

# Surface Mount Fuse Users Guide

## Fuse Function:

Fuses are components design to provide circuit protection against overcurrents and short circuits. Typically a fuse consist of a conductive element that will melt when current in excess of the specified current rating and/or duration are exceeded. The melting of the conductive element shuts off current to the circuit. Fuses are not only rated by the amount of current that will cause the fuse element to melt but also based on how quickly that melting occurs and a maximum rated voltage that will avoid a catastrophic opening (explosion) of the fuse.

## Fuse Characteristics:

**Rated Current** (↕) - the current (x110% of amount specified) that can be applied to the component continuously (considered 1 hour) at +70°C without fusing.

**Internal Cold Resistance** (↕) - the typical maximum DC resistance measured when <10% of the rated current is applied to the fuse while at room temperature.

**I<sup>2</sup>t, Melting Integral or Clearing Time** (↕) - a measurement of the energy (Joules) necessary to melt the fuse element. This value is arrived at by multiplying amperes<sup>2</sup> by time in seconds. It represents the amount of energy to melt the fuse element. A fuse should be selected that will prohibit energy sufficient to damage the circuit from being passed down line of the fuse.

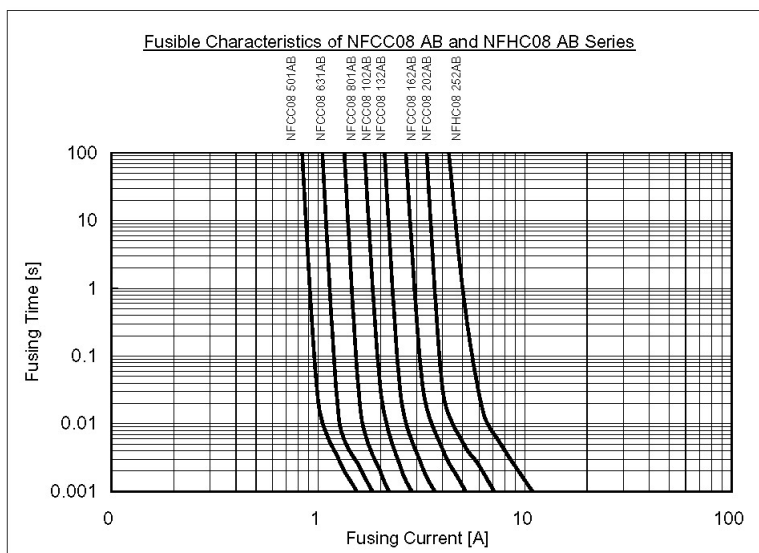
**Typical Voltage Drop** (↕) - the typical voltage drop across the fuse measured at 100% of the rated current at room temperature. This value changes depending on the applied current.

**Rated Voltage** (↕) - the maximum voltage at which the fuse can safely interrupt an overcurrent or short-circuit condition should occur.

**Breaking Capacity or Interrupt Rating** (↕) - the maximum overload current the fuse can safely interrupt. Exceeding the breaking capacity of the fuse can result in a catastrophic opening of the fuse.

**Time-Current Characteristics** (↕) - the time-current characteristics give an indication as to the time it takes to melt the fuse element when a given current is applied. The higher the current the shorter the time required to cause the fuse element to melt. The time-current graph below indicates that the NFCC08 501AD part with a current rating of 0.5A will fuse almost instantly if a 1.5A current is applied. If the applied current is reduced to 1.0A the time required for the fuse to blow increases to 0.02 seconds and at 0.85A the time increases to over 100 seconds.

NFCC/NFHC08AB



**Surface Temperature Rise** (↕) - the maximum temperature increase at the surface of the component when the rated current is applied at room temperature (+10°C ~ +30°C).

(↕) - The higher the better

(↕) - The lower the better

(↕) - Must be determined by the customer