



Actual size

Features

- Small (5.7 x 4.8 x 1.2mm)
- Proven and robust silicon MEMS vibrating ring gyro
- Low bias instability (24°/hr) over short integration period (<1s)
- Low Angular Random Walk (0.28°/√hr)
- In-plane, orthogonal and 20° inclined sensing options (CRM100, CRM200 and CRM120)
- User selectable dynamic ranges; 75°/s, 150°/s, 300°/s and 900°/s (maximum 1,000°/s)
- Analogue and Digital (SPI®) output modes
- User adjustable bandwidth to 160Hz
- 3V supply
- Low power consumption (4mA)
- High shock and vibration rejection
- Hermetically sealed ceramic LCC surface mount package for temperature and humidity resistance
- Integral temperature sensor
- Low integration cost
- Design tools and resources available
- RoHS compliant
- AEC Q100 tested

Applications

- Automotive in-car navigation
- Precision GPS vehicle and personal navigation aiding
- Vehicle yaw, pitch and roll rate sensing
- Gesture sensing
- Motion tracking
- Pointing devices
- Precision agriculture
- Antenna stabilisation
- Industrial and robotics

1 General Description

PinPoint® is a single-axis MEMS angular rate sensor (gyro) capable of measuring angular velocity up to a maximum of $\pm 1,000^\circ/\text{s}$ which has two output modes; an analogue voltage signal which is linearly proportional to angular speed, and a digital signal in SPI® protocol. The choice of output mode; analogue or digital, is determined by the user when connecting it to the user's host PCBA; details of the electrical interface between PinPoint® and the host PCBA are given in Section 7.

PinPoint® is available in several configurations; a) CRM100 which measures angular velocity about an axis perpendicular to the plane of the host PCBA, referred to as 'in-plane' sensing, b) CRM200 which measures angular velocity about an axis which is parallel to the plane of the host PCBA, referred to as 'orthogonal' sensing and c) CRM120 which measures angular velocity about an axis 20° off the perpendicular for applications where the host PCBA is a 20° an inclined angle. This datasheet relates to part number CRM100.

With a combination of CRM100 and CRM200 it is possible for the user to measure angular rate of multiple axes (e.g. any combination of pitch, yaw and roll) from a single host PCBA.

PinPoint® is supplied as a PCBA surface mountable LCC ceramic packaged device. It comprises five main components; silicon MEMS ring Sensor, Pedestal, ASIC, Package Base and Lid. More details of the construction are given in Section 13.

There are eight actuators / transducers distributed evenly around the perimeter of the silicon MEMS ring. Located about its primary axes are a single pair of 'primary drive' actuators and a single pair of 'primary pick-off' transducers. Located about its secondary axes (at 45° to the primary) are two pairs of 'secondary pick-off' transducers see Figure 1.1.

The 'primary drive' actuators and 'primary pick-off' transducers act together in a closed-loop system to excite and control the ring primary operating vibration amplitude and frequency.

Secondary 'pick-off' transducers detect radial movement at the secondary axes, the magnitude of which is proportional to the angular speed of rotation and from which the gyro derives angular rate.

More information about the principles of operation are given in Section 13.

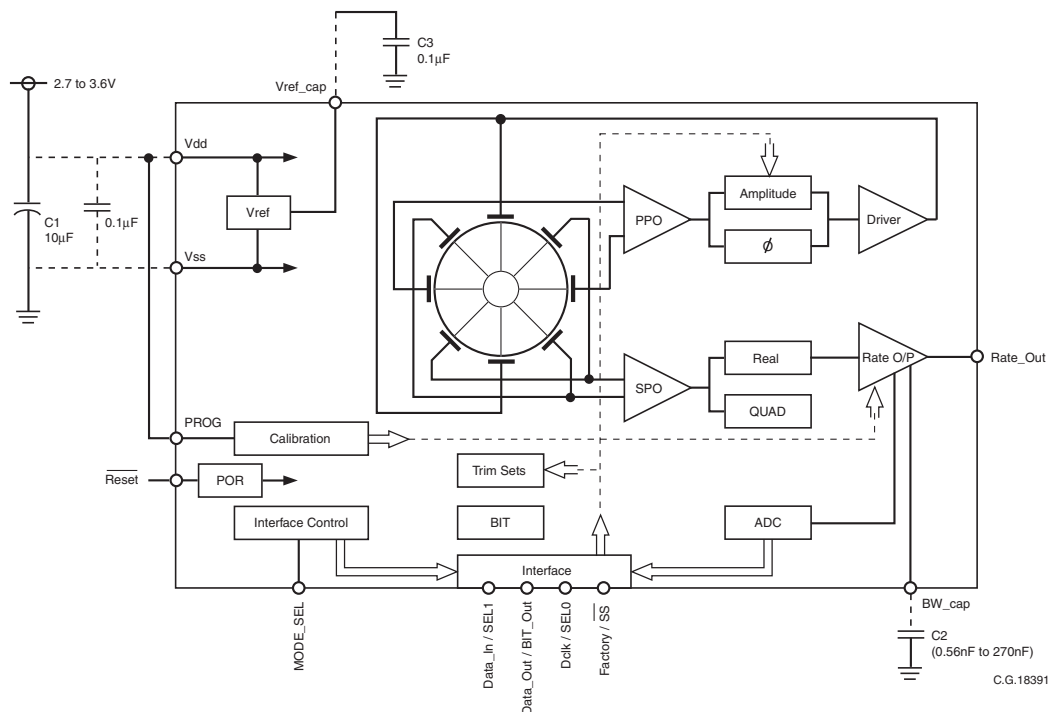


Figure 1.1 CRM100 Functional Block Diagram

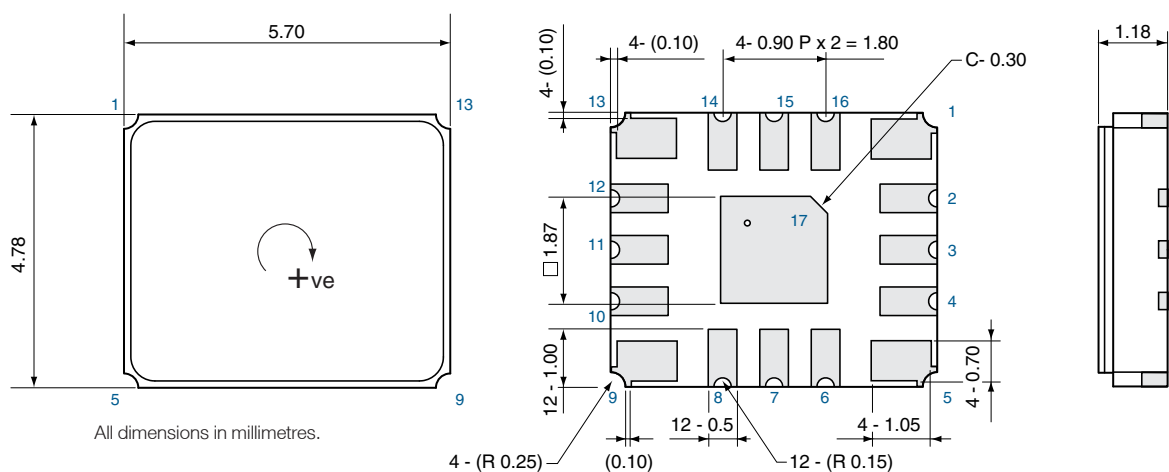


Figure 1.2 CRM100 Overall Dimensions