

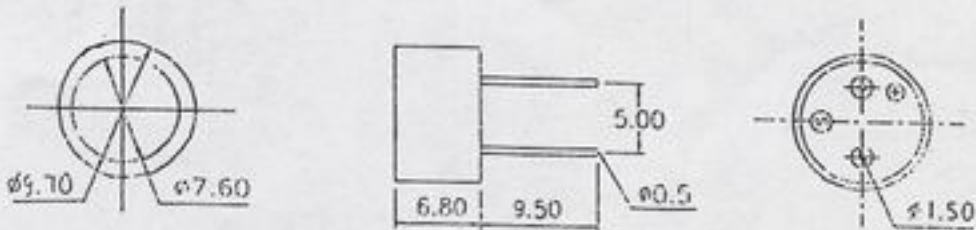
Model Number : 400PT100

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Specification :

Center Frequency	40.0±1.0KHZ
Nominal Impedance At fr	1000 Ohm
Sound Pressure Level	110 dB @ 0dB re 0.0002μbar
Sensitivity	-68 dB @ 0dB = 1Volt/μbar
Ringing (max.)	1.2ms
Beam Angle	85° (-6dB)
Capacitance	1600±20%pF
Operation Temperature	-40°C to +85°C
Storage Temperature	-40°C to +85°C

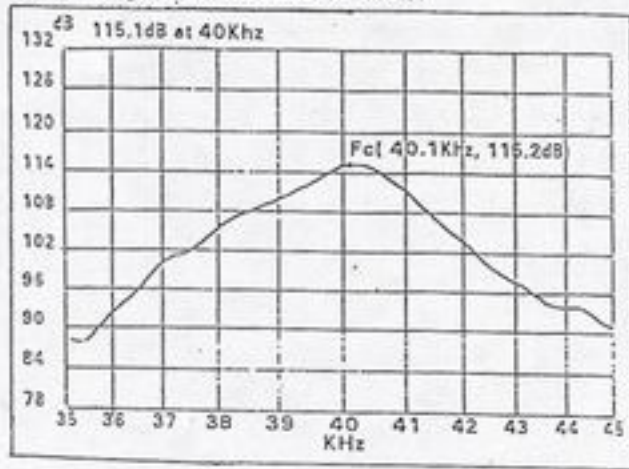
Dimensions : Dimensions are in mm



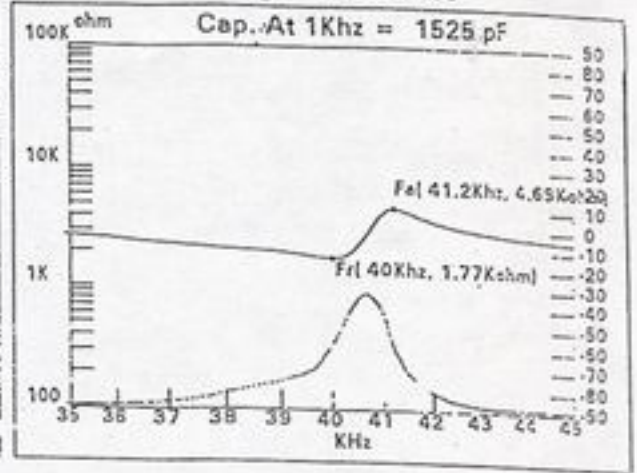
Model Number: 400PT100

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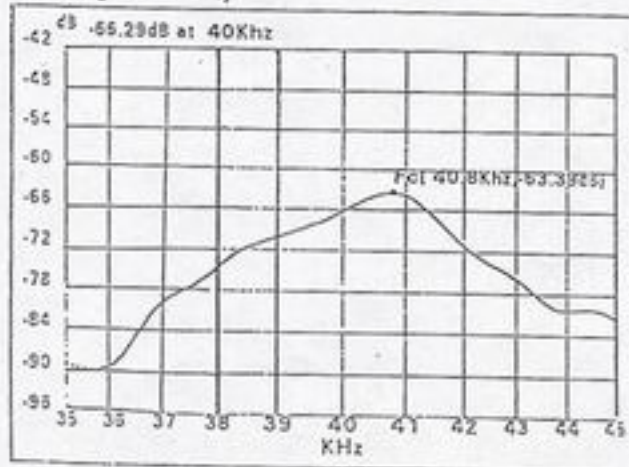
### Transmitting Sound Pressure Level



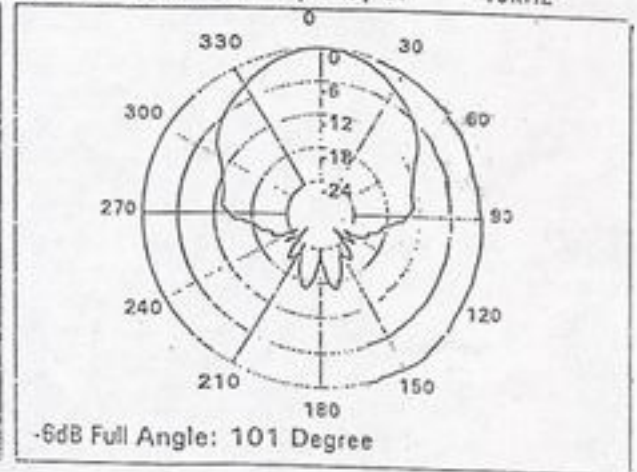
### Impedance/Phase Angle : 400PT100



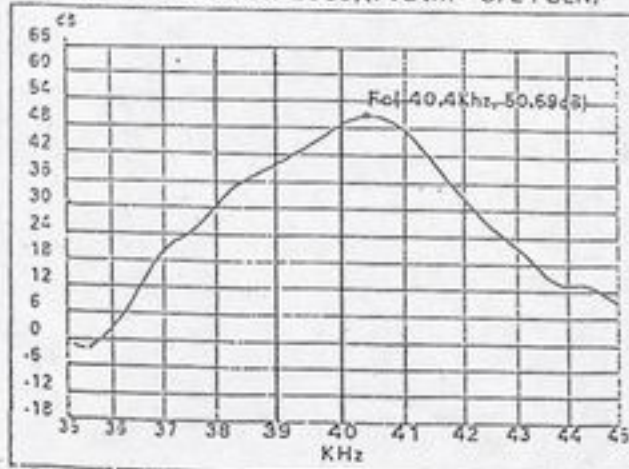
### Receiving Sensitivity



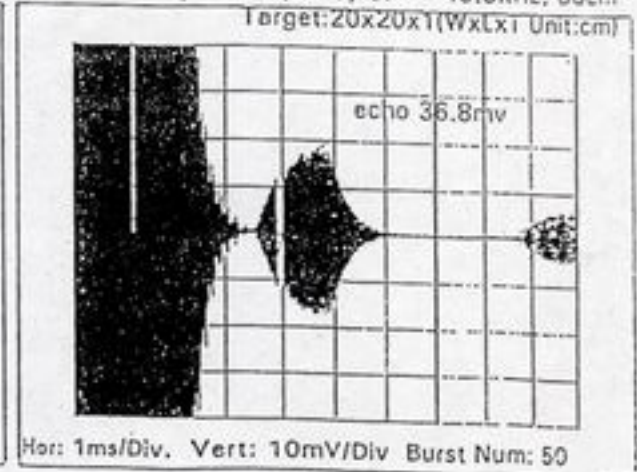
### Radiation Pattern at frequency of 40KHZ



