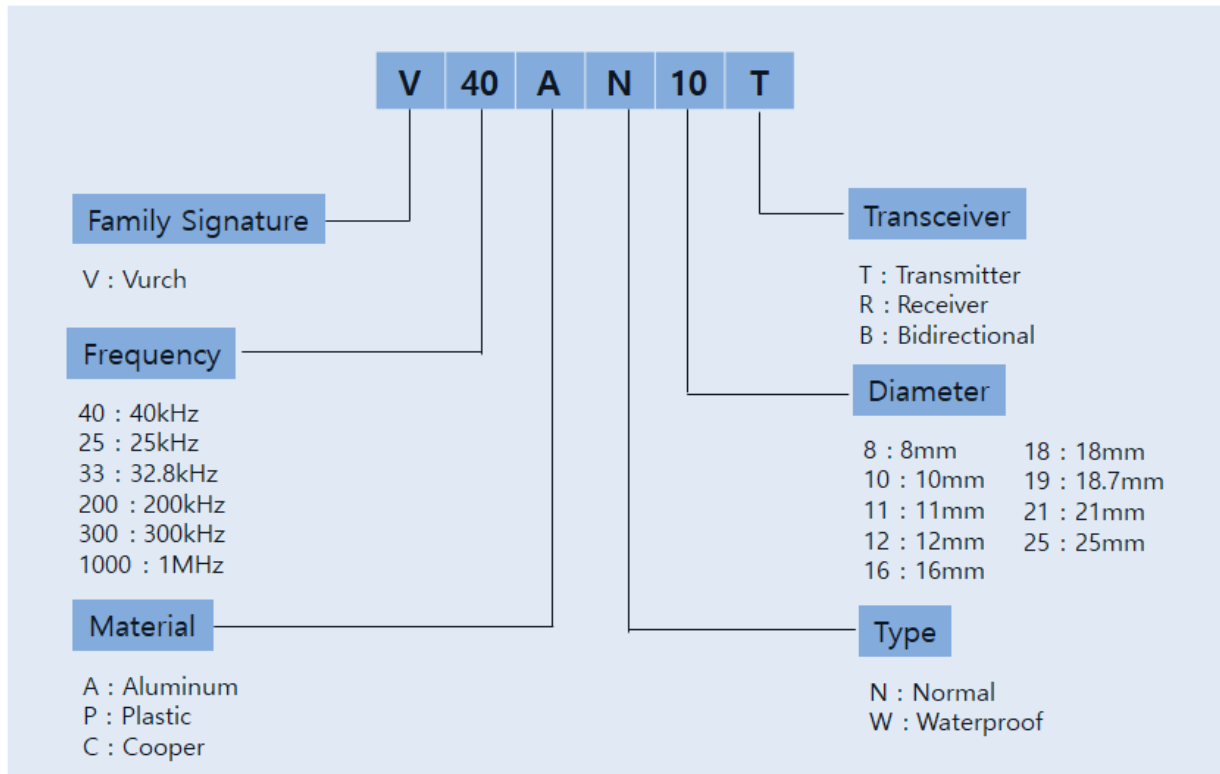




## Ultrasound Transducer Datasheet REV1.2

## Ordering Information

This section describes the devices ordering information. Below figure shows the ordering codes for transducers



(1) The marketing status values are defined as follows:

**ACTIVE** : Product device recommended for new designs

**LIFEBUY** : VURCH has announced that the device will be discontinued, and a lifetime-buy period is in effect

**OBSOLETE** : VURCH has discontinued the production of the device.

## All Products Information

Part Number	Frequency	Material	Color	Type	Diameter	Transceivers
<a href="#">V40AN10T</a>	40kHz	Aluminum	Black	Normal	10mm	Transmitter
<a href="#">V40AN10R</a>	40kHz	Aluminum	Black	Normal	10mm	Receiver
<a href="#">V40PN10T</a>	40kHz	Plastic	Black	Normal	10mm	Transmitter
<a href="#">V40PN10R</a>	40kHz	Plastic	Black	Normal	10mm	Receiver
<a href="#">V40AN12T</a>	40kHz	Aluminum	Silver	Normal	12mm	Transmitter
<a href="#">V40AN12R</a>	40kHz	Aluminum	Silver	Normal	12mm	Receiver
<a href="#">V25AN16T</a>	25kHz	Aluminum	Silver	Normal	16mm	Transmitter
<a href="#">V33AN16T</a>	32.8kHz	Aluminum	Silver	Normal	16mm	Transmitter
<a href="#">V33AN16R</a>	32.8kHz	Aluminum	Silver	Normal	16mm	Receiver
<a href="#">V40AN16T</a>	40kHz	Aluminum	Black	Normal	16mm	Transmitter
<a href="#">V40AN16R</a>	40kHz	Aluminum	Black	Normal	16mm	Receiver
<a href="#">V40PN16T</a>	40kHz	Plastic	Black	Normal	16mm	Transmitter
<a href="#">V40PN16R</a>	40kHz	Plastic	Black	Normal	16mm	Receiver
<a href="#">V40AN16B</a>	40kHz	Aluminum	Silver	Normal	16mm	Bidirectional
<a href="#">V40PN16B</a>	40kHz	Plastic	Black	Normal	16mm	Bidirectional
<a href="#">V40AW14B</a>	40kHz	Aluminum	Silver	Waterproof	14mm	Bidirectional
<a href="#">V40AW16B</a>	40kHz	Aluminum	Black	Waterproof	16mm	Bidirectional
<a href="#">V40AW18B</a>	40kHz	Aluminum	Black	Waterproof	18mm	Bidirectional
<a href="#">V40AW25B</a>	40kHz	Aluminum	Silver	Waterproof	25mm	Bidirectional
<a href="#">V200AW19B</a>	200kHz	Aluminum	Silver	Waterproof	18.7mm	Bidirectional
<a href="#">V300AW13B</a>	300kHz	Aluminum	Silver	Waterproof	13mm	Bidirectional
<a href="#">V400AW11B</a>	400kHz	Aluminum	Silver	Waterproof	11mm	Bidirectional
<a href="#">V1000PW21B</a>	1MHz	Plastic	Black	Waterproof	21mm	Bidirectional

**Pb-Free ( RoHS )** : VURCH's all sensors are RoHS compatible. The terms "Lead-Free" or "Pb-Free" means sensors that are compatible with the current RoHS requirements. Where designed to be soldered at high temperatures, VURCH Pb-Free products are suitable for use in specified lead-free processes.

