

## MINISENSE 100 ANALOG PCB

### SPECIFICATIONS

- Evaluation Circuit for Vibration Sensor
- Low Power – Battery Powered
- LED for Trigger
- High Sensitivity
- Analog and Digital Signal Access Points

The LDTC MiniSense 100 Analog PCB provides a simple way to evaluate the LDTC MiniSense 100. The unit consists of LDTC MiniSense 100, a low-power operation amplifier, comparator, and DC/DC converter, and the passive components used for signal conditioning. The sensor and circuit are assembled on a double-sided PCB with test points, ON/OFF switch, and 0.100" plated through holes for easy user interface. The PCB has adjustable gain and demonstrates the basic capabilities of LDTC MiniSense 100 vibration sensor.

### FEATURES

- Signal Conditioned Vibration Sensor
- High Pass Filter @ 1.3Hz
- Low Pass Filter @ 177Hz
- On Board 3.3 V Battery or User Power Supply
- Both Analog and Digital Output

### APPLICATIONS

- Wake-up Sensor
- Drop Detection Sensor
- Flow Sensor
- Activity Sensor
- Alarm Trigger

## SPECIFICATIONS

CHARACTERISTIC (T=25(C))	SYMBOL	MIN	TYP	MAX	UNITS
Lower Frequency Limit (-3dB Point)	$f_{L3dB}$	-	1.3	-	Hz
High Frequency Limit (-3dB Point)	$f_{U3dB}$	-	177	-	Hz
External Supply Voltage	+V	0.9	3.3	5.5	VDC
Supply Current	I <sub>supply</sub>	-	2.8	-	mA

## PIN DESCRIPTIONS

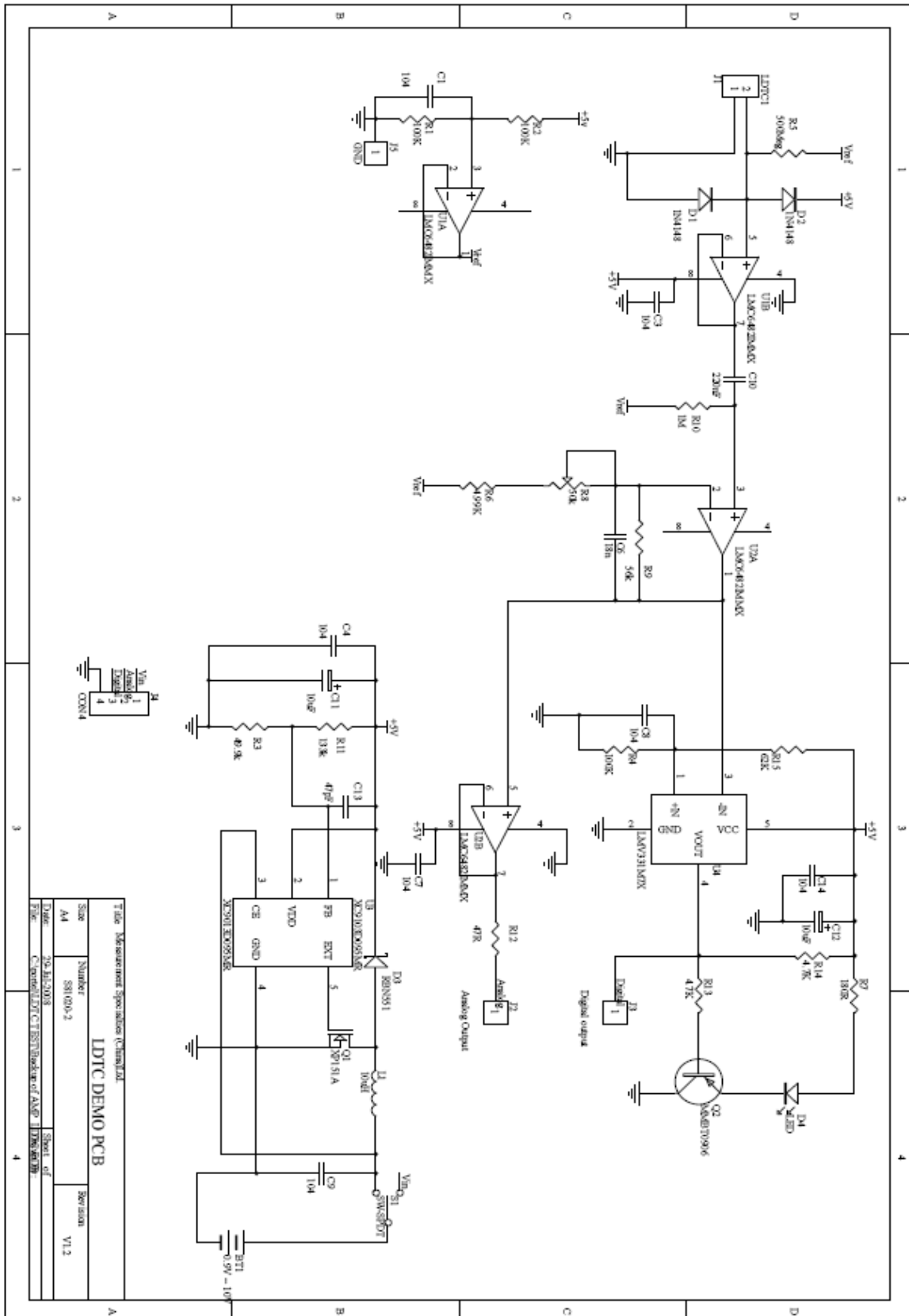
PIN NUMBER	NAME	DESCRIPTION
1	VDD	Connect to Power Supply
2	A	Analog Signal output
3	D	Digital Signal output
4	GND	Connect to GND

