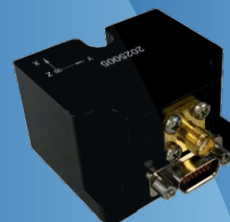


BLITZSensor

- Sense the moment! -

MEMS Inertial Devices





MEMS Inertial Devices and Systems

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MEMS Accelerometers

BS-AO1

ORDER CODE

BS AO1 series - 100 measurement range - A1CS analog output, 1 axis, chip type

Example: BS-AO1-100-A1CS

MEMS Inertial Devices and Systems

- ◇ Extra Small Size, LCC20 packaging
- ◇ Low Noise
- ◇ Harsh Environment(Shock, Vibration, Temperature)
- ◇ ±2~±200g Range
- ◇ Excellent Long-term Stability

Parameter	Unit	-2-A1CS	-10	-15	-30	-50	-100	-200
Range	g	±2	±10	±15	±30	±50	±100	±200
Bias	mg	<20	<50	<100	<150	<250	<500	<1000
Bias Stability	mg	<0.2	<0.5	<0.75	<1	<2	<5	<10
Bias Repeatability	mg	<0.2	<0.5	<0.75	<1.5	<2.5	<5.0	<10
Bias Temp. Coefficient	mg/°C	<0.2	<0.5	<0.75	<1.2	<2.5	<5.0	<10
Scale Factor	mV/g	1000±8	200±2	133.3±1	66.6±1	40±1	20±1	10±1
1 year Scale Factor Stability	ppm	300	300	300	300	300	300	300
Scale Factor Temp. Coefficient	ppm/°C	100	100	100	100	100	100	100
Sensitive Axis Misalignment	mrad (max)	<10	<10	<10	<10	<10	<10	<10
	% (max)	<2	<1	<1	<1	<1	<1	<1
Resolution	mg	0.1	0.3	0.5	1.0	2.5	5.0	10
Non-linearity	% of FS	<0.2	<0.3	<0.3	<0.3	<0.5	<0.5	<0.5
Bandwidth	Hz	0~250	0~500	0~500	0~500	0~500	0~500	0~500
Resonant Frequency	kHz	1.3	2.7	3.8	5.5	5.5	9.8	9.8
Operating Temp.		-40°C~+85°C(default) ; -55°C~+125°C (as request)						
Shock		Up to 20,000g(0.15ms half-sine, 3 time shocks in each direction)						
Recovery Time		<1ms(1000g, 1ms half-sine shock)						
Vibration		20g rms, 20~2000Hz(random noise, 30 minutes in each direction)						
Packaging		Hermetic						
ESD Sensitivity		Class 2 (requirements MIL-STD-883-G, 1 Method 3015.7) HBM 2kV						
Supply Voltage		3.0~7.0Vdc.(Typ. 5.0Vdc)						
Output Range		0.5~4.5Vdc@5.0Vdc Supply Voltage(2.5V±10mV@0g)						
Supply Current		<6mA @5.0Vdc						
Output Impedance/Load Drive		Max 50pF@Vout(pin 16) and Max. 100µF GND(pin 20)						
Weight		<1 grams						
Size		Typ 9.0×9.0×2.6mm (0.35×0.35×0.101inch)						

All values are typical at +25°C,+5Vdc unless otherwise statement.

◇ Applications

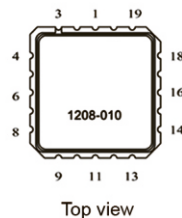
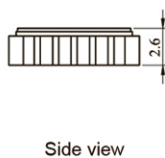
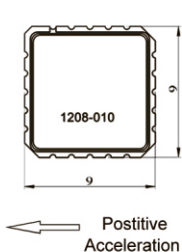
IMU/AHRS for MilAerospace

Land & Sea Inertial Navigation

Directional Drilling

Tilt & Inclination

◇ Structure (unit:mm)



2	VCC	+PWR
3	GND	Ground
15	SST	Self Test
16	Vout	Sensor Output
17	ORG-out	Filter Output (adjustable bandwidth)
18	ECAP	Voltage Reference(½Vcc)
20	GND	Ground

← Positive Acceleration

Side view

Top view

ORDER CODE



BS-AO2 series - **100** measurement range - **D1CS** digital output, 1 axis, chip type

Example: BS-AO2-100-D1CS

MEMS Inertial Devices and Systems

- ◇ Based on MEMS Process
- ◇ LCC20 Package
- ◇ ±2 ~ ±200g Full Scale
- ◇ Integrated Signal Conditioning
- ◇ 20,000g Shock Resistance
- ◇ Self-test, SPI Output

