



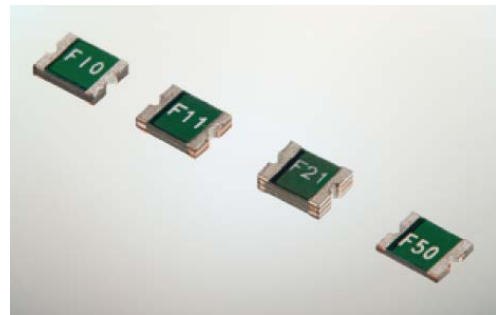
**Product Features:** Small surface mountable, Solid state, Faster time to trip than standard SMD devices, Lower resistance than standard SMD devices

**Operation Current:** 0.05A~2.00A

**Maximum Voltage:** 6V<sub>DC</sub>~60V<sub>DC</sub>

**Temperature Range:** -40°C to 85°C

**Applications:** All high-density boards



### Electrical Characteristics (23°C)

| Part Number  | Hold Current       | Trip Current       | Rated Voltage                      | Max Current          | Typical Power      | Max Time to Trip |      | Resistance       |                   |
|--------------|--------------------|--------------------|------------------------------------|----------------------|--------------------|------------------|------|------------------|-------------------|
|              | I <sub>H</sub> , A | I <sub>T</sub> , A | V <sub>MAX</sub> , V <sub>DC</sub> | I <sub>MAX</sub> , A | P <sub>d</sub> , W | Current          | Time | R <sub>MIN</sub> | R <sub>1MAX</sub> |
|              |                    |                    |                                    |                      |                    | A                | Sec  | Ohms             | Ohms              |
| F1210L005    | 0.05               | 0.15               | 60                                 | 100                  | 0.60               | 0.25             | 1.50 | 3.600            | 50.000            |
| F1210L010    | 0.10               | 0.25               | 60                                 | 100                  | 0.60               | 0.50             | 1.50 | 1.600            | 15.000            |
| F1210L020    | 0.20               | 0.40               | 30                                 | 100                  | 0.60               | 8.00             | 0.02 | 0.800            | 5.000             |
| F1210L035    | 0.35               | 0.70               | 16                                 | 100                  | 0.60               | 8.00             | 0.20 | 0.320            | 1.300             |
| F1210L050    | 0.50               | 1.00               | 16                                 | 100                  | 0.60               | 8.00             | 0.10 | 0.250            | 0.900             |
| F1210L075    | 0.75               | 1.50               | 8                                  | 100                  | 0.60               | 8.00             | 0.10 | 0.130            | 0.400             |
| F1210L075-24 | 0.75               | 1.50               | 24                                 | 100                  | 0.60               | 8.00             | 0.10 | 0.130            | 0.400             |
| F1210L110    | 1.10               | 2.20               | 8                                  | 100                  | 0.80               | 8.00             | 0.30 | 0.060            | 0.210             |
| F1210L110-16 | 1.10               | 2.20               | 16                                 | 100                  | 0.80               | 8.00             | 0.30 | 0.060            | 0.210             |
| F1210L150    | 1.50               | 3.00               | 6                                  | 100                  | 0.80               | 8.00             | 0.50 | 0.040            | 0.110             |
| F1210L175    | 1.75               | 4.00               | 6                                  | 100                  | 0.80               | 8.00             | 0.60 | 0.020            | 0.080             |
| F1210L200    | 2.00               | 4.00               | 6                                  | 100                  | 0.80               | 8.00             | 1.00 | 0.015            | 0.070             |

