefixes

- TR- (5,000 parts in paper tape on a 178 mm (7") reel)

### Electrical characteristics

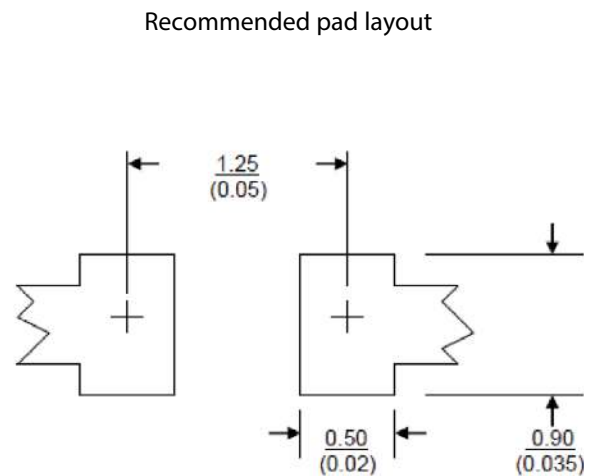
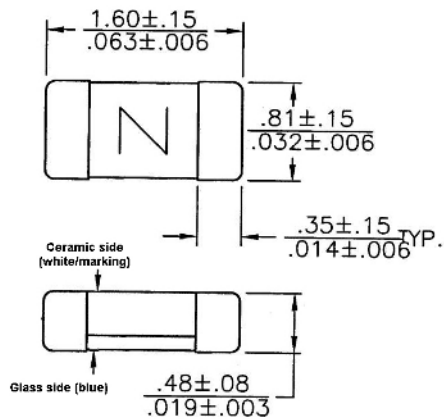
Amp Rating	% of Amp Rating	Opening Time
500 mA – 1.5 A	100%	4 hours minimum
500 mA – 1.5 A	200%	60 seconds maximum

### Product specifications

Part Number <sup>5</sup>	Current rating (A)	Voltage rating (Vdc)	Interrupting rating <sup>1</sup> (A)	Typical DC cold resistance <sup>2</sup> ( $\Omega$ )	Typical pre-arcing <sup>3</sup> I <sup>2</sup> t (A <sup>2</sup> s)	Typical voltage drop (V)	Part marking
0603HV500-R	0.5	63	50	1.025	0.0019	0.60	F
0603HV750-R	0.75	63	50	0.51	0.003	0.50	G
0603HV1-R	1	63	50	0.15	0.007	0.211	H
0603HV1.25-R	1.25	63	50	0.132	0.008	0.201	J
0603HV1.5-R	1.5	63	50	0.086	0.0319	0.138	K

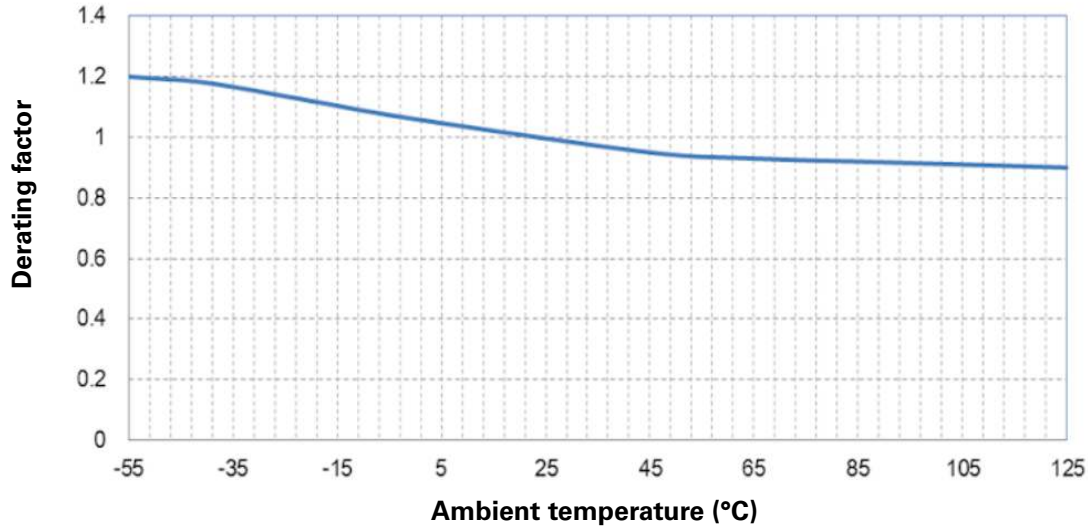
- DC interrupting rating measured at rated voltage, time constant less than 50 microseconds, battery source
- DC cold resistance measured at <10% of rated current
- Typical pre-arcing I<sup>2</sup>t measured with a battery bank at rated dc voltage, 10x-rated current, not to exceed IR, time constant of calibrated circuit less than 50 microsecond
- Typical voltage drop measured at rated current after temperature stabilizes
- Part Number Definition: 0603HVxxx-R  
 0603HV = Product code and size  
 xxx - Ampere rating  
 -R suffix = RoHS complaint