## Application:

- Distance Measurement
- Moving Object Detection
- Obstacle Avoidance

## Specifications:

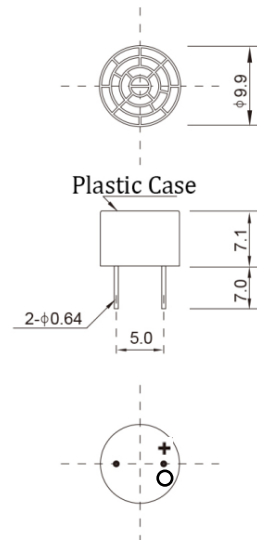
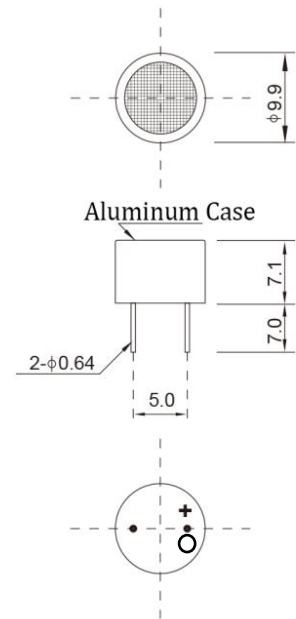
- Operating Frequency: 40 kHz  $\pm$  2%
- Transmitting Sensitivity: 110 dB Min.  
( at 40Khz 10Vp-p/30cm 0dB = 20 uBar )
- Receiving Sensitivity: -70 dB Min.  
( at 40Khz 10Vp-p/30cm 0dB = 10V/Pa )
- Capacitance at 1 kHz: 2500 pF  $\pm$  20%
- Typical Directivity(-6dB): 80°
- Max Driving Voltage: 20 Vp-p  
( Continuous Signal )
- Distance of Detection: 0.2 ~ 5.0m
- Operating Temperature: -30 ~ 80 °C
- Housing: Aluminum or Plastic

\*All above parameters were measured at 25°C .

\*Actual properties are depending on drive circuit.

P/N	Material	Transceivers
V40AN10T	Aluminum	Transmitter
V40AN10R	Aluminum	Receiver
V40PN10T	Plastic	Transmitter
V40PN10R	Plastic	Receiver

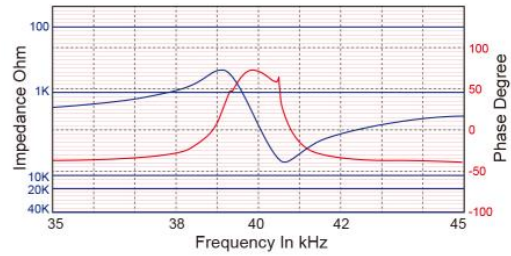
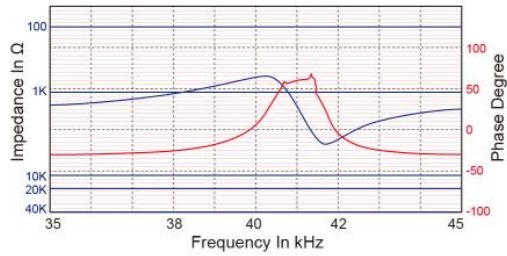
## Appearance & Dimensions



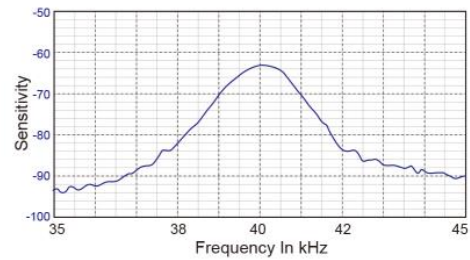
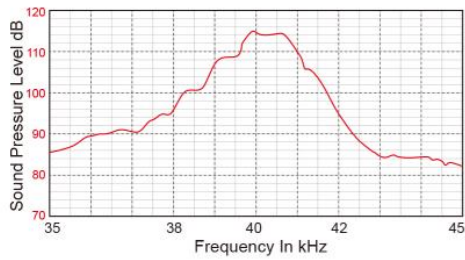


# V40A(P)N10T(R)

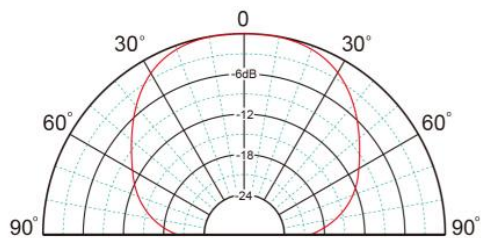
## Impedance Magnitude/Phase



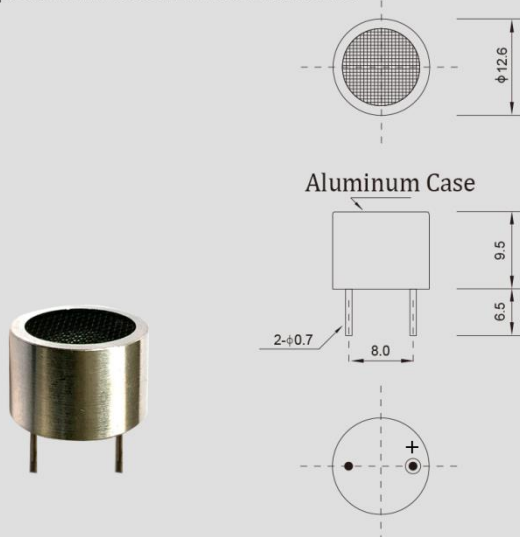
## Sound Pressure Level & Sensitivity



## Directivity



## Appearance & Dimensions



## Specifications:

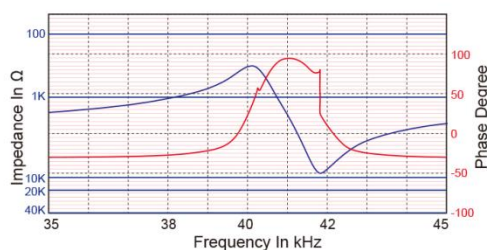
- Operating Frequency: 40 kHz  $\pm$  2%
- Transmitting Sensitivity: 112 dB Min.  
( at 40Khz 10Vp-p/30cm 0dB = 20 uBar )
- Receiving Sensitivity: -70 dB Min.  
( at 40Khz 30cm 0dB = 10V/Pa )
- Capacitance at 1 kHz: 2200 pF  $\pm$  20%
- Typical Directivity(-6dB): 85°
- Max Driving Voltage: 20 Vp-p  
( Continuous Signal )
- Distance of Detection: 0.2 ~ 5.0m
- Operating Temperature: -30 ~ 80 °C
- Housing: Aluminum

\*All above parameters were measured at 25°C .

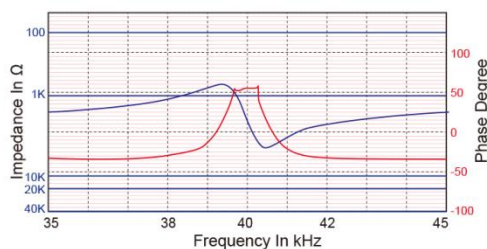
\*Actual properties are depending on drive circuit.