MEMS Accelerometers

BS-AO2

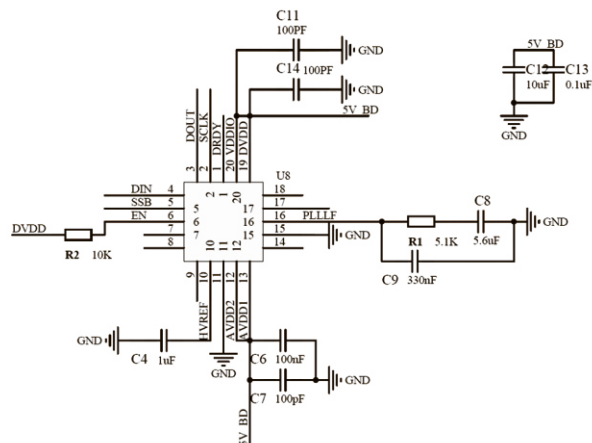
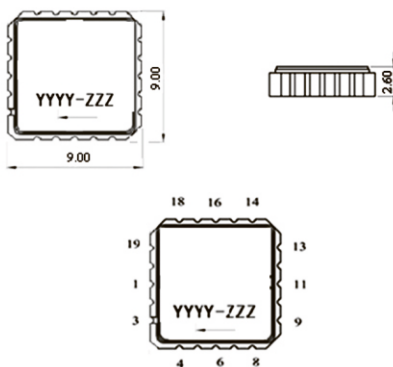
Parameter	Unit	-2-D1CS	-10-D1CS	-15-D1CS	-30-D1CS	-50-D1CS	-100-D1CS	-150-D1CS	-200-D1CS
Full Scale	g	±2	±10	±15	±30	±50	±100	±150	±200
Bias	mg	±20	±50	±50	±50	±50	±100	±100	±100
Bias Stability	mg	≤0.05	≤0.15	≤0.2	≤0.3	≤0.4	≤0.8	≤1	≤1.5
Bias Repeatability	mg	≤0.05	≤0.15	≤0.2	≤0.3	≤0.4	≤0.8	≤1	≤1.5
Bias Temp. Coefficient	mg/°C	≤0.1	≤0.5	≤0.75	≤1.5	≤2	≤5	≤7.5	≤10
Scale Factor Stability	ppm	≤200	≤200	≤200	≤300	≤300	≤500	≤500	≤500
Scale Factor Repeatability	ppm	≤200	≤200	≤200	≤300	≤300	≤500	≤500	≤500
Scale Factor Temp. Coefficient	ppm/°C	≤100	≤100	≤100	≤150	≤150	≤200	≤200	≤200
Resolution	mg	0.05	0.25	0.5	1.0	2.5	5.0	7.5	10
Bandwidth	Hz	147	147	147	147	147	147	147	147
Input axis Mis-alignment	mrad	<10	<10	<10	<10	<10	<10	<10	<10
	%	<1	<1	<1	<1	<1	<1	<1	<1
Non Linearity	%FS(max)	±0.1	±0.3	±0.3	±0.3	±0.3	±0.3	±0.5	±0.5
Resonant Frequency	KHz	1.3	2.7	3.8	4.5	5.8	8.1	10.1	11.4
Start Up Time	s	1	1	1	1	1	1	1	1
Power Consumption	mW	100							
Size	mm ³	9.0×9.0×2.6							
Package		Ceramic LCC20							
Interface		SPI							
Operating Temp.	°C	-40°C~+85°C(default) ; -55°C~+125°C (as request)							
Storing Temp.	°C	-55~125							
Shock Resistance	g	10000							

All values are typical at +25°C, +5Vdc unless otherwise statement

◇ Applications

- Inertial Navigation: Inertial Guidance, Integrated Navigation, Platform Stabilization
- Short-term Navigation: Flight Control, Ballistic Correction, Telemetry
- Posture Control: UAV(Unmanned Aerial Vehicle), Antenna Orientation, North Finder
- Automotive: ESP, Balance Measurement

◇ Structure (Unit: mm)



Top view

Side view

MEMS Inertial Devices and Systems



- Extra Small Size, LCC20 Packaging
- Low Noise
- Excellent Long-term Stability
- $\pm 2 \sim \pm 20,000g$ Range
- Large Bandwidth(DC~5000Hz@5%)
- Harsh Environment(Shock, Vibration, Temperature)

BS-AV15

MEMS Accelerometers

ORDER CODE

BS-AV15 series - 2 measurement range - A1CS analog output, 1 axis, chip type

Example: BS-AV15-2-A1CS

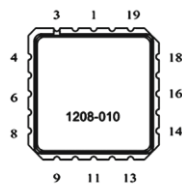
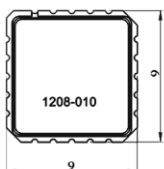
Parameter	Unit	BS-AV15	-10	-30	-50	-100	-200	-500	-1000	-10000	-20000
Range	g	± 2	± 10	± 30	± 50	± 100	± 200	± 500	± 1000	± 10000	± 20000
Bandwidth	Hz	0-250 ($\pm 5\%$)	0-1000 ($\pm 5\%$)	0-1500 ($\pm 5\%$)	0-1500 ($\pm 5\%$)	0-3000 ($\pm 1dB$)	0-3000 ($\pm 1dB$)	0-5000 ($\pm 1dB$)	0-5000 ($\pm 1dB$)	0-7000 ($\pm 3dB$)	0-7000 ($\pm 3dB$)
Resonant Frequency	kHz	1.3	2.7	5.5	5.5	9.8	9.8	18.0	25.8	50.0	50.0
Noise Density	$\mu V/\sqrt{Hz}$	5	10	10	10	10	10	10	10	10	10
Bias	mg	2.5 \pm 0.05	2.5 \pm 0.05	2.5 \pm 0.05	2.5 \pm 0.05	2.5 \pm 0.05	2.5 \pm 0.05	2.5 \pm 0.05	2.5 \pm 0.05	2.5 \pm 0.05	2.5 \pm 0.05
One Year Bias Stability Typ. (Max.)	mg	1.5(<5)	7.5(<25)	22(<75)	37.5(<125)	75(<250)	150(<500)	375(<1250)	750(<2500)	7500(<25000)	15000(<50000)
Switch On/Off Repeatability	mg	<0.15	<0.75	<2.0	<4.0	<10	<15	<30	<75	<500	<1000
Bias Temp. Coefficient	mg/ $^{\circ}C$	<0.2	<0.8	<2.0	<4.0	<10	<15	<30	<75	<500	<1000
Sensitivity	mV/g	1000 \pm 8	200 \pm 2	66.6 \pm 1	40 \pm 1	20 \pm 1	10 \pm 1	4 \pm 0.3	2 \pm 0.3	2 \pm 0.03	0.1 \pm 0.01
1 year Scale Factor Stability Typ. (Max.)	ppm	300 (1000)	300 (1000)	300 (1000)	300 (1000)	300 (1000)	300 (1000)	1500 (5000)	3000 (5000)	5000 (8000)	5000 (8000)
Sensitivity Temp. Coefficient	ppm/ $^{\circ}C$	200	200	200	200	200	200	200	200	200	200
Input Axis Misalignment	mrad (Max)	<10	<10	<10	<10	<10	<10	<10	<10	<10	<10
Cross Axis Sensitivity	% (Max)	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Resolution/Threshold(@1Hz)	mg	0.1	0.3	1	2.5	5	10	20	30	200	400
Non-linearity	% of FS	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<1	<1	<4	<6
Operating Temp.	-55 $^{\circ}C$ ~+125 $^{\circ}C$										
Shock	10,000g(2 ms half-sine, 3 time shocks in each direction)										
Recovery Time	<1 ms(1000g, 1ms half-sine shock)										
Vibration	20g rms, 20~2000Hz(random noise, 30 minutes in each direction)										
Packaging	Hermetic										
ESD Sensitivity	Class 2(requirements MIL-STD-883-G, 1 Method 3015.7),HBM 2kV										
Supply Voltage	3.0~7.0Vdc.(Typ. 5.0Vdc)										
Output Range	0.5~4.5Vdc@5.0Vdc Supply Voltage(2.5V \pm 10mV@0g)										
Supply Current	<6mA @5.0Vdc										
Output Impedance/Load Drive	Max 50pF, Min 10K Ω										
Weight	<1 grams										
Size	Typ 9.0 \times 9.0 \times 2.6mm (0.35 \times 0.35 \times 0.101inch)										

