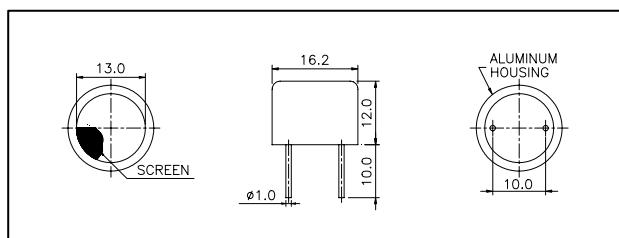


Air Ultrasonic Ceramic Transducers

250ST/R160



Dimensions: dimensions are in mm



Specification

250ST160	Transmitter
250SR160	Receiver
Center Frequency	25.0 ± 1.0 KHz
Bandwidth (-6dB)	250ST180 2.0Khz 250SR180 2.0Khz
Transmitting Sound Pressure Level	112dB min.
at 25.0Khz; 0dB re 0.0002 μ bar per 10Vrms at 30cm	
Receiving Sensitivity	-62dB min.
at 25.0Khz 0dB = 1 volt/ μ bar	
Capacitance at 1Khz	$\pm 20\%$
Max. Driving Voltage (cont.)	20Vrms
Total Beam Angle	-6dB
Operation Temperature	85° typical
Storage Temperature	-30 to 80°C
	-40 to 85°C

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

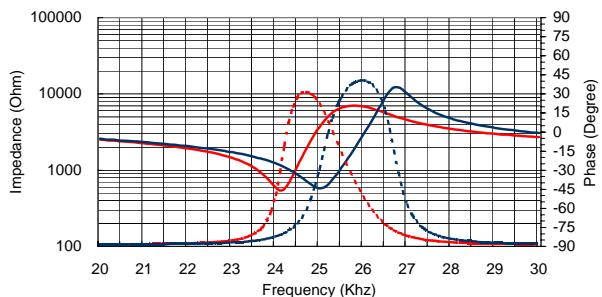
Model available:

1	250ST/R160	Aluminum Housing
2	250ST/R16B	Black Al. Housing
3	250ST/R16P	Plastic Housing

Impedance/Phase Angle vs. Frequency

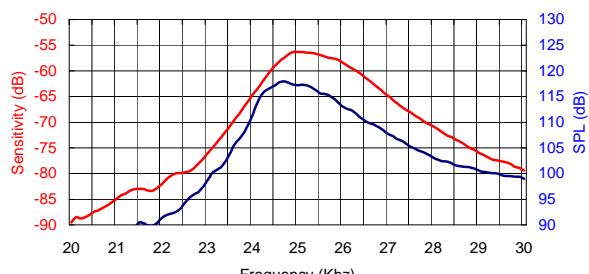
Tested under 1Vrms Oscillation Level

250SR160 Impedance
250SR160 Phase
250ST160 Impedance
250ST160 Phase



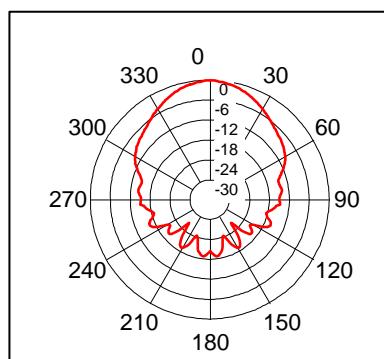
Sensitivity/Sound Pressure Level

Tested under 10Vrms @30cm



Beam Angle

Tested at 25.0Khz frequency

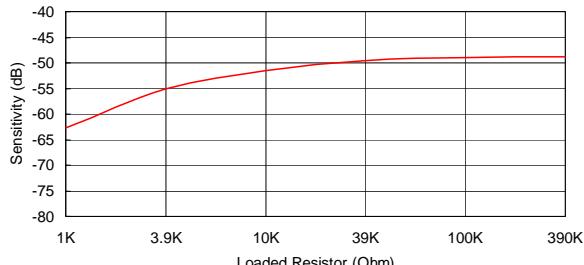


Air Ultrasonic Ceramic Transducers

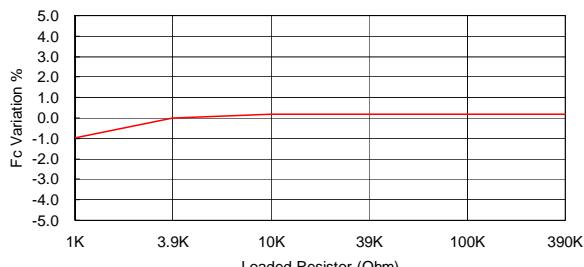
250ST/R160

250SR160 Receiver

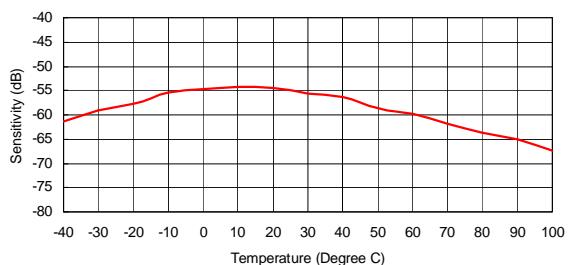
Sensitivity Variation vs. Loaded Resistor



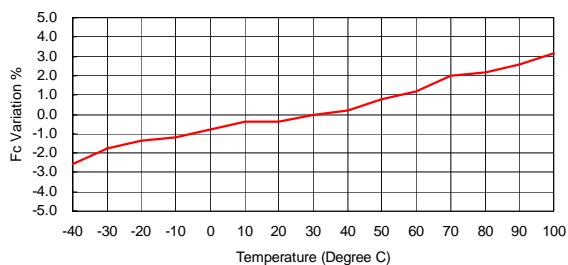
Center Frequency Shift vs. Loaded Resistor



Sensitivity Variation vs. Temperature

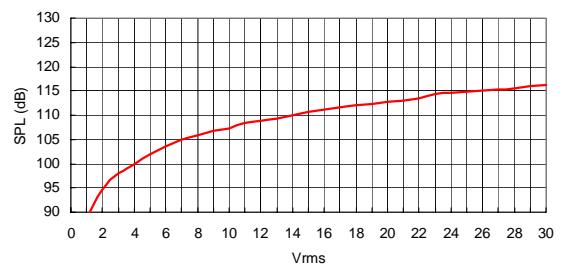


Center Frequency Shift vs. Temperature

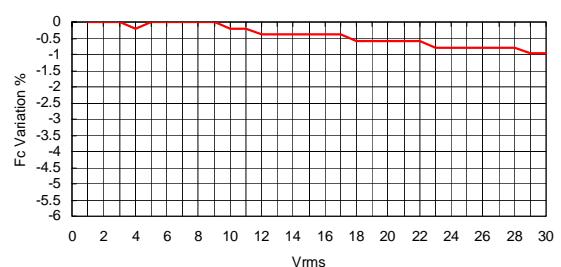


250ST160 Transmitter

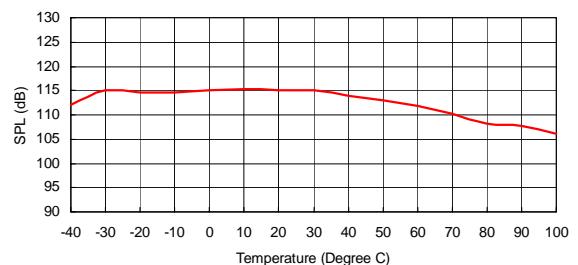
SPL Variation vs. Driving Voltage



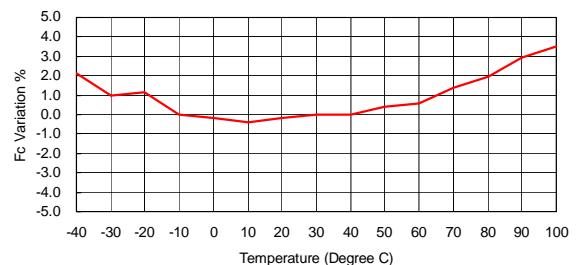
Center Frequency Shift vs. Driving Voltage



SPL Variation vs. Temperature



Center Frequency Shift vs. Temperature

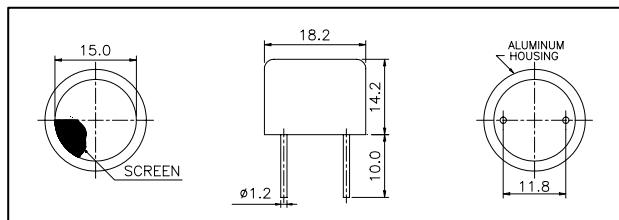


Air Ultrasonic Ceramic Transducers

250ST/R180



Dimensions: dimensions are in mm



Impedance/Phase Angle vs. Frequency

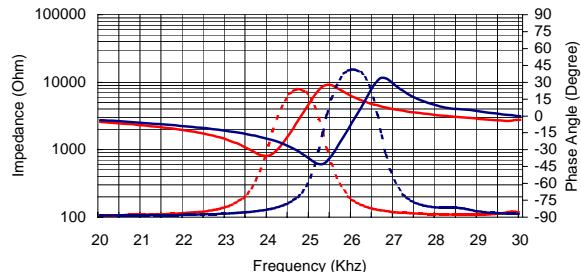
Tested under 1Vrms Oscillation Level

250SR180 Impedance

250SR180 Phase

250ST180 Impedance

250ST180 Phase



Specification

250ST180	Transmitter
250SR180	Receiver
Center Frequency	25.0±1.0Khz
Bandwidth (-6dB)	250ST180 1.5Khz 250SR180 1.8Khz
Transmitting Sound Pressure Level	112dB min.
at 25.0Khz; 0dB re 0.0002µbar per 10Vrms at 30cm	
Receiving Sensitivity	-62dB min.
at 25.0Khz 0dB = 1 volt/µbar	
Capacitance at 1Khz	±20%
Max. Driving Voltage (cont.)	20Vrms
Total Beam Angle	-6dB
Operation Temperature	95° typical
Storage Temperature	-30 to 80°C
	-40 to 85°C

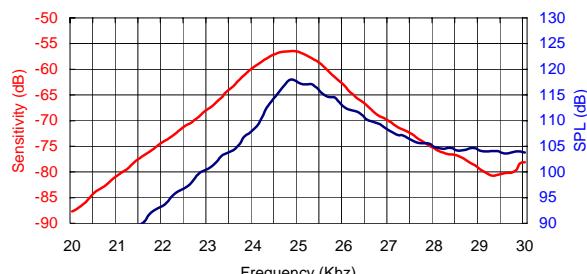
All specification taken typical at 25°C
Closer frequency tolerance can be supplied upon request.

Model available:

1	250ST/R180	Aluminum Housing
2	250ST/R18B	Black Al. Housing

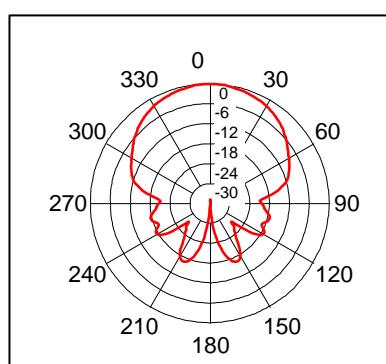
Sensitivity/Sound Pressure Level

Tested under 10Vrms @30cm



Beam Angle

Tested at 25.0Khz frequency

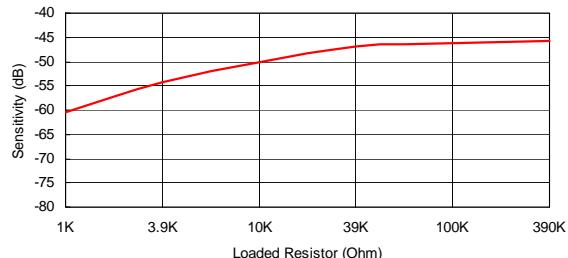


Air Ultrasonic Ceramic Transducers

250ST/R180

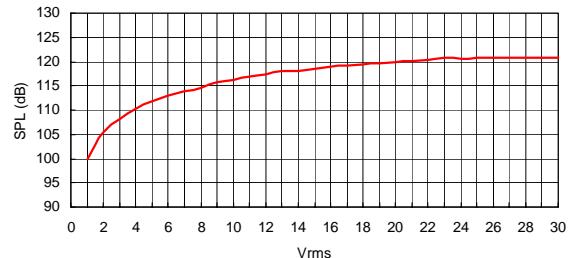
250SR180 Receiver

Sensitivity Variation vs. Loaded Resistor

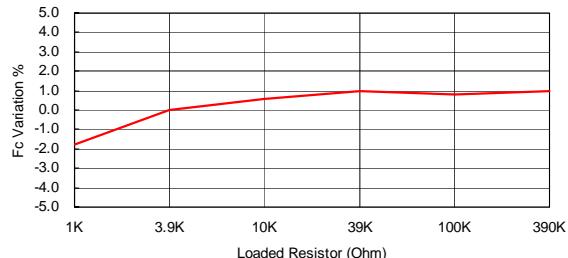


250ST180 Transmitter

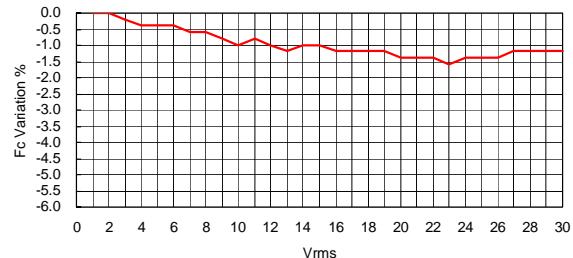
SPL Variation vs. Driving Voltage



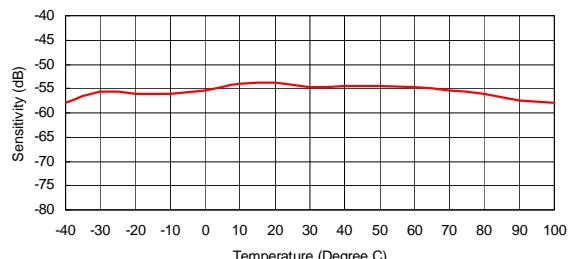
Center Frequency Shift vs. Loaded Resistor



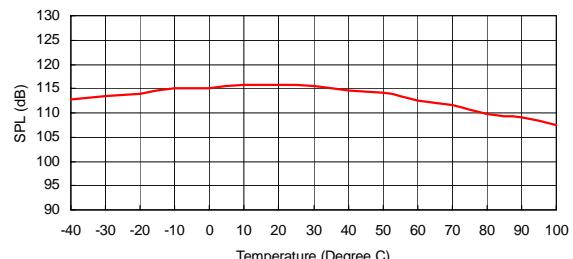
Center Frequency Shift vs. Driving Voltage



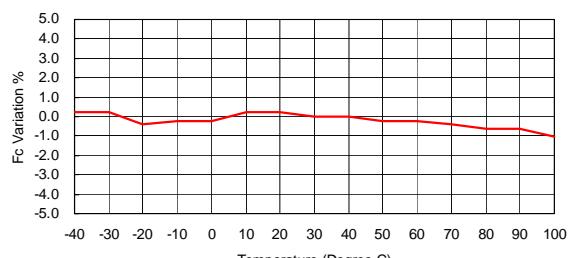
Sensitivity Variation vs. Temperature



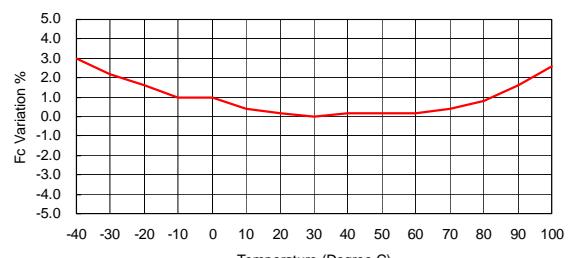
SPL Variation vs. Temperature



Center Frequency Shift vs. Temperature



Center Frequency Shift vs. Temperature

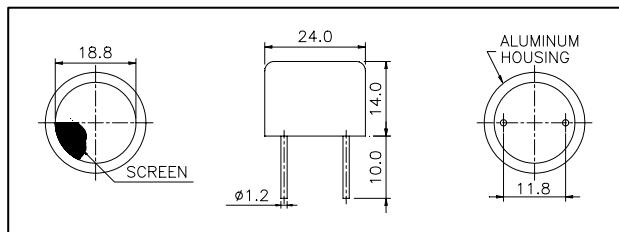


Air Ultrasonic Ceramic Transducers

250ST/R240



Dimensions: dimensions are in mm



Impedance/Phase Angle vs. Frequency

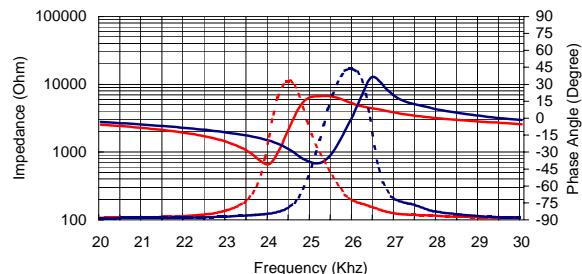
Tested under 1Vrms Oscillation Level

250SR240 Impedance

250SR240 Phase

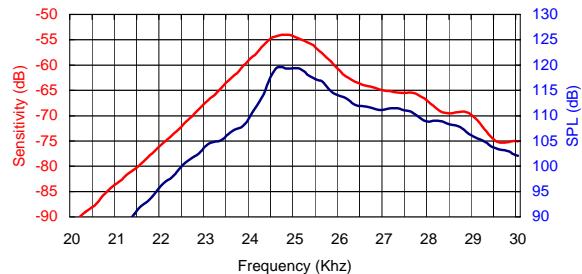
250ST240 Impedance

250ST240 Phase

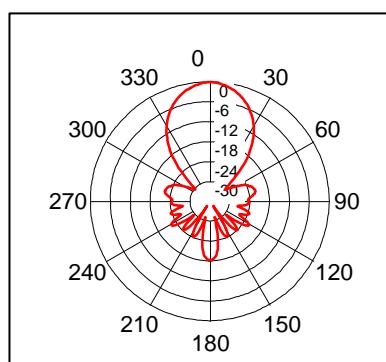


Sensitivity/Sound Pressure Level

Tested under 10Vrms @30cm



Beam Angle: Tested at 25.0Khz frequency



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

Model available:

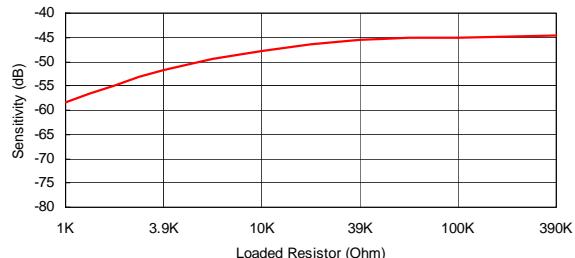
1	250ST/R240	Aluminum Housing
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Air Ultrasonic Ceramic Transducers