## Impedance Magnitude/Phase

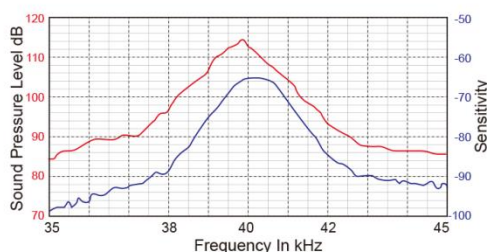
### Transmitting



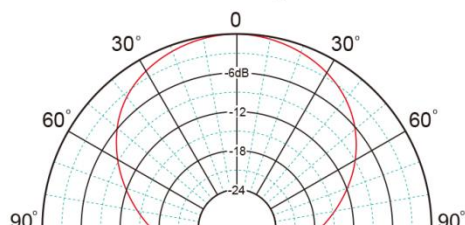
### Receiving



## Sound Pressure Level & Sensitivity



## Directivity



P/N	Material	Transceivers
V40AN12T	Aluminum	Transmitter
V40AN12R	Aluminum	Receiver

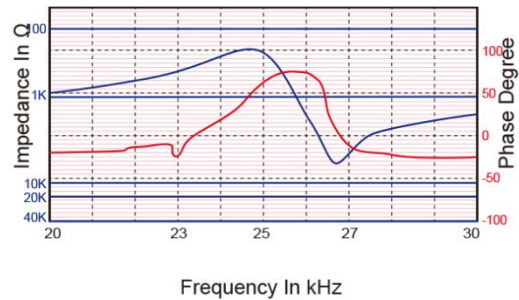
## Application:

- Specially use in transmit ultrasonic.
- High transmit sound pressure.
- Driving dog, mouse and stopping the dog barking.

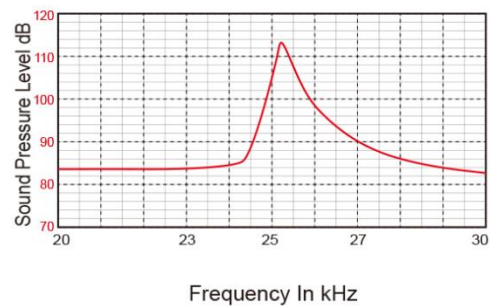
## Specifications:

- Operating Frequency: 25kHz  $\pm$  2%
- Transmitting Sensitivity: 112 dB Min.  
( at 25Khz 10Vp-p/30cm 0dB = 20 uBar )
- Capacitance at 1 kHz: 2400 pF  $\pm$  20%
- Typical Directivity(-6dB): 85°
- Max Driving Voltage: 20 Vp-p  
( Continuous Signal )
- Operating Temperature: -30 ~ 80 °C

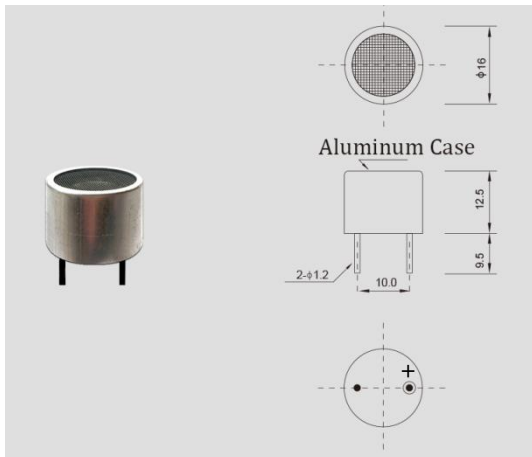
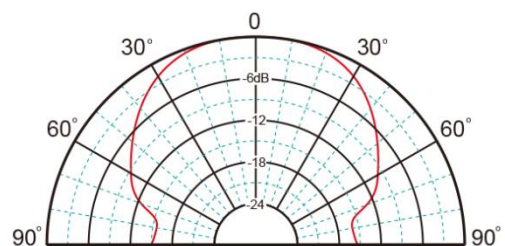
Impredance Magnitude / Phase



Sound Pressure Level & Sensitivity

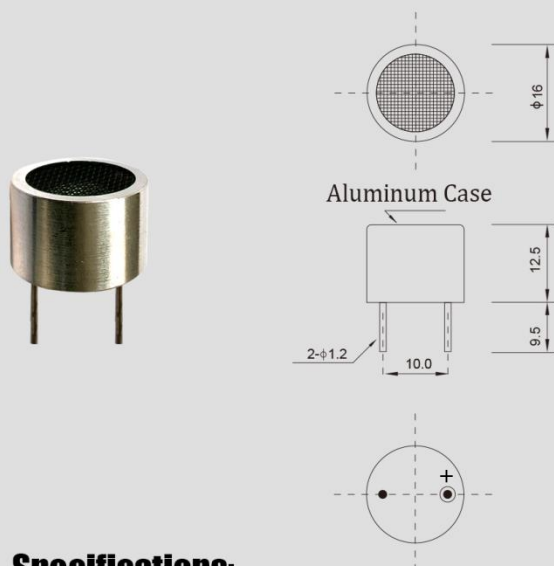


Directivity





## Appearance & Dimensions



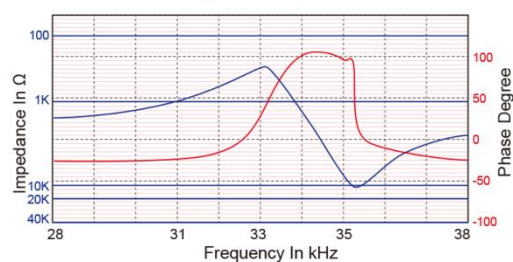
## Specifications:

- Operating Frequency: 32.8 kHz  $\pm$  2%
- Transmitting Sensitivity: 114 dB Min.  
( at 40Khz 30cm 0dB = 20  $\mu$ Bar )
- Receiving Sensitivity: -66 dB Min.  
( at 40Khz 30cm 0dB = 10V/Pa )
- Capacitance at 1 kHz: 2500 pF  $\pm$  20%
- Typical Directivity(-6dB): 95°
- Max Driving Voltage: 20 Vp-p  
( Continuous Signal )
- Operating Temperature: -30 ~ 80 °C
- Distance of Detection: 0.3 ~ 15 m
- Housing: Aluminum

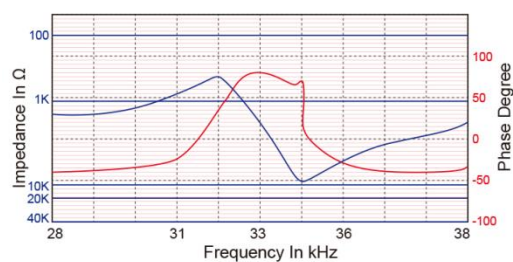
\*All above parameters were measured at 25°C.  
\*Actual properties are depending on drive circuit.