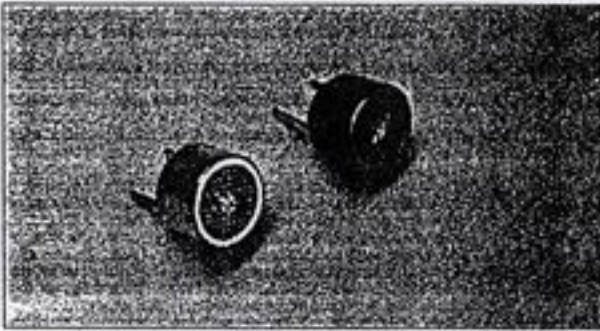
### Figure of Merit(Insertion Loss)(F.O.M = SPL + SEN)



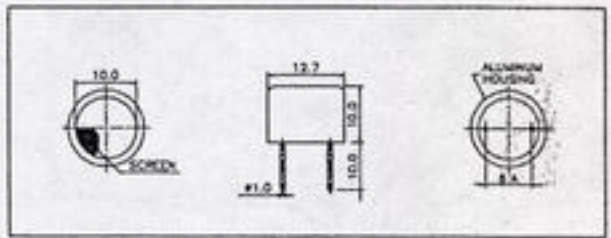
### Echo Sensitivity at frequency of 40.3KHZ, 60cm



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Dimensions: dimensions are in mm



## Specification

<b>400PT120</b>	Transceiver
<b>Center Frequency</b>	40.0±1.0Khz
<b>Bandwidth (-6dB)</b>	2.0Khz
<b>Transmitting Sound Pressure Level</b>	115dB min.
at 40.0Khz; 0dB re 0.0002μbar per 10Vrms at 30cm	
<b>Receiving Sensitivity</b>	-68dB min.
at 40.0Khz 0dB = 1 volt/μbar	
<b>Nominal Impedance (Ohm)</b>	1000
<b>Ringing (ms)</b>	1.2 max.
<b>Capacitance at 1Khz</b>	±20% 2400 pF
<b>Max. Driving Voltage (cont.)</b>	20Vrms
<b>Total Beam Angle</b>	-6dB 85° typical
<b>Operation Temperature</b>	-30 to 80°C
<b>Storage Temperature</b>	-40 to 85°C

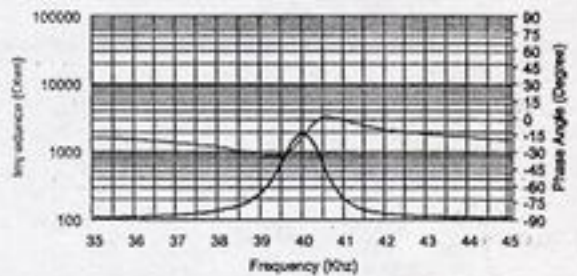
All specification taken typical at 25°C  
Closer frequency tolerance, shorter ringing and wider bandwidth models can be supplied upon request.

Model available:

1	400PT120	Aluminum Housing
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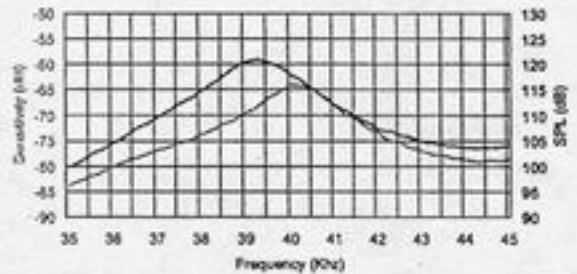
## Impedance/Phase Angle vs. Frequency

Tested under 1Vrms Oscillation Level

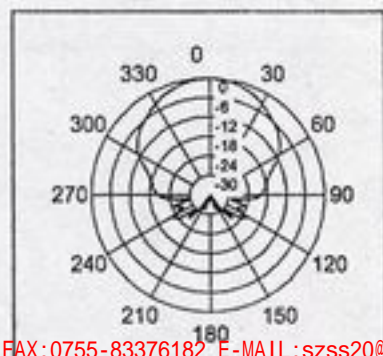


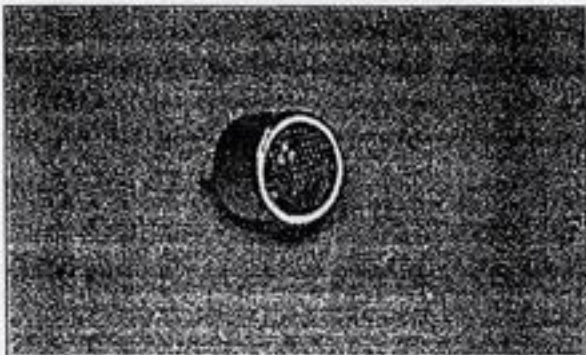
## Sensitivity/Sound Pressure Level

Tested under 10Vrms @30cm

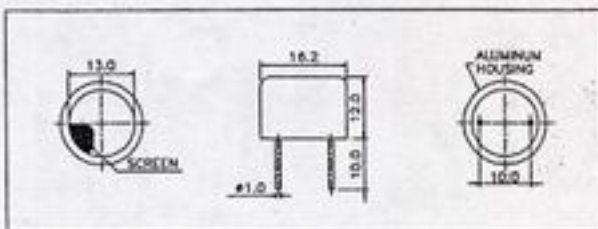


## Beam Angle: Tested at 40.0Khz frequency





Dimensions: dimensions are in mm



## Specification

400PT160	Transceiver
Center Frequency	40.0±1.0Khz
Bandwidth (-6dB) 400PT160	2.0Khz
Transmitting Sound Pressure Level	117dB min.
at resonant frequency; 0dB re 0.0002μbar per 10Vrms at 30cm	
Receiving Sensitivity	-65dB min.
at resonant frequency 0dB = 1 volt/μbar	
Nominal Impedance (Ohm)	1000
Ringing (ms)	1.2 max.
Capacitance at 1Khz ±20%	2400 pF
Max. Driving Voltage (cont.)	20Vrms
Total Beam Angle -6dB	55° typical
Operation Temperature	-30 to 80°C
Storage Temperature	-40 to 85°C

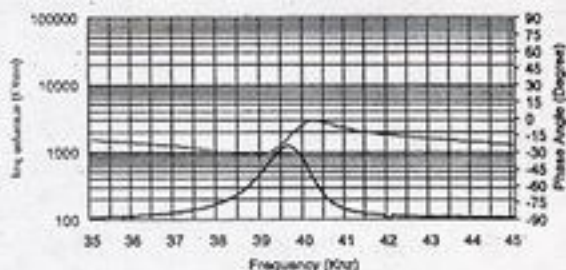
All specification taken typical at 25°C  
Closer frequency tolerance, shorter ringing and wider bandwidth models can be supplied upon request.

