Manifold Absolute Pressure (Temperature) Sensor

Description / Function

Manifold Absolute Pressure (Temperature) Sensor measures the pressure (temperature) of intake manifold for calculating indirectly the intake air flow quantity into the engine, and transmits the signal to Engine Control Unit for optimal fuel injection.

Customer Benefits

- Low cost design: high productivity of 8 million per year
- Can be designed as user requirements (Pressure/Mounting/Output)
- Integrated high level ESD / Surge protection circuit
- Digital EPROM trimming method

Technical Information

- Pressure measuring range: 10 ~ 115 kPa. Abs
- Output voltage: 0.5 ~ 4.5V
- Supply voltage: 5 ± 0.25V
- Accuracy: ±1.5%FS
- Operating temperature range: -40 ~ 150℃
Oxygen Sensor

Description / Function

Oxygen sensor measures the oxygen partial pressure of the exhausted gas to determine air-fuel ratio so as to reduce vehicle emissions by ensuring that engines burn their fuel efficiently and cleanly.

Customer Benefits

- Reduced vehicle emissions by measuring accurate air-fuel ratio
- Plasma TSP (Thermal Shock Protection) Coating to ensure high resistance to environmental influences (particularly water, salt, oil, and poisoning material)
- Low power consumption by integrated Heater into sensor element

Technical Information

<table>
<thead>
<tr>
<th></th>
<th>Binary Sensor</th>
<th>Linear Sensor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exhaust gas temperature</td>
<td>150~930℃</td>
<td>150~930℃</td>
</tr>
<tr>
<td>Output voltage</td>
<td>0 ~ 1 V</td>
<td>-2.45 ~ 2.54 mA</td>
</tr>
<tr>
<td>Light off time</td>
<td>Max. 10 sec.</td>
<td>Max. 7 sec.</td>
</tr>
<tr>
<td>Measuring range</td>
<td>λ=1</td>
<td>λ= 0.65 ~ Air</td>
</tr>
</tbody>
</table>
Air Flow Sensor

Description / Function

Air Flow sensor measures mass air flow ingested to engine to determine exhaust gas recirculation and fuel.

Customer Benefits

- High accuracy (back-flow detection, good pulsation performance)
- Long endurance (Robustness against dust with bypass design)
- Protection against contamination (chip-heating activated to avoid oil contamination of sensor element)

Technical Information

- **Air Flow Range**: -75kg/h ~ +1,000kg/h
- **Operating temperature**: -40 °C ~ 140 °C
- **Output signal**: Digital (SENT/Frequency output)
- **Response time**: Max10ms
- **Accuracy**: ±1.5%
Throttle Position Sensor

Description / Function
Throttle position sensor measures throttle valve opening to determine fuel and ignition timing.

Customer Benefits
- High accuracy (Brush contact technology)
- Long endurance (Shaft rotated by integrated level structure, Robustness against dust)

Technical Information
- Measuring range 0° ~ 100°
- Operating temperature -40 ~ 120°C
- Output signal Analog (0.2V ~ 4.8V)
- Accuracy ±2%
Crankshaft Position Sensor

**Description / Function**
Crankshaft Position Sensor detects the position and/or rotational direction of the target wheel (ferromagnetic material) on the crankshaft linked with piston in the engine cylinder.

**Customer Benefits**
- Fast start up; sensor activated within 1ms
- Rotational direction detection for ISG system
- High accuracy and repeatability
- High air-gap
- Applicable to big target wheel

**Technical Information**
- **Measuring range**: 0 ~ 10,000rpm
- **Overall accuracy**: +/-1.5 ° crk
- **Air gap**: 0.2 ~ 1.8mm
- **Supply voltage**: 4.6 ~ 18V
- **Operating temperature range**: -40 ~ +150 °C
- **Output signal**: Digital (open collector PWM output)
Camshaft Position Sensor

Description / Function
Camshaft Position Sensor detects the position of the target wheel (ferromagnetic material) on the camshaft which controls open and close of intake/exhaust valve.

Customer Benefits
- Fast start up; sensor activated within 1ms
- Flexible layout; twist insensitive mounting
- High accuracy; self-programming for each target wheel condition
- High air-gap
- Auto TPOS (True Power-On State)
- Auto IST (Individual Switching Threshold)

Technical Information
- Measuring range: 0 ~ 4,500rpm
- Overall accuracy: +/-3 ° cam
- Air gap: 0.2 ~ 2.0mm
- Supply voltage: 4.5 ~ 24V
- Operating temperature range: -40 ~ +150 °C
- Output signal: Digital (open collector output)
Fuel tank Pressure Sensor

Description / Function

FTPS measures the fuel tank pressure to detect the leakage of evaporated gas and diagnose the failure of the Purge Control Solenoid Valve (PCSV).

