

# zeptoSMDC Series

## Surface Mount



### Description

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

### 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

### Web Resources



Download ECAD models, order samples, and find technical resources at [www.littelfuse.com](http://www.littelfuse.com)

### Agency Approvals

Agency	Agency File Number
	E74889
	50517757

### 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 °CTYP	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:

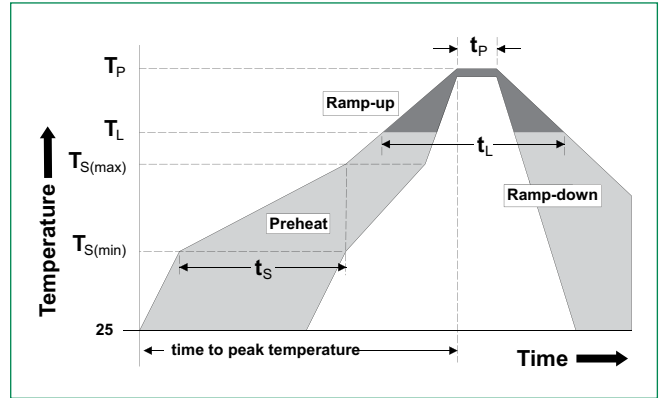
1. Rmin = Minimum resistance of device in initial (un-soldered) state
2. Vmax = Maximum voltage device can withstand without damage at rated current (Imax)
3. Imax = Maximum fault current device can withstand without damage at rated voltage (Vmax)
4. Ihold = Hold current; maximum current device will 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

<b>Profile Feature</b>		Pb-Free Assembly
<b>Average Ramp-Up Rate (Liquidus Temp (TL) to peak)</b>		1~3 °C/second max.
<b>Preheat:</b>	<b>Temperature Min. (Ts<sub>min</sub>)</b>	130 °C
	<b>Temperature Max. (Ts<sub>max</sub>)</b>	180 °C
	<b>Time Min. to Max (ts)</b>	90 – 110 seconds
<b>Ts<sub>max</sub> to TL Ramp-up Rate</b>		≤2 °C/seconds max.
<b>Reflow</b>	<b>Temperature (TL) (Liquidus)</b>	217 °C
	<b>Time (tL)</b>	60~70 seconds
<b>Peak Temperature (Tp)</b>		240 °C
<b>Time within 3°C of actual Peak Temperature (tp)</b>		35 seconds
<b>Ramp-down Rate</b>		2~4 °C/seconds
<b>Time 25°C to peak Temperature (Tp)</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 Specifications

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

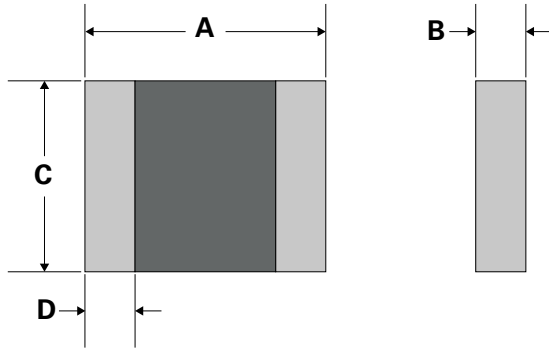
### Environmental Specifications

<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

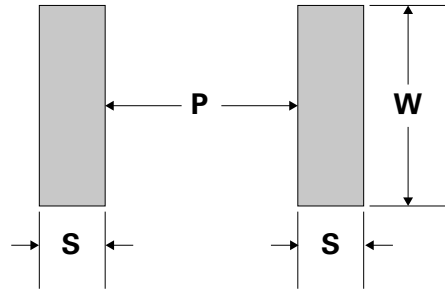
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### Physical Dimensions



### 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)

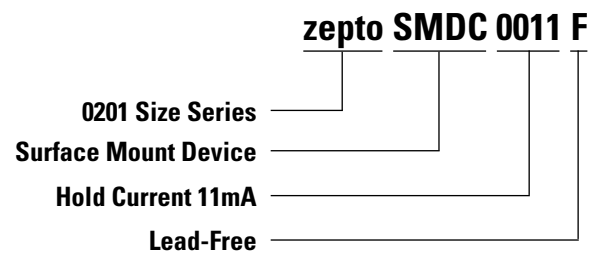
### Packaging

Part Number	Ordering	Tape & Reel Quantity	Minimum Order Quantity	Recommended Pad Layout Figures [mm(in)]		
				Dimension W (Nom)	Dimension S (Nom)	Dimension P (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)

### 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.

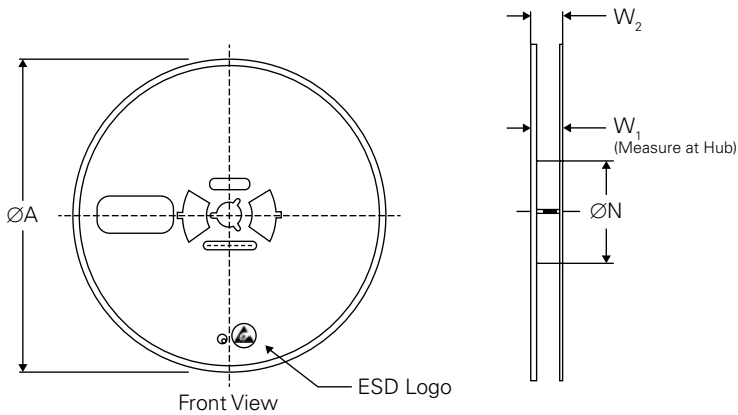
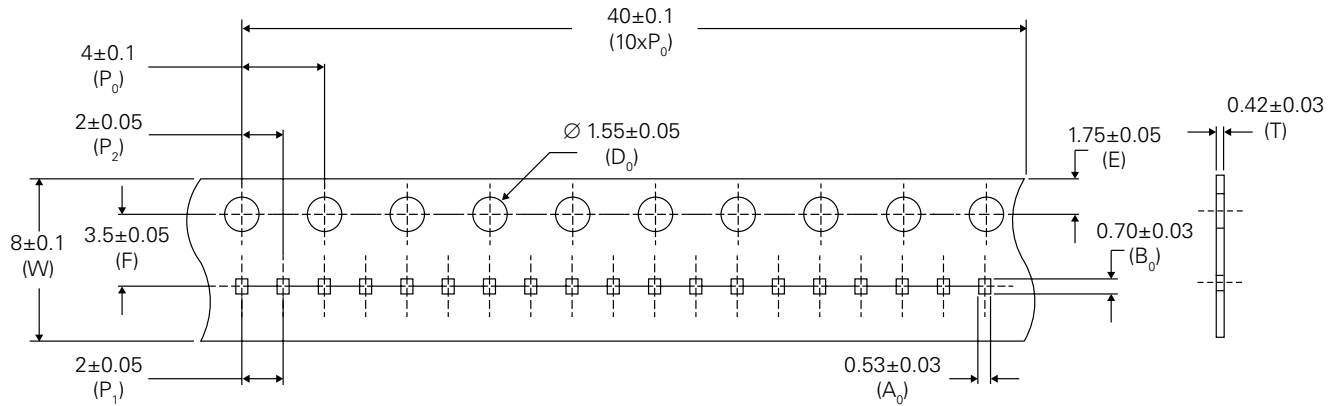
### Part Ordering Number System



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### Tape and Reel Specifications



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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