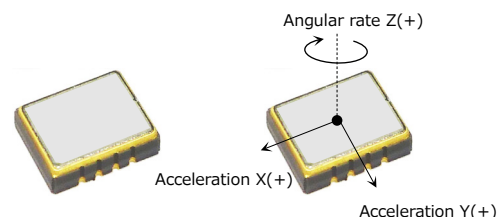


**COMBINED SENSOR  
FOR AUTOMOTIVE**

Product number  
**XC1011SD: X2E0000210002xx**

# XC1011SD

- Combined sensor integrating gyro sensor and dual-axis G sensor in one package
- Ultra-small and low power consumption using the original Double-T structure quartz crystal element
- High reliability by installing the diagnosis function
- Excellent performance of shock-resistance and vibration-resistance
- Digital output: angular rate (Yaw) / acceleration (X, Y-axis) 16bit, Temperature 11bit with SPI
- Conforms to AEC-Q100, Support evaluation of hardware elements in ISO26262 (ASIL D)


**Recommended Application**

- Electric Stability Control System

**Specifications (characteristics)**

| Item                  |                          | Symbol           | Specifications    | Conditions / Remarks                      |
|-----------------------|--------------------------|------------------|-------------------|-------------------------------------------|
| Supply Voltage        |                          | V <sub>DD</sub>  | 3.3 V ±0.165 V    |                                           |
| Storage Temperature   |                          | T <sub>STG</sub> | -40 °C ~ +105 °C  |                                           |
| Operating Temperature |                          | T <sub>OPR</sub> | -40 °C ~ +105 °C  |                                           |
| Angular rate sensor   | Sensitivity              | S <sub>y</sub>   | 175 ±5 LSB/(°/s)  | Ta=+25°C                                  |
|                       | Bias                     | V <sub>0</sub>   | ±525 LSB (±3 °/s) | Ta=+25°C, So=175 LSB/(°/s)                |
|                       | Rate range               | DR <sub>y</sub>  | ±160 °/s          |                                           |
|                       | Non-linearity            | NL <sub>y</sub>  | ±1 % FS           | FS= ±160 °/s                              |
|                       | Frequency characteristic | F <sub>cy</sub>  | 52.6 ±2.6 Hz      | -3dB bandwidth                            |
|                       | Cross axis sensitivity   | CS <sub>y</sub>  | ±5 %              |                                           |
| Acceleration sensor   | Sensitivity              | S <sub>a</sub>   | 1092±22 LSB/G     |                                           |
|                       | Zero G offset            | 0G               | ± 57 mG           | Ta=+25°C, Sa=1092LSB/G, without PCB mount |
|                       | Acceleration range       | DR <sub>a</sub>  | ± 30 G            | Lo-range, Mid-range                       |
|                       | Non-linearity            | NL <sub>a</sub>  | ±43 LSB           | ± 1G                                      |
|                       | Frequency characteristic | F <sub>c1</sub>  | 52.6±2.6 Hz       | Lo-range, -3dB bandwidth                  |
|                       |                          | F <sub>c2</sub>  | 200±10 Hz         | Mid-range, -3dB bandwidth                 |
|                       | Cross axis sensitivity   | CS <sub>a</sub>  | ±3 %              |                                           |
| Current consumption   |                          | I <sub>op</sub>  | 20 mA Max.        | Stationary and No-communication           |
| Start-up time         |                          | T <sub>ACT</sub> | 300 ms Max.       | from V <sub>DD</sub> rise-up 90%          |

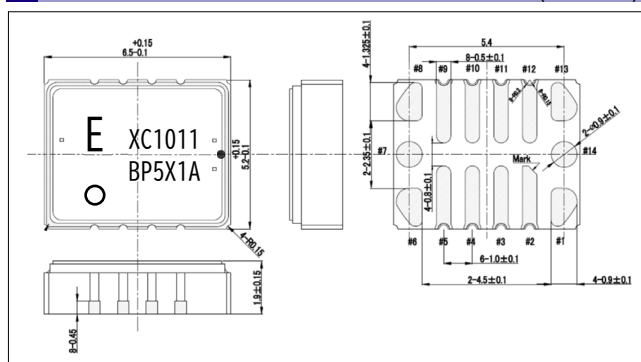
Product Name  
(Standard form)

**XC1011SD**    **50.300 kHz**

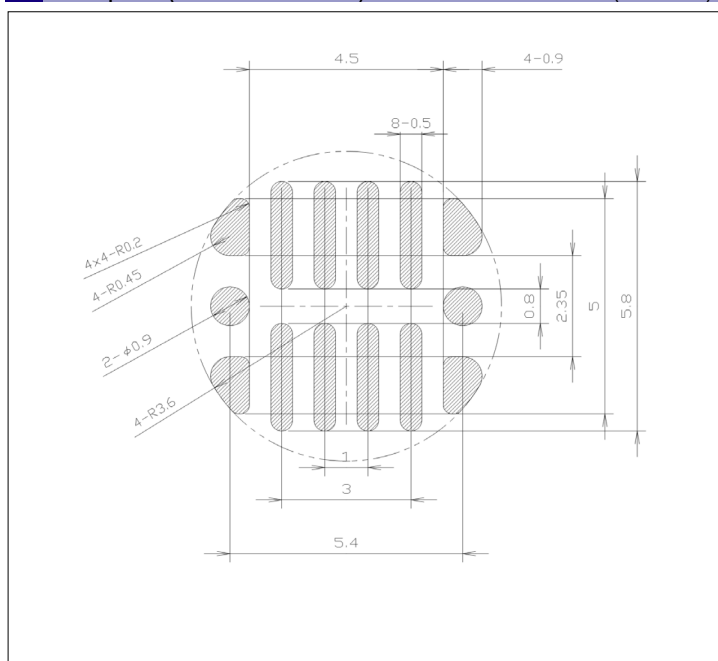
①    ②    ③  
① Model    ② Package type    ③ Frequency (not necessary to specify)

**External Dimensions**

(Unit: mm)


**Footprint (Recommended)**

(Unit: mm)


**Pin Function**

| Pin | Connection | Pin | Connection       |
|-----|------------|-----|------------------|
| 1   | N.C.       | 8   | N.C.             |
| 2   | SS         | 9   | V <sub>DDL</sub> |
| 3   | MISO       | 10  | V <sub>DD</sub>  |
| 4   | SCLK       | 11  | VREFAD           |
| 5   | MOSI       | 12  | GND              |
| 6   | N.C.       | 13  | N.C.             |
| 7   | N.C.       | 14  | N.C.             |

Do not connect "N.C." pins externally devices.

► Explanation of the mark that are using it for the catalog

|                                                                                   |                                                                                                                                                                                                                                 |
|-----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | ► Pb free.                                                                                                                                                                                                                      |
|  | ► Complies with EU RoHS directive.<br>*About the products without the Pb-free mark.<br>Contains Pb in products exempted by EU RoHS directive.<br>(Contains Pb in sealing glass, high melting temperature type solder or other.) |
|  | ► Designed for automotive general equipment.                                                                                                                                                                                    |
|  | ► Designed for automotive applications related to driving and safety.                                                                                                                                                           |

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