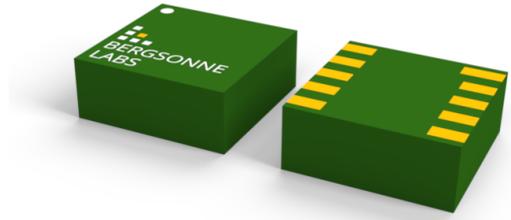




# Sense.I.9

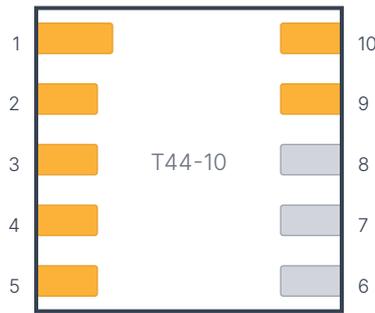
## digital 9-DOF IMU

The Sense.I.9 embeds the TDK InvenSense ICM20948 IMU with a co-packaged 6-DOF IMU and a 3-DOF magnetic compass. The triaxial accelerometer has a configurable 16-bit full-scale range from +/-2g to +/-16g with an output data rate up to 4.5 kHz, while the triaxial rate gyroscope has a 16-bit full-scale range from +/-250 to 2000 degrees per second with an output data rate up to 9 kHz. The triaxial magnetic compass has a 16-bit full-scale range of +/-4900µT with an output data rate of up to 100 Hz. The sensor includes configurable filters and an on-board motion processor.



Overview	
Revision	c
Package	T44-10
Supply	1.71-1.95V
Component	ICM-20948
Interfaces	I2C, SPI

## Pad Assignments



(top view)

PAD	TYPE	FUNCTION	NOTE
1	power	GND	
2	digital interface	I2C.AD0 SPI.MISO	weak internal pull-up sets I2C address to 0x69. Connect to GND to set I2C address to 0x68.
3	digital interface	I2C.EN SPI.CS	weak internal pull-up enables I2C. Connect to GND to switch to SPI mode.
4	interface interface	I2C.CLK SPI.CLK	when using a non-Core processor, ensure adequate external pull-up resistance.
5	interface interface	I2C.DAT SPI.MOSI	when using a non-Core processor, ensure adequate external pull-up resistance.
9	digital	INT	programmable interrupt output
10	power	V+	1.71-1.95V

## Interfaces

I2C <span style="float: right;">I2C</span>			SPI <span style="float: right;">SPI</span>		
Mode		slave	Mode		slave
Max Clock		400kHz	Max Clock		7MHz
Addresses		0x69 (default), 0x68			
Format		7-bit addr, 8-bit data			
FUNCTION	REQ	PAD(S)	FUNCTION	REQ	PAD(S)
I2C.CLK	Yes	4	SPI.MISO	Yes	2
I2C.DAT	Yes	5	SPI.CS	Yes	3
I2C.AD0	No	2	SPI.CLK	Yes	4
I2C.EN	No	3	SPI.MOSI	Yes	5

## Application Notes

### Sensor Axes

The IMU and compass origins are colocated, with the axes aligned at the center of the IC, which is at (-0.2, -0.2) mm relative to the center of the tile. The Z axis (blue head) of the sensor extends from the top surface of the tile, while the X axis (red head) points up between pads 1 and 10.