## Impedance Magnitude/Phase

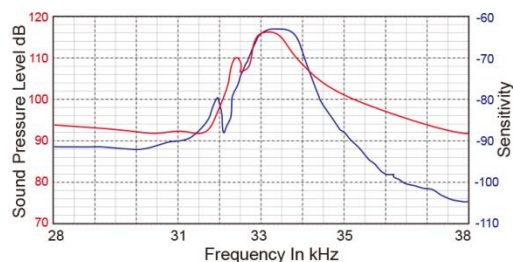
### Transmitting



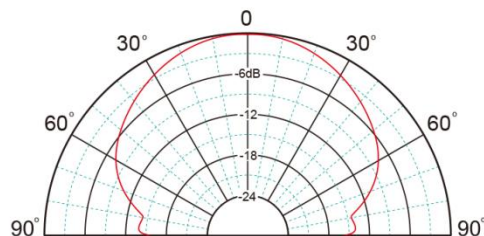
### Receiving



## Sound Pressure Level & Sensitivity



## Directivity



P/N	Material	Transceivers
V33AN16T	Aluminum	Transmitter
V33AN16R	Aluminum	Receiver



## Application:

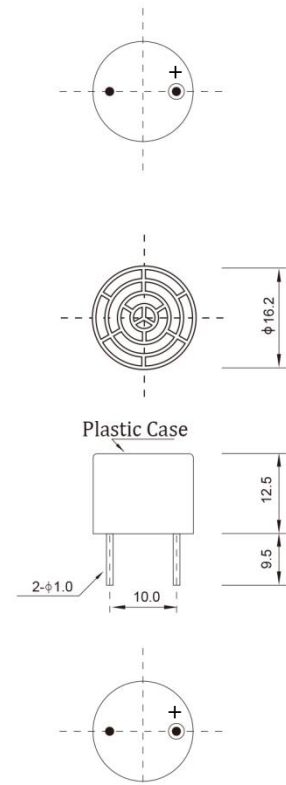
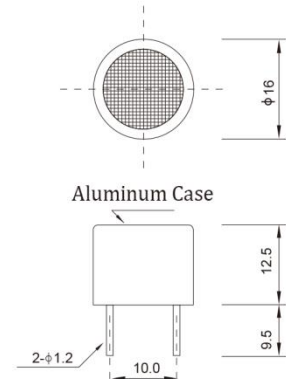
- Distance Measurement
- Moving Object Detection
- Obstacle Avoidance

## Specifications:

- Operating Frequency: 40 kHz  $\pm$  2%
- Transmitting Sensitivity: 117 dB Min.  
( at 40Khz 10Vp-p/30cm 0dB = 20 uBar )
- Receiving Sensitivity: -66 dB Min.  
( at 40Khz 10Vp-p/30cm 0dB = 10V/Pa )
- Capacitance at 1 kHz: 2400 pF  $\pm$  20%
- Typical Directivity(-6dB): 60°
- Max Driving Voltage: 80 Vp-p  
( Impulse wave )
- Operating Temperature: -30 ~ 80 °C
- Distance of Detection: 0.3 ~ 15 m
- Housing: Aluminum or Plastic

\*All above parameters were measured at 25°C .  
\*Actual properties are depending on drive circuit.

## Appearance & Dimensions



P/N	Material	Transceivers
V40AN16T	Aluminum	Transmitter
V40AN16R	Aluminum	Receiver
V40PN16T	Plastic	Transmitter
V40PN16R	Plastic	Receiver

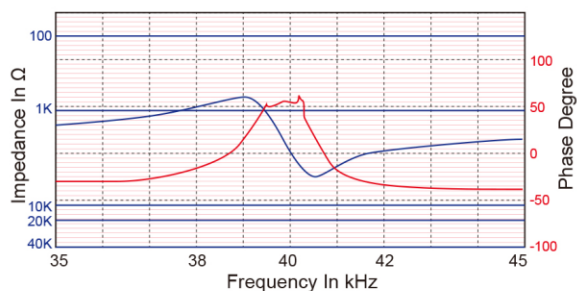
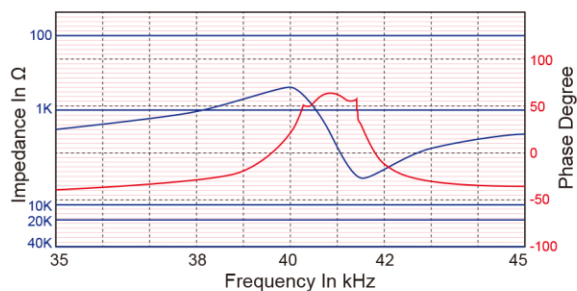


# V40A(P)N16T(R)

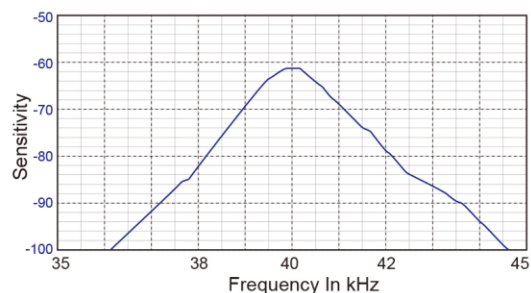
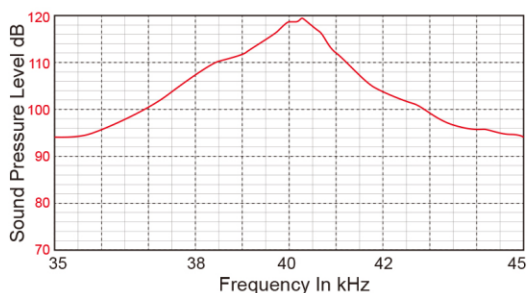
## Transmitting

