hillcrestlabs™
an InterDigital company

FSM300

Freespace® AHRS/IMU Module

Product Brief

FSM300

freespace® by Hillcrest Labs

The FSM300 is a self-contained AHRS/IMU module integrating a 3-axis accelerometer, 3-axis gyroscope, and 3-axis magnetometer, along with a low-power 32-bit ARM Cortex M0+ MCU running Hillcrest's high-performance sensor hub software stack.

The FSM300 provides superior AHRS and IMU performance for all human and machine motions in many consumer and IoT applications. The small, turn-key component benefits developers and integrators through faster time-to-market, reductions in development time, reduced BOM cost, and the highest precision and quality.

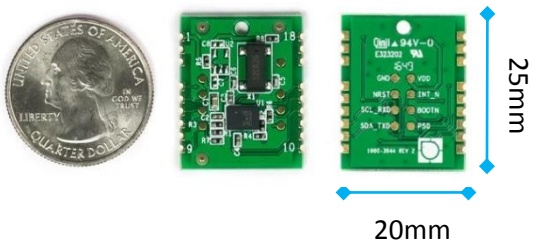
FEATURE HIGHLIGHTS

- ✓ **MotionEngine™ 9-Axis and 6-Axis Sensor Fusion –** Provides raw, calibrated and fused sensor orientation data with best in class accuracy and stability
- ✓ **Configurable Sampling Rate –** Sampling rates up to 1 kHz to create seamless experiences
- ✓ **Calibration –** Both dynamic and factory-based calibration to deliver the highest performance
- ✓ **Intelligent Power Management –** Manages sensor states to conserve power without sacrificing quality of motion data
- ✓ **Simplified UART Interface** – Requires no configuration and simply outputs data
- ✓ **Magnetic Interference Rejection** – Algorithms detect and remove effects of hard and soft iron interference
- ✓ **Always-on Capabilities –** Low power, high accuracy algorithms like step counter, tap, and shake detectors
- ✓ **Activity Tracking –** Walking, Running, On Bike, and In Vehicle state detection for context-aware applications
- ✓ **Suitable for Android, Linux, and Embedded Designs –** Driver example code available for ease of integration
- ✓ **Firmware Upgradeable** – Embedded bootloader enables factory and in-field firmware updates

PHYSICAL ATTRIBUTES

Software	motion engine	Hillcrest Labs' proprietary sensor processing software	
Sensors	accel	gyro	mag
Processor	mcu	ARM Cortex-M0+	
Interfaces	I2C	SPI	UART

Dimensions



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TYPICAL CONSUMER AND IOT APPLICATIONS

Robots / Autonomous Vehicles

Industrial Monitoring

Wearable

PERFORMANCE METRICS AND CALIBRATION

Key Performance Metrics

Sampling Rate	Up to 1 KHz
Latency	2.0 msec
Rotation Vector Accuracy	3.0° - Dynamic* 1.0° - Static*
Long-Term Heading Drift	0.5 °/min
Max Rate Angle	± 2000 °/s
Power Consumption	11.4mA @ 3.0V

**Specs for 3D calibrated module*

Calibration Options

The FSM300 is calibrated in the z-axis, providing increased precision and consistency across devices for applications involving planar motion. Proprietary dynamic calibration algorithms internal to the FSM300 improve performance over time.

The FSM305 features full 3D factory calibration for applications demanding high-accuracy orientation measurements beyond what dynamic calibration provides. Please contact Hillcrest for more information.

ABOUT HILLCREST LABS

Hillcrest Labs, a subsidiary of InterDigital, Inc. (NASDAQ:IDCC), is a leading global supplier of software, components and intellectual property to enable the intelligent use of sensors in consumer electronics and IoT devices. Our proprietary and patented Freespace® technology transforms human and machine movement into high quality, application-ready information which enables developers and manufacturers to create everyday products that work with precision. Learn more at hillcrestlabs.com or contact us.

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