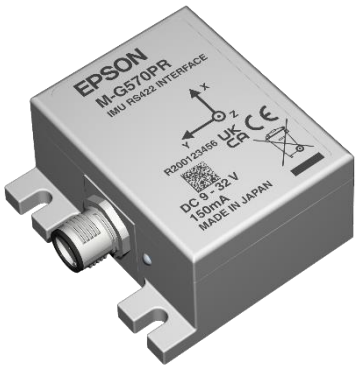
IMU (Inertial Measurement Unit)

M-G570PR20

RoHS Compliant

Product Name and Number
M-G570PR20: X2G000211000200

- Small size & Light Weight : 65 x 60 x 30 mm^3, 150 g
- Low-Noise, High-Stability
  - Gyro Bias Instability : 0.5 °/h
  - Angular Random Walk : 0.04 °/$\sqrt{h}$
- Six-degrees-of-freedom Sensor
  - Triple Axis Gyroscope : ±450 °/s
  - Triple Axis Accelerometer : ±15 G
- Calibrated Stability (Bias, Scale Factor, Axial Alignment)
- Interface : RS-422
- Operating Temperature : -30 °C to +70 °C
- Power Supply Voltage : 9 V to 24 V
- Waterproof and Dustproof : IP67



Recommended Application

Antenna Platform Stabilization / Camera Gimbals / Navigation Systems / Vibration Control and Stabilization / Pointing and Tracking Systems

RECOMMENDED OPERATING CONDITION

Parameter	Condition	Min.	Typ.	Max.	Unit
Power Supply Voltage	V_{IN} to GND *2	9 *1	12	24	V
Port Input Voltage	RD+ / RD- to GND	–	5	–	V
Operating Temperature		-30	–	+70	°C

*1. When power supply voltage is 9 V or less, the host may not be able to communicate with this node normally even if the LED turns on.
*2. The power supply voltage must reach the recommended operating condition within 2 seconds after power is applied to this node.

SPECIFICATIONS

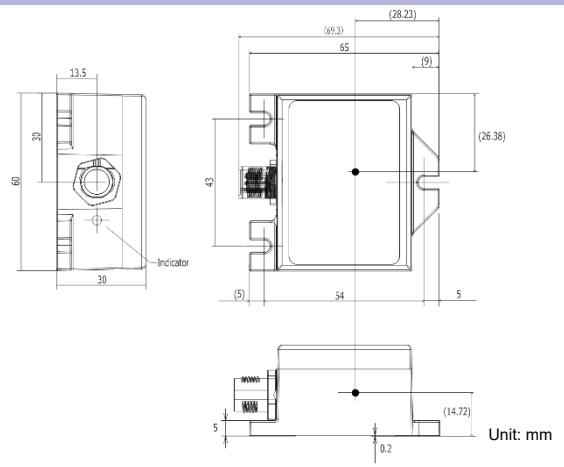
V_{IN} = 12 V, Ta = 25 °C, angular rate = 0 °/s, ±1 G, unless otherwise specified