## Receiving

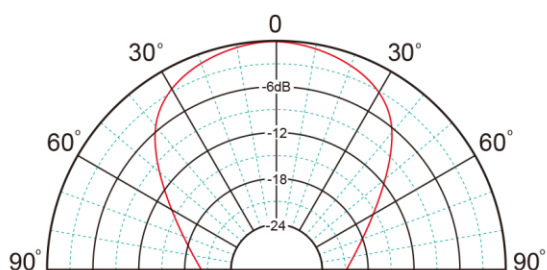
### Impedance Magnitude/Phase



### Sound Pressure Level & Sensitivity



### Directivity



## Application:

- Distance Measurement
- Moving Object Detection
- Obstacle Avoidance

## Specifications:

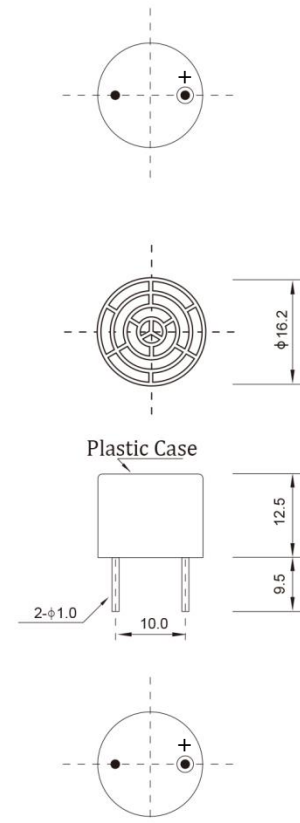
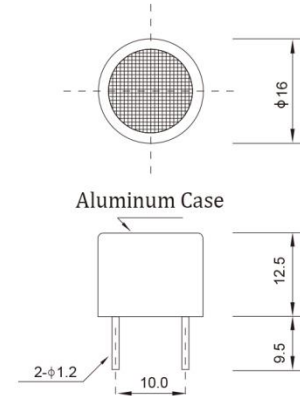
- Operating Frequency: 40 kHz  $\pm$  2%
- Transmitting Sensitivity: 114 dB Min.  
( at 40Khz 10Vp-p/30cm 0dB = 20 uBar )
- Receiving Sensitivity: -69 dB Min.  
( at 40Khz 10Vp-p/30cm 0dB = 10V/Pa )
- Capacitance at 1 kHz: 2400 pF  $\pm$  20%
- Ringing: 1.2 ms Max.
- Typical Directivity(-6dB): 55°
- Max Driving Voltage: 80 Vp-p  
( Impulse wave )
- Operating Temperature: -30 ~ 80 °C
- Distance of Detection: 0.3 ~ 15 m
- Housing: Aluminum or Plastic

\*All above parameters were measured at 25°C .

\*Actual properties are depending on drive circuit.

P/N	Material	Transceivers
V40AN16B	Aluminum	Bidirectional
V40PN16B	Plastic	Bidirectional

## Appearance & Dimensions



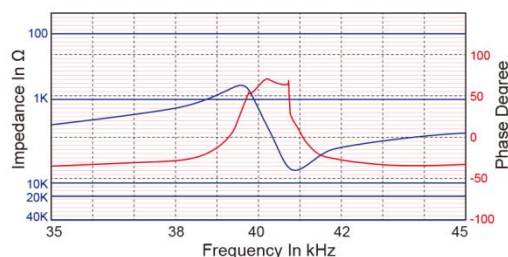
## Specifications:

- Operating Frequency: 40 kHz  $\pm$  2%
- Transmitting Sensitivity: 100 dB Min.  
( at 40Khz 10Vp-p/30cm 0dB = 20 uBar )
- Receiving Sensitivity: -82 dB Min.  
( at 40Khz 10Vp-p/30cm 0dB = 10V/Pa )
- Capacitance at 1 kHz: 1900 pF  $\pm$  20%
- Ringing: 1.2 ms Max.
- Typical Directivity: 75°  
(-6dB)
- Max Driving Voltage: 120 Vp-p  
( Impluse wave )
- Operating Temperature: -30 ~ 80 °C
- Housing: Aluminum

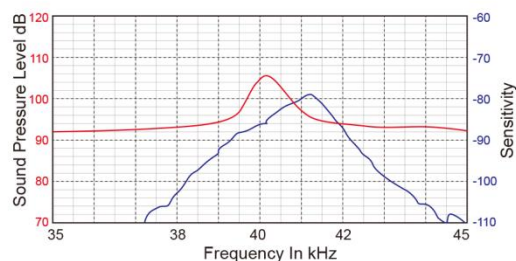
\*All above parameters were measured at 25°C .

\*Actual properties are depending on drive circuit.

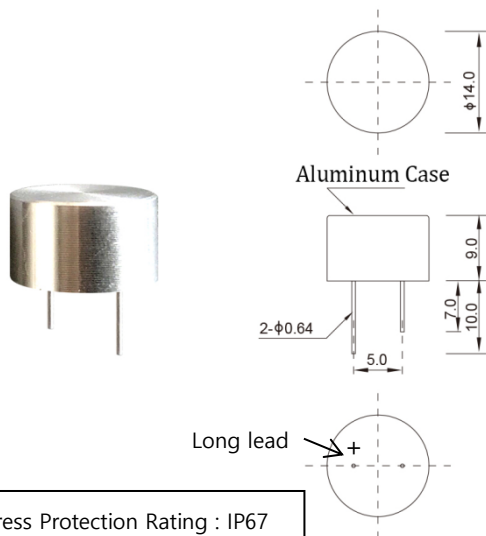
### Impredance Magnitude / Phase



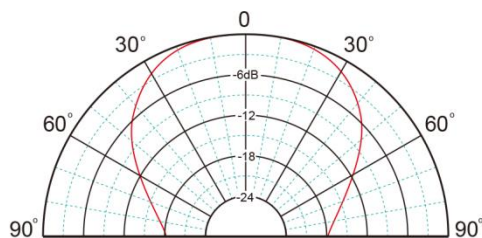
### Sound Pressure Level & Sensitivity



## Appearance & Dimensions



### Directivity



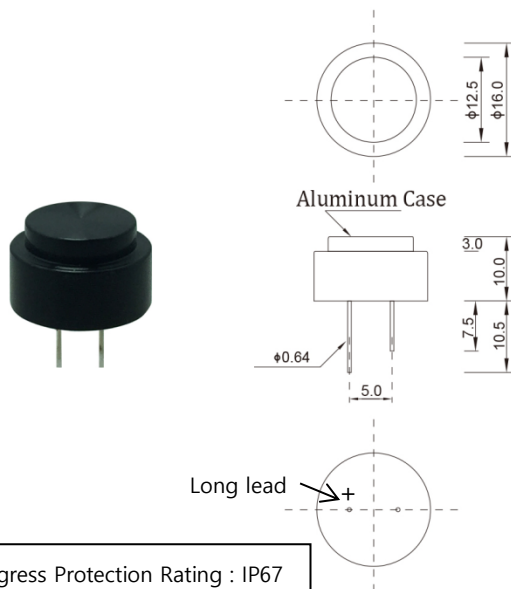
## Specifications:

- Operating Frequency: 40 kHz  $\pm$  2%
- Transmitting Sensitivity: 103 dB Min.  
( at 40Khz 10Vp-p/30cm 0dB = 20 uBar )
- Receiving Sensitivity: -80 dB Min.  
( at 40Khz 10Vp-p/30cm 0dB = 10V/Pa )
- Capacitance at 1 kHz: 2000 pF  $\pm$  20%
- Ringing: 1.2 ms Max.
- Typical Directivity: 80°  
(-6dB)
- Max Driving Voltage: 120 Vp-p  
( Impluse wave )
- Operating Temperature: -30 ~ 80 °C
- Housing: Aluminum

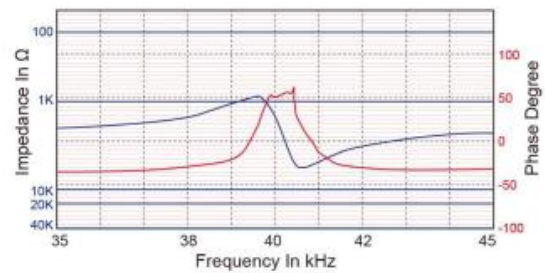
\*All above parameters were measured at 25°C .

