

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
R_p	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 4.2	kV DC 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}

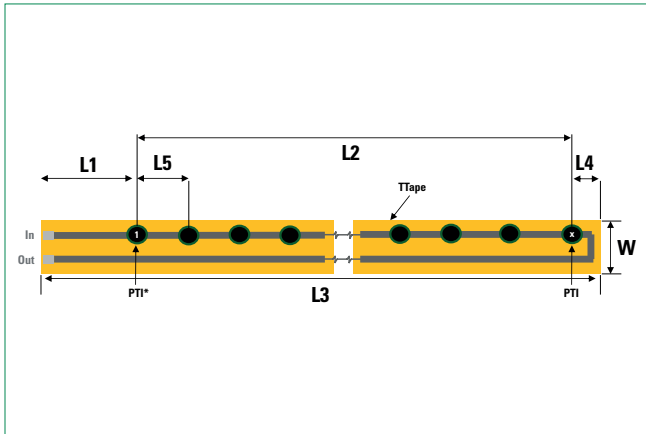
Specification	Value	Units
Operating temperature	-40 to +85	°C
Storage temperature	-40 to +55	°C
Pressure on PTI	<1500	Pa

TTP Series

Distributed Temperature Monitoring Platform

Dimensions

Part Number: TTP0335F010
Measurement: mm



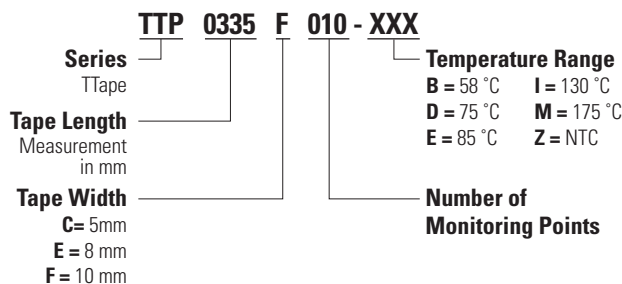
Note:

* 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:

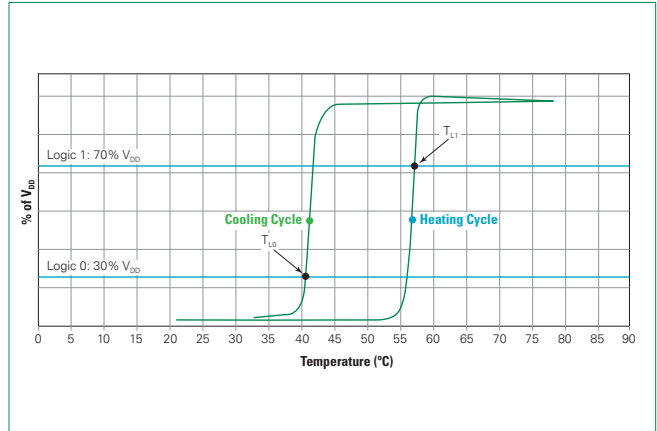
Part number and dimensions are for standard sample devices.

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

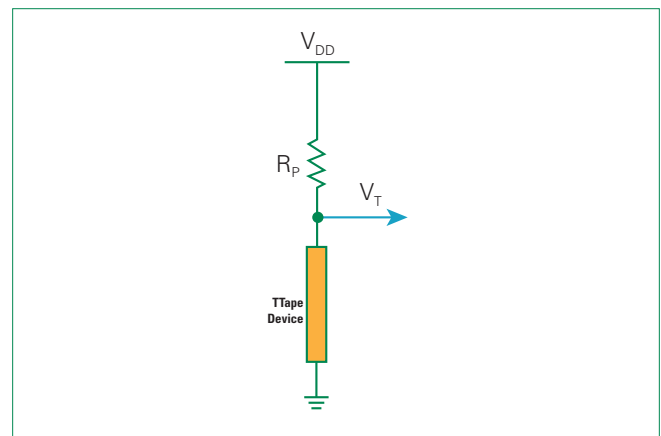
e.g.: 2 temperature range 58°C +75°C: TTP0335F010-BD

Disclaimer Notice - Information furnished is believed to be accurate and reliable. However, users should independently evaluate the suitability of and test each product selected for their own applications. Littelfuse products are not designed for, and may not be used in, all applications. Read complete Disclaimer Notice at <http://www.littelfuse.com/disclaimer-electronics>.

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

1. Using 10-bit or better A/D recommended

2. 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.

3. 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.