MTLT305D Series

Dynamic Tilt Sensor Module

The ACEINNA MTLT305D is a dynamic tilt sensor, 3D accelerometer and 3D Rate Sensor (Gyro) with CAN J1939 and RS232 Interfaces. The MTLT305D integrates highly reliable MEMS based accelerometers and gyroscopes, a 32-bit microprocessor, protection and supporting circuitry for robust operation in many environments. The MTLT305D uses advanced sensor fusion, Extended Kalman Filtering and calibration algorithms to achieve 0.5 degree tilt and <10 milli-g acceleration accuracy in a wide variety of dynamic conditions. The MTLT30xD available in an IP68, 69K plastic enclosure with an IP67 Ampseal 16 6 position connector.

Applications

- Construction (boom tilt measurement, bucket leveling)
- Tilt/slope safety for dynamic vehicles (forklift, aerial lifts)
- Vehicle Attitude Monitoring
- Robotics Control

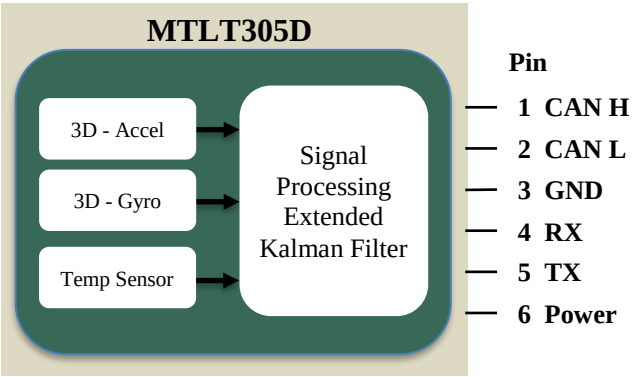
Construction

Aerial Lift

Platform

Features

- High Performance 3 axis MEMS Accelerometer and Inclination Sensor
- Gyro compensated with Extended Kalman Filter for Dynamic conditions
- Standard Performance Grade
  - 0.15º Static accuracy
  - 0.50º Dynamic accuracy
- CAN 2.0 J1939 Interface
- Miniature IP68, 69K enclosure (65 x 66 x 27 mm)
- Wide Temp Range, -40C to +85C
- High Reliability, MTBF > 50k hours
- ITAR- Free



Tools and Support

NAV-VIEW provides an easy to use graphical interface to display, record, playback, and analyze all the MTLT305D parameters over the RS232 port.

NAV-VIEW can also be used to set a wide range of user-configurable fields in the MTLT305D to optimize the system performance for your dynamic applications.

NAV-VIEW software is available for download from ACEINNA's website at: www.aceinna.com/support

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MTLT305D Series

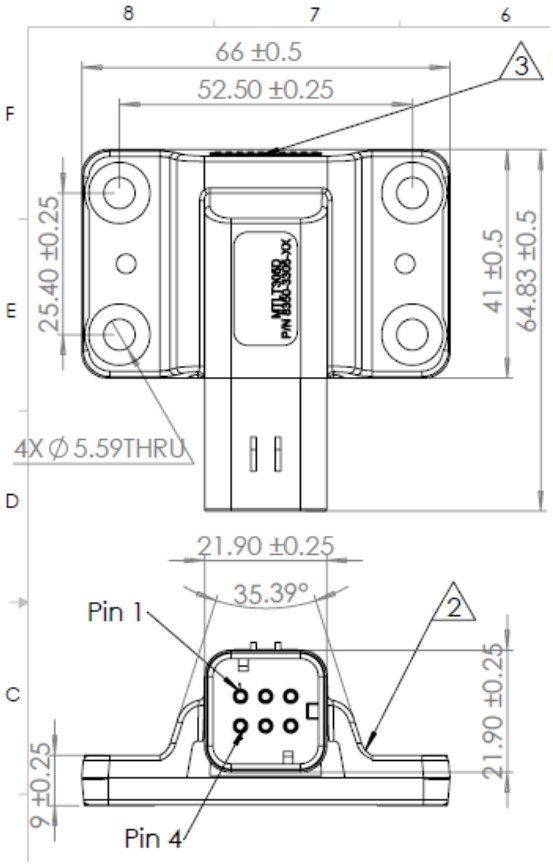
Dynamic Tilt Sensor Module

Performance Characteristics

Ta = 25°C, VDC = 15.0V, unless otherwise stated

Sensor Performance	
	MTLT305D
Axes (Tilt)	Pitch; Roll
Range	±70°, ±180°
Resolution	<0.05°
Max Angular Rate	≤400 °/s
Static Accuracy[1] TA = 25 C	0.15°
Dynamic Accuracy[2]	0.50°
Temperature Stability[3]	0.05°
Axes (Acceleration)	X, Y, Z
Range	±78 m/s/s
Resolution	0.01 m/s/s
Accuracy (±1g input; -40 to 85C)	±0.1 m/s/s
Output Data Rate (Hz)	Selectable to 100 Hz
Electrical	
Input Voltage	4.9 V – 32 V
Power Consumption	<400 mW
Interface	CAN2.0 J1939
Environment	
Operating Temperature (°C)	-40 °C to 85°C
Non-Operating Temperature (°C)	-40 °C to 85°C
Physical	
Enclosure	Plastic
Interface	Ampseal 16 6 Position
Size (mm)	65 x 66 x 27
Protection Class	IP 68, 69K (IP67 Mated)

Note 1: RMS Error over entire operating angle range
Note 2: RMS Error during 50-minute Passenger Vehicle Drive test, referenced to Novatel system
Note 3: RMS Error of deviation from 25C value. Pitch and Roll = 0