Parameter	Test Conditions / Comments	Min.	Typ.	Max.	Unit
GYRO SENSOR					
Sensitivity					
Dynamic Range		–	±450	–	°/s
Scale Factor	16 bits	-0.2%	66	+0.2%	LSB/(°/s)
	32 bits	-0.2%	66 x (2^{16})	+0.2%	
Nonlinearity (Best fit straight line)	1 σ	–	0.05	–	% of FS
Misalignment	1 σ, Axis-to-axis, Δ = 90° ideal	–	0.15	–	°
Bias					
Initial Error	1 σ, −30 °C ≤ Ta ≤ +70 °C	–	360	–	°/h
Repeatability	1 σ, Turn-on to turn-on *3	–	36	–	°/h
Bias Instability	Average	–	0.5	–	°/h
Angular Random Walk	Average	–	0.04	–	°/$\sqrt{h}$
Linear Acceleration Effect	Average	–	18	–	(°/h)/G
Noise Density	f = 10 Hz to 20 Hz	–	2.9	–	(°/h)/$\sqrt{Hz}$, rms
Frequency Property					
3 dB Bandwidth		–	189	–	Hz
ACCELEROMETERS					
Sensitivity					
Dynamic Range		–	±15	–	G
Scale Factor	16 bits	-0.1%	2	+0.1%	LSB/mG
	32 bits	-0.1%	2 x (2^{16})	+0.1%	
Nonlinearity (Best fit straight line)	1 σ, < 5 G	–	0.1	–	% of FS
Misalignment	1 σ, Axis-to-axis, Δ = 90 ° ideal	–	0.15	–	°
Bias					
Initial Error	1 σ, −30 °C ≤ Ta ≤ +70 °C	–	2	–	mG
Repeatability	1 σ, Turn-on to turn-on *3	–	2	–	mG
Bias Instability	Average	–	14	–	µG
Velocity Random Walk	Average	–	0.012	–	(m/s)/$\sqrt{h}$
Noise Density	f = 10 Hz to 20 Hz	–	29	–	µG/$\sqrt{Hz}$, rms
Frequency Property					
3 dB Bandwidth		–	333	–	Hz
TEMPERATURE SENSOR					
Scale Factor *1*2	Output = 0 @ +25 °C	–	0.00390625	–	°C/LSB

*1. This is a reference value used for internal temperature compensation. There is no guarantee that the value gives an absolute value of the internal temperature.
*2. This is the temperature scale factor for the upper 16 bits (TEMP_HIGH).
*3. Turn-on to turn-on / Day by day, estimated variation during 5 consecutive days.

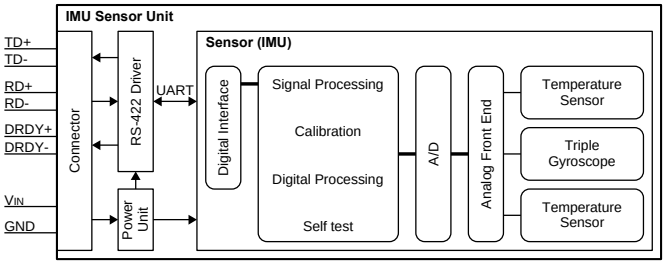
Note:
- The values in the specifications are based on the data calibrated at the factory. The values may change according to the way the product is used.
- The Typ. values in the specifications are average values or 1σ values.
- Unless otherwise noted, the Max./Min. values in the specifications are design values or Max./Min. values at the factory tests.

OUTLINE DIMENSIONS

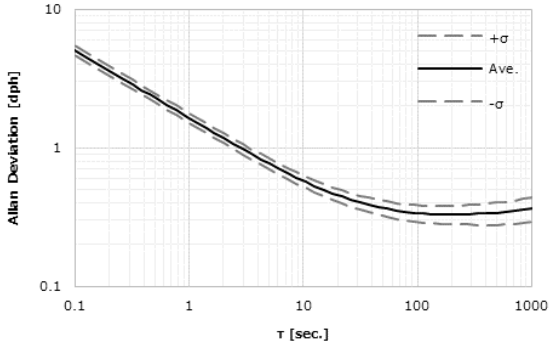


Unit: mm

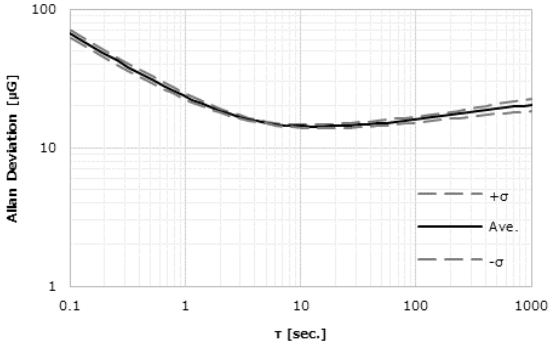
BLOCK DIAGRAM



TYPICAL PERFORMANCE CHARACTERISTICS



Gyro Allan Variance Characteristic



Accelerometer Allan Variance Characteristic

The product characteristics shown above are just examples and are not guaranteed as specifications.

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