

Attracting Tomorrow



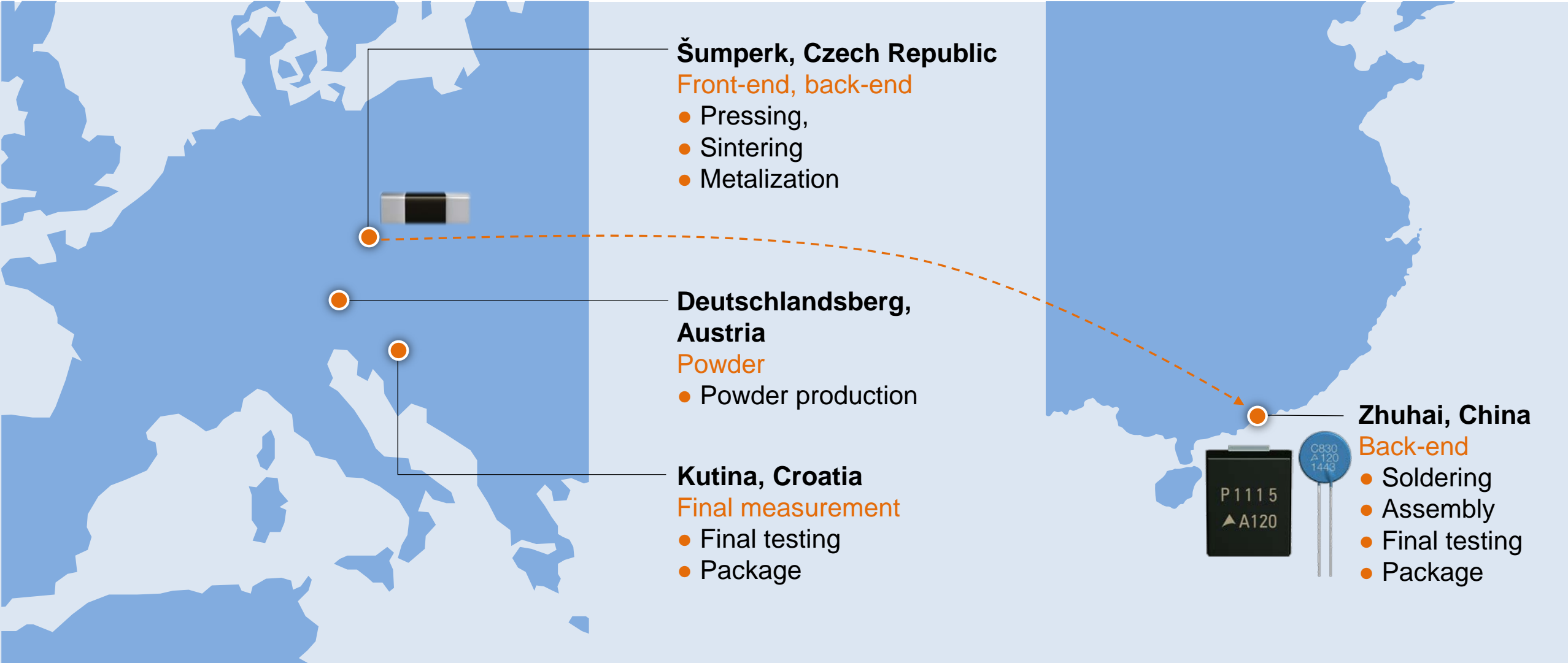
Overload PTC Thermistors

Resettable Fuses

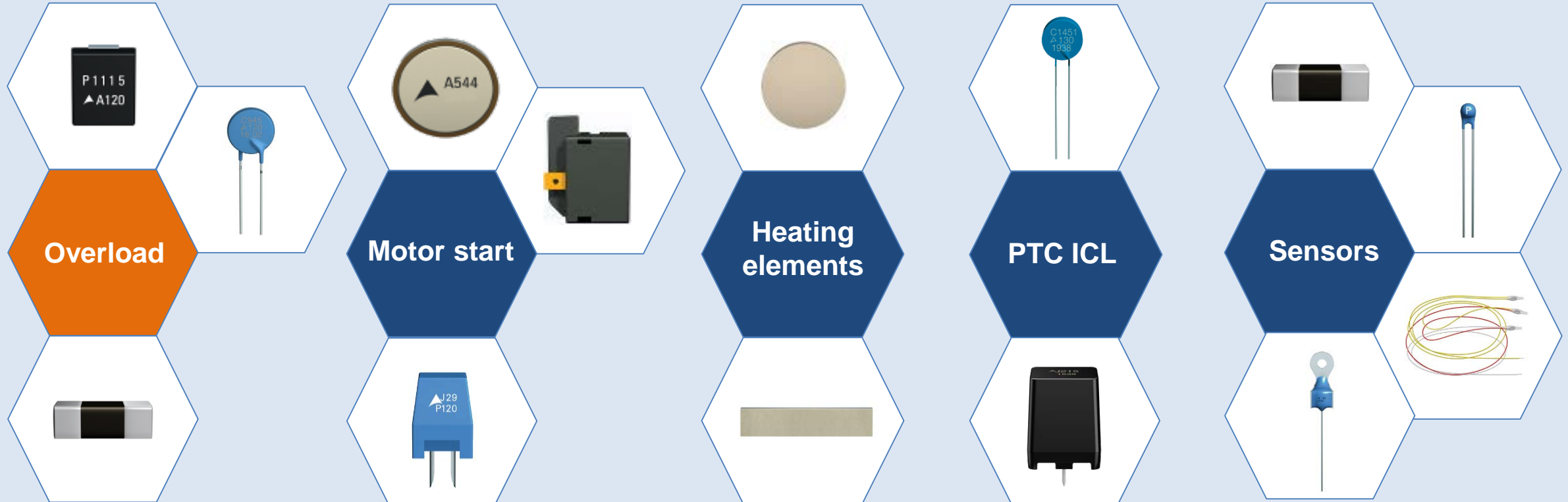
TDK Electronics AG
Piezo & Protection Devices Business Group
Product Marketing PTC Thermistors
