M-A352AD10

EPSON
EXCEED YOUR VISION

High Accuracy Three Axis Accelerometer

■ GENERAL DESCRIPTION

The M-A352 is a three axis digital output accelerometer featuring ultra-low noise, high stability, and low power consumption using fine processing technology of Quarts. Incorporating both high accuracy and durability, the versatile M-A352 is well suited to a wide-range of challenging applications such as SHM, seismic observation, condition monitoring for industrial equipment, and pose detection for industrial machinery (i.e. construction machinery/attachments, agricultural machinery/ implements, robots).

■ FEATURES

- **Ultra-low noise：0.2μG/√Hz typ.**
- **Improved shock resistance: 1,000G**
- **Selectable output format: Acceleration / Tilt Angle**
- **Selectable interface: SPI / UART**
- **Programmable low-pass digital filters**
- **Low jitter external trigger function for synchronous sampling**
- **Solid Metallic Case (Size : 48mm x 24mm x 16mm, Weight: 25g)**

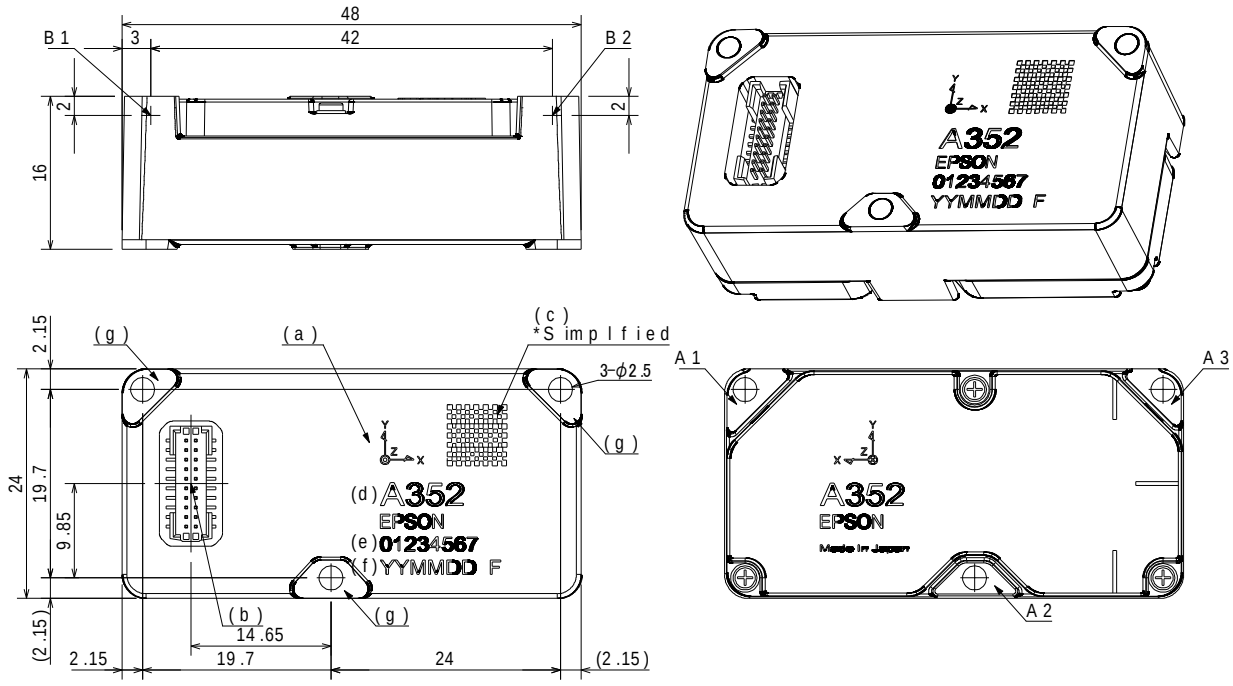
■ SPECIFICATION

T_A=-30°C to +85℃, VCC=3.15V~3.45V, ≤±1G, unless otherwise noted.

