

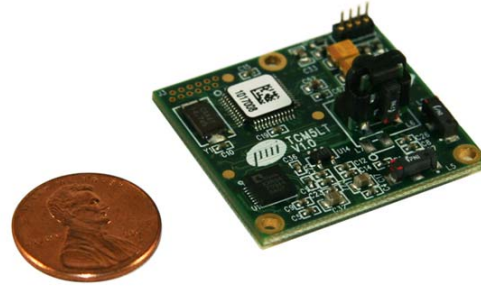
PNI – TCM5LT

360° Tilt Compensated 3-axis Compass Module

General Description

The TCM5LT uses advanced algorithms, with hard iron and soft iron corrections, to provide highly accurate heading information, in **any orientation**. This is accomplished by integrating 3-axis magnetic field sensing, 3-axis tilt sensing, and compass heading into a single module. The output information of the unit will indicate accurate attitude position (X, Y and Z coordinates) of the module and can be used in systems requiring full 360° rotation. Advanced electronics and built in algorithms counter the effects of hard and soft iron interference, making the TCM5LT accurate in most any environment. PNI's patented Magneto-Inductive (MI) sensors and pioneering processor technology combine to provide all this performance under a low power budget that extends mission duration.

The magnetic sensors and accelerometers are calibrated to operate from -40 to 85°C; hence the measurement is very stable over temperature and inherently free from offset drift



Features

- Tilt compensated compass heading over full 360° rotation
- High accuracy compass heading: 0.3°
- Ultra low power (sleep) mode: 85-220 μ A
- High resolution: 0.1°
- High repeatability: 0.05°
- Multiple measurement modes: Compass heading, magnetic field and tilt
- Calibrated field measurement range: $\pm 125 \mu$ T (± 1.25 Gauss)
- High resolution field measurement: 0.05μ T (0.0005 Gauss)
- Advanced calibration: Hard and Soft Iron
- Compact size: 3.3 x 3.1 x 1.3 cm
- Calibrated magnetic field intensity in 3 dimensions.
- Data output via logic level using a binary high performance protocol for superior data integrity and scalability
- Improved start-up time over the TCM5L: 40-70 mSec from power down for valid measurement; 10-25 mSec from power down to power up acknowledgement.
- Simplified calibration routine requiring only 12 calibration points available for difficult to maneuver applications

Ordering Information

NAME	Part Number	Package
TCM5LT	12720	Each

PNI – TCM5LT 360° Tilt Compensated 3-axis Compass Module

Parameter	TCM5LT	Units
Heading Specifications		
Accuracy with <70° of tilt	0.3°	Deg RMS
Accuracy with >70° of tilt	0.5°	
Resolution	0.1°	
Repeatability [1]	0.05°	
Max Dip Angle w/ accuracy	85°	Deg
Magnetometer Specifications		
Calibrated Field Measurement Range	± 125	µT
Magnetic Resolution	± .05	
Magnetic Repeatability	± 0.1	
Tilt Specification		
Pitch Accuracy	0.2°	Deg RMS
Roll Accuracy	0.2° for Pitch < 65°	
	0.5° for Pitch < 80° 1.0° for Pitch < 86°	
Tilt Range	± 90° pitch ± 180° roll	Deg
Tilt Resolution	< 0.01°	Deg RMS
Tilt Repeatability [1]	0.05°	
Calibration		
Hard Iron Calibration	Yes	
Soft Iron Calibration	Yes	
Mechanical Specifications		
Dimensions (L x W x H)	3.3 x 3.1 x 1.3	cm
Weight	12	grams
Mounting Options	Screw mounts/standoff Horizontal or Vertical	
Interface Connector	4-pin	
I/O Specifications		
Latency from power-down to valid measurement	≤ 70	mSec
Latency from power-down to power-up	≤ 25	
Maximum Sample Rate	20	samples/sec
UART Communication Rate	300 to 115200	baud
Output Formats	Binary High Performance Protocol	
Power Specifications		
Supply Voltage	3.3 to 5.5 (unregulated)	VDC
Current Draw – Poll mode	11.5 RMS	mA
Current Draw – Push mode	7.2 RMS	
Idle Mode	7.2 – 11.5	µA
Sleep Mode	85 – 220	
Environmental Specifications		
Operating Temperature	-40° to 85°	C
Storage Temperature	-40° to 85°	
Shock	Up to 2500 G's per MIL-STD-810F	
Vibration	Qualified to MIL-STD-810F	
Humidity	Non-condensing/Qualified to MIL-STD-810F	

[1] Repeatability is based on statistical data at ±3 sigma limit about the mean