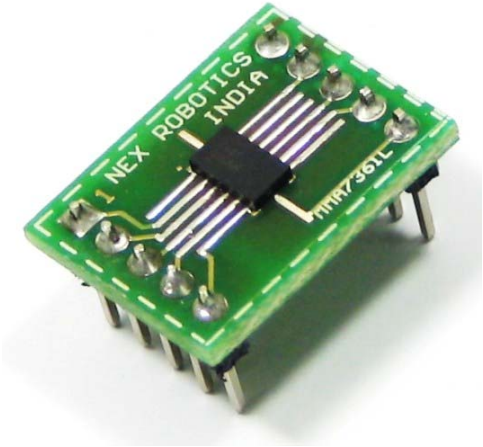
MMA7361L ±1.5g, ±6g Three axis Low-G Accelerometer Module



Introduction:

MMA7361L is a Three axis Low-G accelerometer Module which gives selectable acceleration range from ±1.5g or ±6g. Board has all the necessary components required for the chip. Board made up of high quality silver plated double sided PCB for giving extra strength to the connectors.

MMA7361L accelerometer has building signal conditioning, a 1-pole low pass filter, temperature compensation, self test, 0g-Detect which detects linear freefall, and g-Select which allows for the selection between 2 sensitivities. It also includes a Sleep Mode that makes it ideal for handheld battery powered electronics.

Possible applications of this board includes 3D-Gaming: Tilt and Motion Sensing, Event recorder, HDD MP3 Player: Freefall Detection, Laptop PC: Freefall Detection, Anti-Theft, Cell Phone: Image Stability, Text Scroll, Motion Dialing, E-Compass, Pedometer: Motion Sensing, PDA: Text Scroll, Navigation and Dead Reckoning: E-Compass Tilt Compensation, Robotics: Motion Sensing etc.

Features

- Acceleration range along X, Y, Z axis.
- High sensitivity: 800mV/g @1.5g
- Acceleration Range: ±1.5g or ±6g
- 0g-Detect: For linear fall free protection
- Embedded Self-Test, which allows testing electrical and mechanical parts of the sensor
- Sleep mode: provides significant reduction in current
- Ratiometricity: provides system level cancellation of supply include errors in the analog to digital conversion process.
- Environmentally preferred product
- High shock and vibration survivability

Specification

- Supply voltage (Vdd): 2.2V to 3.6V @ 400µA
- Sleep mode current: 10 µA
- Sensitivity: 1.5g : 800 mV/g
  6g : 206 mV/ g
- Static Acceleration : XOUT,YOUT,ZOUT
  @ -1g : 0.85V
  @ 0g : 1.65V
  @ +1g: 2.45V
- Self-Test input: 0V to Vdd
- Bandwidth:
  XOUT, YOUT: 400Hz
  ZOUT : 300Hz
- Output Impedance : 32KΩ

Connections:

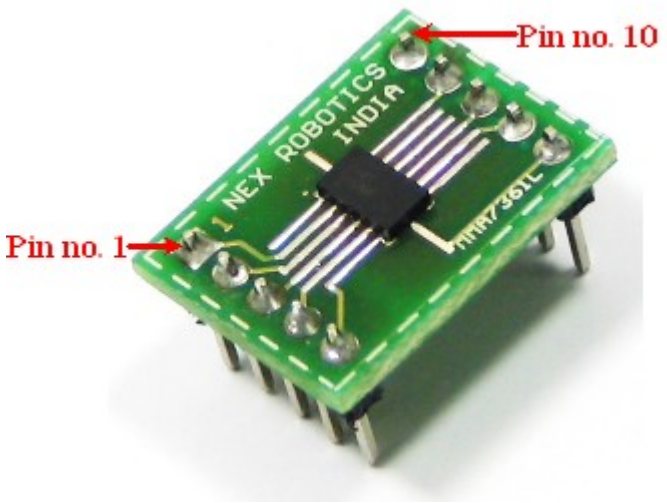


Figure 1: Pin Configuration

Pin#	Pin name	Description
1	XOUT	X direction output Voltage
2	YOUT	Y direction output Voltage
3	ZOUT	Z direction output Voltage
4	Vss	Supply Ground
5	Vdd	3.3V supply voltage
6	Sleep (Active Low)	Logic input pin for sleep mode
7	0g-Detect	Freefall digital logic output signal
8	g-select	Logic input pin to select G level
9	ST	Self-test (logic 0: normal mode; logic 1: self-test)
10	NC	Leave Unconnected

Pin Description:

XOUT: This provides the change in acceleration in X direction in terms of analog voltage

YOUT: This provides the change in acceleration in Y direction in terms of analog voltage

ZOUT: This provides the change in acceleration in Z direction in terms of analog voltage

Vss: Supply Ground: This is the supply ground pin for system.