Munich, Germany
July 2020



Production plants



PTC product range



Parameters
 U: 12...1000 V
 R: 0.3...1800 Ω
 Ø: 4...22 mm
 SMD: 0603...4032

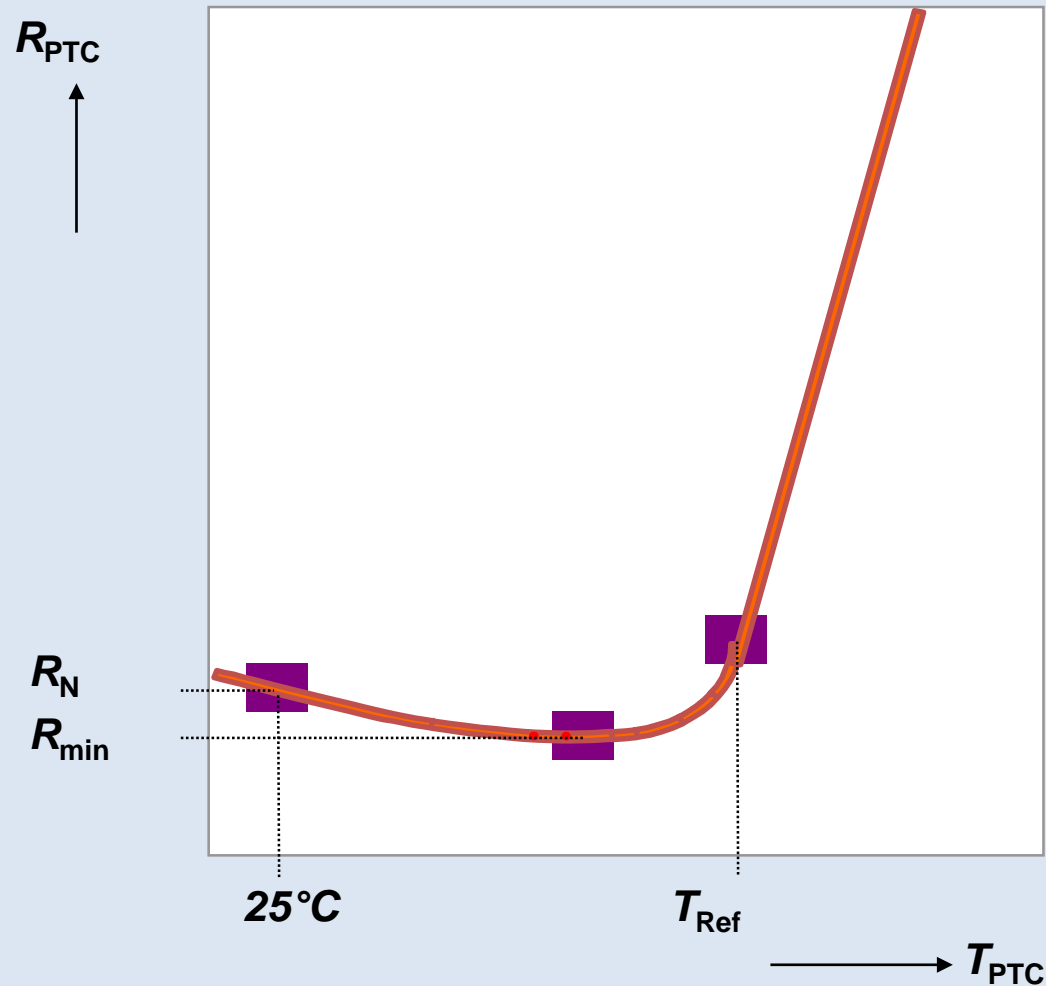
Parameters
 U: 180...265 V
 R: 4.7...5000 Ω
 Ø: 16...20 mm

