

# 40 kHz Ultrasonic Receiver & PreAmplifier Board

- Wide Horizontal Beam Directivity
- Broad bandwidth
- Low Q Resonance
- Excellent Impact Resistance
- Low Cost
- Lightweight

**Piezoelectric Film (PVDF) Ultrasound Receivers** offer unique advantages for air ranging applications. Cylindrical 40kHz PVDF receivers exhibit very wide horizontal beam directivity and broad bandwidth characteristics. These characteristics lend unique solutions in many applications such as two-dimensional positioning, digitizer, object detection, and distance measurement. Depending on the applications, resonance frequency and vertical beam directivity of the receiver can easily be customized by changing the diameter and length of the PVDF cylinder.

The receiver has a very wide horizontal beam angle and it can be reduced by changing the housing design if necessary. PVDF receivers also have very low resonance Q value. Typically, PVDF receivers have a Q value of 4. This means that the rising time and the signal decay time are much faster than the conventional ceramic receivers. This characteristic is suitable for high speed data acquisition or high speed digitizer applications. Also, a preamplifier is available for easy evaluation of 40 kHz receivers.



## FEATURES

- PVDF Thickness: 30  $\mu\text{m}$
- Resonance Frequency: 40 kHz
- Bandwidth: 10 kHz
- Resonance Q: 4
- Sensitivity Output: 1.5 mV/Pa -76 dB
- Horizontal Beam Directivity:  $\pm 150^\circ$
- Vertical Beam Directivity:  $\pm 40^\circ$
- Capacitance: 140 pF
- Storage Temperature:  $-20^\circ\text{C}$  -  $+85^\circ\text{C}$
- Operating Temperature:  $+5^\circ\text{C}$  -  $+60^\circ$

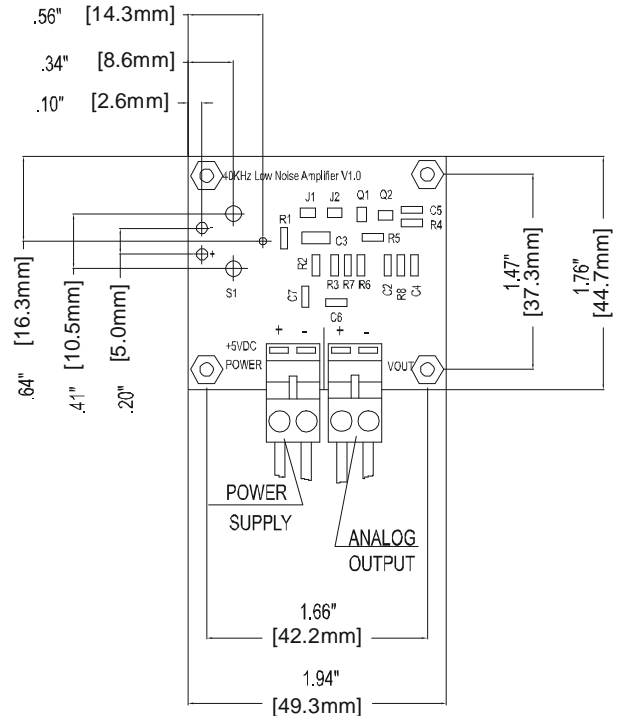
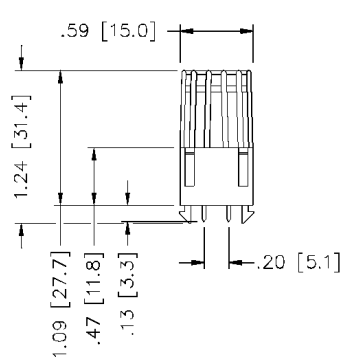
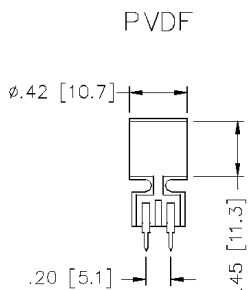
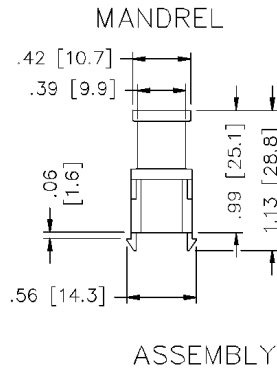
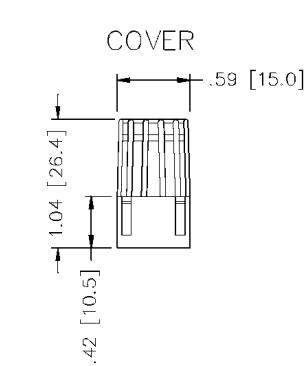
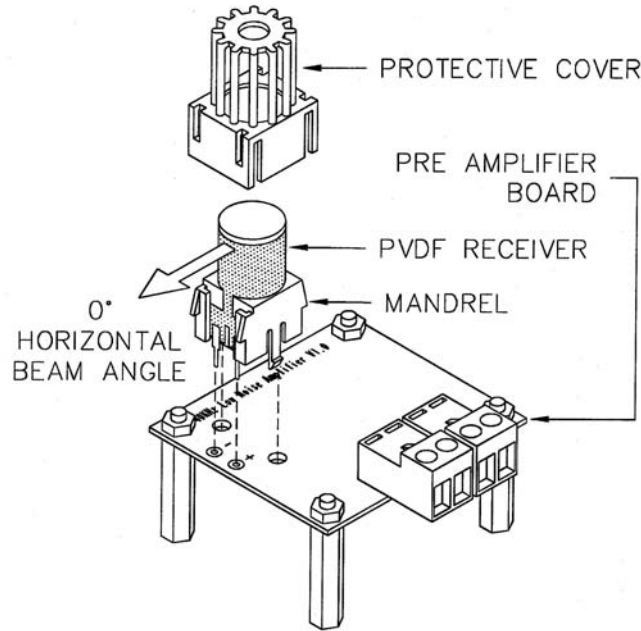
## APPLICATIONS

