

Automotive Sensors

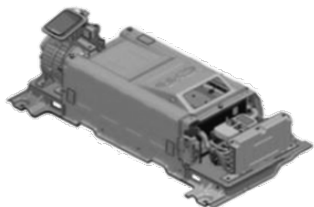


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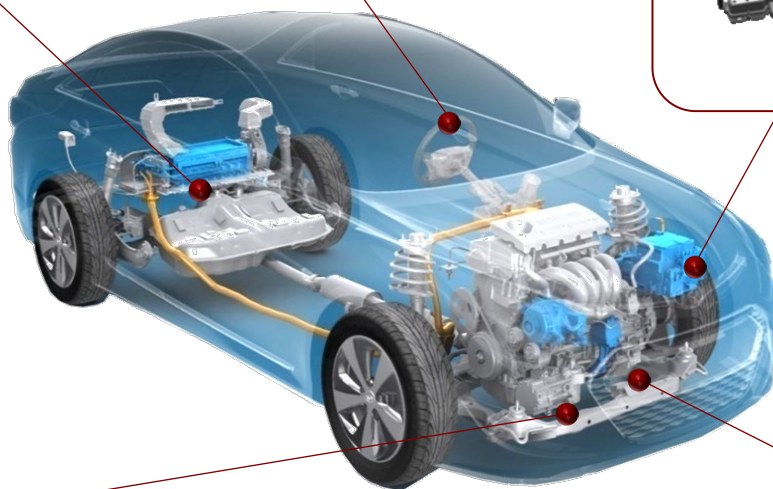
1. Sensors By Usage

Battery Module

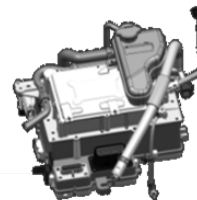


- BMS (battery management system)
- Module
- Cell Pack
- In-Outlet
- Bus-bar Sensor
- Coolant

Steering Wheel Heater

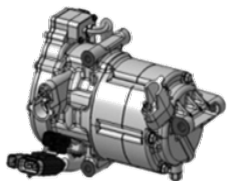


Inverter/Converter



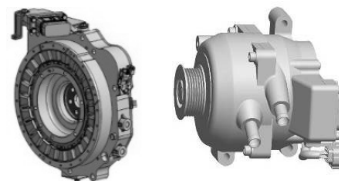
- DC/DC Converter
- Inverter Module
- Reactor
- IGBT
- SiC

Air Conditioning Module



- HVAC

Motor Module

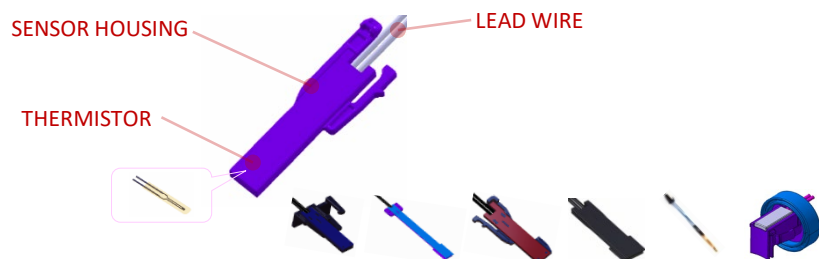


- Drive Motor
- HSG Motor
- In-wheel Motor

2-1. Battery Module

Battery Module, Coolant

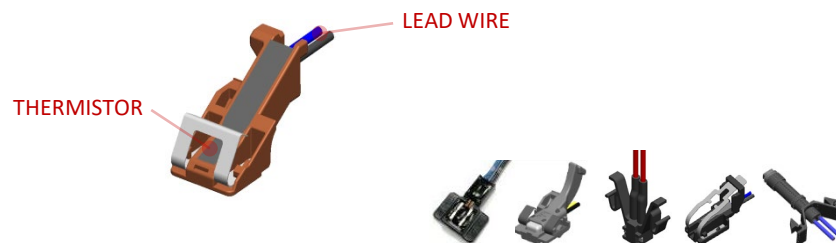
Battery Module Sensor



➤ Specification

- Thermistor type : JT
- Resistance : $R_{25} = 10.0k\Omega \pm 1\%$
- B Value : $B_{25/85} = 3435K \pm 1\%$
- Insulation Volt & Resistance : DC500V / Min.100M Ω
AC1800V / 1sec.
- Operating Temperature : $-40^{\circ}C \sim +80^{\circ}C$

Battery Module Sensor



➤ Specification

- Thermistor type : AT, NT, ET
- Resistance : $R_{25} = 10.0k\Omega \pm 1\%$
- B Value : $B_{25/85} = 3435K \pm 1\%$
- Insulation Volt & Resistance : DC500V / Min. 100M Ω
AC1200V / 1sec.
- Operating Temperature : $-40^{\circ}C \sim +80^{\circ}C$