250ST/R240

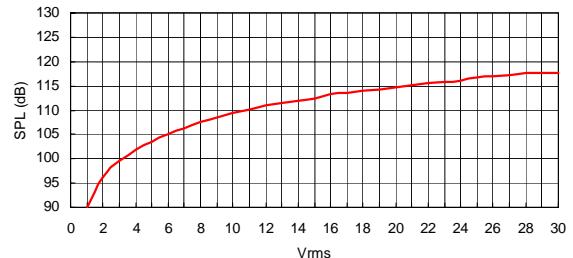
250SR240 Receiver

Sensitivity Variation vs. Loaded Resistor

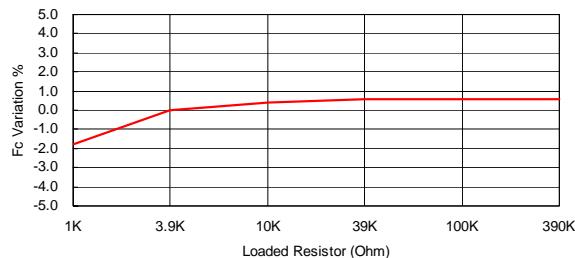


250ST240 Transmitter

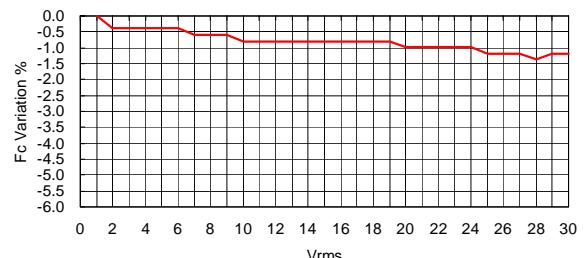
SPL Variation vs. Driving Voltage



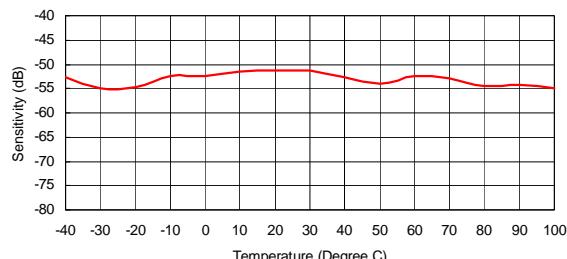
Center Frequency Shift vs. Loaded Resistor



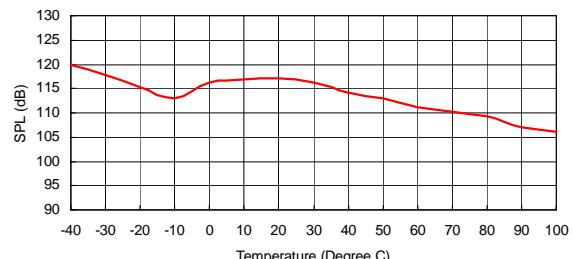
Center Frequency Shift vs. Driving Voltage



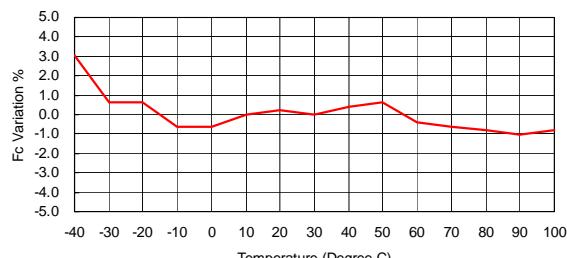
Sensitivity Variation vs. Temperature



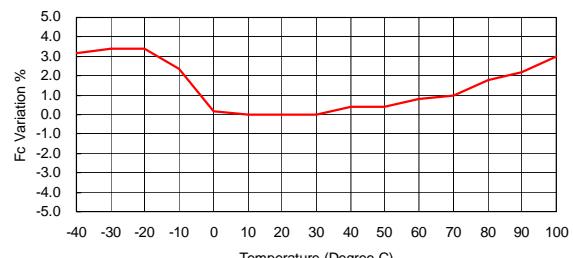
SPL Variation vs. Temperature



Center Frequency Shift vs. Temperature



Center Frequency Shift vs. Temperature

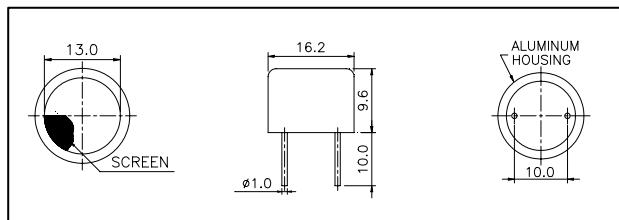


Air Ultrasonic Ceramic Transducers

328ST/R160



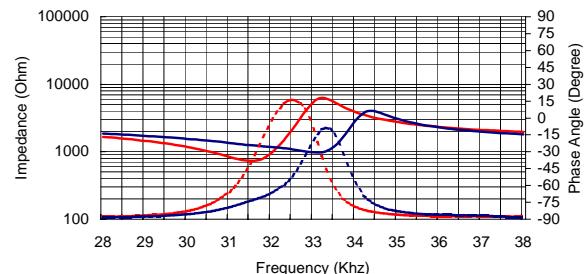
Dimensions: dimensions are in mm



Impedance/Phase Angle vs. Frequency

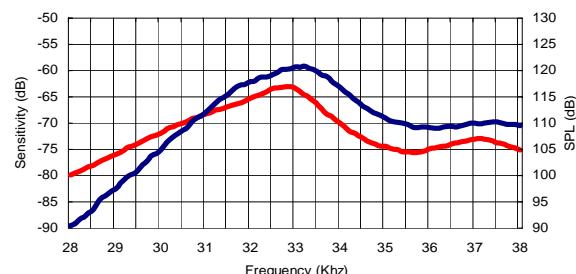
Tested under 1Vrms Oscillation Level

328SR160 Impedance	
328SR160 Phase	
328ST160 Impedance	
328ST160 Phase	



Sensitivity/Sound Pressure Level

Tested under 10Vrms @30cm

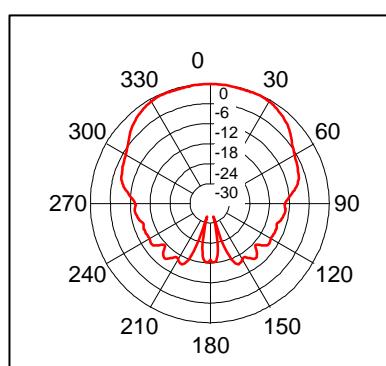


Beam Angle: Tested at 32.8Khz frequency

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

Model available:

1	328ST/R160	Aluminum Housing
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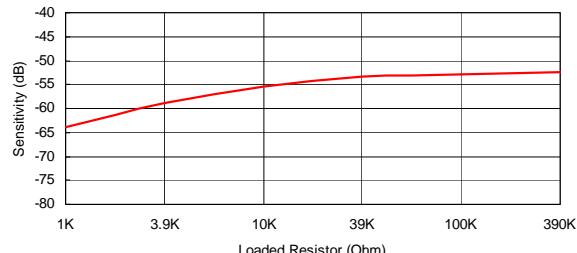


Air Ultrasonic Ceramic Transducers

328ST/R160

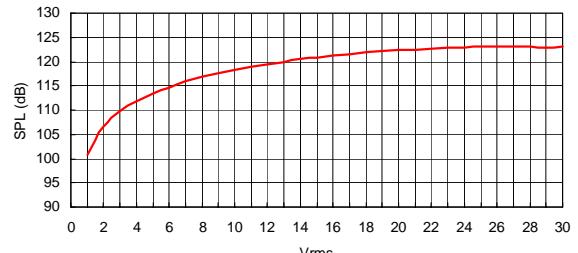
328SR160 Receiver

Sensitivity Variation vs. Loaded Resistor

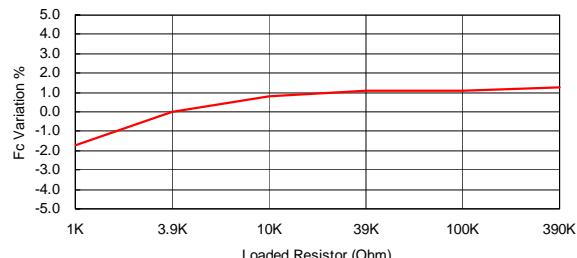


328ST160 Transmitter

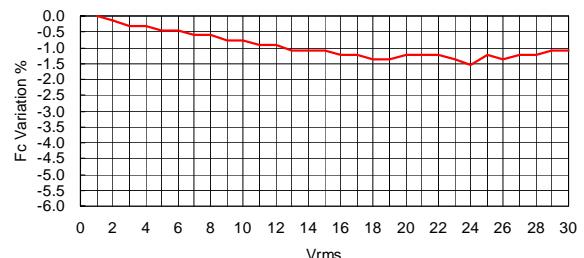
SPL Variation vs. Driving Voltage



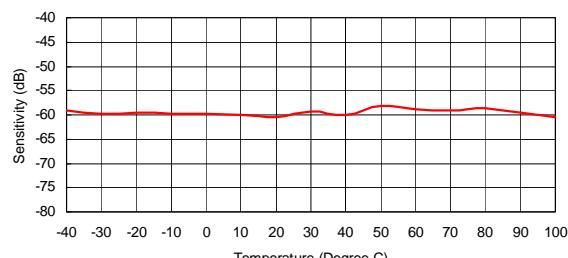
Center Frequency Shift vs. Loaded Resistor



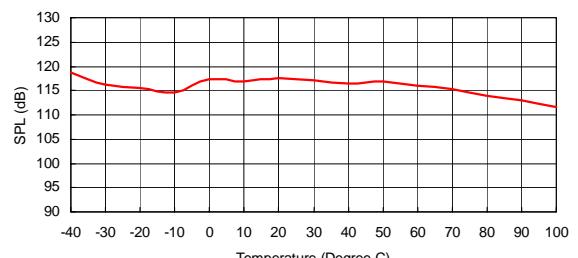
Center Frequency Shift vs. Driving Voltage



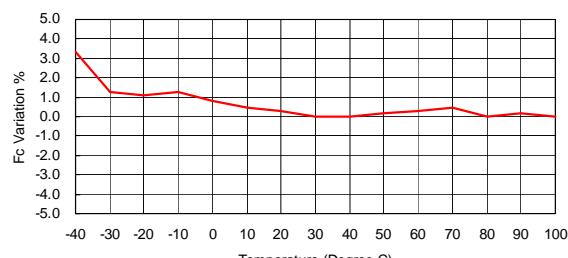
Sensitivity Variation vs. Temperature



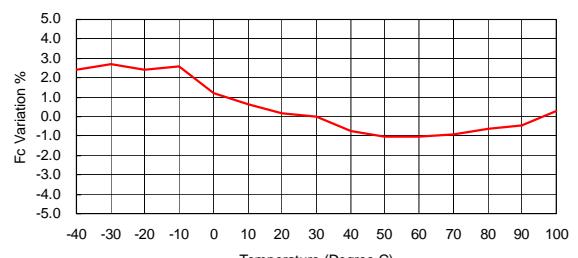
SPL Variation vs. Temperature



Center Frequency Shift vs. Temperature



Center Frequency Shift vs. Temperature

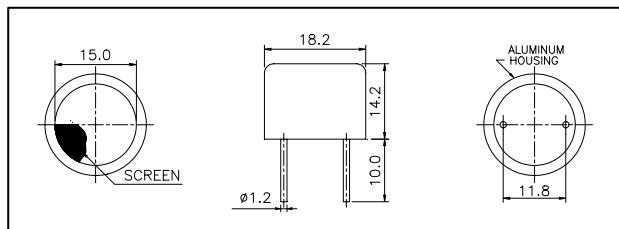


Air Ultrasonic Ceramic Transducers

328ST/R180



Dimensions: dimensions are in mm



Specification

328ST180	Transmitter
328SR180	Receiver
Center Frequency	$32.8 \pm 1.0 \text{Khz}$
Bandwidth (-6dB)	328ST180 2Khz 328SR180 2Khz
Transmitting Sound Pressure Level	117dB min. at 32.8Khz; 0dB re 0.0002 μbar per 10Vrms at 30cm
Receiving Sensitivity	-64dB min. at 32.8Khz 0dB = 1 volt/ μbar
Capacitance at 1Khz	$\pm 20\%$
Max. Driving Voltage (cont.)	20Vrms
Total Beam Angle	-6dB
Operation Temperature	-30 to 80°C
Storage Temperature	-40 to 85°C

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

Model available:

1	328ST/R180	Aluminum Housing
2	328ST/R18B	Black Al. Housing

Impedance/Phase Angle vs. Frequency

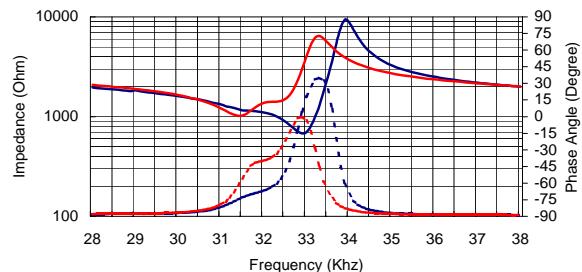
Tested under 1Vrms Oscillation Level

328SR180 Impedance

328SR180 Phase

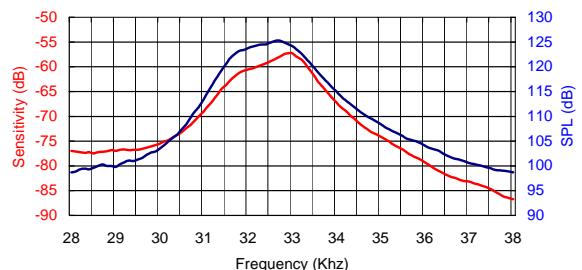
328ST180 Impedance

328ST180 Phase

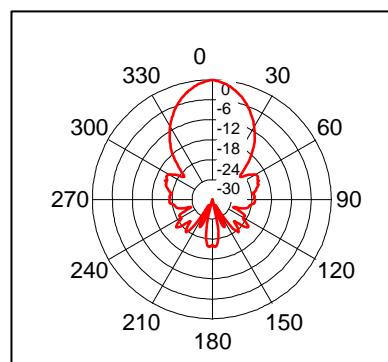


Sensitivity/Sound Pressure Level

Tested under 10Vrms @30cm



Beam Angle: Tested at 32.8Khz frequency



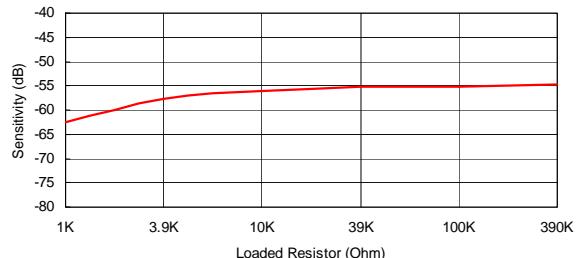
Air Ultrasonic Ceramic Transducers

328ST/R180

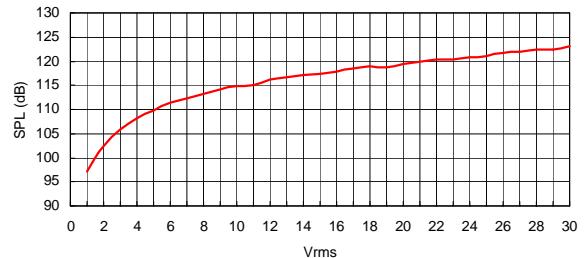
328SR180 Receiver

328ST180 Transmitter

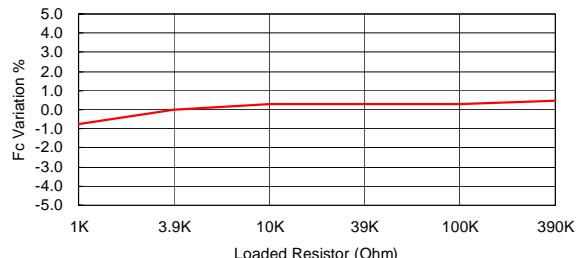
Sensitivity Variation vs. Loaded Resistor



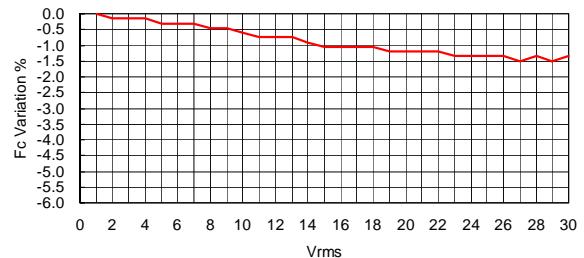
SPL Variation vs. Driving Voltage



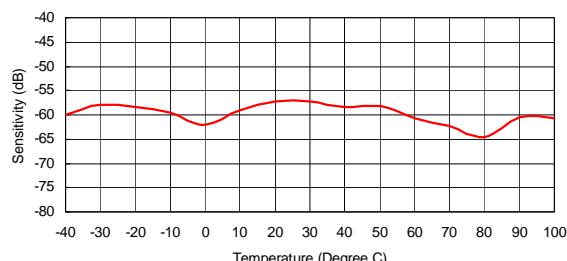
Center Frequency Shift vs. Loaded Resistor



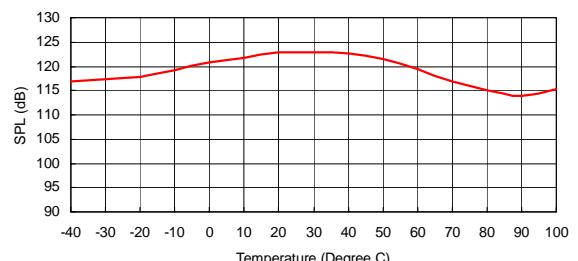
Center Frequency Shift vs. Driving Voltage



