

GENERAL DESCRIPTION

The ADXL213EB is a simple evaluation board that allows quick evaluation of the performance of the ADXL213 dual axis $\pm 1.2 g$ accelerometer. The user needs to add only three additional through-hole passive components, depending on the bandwidth required in the application. The ADXL213EB has a 5-pin 0.1 inch spaced header for access to all power and signal lines that the user can attach to a prototyping board (breadboard) or wire using a standard plug. Two holes are provided for mechanical attachment of the ADXL213EB to the application.

CIRCUIT DESCRIPTION

The schematic and parts list of the ADXL213EB are shown in Figure 1 and Table 1, respectively. The minimal application requires at least one resistor (R_{SET}) added to the board to set the PWM period (T_2). Analog bandwidth can be set by adding capacitors C2 and C3. See the ADXL213 data sheet for a complete description of the operation of the accelerometer.

The part layout of the ADXL213EB is shown in Figure 2. The ADXL213EB has two factory-installed 2200 pF capacitors (C1 and C4) at X_{FILT} and Y_{FILT} to satisfy the minimum filter capacitor specification for the ADXL213. Many applications require a narrower bandwidth (and lower noise), in which case the user can add a through-hole capacitor 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 pin function descriptions for the ADXL213EB are listed in Table 2.

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 3 for typical R_{SET} values.

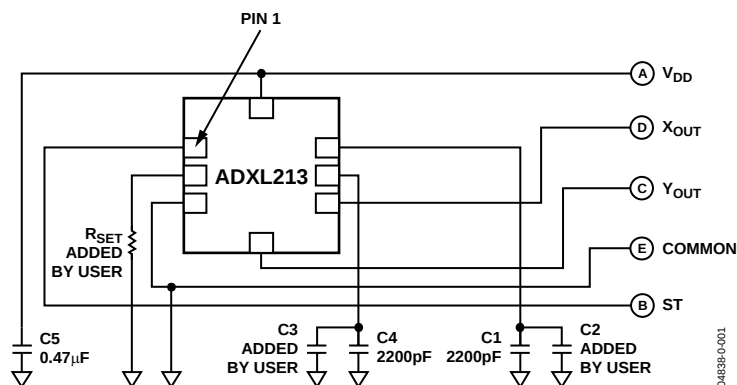


Figure 1. ADXL213EB Schematic

Rev. 0

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ADXL213EB

Table 1. ADXL213EB Parts List

Reference	Value	Function
C1	2200 pF/25 V	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/25 V	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	ADXL213	Dual axis $\pm 2 g$ accelerometer.

Table 2. ADXL213EB Pin Function Descriptions

Pin Reference	Function
E	Ground
B	Self-Test Input
D	X Axis Duty Cycle Out
C	Y Axis Duty Cycle Out
A	+V Supply (3 VDC to 5.25 VDC)

Table 3. DCM Period vs. R_{SET} Value

T2 Period	R_{SET}
1 ms	124 k Ω
2 ms	248 k Ω
5 ms	620 k Ω
10 ms	1.24 M Ω

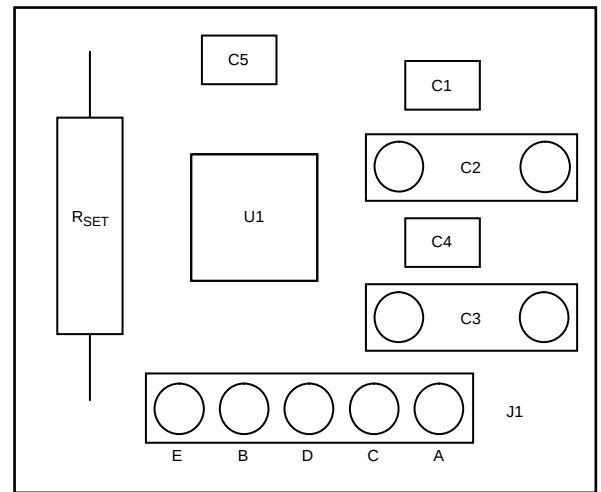


Figure 2. ADXL213EB Part Layout (Top View)

SETTING THE ADXL213'S BANDWIDTH

The ADXL213EB is supplied with the minimum specified X_{FILT} and Y_{FILT} values installed. Many applications require a narrower bandwidth to improve noise performance. See Table 4 for typical capacitor values.

Table 4. Typical X_{FILT} and Y_{FILT} Values vs. Bandwidth and Noise Performance

X_{FILT} , Y_{FILT}	Bandwidth	RMS Noise
0.01 μ F	500 Hz	4.5 mg
0.047 μ F	100 Hz	2 mg
0.1 μ F	50 Hz	1.4 mg
0.47 μ F	10 Hz	0.6 mg

SPECIAL NOTES ON HANDLING

The ADXL213EB is not reverse polarity protected. Reversing the +V supply and ground pins causes damage to the ADXL213.

Dropping the ADXL213EB on a hard surface can generate several thousand g of acceleration, enough to damage the accelerometer. See the ADXL213 data sheet for information on shock survivability.

ORDERING GUIDE

Model	Package Description
ADXL213EB	Evaluation Board