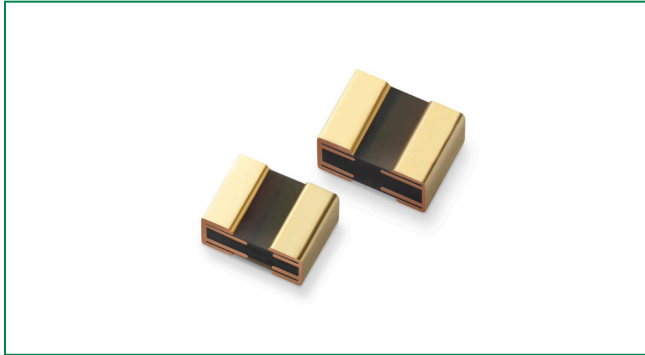




## PPTC zeptoSMDC Series



### Description

Littelfuse zeptoSMDC Series PPTC is developed for overcurrent and overtemperature protection at low-cost in mobile application components. It works as a 'fail-safe' to protect battery management ICs and fuel gauges.

### Features

- Maximum electrical rating: 13 VDC
- Short circuit current: 82~200mA
- Small footprint 0201 size
- RoHS compliant
- ISO/TS 16949 certified

### Applications

- Mobile phone
- Wearable device
- Lithium battery management

### Benefits

- Resettable
- Save space in PCBs due to small footprint

### Electrical Characteristics

Part Number	Initial Resistance Ohms @ 25°C		$V_{MAX}^2$ (Vdc)	$I_{MAX}^3$ (mA)	Trip Temperature °C TYP	Hold Current <sup>4</sup> (mA) @ 25°C	Time to Trip <sup>5</sup>		Post Process Resistance <sup>6</sup>	
	Min <sup>1</sup>	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.  $R_{min}$  = Minimum resistance of device in initial (un-soldered) state
2.  $V_{max}$  = Maximum voltage device can withstand without damage at rated current ( $I_{max}$ )
3.  $I_{max}$  = Maximum fault current device can withstand without damage at rated voltage ( $V_{max}$ )
4.  $I_{hold}$  = 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

### Environmental Specifications

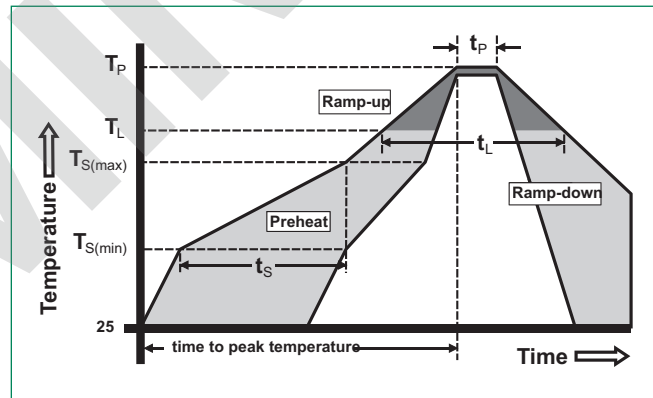
<b>Operating Temperature</b>	-20°C to 60°C
<b>Passive Aging</b>	+85°C, 1000 hours -25% typical resistance change
<b>Humidity Aging</b>	+65°C, 90% R.H., 100 hours -/+15% typical resistance change
<b>Thermal Shock</b>	MIL-STD-202, Method 107G -33% typical resistance change -40°C to +85°C (20 Times)
<b>Vibration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

### Physical Specifications

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

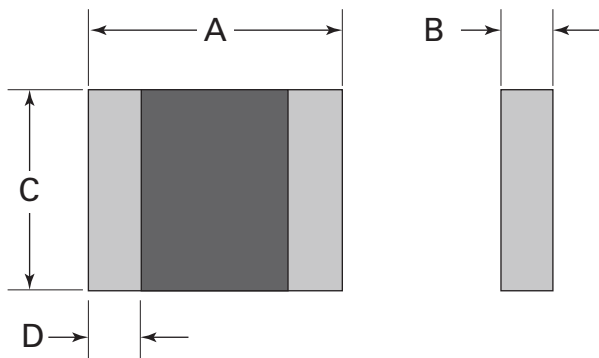
### Soldering Parameters

<b>Profile Feature</b>	Pb-free assembly	
<b>Average Ramp-Up Rate (Liquidus Temp (<math>T_L</math>) to peak)</b>	1~3°C/second max.	
<b>Preheat</b>	Temperature Min. ( $T_{s_{min}}$ )	130°C
	Temperature Max. ( $T_{s_{max}}$ )	180°C
	Time Min. to Max. ( $T_s$ )	90-110 seconds
<b><math>T_{s_{max}}</math> to <math>T_L</math> Ramp-up Rate</b>	≤2°C/seconds max.	
<b>Reflow</b>	Temperature ( $T_L$ ) (Liquidus)	217°C
	Time ( $t_L$ )	60~70 seconds
<b>Peak Temperature (<math>T_p</math>)</b>	240°C	
<b>Time within 3°C of actual Peak Temperature (<math>t_p</math>)</b>	35 seconds	
<b>Ramp-Down Rate</b>	2~4°C/seconds	
<b>Time 25°C to Peak Temperature (<math>T_p</math>)</b>	300 seconds max.	

