



## High Performance with Sinter Technology

### Platinum temperature sensors for power electronics

Operation of power electronic devices at the upper performance limit requires accurate and fast temperature detection. The design of sinterable temperature sensors allows for a potential free positioning next to the heat source or die. The topside metallization is designed for Al-thick wire bonding; the backside is designed for silver sinter processes with optional pressure steps. No additional structuring of the substrate is needed for direct sintering due to electrical insulation of both metallization sides.

#### Key Benefits:

- Optimized long-term stability with high precision over entire lifetime
- Potential free positioning direct to heat source or die
- Application temperature range exceeding 200 °C
- Contacts optimized for state-of-the-art bonding solutions

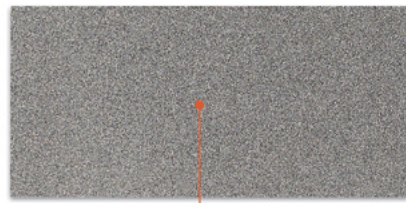
#### Pt-resistance thin film



#### Glass covering



#### Backside metallization



Technical Parameters	
Temperature Range	-50 °C bis 200 °C
Tolerance Class	F 0.6
Temperature Coefficient	TCR = 3850 ppm/K
Measuring Current	1000 Ω: 0.1 bis 0.3mA



#### Components of the sinterable temperature sensor:

- Pt-resistance thin film
- Bond pads for Al-thick wire bonding
- Glass covering
- Aluminium oxide-substrate
- Backside metallization

#### Our Innovation - Your Advantage

- Signal stability at high precision with standardized Pt-characteristics for long-term reliability
- Optimal thermic coupling (quick response time) through silver sintered connections
- Wide operation window: Application temperature range over 200 °C, depending on joining technology
- With electrical insulation between the board and bondpad a separate conductor track is not necessary and allows a positioning direct at the heat source or die.
- Chip assembly on the substrate by silver sintering
- Fast and reliable connection with standard bonding solutions (e.g., Heraeus Al-thick wires)

#### Passed reliability tests:

Reliability Tests	Condition
High Temperature Storage	t=1000 hours (200 °C)
Temperature Cycling	1000 cycles @ -40 °C/ +150 °C
Humidity (unbiased)	RH=85 %, t=1000 hours (85 °C)
Low Temperature Storage	t=1000 hours (-50 °C)
Operational Life	t=1000 hours @ 0.1 mA (200 °C)

Experimental setup:  
1206 SMD chip, Heraeus Al H11 thick wire Ø 300 µm

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