Parameters
 U: 12...800 V
 R: 0.75...960 Ω
 th: 1...3.0 mm
 Ts: 40...280 °C

Parameters
 U: 400...1000 V
 R: 22...7500 Ω
 C_{th}: 0.5...2.3 J/K

Parameters
 T_{sens}: 60...180 °C
 Size: Leaded, SMD,
 single, tripple sensor
 SMD: 0402, 0603, 0805

Description of a PTC and key parameters: Typical R/T curve



What is a PTC?

A PTC (**P**ositive **T**emperature **C**oefficient) is a resistor whose resistance varies with temperature.

With increasing temperature, the resistance of the PTC will increase.

R_N Resistance value at 25°C

R_{min} Minimum resistance of the PTC

T_{ref} Reference temperature or Curie temperature; at this temperature, the resistance value is $2 \times R_{min}$.

Overload PTCs: Function & technology advantages

- Protects circuit in case of overcurrent or over temperature
- Self-regulating behavior
- No risk of fire compared to fixed resistors
- No replacement needed after failure case (*resettable fuse*)
- SMD types available for usage on small PCBs

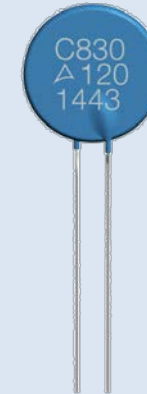


Overload PTCs: Company advantages

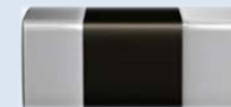
- Market leader for PTC thermistor products
- More than 50 years experience in PTC technology
- Low / medium / high-voltage types available (12 V to 1000 V)
- Wide resistance range available (0.3 Ω to 1500 Ω)
- Products based on AEC-Q200 qualification available
- Customer-specific products possible
- 100% resistance measuring

Product range overview (1)

- Diameter min/max 4.0 ... 22 mm
- Rated voltage 12 ... 1000 V
- Rated current 3 ... 1800 mA
- Switching current 17 ... 3600 mA
- R25 0.3 ... 1500 Ohm
- Approvals UL1434, IECQ, VDE, AEC Q-200



- Case sizes 0402, 0603, 1210
- Rated voltage 24 ... 230 V
- Rated current 12 ... 90 mA
- Switching current 22 ... 180 mA
- R25 27 ... 1500 Ohm
- Approvals UL, AEC Q-200



Product range overview (2)

- Case sizes 3225, 4032
- Rated voltage 24 ... 63 V
- Rated current 40 ... 310 mA
- Switching current 85 ... 640 mA
- R25 3.1 ... 55 Ohm
- Approvals AEC Q-200



Applications (1)

Battery management systems for green energy storage



Charging stations for e-mobility



12V / 24V DC motors for seat adjustment or window control



Applications (2)

Circuit breaker



Power supply for LED lighting



Switch-mode power supply



Checklist of design inputs

Mechanical parameters	Electrical parameters	Others
Dimensions / Case size	Operating voltage	Packaging
	Operating current	Automotive or industrial applications
	Rated and switching current	Max. operating temperature



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