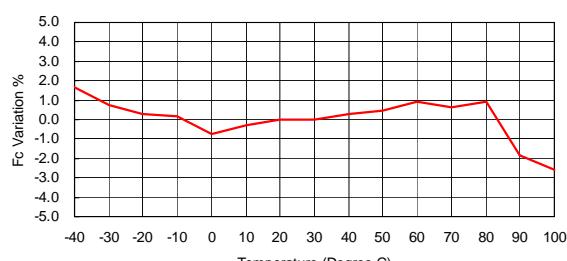
Sensitivity Variation vs. Temperature



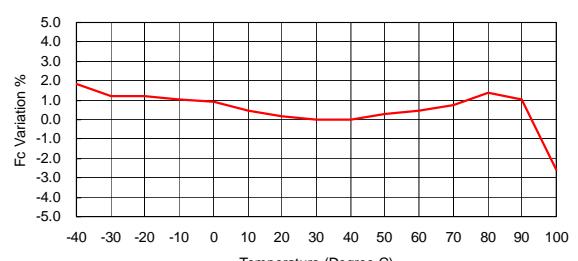
SPL Variation vs. Temperature



Center Frequency Shift vs. Temperature



Center Frequency Shift vs. Temperature

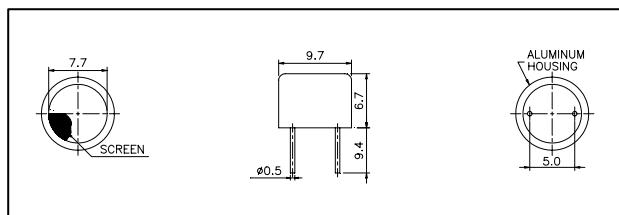


Air Ultrasonic Ceramic Transducers

400ST/R100



Dimensions: Dimensions are in mm



Impedance/Phase Angle vs. Frequency

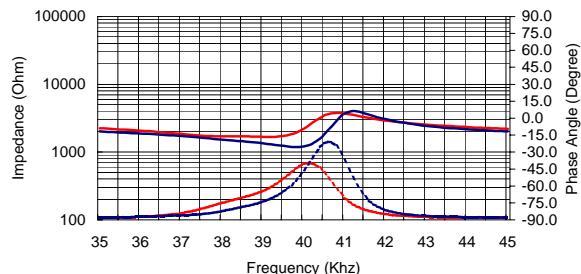
Tested under 1Vrms Oscillation Level

400SR100 Impedance

400SR100 Phase

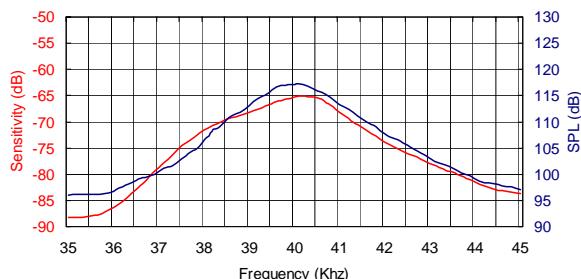
400ST100 Impedance

400ST100 Phase



Sensitivity/Sound Pressure Level

Tested under 10Vrms @30cm



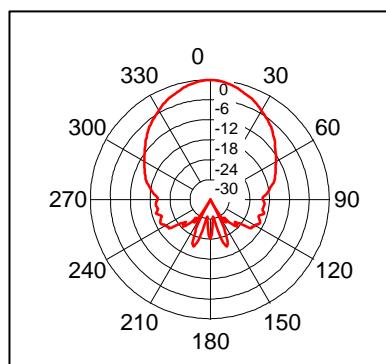
Beam Angle: Tested at 40.0Khz frequency

400ST100	Transmitter
400SR100	Receiver
Center Frequency	40.0 ± 1.0 KHz
Bandwidth (-6dB)	400ST100 2.5Khz 400SR100 3.0Khz
Transmitting Sound Pressure Level	112dB min.
at 40.0Khz; 0dB re 0.0002 μ bar per 10Vrms at 30cm	
Receiving Sensitivity	-70dB min.
at 40.0Khz 0dB = 1 volt/ μ bar	
Capacitance at 1Khz	$\pm 20\%$
Max. Driving Voltage (cont.)	10Vrms
Total Beam Angle	-6dB
Operation Temperature	-30 to 80°C
Storage Temperature	-40 to 85°C

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

Model available:

1	400ST/R100	Aluminum Housing
2	400ST/R10B	Black Al. Housing
3	400ST/R10P	Plastic Housing

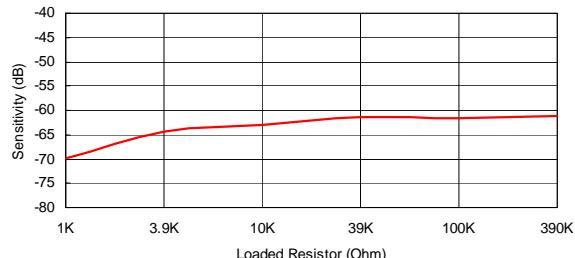


Air Ultrasonic Ceramic Transducers

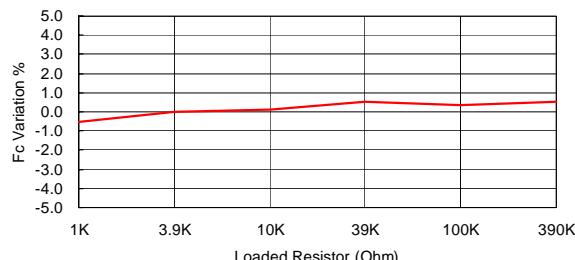
400ST/R100

400SR100 Receiver

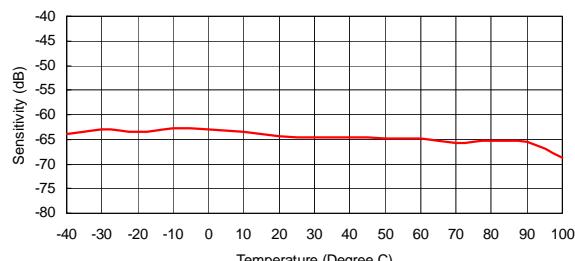
Sensitivity Variation vs. Loaded Resistor



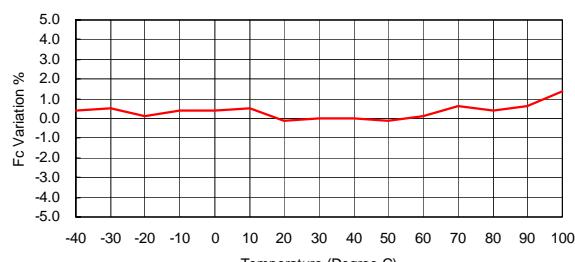
Center Frequency Shift vs. Loaded Resistor



Sensitivity Variation vs. Temperature

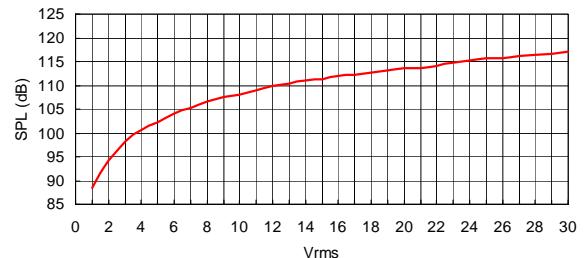


Center Frequency Shift vs. Temperature

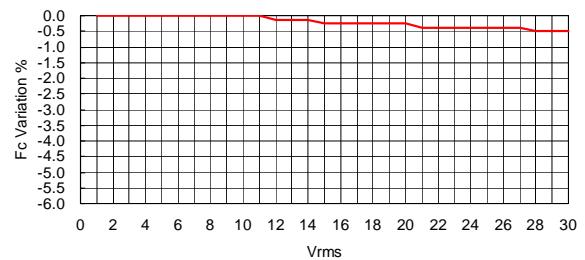


400ST100 Transmitter

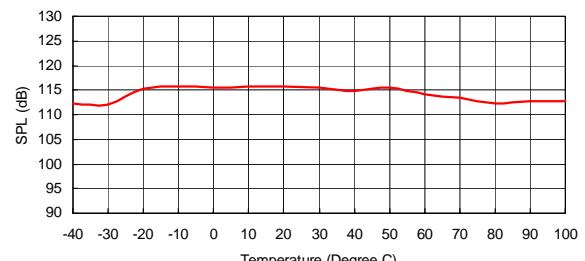
SPL Variation vs. Driving Voltage



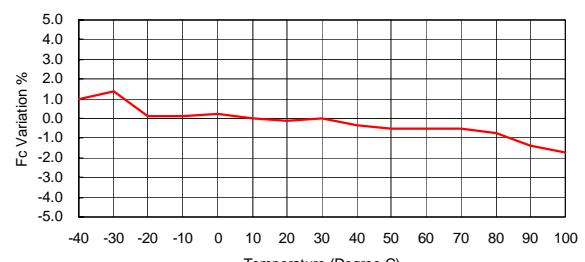
Center Frequency Shift vs. Driving Voltage



SPL Variation vs. Temperature



Center Frequency Shift vs. Temperature

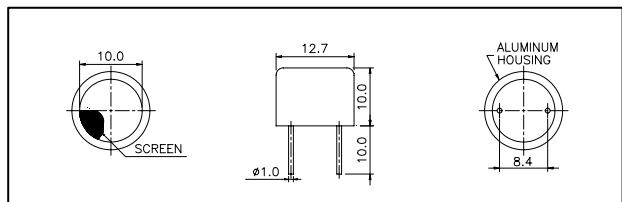


Air Ultrasonic Ceramic Transducers

400ST/R120



Dimensions: dimensions are in mm



Specification

400ST120	Transmitter
400SR120	Receiver
Center Frequency	40.0 ± 1.0 KHz
Bandwidth (-6dB)	400ST120 2.0Khz 400SR120 2.0Khz
Transmitting Sound Pressure Level	115dB min.
at 40.0Khz; 0dB re 0.0002 μ bar per 10Vrms at 30cm	
Receiving Sensitivity	-67dB min.
at 40.0Khz 0dB = 1 volt/ μ bar	
Capacitance at 1Khz	$\pm 20\%$
Max. Driving Voltage (cont.)	20Vrms
Total Beam Angle	-6dB
Operation Temperature	85° typical
Storage Temperature	-30 to 80°C
	-40 to 85°C

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

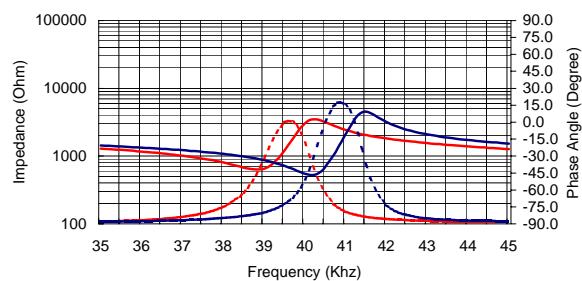
Model available:

1	400ST/R120	Aluminum Housing
2	400ST/R12B	Black Al. Housing

Impedance/Phase Angle vs. Frequency

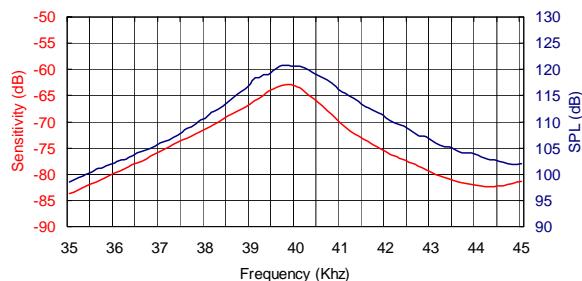
Tested under 1Vrms Oscillation Level

400SR120 Impedance
400SR120 Phase
400ST120 Impedance
400ST120 Phase

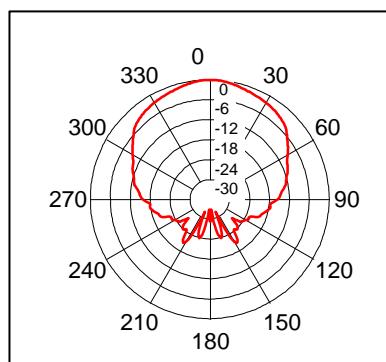


Sensitivity/Sound Pressure Level

Tested under 10Vrms @30cm



Beam Angle: Tested at 40.0Khz frequency

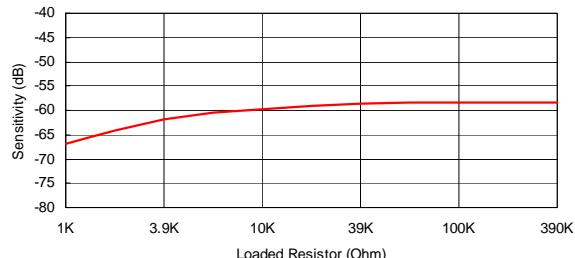


Air Ultrasonic Ceramic Transducers

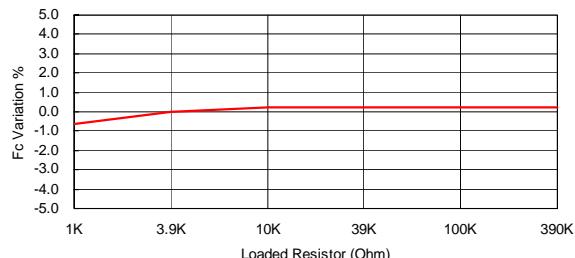
400ST/R120

400SR120 Receiver

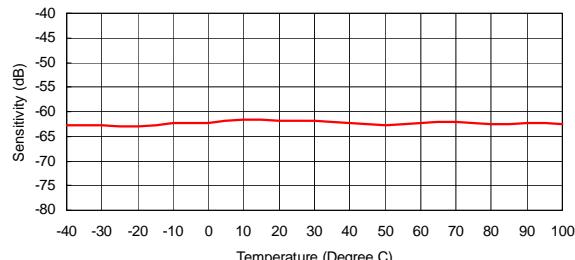
Sensitivity Variation vs. Loaded Resistor



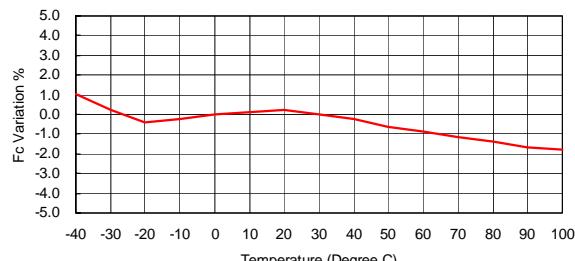
Center Frequency Shift vs. Loaded Resistor



Sensitivity Variation vs. Temperature

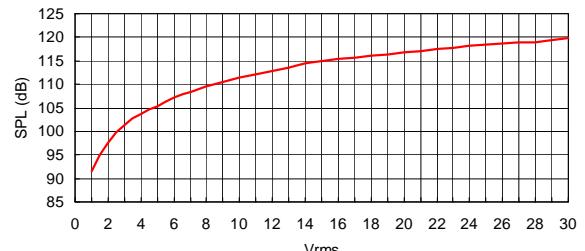


Center Frequency Shift vs. Temperature

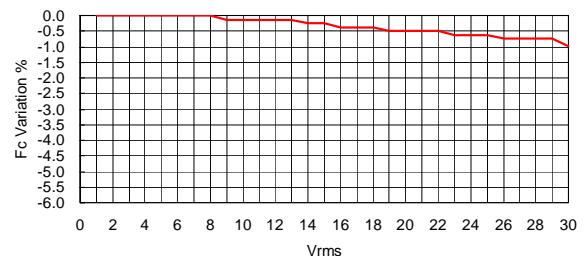


400ST120 Transmitter

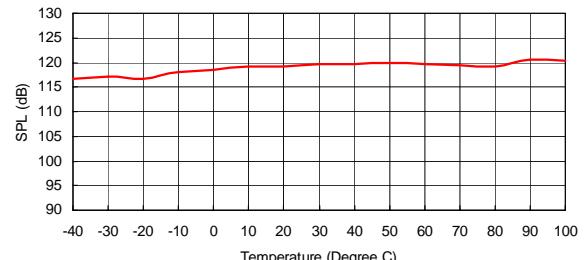
SPL Variation vs. Driving Voltage



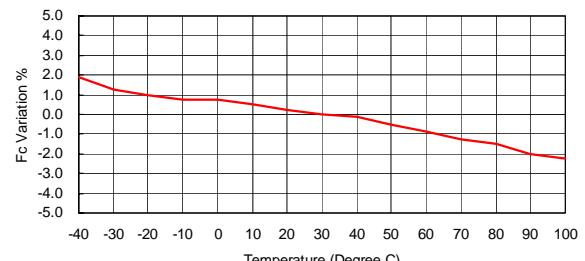
Center Frequency Shift vs. Driving Voltage



SPL Variation vs. Temperature



Center Frequency Shift vs. Temperature

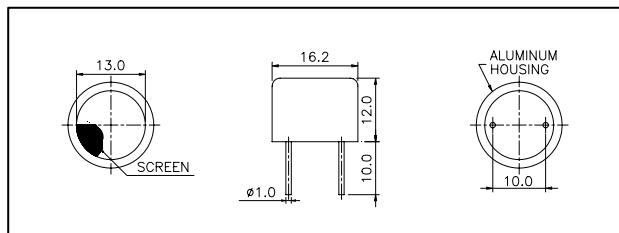


Air Ultrasonic Ceramic Transducers

400ST/R160



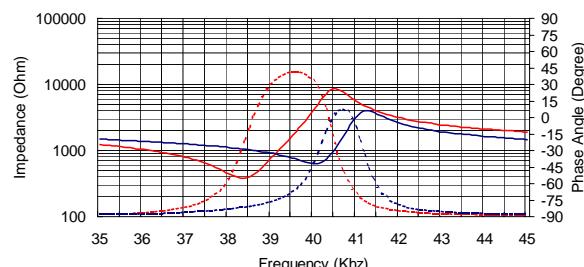
Dimensions: dimensions are in mm



Impedance/Phase Angle vs. Frequency

Tested under 1Vrms Oscillation Level

400SR160 Impedance
400SR160 Phase
400ST160 Impedance
400ST160 Phase



Specification

400ST160	Transmitter
400SR160	Receiver
Center Frequency	40.0±1.0Khz
Bandwidth (-6dB)	400ST160 2.0Khz 400SR160 2.5Khz
Transmitting Sound Pressure Level	120dB min.
at 40.0Khz; 0dB re 0.0002µbar per 10Vrms at 30cm	
Receiving Sensitivity	-65dB min.
at 40.0Khz 0dB = 1 volt/µbar	
Capacitance at 1Khz	±20%
Max. Driving Voltage (cont.)	20Vrms
Total Beam Angle	-6dB
Operation Temperature	-30 to 80°C
Storage Temperature	-40 to 85°C

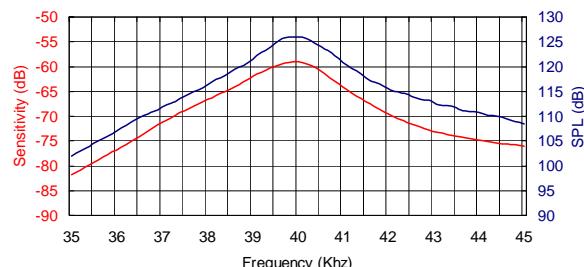
All specification taken typical at 25°C
Closer frequency tolerance can be supplied upon request.