Model available:

1	400PT160	Aluminum Housing
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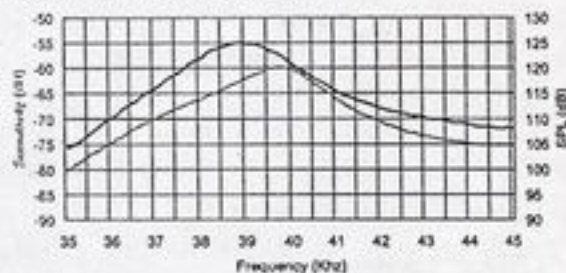
## Impedance/Phase Angle vs. Frequency

Tested under 1Vrms Oscillation Level

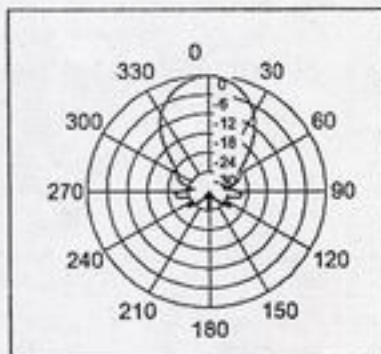


## Sensitivity/Sound Pressure Level

Tested under 10Vrms @30cm

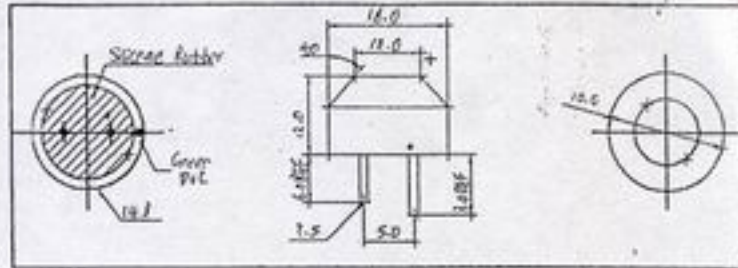


Beam Angle: Tested at 40.0Khz frequency





**Dimensions:** dimensions are in mm



**Specification**

<b>400EP18A</b>	Transceiver
<b>Center Frequency</b>	40.0±1.0Khz
<b>Bandwidth (-6dB)</b>	400EP18A 1.5Khz
<b>Transmitting Sound Pressure Level</b> at resonant frequency; 0dB re 0.0002μbar per 10Vrms at 30cm	108dB min.
<b>Receiving Sensitivity</b> at resonant frequency 0dB = 1 volt/μbar	-75dB min.
<b>Nominal Impedance (Ohm)</b>	500
<b>Ringing (ms)</b>	1.2 max.
<b>Capacitance at 1Khz</b>	±20% 1900 pF
<b>Max. Driving Voltage (cont.)</b>	20Vrms
<b>Total Beam Angle</b>	-6dB 85°
<b>Operation Temperature</b>	-20 to 70°C
<b>Storage Temperature</b>	-40 to 80°C

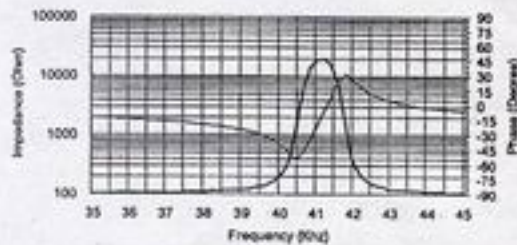
All specification is typical at 25°C  
Closer frequency tolerance, shorter ringing and wider bandwidth models can be supplied upon request.

Model available:

1	400EP18A	Black Al. Housing
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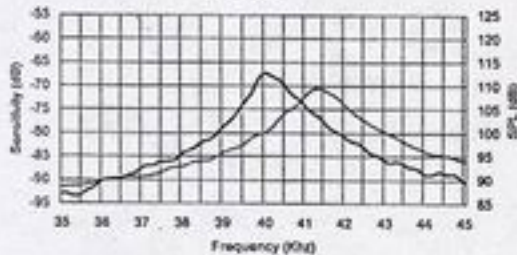
**Impedance/Phase Angle vs. Frequency**

Tested under 1Vrms Oscillation Level

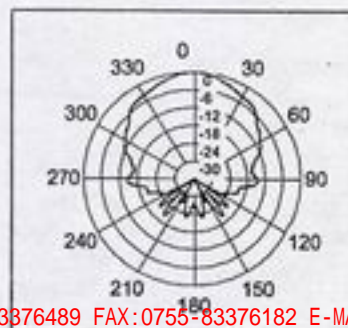


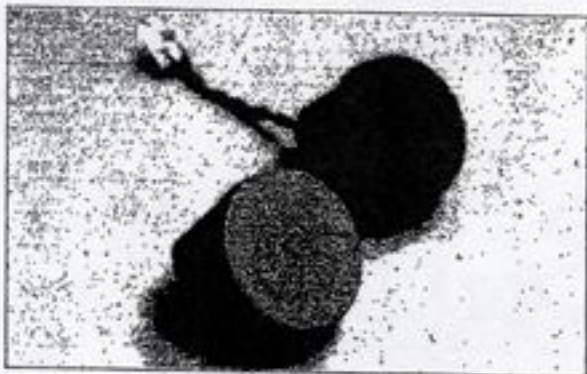
**Sensitivity/Sound Pressure Level**

Tested under 10Vrms @30cm



**Beam Angle:** Tested at 40.0Khz frequency





## Asymmetric Beam Patterns

### Specification

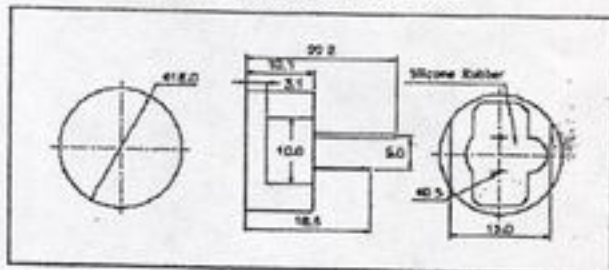
400EP18D	Transceiver
Center Frequency	40.0±1.0Khz
Bandwidth (-6dB) F.O.M.	1.2Khz
Transmitting Sound Pressure Level	100dB min.
at resonant frequency; 0dB re 0.0002μbar per 10Vrms at 30cm	
Receiving Sensitivity	-80dB min.
at resonant frequency 0dB = 1 volt/μbar	
Nominal Impedance (Ohm)	850
Ringling (measured with rubber holder as per figure on next page)	1.5ms max.
Capacitance at 1KHz ±20%	1750 pF
Temperature Compensated Type	3800 pF
Max. Driving Voltage (Cont.)	20Vrms
2% Duty (Bursts)	100Vpp
Total Beam Angle Wide*	135±12°
-6dB Narrow*	75±12°
Operation Temperature	-30 to 80°C
Storage Temperature	-40 to 85°C