All values are typical at +25 $^{\circ}C$, +5Vdc unless otherwise statement.

Applications

- | | | |
|------------------------------|-------------------------------|------------------------------------|
| Aviation & Aerospace | Helicopter & Aircraft Testing | Automotive Testing & Crash Testing |
| Civil Engineering Structures | Railway Technology | Industrial Testing |

Structure (unit:mm)



2		
3	GND	
15	SST	
16	V _{OUT}	
17	ORG-OUT	
18	ECAP	
20	GND	



Dual-axial MEMS Gyros

BS-GU3-M-D2EW

MEMS Inertial Devices and Systems

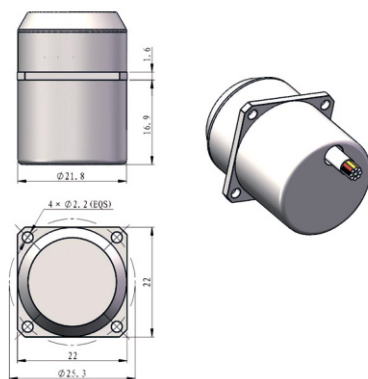
- ◇ Based on MEMS Process
- ◇ Standard Ceramic Packaging
- ◇ Temp. Output
- ◇ Ultra Small Size
- ◇ Lower Power
- ◇ 2000g Shock Resistance

Parameter	Unit	BS-GU3-M-D2EW
Range	°/s	±450 (Extendable to 3600 °/s)
Bias (Full Temp. , 1 σ)	°/h	≤150
Bias Instability	°/h	≤3
Bias Stability	°/h	≤15
Bias Repeatability	°/h	≤15
Angle Random Walk	°/√h	≤0.25
Scale Factor Nonlinearity	ppm	≤50
Bandwidth	Hz	150 (10 ~ 250Hz Adjustable)
Refresh Rate	Hz	2000
Supply Voltage	V	5±0.3
Operating Temp.	°C	-45 ~ +85
Storing Temp.	°C	-55 ~ + 105
Shock Resistance	g	≥2000
Vibration	grms	≥20
Size	mm	22.0×22.0×30.5
Weight	g	≤ 55
Interface	--	RS422
Output	--	High Temperature Cable

◇ Applications

Inertial Navigation: Inertial Guidance, Integrated Navigation, Platform Stabilization Short-term Navigation: Flight Control, Ballistic Correction, Telemetry
 Posture Control: UAV(Unmanned Aerial vehicle), Antenna Orientation, North Finder Automotive: Balance Measurement

◇ Structure (Unit : mm)



Top view

Cable	Definition	Note
Red	VDD	Power +
Black/Grey	GND	Power Ground
Yellow	TX+	RS422 Transmit +
Green	TX-	RS422 Transmit -
White	RX+	RS422 Receive +
Orange	RX-	RS422 Receive -
Other	NC	Blank

The image shown here is indicative only, the actual product may differ.

Definition



MIMU

BS-GC4-M-D3EC

MEMS Inertial Devices and Systems

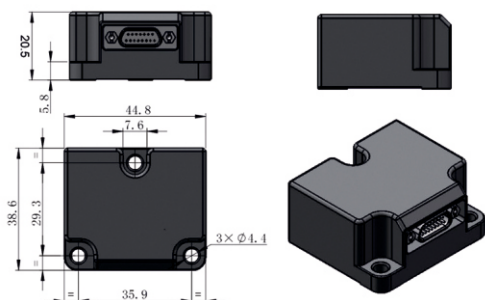
- ◇ Based on MEMS process
- ◇ Digital Gyros & Accelerometers
- ◇ High Speed Processor Embedded
- ◇ Compensation & Calibration
- ◇ Low power, Small Size
- ◇ High Tolerance

	Parameter	BS-GC4-M-D3EC
Gyro Performance	Range	±450 °/s
	Bias in Full temperature	≤100 °/h
	Bias Stability	≤8 °/h
	Bias Repeatability(1σ)	≤5 °/h
	Scale Factor Non-linearity	≤20 ppm
	Sensitive Axis Misalignment	10 ′
	Threshold/Resolution	0.005°/s
	-3 dB Bandwidth	150 Hz (10~250 Hz Adjustable)
	G-Sensitivity	0.005 °/s/g
System Performance	Data Rate	1000 Hz
	Weight	≤80 g
	Size	44.8 mm×38.6 mm×21.5 mm
	Supply Voltage	5±0.3 V
	Power Consumption	≤1.5 W
	Interface / Connector	RS422 / J30J-15ZKP
	Shock Resistance	≥2000 g
	Vibration Level	≥20 g rms
	Operating Temp.	-45 °C~85 °C
	Storing Temp.	-55 °C~105 °C