**\*\*Note: when switch set to "OFF", PCB uses external power if applied to (+) & (-) input pins\*\***

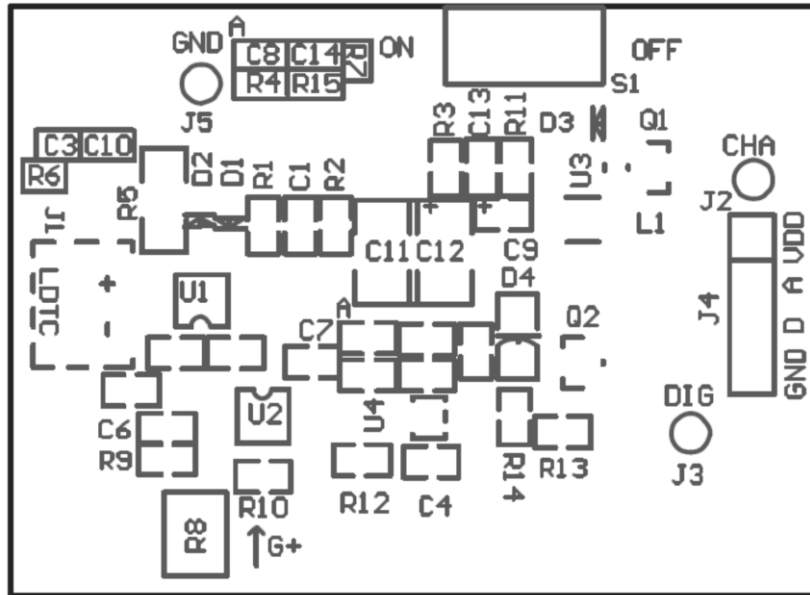
## ENVIRONMENTAL CHARACTERISTICS

CHARACTERISTICS	SYMBOL	MIN	TYP	MAX	UNITS
Operating Temperature	TOP	-20	-	+85	°C
Storage Temperature	TS	-40	-	+105	°C
Relative Humidity	RH	0	-	90	%R.H