\*Actual properties are depending on drive circuit.

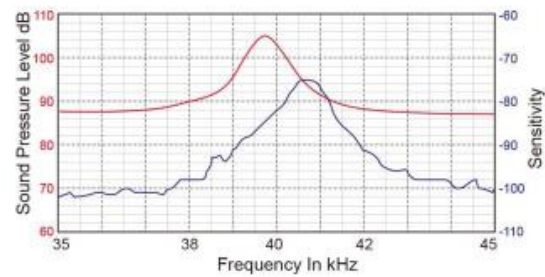
## Appearance & Dimensions



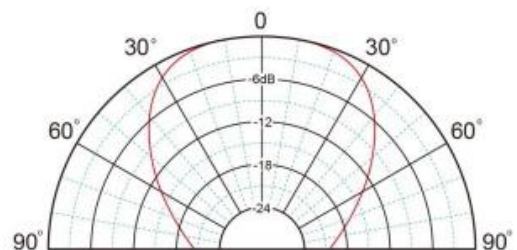
## Impredance Magnitude / Phase



## Sound Pressure Level & Sensitivity



## Directivity



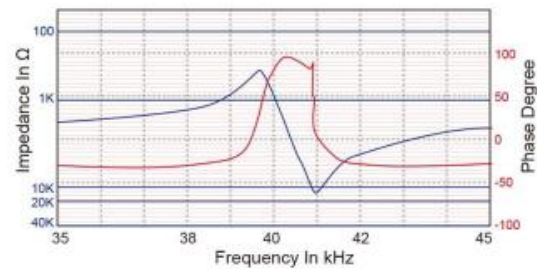


## Specifications:

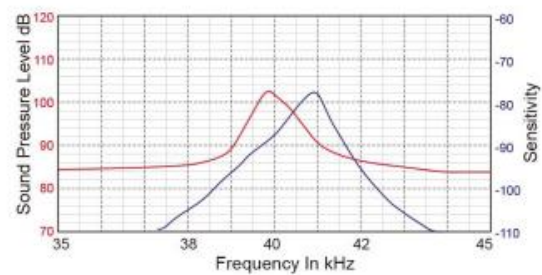
- Operating Frequency: 40 kHz  $\pm$  2%
- Transmitting Sensitivity: 98 dB Min.  
( at 40Khz 10Vp-p/30cm 0dB = 20 uBar )
- Receiving Sensitivity: -82 dB Min.  
( at 40Khz 10Vp-p/30cm 0dB = 10V/Pa )
- Capacitance at 1 kHz: 2000 pF  $\pm$  20%
- Ringing: 1.2 ms Max.
- Typical Directivity: 100°  
(-6dB)
- Max Driving Voltage: 150 Vp-p  
( Impluse wave )
- Operating Temperature: -30 ~ 80 °C
- Housing: Aluminum

\*All above parameters were measured at 25°C.  
\*Actual properties are depending on drive circuit.

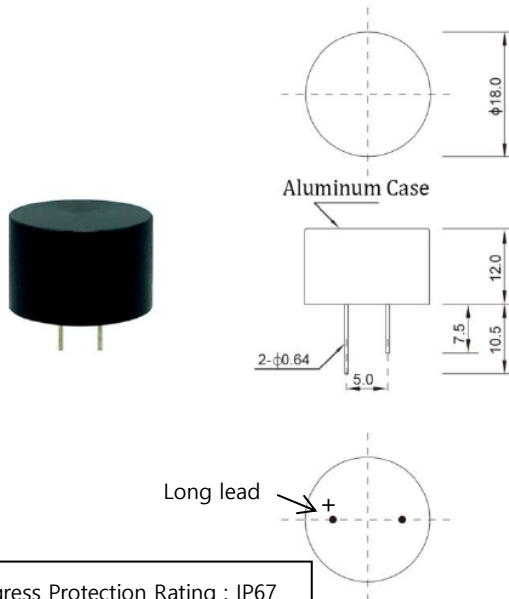
## Impedance Magnitude / Phase



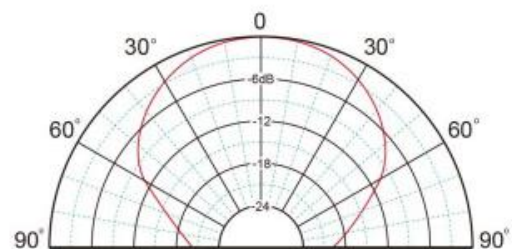
## Sound Pressure Level & Sensitivity



## Appearance & Dimensions



## Directivity





## Appearance & Dimensions



Ingress Protection Rating : IP67

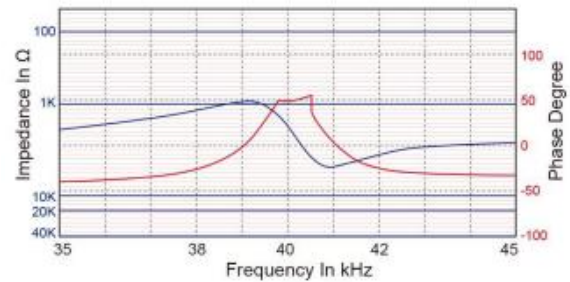
## Specifications:

- Operating Frequency: 40 kHz  $\pm$  2%
- Transmit Sensitivity: 106 dB Min.  
( at 40Khz 30cm 0dB = 20 uBar )
- Receiving Sensitivity: -78 dB Min.  
( at 40Khz 30cm 0dB = 10V/Pa )
- Capacitance at 1 kHz: 2000 pF  $\pm$  20%
- Ringing: 1.2 ms Max.
- Typical Directivity: 35 °  
(-6dB)
- Max Driving Voltage: 120 Vp-p  
( Impluse wave )
- Operating Temperature: -30 ~ 80 °C
- Housing: Aluminum

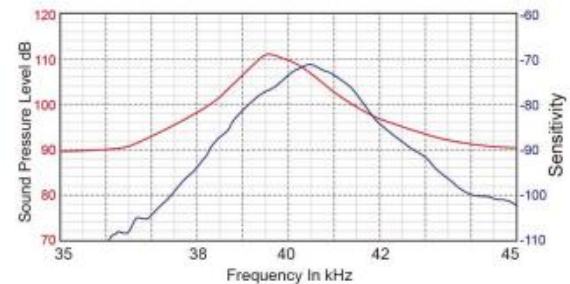
\*All above parameters were measured at 25°C .