All specification taken typical at 25°C  
Both lead pins and lead wires output are available

Models available:

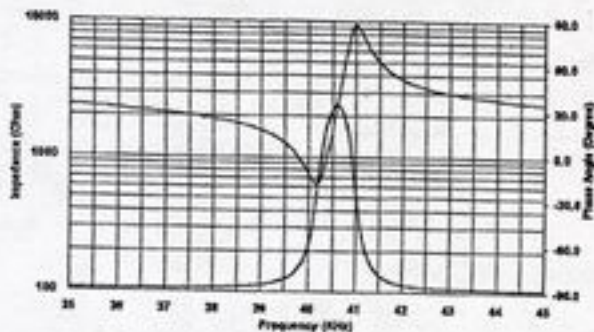
1	400EP18D	Black Al. Housing
2	400EP18D0	Natural Al. Housing

## Dimensions: dimensions are in mm



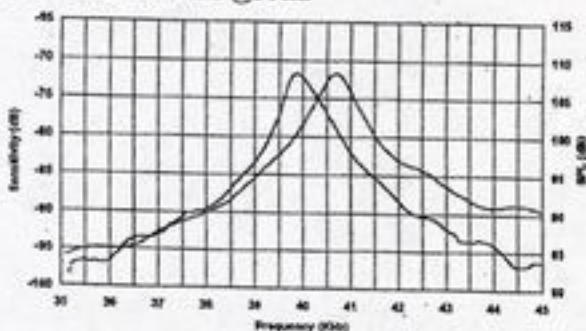
## Impedance/Phase Angle vs. Frequency

Tested under 1Vrms Oscillation Level



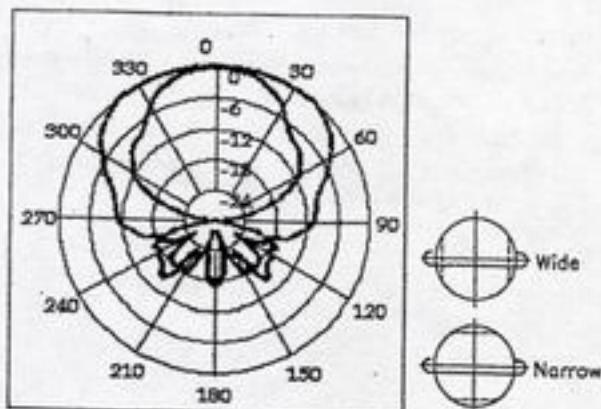
## Sensitivity/Sound Pressure Level

Tested under 10Vrms @30cm



## Beam Angle: Tested at 40.0Khz frequency

Wide Angle \_\_\_\_\_ Narrow Angle \_\_\_\_\_



# Air Ultrasonic Ceramic Transducers

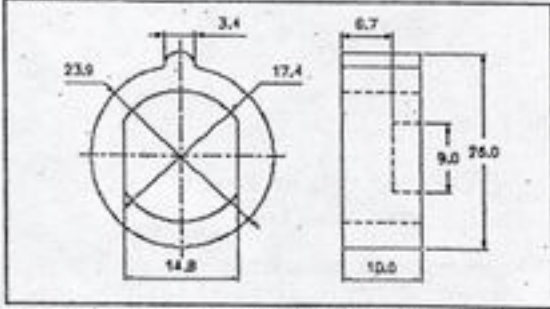
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400EP18D

## Notice for Mounting:

For short distance measurement we recommend to use a rubber holder to hold entire transducer for minimizing ringing. The figures shown as below are measured with and without rubber holder for your design reference

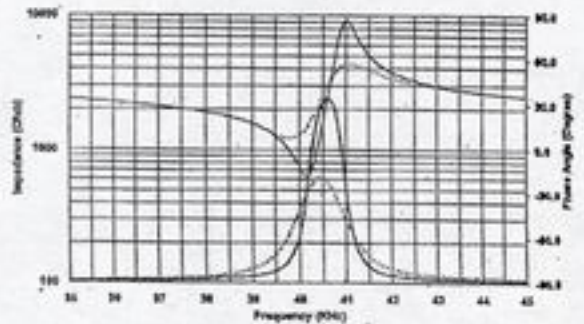
**Rubber Holder:** Silicone rubber of hardness of 70 shore A



## Impedance/Phase Angle vs. Frequency

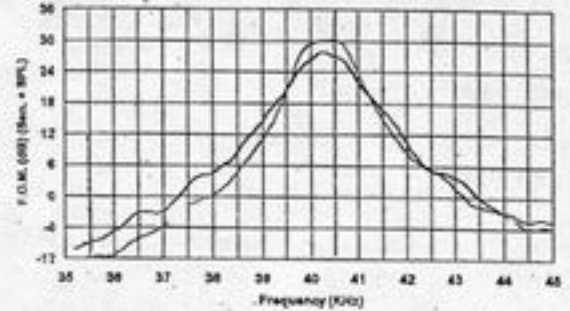
Tested under 1Vrms Oscillation Level

- Z (400EP18D alone) \_\_\_\_\_
- θ (400EP18D alone) \_\_\_\_\_
- Z (400EP18D with rubber holder) - - - - -
- θ (400EP18D with rubber holder) - - - - -



## Figure of Merit (Sensitivity + SPL)

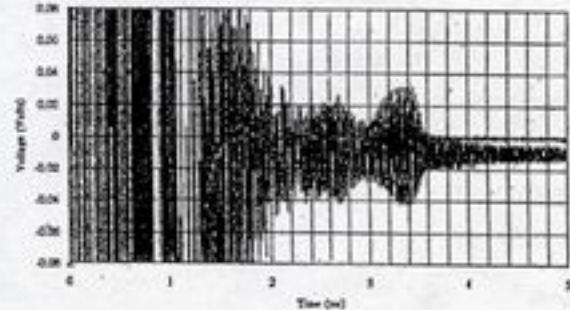
- FOM (400EP18D alone) \_\_\_\_\_
- FOM (400EP18D with rubber holder) \_\_\_\_\_



## Ringing & Echo:

Distance: 30 cm round trip; Target:

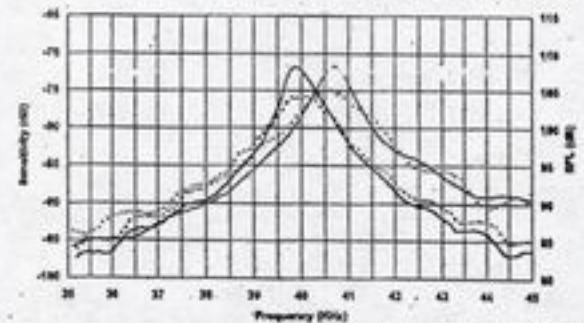
- 400EP18D alone \_\_\_\_\_
- 400EP18D with rubber holder \_\_\_\_\_



