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
- Mositure sensitivity level (MSL): 1

Applications

Secondary circuit protection

BUSSMANN SERIES

- 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

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

| voltage Part marking | Typical voltage drop (V) | | Typical DC resistance ² | Interrupting ing rating ¹ (A) | Voltage rating (Vdc) | Current rating (A) | Part Number⁵ |
|-------------------------|-----------------------------|--------|---------------------------------------|--|-------------------------|-----------------------|--------------|
| F | 0.60 | 0.0019 | 1.025 | 50 | 63 | 0.5 | 0603HV500-R |
| G | 0.50 | 0.003 | 0.51 | 50 | 63 | 0.75 | 0603HV750-R |
| Н | 0.211 | 0.007 | 0.15 | 50 | 63 | 1 | 0603HV1-R |
| J | 0.201 | 0.008 | 0.132 | 50 | 63 | 1.25 | 0603HV1.25-R |
| К | 0.138 | 0.0319 | 0.086 | 50 | 63 | 1.5 | 0603HV1.5-R |
| - | | | | | | | |

1. DC interrupting rating measured at rated voltage, time constant less than 50 microseconds, battery source

2. DC cold resistance measured at <10% of rated current

3. Typical pre-arcing I²t 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

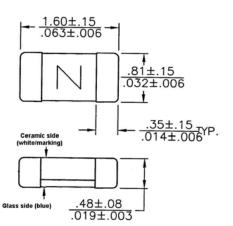
4. Typical voltage drop measured at rated current after temperature stabilizes

5. Part Number Definition: 0603HVxxx-R

0603HV = Product code and size xxx - Ampere rating

-R suffix = RoHS complaint

Dimensions-mm



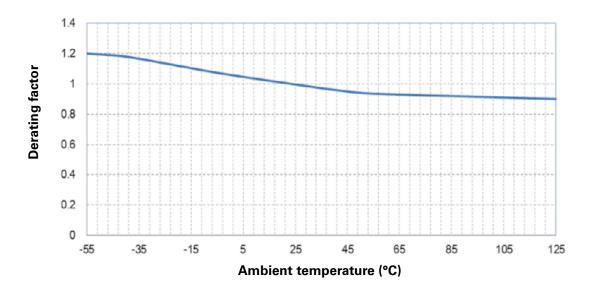
 $\begin{array}{c|c} & & 1.25 \\ \hline & & 0.05 \end{array} \end{array} \xrightarrow{\bullet} \\ & & & + \end{array} \\ & & & + \end{array} \\ & & & & + \end{array} \\ & & & & - \end{array} \xrightarrow{0.50} \left[\bullet \\ & & & 0.50 \\ \hline & & & 0.005 \end{array} \right]$

Recommended pad layout

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

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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

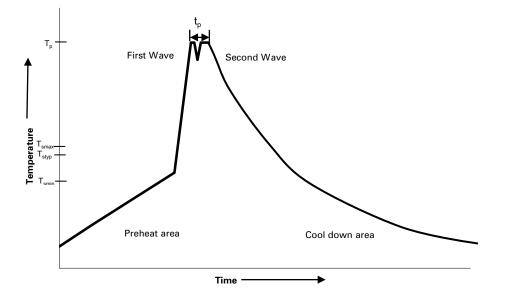
The ordering code is the part number replacing the " with a "-" plus adding the packaging preffix.

Packaging prefix

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

| | Ordering code | |
|--------------|-----------------|--|
| Part Number | 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 featu | Ire | 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 |
| Δ preheat to r | nax Temperature | 150 °C max. | 150 °C max. |
| Peak temperat | ure (T _P)* | 235 °C – 260 °C | 250 °C – 260 °C |
| Time at peak t | emperature (t _p) | 10 seconds max 5 seconds max each wave | 10 seconds max 5 seconds max each wave |
| Ramp-down ra | te | ~ 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 2 | 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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Solder reflow profile

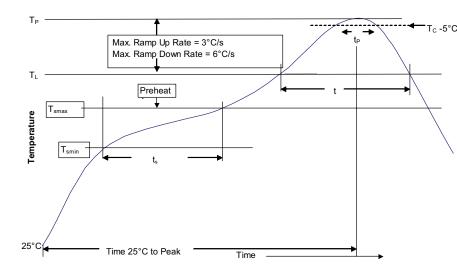


Table 1 - Standard SnPb solder (T_c)

| C Package thickness | Volume mm3 <350 | Volume mm3 ≥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 ³ <350 | Volume mm ³ 350 - 2000 | Volume mm ³ >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 (TL) Time (tL) maintained above T_{L} | 183 °C 60-150 seconds | 217 °C 60-150 seconds |
| Peak package body temperature (Tp)* | 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 TL) | 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_{D}) is defined as a supplier minimum and a user maximum.

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