◇ Applications

- Integrated Navigation Systems & Inertial Guidance Systems
- Flight Control & Guidance Systems
- Attitude Heading Reference Systems (AHRS)
- Stabilization of Antennas, Cameras & Platforms

◇ Structure (unit:mm)



Top View & Side View

ID	Definition	Note
1	Tx-	RS422 Transmit Negative
2	Rx-	RS422 Receive Negative
3~5	NC	Blank
6~7	Reserved	Reserved
8	VCC(+5V)	Power
9	Tx+	RS422 Transmit Positive
10	Rx+	RS422 Receive Positive
11	NC	Blank
12~13	GND	Power Ground
14	NC	Blank
15	GND	RS422 Ground

Definition



MIMU

BS-GU5-M-D3EC

MEMS Inertial Devices and Systems

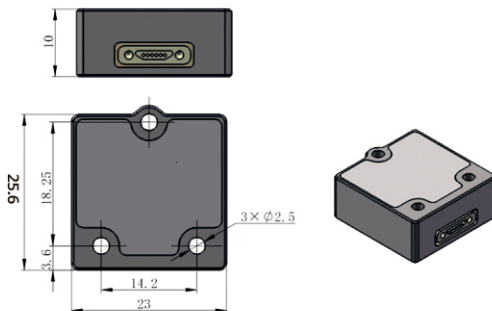
- ◇ Based on MEMS process
- ◇ Digital Gyros & Accelerometers
- ◇ High Speed Processor Embedded
- ◇ Compensation & Calibration
- ◇ Low power, Small Size
- ◇ High Tolerance

	Parameter	BS-GU5-M-D3EC
Gyro Performance	Range	±450 °/s (Extendable to ±3600°/s)
	Bias in Full temperature	≤ 100 °/h
	Bias Stability	≤10 °/h
	Bias Repeatability(1σ)	≤8 °/h
	Scale Factor Non-linearity	≤50 ppm
	Sensitive Axis Misalignment	≤10 ′
	Threshold/Resolution	0.005°/s
	G-Sensitivity	0.01 °/s/g
	-3 dB Bandwidth	150 Hz (10~250Hz Adjustable)
System Performance	Refresh Rate	1000 Hz
	Weight	≤30 g
	Size	23 mm×23 mm×10 mm
	Supply Voltage	5±0.3 V
	Interface	RS422
	Connector	JMC-1284Z2-JH
	Vibration Level	≥20 g rms
	Shock Resistance	≥2000 g
	Operating Temp.	-45 °C~+85 °C
	Storing Temp.	-55 °C~+105 °C

◇ Applications

- Integrated Navigation Systems & Inertial Guidance Systems
- Flight Control & Guidance Systems
- Attitude Heading Reference Systems (AHRS)
- Stabilization of Antennas, Cameras & Platforms

◇ Structure (unit:mm)



Side View & Top View

ID	Definition	Note
1	VCC(+5V)	Power Positive
2	GND	Power Ground
3	Rx+	RS422 Receive Positive
4	Rx-	RS422 Receive Negative
5	Tx-	RS422 Transmit Negative
6	Tx+	RS422 Transmit Positive

Definition



Tri-axial MEMS Gyros

BS-GU6-M-D3EW

MEMS Inertial Devices and Systems

- ◇ Based on MEMS Process
- ◇ Digital Gyros & Accelerometers
- ◇ High Speed Processor Embedded
- ◇ Compensation & Calibration
- ◇ Low Power, Extra-small Size
- ◇ Robust for Vibration & Shock

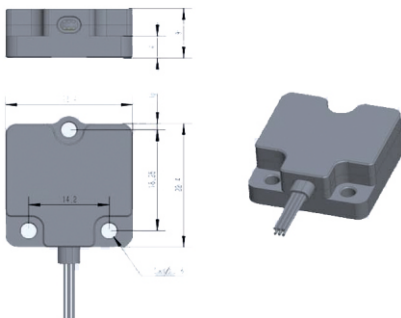
	Parameter	BS-GU6-M-D3EW
Gyro Performance	Range	±450 °/s
	Bias (Full Temp.)	≤150 °/h
	Bias Stability(1σ, 10s on average)	≤20 °/h
	Bias Repeatability	≤15 °/h
	Nonlinearity	≤50 ppm
	Misalignment Error Axis to Axis, 1σ	15'
	Linear Acceleration Effect Any direction, 1σ	0.01°/s/g
	-3 dB Bandwidth	150 Hz(10~250 Hz Adjustable)
System Performance	Output Data Rate	1000 Hz
	Weight	≤30 g
	Size	22.4 mm × 22.4 mm × 9 mm
	Supply Voltage	5±0.3 V
	Power Consumption	0.15 W
	Shock Resistance	≥2000 g
	Vibration Level	≥20 g rms
	Operating Temp.	-45°C~+85°C
	Storing Temp.	-55°C~+105°C

All values are typical at +23°C±2°C, -40°C,+85°C measured, unless otherwise statement.

