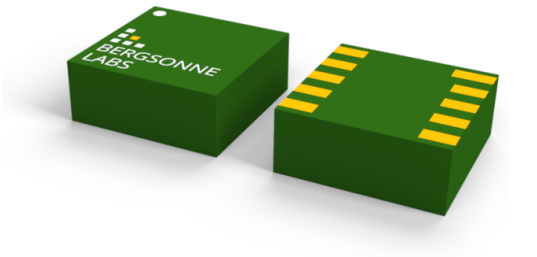
Sense.I.6P8

high-precision 6-DOF IMU

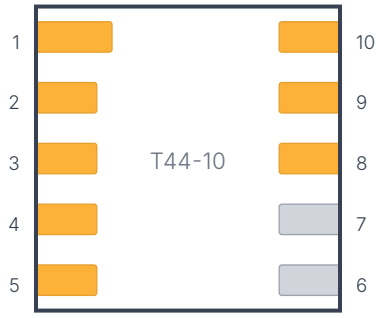
The Sense.I.6P is a precision 6-DOF inertial measurement unit based on the TDK Invensense ICM-42688P. The 16-bit accelerometer full-scale range can be set to +/- 2g, 4g, 8g, or 16g with an output data rate of up between 1.5Hz and 32kHz, while the 16-bit gyro range can be set to +/- 15.6, 31.5, 62.5, 125, 250, 500, 1000, or 2000 degrees per second with an output data rate of 12.5Hz and 32kHz. The sensor includes a user-programmable filters, on-board motion functions (pedometer, tilt, tap, raise, etc.), and a 2kB FIFO. This IMU is functionally very similar to the Sense.I.6P6, which has higher maximum ranges (32g and 4000 degrees per second) but with slightly higher gyro noise and worse temperature stability.



Overview

Revision	a
Package	T44-10
Supply	1.8–3.6V
Component	ICM-42688P
Interfaces	I2C, I3C, SPI

Pad Assignments



(top view)

PAD	TYPE	FUNCTION	NOTE
1	power	GND	
2	digital	I2C.ADO	internal pull-up sets the I2C address to 0x69, ground for 0x68
	interface	SPI.MISO	
3	digital	I2C.EN	internal pull-up enables I2C/I3C, ground for SPI
	interface	SPI.CS	
4	interface	I2C.CLK	
	interface	SPI.CLK	
	interface	I3C.CLK	
5	interface	I2C.DAT	
	interface	SPI.MOSI	
	interface	I3C.DAT	
8	digital	INT2	
9	digital	INT1	
10	power	V+	1.8-3.6V

Interfaces

I2C

I2C

Mode	slave
Addresses	0x69 (default), 0x68
Format	7-bit addr

FUNCTION	REQ	PAD(S)
I2C.CLK	Yes	4
I2C.DAT	Yes	5

I3C

I3C

Mode	slave
Max Clock	12.5MHz (SDR)

FUNCTION	REQ	PAD(S)
I3C.CLK	Yes	4
I3C.DAT	Yes	5

SPI

SPI

Mode	slave
Max Clock	24MHz

FUNCTION	REQ	PAD(S)
SPI.MISO	Yes	2
SPI.CS	Yes	3
SPI.CLK	Yes	4
SPI.MOSI	Yes	5

Application Notes

Sensor Axes

The Z axis of the IMU protrudes through the center of the tile, while the XY plane is approximately 1.0mm from the bottom surface of the tile, with the X axis pointing toward the left side (pads 1-5), as shown.