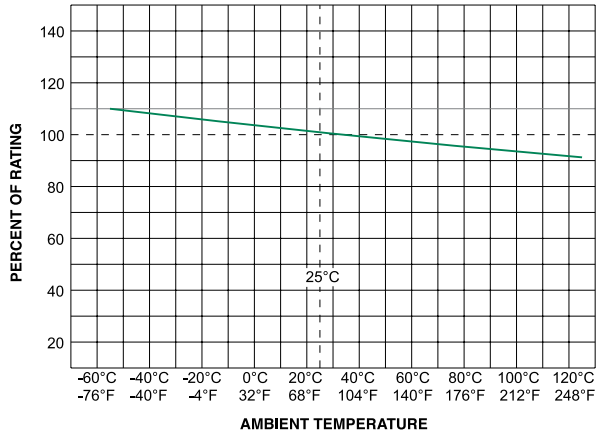


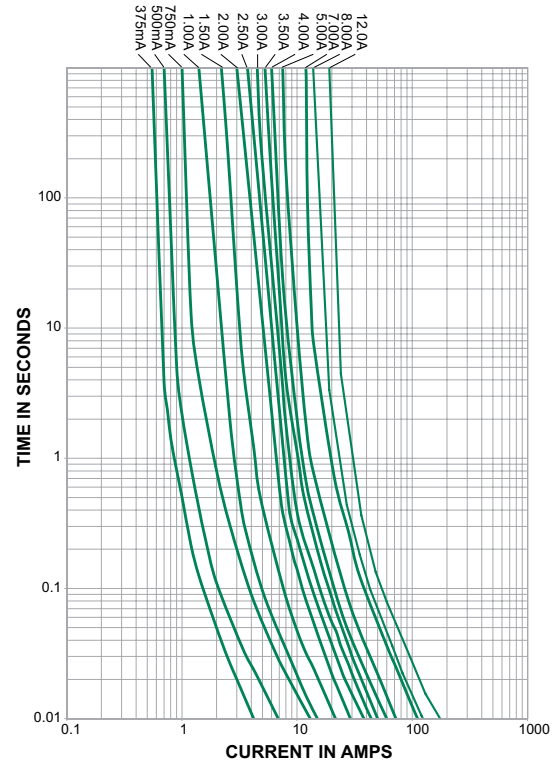
### Temperature Re-rating Curve



**Note:**

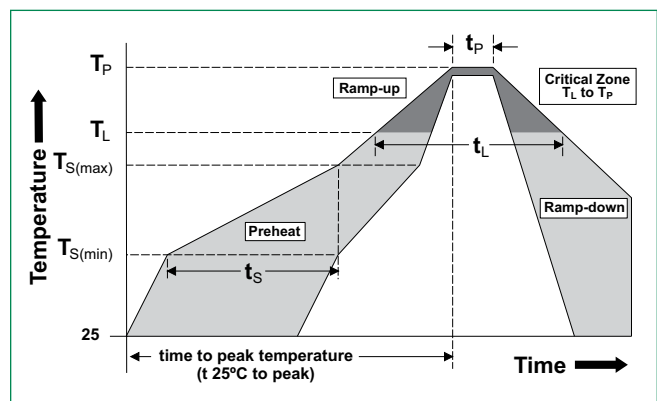
1. Rerating depicted in this curve is in addition to the standard derating of 25% for continuous operation.

### Average Time Current Curves



### Soldering Parameters

| Reflow Condition                                      |                                    | Pb – Free assembly                     |
|-------------------------------------------------------|------------------------------------|----------------------------------------|
| Pre Heat                                              | - Temperature Min ( $T_{s(min)}$ ) | 150°C                                  |
|                                                       | - Temperature Max ( $T_{s(max)}$ ) | 200°C                                  |
|                                                       | - Time (Min to Max) ( $t_s$ )      | 60 – 180 secs                          |
| Average ramp up rate (Liquidus Temp ( $T_L$ ) to peak |                                    | 5°C/second max.                        |
| $T_{s(max)}$ to $T_L$ - Ramp-up Rate                  |                                    | 5°C/second max.                        |
| Reflow                                                | - Temperature ( $T_L$ ) (Liquidus) | 217°C                                  |
|                                                       | - Temperature ( $t_L$ )            | 60 – 150 seconds                       |
| Peak Temperature ( $T_p$ )                            |                                    | 260 <sup>+0/-5</sup> °C                |
| Time within 5°C of actual peak Temperature ( $t_p$ )  |                                    | 20 – 40 seconds                        |
| Ramp-down Rate                                        |                                    | 5°C/second max.                        |
| Time 25°C to peak Temperature ( $T_p$ )               |                                    | 8 minutes max.                         |
| Do not exceed                                         |                                    | 260°C                                  |
| Wave Soldering Parameters                             |                                    | 260°C Peak Temperature, 3 seconds max. |