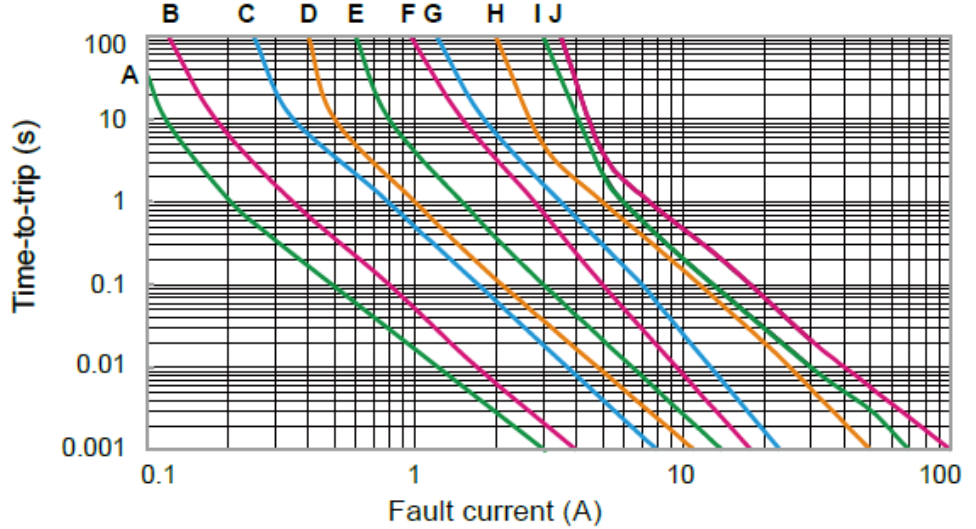
### Thermal Derating for PPTC Device at Various Ambient Temperatures

| Temperatures       | -40°C | -20°C | 0°C  | 23°C | 30°C | 40°C | 50°C | 60°C | 70°C | 85°C |
|--------------------|-------|-------|------|------|------|------|------|------|------|------|
| Current Derating % | 145%  | 130%  | 115% | 100% | 92%  | 83%  | 76%  | 70%  | 62%  | 50%  |

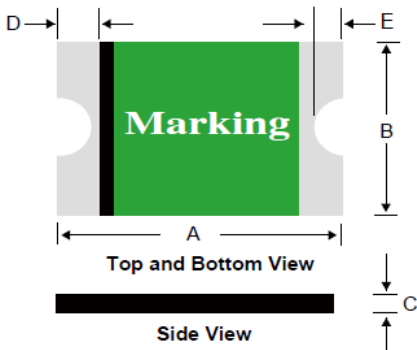


**Typical Time-To-Trip at 23°C**

- A = F1210L005
- B = F1210L010
- C = F1210L020
- D = F1210L035
- E = F1210L050
- F = F1210L075 /  
F1210L075-24
- G = F1210L110 /  
F1210L110-16
- H = F1210L150
- I = F1210L175
- J = F1210L200



**Product Dimensions (Millimeters)**

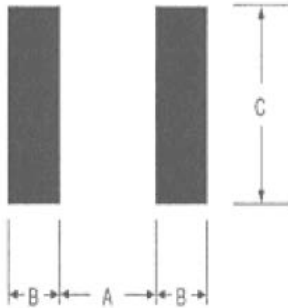


| Part Number  | A    |      | B    |      | C    |      | D    |      | E    |      |
|--------------|------|------|------|------|------|------|------|------|------|------|
|              | Min  | Max  | Min  | Max  | Min  | Max  | Min  | Max  | Min  | Max  |
| F1210L005    | 3.00 | 3.43 | 2.35 | 2.80 | 0.60 | 1.15 | 0.25 | 0.75 | 0.10 | 0.45 |
| F1210L010    | 3.00 | 3.43 | 2.35 | 2.80 | 0.60 | 1.15 | 0.25 | 0.75 | 0.10 | 0.45 |
| F1210L020    | 3.00 | 3.43 | 2.35 | 2.80 | 0.40 | 0.85 | 0.25 | 0.75 | 0.10 | 0.45 |
| F1210L035    | 3.00 | 3.43 | 2.35 | 2.80 | 0.40 | 0.80 | 0.25 | 0.75 | 0.10 | 0.45 |
| F1210L050    | 3.00 | 3.43 | 2.35 | 2.80 | 0.30 | 0.75 | 0.25 | 0.75 | 0.10 | 0.45 |
| F1210L075    | 3.00 | 3.43 | 2.35 | 2.80 | 0.30 | 0.70 | 0.25 | 0.75 | 0.10 | 0.45 |
| F1210L075-24 | 3.00 | 3.43 | 2.35 | 2.80 | 0.80 | 1.20 | 0.25 | 0.75 | 0.10 | 0.45 |
| F1210L110    | 3.00 | 3.43 | 2.35 | 2.80 | 0.60 | 1.00 | 0.25 | 0.75 | 0.10 | 0.45 |
| F1210L110-16 | 3.00 | 3.43 | 2.35 | 2.80 | 0.60 | 1.00 | 0.25 | 0.75 | 0.10 | 0.45 |
| F1210L150    | 3.00 | 3.43 | 2.35 | 2.80 | 0.50 | 0.90 | 0.25 | 0.75 | 0.10 | 0.45 |
| F1210L175    | 3.00 | 3.43 | 2.35 | 2.80 | 0.80 | 1.40 | 0.25 | 0.75 | 0.10 | 0.45 |
| F1210L200    | 3.00 | 3.43 | 2.35 | 2.80 | 0.80 | 1.40 | 0.25 | 0.75 | 0.10 | 0.45 |