## Sensitivity/Sound Pressure Level

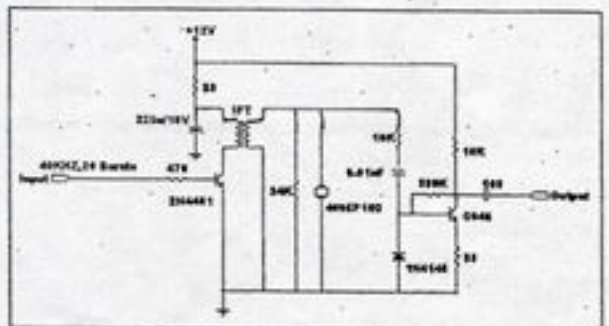
Tested under 10Vrms @30cm

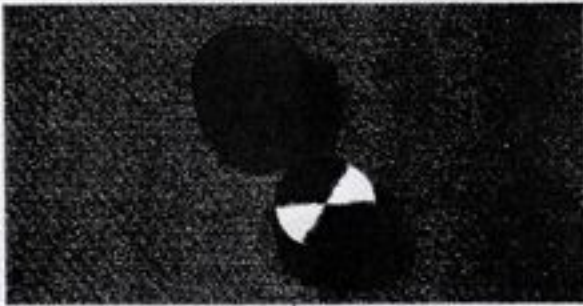
- Sensitivity (400EP18D alone) \_\_\_\_\_
- SPL (400EP18D with rubber holder) \_\_\_\_\_
- Sensitivity (400EP18D alone) - - - - -
- SPL (400EP18D with rubber holder) - - - - -



## Ringing & Echo Measurement:

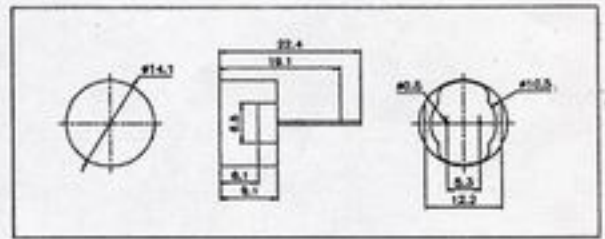
IFT: Turn ratio 1:10; Secondary: 2 – 10mH adjustable





**Asymmetric Beam Patterns**

**Dimensions:** dimensions are in mm



## Specification

<b>400EP14D</b>	Transceiver
<b>Center Frequency</b>	40.0±1.0Khz
<b>Bandwidth (-6dB)</b>	1.5Khz
<b>Transmitting Sound Pressure Level</b> at resonant frequency; 0dB re 0.0002μbar per 10Vrms at 30cm	103dB min.
<b>Receiving Sensitivity</b> at resonant frequency 0dB = 1 volt/μbar	-78dB min.
<b>Nominal Impedance (Ohm)</b>	1000
<b>Ringing (ms)</b>	1.2 max.
<b>Capacitance at 1KHz</b>	±20% 1250 pF
<b>Max. Driving Voltage (cont.)</b>	20Vrms
2% Duty (Bursts)	100Vpp
<b>Total Beam Angle</b> Wide	125° typ.
-6dB Narrow	65° typ.
<b>Operation Temperature</b>	-30 to 80°C
<b>Storage Temperature</b>	-40 to 85°C

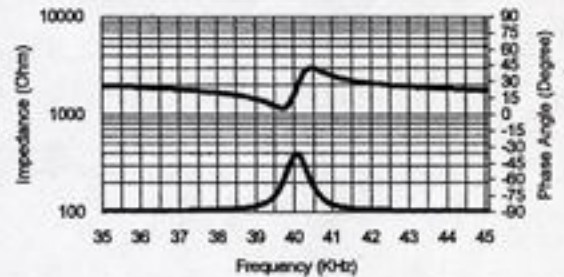
All specification taken typical at 25°C  
Both lead pins and lead wires output are available

Models available:

