

# BHA260

## Ultra-low power and high-performance smart sensor hub with integrated accelerometer

### GENERAL DESCRIPTION

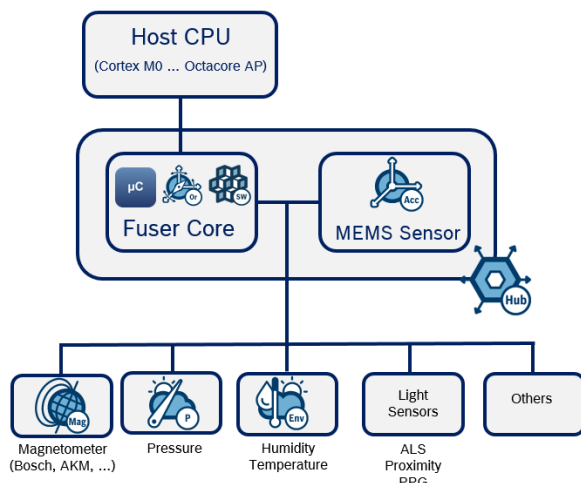
The BHA260 is a family of ultra-low power smart hubs consisting of Bosch Sensortec's new, programmable 32-bit microcontroller (Fuser2), a state-of-the-art 3-axis accelerometer and a powerful software framework containing pre-installed sensor fusion and other sensor processing software within a small 22 pad LGA package.

The Fuser2 Core is configurable to operate at 20 MHz (Long Run mode) and 50 MHz (Turbo mode). It can boot from a wide variety of hosts, ranging from a small Cortex-M0™ MCU up to multicore application processors. In combination with its wide connectivity and extensibility, the BHA260 becomes a versatile and ideal solution when it comes to always-on sensor processing at ultra-low power consumption.

### BHA260 TARGET APPLICATIONS

- ▶ 24/7 always-on sensor processing at ultra-low power consumption
- ▶ Power management and wake-up control, 3D orientation, step counting, activity recognition, pose and head tracking, context awareness
- ▶ Wrist-mounted, hearables, eyewear and other wearable devices
- ▶ Smartphones and other mobile communication devices
- ▶ AR/VR/MR reality headset and controller devices

### OVERVIEW



### FEATURES

The BHA260 provides an ideal all-in-one solution for always-on sensor applications such as fitness tracking, step counting, indoor navigation and gesture recognition.

#### Hardware features

##### CPU Core

- ▶ ARC EM4 CPU with ARCV2 16/32 bit instruction set (up to 3.6 CoreMark/MHz)
- ▶ Floating Point Unit (FPU) / Memory Protection Unit (MPU)
- ▶ 4-channel micro DMA Controller / 2-way associative Cache Controller

##### Memory

- ▶ 256 kByte on-chip SRAM
- ▶ 144 kByte on-chip ROM preloaded with software

##### Connectivity

- ▶ Host interface configurable as SPI or I2C
- ▶ 2 master interfaces (1x selectable SPI/I2C master and 1xI2C master)
- ▶ Up to 12 GPIOs
- ▶ Fast I/O operations:
  - ▶ SPI and GPIOs up to 50 MHz
  - ▶ I2C up to 3.4 MHz

##### Integrated sensor

- ▶ 16-bit 3-axis accelerometer

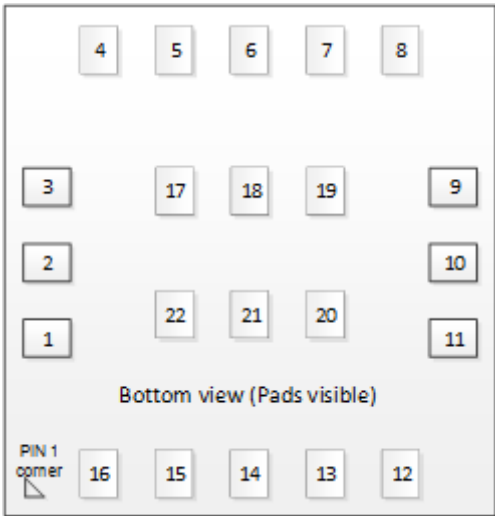
#### Software features

- ▶ Open sensor development platform
- ▶ Integrated Software Framework and OpenRTOS™ with full Android™ compliant sensor stack
- ▶ Integrated BSX sensor fusion software for reliable 3D motion tracking, activity recognition, and more
- ▶ Powerful SDK for easy customization and support for
  - ▶ Metaware C Compiler for ARC
  - ▶ GNU C Compiler for ARC

**TECHNICAL SPECIFICATIONS**

BHA260 Technical data	
Operating voltage	1.8 V
Current consumption	
Fuser2 (running CoreMark)	
– Long Run mode (20 MHz)	950 µA
– Turbo mode (50 MHz)	2.8 mA
Sensor Algorithm operation (including sensor)	
– Significant Motion	32 µA
– Step Counter	46 µA
– Activity Recognition	77 µA
Standby current	8 µA
Sensor Fusion Performance	
– Static accuracy (Head., Pitch, Roll)	2, 2, 2, Degrees
– Dynamic accuracy (Head., Pitch, Roll)	7, 2, 2 Degrees
– Calibration time	<1 second
– Orientation stabilization time	0.2 seconds

**PIN CONFIGURATION**



8	VREG	Voltage regulator output
9		Host Interface:
		SPI MISO /
	HSDO	I2C address select
10		Host Interface:
	HSDX	SPI MOSI / I2C SDA
11		Host Interface:
		SPI Chip select /
	HCSB	Protocol Select
12	M3SDA	M3 I2C SDA
13	RESETN	Reset input
14	M3SCL	M3 I2C SCL
15	MCSB3	SPI Chip Select 3
16	M2SCX	M2: SPI SCK / I2C SCL
17	MCSB2	SPI Chip Select 2
18	MCSB1	SPI Chip Select 1
19		Host Interface
	HSCX	SPI SCK / I2C SCL
20	HIRQ	Host Interface Interrupt
21		M2: SPI MISO /
	M2SDI	I2C unused
22	RESV	Do Not Connect

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Pin configuration		
Pin	Name	Description
1	JTAG_CLK	Debug Clock
2	M2SDX	M2: SPI MOSI / I2C SDA
3	JTAG_DIO	Debug Data
4	GND	Analog Sensor Ground
5	GNDIO	Digital IO and Fuser Ground
6	VDDIO	Digital IO and Fuser Supply
7	VDD	Analog Sensor Supply

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