Absolute Maximum Ratings	
Input Voltage (V)	36 (1hr)
Load Dump	ISO16750-2(2010) pulse 5b (Vc = 56V, Ri = 8Ω)
Shock	1000 g ½ sine 0.1 ms any Axis

Part Ordering Information	
MTLT305D	3D Rate, 3D Linear Acceleration and Pitch and Roll Sensor
MTLT305D Cable	Mating Connector with Flying leads

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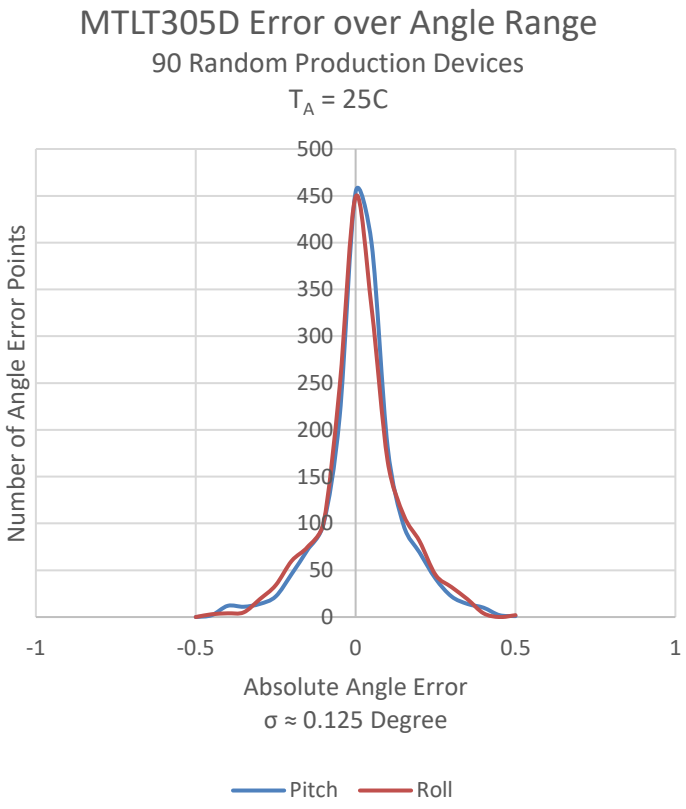
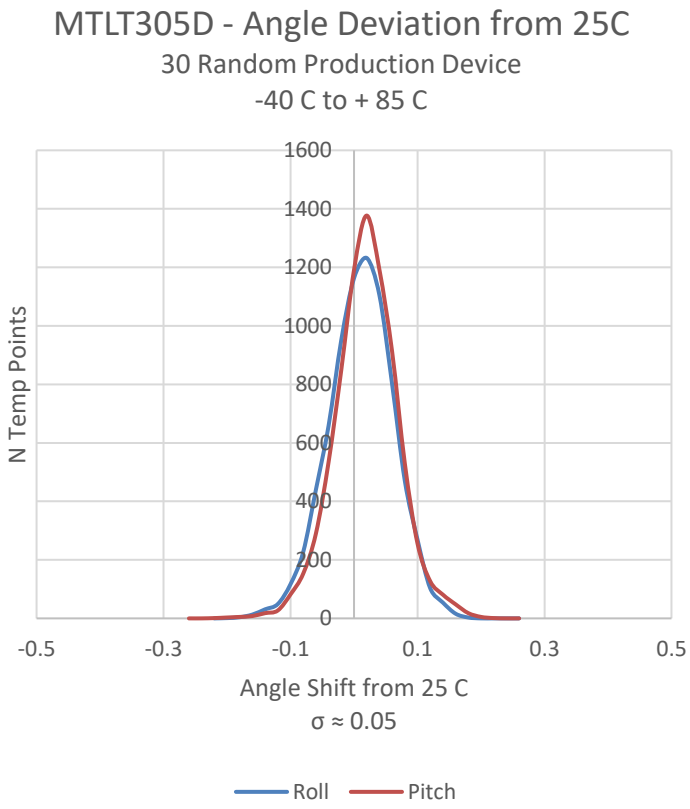
Supplemental Performance Information

Static Angle Accuracy and Temperature Stability



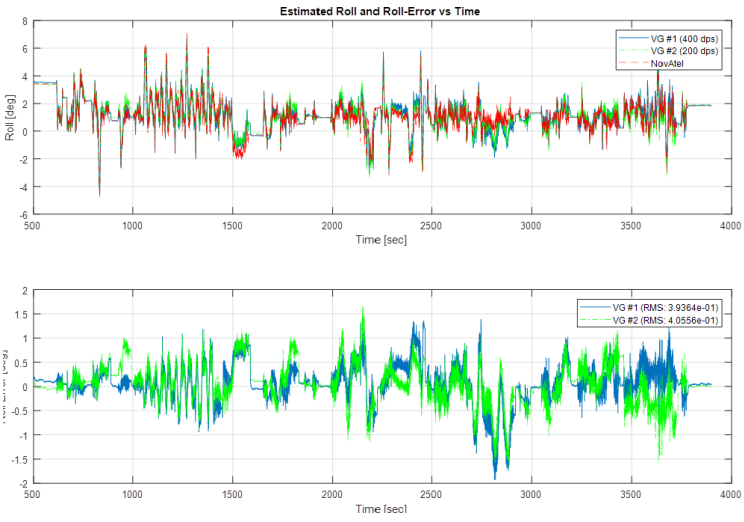


Dynamic Performance

RMS Error of MTLT305D as compared to Novatel Reference unit during 50 minute passenger vehicle Drive Test

Roll RMS Error	Pitch RMS Error
0.394	0.346

Roll and Roll Error During Drive Test



Pitch and Pitch Error During Drive Test