

# InterSense® NavChip™ IMU Data Sheet

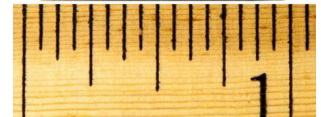


High-precision, rugged  
MEMS 6-axis Inertial  
Measurement Unit (IMU)



# InterSense® NavChip™ IMU

The NavChip is a high precision MEMS 6-axis Inertial Measurement Unit (IMU). Using proprietary technologies and advanced signal processing techniques, the NavChip achieves a level of performance, miniaturization, and environmental ruggedness superior to competing IMUs using standard off-the-shelf MEMS sensors. The NavChip is a very low drift IMU with a full-scale acceleration range of  $\pm 16g$  and a full-scale angular rate of  $2,000^\circ/s$ . It is fully factory-calibrated and temperature compensated over an operating range of  $-40^\circ C$  to  $+85^\circ C$ .



Technical Specifications		Typical values		
		NavChip	NavChip Series 3 Class B	NavChip Series 3 Class A
Gyros	$\Delta$ bias, scale, misalignment	Factory calibrated and temperature compensated over full temperature range		
	In-run bias stability	5°/hr		4°/hr
	Bias accuracy over temp range	$\pm 0.2^\circ/s$		
	g sensitive bias	0.004°/s/g		
	Angle random walk	0.18 °/√hr		
	Scale factor accuracy	$\pm 0.05\%$		
	Scale factor linearity	0.01%		
	Axis alignment accuracy	$\pm 0.03^\circ$		
Accels	$\Delta V$ bias, scale, misalignment	Factory calibrated and temperature compensated over full temperature range		
	In-run bias stability	0.04 mg		0.006 mg
	Velocity random walk	0.03 m/s/√hr		0.02 m/s/√hr
	Bias accuracy over temp range	$\pm 3$ mg		
	Scale factor accuracy	$\pm 0.09\%$		
	Scale factor linearity	0.06%		
	Axis alignment accuracy	$\pm 0.03^\circ$		
Limits	Operating & storage temp	$-40^\circ C$ to $+85^\circ C$		
	Full scale acceleration range	$\pm 16g$		
	Full scale angle rate	2000°/s		
	Vdd to GND	$-0.3$ V to $+6.0$ V		
	In/out to GND	$-0.3$ V to $3.3$ V		
SWaP	Size	12.5mm x 24.5mm x 5.4mm	12.5mm x 24.5mm x 6.1mm	
	Weight	3g		
	Power consumption @ 3.3 V	135mW (scales linearly with voltage)		
Output	Interfaces	UART, SPI	UART, SPI, I <sup>2</sup> C	
	Data	Compensated $\Delta V$ and $\Delta$	Compensated $\Delta V$ and $\Delta$ , AHRS	
	$\Delta V, \Delta$ output rate	Up to 200 Hz	Up to 1000 Hz	
	Adapters	RS-422, USB/TTL serial, ADIS		
	Default sampling rate/period	1000 Hz (1 ms)		
	UART data rate	38,400 to 921,600 baud, configurable		
Input	Voltage	3.25 V - 5.5 V (typical 3.3 V)		
	Current	40 mA		
	Optional external sync pin	1-1000 ms period (integer)		

US Patents: 8762091 and Patents Pending.

<sup>1</sup> TYP Specs are mean values or 1 for values that are nominally zero.

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