



Dual Axis Accelerometer Evaluation Board

ADXL202EB

GENERAL DESCRIPTION

The ADXL202EB is a simple evaluation board that allows the user to quickly evaluate the performance of the ADXL202 dual axis $\pm 2g$ accelerometer. Only three additional through-hole passive components must be added, depending on the bandwidth required in your application. The ADXL202EB has a 5-pin 0.1-inch spaced header for access to all power and signal lines that may be attached to a prototyping board (breadboard) or wired via a standard plug. Two holes are provided for mechanical attachment of the ADXL202EB to your application.

CIRCUIT DESCRIPTION

The schematic and parts list of the ADXL202EB are shown in Figure 1 and Table I respectively. The minimal application will require at least one resistor (R_{SET}) added to the board to set the PWM period (T_2). Analog bandwidth may be set by adding capacitors C2 and C3. Refer to the ADXL202 data sheet for a complete description of the operation of the accelerometer.

The part layout of the ADXL202EB is shown in Figure 2. The ADXL202EB has two factory-installed 2200 pF capacitors (C1 and C4) at X_{FILT} and Y_{FILT} to satisfy the minimum filter capacitor specification of the ADXL202. Your application will likely require narrower bandwidth (and lower noise), in which case a through-hole capacitor may be added in parallel in the space provided at C2 and C3 respectively. When calculating the capacitance required to achieve the desired analog bandwidth do not forget to subtract the 2200 pF already on the PCB. The pinout description of the ADXL202EB is shown in Table II.

SETTING THE PERIOD OF THE DUTY CYCLE MODULATOR

The DCM period is set by R_{SET} . Choose a value between 100 k Ω and 2 M Ω . See Table III for some typical R_{SET} values.

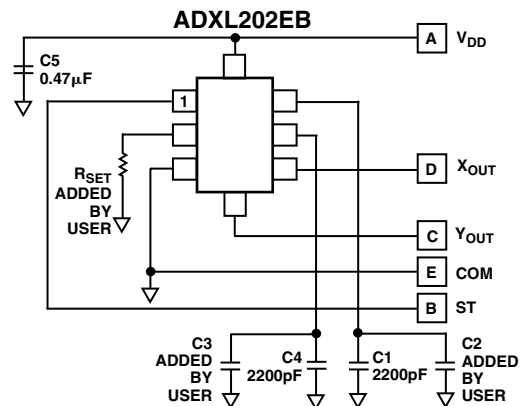


Figure 1. ADXL202EB Schematic

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Table I. ADXL202EB Parts List

| Reference | Value | Function |
|-----------|---------------|--|
| C1 | 2200 pF/25V | X _{FILT} . Sets X axis analog bandwidth along with C2 |
| C2 | Added by User | X _{FILT} . Sets X axis analog bandwidth along with C1 |
| C3 | Added by User | Y _{FILT} . Sets Y axis analog bandwidth along with C4 |
| C4 | 2200 pF/25V | Y _{FILT} . Sets Y axis analog bandwidth along with C3 |
| J1 | Connector | All power and signal connection through J1 |
| R1 | Added by User | R _{SET} . Sets the PWM period (T2) |
| U1 | ADXL202 | Dual axis ±2g accelerometer |

Table II. ADXL202EB Pinout Description

| Pin Reference | Pinout |
|---------------|---------------------------|
| E | GROUND |
| B | SELF-TEST INPUT |
| D | X AXIS DUTY CYCLE OUT |
| C | Y AXIS DUTY CYCLE OUT |
| A | +V SUPPLY (3 to 5.25 VDC) |

Table III. DCM Period vs. R_{SET} Value

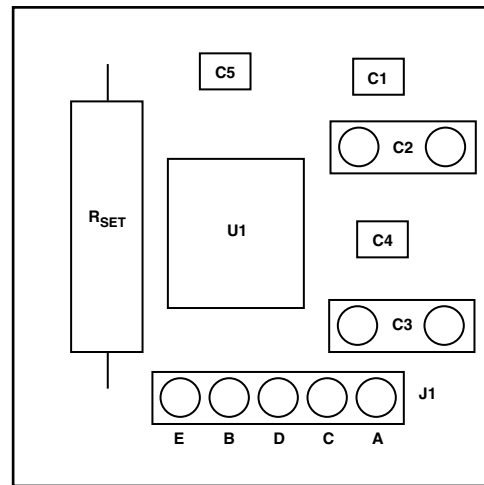
| T2 Period | R _{SET} |
|-----------|------------------|
| 1 ms | 124 kΩ |
| 2 ms | 248 kΩ |
| 5 ms | 620 kΩ |
| 10 ms | 1.24 MΩ |

Table IV. Typical X_{FILT} and Y_{FILT} Values vs. Bandwidth and Noise Performance

| X _{FILT} , Y _{FILT} | Bandwidth | RMS Noise |
|---------------------------------------|-----------|-----------|
| 0.01 μF | 500 Hz | 12.7 mg |
| 0.047 μF | 100 Hz | 7 mg |
| 0.1 μF | 50 Hz | 4.2 mg |
| 0.47 μF | 10 Hz | 2.3 mg |

SETTING THE ADXL202'S BANDWIDTH

The ADXL202EB is supplied with the minimum specified X_{FILT} and Y_{FILT} values installed. Your application will likely require a narrower bandwidth to improve noise performance. See Table IV for some typical capacitor values.


Figure 2. ADXL202EB Part Layout (Top View)

SPECIAL NOTES ON HANDLING

Note that the ADXL202EB is not reverse polarity protected. Reversing the +V_{SUPPLY} and Ground pins will damage the ADXL202.

Dropping the ADXL202EB on a hard surface may generate several thousand *g* of acceleration. Enough to damage the accelerometer. Please refer to the ADXL202 data sheet for information on shock survivability.