Models available:

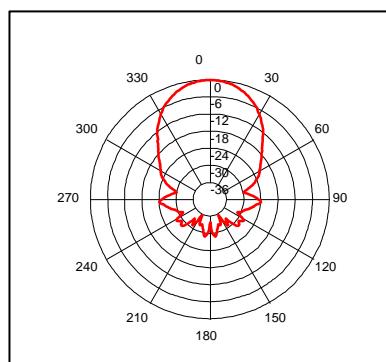
1	400ST/R160	Aluminum Housing
2	400ST/R16B	Black Al. Housing
3	400ST/R16P	Plastic Housing

Sensitivity/Sound Pressure Level

Tested under 10Vrms @30cm



Beam Angle: Tested at 40.0Khz frequency

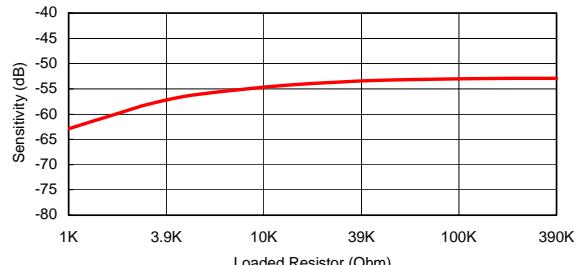


Air Ultrasonic Ceramic Transducers

400ST/R160

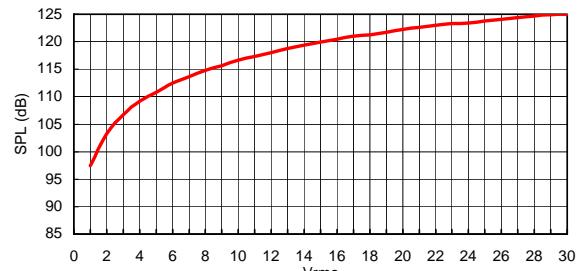
400SR160 Receiver

Sensitivity Variation vs. Loaded Resistor

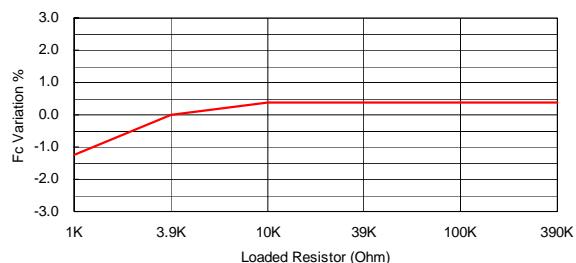


400ST160 Transmitter

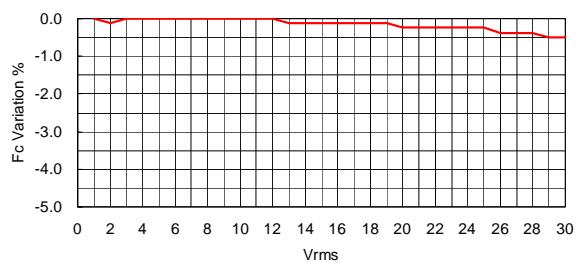
SPL Variation vs. Driving Voltage



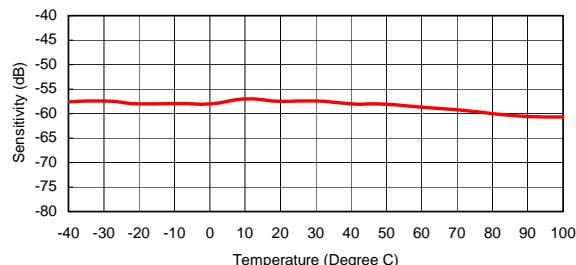
Center Frequency Shift vs. Loaded Resistor



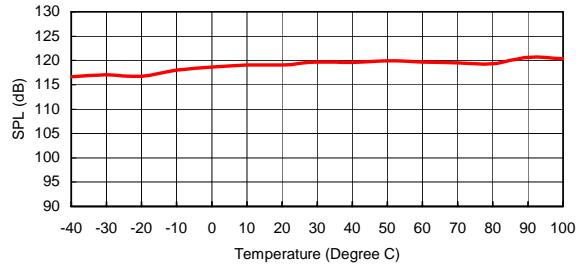
Center Frequency Shift vs. Driving Voltage



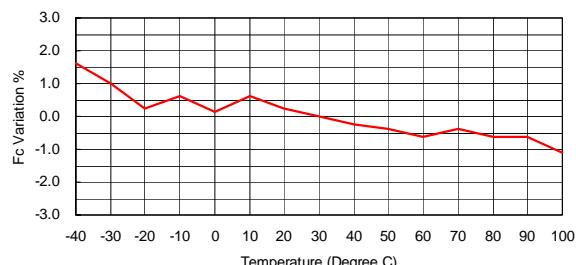
Sensitivity Variation vs. Temperature



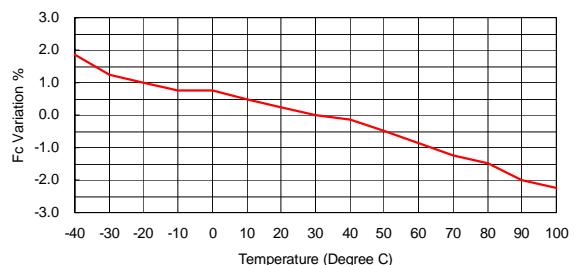
SPL Variation vs. Temperature



Center Frequency Shift vs. Temperature



Center Frequency Shift vs. Temperature

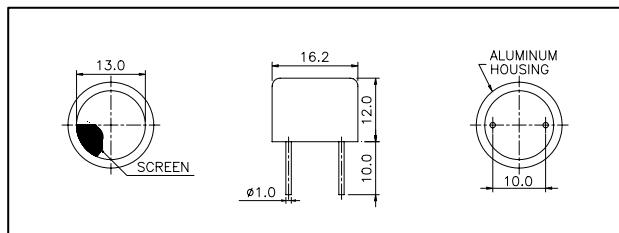


Air Ultrasonic Ceramic Transducers

400WB160



Dimensions: dimensions are in mm



Specification

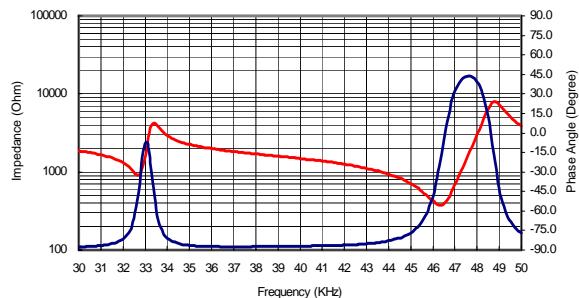
400WB160	Transceiver
Center Frequency	40.0±1.0Khz
Bandwidth (-6dB) Transmitter	10Khz
(-6dB) Receiver	10Khz
Transmitting Sound Pressure Level	105dB min.
at 40.0Khz; 0dB re 0.0002µbar per 10Vrms at 30cm	
Receiving Sensitivity	-78dB min.
at 40.0Khz 0dB = 1 volt/µbar	
Nominal Impedance (Trans.)	800 Ohm
Capacitance at 1Khz ±20%	2500 pF
Max. Driving Voltage (cont.)	20Vrms
Total Beam Angle -6dB	50° typical
Operation Temperature	-30 to 80°C
Storage Temperature	-40 to 85°C

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

Model available

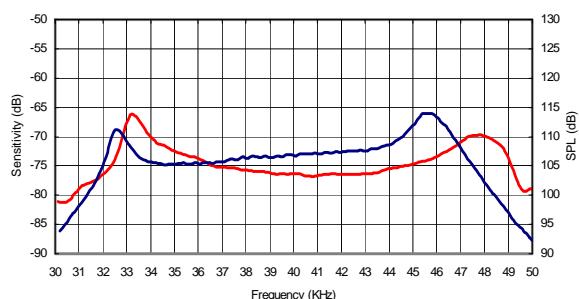
400WB160	Aluminum Housing
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Impedance/Phase Angle vs. Frequency

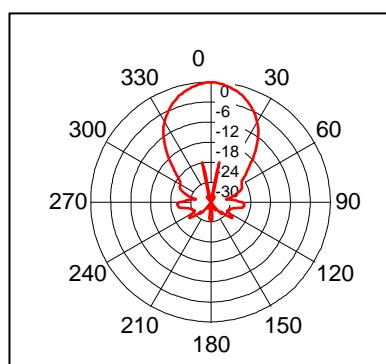


Sensitivity/Sound Pressure Level

Tested under 10Vrms @30cm



Beam Angle: Tested at 40.0Khz frequency

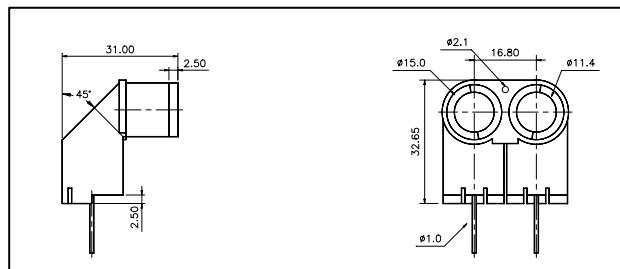


Air Ultrasonic Ceramic Transducers

500MB120



Dimensions: dimensions are in mm



Impedance/Phase Angle vs. Frequency

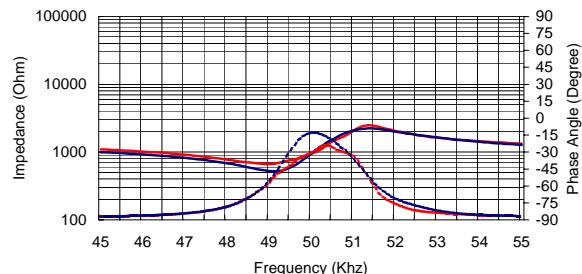
Tested under 1Vrms Oscillation Level

Receiver Impedance

Receiver Phase

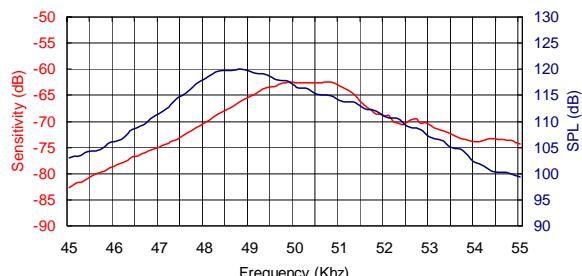
Transmitter Impedance

Transmitter Phase

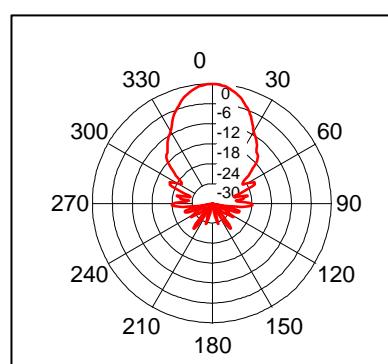


Sensitivity/Sound Pressure Level

Tested under 10Vrms @30cm



Beam Angle: Tested at 50.0Khz frequency



Specification

500MB120	Dual Transducer
Center Frequency	50.0 ± 1.0 KHz
Bandwidth (-6dB)	3Khz
Transmitting Sound Pressure Level	113dB min.
at 50.0Khz; 0dB re 0.0002 μ bar per 10Vrms at 30cm	
Receiving Sensitivity	-67dB min.
at 50.0Khz 0dB = 1 volt/ μ bar	
Sensitivity/Cross Talk Ratio	15 dB
Nominal Impedance (Trans.)	800 Ohm
Capacitance at 1Khz	$\pm 20\%$
Max. Driving Voltage (cont.)	20Vrms
Total Beam Angle	-6dB
	30° typical
Operation Temperature	-30 to 70°C
Storage Temperature	-40 to 80°C

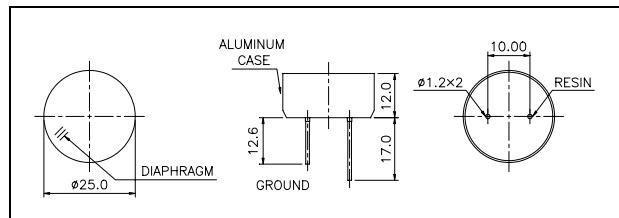
All specification taken typical at 25°C
Closer frequency tolerance can be supplied upon request.

Air Ultrasonic Ceramic Transducers

328ET/R250



Dimensions: dimensions are in mm



Specification

328ET250	Transmitter
328ER250	Receiver
Center Frequency	$32.8 \pm 1.0 \text{Khz}$
Bandwidth (-6dB)	328ET250 1.0Khz 328ER250 1.0Khz
Transmitting Sound Pressure Level	113dB min. at 32.8Khz; 0dB re 0.0002 μbar per 10Vrms at 30cm
Receiving Sensitivity	-67dB min. at 32.8Khz 0dB = 1 volt/ μbar
Capacitance at 1Khz	$\pm 20\%$
Max. Driving Voltage (cont.)	20Vrms
Total Beam Angle	-6dB
Operation Temperature	33° typical
Storage Temperature	-30 to 80°C
-40 to 85°C	

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

Model available:

1	328ET/R250	Aluminum Housing
2	328ET/R25B	Black Alum. Housing
3	328ET/R25S	SUS 316 Housing

Impedance/Phase Angle vs. Frequency

Tested under 1Vrms Oscillation Level

328ER250 Impedance



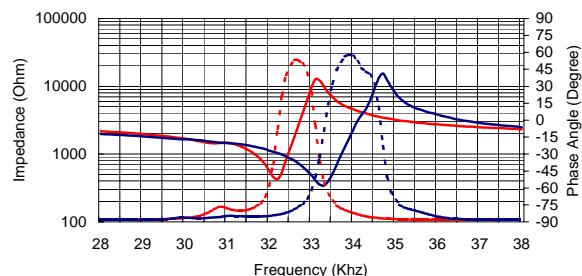
328ER250 Phase



328ET250 Impedance

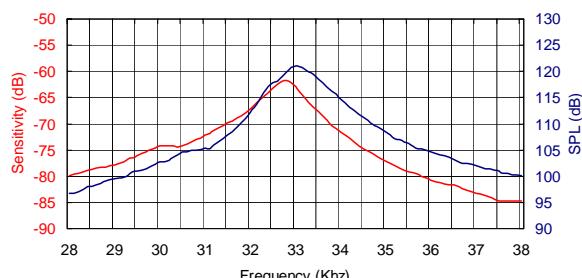


328ET250 Phase

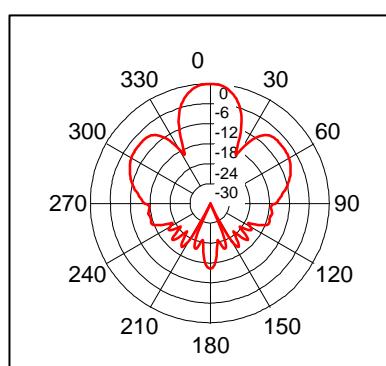


Sensitivity/Sound Pressure Level

Tested under 10Vrms @30cm



Beam Angle: Tested at 32.8Khz frequency

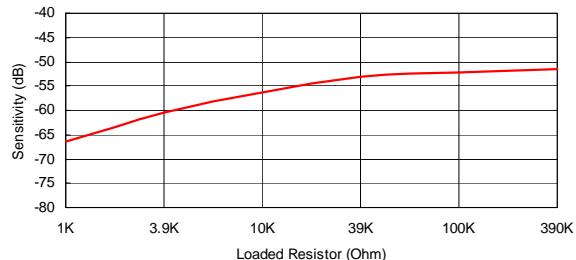


Air Ultrasonic Ceramic Transducers

328ET/R250

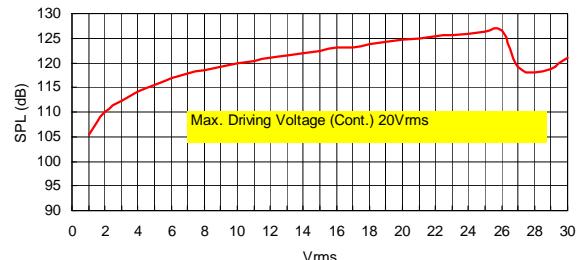
328ER250 Receiver

Sensitivity Variation vs. Loaded Resistor

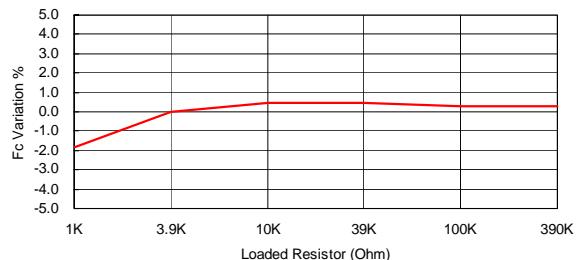


328ET250 Transmitter

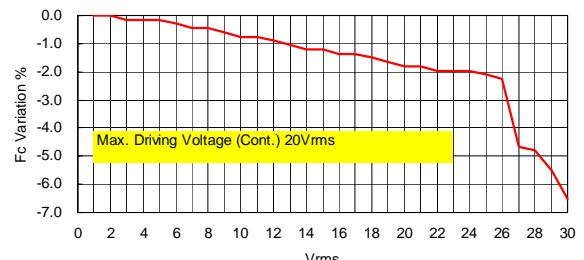
SPL Variation vs. Driving Voltage



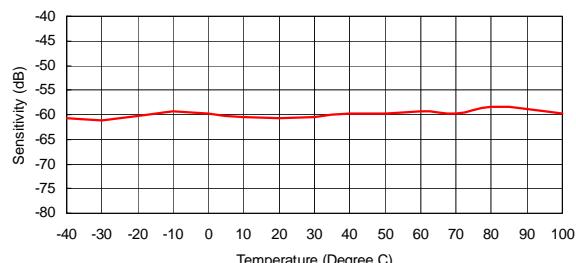
Center Frequency Shift vs. Loaded Resistor



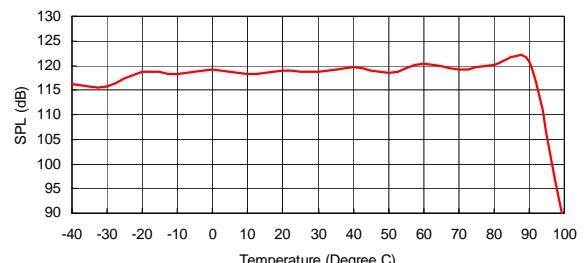
Center Frequency Shift vs. Driving Voltage



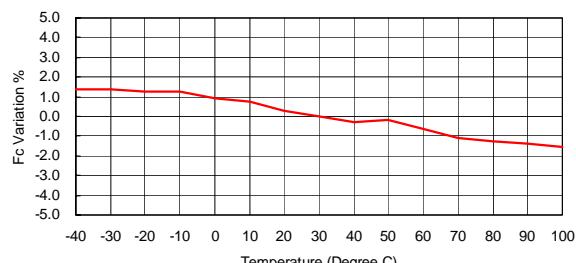
Sensitivity Variation vs. Temperature



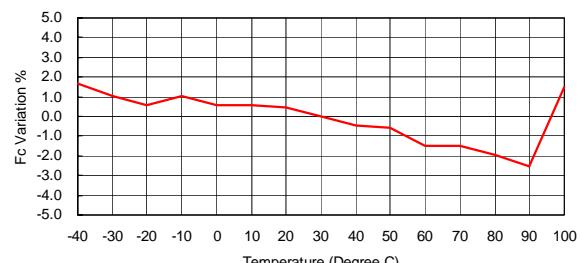
SPL Variation vs. Temperature



Center Frequency Shift vs. Temperature



Center Frequency Shift vs. Temperature

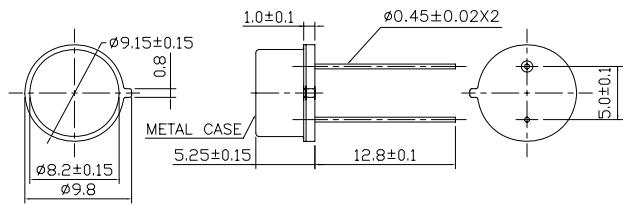


Air Ultrasonic Ceramic Transducers

400ET/R080



Dimensions: dimensions are in mm



Specification

400ET080	Transmitter
400ER080	Receiver
Center Frequency	40.0 ± 3.0 KHz
Bandwidth (-6dB)	400ET080 1.5Khz 400ER080 2.0Khz
Transmitting Sound Pressure Level	100dB min.
at 40.0Khz; 0dB re 0.0002 μ bar per 10Vrms at 30cm	
Receiving Sensitivity	-80dB min.
at 40.0Khz 0dB = 1 volt/ μ bar	
Capacitance at 1Khz	$\pm 20\%$
Max. Driving Voltage (cont.)	15Vrms
Total Beam Angle	-6dB
Operation Temperature	-30 to 80°C
Storage Temperature	-40 to 85°C

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

Model available:

1	400ET/R080	Plated Metal Housing
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Impedance/Phase Angle vs. Frequency