\*Actual properties are depending on drive circuit.

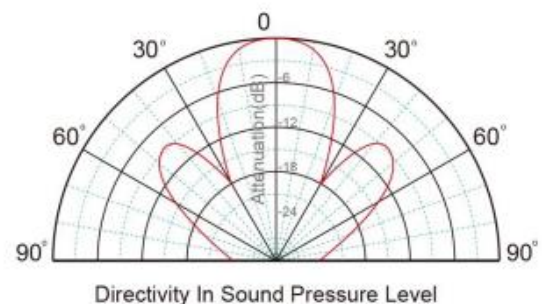
## Impredance Magnitude / Phase



## Sensitivity & Sound Pressure Level



## Directivity



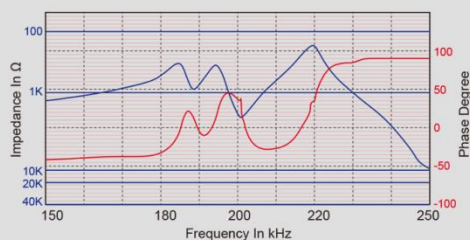
## Specifications:

- Operating Frequency: 200 kHz  $\pm$  2%
- Echo Sensitivity: -65 dB Min.  
( 0dB = 100Vpp 10 Bursts/20cm )
- Capacitance at 1 kHz: 385 pF  $\pm$  20%
- Ringing: 0.6 ms Max.
- Typical Directivity: 8°  
(-6dB)
- Max Driving Voltage: 150 Vp-p  
( Impulse wave )
- Operating Temperature: -30 ~ 80 °C
- Housing: Aluminum

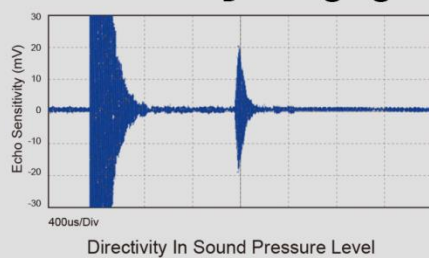
\*All above parameters were measured at 25°C .

\*Actual properties are depending on drive circuit.

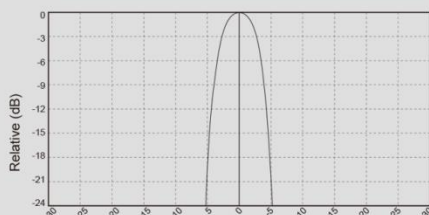
## Impedance Magnitude / Phase



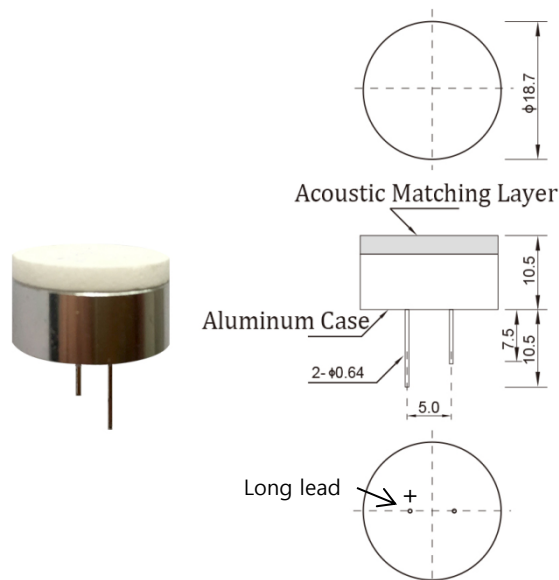
## Echo Sensitivity & Ringing



## Directivity



## Appearance & Dimensions



Ingress Protection Rating : IP65

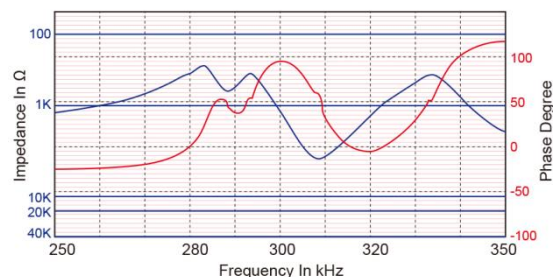
## Specifications:

- Operating Frequency: 300 kHz  $\pm$  2%
- Echo Sensitivity: -75 dB Min.  
( 0dB = 100Vpp. 10Bursts /10cm )
- Capacitance at 1 kHz: 270 pF  $\pm$  20%
- Distance of Detection: 0.1 ~ 0.8m
- Typical Directivity: 8°  
(-6dB)
- Max Driving Voltage: 100 Vp-p  
( Impluse wave )
- Operating Temperature: -30 ~ 80 °C
- Housing: Aluminum

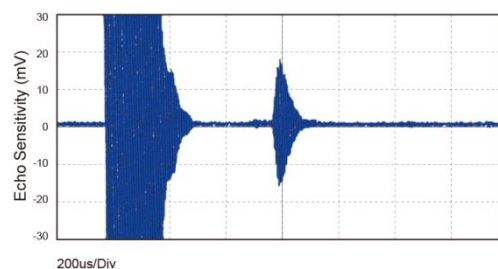
\*All above parameters were measured at 25°C .

\*Actual properties are depending on drive circuit.

