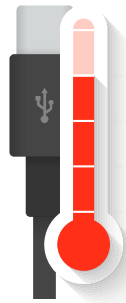
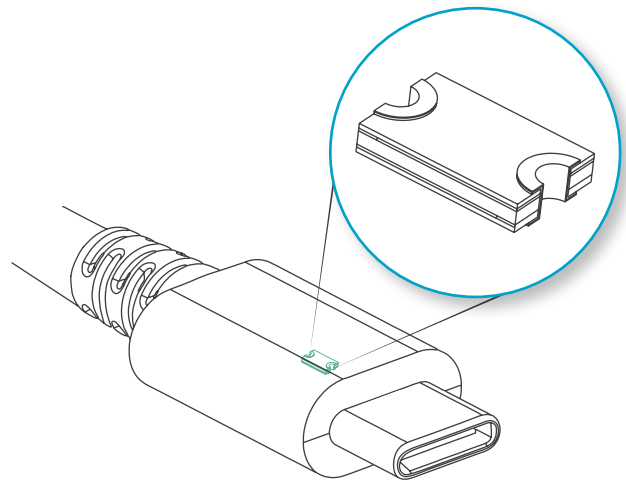
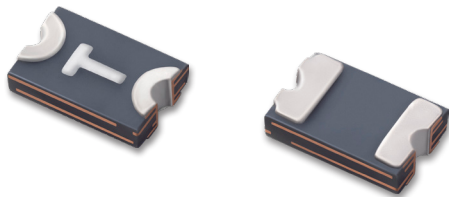


OVER HEATING PROTECTION FULL USB-PD COMPLIANT



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



Reversible
Connector



Fast
Data
Transfer



Low
Temperature
with **setP™**

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 |

Keep the Plug Surface Cool

Problem Condition:

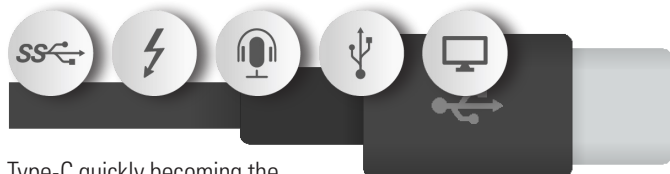
More Power
Smaller pin-to-pin
Universal Fit



Higher Risk

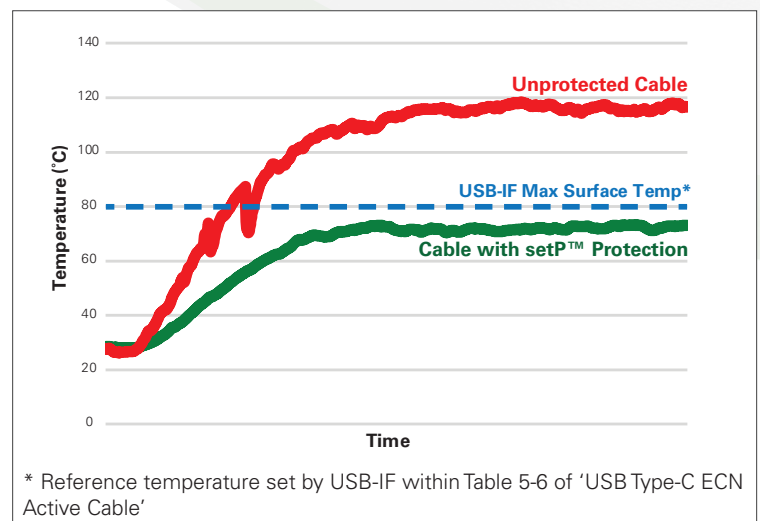


Easier for contamination or deformed pins to cause a fault. Higher power increases risk of thermal event.

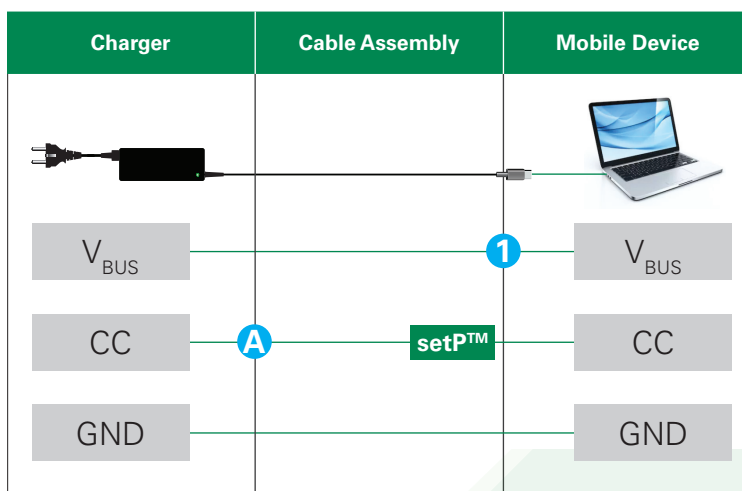


Type-C quickly becoming the industry standard connector

Surface Temperature During Over-temperature Fault



Circuit Diagram and Protection Explanation



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

- setP™ is placed on the CC line of the Type-C plug
- When a fault occurs, producing heat at point 1
 1. setP™ senses heat, and its resistance (R_{setP}) increases
 2. R_{setP} rise causes the voltage at A to increase beyond the specified value*
 3. Charging system assumes the cable is detached due to voltage at A being greater than the specified value*
 4. Charging system turns off the V_{BUS} power
- The system is protected
- To clear the fault: Disconnect the cable and remove debris

* Value for specified voltage is defined by USB-IF