## Pad Layouts, Solder Reflow and Rework Recommendations

The dimension in the table below provide the recommended pad layout for each F1210L device



| Pad dimensions (millimeters) |              |              |              |
|------------------------------|--------------|--------------|--------------|
| Device                       | A<br>Nominal | B<br>Nominal | C<br>Nominal |
| All F1210L Series            | 2.00         | 1.00         | 2.80         |

| Profile Feature   | Pb-Free Assembly |
|---|------------------|
| Average Ramp-Up Rate (T <sub>smax</sub> to T <sub>p</sub> )   | 3°C/second max.  |
| Preheat:  |                  |
| Temperature Min (T <sub>smin</sub> )                          | 150°C            |
| Temperature Max (T <sub>smax</sub> )                          | 200°C            |
| Time (t <sub>s</sub> T <sub>smin</sub> to T <sub>smax</sub> ) | 60~180 seconds   |
| Time maintained above:  |                  |
| Temperature(T <sub>L</sub> )                                  | 217°C            |
| Time (t <sub>L</sub> )  | 60~150 seconds   |
| Peak/Classification Temperature(T <sub>p</sub> ):             | 260°C            |
| Time within 5°C of actual Peak:                               |                  |
| Temperature (t <sub>p</sub> )                                 | 20~40 seconds    |
| Ramp-Down Rate:   | 6°C/second max.  |
| Time 25°C to Peak Temperature:                                | 8 minutes max.   |

Note 1: All temperatures refer to of the package,  
measured on the package body surface.

### Solder reflow

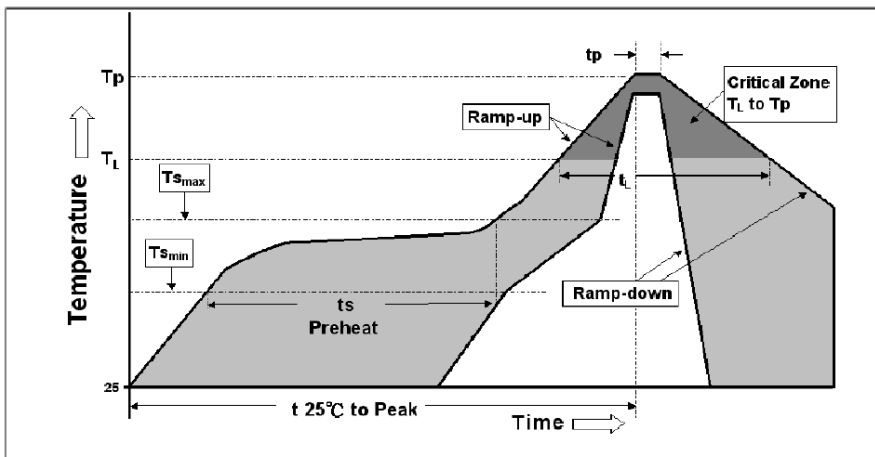
✘ Due to “Lead Free” nature, Temperature and Dwelling time for the soldering zone is higher than those for Regular. This may cause damage to other components.

1. Recommended max past thickness > 0.25mm.
2. Devices can be cleaned using standard methods and aqueous solvent.
3. Rework use standard industry practices.
4. Storage Environment: < 30°C / 60%RH

### Caution:

1. If reflow temperatures exceed the recommended profile, devices may not meet the performance requirements.
2. Devices are not designed to be wave soldered to the bottom side of the board.

## Reflow Profile



NOTE: Specification subject to change without notice.