1	400EP14D	Black Al. Housing
2	400EP14D0	Natural Al. Housing

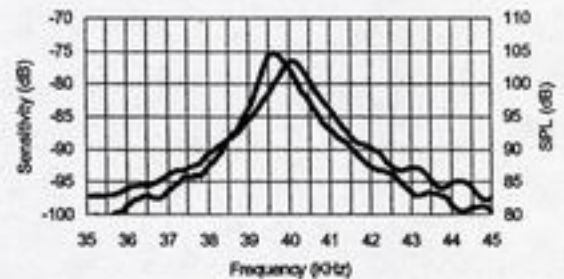
## Impedance/Phase Angle vs. Frequency

Tested under 1Vrms Oscillation Level



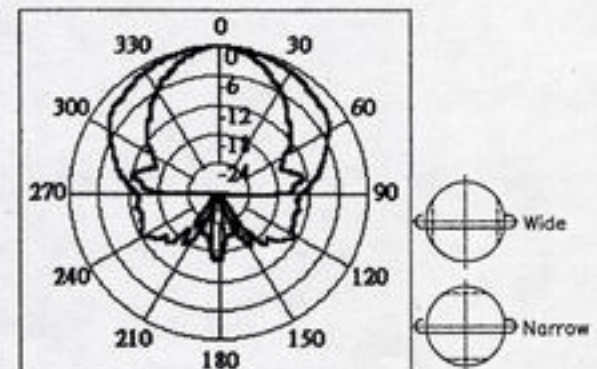
## Sensitivity/Sound Pressure Level

Tested under 10Vrms @30cm



## Beam Angle: Tested at 40.0Khz frequency

Wide Angle \_\_\_\_\_ Narrow Angle \_\_\_\_\_





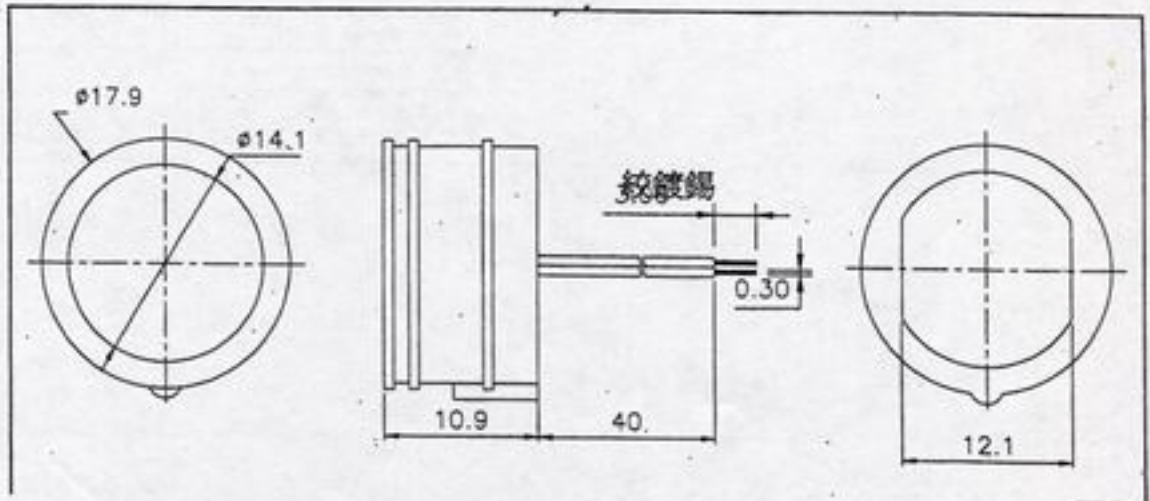
Model Number :400EP14DR040

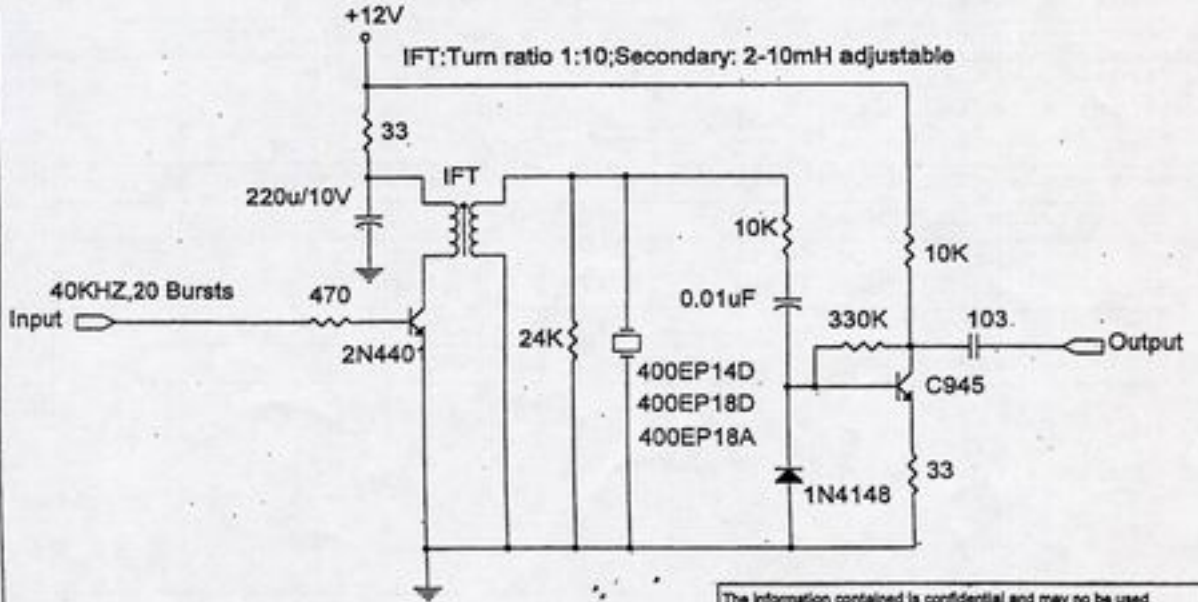
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Specification :

Center Frequency	40.0±1.0KHZ
Transmitting Sound Pressure Level(min)	103 dB @ 30cm,10Vrms Sine Wave; 0dB re 0.0002μ bar
Sensitivity(min)	-78 dB @ 0dB re 1Volt/μbar
Ringing (max.) as per attached circuit	1.2ms
Beam Angle (Round Side)	125° typ. (-6dB Full Angle)
Beam Angle (Cutting Side)	63° typ. (-6dB Full Angle)
Capacitance At 1KHz	1250±20%Pf
Max. Driving Voltage (cont)	20Vrms
Max. Driving Voltage (Bursts)	100Vp-p @ 20 bursts
Operation Temperature	-30°C to +80°C
Storage Temperature	-40°C to +85°C

Dimensions : Dimensions are in mm





The information contained is confidential and may not be used without written permission.

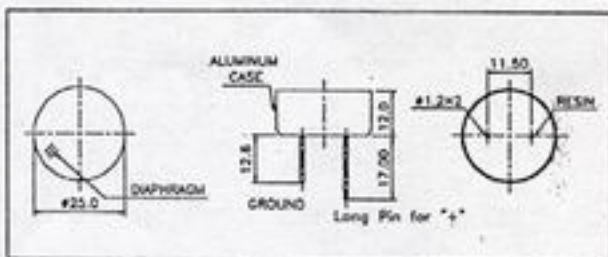
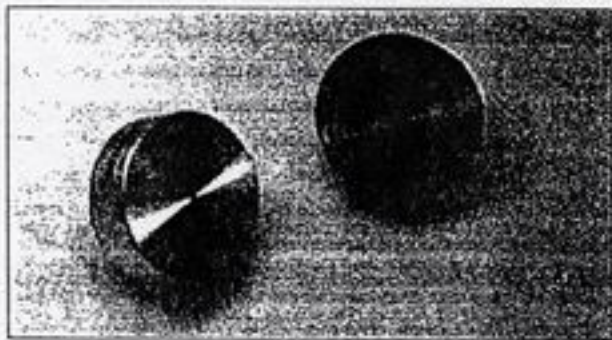
758	400EP SENSOR	
Rev A	Document Number	1.0
date	USR400.SCH	
Thursday, January 04, 2001	12:58	

# Air Ultrasonic Ceramic Transducers

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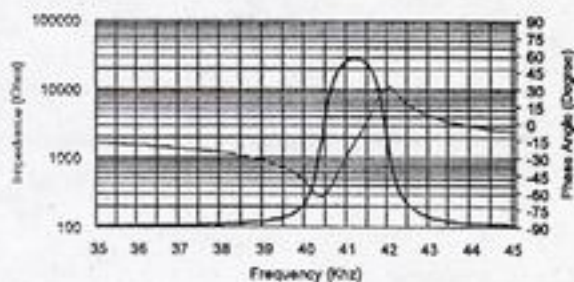
**400EP250**