Customer Benefits

- Low cost design: high productivity of 2 million per year
- Can be designed as user requirements (Pressure/Mounting/Output)
- Integrated high level ESD / Surge protection circuit
- Digital EPROM trimming method

Technical Information

- Pressure measuring range: -6.666 ~ +6.666 kPa. Gauge
- Output voltage: 0.5 ~ 4.5V
- Supply voltage: 5 ± 0.25V
- Accuracy: ±2.5%FS
- Operating temperature range: -30 ~ 100 °C
Description / Function

The engine oil pressure and temperature are measured by OPS so that the ECU can control the oil pump.

Customer Benefits

- Can be designed as user requirements (Pressure/Mounting/Output)
- Integrated high level ESD / Surge protection circuit
- Measure oil temperature in oil pump assy (optional)
- Digital EPROM trimming method

Technical Information

- Pressure measuring range 0 ~ 10 bar.gauge
- Output voltage 0.5 ~ 4.5V
- Supply voltage 5 ± 0.25V
- Accuracy ±1.0%FS ~ ±2.0%FS (at 0bar. Gauge ~ 10bar. Gauge)
- Operating temperature range 40 ~ 140°C
Inhibitor Switch

Description / Function
The inhibitor Switch is installed on Auto transmission body and detects the position of gearshift.

Customer Benefits
- High accuracy (P/R/N/D detection, intermediate position detection)
- Long endurance (Robustness against dust, aluminum cover integrated)
- Low operating torque
- Non contacting type (PWM duty cycle output, Dual output)

Technical Information
- Detecting position: 7 positions of gearshift
  (P-R-N-D / intermediate position)
- Operating torque: max. 3.5kgf.cm
- Operation Temperature: -40°C ~ +150°C
- Acceptable current range: 0.2A ~ 15A
- Non-contact Type range: 10 ~ 90[%], 90 ~ 10[%]
Speed Sensor

Description / Function

Speed sensor detects the rotation velocity of the wheel axle and input RPM of the automatic transmission for optimal driving conditions controlled by the Transmission Control Unit (TCU).

Customer Benefits

- High air-gap
- Excellent accuracy and High sensitivity
- Wide Operating temperature range
- High ESD robustness, high EMC resilience

Technical Information

- Measuring frequency range: 0 ~ 10,000 Hz
- Air-gap: 0.2 ~ 2.0 mm
- Supply voltage: 7 ~ 20 V
- Operating temperature range: -40 ~ +150 °C
- Output signal: Digital output
Differential Pressure Sensor

Description / Function
DPS measures front and rear pressure difference of DPF (Diesel Particle filter) which is mounted at exhaust pipe. Measuring pressure is converted to electrical signal and transmitted to ECU. ECU determines the regeneration timing of DPF.

Customer Benefits
- Can be designed as user requirements (Pressure/Mounting/Output)
- Integrated high level ESD / Surge protection circuit
- Robustness against emission gas
- Digital EPROM trimming method

Technical Information
- Pressure measuring range: -14.3 ~ 100kPa.gauge
- Output voltage: 0.5 ~ 4.5V
- Supply voltage: 5 ± 0.25V
- Accuracy: ±2.25%FS
- Operating temperature range: -40 ~ 130 ℃
CVVL Position Sensor

Description / Function
CVVL Position Sensor measures rotation angle of CVVL control shaft to determine valve lift of intake

Customer Benefits
- High accuracy (Magnet integrated, individual programming in EoL)
- Long endurance
  (Non-contact measurement with IC, Robustness against dust)
- Smart sensor (Self-diagnosis, Redundancy output)

Technical Information
- Measuring range: 0° ~ 180°
- Operating temperature: -40 ~ 150°C
- Output signal: Digital (SPI output)
- Accuracy: ±2°
High Pressure Sensor

Description / Function

High Pressure Sensor on fuel rail measures pressure of fuel and transfer signal to Engine Control Unit.

Customer Benefits

- High accuracy from optimization of calibration
- (a small tolerance, good linearization of output)
- Excellent endurance
- (Electromagnetical and Environmental test, Worst Of Worst condition test of product, system and vehicle level)
- Light weight(32g), Miniaturization(46mm)

Technical Information

- Pressure Range: 0 bar ~ 280 bar.gauge
- Operating temperature: -40 ℃ ~ 140 ℃
- Over/Inverse voltage: ± 24 V
- Response time: max. 2 ms
- Accuracy: ±1.0%FS