# zeptoSMDC Series
## Surface Mount

**HF** RoHS

## Description

Littelfuse zeptoSMDC Series PPTC is developed for overcurrent and overtemperature protection in mobile applications. It works to protect battery management ICs and fuel auges.

## Features

- Maximum electrical rating: 13 VDC
- Short circuit current: 82~200mA
- Small footprint 0201 size
- RoHS compliant
- ISO/TS 16949 certified
- Resets to normal operation after fault is cleared
- Help protect battery monitor IC from electrical over-stress
- Save space due to small footprint

## Additional Information

**Resources**

**Accessories**

**Samples**

## Applications

- Smartphones and Tablets
- Notebook PC
- e-Readers
- Portable medical equipment
- Mobile point of sale
- Wearables
- Smartwatches
- Wireless speakers
- Portable game players

## Electrical Characteristics

| Part Number | Initial Resistance Ohms @ 25°C | | $V_{MAX}$[2] (Vdc) | $I_{MAX}$[3] (mA) | Trip Temperature °C TYP | Hold Current[4] (mA) @ 25°C | Time to Trip[5] | | Post Process Resistance[6] | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Min[1] | Max | | | | | Current (mA) | Time (ms) Max | ohms @ -20°C Min | ohms @ 60°C Max |
| zeptoSMDC0011F | 10 | 80 | 13 | 82 | 125 | 11 | 80 | 20 | 68 | 290 |
| zeptoSMDC0015F | 10 | 60 | 13 | 200 | 125 | 15 | 80 | 20 | 28 | 150 |

**Notes:**

**1.** Rmin = Minimum resistance of device in initial (un-soldered) state
**2.** Vmax = Maximum voltage device can withstand without damage at rated current (Imax)
**3.** Imax = Maximum fault current device can withstand without damage at rated voltage (Vmax)
**4.** Ihold = Hold current: maximum current device will pass without tripping in 25°C still air. Values specified using PCB's with 0.004" x 1.0 ounce copper traces
**5.** Time to trip values specified using PCB's with 0.004" x 1.0 ounce copper traces
**6.** With LOCTITE ECCOBOND UF 3915, curing condition: 140°C/20mins, resistance is measured 12 hours post coating curing process

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## Soldering Parameters

| Profile Feature | | Pb-Free Assembly |
|---|---|---|
| Average Ramp-Up Rate (Liquidus Temp (TL) to peak | | 1~3 °C/second max. |
| Preheat: | Temperature Min. ($Ts_{min}$) | 130 °C |
| | Temperature Max. ($Ts_{max}$) | 180 °C |
| | Time Min. to Max (ts) | 90 – 110 seconds |
| $Ts_{max}$ to $T_L$ Ramp-up Rate | | ≤2 °C/seconds max. |
| Reflow | Temperature ($T_L$) (Liquidus) | 217 °C |
| | Time ($t_L$) | 60~70 seconds |
| Peak Temperature ($T_P$) | | 240 °C |
| Time within 3°C of actual Peak Temperature ($t_p$) | | 35 seconds |
| Ramp-down Rate | | 2~4 °C/seconds |
| Time 25°C to peak Temperature ($T_P$) | | 300 seconds max. |
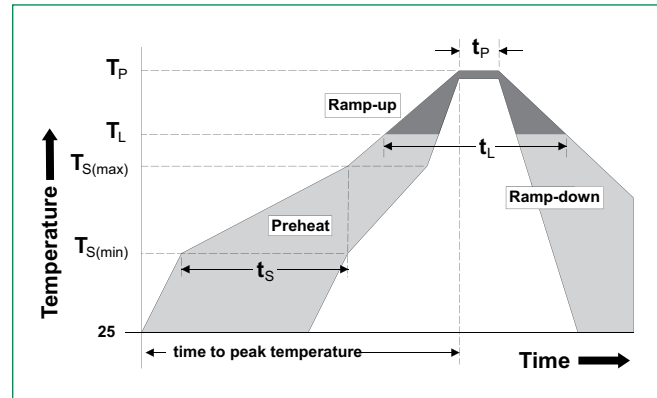


- All temperature refer to topside of the package, measured on the package body surface.
- If reflow temperature exceeds the recommended profile, devices may not meet the performance requirements.
- Recommended reflow methods:IR, vapor phase oven, hot air oven.
- Customer should validate that the solder paste amount and reflow recommendations to meet its application
- Recommended maximum paste thickness is 0.25 mm (0.010 inch).
- Devices can be cleaned using standard industry methods and aqueous solvents.
- Devices can be reworked using the standard industry practices (avoid contact to
- the device).