Battery Module Sensor (SMD)



➤ Specification

- Thermistor type : KT, HT
- Resistance : $R_{25} = 10.0k\Omega \pm 1\%$
- B Value : $B_{25/85} = 3435K \pm 1\%$
- Operating Temperature : $-40^{\circ}C \sim +125^{\circ}C$

Battery Coolant Sensor



➤ Specification

- Thermistor type : ETB
- Resistance : $R_{25} = 10.0k\Omega \pm 1\%$
- B Value : $B_{25/85} = 3435K \pm 1\%$
- Insulation Volt & Resistance : DC500V / Min. 100M Ω
AC 600V / 1sec.
- Operating Temperature : $-40^{\circ}C \sim +85^{\circ}C$

2-2. Battery Module

Battery In-Outlet, Bus-Bar

Battery In-Outlet Sensor



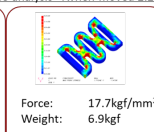
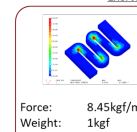
➤ Specification

- Thermistor type : AT
- Resistance : $R_{25} = 10.0k\Omega \pm 1\%$
- B Value : $B_{25/85} = 3435K \pm 1\%$
- Insulation Volt & Resistance : DC500V / Min. 100M Ω
AC1800V / 1sec.
- Operating Temperature : $-40^{\circ}C \sim +110^{\circ}C$

Battery Module Sensor (Cylindrical type)



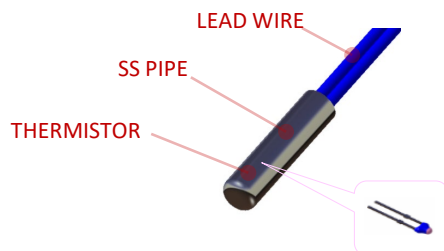
Exerted force analysis (when moved 2.2mm~2.3mm)



➤ Specification

- Thermistor type : NT-4
- Resistance : $R_{25} = 10.0k\Omega \pm 1\%$
- B Value : $B_{25/85} = 3435K \pm 1\%$
- Insulation Volt & Resistance : DC500V / Min. 100M Ω
AC500V / 1sec.
- Operating Temperature : $-40^{\circ}C \sim +80^{\circ}C$

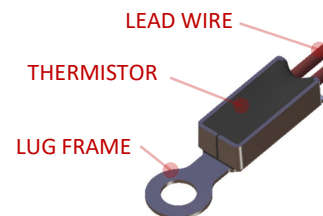
Charge Inlet Sensor



➤ Specification

- Thermistor type : AT
- Resistance : $R_{25} = 10.0k\Omega \pm 1\%$
- B Value : $B_{25/85} = 3435K \pm 1\%$
- Insulation Volt & Resistance : DC500V / Min. 100M Ω
AC1800V / 1sec.
- Operating Temperature : $-40^{\circ}C \sim +110^{\circ}C$

Bus-Bar Sensor

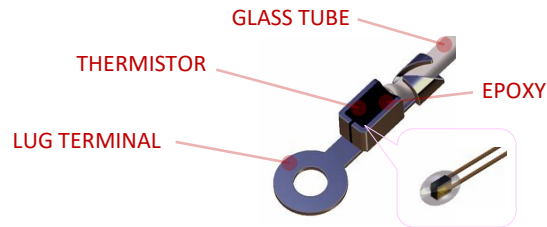


➤ Specification

- Thermistor type : AR-5
- Resistance : $R_{25} = 10.0k\Omega \pm 1\%$
- B Value : $B_{25/85} = 3435K \pm 1\%$
- Insulation Volt & Resistance : DC500V / Min. 100M Ω
AC1200V / 1sec.
- Operating Temperature : $-40^{\circ}C \sim +150^{\circ}C$

3. Inverter / Converter / Motor Module

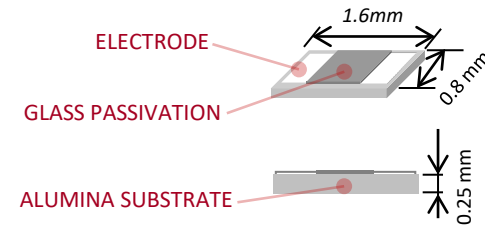
Inverter Converter Temp Sensor



➤ Specification

- Thermistor type : NT
- Resistance : $R_{180} = 0.7204k\Omega \pm 5\%$
- B Value : $B_{25/85} = 3,435K \pm 2\%$
- Insulation Volt & Resistance : DC500V / Min. $100M\Omega$
AC1800V / 1sec.
- Operating Temperature : $-40^{\circ}C \sim +200^{\circ}C$