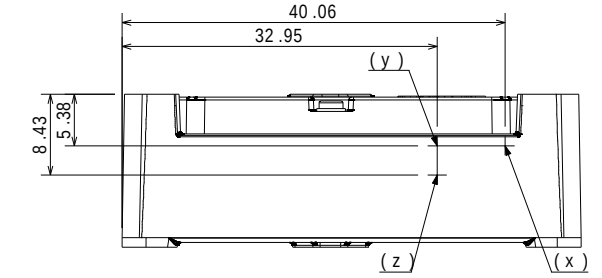
Parameter	Test Conditions / Comments	Min	Typ	Max	Unit
SPECIFICATIONS					
Output Range	f = DC ~ 460Hz			±15	G
Scale Factor	2^{-24}G/LSB		0.06		μG/LSB
Sensitivity Error	25°C, ≤ 1G		±500		$\times 10^{-6}$ (ppm)
Nonlinearity	≤ 1G, Best fit straight line, RT			±0.03	% of FS
Misalignment	25°C			±0.1	Deg
Initial Error	25°C			±2	mG
Bias Repeatability	TA=25°C and VCC=3.3V for one year after shipment		3		mG
Bias Temperature Error	25°C			±2	mG
Noise Density	25°C, Avg, f = 0.5Hz ~ 6Hz		0.2	0.7	μG/√Hz, rms
Cantilever Resonance frequency	25°C, VCC3.3V		850		Hz
VRC	at 50Hz, 25°C, VCC3.3V			±50	$\mu G/G^2$
Power Supply Current	Standard noise floor condition, 200Sps, Average		13.2	18.0	mA
	Reduced noise floor condition, 200Sps, Average		16.2	20.0	mA
	Sleep mode		1.3	2.0	mA
FUNCTION					
Built-in LPF Cut off	-6dB at 25℃, selectable	9		460	Hz
User LPF		4, 64, 128, 512			Tap
Output Data Rate		50		1,000	Sps
Ext.Trigger Input Cycle		1		20	ms
Ext.Trigger Jitter	ADC's completion to Ext.Trigger input	0		5	μs
RECOMMENDED OPERATING CONDITION					
VCC to GND		3.15	3.3	3.45	V
Operating temperature range	No condensation	-30		85	°C
ABSOLUTE MAXIMUM RATINGS					
Acceleration/Shock	Half-sine 0.2msec	1,000			G
MTBF	JIS-C5003, 60% reliability leve	87,600			Hour
Storage Temperature Range	No condensation	-40		85	℃

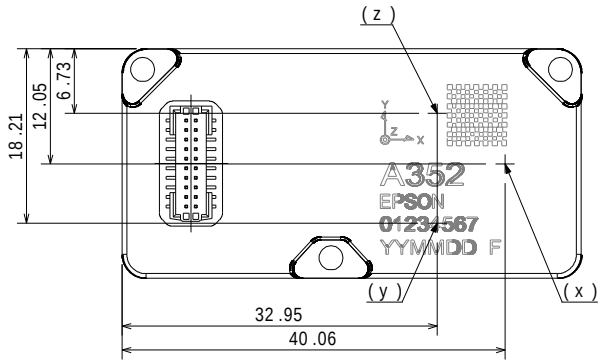
Note) This accelerometer is referenced to the standard gravity acceleration value. (9.80665m/s^2)

■ OUTLINE DIMENTIONS



(a)	Directions of the detection axes
(b)	Connector Position
(c)	Matrix Code (DataMatrix) Including Product Name & S/N & Date & Factory Code
(d)	Product Name
(e)	Serial Number
(f)	Date & Factory Code
(g)	Frame Ground
(x)	X Axis Sensor Position
(y)	Y Axis Sensor Position
(z)	Z Axis Sensor Position





Header Part Number

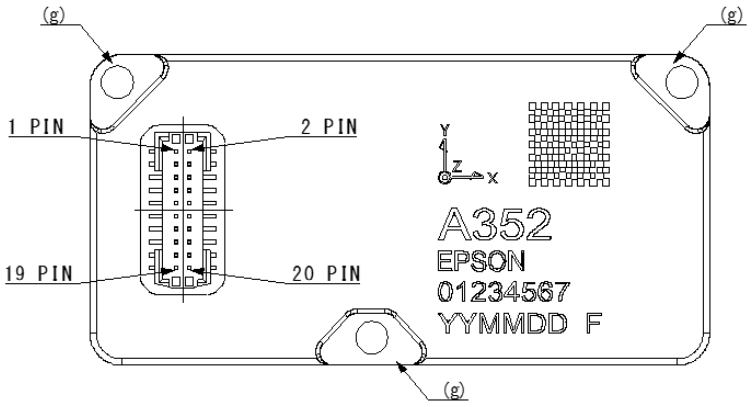
Maker	Parts Number	RoHS Compliant
Samtec	FTMH-110-02-L-DV-ES	Yes

Recommended socket parts at the host side

Maker	Parts Number	RoHS Compliant
Samtec	CLM-110-02-H-D	Yes
Samtec	CLM-110-02-L-D	Yes

*1) This product is calibrated based on the surfaces A1, A2, A3, and B1, B2.
*2) In order to demonstrate the performance of the product properly, please fix surfaces A1, A2, A3 to rugged parts with M2 screw.
*3) When high connection reliability is required, please tighten this product together with the board on which the connector is mounted.