◇ Applications

- Integrated Navigation Systems & Inertial Guidance Systems
- Flight Control & Guidance Systems
- Attitude Heading Reference Systems (AHRS)
- Stabilization of Antennas, Cameras & Platforms

◇ Structure (unit:mm)



Top view

Color	Definition	Note
Red	VCC(+5V)	Power
Black	VGND	Power Ground
White	Rx+	Receive Positive
Brown	Rx-	Receive Negative
Green	Tx-	Transmit Negative
Yellow	Tx+	Transmit Positive

Definition



MIMU

BS-IC7-M-D6EC

MEMS Inertial Devices and Systems

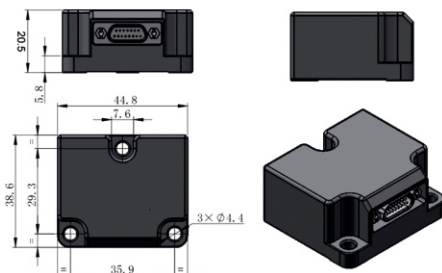
- ◇ Based on MEMS process
- ◇ Digital Gyros & Accelerometers
- ◇ High Speed Processor Embedded
- ◇ Compensation & Calibration
- ◇ Low power, Small Size
- ◇ High Tolerance

	Parameter	BS-IC7-M-D6EC
Gyro Performance	Range	±450 °/s
	Bias in Full temperature	≤100 °/h
	Bias Stability	≤8 °/h
	Bias Repeatability(1σ)	≤5 °/h
	Scale Factor Non-linearity	≤20 ppm
	Sensitive Axis Misalignment	10 '
	Threshold/Resolution	0.005°/s
	-3 dB Bandwidth	150 Hz (10~250 Hz Adjustable)
	G-Sensitivity	0.005 °/s/g
Accelerometer Performance	Range	±15 g
	Bias in Full temperature	≤2 mg
	Bias Stability(1σ, 10s on average)	≤ 0.2 mg
	Bias Repeatability	≤ 0.2 mg
	Scale Factor Non-linearity(±1g)	≤ 100 ppm
	Threshold/Resolution	1 mg
	Sensitive Axis Misalignment	10 '
	-3 dB Bandwidth	150 Hz(10~250 Hz Adjustable)
System Performance	Data Rate	1000 Hz
	Weight	≤80 g
	Size	44.8 mm×38.6 mm×21.5 mm
	Supply Voltage	5±0.3 V
	Power Consumption	≤1.5 W
	Interface / Connector	RS422 / J30J-15ZKP
	Shock Resistance	≥2000 g
	Vibration Level	≥20 g rms
	Operating Temp.	-45 °C~85 °C
Storing Temp.	-55 °C~105 °C	

◇ Applications

- Integrated Navigation Systems & Inertial Guidance Systems
- Flight Control & Guidance Systems
- Attitude Heading Reference Systems (AHRS)
- Stabilization of Antennas, Cameras & Platforms

◇ Structure (unit:mm)



Top View & Side View

ID	Definition	Note
1	Tx-	RS422 Transmit Negative
2	Rx-	RS422 Receive Negative
3~5	NC	Blank
6~7	Reserved	Reserved
8	VCC(+5V)	Power
9	Tx+	RS422 Transmit Positive
10	Rx+	RS422 Receive Positive
11	NC	Blank
12~13	GND	Power Ground
14	NC	Blank
15	GND	RS422 Ground

Definition



MEMS Inertial Devices and Systems

MIMU

BS-IC8-M-D6EC

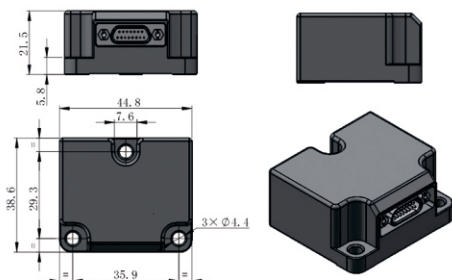
- ◇ Based on MEMS process
- ◇ Digital Gyros & Accelerometers
- ◇ High Speed Processor Embedded
- ◇ Compensation & Calibration
- ◇ Low power, Small Size
- ◇ High Tolerance

	Parameter	BS-IC8-M-D6EC
Gyro Performance	Range	±450 °/s (can be extended to ±4000°/s)
	Bias in Full temperature(1σ,10s on average)	≤100 °/h
	Bias Stability(Full Temp., 1σ,10s on average)	≤10 °/h
	Bias Repeatability(Full Temp., 1σ)	≤10 °/h
	Scale Factor Non-linearity	≤50 ppm
	Sensitive Axis Misalignment	10 ′
	Threshold/Resolution	0.005°/s
	-3 dB Bandwidth	150 Hz (10~250 Hz Adjustable)
	G-Sensitivity	0.005 °/s/g
Accelerometer Performance	Range	±50g (Extendable to 150g)
	Bias in Full temperature	≤10 mg
	Bias Stability(Full Temp., 1σ, 10s on average)	≤ 1 mg
	Bias Repeatability(Full Temp.,1 σ)	≤ 1 mg
	Scale Factor Non-linearity(±1g)	≤ 3000 ppm
	Threshold/Resolution	1 mg
	Sensitive Axis Misalignment	10 ′
	-3 dB Bandwidth	150 Hz(10~250 Hz, Adjustable)
System Performance	Data Rate	1000 Hz
	Weight	≤80 g
	Size	44.8 mm × 38.6 mm × 21.5 mm
	Supply Voltage	5±0.3 V
	Power Consumption	≤1.5 W
	Interface / Connector	RS422 / J30J-15ZKP
	Shock Resistance	≥2000 g
	Vibration Level	≥20 g rms
	Operating Temp.	-45 °C~+85 °C
	Storing Temp.	-55 °C~+105 °C

◇ Applications

- Integrated Navigation Systems & Inertial Guidance Systems
- Flight Control & Guidance Systems
- Attitude Heading Reference Systems (AHRS)
- Stabilization of Antennas, Cameras & Platforms

◇ Structure (unit:mm)



Top View & Side View

ID	Definition	Note
1	Tx-	RS422 Transmit Negative
2	Rx-	RS422 Receive Negative
3~5	NC	Blank
6~7	Reserved	Reserved
8	VCC(+5V)	Power
9	Tx+	RS422 Transmit Positive
10	Rx+	RS422 Receive Positive
11	NC	Blank
12~13	GND	Power Ground
14	NC	Blank
15	GND	RS422 Ground