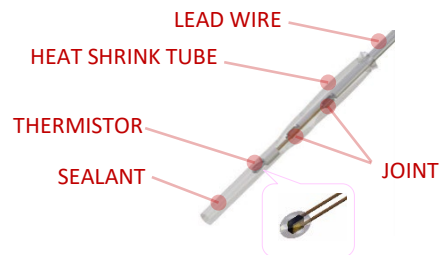
IGBT/SiC Temp Sensor



➤ Specification

- Thermistor type : FT
- Resistance : $R_{25} = 10k\Omega \pm 5\%$
- B Value : $B_{25/85} = 3,435K \pm 1\%$
- Insulation Volt & Resistance : DC100V / Min. $100M\Omega$
- Operating Temperature : $-40^{\circ}C \sim +125^{\circ}C$

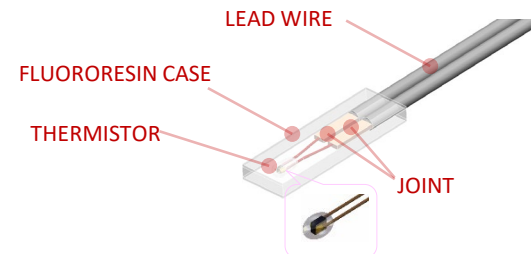
Motor Sensor



➤ Specification

- Thermistor type : NT
- Resistance : $R_{150} = 0.3118k\Omega \pm 3\%$
- B Value : $B_{25/85} = 3,435K \pm 2\%$
- Insulation Volt & Resistance : DC500V / Min. $100M\Omega$
AC1800V / 1sec.
- Operating Temperature : $-40^{\circ}C \sim +200^{\circ}C$

Motor Sensor



➤ Specification

- Thermistor type : NT
- Resistance : $R_{100} = 3.766k\Omega \pm 3.5\%$
- B Value : $B_{25/85} = 2,240K \pm 2\%$
- Insulation Volt & Resistance : DC500V / Min. $100M\Omega$
AC1800V / 1sec.
- Operating Temperature : $-40^{\circ}C \sim +200^{\circ}C$

4. Steering & Seat Heater/HVAC module

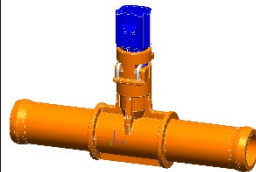
Seat (Warmer Sensor)



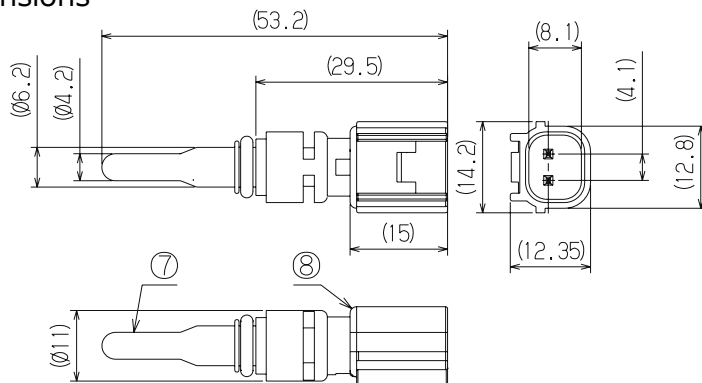
➤ Specification

- Thermistor type : AT
- Resistance : $R_{25} = 8.0k\Omega \pm 1\%$
- B Value : $B_{25/85} = 4,000K \pm 1\%$
- Insulation Volt & Resistance : DC100V / Min. 100M Ω
AC100V / 1sec.
- Operating Temperature : $-40^{\circ}C \sim +90^{\circ}C$

Coolant Sensor Appearance



Dimensions



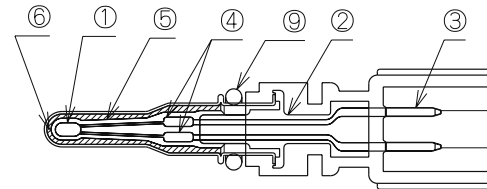
Specifications



【Response speed】 Approx. 6.1sec.
(room 25℃ → silicone oil 100℃)

【Temperature Range】 (A) -40℃~120℃
(B) -40℃~90℃

Materials



[unit : mm]

No.	Description
①	Thermistor
②	Terminal Insert Molding
③	Terminal
④	Solder
⑤	Under Coat
⑥	Filler
⑦	Pipe
⑧	Insert Molding
⑨	O Ring

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