- Two-dimensional Position Detection
- Digitizer
- Distance Measurement
- Object Detection
- General Purpose Air Ranging Applications

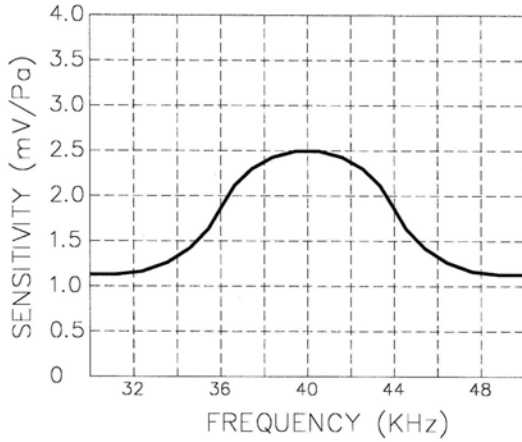
## specifications

	Min	Typ	Max	Unit
Supply Voltage		5		VDC
Supply Current		0.03		ADC
Frequency		40		kHz
Gain		31		dB

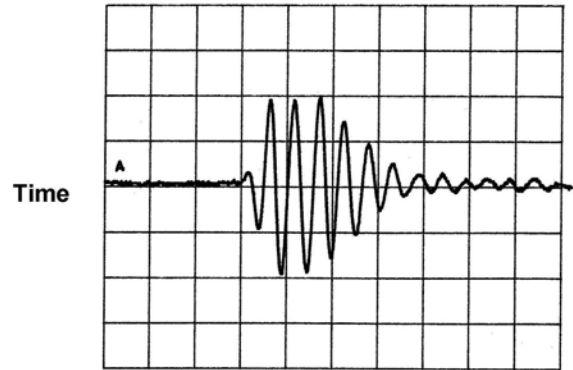
## dimensions



## TYPICAL FREQUENCY RESPONSE



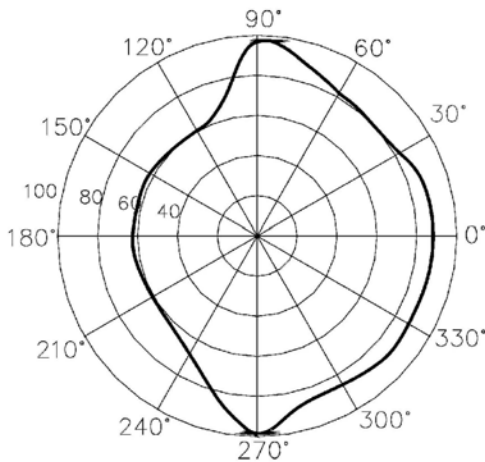
## TYPICAL TIME RESPONSE



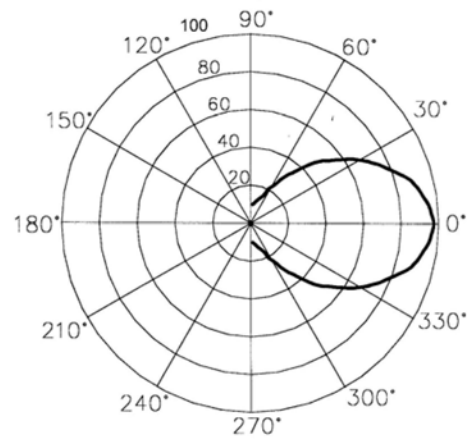
20mV/div, 50  $\mu$ s/div