Definition



MIMU

BS-IU9-M-D6EC

MEMS Inertial Devices and Systems

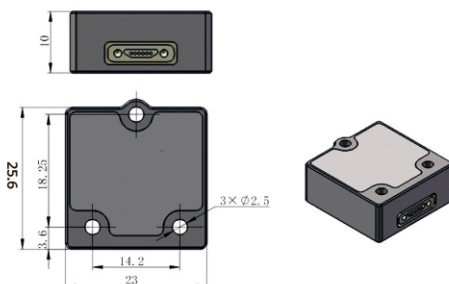
- ◇ Based on MEMS process
- ◇ Digital Gyros & Accelerometers
- ◇ High Speed Processor Embedded
- ◇ Compensation & Calibration
- ◇ Low power, Small Size
- ◇ High Tolerance

	Parameter	BS-IU9-M-D6EC
Gyro Performance	Range	±450 °/s (Extendable to ±3600°/s)
	Bias in Full temperature	≤ 100 °/h
	Bias Stability	≤10 °/h
	Bias Repeatability(1σ)	≤8 °/h
	Scale Factor Non-linearity	≤50 ppm
	Sensitive Axis Misalignment	≤10 ′
	Threshold/Resolution	0.005°/s
	G-Sensitivity	0.01 °/s/g
	-3 dB Bandwidth	150 Hz (10~250Hz Adjustable)
Accelerometer Performance	Range	±15g
	Bias in Full temperature	≤2 mg
	Bias Stability(1σ, 10s on average)	≤0.2 mg
	Bias Repeatability(1σ)	≤0.2 mg
	Scale Factor Non-linearity(<1g)	≤200 ppm
	Threshold/Resolution	≤ 0.1 mg
	Sensitive Axis Misalignment	10 ′
		-3 dB Bandwidth
System Performance	Refresh Rate	1000 Hz
	Weight	≤30 g
	Size	23 mm×23 mm×10 mm
	Supply Voltage	5±0.3 V
	Interface	RS422
	Connector	JMC-1284Z2-JH
	Vibration Level	≥20 g rms
	Shock Resistance	≥2000 g
	Operating Temp.	-45 °C~+85 °C
Storing Temp.	-55 °C~+105 °C	

◇ Applications

- Integrated Navigation Systems & Inertial Guidance Systems
- Flight Control & Guidance Systems
- Attitude Heading Reference Systems (AHRS)
- Stabilization of Antennas, Cameras & Platforms

◇ Structure (unit:mm)



ID	Definition	Note
1	VCC(+5V)	Power Positive
2	GND	Power Ground
3	Rx+	RS422 Receive Positive
4	Rx-	RS422 Receive Negative
5	Tx-	RS422 Transmit Negative
6	Tx+	RS422 Transmit Positive



MIMU

BS-IU10-M-D6EW

MEMS Inertial Devices and Systems

- ◇ Based on MEMS Process
- ◇ Digital Gyros & Accelerometers
- ◇ High Speed Processor Embedded
- ◇ Compensation & Calibration
- ◇ Low Power, Extra-small Size
- ◇ Robust for Vibration & Shock

Parameter	BS-IU10-M-D6EW		
Gyro Performance	Range	±450 °/s (can be extended to ±3600°/s)	○
	Bias (Full Temp.)	≤150 °/h	√
	Bias Stability(1σ, 10s on average)	≤12 °/h	√
	Bias Repeatability	≤12 °/h	√
	Nonlinearity	≤50 ppm	√
	Sensitive Axis Misalignment	10'	√
	Linear Acceleration Effect Any direction, 1σ	0.005°/s/g	√
Accelerometer Performance	Dynamic Range	±10 g	○
	Bias (Full Temp.)	≤5 mg	√
	Bias Stability(1σ, 10s on average)	≤0.3 mg	√
	Bias Repeatability	≤0.3 mg	√
	Nonlinearity	≤200 ppm	√
System Performance	-3 dB Bandwidth	150 Hz	○
	Output Data Rate	1000 Hz	○
	Weight	≤30 g	○
	Size	22.4 mm × 22.4 mm × 9 mm	○
	Supply Voltage	5±0.3 V	○
	Power Consumption	0.15 W	○
	Shock Resistance	≥2000 g	○
	Vibration Level	≥20 g rms	○
	Operating Temp.	-45°C~+85°C	○
Storing Temp.	-55°C~+105°C	○	

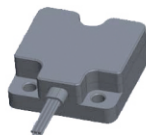
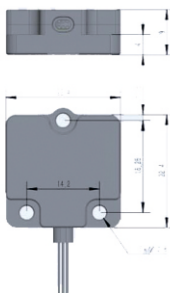
All values are typical at +23°C±2° C, -40°C,+85°C measured unless otherwise statement.

Note: √ means we will list this parameter performance value in our Test Report ; Totally 11 value in our Test Report ;
○ means we assure the parameter performance value when design, but not shown in our Test Report.

◇ Applications

- Integrated Navigation Systems & Inertial Guidance Systems
- Flight Control & Guidance Systems
- Attitude Heading Reference Systems (AHRS)
- Stabilization of Antennas, Cameras & Platforms

◇ Structure (unit:mm)



Color	Definition	Note
Red	VCC(+5V)	Power
Black	VGND	Power Ground
White	Rx+	Receive Positive
Brown	Rx-	Receive Negative
Green	Tx-	Transmit Negative
Yellow	Tx+	Transmit Positive



MIMU

BS-IU11-M-D6EC

MEMS Inertial Devices and Systems

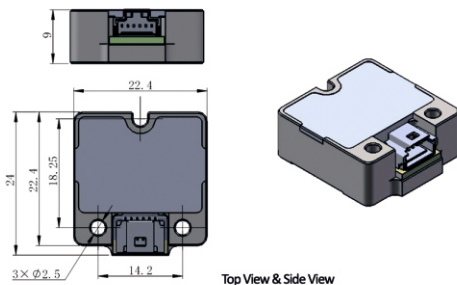
- ◇ Based on MEMS process
- ◇ Digital Gyros & Accelerometers
- ◇ High Speed Processor Embedded
- ◇ Compensation & Calibration
- ◇ Low power, Small Size
- ◇ High Tolerance