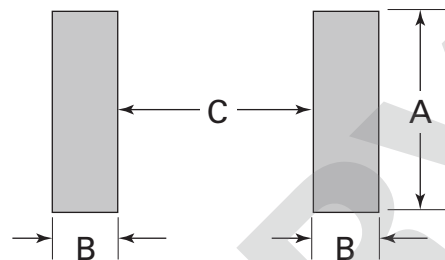


- All temperature refer to topside of the package, measured on the package body surface.
- If reflow temperature exceeds the recommended profile, devices may not meet the performance requirements.
- Recommended reflow methods: IR, vapor phase oven, hot air oven.
- Customer should validate that the solder 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 Dimension**



**Solder Pad Layout**

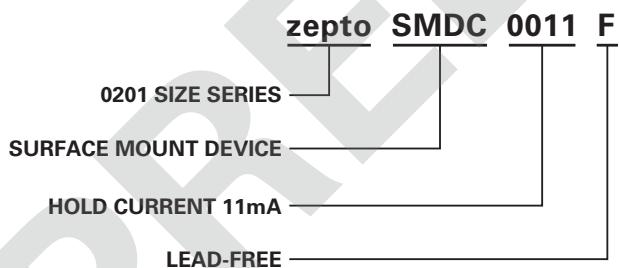


Part Number	A		B		C		D	
	Min	Max	Min	Max	Min	Max	Min	Max
zeptoSMDC0011F	0.55 (0.022)	0.65 (0.026)	—	0.40 (0.016)	0.40 (0.016)	0.50 (0.020)	0.10 (0.004)	0.25 (0.010)
zeptoSMDC0015F	0.55 (0.022)	0.65 (0.026)	—	0.40 (0.016)	0.40 (0.016)	0.50 (0.020)	0.10 (0.004)	0.25 (0.010)

**Packaging**

Part Number	Ordering	Tape & Reel Quantity	Minimum Order 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)

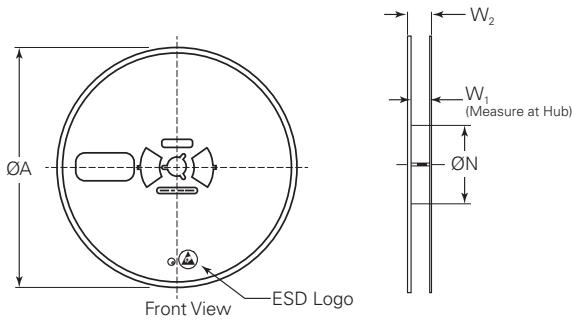
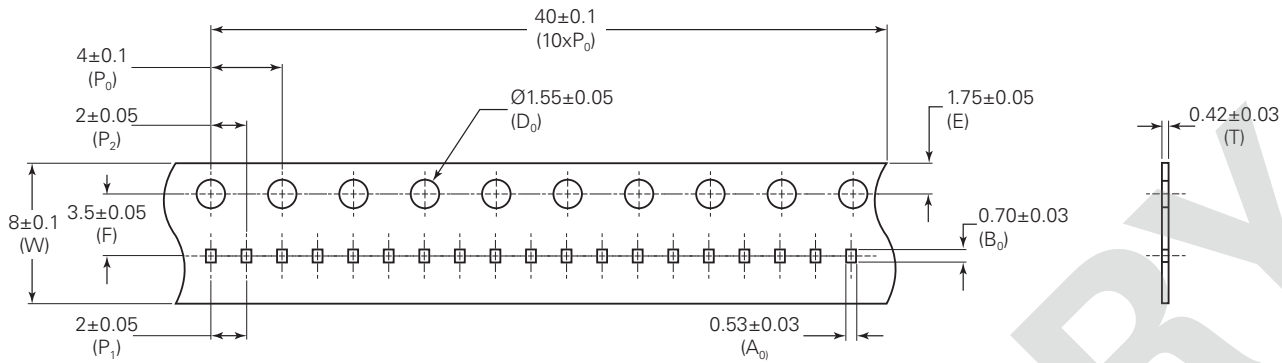
**Part Numbering System**



**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 in device 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.

**Tape and Reel Specifications**



Standard Pack Quantity: 15,000 pcs  
Minimum Order Quantity: 15,000 pcs

All dimensions in mm	
<b>W</b>	8 ± 0.1
<b>P<sub>0</sub></b>	4 ± 0.1
<b>P<sub>1</sub></b>	2 ± 0.05
<b>P<sub>2</sub></b>	2 ± 0.05
<b>A<sub>0</sub></b>	0.53 ± 0.03
<b>B<sub>0</sub></b>	0.70 ± 0.03
<b>D<sub>0</sub></b>	1.55 ± 0.05
<b>F</b>	3.5 ± 0.05
<b>E</b>	1.75 ± 0.05
<b>T</b>	0.42 ± 0.03
<b>A</b>	178.0 ± 1.0
<b>N</b>	54.0 ± 0.5
<b>W<sub>1</sub></b>	9.5 ± 0.5
<b>W<sub>2 max</sub></b>	15.0

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