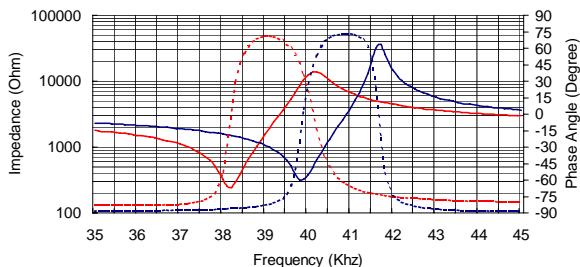
Tested under 1Vrms Oscillation Level

400ER080 Impedance

400ER080 Phase

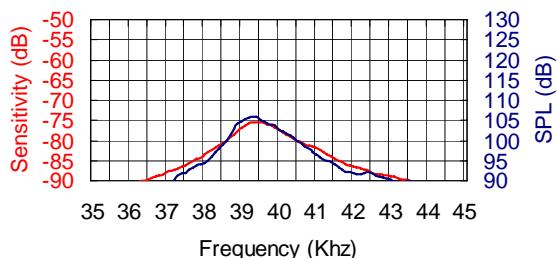
400ET080 Impedance

400ET080 Phase

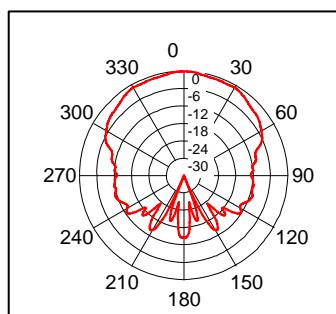


Sensitivity/Sound Pressure Level

Tested under 10Vrms @30cm



Beam Angle: Tested at 40.0Khz frequency

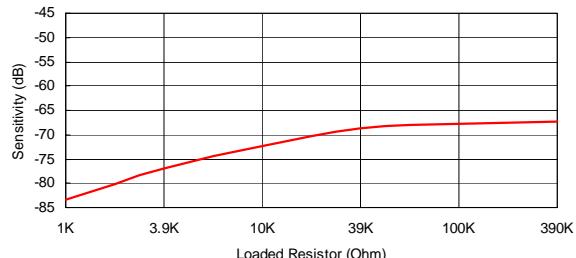


Air Ultrasonic Ceramic Transducers

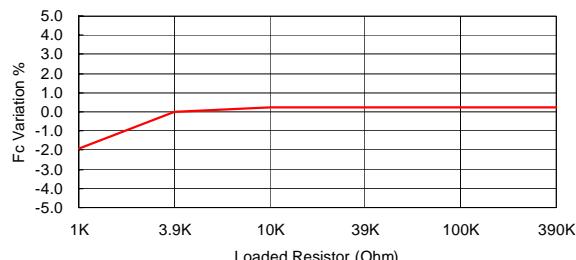
400ET/R080

400ER080 Receiver

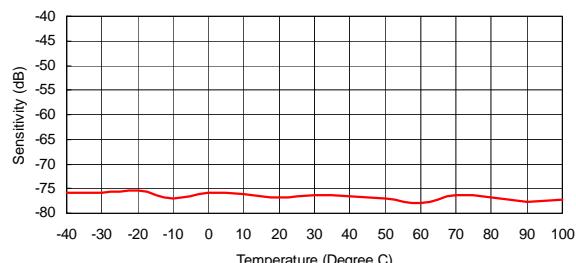
Sensitivity Variation vs. Loaded Resistor



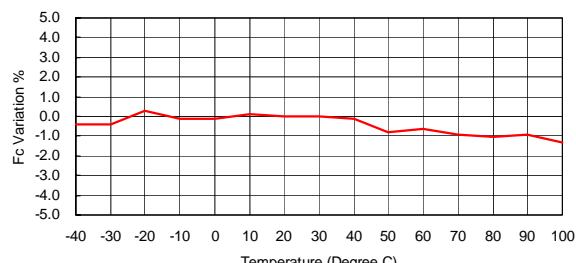
Center Frequency Shift vs. Loaded Resistor



Sensitivity Variation vs. Temperature

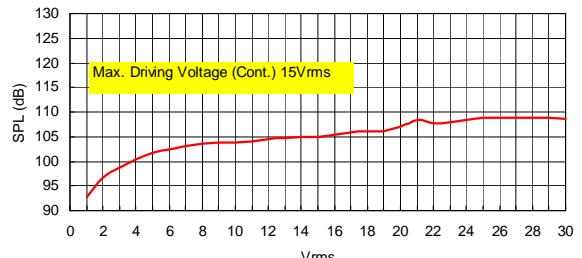


Center Frequency Shift vs. Temperature

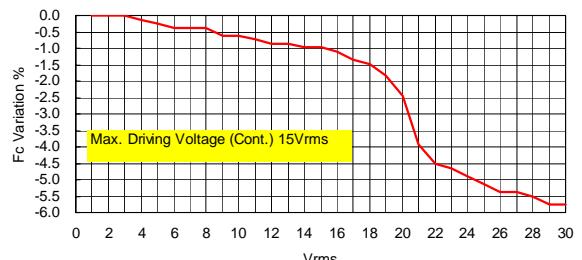


400ET080 Transmitter

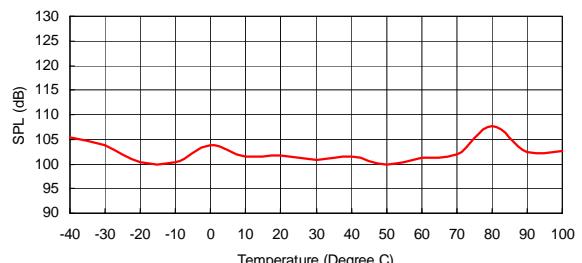
SPL Variation vs. Driving Voltage



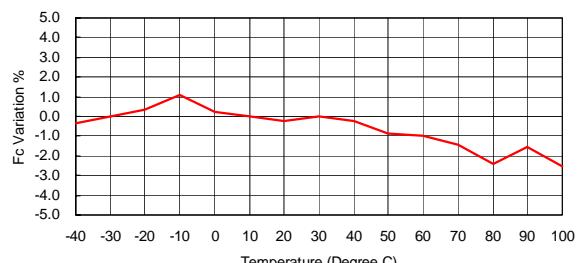
Center Frequency Shift vs. Driving Voltage



SPL Variation vs. Temperature



Center Frequency Shift vs. Temperature

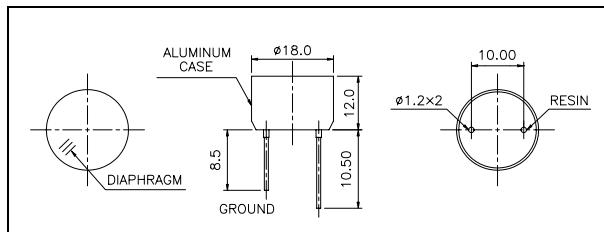


Air Ultrasonic Ceramic Transducers

400ET/R180



Dimensions: dimensions are in mm



Specification

400ET180	Transmitter
400ER180	Receiver
Center Frequency	40.0 ± 1.0 KHz
Bandwidth (-6dB)	400ET180 1.5Khz 400ER180 1.5Khz
Transmitting Sound Pressure Level	115dB min.
at 40.0Khz; 0dB re 0.0002 μ bar per 10Vrms at 30cm	
Receiving Sensitivity	-70dB min.
at 40.0Khz 0dB = 1 volt/ μ bar	
Capacitance at 1Khz	$\pm 20\%$
Max. Driving Voltage (cont.)	15Vrms
Total Beam Angle	-6dB
Operation Temperature	-30 to 80°C
Storage Temperature	-40 to 85°C

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

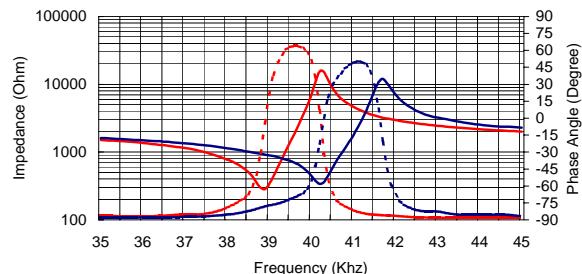
Model available:

1	400ET/R180	Aluminum Housing
2	400ET/R18B	Black Alum. Housing

Impedance/Phase Angle vs. Frequency

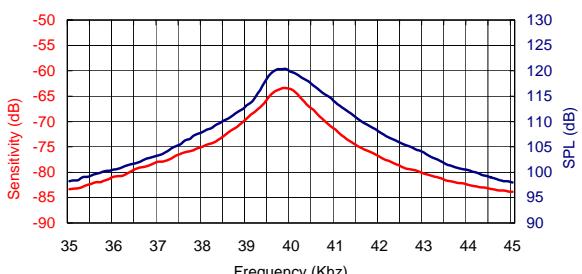
Tested under 1Vrms Oscillation Level

400ER180 Impedance
400ER180 Phase
400ET180 Impedance
400ET180 Phase

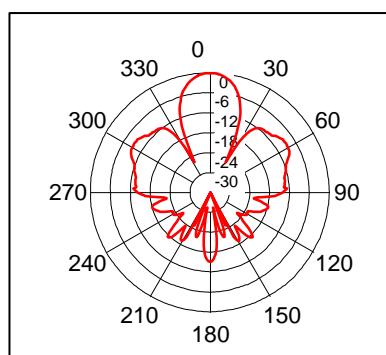


Sensitivity/Sound Pressure Level

Tested under 10Vrms @30cm



Beam Angle: Tested at 40.0Khz frequency

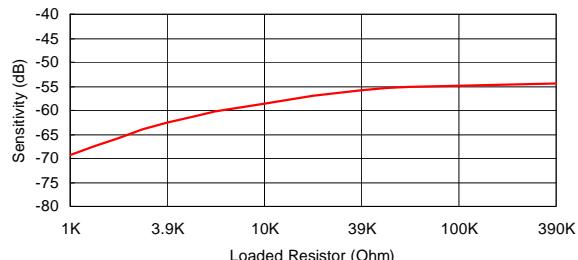


Air Ultrasonic Ceramic Transducers

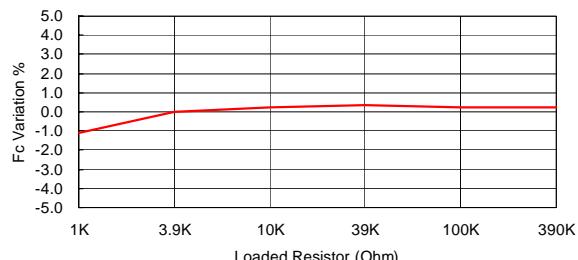
400ET/R180

400ER180 Receiver

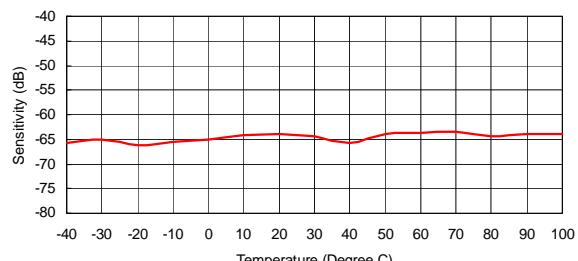
Sensitivity Variation vs. Loaded Resistor



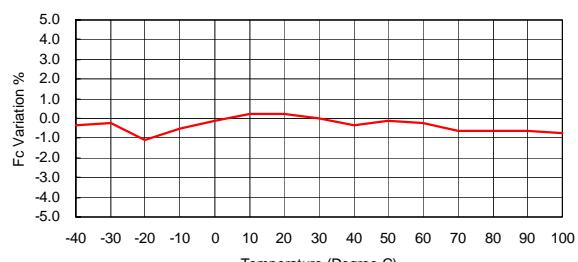
Center Frequency Shift vs. Loaded Resistor



Sensitivity Variation vs. Temperature



Center Frequency Shift vs. Temperature

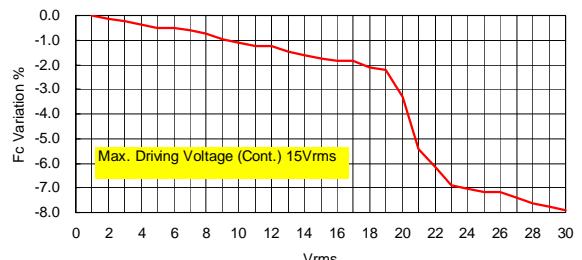


400ET180 Transmitter

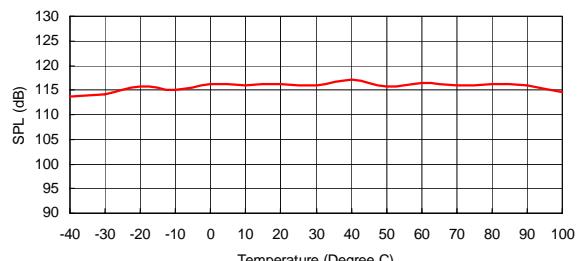
SPL Variation vs. Driving Voltage



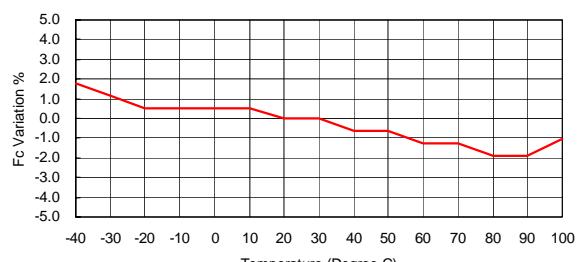
Center Frequency Shift vs. Driving Voltage



SPL Variation vs. Temperature



Center Frequency Shift vs. Temperature

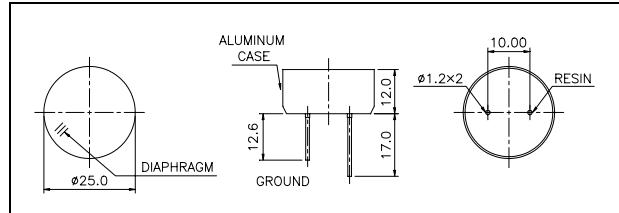


Air Ultrasonic Ceramic Transducers

400ET/R250



Dimensions: dimensions are in mm



Specification

400ET250	Transmitter
400ER250	Receiver
Center Frequency	40.0±1.0Khz
Bandwidth (-6dB)	400ET250 1.0Khz 400ER250 1.0Khz
Transmitting Sound Pressure Level	115dB min. (107 dB min. at 40.0Khz; 0dB re 0.0002µbar per 10Vrms at 30cm for SUS316)
Receiving Sensitivity	-70dB min. (-72 dB min. at 40.0Khz 0dB = 1 volt/µbar for SUS316)
Capacitance at 1Khz	±20% 2400 pF
Max. Driving Voltage (cont.)	20Vrms
Total Beam Angle	-6dB 30° typical
Operation Temperature	-30 to 80°C
Storage Temperature	-40 to 85°C

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

Model available:

1	400ET/R250	Aluminum Housing
2	400ET/R25B	Black Alum. Housing
3	400ET/R25S	SUS 316 Housing

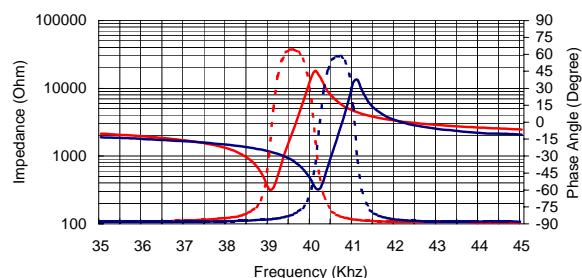
Impedance/Phase Angle vs. Frequency

Tested under 1Vrms Oscillation Level

400ER250 Impedance

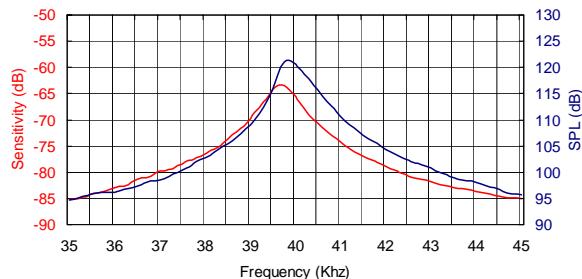
400ER250 Phase

400ET250 Impedance



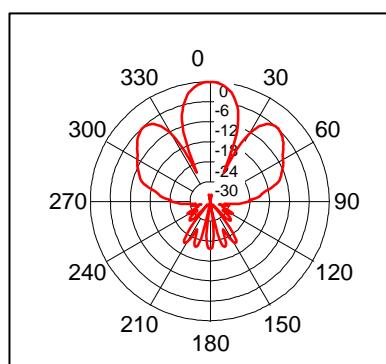
400ET250 Phase

Sensitivity/Sound Pressure Level



Tested under 10Vrms @30cm

Beam Angle: Tested at 40.0Khz frequency

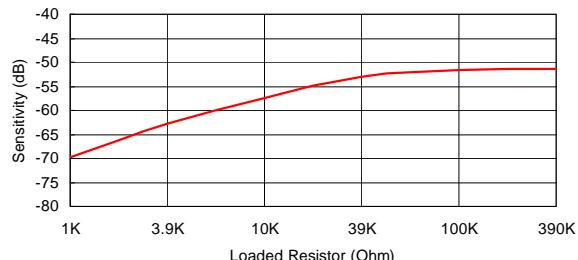


Air Ultrasonic Ceramic Transducers

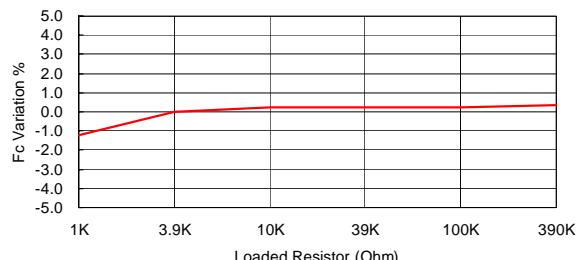
400ET/R250

400ER250 Receiver

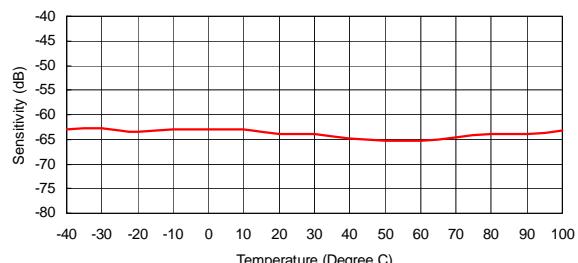
Sensitivity Variation vs. Loaded Resistor



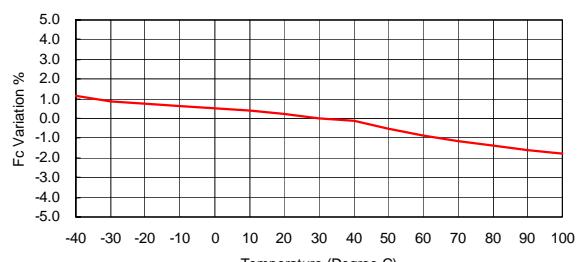
Center Frequency Shift vs. Loaded Resistor