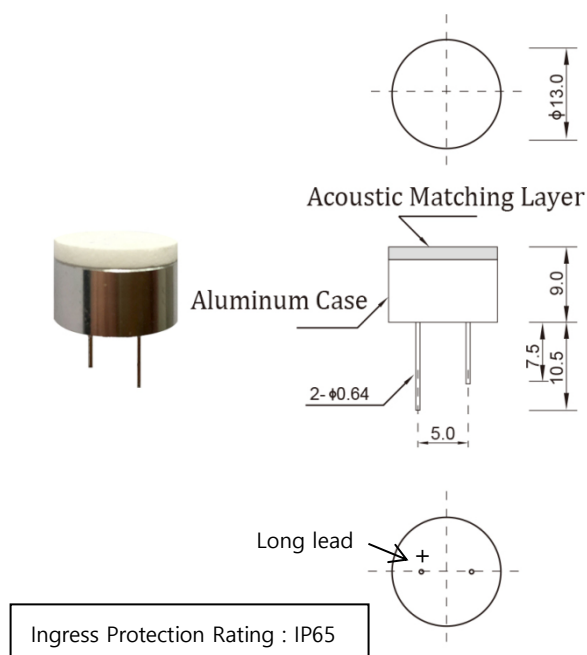
## Impredance Magnitude / Phase



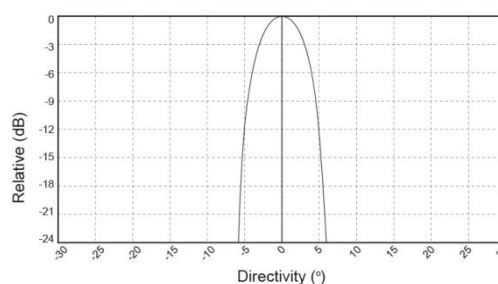
## Echo Sensitivity & Ringing



## Appearance & Dimensions



## Directivity

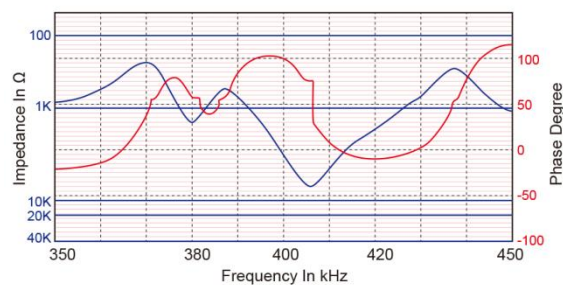


## Specifications :

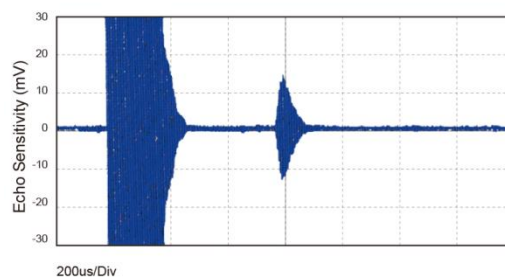
- Operating Frequency: 400 kHz  $\pm$  2%
- Echo Sensitivity: -80 dB Min.  
( 0dB = 100Vpp, 10Bursts/10cm )
- Capacitance at 1 kHz: 170 pF  $\pm$  20%
- Distance of Detection: 0.1 ~ 3.0m.
- Typical Directivity: 7°  
(-6dB)
- Max Driving Voltage: 100 Vp-p  
( Impluse wave )
- Operating Temperature: -30 ~ 80 °C
- Housing: Aluminum

\*All above parameters were measured at 25°C .  
\*Actual properties are depending on drive circuit.

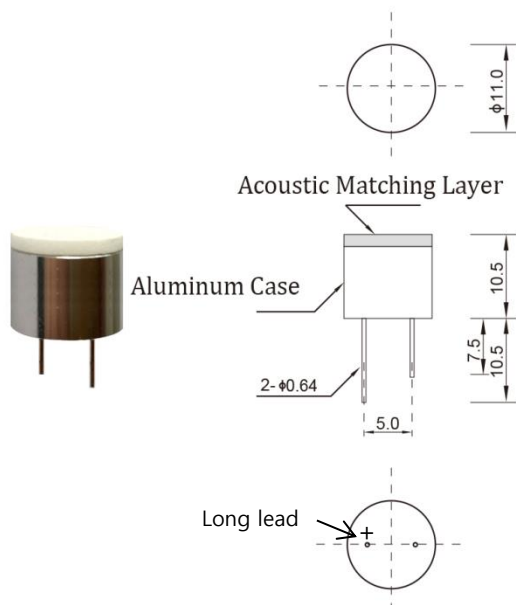
## Impredance Magnitude / Phase



## Echo Sensitivity & Ringing

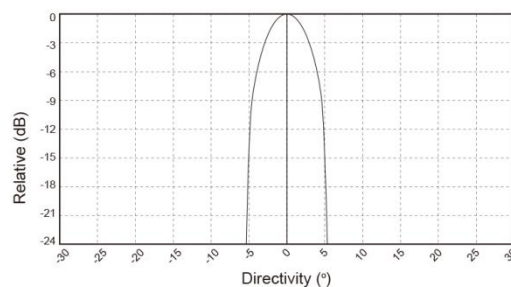


## Appearance & Dimensions



Ingress Protection Rating : IP65

## Directivity



## Specifications:

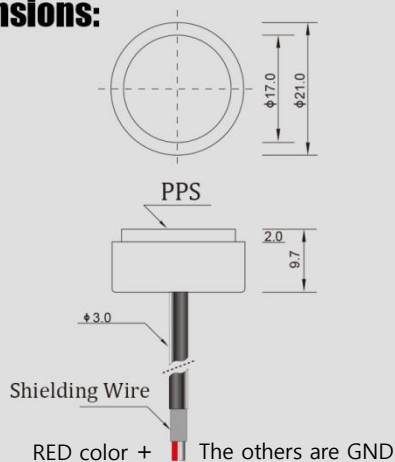
- Operating Frequency: 1 MHz  $\pm$  5%
- Echo Sensitivity: -30 dB Min.  
(0dB = 6.0Vpp, 10Bursts/5cm)
- Capacitance at 1 kHz: 1200 pF  $\pm$  20%
- Distance of Detection: 0.1 ~ 5.0m.
- Typical Directivity: 7°  
(-6dB)
- Max Driving Voltage: 100 Vp-p  
(Impulse wave)
- Operating Temperature: -30 ~ 80 °C
- Housing: PPS

Ingress Protection Rating : IP67

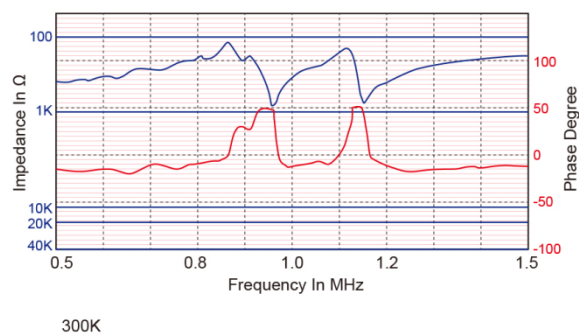
## Appearance:



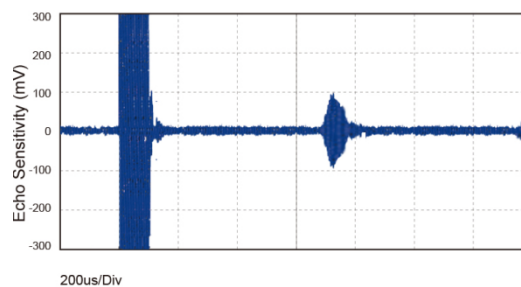
## Dimensions:



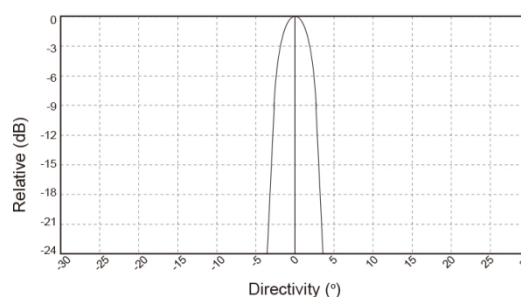
## Impedance Magnitude / Phase



## Echo Sensitivity & Ringing



## Directivity





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