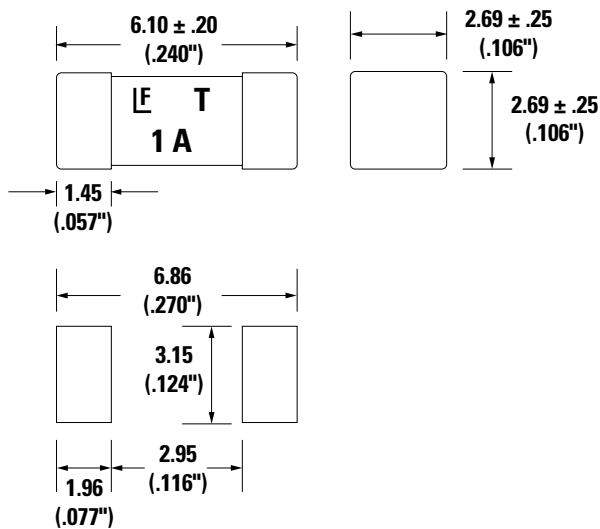


### Product Characteristics

|                                              |                                                                                                                                                 |
|----------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Materials</b>                             | <b>Body:</b> Ceramic<br><b>Terminations:</b><br>Gold-plated Caps / Sn-dipped Silver Plated Caps (452 Series)<br>Silver-plated Caps (454 Series) |
| <b>Product Marking</b>                       | Brand, Ampere Rating                                                                                                                            |
| <b>Operating Temperature</b>                 | -55°C to 125°C                                                                                                                                  |
| <b>Moisture Sensitivity Level</b>            | Level 1, J-STD-020                                                                                                                              |
| <b>Solderability</b>                         | MIL-STD-202, Method 208                                                                                                                         |
| <b>Insulation Resistance (after Opening)</b> | MIL-STD-202, Method 302, Test Condition A (10,000 ohms minimum)                                                                                 |

|                                     |                                                                                                                             |
|-------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|
| <b>Thermal Shock</b>                | MIL-STD-202, Method 107, Test Condition B, 5 cycles, -65°C / +125°C, 15 minutes @ each extreme                              |
| <b>Mechanical Shock</b>             | MIL-STD-202, Method 213, Test I: Deenergized. 100G's pk amplitude, sawtooth wave 6ms duration, 3 cycles XYZ+xyz = 18 shocks |
| <b>Vibration</b>                    | MIL-STD-202, Method 201: 0.03" amplitude, 10-55 Hz in 1 min. 2hrs each XYZ=6hrs                                             |
| <b>Moisture Resistance</b>          | MIL-STD-202, Method 106, 10 cycles                                                                                          |
| <b>Salt Spray</b>                   | MIL-STD-202, Method 101, Test Condition B (48hrs)                                                                           |
| <b>Resistance to Soldering Heat</b> | MIL-STD-202, Method 210, Test condition B (10 sec at 260°C)                                                                 |

### Dimensions

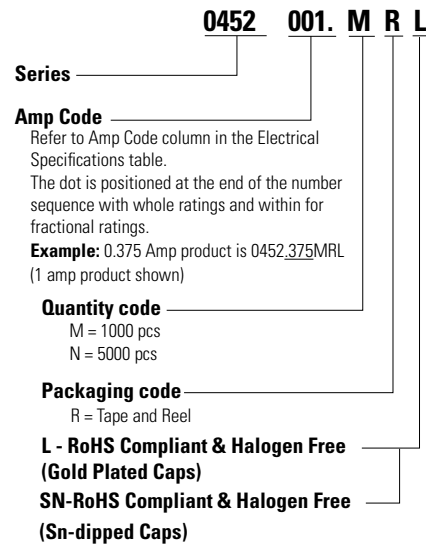


Recommended pad layout

### Packaging

| Packaging Option   | Packaging Specification        | Quantity | Quantity & Packaging Code |
|--------------------|--------------------------------|----------|---------------------------|
| 12mm Tape and Reel | EIA RS-481-1 (IEC 286, part 3) | 5000     | NR                        |
| 12mm Tape and Reel | EIA RS-481-1 (IEC 286, part 3) | 1000     | MR                        |

### Part Numbering System



#### Notes:

452 series may be ordered as "RoHS and HF (Gold Plated Caps)" ("L" suffix).  
454 series is available only as "RoHS and HF" version and does not require "L" suffix.  
Please do not include "L" suffix within 454 series ordering instructions.

### Additional Information



**Datasheet  
452 Series**



**Datasheet  
454 Series**



**Resources  
452 Series**



**Resources  
454 Series**



**Samples  
452 Series**



**Samples  
454 Series**

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