Sensitivity Variation vs. Temperature

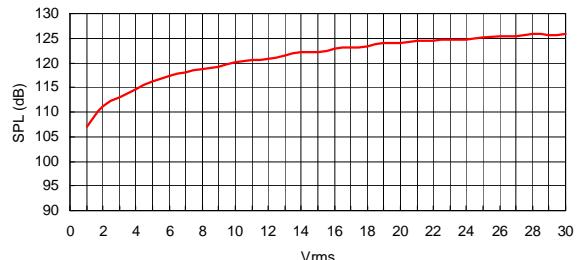


Center Frequency Shift vs. Temperature

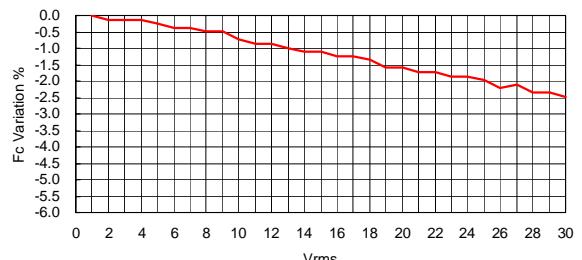


400ET250 Transmitter

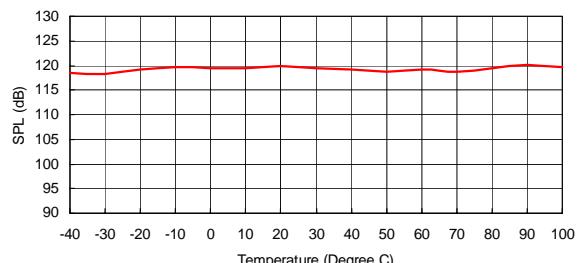
SPL Variation vs. Driving Voltage



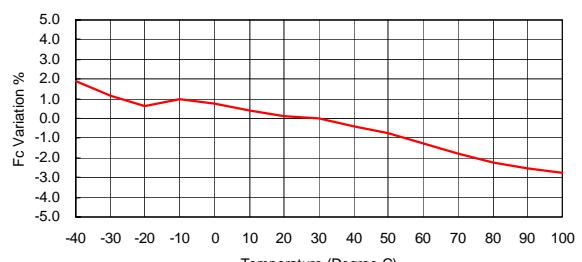
Center Frequency Shift vs. Driving Voltage



SPL Variation vs. Temperature



Center Frequency Shift vs. Temperature

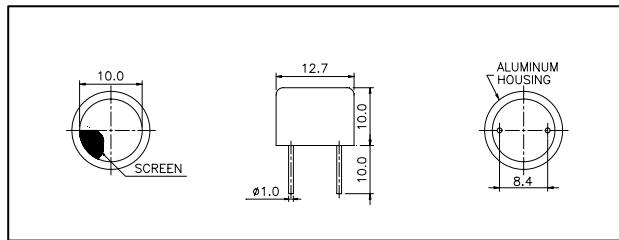


Air Ultrasonic Ceramic Transducers

400PT120



Dimensions: dimensions are in mm



Impedance/Phase Angle vs. Frequency

Tested under 1Vrms Oscillation Level

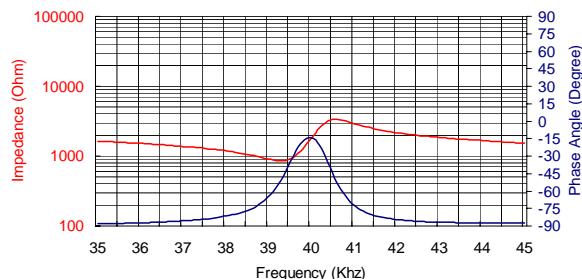
Specification

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

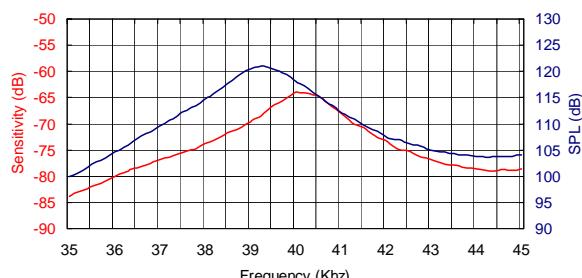
Model available:

1	400PT120	Aluminum Housing
2	400PT12B	Black Al. Housing
3	400PT12P	Plastic Housing

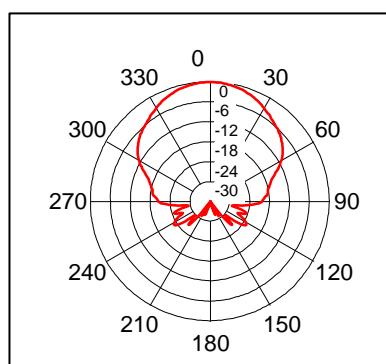


Sensitivity/Sound Pressure Level

Tested under 10Vrms @30cm



Beam Angle: Tested at 40.0Khz frequency

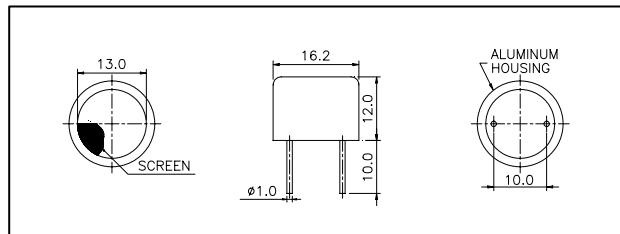


Air Ultrasonic Ceramic Transducers

400PT160

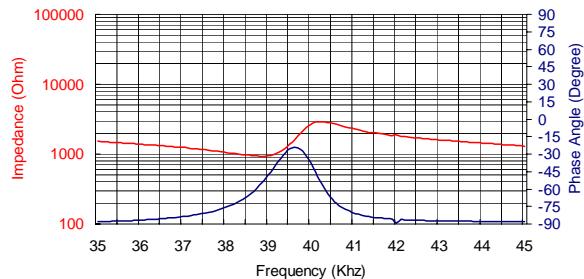


Dimensions: dimensions are in mm



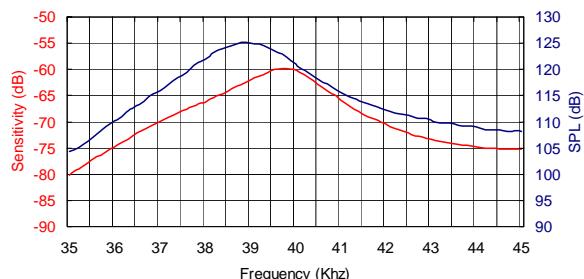
Impedance/Phase Angle vs. Frequency

Tested under 1Vrms Oscillation Level

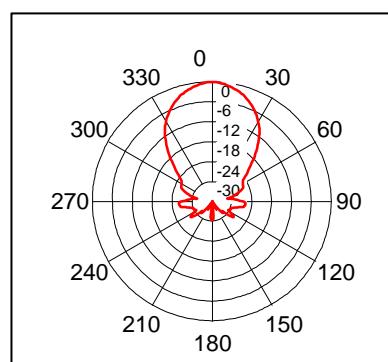


Sensitivity/Sound Pressure Level

Tested under 10Vrms @30cm



Beam Angle: Tested at 40.0Khz frequency



Specification

400PT160	Transceiver
Center Frequency	40.0 ± 1.0 KHz
Bandwidth (-6dB)	400PT160 2.0Khz
Transmitting Sound Pressure Level	117dB min.
at resonant frequency; 0dB re 0.0002 μ bar per 10Vrms at 30cm	
Receiving Sensitivity	-65dB min.
at resonant frequency 0dB = 1 volt/ μ bar	
Nominal Impedance (Ohm)	1000
Ringing (ms) max.	1.2 – PT160 1.5 – PT16P
Capacitance at 1Khz	$\pm 20\%$
Max. Driving Voltage (cont.)	20Vrms
Total Beam Angle	-6dB
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:

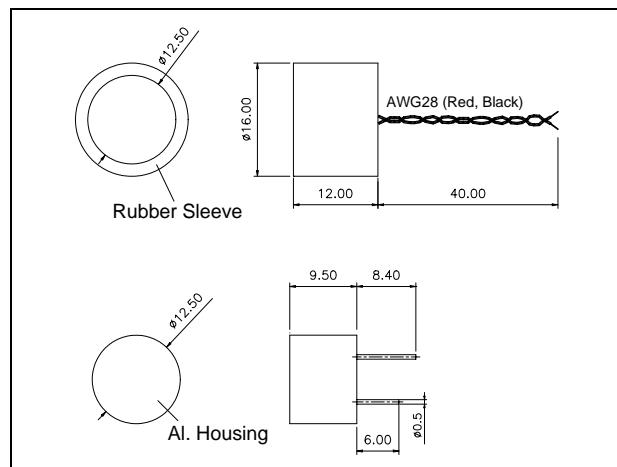
1	400PT160	Aluminum Housing
2	400PT16P	Plastic Housing

Air Ultrasonic Ceramic Transducers

400EP125



Dimensions: dimensions are in mm



Specification

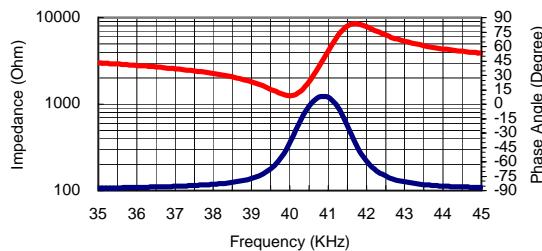
400EP125	Transceiver
Center Frequency	40.0±1.0Khz
Bandwidth (-6dB)	400EP125 1.5Khz
Transmitting Sound Pressure Level (with rubber sleeve) at resonant frequency; 0dB re 0.0002µbar per 10Vrms at 30cm	98dB min.
Receiving Sensitivity (with rubber sleeve) at resonant frequency 0dB = 1 volt/µbar	-80dB min.
Nominal Impedance (Ohm)	1000
Ringing (ms) @25°C	1.2 max.
Capacitance at 1Khz ±20%	1400 pF
Max. Driving Voltage (Cont.)	20Vrms
20 bursts, 25ms repetition rate	100Vpp
Total Beam Angle -6dB	125°
Operation Temperature	-30 to 80°C
Storage Temperature	-40 to 85°C

All specification taken typical at 25°C
Models of less ringing are available

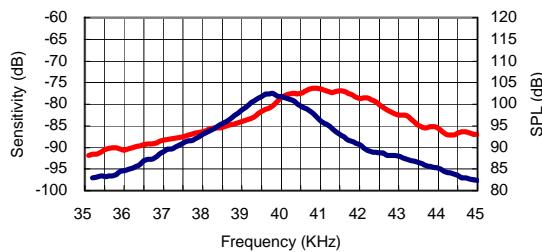
Models available:

1	400EP125	Natural Aluminum Housing
2	400EP125B	Black Painted Housing
3	400EP125BR	Black Housing+Rubber Sleeve

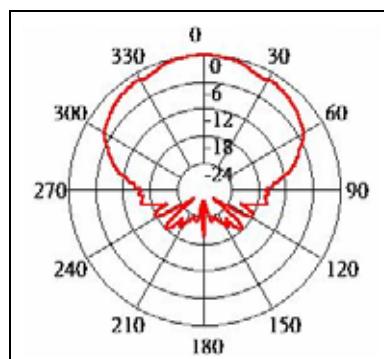
Impedance/Phase Angle vs. Frequency Tested under 1Vrms Oscillation Level



Sensitivity/Sound Pressure Level SPL Tested under 10Vrms@30cm



Beam Angle: Tested at 40.0Khz frequency





Asymmetric Beam Patterns

Specification

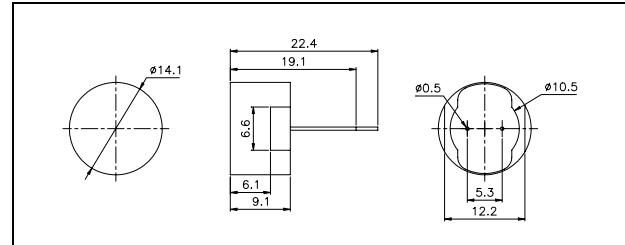
400EP14D	Transceiver
Center Frequency	40.0 ± 1.0 KHz
Bandwidth (-6dB)	2.0Khz
Transmitting Sound Pressure Level	103dB min. (Transducer alone)
at resonant frequency; 0dB re 0.0002 μ bar per 10Vrms at 30cm	
Receiving Sensitivity	-78dB min. (Transducer alone)
at resonant frequency 0dB = 1 volt/ μ bar	
Nominal Impedance (Ohm)	1000
Ringing (ms)	1.2 max.
Capacitance at 1KHz $\pm 20\%$	1600 pF
Temperature Compensated Type	3200 pF
Max. Driving Voltage (cont.)	20Vrms
20 bursts, 25ms repetition rate	100Vpp
Total Beam Angle Wide	125° typ.
-6dB Narrow	65° typ.
Operation Temperature	-40 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:

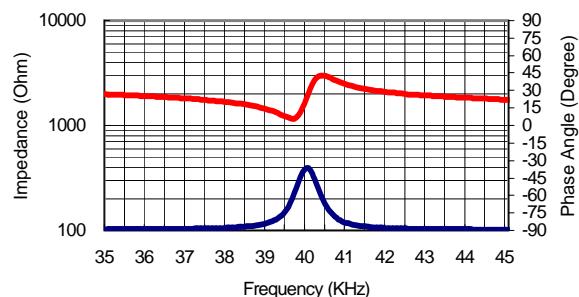
1	400EP14D	Black Painted Housing
2	400EP14DC	Temperature compensated (TC)
3	400EP14DCR	T.C. + Rubber Sleeve

Dimensions: dimensions are in mm



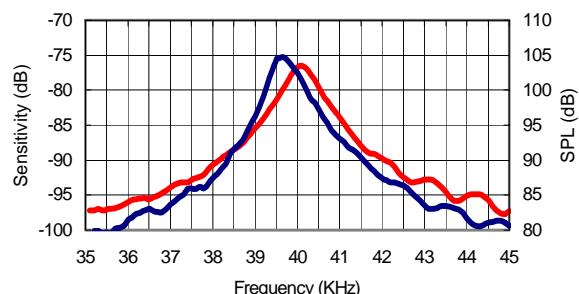
Impedance/Phase Angle vs. Frequency

Tested under 1Vrms Oscillation Level



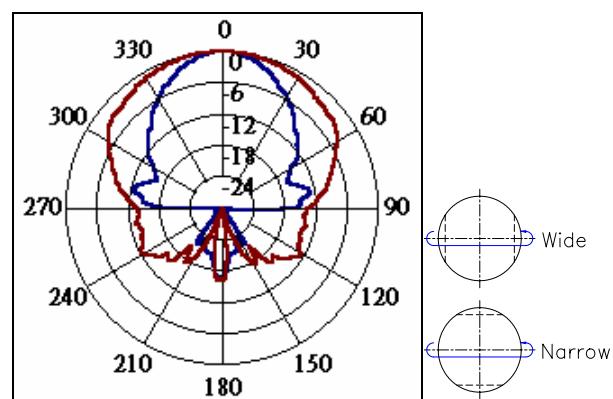
Sensitivity/Sound Pressure Level

Tested under 10Vrms @30cm



Beam Angle: Tested at 40.0Khz frequency

Wide Angle Narrow Angle

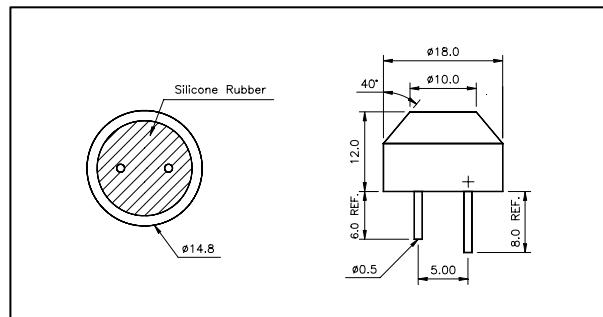


Air Ultrasonic Ceramic Transducers

400EP18A



Dimensions: dimensions are in mm



Specification

400EP18A	Transceiver
Center Frequency	40.0±1.0Khz
Bandwidth (-6dB)	400EP18A 2.0Khz
Transmitting Sound Pressure Level	108dB min.
at resonant frequency; 0dB re 0.0002μbar per 10Vrms at 30cm	
Receiving Sensitivity	-75dB min.
at resonant frequency 0dB = 1 volt/μbar	
Nominal Impedance (Ohm)	750
Ringing (ms)	1.2 max.
Capacitance at 1Khz ±20%	2000 pF
Temperature Compensated Type	4000 pF
Max. Driving Voltage (Cont.)	20Vrms
20 bursts, 25ms repetition rate	100Vpp
Total Beam Angle -6dB	85°
Operation Temperature	-30 to 80°C
Storage Temperature	-40 to 85°C

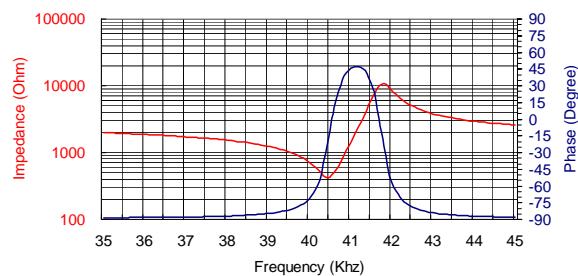
All specification taken typical at 25°C
Both lead pins and lead wires output are available. Temperature compensated type is available upon request.

