GENERAL DESCRIPTION

The ICM-456xy is an ultra-high-performance 6-axis MEMS motion sensor family with the world’s first BalancedGyro™ technology and lowest power consumption.

The sensor combines a 3-axis gyroscope and a 3-axis accelerometer in a compact 2.5 mm x 3 mm x 0.81 mm package. It has a configurable host interface that supports I³CSM, I²C, and SPI serial communication, triple interface (host interface + 2 Optical Image Stabilization (OIS) interface), up to 8 KB FIFO and 2 programmable interrupts.

FEATURES

- 6-axis current: 0.43 mA (Low Noise mode)
- Sensitivity error: ±0.2% with Self-Calibration
- Gyro Full-scale range: Up to ±4000 dps
- Accelerometer Full-scale range: Up to ±32g
- Gyro Noise: 3.8 mdps/rtHz
- Accelerometer Noise: 70 µg/rtHz
- eDMP - Enhanced Digital Motion Processor for implementing motion algorithms
- On-chip APEX Motion Functions: Pedometer, Tilt Detection, Single/Double Tap Detection, Raise to Wake, Wake on Motion, Free-Fall Detection, Significant Motion Detection, Low-G Detection, High-G Detection
- FIFO Data Rate (FDR) for system power savings
- Triple Interface (UI + 2 OIS) for OIS applications

HIGHLIGHTS

World’s first BalancedGyro technology

- Supreme vibration rejection (Lowest VRE, VIN)
- Best-in-class temperature stability
- Reduced sensor-to-sensor coupling

Highest accuracy self-calibration

- 5x sensitivity accuracy advantage
- Lifetime sensor accuracy of 0.2%
- No factory calibration overhead

Industry’s lowest current consumption

- Lowest 6-axis Active Motion current – 430 µA
- Ultra-low power mode; Sleep current – 2.9 µA

APPLICATIONS

- Smartphones and Tablets
- Hearables (TWS) and Wearables
- Augmented Reality Glasses
- Virtual Reality
- High-Accuracy Robotics
- Gaming Controllers
- Drones, Flight Controllers

<table>
<thead>
<tr>
<th>PART NUMBER</th>
<th>TARGET APPLICATIONS</th>
<th>INTERFACES</th>
<th>FSR</th>
<th>DATA RESOLUTION</th>
<th>RTC SUPPORT</th>
</tr>
</thead>
<tbody>
<tr>
<td>ICM-45686</td>
<td>AR/VR, HMD, and Controllers</td>
<td>Host Interface + AUX OIS Controller / I²C Master to connect external sensors</td>
<td>±4000dps, ±32g</td>
<td>16-bits (baseline); FIFO packet option: Gyro 19-bits, Accel 18-bits</td>
<td>Yes</td>
</tr>
<tr>
<td>ICM-45631</td>
<td>OIS Smartphones, OIS Modules</td>
<td>Host Interface + 2x AUX OIS Controller Interfaces</td>
<td>±2000dps, ±16g</td>
<td>16-bits (baseline); FIFO packet option: Gyro 19-bits, Accel 18-bits</td>
<td>Yes</td>
</tr>
<tr>
<td>ICM-45605</td>
<td>Wearables, Hearables, Game Controllers, Cameras, IoT, Drones</td>
<td>Host Interface + I²C Master to connect external sensors</td>
<td>±2000dps, ±16g</td>
<td>16-bits</td>
<td>No</td>
</tr>
</tbody>
</table>