6-Axis Dual-Mode (UI and OIS) MEMS MotionTracking™ Device

GENERAL DESCRIPTION

The ICM-20690 is a 6-axis MotionTracking device with a main Interface for UI and an Auxiliary interface configurable as SPI slave for Optical Image Stabilization (OIS) applications or as I2C Master to support other sensors such as compass or pressure sensor. It is available in a 2.5x3x0.91mm 14-pin LGA package.

- Concurrent UI+OIS with I2C/SPI Slave to host & Slave SPI at 20Mhz for OIS (low phase delay)
- Independent FSR selection for each interface
- OIS FSR range 32 to 250 for highest resolution
- Only solution with 4-axis OIS support concurrently
- Lowest gyro noise at 4 mdps
- Only 6-axis chip with 1% sensitivity tolerance that supports calibration-less production
- Best offset vs temperature performance
- EIS FSYNC support

The ICM-20690 features a 1K-byte FIFO that can lower the traffic on the serial bus interface, and reduce power consumption by allowing the system processor to burst read sensor data and then go into a low-power mode.

Other industry-leading features include on-chip 16-bit ADCs, programmable digital filters, an embedded temperature sensor, and programmable interrupts. The device features I^2C and SPI serial interfaces, a VDD operating range of 1.71 to 3.45V, and a separate digital IO supply, VDDIO from 1.71V to 3.45V.

ORDERING INFORMATION

PART	TEMP RANGE	PACKAGE
ICM-20690†	−40°C to +85°C	14-Pin LGA

†Denotes RoHS and Green-Compliant Package

BLOCK DIAGRAM
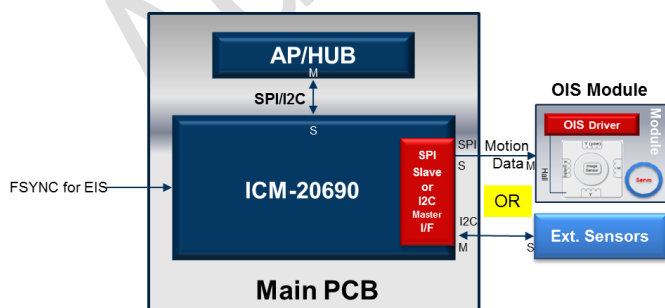
APPLICATIONS

- Smartphones and Tablets
- Head Mounted Displays
- Wearable Sensors

FEATURES

- 3-Axis Gyroscope with independently programmable FSR of ±31.25, ±62.5, ±125, ±250, ±500, ±1000 and ±2000dps for UI and OIS paths
- 3-Axis Accelerometer with independently programmable FSR of ±2, ±4, ±8 and ±16g for UI path and ±1, ±2, ±4 and ±8g for OIS path
- Host interface: 8MHz SPI or 400kHz I2C slave
- Auxiliary interface: 20MHz SPI slave interface (e.g. interface to OIS controller) OR 400kHz I2C master interface (e.g. interface to external sensors)
- 1K byte FIFO buffer enables the application processor to read the data in bursts
- On-Chip 16-bit ADCs and Programmable Filters
- Digital-output temperature sensor
- VDD operating range of 1.71 to 3.45V
- MEMS structure hermetically sealed and bonded at wafer level
- RoHS and Green compliant

TYPICAL OPERATING CIRCUIT