M-A351AS/AU

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3axis Accelerometer

■ GENERAL DESCRIPTION

M-A351AS and M-A351AU measures 3axis acceleration with high accuracy and high stability. The M-A351 sensor unit is based on Quartz technology (QMEMS) for high accuracy, high stability, small size, and low power consumption. With up to 100Hz sensor bandwidth and 1000Sps data output rate, the M-A351 sensor unit enables wide dynamic range vibration measurement.

The M-A351 sensor unit utilizes unique digital sensing architecture which minimizes the requirement for expensive analog circuit components such as high resolution AD converters. The digital sensing architecture and serial interface also simplifies design integration and eliminates analog noise challenges.

The M-A351 series accelerometer simplifies the development and differentiation of industrial seismic, vibration, structural measurement systems.

■ FEATURES

- Small Size and Lightweight : 24x24x19mm, 12grams
- Low Noise : 0.5µGrms/√Hz (Average)
- High Resolution : 0.06µG/LSB
- Wide Bandwidth : 100Hz (selectable)
- Output Rate : 1000Sps (selectable)
- Three Axis Accelerometer : ±5G
- Digital Serial Interface : SPI (M-A351AS) / UART (M-A351AU)
- Wide Operating Temperature Range : −20℃ to +85℃
- Low Power Consumption : 66mW, 3.3V
- Output Mode Selection (each axis) : Acceleration, Tilt Angle, or Tilt Angle Speed

■ SPECIFICATION

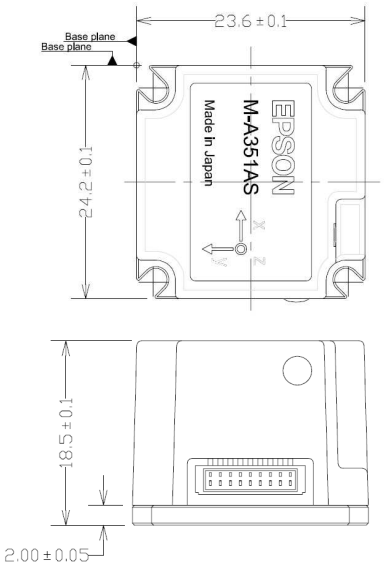
T_A=-20℃ to +85℃, VCC=3.15V to 3.45V,±1G, unless oth erwise noted.

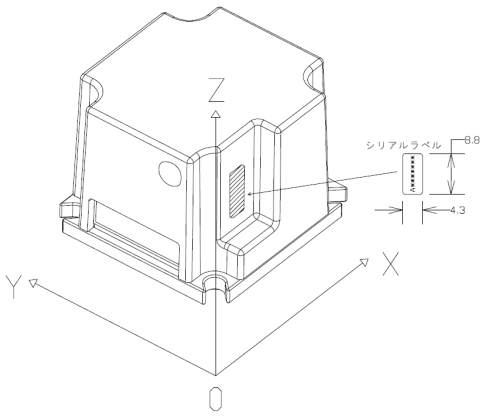
Parameter	Test Conditions / Comments	Spec.	Unit
Acceleration Output Data Type			
Input Range (*1)	Reduced accuracy operating range	+/-5	G
Input Range (*2)	Accuracy guaranteed by specification	+/-1	G
Null Offset	T_A=25℃	+/-4	mG
Null Offset Repeatability	T_A=25℃ and VCC=3.3V for one year after shipment	3	mG
Null Offset Temperature Variation	-20℃ to +85℃	+/-4	mG
Noise Density	T_A=25℃,average 0.5Hz to 6Hz,horizontal (+/-5deg.)	0. 5	µGrms/√Hz
	T_A=25℃,peak 0.5Hz to 100Hz,horizontal (+/-5deg.)	60	µGrms/√Hz
Resolution	UART/SPI (Binary)	0.06	µG/LSB
Tilt Angle Output Data Type (*3)			
Input Range	Accuracy guaranteed by specification	+/-0.785	rad
Null Offset Repeatability	T_A=25℃ and VCC=3.3V for one year after shipment	+/-3 .491	mrad
Resolution	UART/SPI (Binary)	0.002	µrad/LSB
Tilt Angle Speed Output Data Type (*4)			
Calculating Range	Unit per millisecond of measurement trigger	+/-2.094	rad/ms
Resolution	UART/SPI (Binary)	2	(µrad/s)/LSB
Common			
Filter Bandwidth (*5)	Selectable with command	5,10,20,50,100	Hz
Data Output Rate (*5)	UART, Selectable with command	Up to 1000	Sps
	SPI, Selectable with command	Up to 500	Sps
Power Supply Voltage	T_A=25℃	3.3	V
Consumption Current	Measurement mode, T_A=25℃	20	mA

*1 The range from above ±1G to ±5G is outside the guaranteed accuracy specifications.
*2 The calibrated standard 1G gravitational acceleration value is 9.80665 m/s^2.
*3 Tilt angle is internally calculated from the gravitational acceleration.
*4 Tilt angle speed = delta tilt angle / data rate.
*5 The output data rate and internal filter bandwidth is selectable by the command.

M-A351AS/AU

■ OUTLINE DIMENSIONS

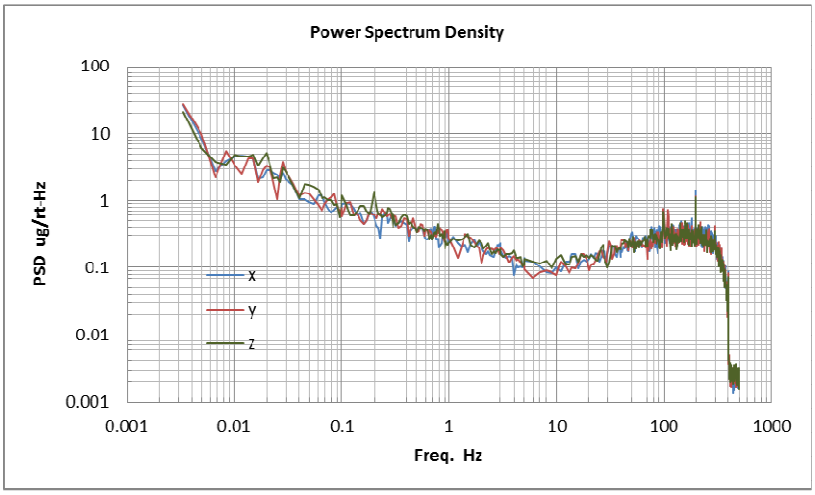




Outline Dimensions (millimeters)

Connector Socket in the Device
Manufacturer: JST Company
Part Number: BM09B-SRSS-TB
Recommended Header on the Host Side
Manufacturer: JST Company
Parts Number: SHR-09V-S-B (housing and knob)
SSH-003T-P0.2-H (contact)

■ EXAMPLE OF THE MAIN CHARACTERISTIC(NOISE DENSITY)



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