Vdd: Supply voltage: apply the 3.3 v supply to this pin.

Sleep(Active Low): This is control input pin, logic High for normal mode where system consume only 400µA current and logic low for Sleep mode where system consume only 10µA current.

0g-Detect: The sensor offers a 0g-Detect feature that provides a logic high signal when all three axes are at 0g. This feature enables the application of Linear Freefall protection if the signal is connected to an interrupt pin or a poled I/O pin on a microcontroller.

G-select: The G-Select feature allows for the selection between two sensitivities. Depending on the logic input placed on this pin, the device internal gain will be changed allowing it to function with a 1.5g or 6g sensitivity.

G-Select (logic level)	G-Range	Sensitivity
0	1.5G	800mV/G
1	6G	206mV/G

ST(Self-test): Self Test allows the verification of the mechanical and electrical integrity of the accelerometer at any time before or after installation.

To use this feature to verify the 0g-Detect function, the accelerometer should be held upside down so that the z-axis experiences -1g. When the self test function is initiated, an electrostatic force is applied to each axis to cause it to deflect. The x- and y-axis are deflected slightly while the z-axis is trimmed to deflect 1g. This procedure assures that both the mechanical (g-cell) and electronic sections of the accelerometer are functioning. To test Self Test function apply logic 1 to the pin. For normal operation keep this pin logic 0.

Circuit Diagram:

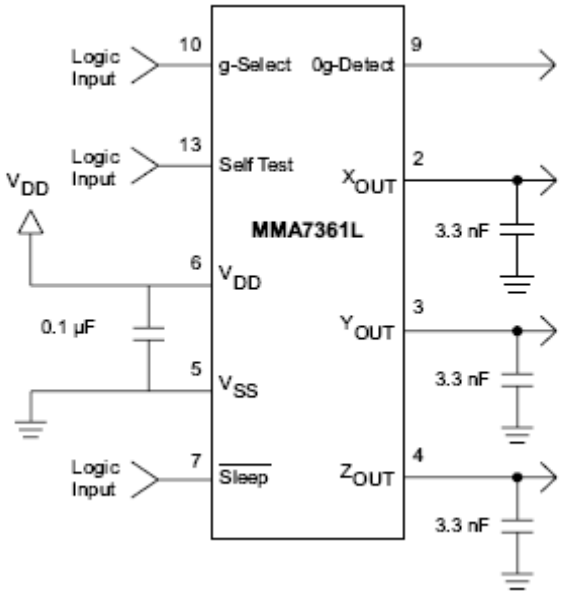


Figure 2: Accelerometer with recommended connections

0.1µF power supply decoupling capacitors placed near the supply pins. Use a 3.3nF capacitor on the outputs of the accelerometer to minimize clock noise (from the switched capacitor filter circuit). A/D sampling rate and any external power supply switching frequency should be selected such that they do not interfere with the internal accelerometer sampling frequency (11 kHz for the sampling frequency). This will prevent aliasing errors.

The compact board with few mounted components gives you the analog output voltage on the connector pins.

Note:
For more information on the MMA7361L (Three axis Low-g Accelerometer) download the MMA7361L datasheet from the MMA7361L ±1.5g, ±6g Three axis Low-g Accelerometer Module product page from NEX Robotics' website.

Notice

The contents of this manual are subject to change without notice. All efforts have been made to ensure the accuracy of contents in this manual. However, should any errors be detected, NEX Robotics welcomes your corrections. You can send us your queries / suggestions at
info@nex-robotics.com

⚠ **Product's electronics is static sensitive. Use the product in static free environment.**
⚠ **Read the user manuals completely before start using this product**

Recycling:

Almost all the part of this product are recyclable. Please send this product to the recycling plant after its operational life. By recycling we can contribute to cleaner and healthier environment for the future generations.