



**THE DATASHEET OF  
ICM-20689**



## High Performance 6-Axis MEMS MotionTracking™ Device in 4x4 mm Package

### GENERAL DESCRIPTION

The ICM-20689 is a 6-axis MotionTracking device that combines a 3-axis gyroscope, 3-axis accelerometer, and a Digital Motion Processor™ (DMP) in a small 4x4x0.9 mm (24-pin QFN) package.

- Large 4K-byte FIFO to reduce 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
- Gyroscope programmable FSR of  $\pm 250\text{dps}$ ,  $\pm 500\text{dps}$ ,  $\pm 1000\text{dps}$  and  $\pm 2000\text{dps}$
- Accelerometer with Programmable FSR of  $\pm 2g$ ,  $\pm 4g$ ,  $\pm 8g$  and  $\pm 16g$
- EIS FSYNC support

The ICM-20689 includes on-chip 16-bit ADCs, programmable digital filters, an embedded temperature sensor, and programmable interrupts. The device features an operating voltage range down to 1.71 V. Communication ports include I<sup>2</sup>C and high speed SPI at 8 MHz.

### APPLICATIONS

- Mobile phones and tablets
- Drones
- Motion-based game controllers
- 3D remote controls for Internet connected DTVs and set top boxes, 3D mice
- Wearable sensors for health, fitness and sports

### FEATURES

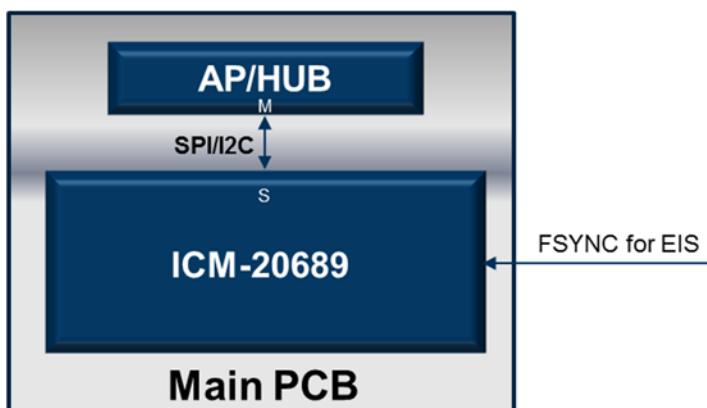
- User-programmable interrupts
- Wake-on-motion interrupt for low power operation of applications processor
- 4K-byte FIFO buffer enables the applications processor to read the data in bursts
- On-Chip 16-bit ADCs and Programmable Filters
- Host interface: 8 MHz SPI or 400 kHz Fast Mode I<sup>2</sup>C
- Digital-output temperature sensor
- VDD operating range of 1.71 V to 3.45 V
- MEMS structure hermetically sealed and bonded at wafer level
- RoHS and Green compliant

### ORDERING INFORMATION

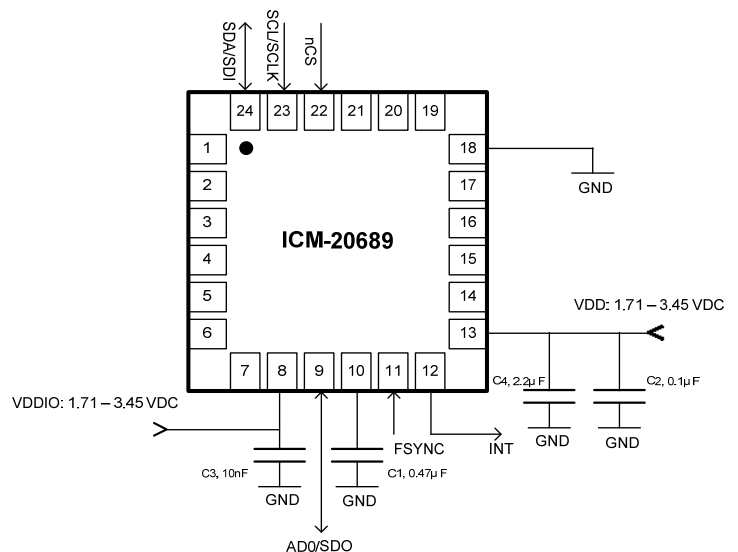
PART	TEMP RANGE	PACKAGE
ICM-20689†	-40°C to +85°C	24-Pin QFN

†Denotes RoHS and Green-Compliant Package

### BLOCK DIAGRAM



### TYPICAL OPERATING CIRCUIT



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