## Physical Specifications

| Terminal Material | Solder-Plated Copper (Solder Material: NiAu) |
|---|---|
| Lead Solderability | Meets EIA Specification RS186-9E, ANSI/J- STD-002B, Test S |

## Environmental Specifications

| Operating Temperature | -20°C to 60°C |
|---|---|
| Passive Aging | +85°C, 1000 hours<br>-25% typical resistance change |
| Humidity Aging | +65°C, 90%, R.H.,100 hours<br>-/+15% typical resistance change |
| Thermal Shock | MIL-STD-202, Method 107G<br>-33% typical resistance change<br>-40°C to 85°C (20 times) |
| Vibration | MIL–STD–202, Method 204 Condition A<br>No change |
| Moisture Sensitivity Level | Level 2a, J–STD–020 |

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## Physical Dimensions
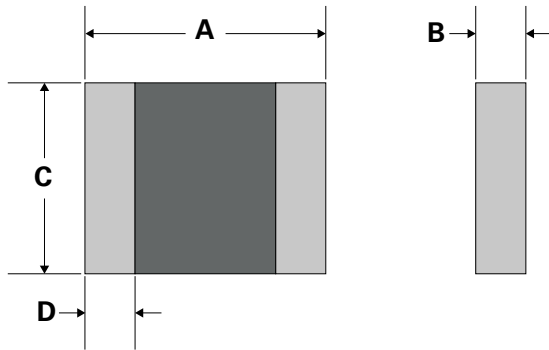


## Solder Pad Layout
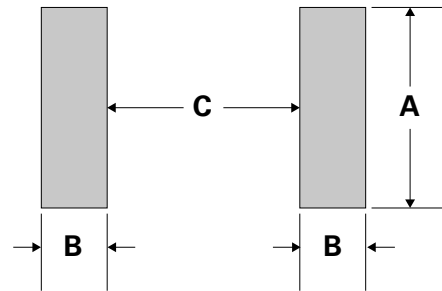


| Part Number | A | | B | | C | | D | |
|---|---|---|---|---|---|---|---|---|
| | Min | Max | Min | Max | Min | Max | Min | Max |
| zeptoSMDC0011F | 0.55 (0.022) | 0.65 (0.026) | - | 0.40 (0.016) | 0.40 (0.016) | 0.50 (0.020) | 0.10 (0.004) | 0.25 (0.010) |
| zeptoSMDC0015F | 0.55 (0.022) | 0.65 (0.026) | - | 0.40 (0.016) | 0.40 (0.016) | 0.50 (0.020) | 0.10 (0.004) | 0.25 (0.010) |

## Packaging

| Part Number | Ordering | Tape & Reel Quantity | Minimum Orgder Quantity | Recommended Pad Layout Figures [mm(in)] | | |
|---|---|---|---|---|---|---|
| | | | | Dimension A (Nom) | Dimension B (Nom) | Dimension C (Nom) |
| zeptoSMDC0011F | RF5005-000 | 15,000 | 15,000 | 0.45 (0.0178) | 0.325 (0.013) | 0.250 (0.010) |
| zeptoSMDC0015F | RF5006-000 | 15,000 | 15,000 | 0.45 (0.0178) | 0.325 (0.013) | 0.250 (0.010) |

## Part Ordering Number System

zepto SMDC 0011 F

- 0201 Size Series
- Surface Mount Device
- Hold Current 11mA
- Lead-Free
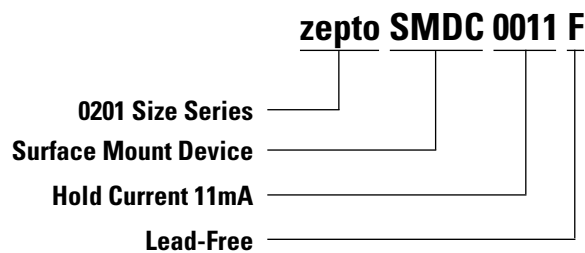
## Warning

- Electrical performance of the device can differ according to installation conditions. Users should independently evaluate the suitability of the device under the actual application conditions.
- Operation beyond maximum ratings may result indevice damage.
- Exposure to silicon-based oils, solvents, electrolytes, acids, or similar materials can adversely affect device performance.
- The device undergoes thermal expansion during fault conditions. It should be provided with adequate space to allow expansion and should be protected against mechanical stress.
- Consult with Littelfuse if the device will experience thermal process other than reflow onto PCB board, such as molding or hand soldering.