ELECTRICAL SCHEMATIC



ELECTRICAL PCB REFERENCE

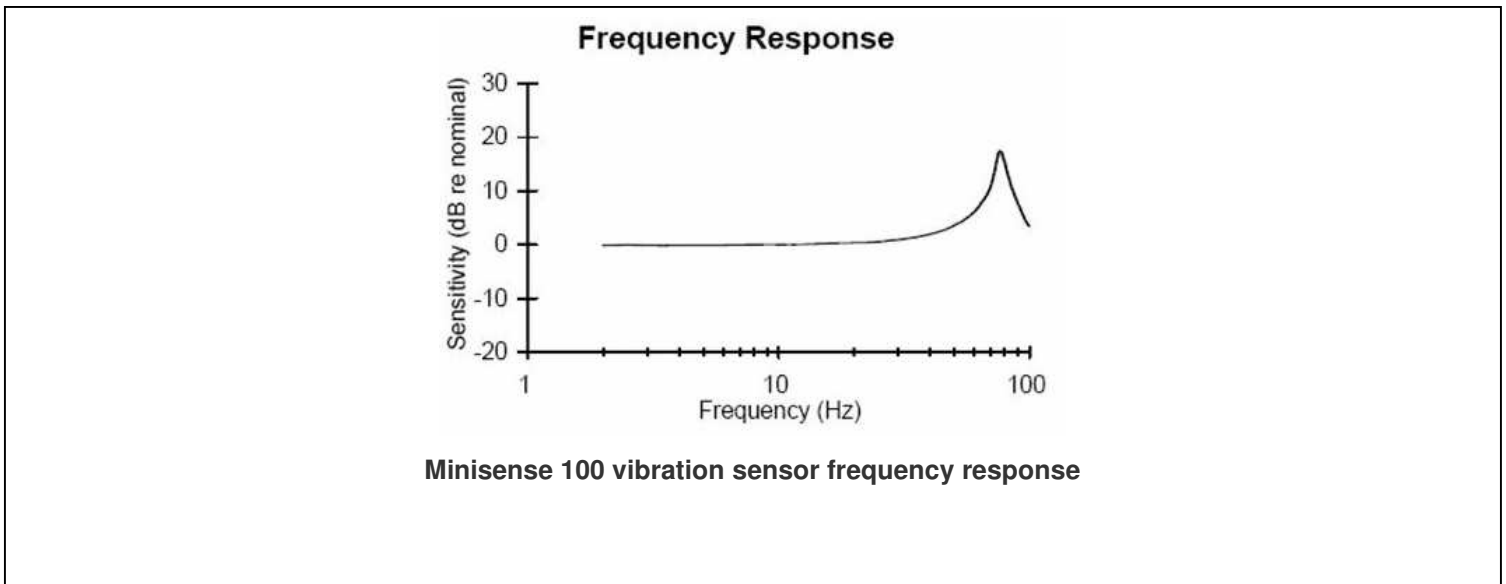


ELECTRICAL PCB DESCRIPTION

The impedance matching resistor, R5, in parallel with the 240pF sensor capacitance, establishes the high pass input filter at approximately 1.3Hz ( $f=1/2\pi RC$ ). After impedance buffering the LDTc signal is DC coupled to a gain stage through a 0.7Hz high pass filter formed by C10 and R10. The amplifier gain is set by R9, R6, and the R8 potentiometer in the OP-amp's feedback loop:  $Gain=1+ [R9/(R8+R6)]$  with a max gain of 20dB, min gain of 6dB. C6 in parallel with R9 in the feedback loop form a low pass filter with a corner frequency of 177Hz.

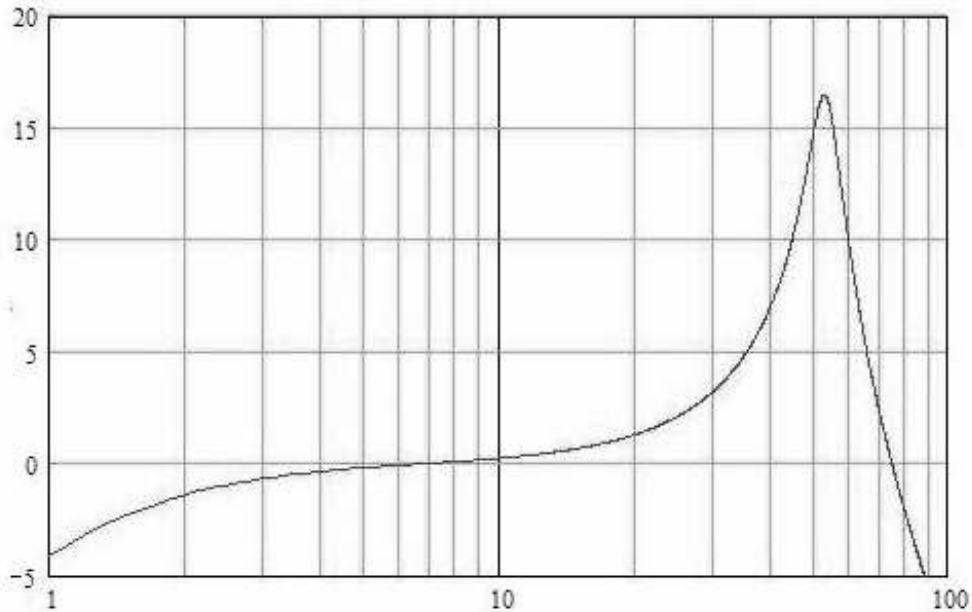
After signal conditioning the analog voltage is buffered for output and also fed into a comparator. R15 & R4 set the threshold voltage. If the amplified signal exceeds the threshold voltage, the comparator output will be pulled low through a 4.7K resistor and the PNP transistor will turn on the LED. The reference voltage, VREF, is 1.65V, or half of the internal 3.3V rail. The on board 3.3V battery and external power are converted to a 5V supply using a DC-DC converter.

FREQUENCY RESPONSE



MiniSense 100 vibration sensor Analog PCB Acceleration Response

Frequency Response



ORDERING INFORMATION

Description	Part Number
MiniSense 100 Analog PCB	1007215

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