

TTP Series

Distributed Temperature Monitoring Platform



Web Resources



Download ECAD models, order samples, and find technical resources at www.littelfuse.com

Electrical Specifications

Recommended operating conditions

Name	Description	Value	Units
V_{DD}	Power supply range	3.3 to 5.5	V
Rp	Pull up resistor value when $V_{DD} = 3.3$ to 5.5 V	200 ($\pm 5\%$)	k Ω

Absolute maximum ratings

Name	Description	Value	Units
V_{max}	Voltage	6	V
I_{max}	Current	6	mA
-	Dielectric withstand. Tested per MIL-STD-202 Test Method 301	6	kV DC
-		4.2	kV AC
-	Minimum bend radius	9	mm

Description

The TTape™ platform is a distributed temperature monitoring technology for battery packs that helps to improve the detection of localized cell overheating. This device helps to increase the lifetime of batteries and provides a means to identify and avoid thermal runaway conditions.

Features

- Simple integration with existing BMS solutions complementing NTCs
- No calibration or temperature look-up tables needed
- Pressure sensitive adhesive for simple and quick installation
- AEC-Q200 Qualified

Benefits

- Over-temperature monitoring of many cells or large area with single MCU input
- Helps the MCU to wake from sleep mode at overtemperature events
- <1s response for temperature monitoring
- Extremely thin device suitable for conformal installation
- Increased spatial resolution of temperature monitoring

Applications

- Li-ion battery packs
- Large area, distributed, temperature monitoring

Operating Conditions

Device continues to meet all specifications and performance criteria System capable of detecting T_{L1}

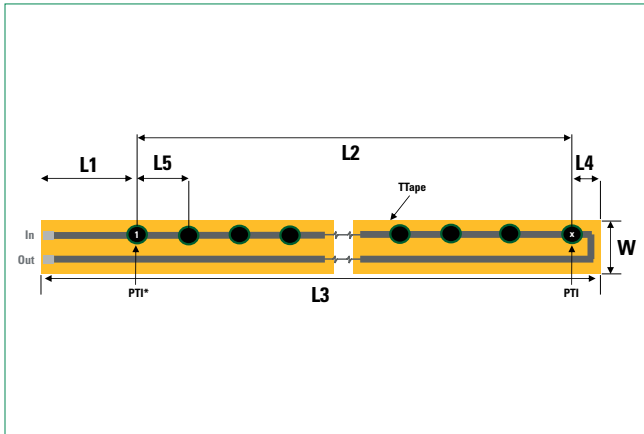
Specification	Value	Units
Operating temperature	-40 to +85	°C
Storage temperature	-40 to +55	°C
Pressure on PTI	<1500	Pa

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Dimensions

Part Number: TTP0335F010
Measurement: mm



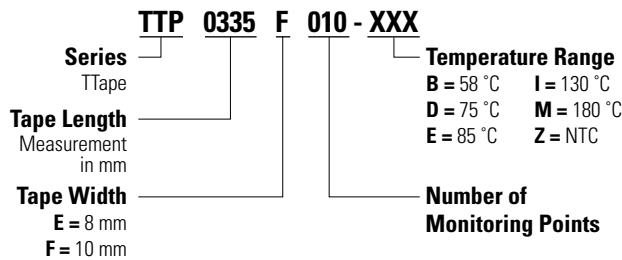
Note:

* Printed Temperature Indicator (Monitoring Point or Individual Sensing Element on TTape device)

Parameter		TTP 0335 F 010 sample	Customized design
Number of Printed Thermal Indicators (PTIs)		10	≤50
Position of the first thermal indicator from the tape edge	L1	45±0,5 mm	≥15 mm
Distance between first and last thermal indicator	L2	274±0,5 mm	depending on design
TTape device total length	L3	337±0,5 mm	<1 m (typical)*
Distance between the last thermal indicator and the end of the tape	L4	17 mm±0,5 mm	≥10 mm
Pitch between Printed Thermal Indicators (PTIs) (can vary from PTI to PTI)	L5	30 mm±0,5 mm	≥10 mm
Tape width	W	10±0,5 mm	8 mm
Diameter of Printed Thermal Indicators (PTIs)		≤ 5 mm	≤ 5 mm
Device Thickness		< 1 mm	< 1 mm

Note: * < 8 m (stitching option available)

Part Numbering System



Notes:

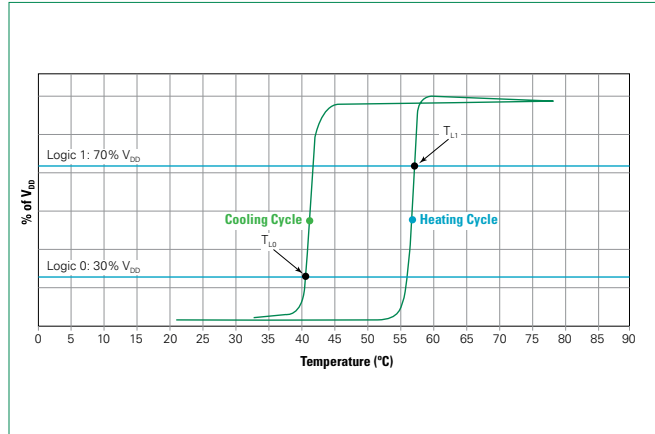
Part number and dimensions are for standard sample devices.

TTape device will be customized to the geometrical needs of the application.

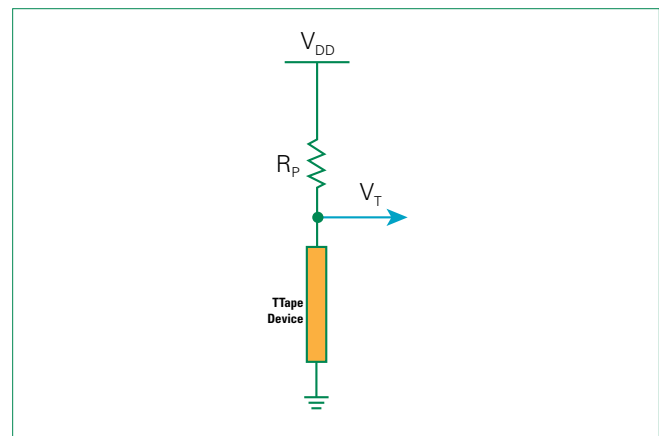
e.g.: 2 temperature range 58°C +75°C: TTP0335F010-BD

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Temperature Indication Characteristics



Notes: Graph for 58°C.



	Trip Temperature T _{L1}	Reset Temperature T _{L0}
58 class	58°C ±3°C	42°C ±3°C
75 class*	75°C ±3°C	65°C ±3°C
85 class*	85°C ±3°C	75°C ±3°C
130 class*	130°C ±5°C	120°C ±5°C
175 class*	175°C ±5°C	165°C ±5°C

Notes: * preliminary specification, engineering samples available

- Using 10-bit or better A/D recommended
- Specification applies when less than 11 monitoring Points are heated and cooled simultaneously. Typical values for T_{L1} and T_{L0} decrease approximately 3 °C when simultaneously heating and cooling between 11 and 25 Monitoring Points.
- After performing AEC-Q200 'Biased Humidity' test, which applies 85 °C at 85% relative humidity for 1000 hours, trip temperature will decrease. T_{L1} will be greater than 45 °C and T_{L0} will be greater than 30 °C.