	Parameter	BS-IU11-M-D6EC
Gyro Performance	Range	±250 °/s
	Bias in Full temperature	≤0.1 °/s
	Bias Stability(1σ, 10s on average)	≤15 °/h
	Bias Repeatability(1σ)	≤15 °/h
	Angular Random Walk	≤0.3 °/√Hr
	Scale Factor Non-linearity	≤100 ppm
	Installation Error	≤ 0.7 °
	Bandwidth	≥100 Hz
Accelerometer Performance	Range	±4 g
	Bias in Full temperature	≤2.5 mg
	Bias Stability(1σ, 10s on average)	≤0.3 mg
	Bias Repeatability(1σ)	≤0.3 mg
	Scale Factor Non-linearity(±1g)	≤300 ppm
	Installation Error	≤ 0.7 °
System Performance	Bandwidth	≥100 Hz
	Refresh Rate	200 Hz
	Weight	≤25 g
	Size	24 mm×22.4 mm×9 mm
	Supply Voltage	5±0.3 V
	Power Consumption	≤0.25 W
	Interface	UART
	Connector	Molex
	Operating Temp.	-40 °C~+85 °C
Storing Temp.	-40 °C~+95 °C	

◇ Applications

- Integrated Navigation Systems & Inertial Guidance Systems
- Flight Control & Guidance Systems
- Attitude Heading Reference Systems (AHRS)
- Stabilization of Antennas, Cameras & Platforms

◇ Structure (unit:mm)



ID	Symbol	Note
1	VCC(+5V)	Power Positive
2	GND	Power Ground
3	TXD	Transmit
4	RXD	Receive
5	-	-
6	-	-

Definition



MEMS Inertial Devices and Systems

Inertial Navigation System

BS-NU12-M-D6EC

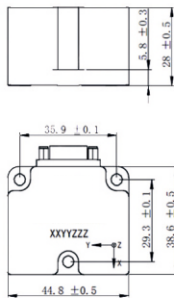
- ◇ Based on MEMS Process
- ◇ Compensated for over temperature
- ◇ Fully calibrated for parameters of each axis of sensors
- ◇ High accuracy gyros 10°/h
- ◇ Low power, small size
- ◇ Robust for vibration & shock

Parameter	BS-NU12-M-D6EC	
Heading	Range	-180 ° ~ + 180 °
	Accuracy	≤0.2 °
Attitude	Range : Roll, Pitch	-180 ° ~ + 180 ° , -75 ° ~ + 75 °
	Dynamic Accuracy	≤0.3 °
Gyroscope	Range : X,Y,Z	±450 °/s
	Angular Random Walk	≤0.2 °/√h
	Bias Stability (1s smoothing)	≤10 °/h
	Bias Repeatability	≤10 °/h
	Scale Factor Non-linearity	≤50 ppm
Accelerometer	Range : X,Y,Z	±10 g
	Bias	≤5 mg
	Bias Stability (1σ)	≤ 0.2 mg
	Bias Repeatability	≤ 0.2 mg
	Scale Factor Non-linearity(in ±1g)	≤150 ppm
System Performance	Input Voltage	5±0.2 V
	Power consumption	≤2 W
	Interface	RS422
	Data Rate	200 Hz (Extendable to 500 Hz)
	Baud Rate	115200 Default Value
	Size	44.8 mm× 38.6 mm× 28 mm
	Weight	<75 g
	Operating Temp.	-45 ~ + 85°C
	Storing Temp.	-50 ~ + 85 °C

◇ Applications

Integrated Navigation Systems & Inertial Guidance Systems Flight Control & Guidance Systems
 Attitude Heading Reference Systems (AHRS) Stabilization of Antennas, Cameras & Platforms

◇ Structure (unit:mm)

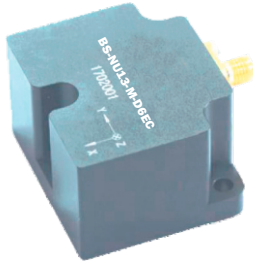


Top view

Side view

No.	Pin	Definition
1	+5V	Power
2	GND	Power ground
3	RS422_TX_P	RS422 Transmit Positive
4	RS422_TX_N	RS422 Transmit Negative
5	RS422_RX_P	RS422 Receive Positive
6	RS422_RX_N	RS422 Receive Negative
7	AUX_RS232_TXA	Extened serial port output A
8	AUX_RS232_RXA	Extened serial port input A
9	SGND	Signal ground
10-15	N/A	Reserved

Definition



INS GNSS Integrated Navigation System

BS-NU13-M-D6EC

MEMS Inertial Devices and Systems

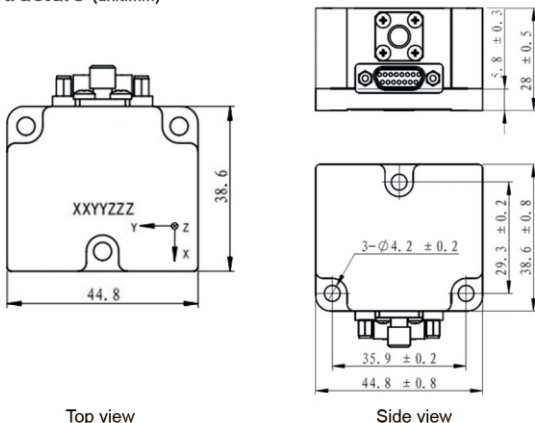
- ◇ Based on MEMS Process
- ◇ High accuracy gyros 5°/h (Allan variance)
- ◇ Compensated for over temperature
- ◇ Low power, small size
- ◇ Fully calibrated for parameters of each axis of sensors
- ◇ Robust for vibration & shock