**NOTE:** Measured with PVDF transmitter (100Vp drive) and preamplifier (gain of 17)

## TYPICAL HORIZONTAL BEAM DIRECTIVITY

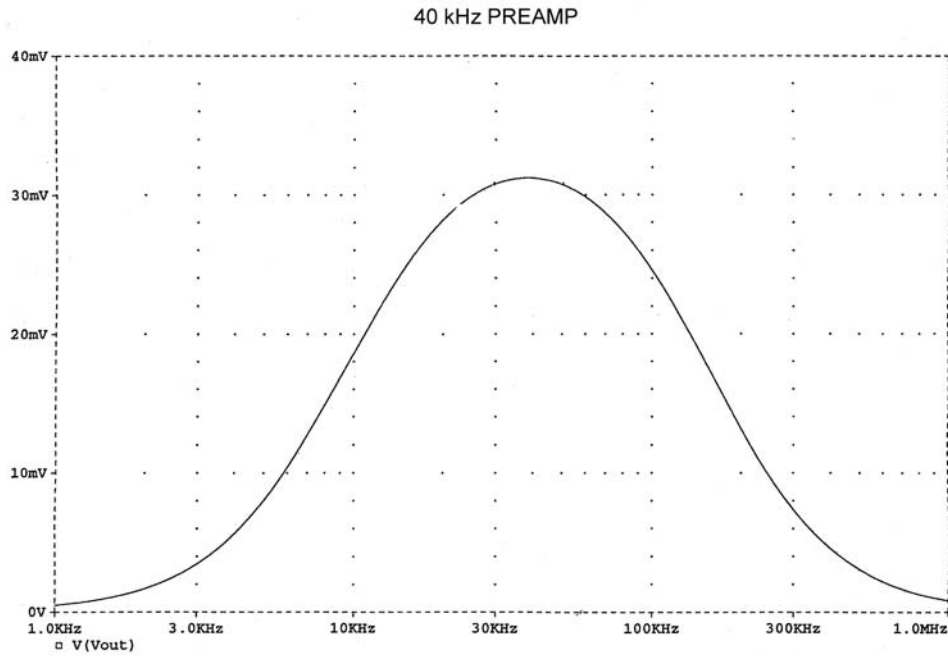


## TYPICAL VERTICAL BEAM DIRECTIVITY

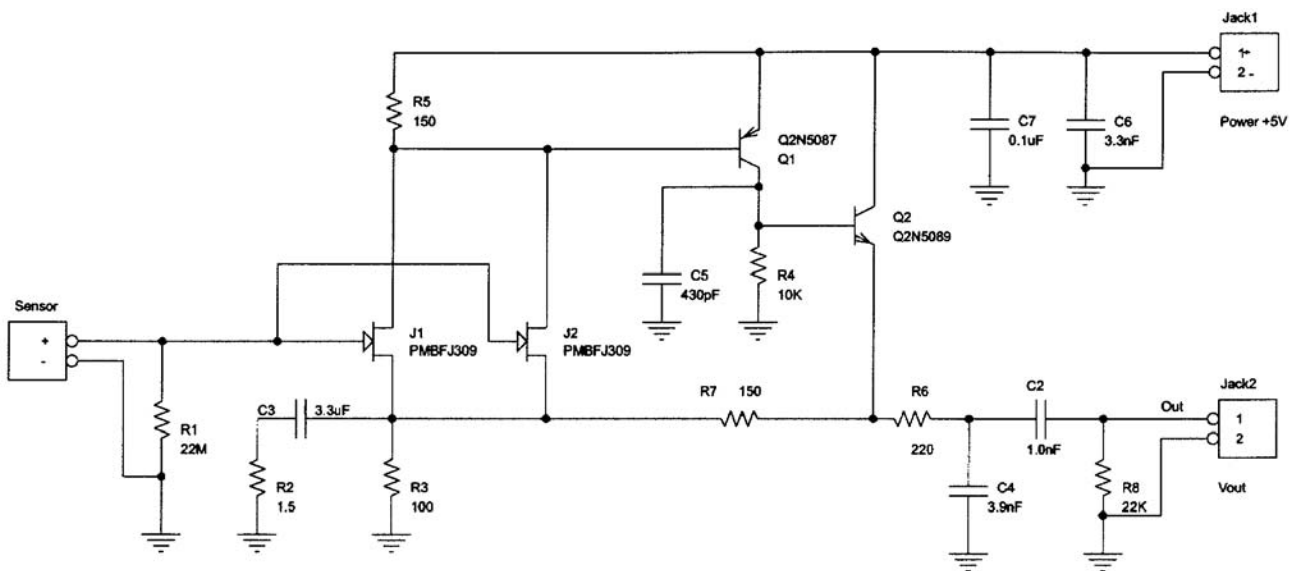


## preamplifier gain

Pre-amplifier has gain of 31 and a bandwidth filter to maximize the S/N ratio. The receiver can be snapped onto the pre-amplifier.



## circuit diagram



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## ordering information

<b>Description</b>	<b>Part #</b>	<b>Model #</b>
40kHz Receiver	1005856-1	US40KR-01
Preamplifier Board	1005857-1	US40KA-01

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