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## Tape and Reel Specifications
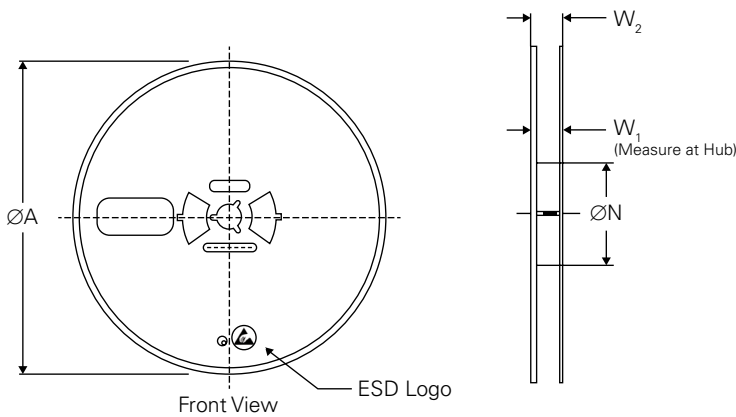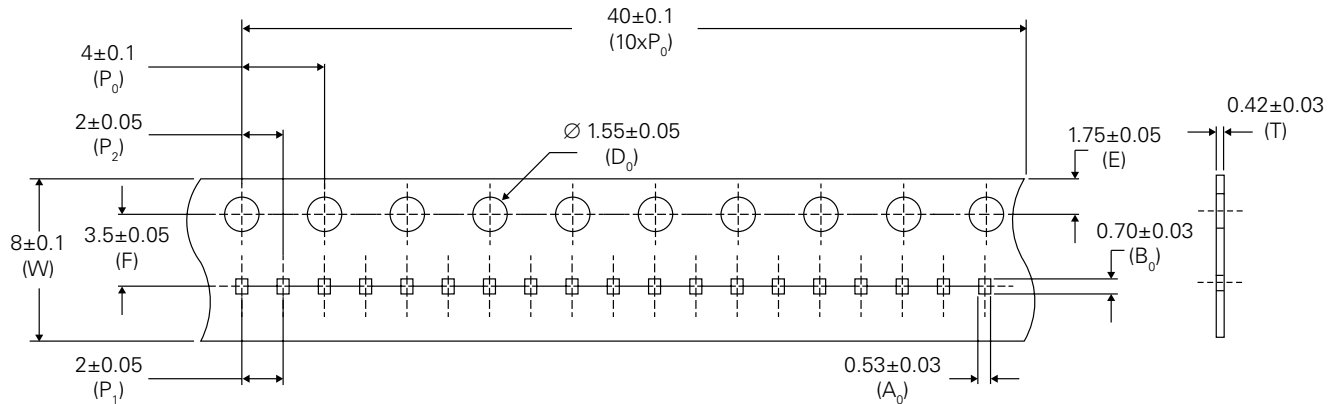


| All dimensions in mm | |
|---|---|
| W | 8 ±0.1 |
| $P_0$ | 4 ± 0.1 |
| $P_1$ | 2 ± 0.05 |
| $P_2$ | 2 ± 0.05 |
| $A_0$ | 0.53 ± 0.03 |
| $B_0$ | 0.70 ± 0.03 |
| $D_0$ | 1.55 ± 0.05 |
| F | 3.5 ± 0.05 |
| E | 1.75 ± 0.05 |
| T | 0.42 ± 0.03 |
| A | 178.0 ± 1.0 |
| N | 54.0 ± 0.5 |
| $W_1$ | 9.5 ± 0.5 |
| $W_{2\,max}$ | 15.0 |

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