**Dimensions:** dimensions are in mm



## Impedance/Phase Angle vs. Frequency

Tested under 1Vrms Oscillation Level

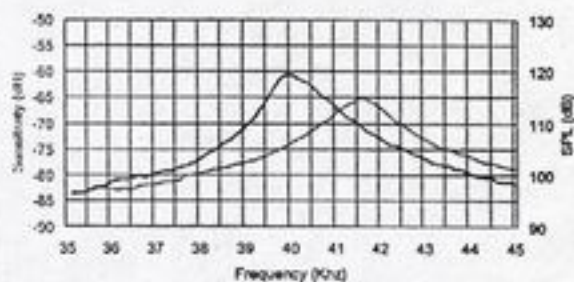


## Specification

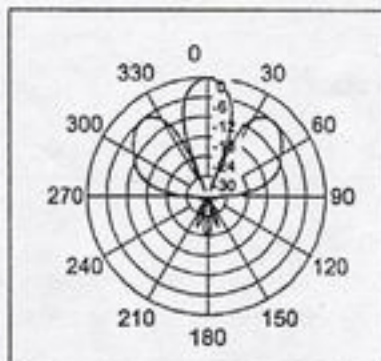
<b>400EP250</b>	Transceiver
<b>Center Frequency</b>	40.0±1.0Khz
<b>Bandwidth (-6dB) 400EP250</b>	4.0Khz
<b>Transmitting Sound Pressure Level</b> at resonant frequency; 0dB re 0.0002μbar per 10Vrms at 30cm	113dB min.
<b>Receiving Sensitivity</b> at resonant frequency 0dB = 1 volt/μbar	-72dB min.
<b>Nominal Impedance (Ohm)</b>	2400
<b>Ringing (ms)</b>	1.2 max.
<b>Capacitance at 1Khz ±20%</b>	2400 pF
<b>Max. Driving Voltage (cont.)</b>	20Vrms
<b>Total Beam Angle -6dB</b>	30°
<b>Operation Temperature</b>	-30 to 80°C
<b>Storage Temperature</b>	-40 to 85°C

## Sensitivity/Sound Pressure Level

Tested under 10Vrms @30cm



## Beam Angle: Tested at 40.0Khz frequency



All specification taken typical at 25°C  
Closer frequency tolerance, shorter ringing and wider bandwidth models can be supplied upon request.

Model available:

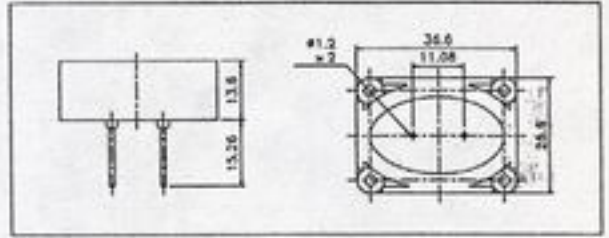
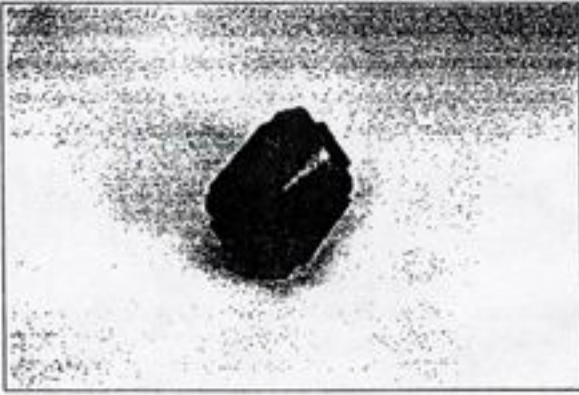
1	400EP250	Aluminum Housing
2	400EP25B	Black Al. Housing

# Air Ultrasonic Ceramic Transducers

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**480EP900**

Dimensions: dimensions are in mm

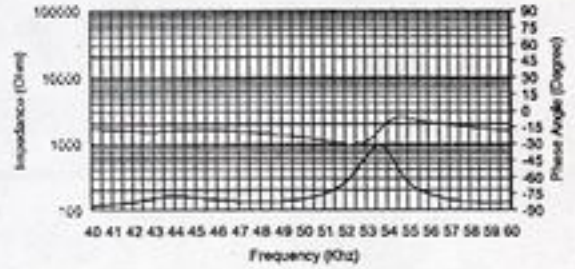


## Specification

<b>480EP900</b>	Transceiver
<b>Center Frequency</b>	48.0±1.0Khz
<b>Bandwidth (100dB) Transmitter</b>	15.0Khz
<b>(-80dB) Receiver</b>	15.0Khz
<b>Transmitting Sound Pressure Level</b>	100dB min.
at 48Khz; 0dB re 0.0002μbar per 10Vrms at 30cm	
<b>Receiving Sensitivity</b>	-80dB min.
at 48.0Khz; 0dB = 1 volt/μbar	
<b>Nominal Impedance (Ohm)</b>	1000
<b>Ringing (ms)</b>	1.2 max.
<b>Capacitance at 1Khz ±20%</b>	2400 pF
<b>Max. Driving Voltage (cont.)</b>	20Vrms
<b>Total Beam Angle -6dB</b>	
Long Axis (X)	43/48/53Khz 22/24/28°
Short Axis (Y)	31/51/33°
<b>Operation Temperature</b>	-20 to 70°C
<b>Storage Temperature</b>	-40 to 80°C

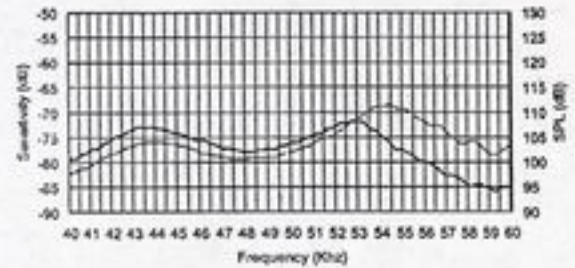
## Impedance/Phase Angle vs. Frequency

Tested under 1Vrms Oscillation Level



## Sensitivity/Sound Pressure Level

Tested under 10Vrms @30cm

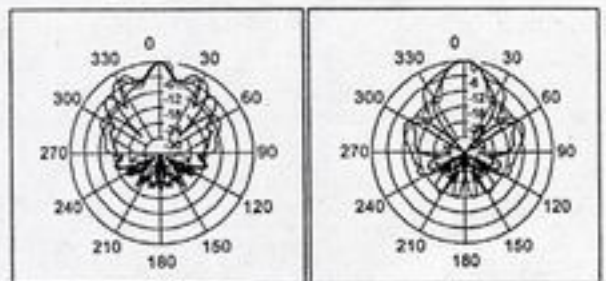


## Beam Angle:

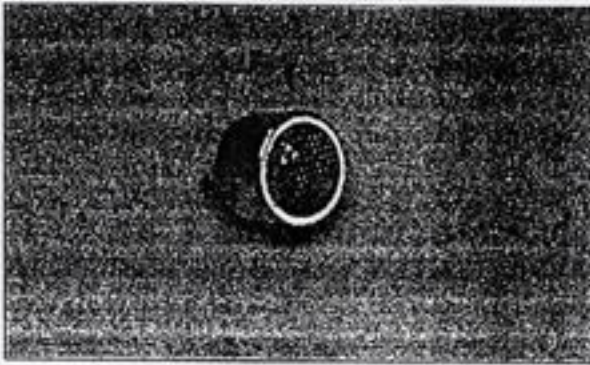
43Khz	_____
48Khz	_____
53Khz	_____

X Axis

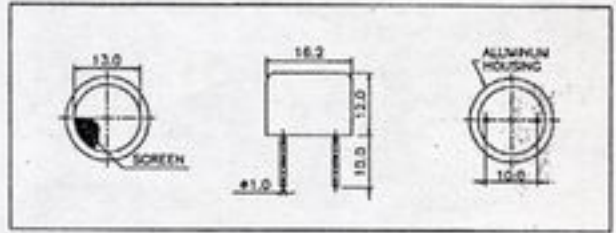
Y Axis



All specification taken typical at 25°C  
Closer frequency tolerance, shorter ringing and wider bandwidth models can be supplied upon request.