■PIN LAYOUT AND FUNCTION



Pin No.	Mnemonic	Type*1	Description
1	SCLK	I	SPI Serial Clock *2
2	SDO	O	SPI Data Output *2
5	SDI	I	SPI Data Input *2
6	/CS	I	SPI Chip Select *2
7	SOUT	O	UART Data Output *2
9	SIN	I	UART Data Input *2
13	DRDY	O	Data Ready
14	EXT	I	External Trigger Input (Sleep Wakeup Input)
16	/RST	I	Reset
10,11,12	VCC	S	Power Supply 3.3V
3,4,8,15	GND	S	Ground *3
17,18,19,20	NC	N/A	Do Not Connect

*1 Pin Type I: Input, O: Output, I/O: Input/Output, S: Supply, N/A: Not Applicable
*2 Connect only one of the serial interfaces (SPI or UART) at a time. This product malfunctions when both SPI and UART are connected at the same time.
*3 Please connect (g) Frame Ground to any GND pin (No.3, 4, 8, 15).

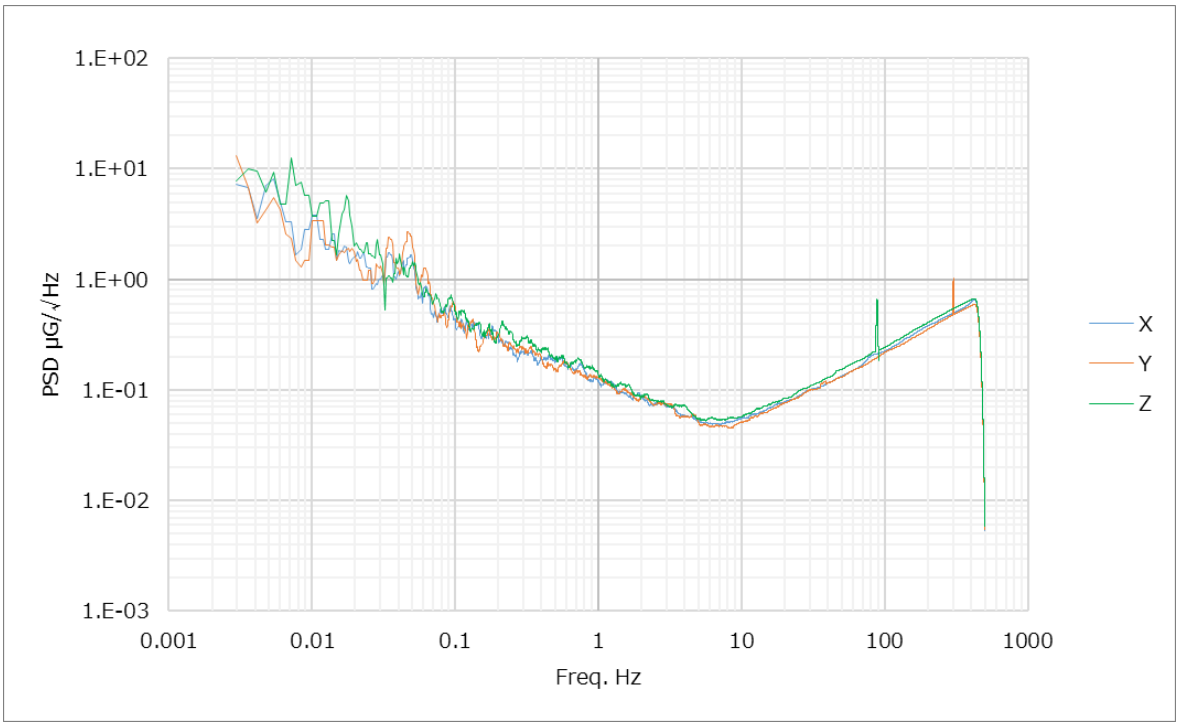
■EVALUTION TOOLS

Evaluation tools can be provided for the M-A352. For details, contact our representatives.

Product Model Number	Product Name	Comments
X2H000021000200	M-G32EV041	USB Evaluation Board for M-A352AD10 *Works with Logger Software.
X2H000021000300	M-G32EV051	Relay board for M-A352AD10 *Combination with M-G32EV041 is possible.

■ Noise Density Data

Power Spectrum Density (Reduced noise floor condition)



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SEIKO EPSON CORPORATION

MD SALES & MARKETING DEPT.

JR Shinjuku Miraina Tower, 4-1-6 Shinjuku, Shinjuku-ku, Tokyo, 160-8801, Japan
Phone: +81-3-6682-4322 FAX: +81-3-6682-5016

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