Parameter	BS-NU13-M-D6EC	
Heading	Range	-180 ° ~ + 180 °
	Accuracy	≤0.2 °
Attitude	Range : Roll, Pitch	-180 ° ~ + 180 ° , -75 ° ~ + 75 °
	Dynamic Accuracy	≤0.2 °
GPS Outage	Position Drift (1 min)	≤3 m (with odometer)
	Heading Drift (1min)	≤0.2 °
Gyroscope	Range : X,Y,Z	±450 °/s
	Angular Random Walk	≤0.2 °/√h
	Bias Stability (1s smoothing)	≤10 °/h
	Scale Factor Non-linearity	≤50 ppm
	Sensitive Axis Misalignment	10'
Accelerometer	Range : X,Y,Z	±10 g
	Bias	≤5 mg
	Bias Stability (1σ)	≤0.2 mg
	Bias Repeatability	≤0.2 mg
	Scale Factor Non-linearity (in ±1g)	≤150 ppm
GNSS Receiver	Sensitive Axis Misalignment	10'
	Horizontal Position Accuracy	≤1.5 m
	Vertical Position Accuracy	≤2 m
	Velocity (1σ)	≤0.05 m/s
	Heading (1σ)	≤0.3 °
System Performance	Frequency	GPS L1, GLONASS L1, Beidou L1
	Input Voltage	5±0.2 V
	Power consumption	≤2 W
	Interface	RS422
	Baud Rate	115200 default value
System Performance	Size	44.8 mm× 38.6 mm× 28 mm
	Operating Temperature	-45°C~+85°C
	Storing Temperature	-50°C~+85°C

◇ Applications

Integrated Navigation Systems & Inertial Guidance Systems Flight Control & Guidance Systems
 Attitude Heading Reference Systems (AHRS) Stabilization of Antennas, Cameras & Platforms

◇ Structure (unit:mm)



No.	Pin	Definition
1	+5V	Power
2	GND	Power ground
3	RS422 TX P	RS422 Transmit Positive
4	RS422 TX N	RS422 Transmit Negative
5	RS422 RX P	RS422 Receive Positive
6	RS422 RX N	RS422 Receive Negative
7	AUX_RS232_TXA	Extended serial port output A
8	AUX_RS232_RXA	Extended serial port input A
9	SGND	Signal ground
10~15	NA	Reserved



INS GNSS Integrated Navigation System

BS-NU14-M-D6EC

MEMS Inertial Devices and Systems

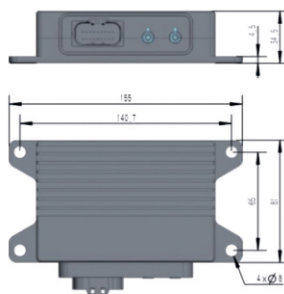
- ◇ Based on MEMS Process
- ◇ Compensated for over temperature
- ◇ Fully calibrated for parameters of each axis of sensors
- ◇ High accuracy gyros 2°/h (Allan variance)
- ◇ Low power, small size
- ◇ Robust for vibration & shock

	Parameter	BS-NU14-M-D6EC
Heading	Range	-180 ° ~ + 180 °
	Accuracy	<0.1 °
Attitude	Range : Roll, Pitch	-180 ° ~ + 180 ° , -90 ° ~ + 90 °
	Dynamic Accuracy	<0.05 °
GPS Outage	Position Drift (1km or 2min)	0.2% (with odometer)
	Heading Drift (1min)	0.15°
Gyroscope	Range : X,Y,Z	±450 °/s
	Angular Random Walk	≤0.25 °/√h
	Bias Instability (Allan variance)	≤2 °/h
	Bias Stability	≤10 °/h
	Scale Factor Non-linearity	≤50 ppm
	Sensitive Axis Misalignment	0.05%
Accelerometer	Range : X,Y,Z	±10 g
	Bias Stability (1σ)	≤0.2 mg
	Bias Repeatability	≤0.2 mg
	Scale Factor Non-linearity (in ±1g)	≤200 ppm
	Sensitive Axis Misalignment	0.05%
	Velocity Random Walk	≤0.02 m/s/√h
GNSS Receiver	Position	≤1.5 m (SPP), 2cm+1 ppm (RTK)
	Velocity (1σ)	≤0.03 m/s
	Attitude (1σ)	≤0.2 ° (Baseline 2 m)
	Heading (1σ)	≤0.2 ° (Baseline 1m)
		≤0.08 ° (Baseline 2 m)(GNSS INS Integrated Value)
System Performance	Signal Frequency	BDS: B1/B2 GPS:L1/L2 GLONASS:L1/L2 GALILEO: E1/E5b
	Input Voltage	9~24 V
	Power consumption	≤6 W
	Interface	RS422, CAN
	Data Rate	100/200 Hz
	Baud Rate	230400 bps
	Size	155 mm× 81 mm× 34.5 mm
	Weight	≤415 g
	Operating Temp.	-45~+85°C
	Storing Temp.	-50~+85°C

◇ Applications

Integrated Navigation Systems & Inertial Guidance Systems Flight Control & Guidance Systems
Attitude Heading Reference Systems (AHRS) Stabilization of Antennas, Cameras & Platforms

◇ Structure (unit:mm)



Top View

PIN No.	Signal Name	PIN No.	Signal Name
1	CAN2_L	10	1PPS
2	CAN2_H	11	-
3	CAN1_L	12	GND
4	CAN1_H	13	-
5	GNSS_DIFF_TXD	14	RS422 R+
6	GNSS_DIFF_RXD	15	-
7	GND	16	RS422 R-
8	Power Ground	17	RS422 T+
9	Power Positive	18	RS422 T-

Pin Definition

BLITZSensor

2022-2023