

## World's First Wide-Range 6-Axis MotionTracking™ Device for Sports

### GENERAL DESCRIPTION

Many of today's wearable and sports solutions, which analyze the motion of a user's golf or tennis swings, soccer ball kicks, or basketball activities, require higher than currently available  $\pm 2000$  dps (degrees per second) FSR for gyroscope and  $\pm 16g$  FSR for accelerometer to better insure that critical data is not lost at the point of high impact or high speed rotation. The ICM-20649 6-axis inertial sensor offers the smallest size, lowest profile and lowest power in conjunction with industry leading high FSR.

With an extended FSR range of  $\pm 4000$  dps for gyroscope and  $\pm 30g$  for accelerometer, the ICM-20649 enables precise analysis of contact sports applications providing continuous motion sensor data before, during and after impact providing more accurate feedback

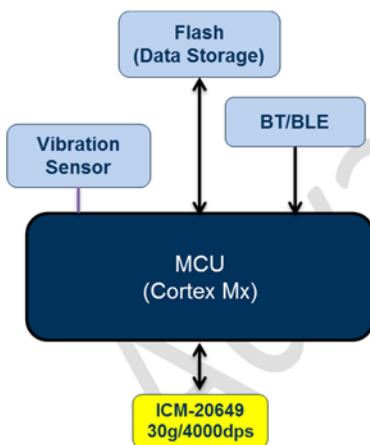
The ICM-20649 is the world's first wide-range 6-axis MotionTracking device for Sports and other High Impact applications. It is available in a 3x3x0.9mm 24-pin QFN package.

### ORDERING INFORMATION

PART	TEMP RANGE	PACKAGE
ICM-20649†	-40°C to +85°C	24-Pin QFN

†Denotes RoHS and Green-Compliant Package

### BLOCK DIAGRAM



**Motion Analysis Pod Architecture**

### APPLICATIONS

- Sports
- Wearable Sensors
- High Impact Applications

### FEATURES

- 3-Axis Gyroscope with Programmable FSR of  $\pm 500$ dps,  $\pm 100$ dps,  $\pm 2000$ dps and  $\pm 4000$ dps
- 3-Axis Accelerometer with Programmable FSR of  $\pm 4g$ ,  $\pm 8g$ ,  $\pm 16g$  and  $\pm 30g$
- User-programmable interrupts
- Wake-on-motion interrupt for low power operation of applications processor
- 512 byte FIFO buffer enables the applications processor to read the data in bursts
- On-Chip 16-bit ADCs and Programmable Filters
- DMP Enabled:
  - SMD, Step Count, Step Detect, Activity Classifier, RV, GRV
  - Calibration of accel/gyro/compass
- Host interface: 7 MHz SPI or 400 kHz Fast Mode I2C
- Digital-output temperature sensor
- VDD operating range of 1.71 V to 3.6 V
- MEMS structure hermetically sealed and bonded at wafer level
- RoHS and Green compliant

### TYPICAL OPERATING CIRCUIT