Models available:

1	400EP18A	Black Al. Housing
2	400EP18A0	Natural Al. Housing
3	400EP18AC	Temp. Compensated

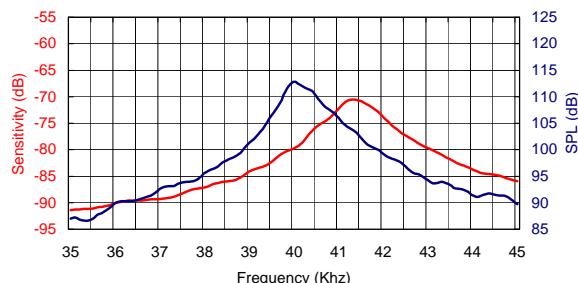
Impedance/Phase Angle vs. Frequency

Tested under 1Vrms Oscillation Level

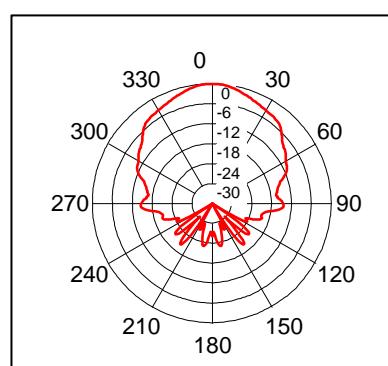


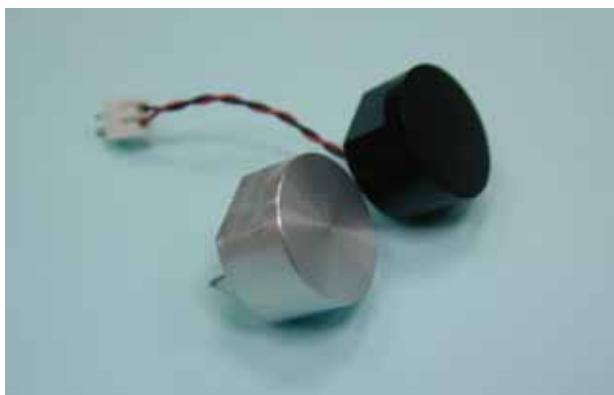
Sensitivity/Sound Pressure Level

Tested under 10Vrms @30cm

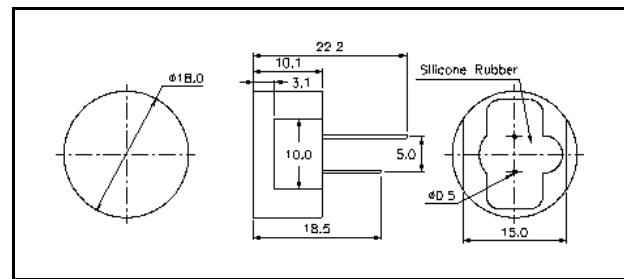


Beam Angle: Tested at 40.0Khz frequency



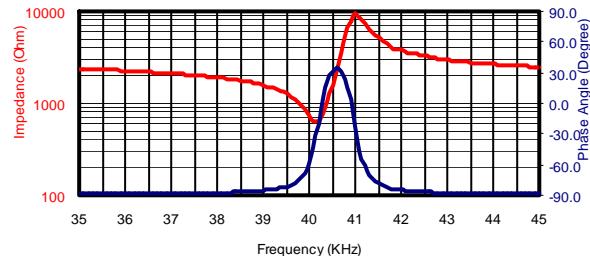


Dimensions: dimensions are in mm



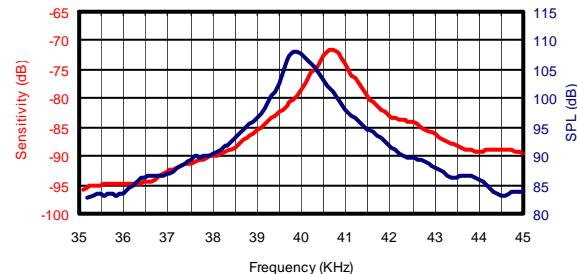
Impedance/Phase Angle vs. Frequency

Tested under 1Vrms Oscillation Level



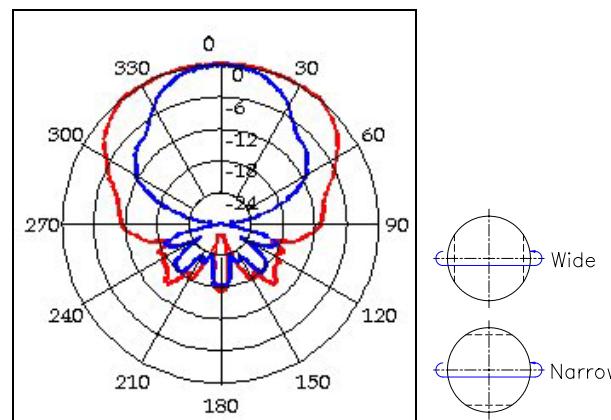
Sensitivity/Sound Pressure Level

Tested under 10Vrms @30cm



Beam Angle: Tested at 40.0Khz frequency

Wide Angle Narrow Angle



Asymmetric Beam Patterns

Specification

400EP18D	Transceiver
Center Frequency	40.0 ± 1.0 KHz
Bandwidth (-6dB) F.O.M.	2.0Khz
Transmitting Sound Pressure Level	100dB min.
at resonant frequency; 0dB re 0.0002 μ bar per 10Vrms at 30cm	
Receiving Sensitivity	-80dB min.
at resonant frequency 0dB = 1 volt/ μ bar	
Nominal Impedance (Ohm)	1000
Ringing	1.2ms max.
Capacitance at 1KHz $\pm 20\%$	1800 pF
Temperature Compensated Type	3600 pF
Max. Driving Voltage (Cont.)	20Vrms
20 bursts, 25ms repetition rate	100Vpp
Total Beam Angle	135° typ.
-6dB	75° typ.
Operation Temperature	-30 to 80°C
Storage Temperature	-40 to 85°C

All specification taken typical at 25°C

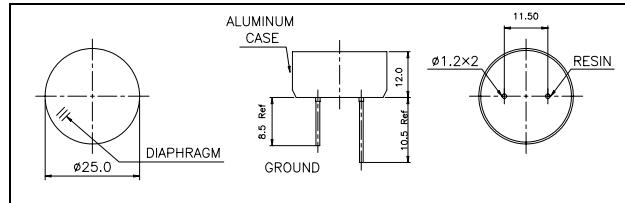
Both lead pins and lead wires output are available

Models available:

1	400EP18D	Black Al. Housing
2	400EP18DC	Temp. Compensated
3	400EP18DCR	T.C. with Rubber Sleeve

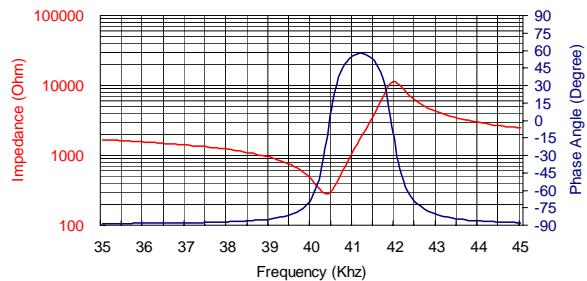


Dimensions: dimensions are in mm



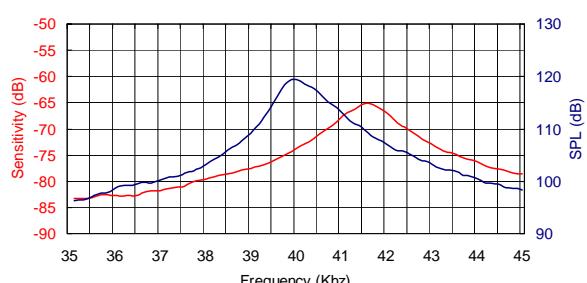
Impedance/Phase Angle vs. Frequency

Tested under 1Vrms Oscillation Level

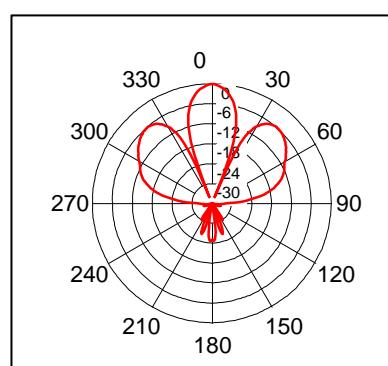


Sensitivity/Sound Pressure Level

Tested under 10Vrms @30cm



Beam Angle: Tested at 40.0Khz frequency



Specification

400EP250	Transceiver
Center Frequency	40.0 ± 1.0 KHz
Bandwidth (-6dB)	400EP250 2.0Khz(FOM)
Transmitting Sound Pressure Level	113dB min.
at resonant frequency; 0dB re 0.0002 μ bar per 10Vrms at 30cm	
Receiving Sensitivity	-72dB min.
at resonant frequency 0dB = 1 volt/ μ bar	
Nominal Impedance (Ohm)	300
Ringing (ms)	1.2 max.
Capacitance at 1Khz $\pm 20\%$	2400 pF
Temperature Compensated Type	4800 pF
Max. Driving Voltage (cont.)	20Vrms
Total Beam Angle -6dB	30° 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,
wider bandwidth and temperature compensated
models can be supplied upon request.

Model available:

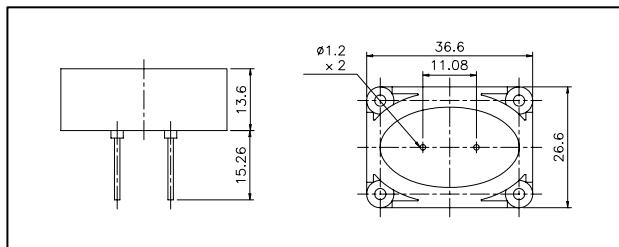
1	400EP250	Aluminum Housing
2	400EP25B	Black Al. Housing

Air Ultrasonic Ceramic Transducers

480EP900



Dimensions: dimensions are in mm



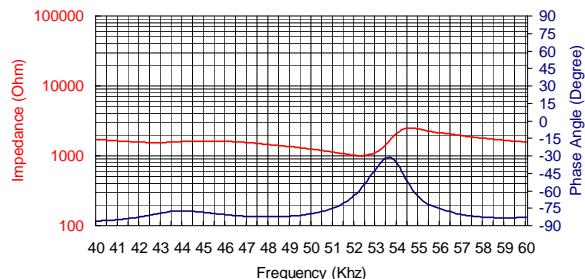
Asymmetric Beam Patterns

Specification

480EP900	Transceiver
Center Frequency	48.0±2.0Khz
Bandwidth (100dB) Transmitter	15.0Khz
(-80dB) Receiver	15.0Khz
Transmitting Sound Pressure Level	100dB min.
at 48Khz; 0dB re 0.0002μbar per 10Vrms at 30cm	
Receiving Sensitivity	-80dB min.
at 48.0Khz; 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	Typical
Long Axis (X)	43/48/53Khz
Short Axis (Y)	31/51/33°
Operation Temperature	-30 to 70°C
Storage Temperature	-40 to 80°C

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

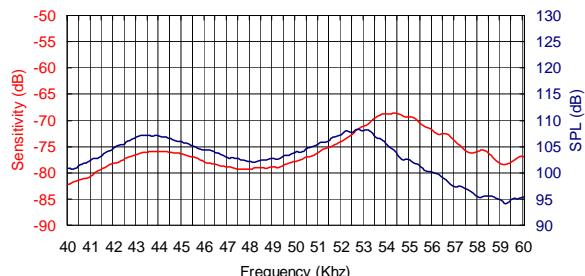
Impedance/Phase Angle vs. Frequency



Tested under 1Vrms Oscillation Level

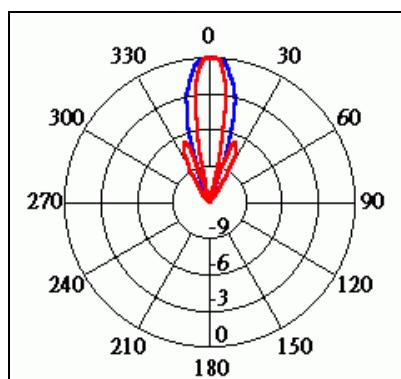
Sensitivity/Sound Pressure Level

Tested under 10Vrms @30cm



Beam Angle: @48KHz

Short Axis
Long Axis



Air Ultrasonic Ceramic Transducers

Accessories



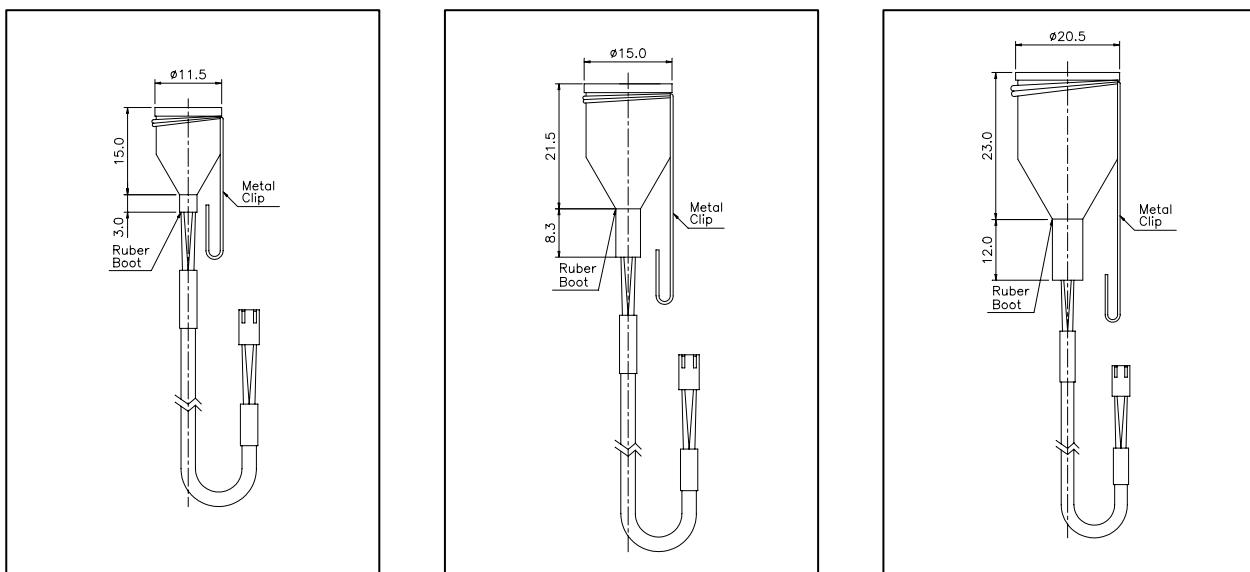
Ultrasonic Transducer Assembled Units

Transducers equip with a 2.5 meters shield cable and covered by a rubber boot with a metal clip for easy installation are very suitable for most of vehicle alarms.

RCA, Amp or Molex type connector at the other cable end is available upon request.

Specification

Model Number	SQS-04	SQS-05	SQS-06
Transducer used	400ST/R100 or 10P	400ST/R120	400ST/R160 or 16P
Cable length	2.5 meters		
Connector used	RCA/Amp/Molex type or others upon request		

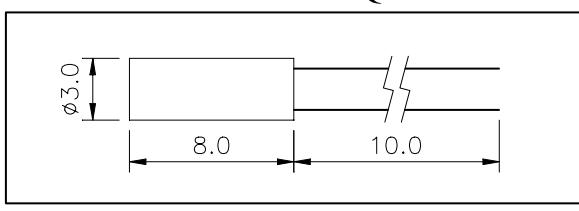


Dimensions

SQS-04



SQS-05



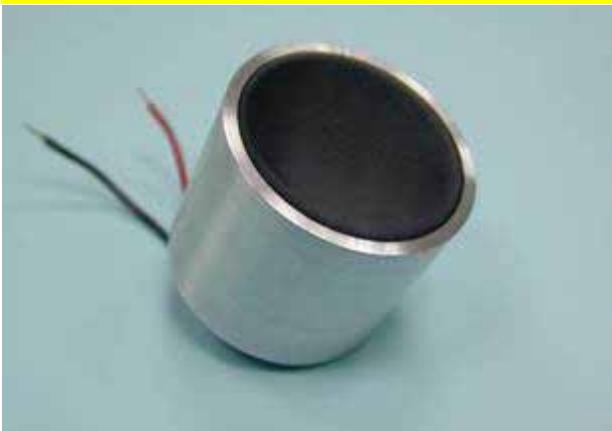
SQS-06

Miniature Tuning Fork Quartz Crystals Specification

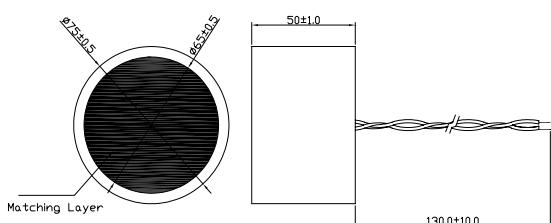
Model Number	Nominal Frequency Hz	Tolerance at 25°C PPM	Temperature Stability -10°C to +70°C PPM	Load Capacitance pF	Series Resistance Ohm	Shunt Capacitance pF	Drive Level mW
S40000	40,000	± 60	± 45	12.5	35,000	2.3	0.001
S32768	32,768	± 20	± 30	12.5	35,000	2.3	0.001

Air Ultrasonic Ceramic Transducers

043SR750



Dimensions: dimensions are in mm



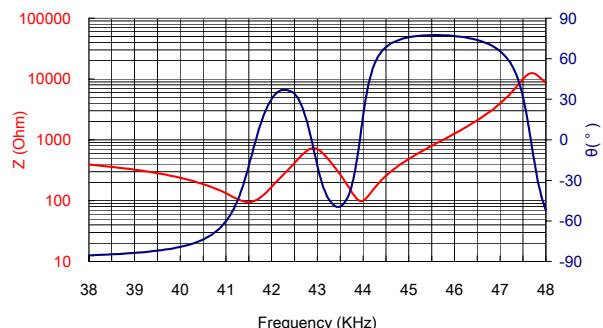
Specification

043SR750		Transceiver
Center Frequency (KHz)		43.00±5.0
Echo Sensitivity 0dB = 20Vp-p @ 90 cm		-57 dB min.
Dead Zone		70 cm
Bandwidth (Echo Sensitivity)		4 KHz
Nominal Impedance (Ohm)		700
Capacitance at 1Khz	±20%	5700 pF
Max. Driving Voltage (Pulse)		100Vpp 10% duty cycle
Total Beam Angle	-3dB	8.5° typical
	-6dB	12.0° typical
Matching Window		Silicone Rubber
Operation Temperature		0 to 70°C
Storage Temperature		-20 to 80°C

All specification taken typical at 25°C
Low ringing model can be arranged

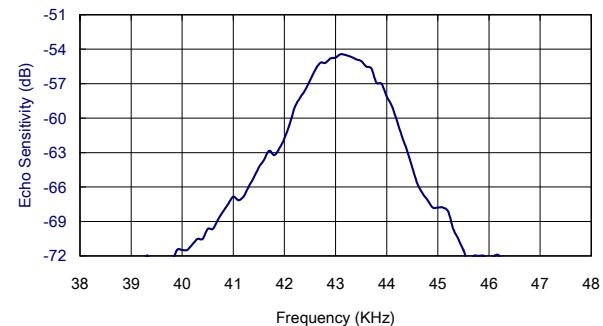
Impedance/Phase Angle vs. Frequency

Tested under 1Vrms Oscillation Level



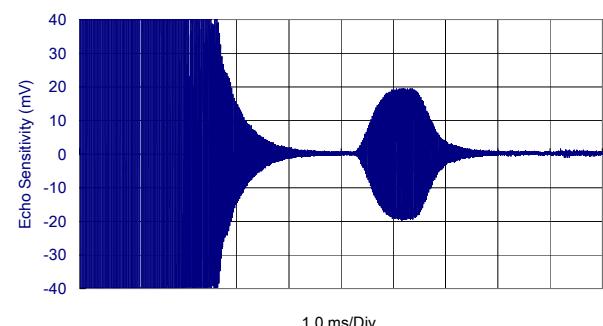
Echo Sensitivity vs. Frequency

Tested at distance of 90cm, 20Vp-p, 50 bursts

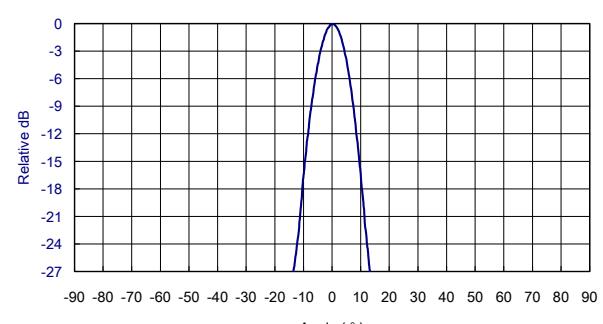


Echo Sensitivity/Ringing

Tested under 20Vp-p, 50 bursts, 90cm



Beam Angle: Tested at 43.5Khz frequency

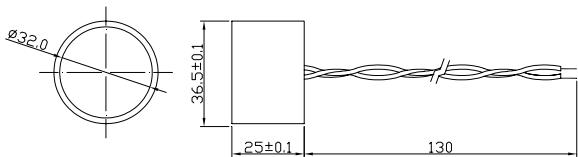


Air Ultrasonic Ceramic Transducers

080SR365



Dimensions: dimensions are in mm



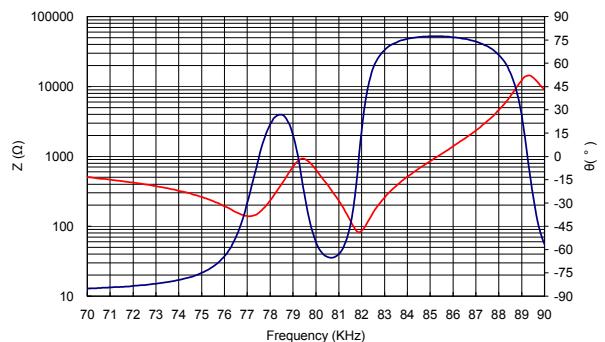
Specification

080SR365	Transceiver
Center Frequency (KHz)	80.00±5.0
Echo Sensitivity 0dB = 20Vp-p @ 50 cm	-57 dB min.
Dead Zone	35 cm
Bandwidth (Echo Sensitivity)	4.5 KHz
Nominal Impedance (Ohm)	700
Capacitance at 1Khz ±20%	2800 pF
Max. Driving Voltage (Pulse)	700Vpp 2% duty cycle
Total Beam Angle	-3dB 8.0° typical
	-6dB 11.0° typical
Matching Window	Silicone Rubber
Operation Temperature	-20 to 70°C
Storage Temperature	-30 to 80°C

