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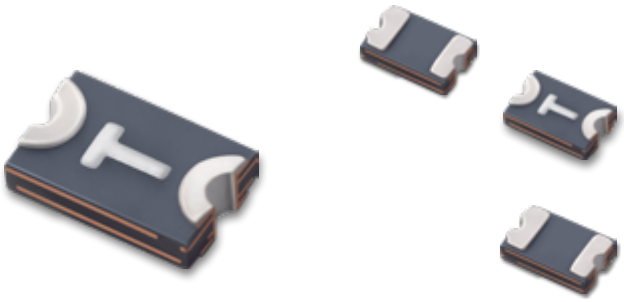
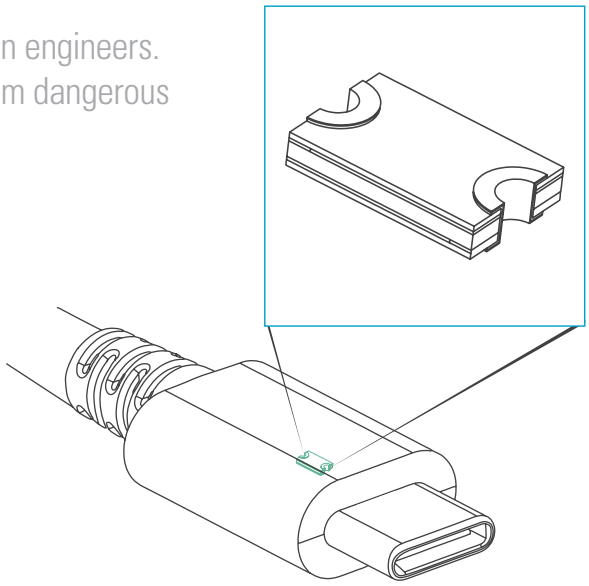
New Product **Brief**

Over Heating **Protection** Fully **USB-PD** Compliant

Implementing USB Type-C charging presents challenges to design engineers. Littelfuse temperature indicator solutions help protect cables from dangerous overheating due to resistive faults from power line to ground.





- Fast-Charging for Mobile
- Reversable Connector
- Fast Data Transfer
- Low Temperature with **setP™**

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setP™ Key Characteristics

Function	Applications	Ordering Number	Indicating Temperature	Resistance @ 25°C	Indicating Resistance	Footprint
Over-temperature Protection	Captive cable USB Type-C Chargers	SETP0805-100-SE	100°C ±10°	12Ω or less	35kΩ or greater	0805
Over-temperature Protection	USB Type-C to Type-C Cables	SETP0805-100-CC	100°C ±10°	6Ω or less	35kΩ or greater	0805

Keeps the Plug Surface Cool

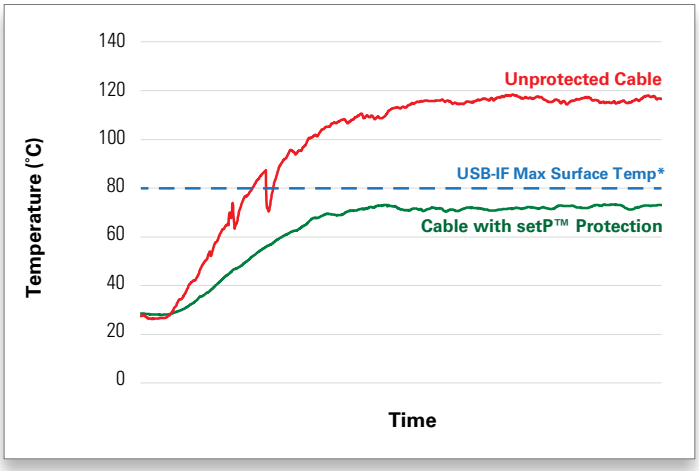
Problem Condition

- More Power
- Smaller pin-to-pin
- Universal Fit

→ Higher Risk

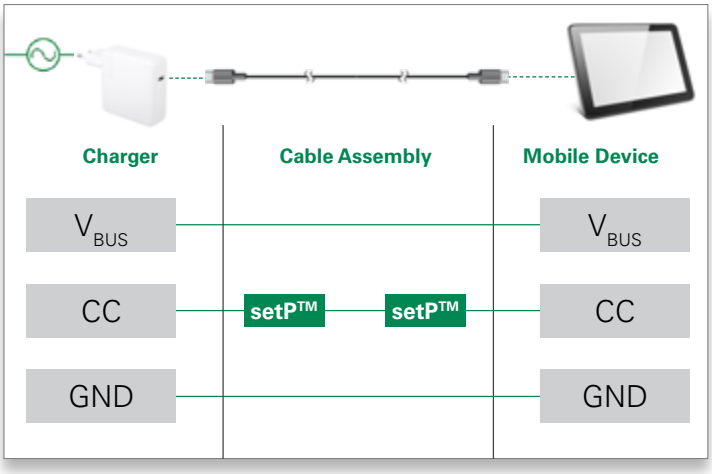
Easier for contamination or deformed pins to cause a fault. Higher power increases risk of thermal event.

Surface Temperature During Over-temperature Fault



** Reference temperature set by USB-IF within Table 6-14 of the USB Type-C Cable and Connector Specification.*

Circuit Diagram & Protection Explanation



setP™, located inside the Type-C plug, senses the temperature of the USB Type-C Connector.

- Charger is connected to the AC power line and cable is connected to the mobile device
- Fault occurs causing heat (either at charger or mobile device side),
  1. setP™ senses heat, then resistance (R_{setP}) increase
  2. R_{setP} increase causes voltage on CC Line to increase beyond specified value*
  3. System assumes cable detached due to voltage on CC being higher than specified value*, thus V_{BUS} power is turned off
- The system is protected
- To clear the fault: Disconnect the cable and remove debris

** vOpen value is defined by USB-IF as either 1.65V or 2.75V*

Type-C is quickly becoming the industry standard connector