### Dimensions—mm



Fuse to be installed with ceramic side up (white/markings)

**Temperature derating curve**



**Environmental data**

Operating temperature: -55 °C to +125 °C (with derating)

Storage temperature (component): -55 °C to +125 °C

Terminal strength test: Force of 1.8 kg for 60 seconds (no physical evidence of mechanical or physical damage, change in resistance < 5%)

**Ordering codes**

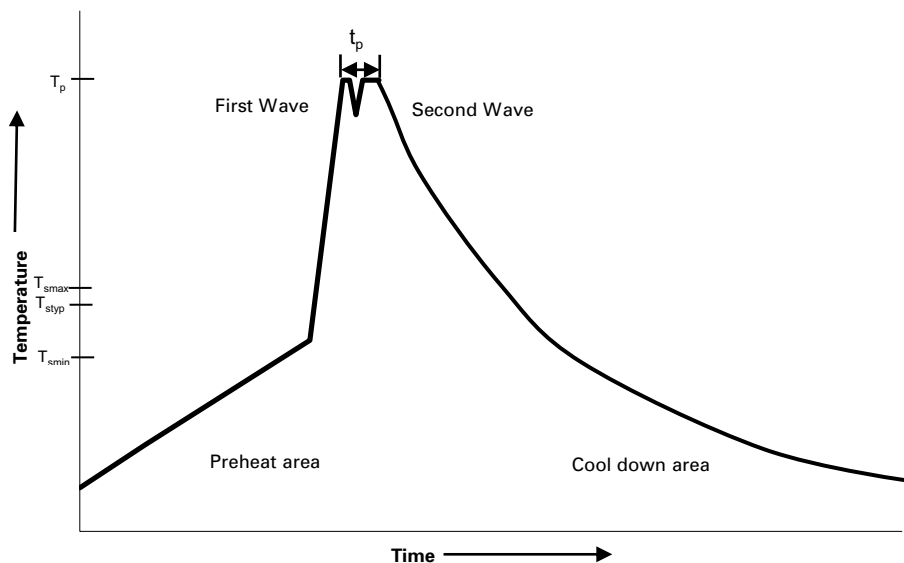
The ordering code is the part number replacing the “/” with a “-” plus adding the packaging prefix.

**Packaging prefix**

TR- (5,000 parts in paper tape on a 178 mm (7”) reel)

Part Number	Ordering code
	TR- option
0603HV500-R	TR-0603HV500-R
0603HV750-R	TR-0603HV750-R
0603HV1-R	TR-0603HV1-R
0603HV1.25-R	TR-0603HV1-25-R
0603HV1.5-R	TR-0603HV1-5-R

### Wave solder profile



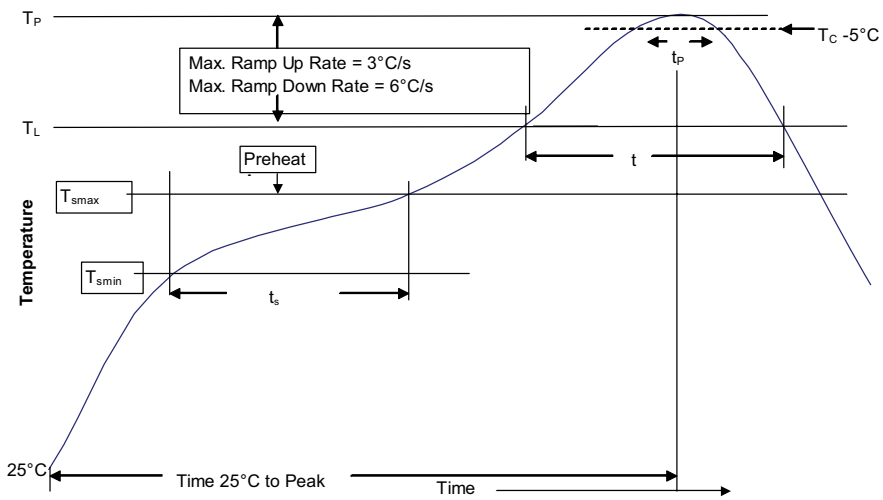
### Reference EN 61760-1:2006

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

**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		
• Temperature min. ( $T_{smin}$ )	100 °C	150 °C
• Temperature max. ( $T_{smax}$ )	150 °C	200 °C
• Time ( $T_{smin}$ to $T_{smax}$ ) ( $t_s$ )	60-120 seconds	60-120 seconds
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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