Dimensions: dimensions are in mm



## Specification

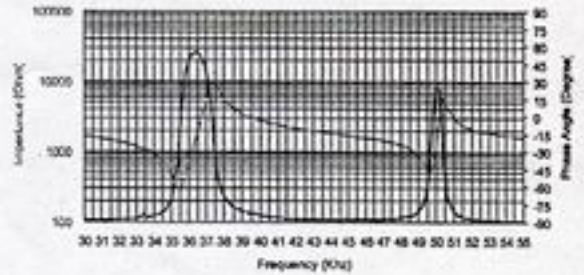
<b>400WB160</b>	Transceiver
<b>Center Frequency</b>	40.0±1.0Khz
<b>Bandwidth (105dB) Transmitter</b>	15Khz
<b>(-75dB) Receiver</b>	15Khz
<b>Transmitting Sound Pressure Level</b>	105dB min.
at 40.0Khz; 0dB re 0.0002μbar per 10Vrms at 30cm	
<b>Receiving Sensitivity</b>	-72dB min.
at 40.0Khz 0dB = 1 volt/μbar	
<b>Nominal Impedance (Trans.)</b>	1000 Ohm
<b>Capacitance at 1Khz ±20%</b>	2500 pF
<b>Max. Driving Voltage (cont.)</b>	20Vrms
<b>Total Beam Angle -6dB</b>	50°
<b>Operation Temperature</b>	-30 to 80°C
<b>Storage Temperature</b>	-40 to 85°C

All specification taken typical at 25°C  
Closer frequency tolerance can be supplied upon request.

Model available

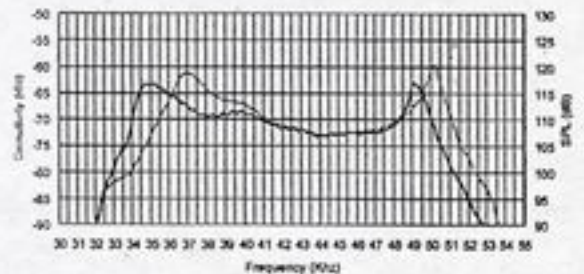
400WB160	Aluminum Housing
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## Impedance/Phase Angle vs. Frequency

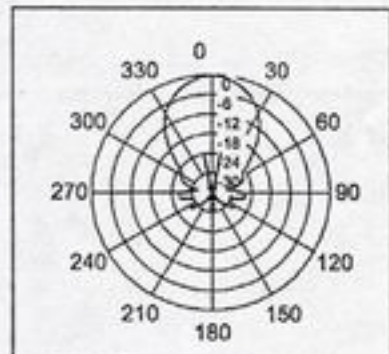


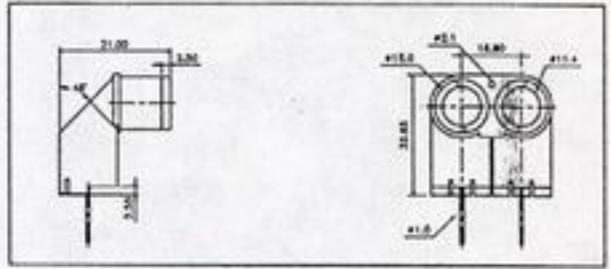
## Sensitivity/Sound Pressure Level

Tested under 10Vrms @30cm



## Beam Angle: Tested at 40.0Khz frequency





**Specification**

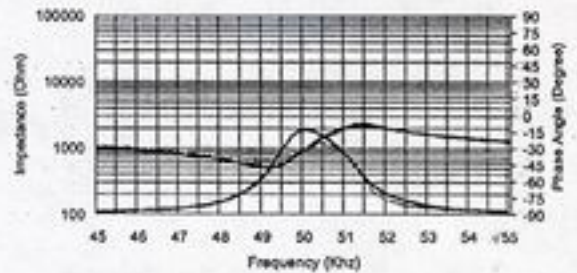
<b>500MB120</b>	Dual Transducer
<b>Center Frequency</b>	50.0±1.0Khz
<b>Bandwidth (-6dB)</b>	3Khz
<b>Transmitting Sound Pressure Level</b> at 50.0Khz; 0dB re 0.0002μbar per 10Vrms at 30cm	113dB min.
<b>Receiving Sensitivity</b> at 50.0Khz 0dB = 1 volt/μbar	-67dB min.
<b>Sensitivity/Cross Talk Ratio</b>	15 dB
<b>Nominal Impedance (Trans.)</b>	1000 Ohm
<b>Capacitance at 1Khz ±20%</b>	2400 pF
<b>Max. Driving Voltage (cont.)</b>	20Vrms
<b>Total Beam Angle</b>	-6dB 30°
<b>Operation Temperature</b>	-20 to 70°C
<b>Storage Temperature</b>	-40 to 80°C

All specification taken typical at 25°C  
Closer frequency tolerance can be supplied upon request.

**Impedance/Phase Angle vs. Frequency**

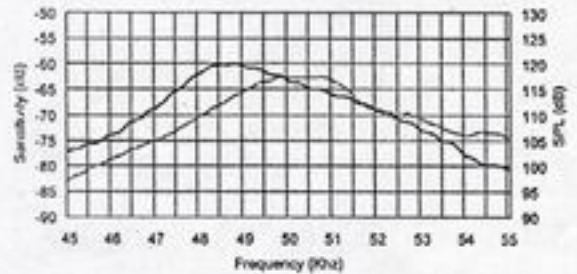
Tested under 1Vrms Oscillation Level

Transmitter Impedance \_\_\_\_\_  
 Transmitter Phase \_\_\_\_\_  
 Receiver Impedance \_\_\_\_\_  
 Receiver Phase \_\_\_\_\_

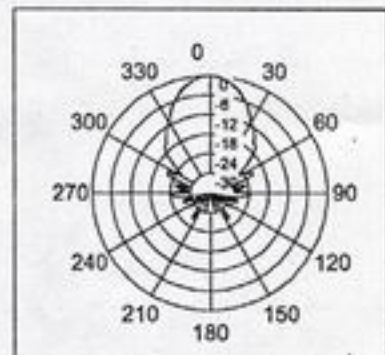


**Sensitivity/Sound Pressure Level**

Tested under 10Vrms @30cm



**Beam Angle: Tested at 50.0Khz frequency**



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