All specification taken typical at 25°C
Low ringing model can be arranged

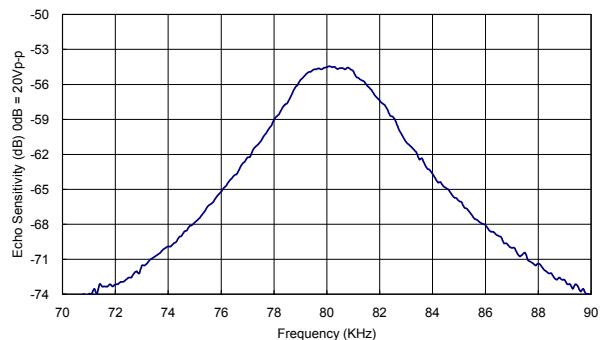
Impedance/Phase Angle vs. Frequency

Tested under 1Vrms Oscillation Level



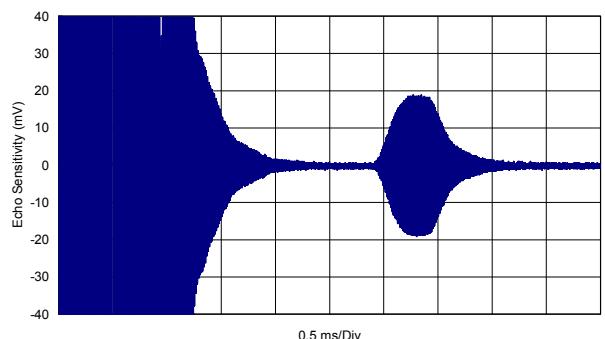
Echo Sensitivity vs. Frequency

Tested at distance of 50cm, 20Vp-p, 40 bursts

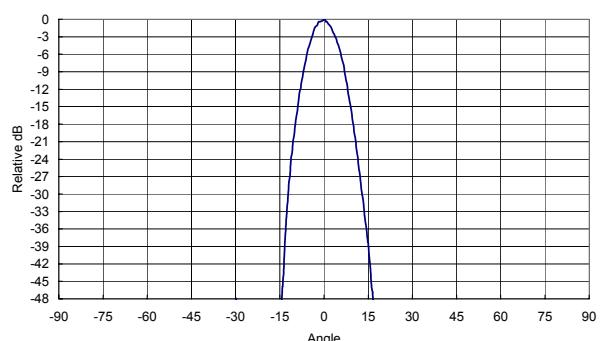


Echo Sensitivity/Ringing

Tested under 20Vp-p, 40 bursts, 50cm

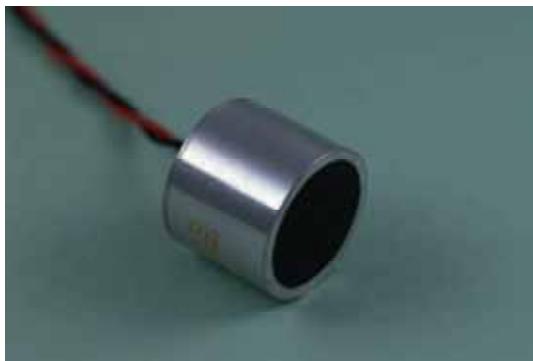


Beam Angle: Tested at 80 KHz frequency

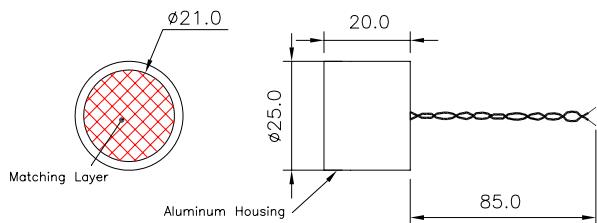


Air Ultrasonic Ceramic Transducers

125SR250



Dimensions: dimensions are in mm



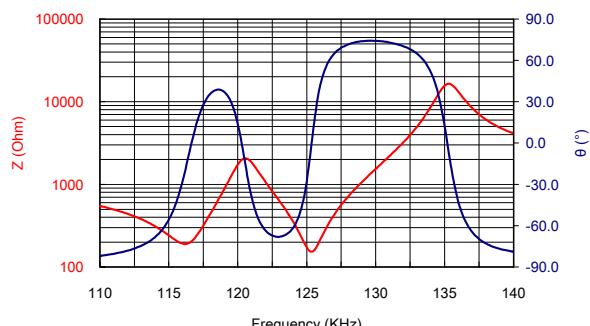
Specification

125SR250	Transceiver	
Center Frequency (KHz)	125.0 ± 10.0	
Echo Sensitivity 0dB = 20Vp-p @ 25 cm	-58 dB min.	
Dead Zone	20 cm	
Bandwidth (Echo Sensitivity)	10KHz	
Nominal Impedance (Ohm)	1200	
Capacitance at 1Khz ±20%	1250 pF	
Max. Driving Voltage (Pulse)	100Vpp 10% duty cycle	
Total Beam Angle	-3dB -6dB	10.0° typical 14.5° typical
Matching Window	Silicone Rubber	
Operation Temperature	0 to 70°C	
Storage Temperature	-20 to 80°C	

All specification taken typical at 25°C
Low ringing model can be arranged

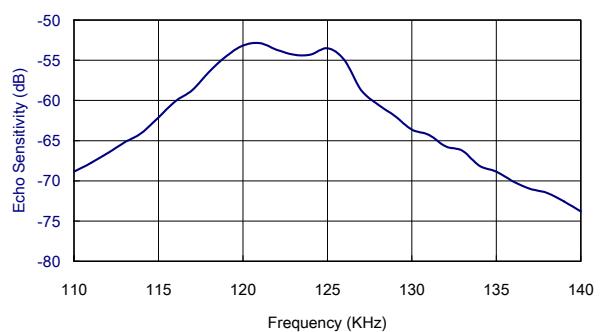
Impedance/Phase Angle vs. Frequency

Tested under 1Vrms Oscillation Level



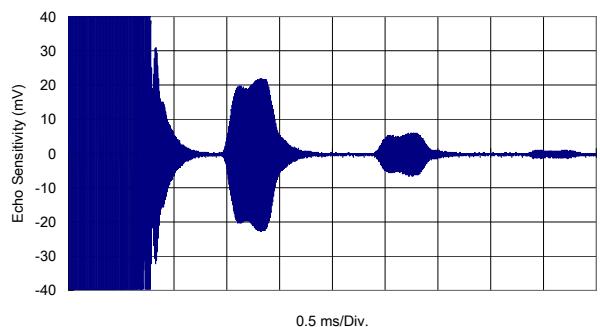
Echo Sensitivity vs. Frequency

Tested at distance of 25cm, 20Vp-p, 50 bursts

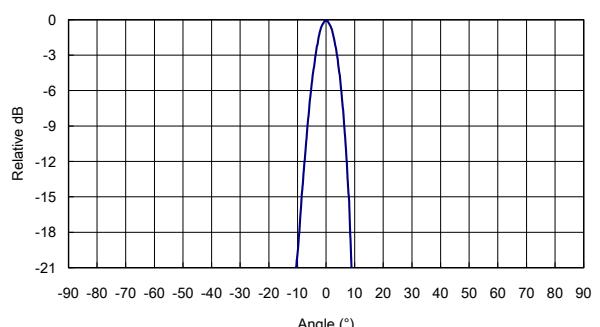


Echo Sensitivity/Ringing

Tested under 20Vp-p, 50 bursts, 25cm

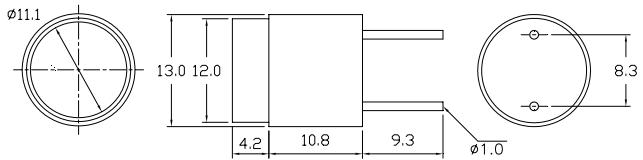


Beam Angle: Tested at 125.0Khz frequency



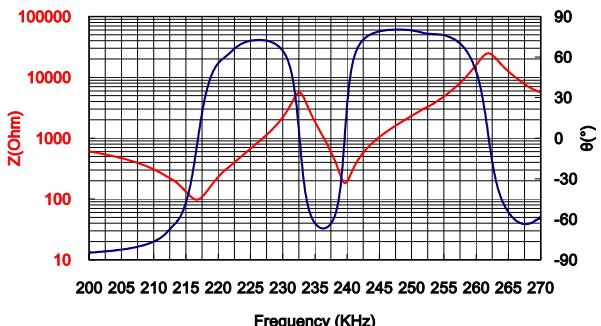


Dimensions: dimensions are in mm



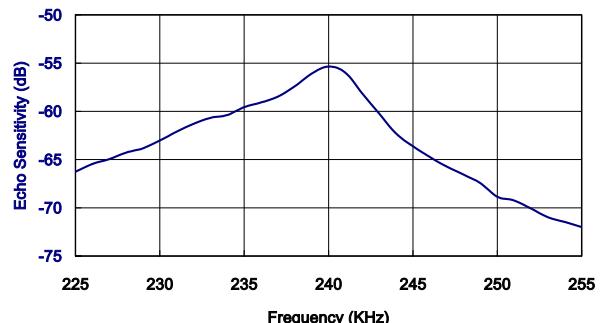
Impedance/Phase Angle vs. Frequency

Tested under 1Vrms Oscillation Level

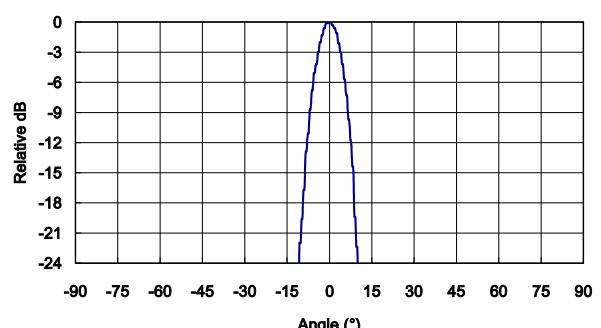


Echo Sensitivity

Tested under 20Vp-p @25cm; 0dB=20Vp-p



Beam Angle: Tested at 235.0Khz frequency



Specification

320SR130	Transceiver	
Center Frequency (KHz)	320.0 ± 10.0	
Echo Sensitivity 0dB = 20Vp-p @ 25 cm	-61 dB min.	
Dead Zone	15 cm	
Bandwidth (Echo Sensitivity)	10KHz	
Nominal Impedance (Ohm)	1200	
Capacitance at 1Khz $\pm 20\%$	1120 pF	
Max. Driving Voltage (Pulse)	50Vpp 10% duty cycle	
Total Beam Angle	-3dB -6dB	7.5° typical 10.5° typical
Matching Window	Silicone Rubber	
Operation Temperature	0 to 70°C	
Storage Temperature	-20 to 80°C	

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

Model available:

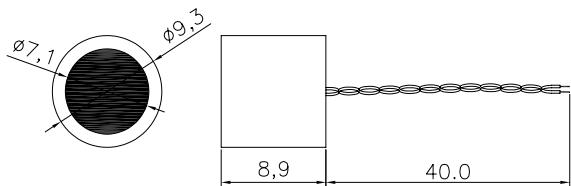
1	235AC013	Aluminum Housing
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Air Ultrasonic Ceramic Transducers

320SR093



Dimensions: dimensions are in mm



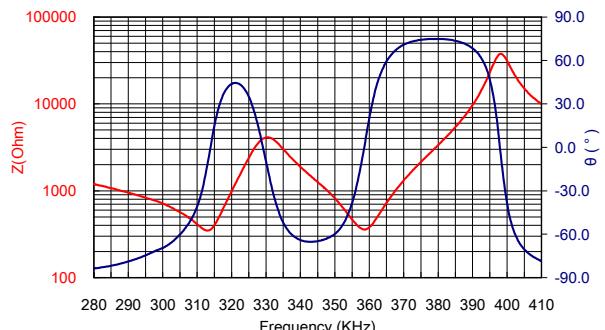
Specification

320SR093	Transceiver
Center Frequency (KHz)	320.0 ± 10.0
Echo Sensitivity 0dB = 20Vp-p, 50 Bursts @ 10 cm	-65 dB min.
Dead Zone	8 cm
Bandwidth (Echo Sensitivity)	10Khz
Nominal Impedance (Ohm)	1200
Capacitance at 1Khz ±20%	270 pF
Max. Driving Voltage (Pulse)	50Vpp 10% duty cycle
Total Beam Angle	-3dB 9.5° typical
	-6dB 12.5° typical
Matching Window	Silicone Rubber
Operation Temperature	0 to 70°C
Storage Temperature	-20 to 80°C

All specification taken typical at 25°C
Low ringing model can be arranged

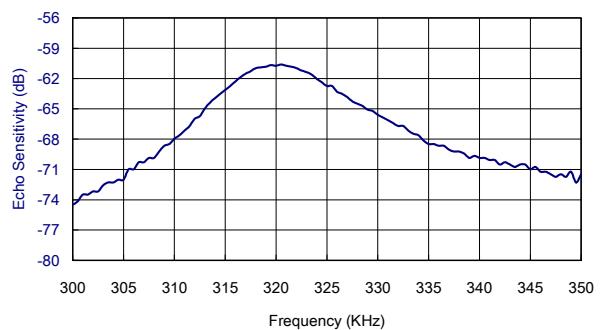
Impedance/Phase Angle vs. Frequency

Tested under 1Vrms Oscillation Level



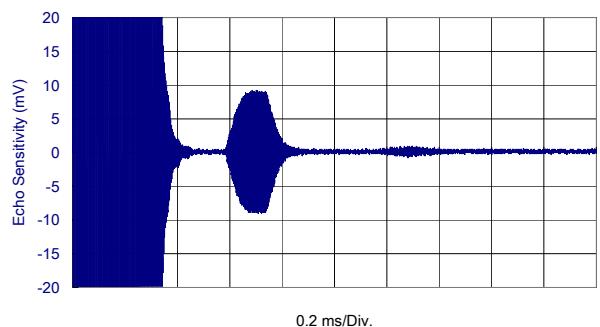
Echo Sensitivity vs. Frequency

Tested at distance of 10cm, 20Vp-p, 50 bursts

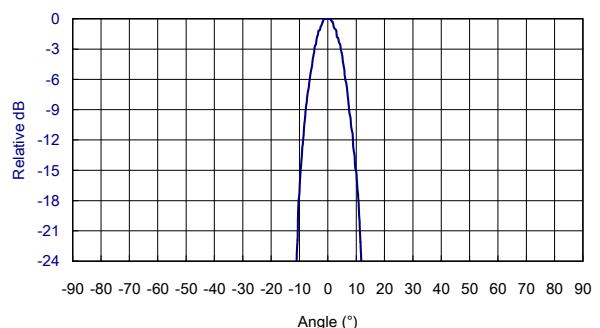


Echo Sensitivity/Ringing

Tested under 20Vp-p, 50 bursts, 10cm



Beam Angle: Tested at 314.0 KHz frequency

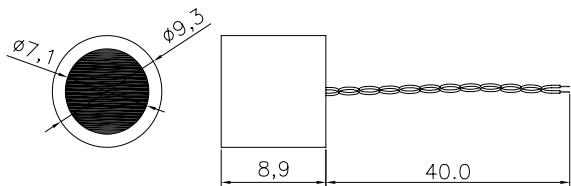


Air Ultrasonic Ceramic Transducers

320SR093



Dimensions: dimensions are in mm



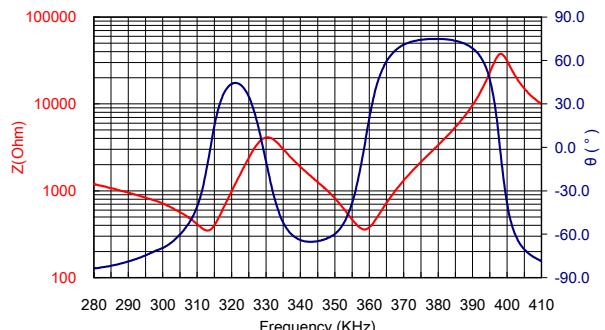
Specification

320SR093	Transceiver
Center Frequency (KHz)	320.0 ± 10.0
Echo Sensitivity 0dB = 20Vp-p, 50 Bursts @ 10 cm	-65 dB min.
Dead Zone	8 cm
Bandwidth (Echo Sensitivity)	10Khz
Nominal Impedance (Ohm)	1200
Capacitance at 1Khz ±20%	270 pF
Max. Driving Voltage (Pulse)	50Vpp 10% duty cycle
Total Beam Angle	-3dB 9.5° typical
	-6dB 12.5° typical
Matching Window	Silicone Rubber
Operation Temperature	0 to 70°C
Storage Temperature	-20 to 80°C

All specification taken typical at 25°C
Low ringing model can be arranged

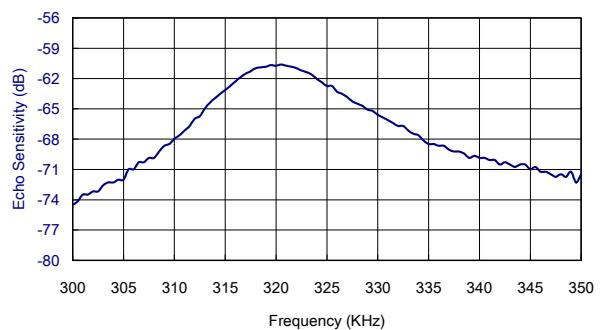
Impedance/Phase Angle vs. Frequency

Tested under 1Vrms Oscillation Level



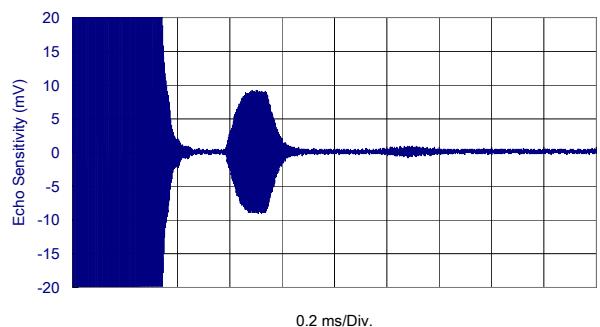
Echo Sensitivity vs. Frequency

Tested at distance of 10cm, 20Vp-p, 50 bursts

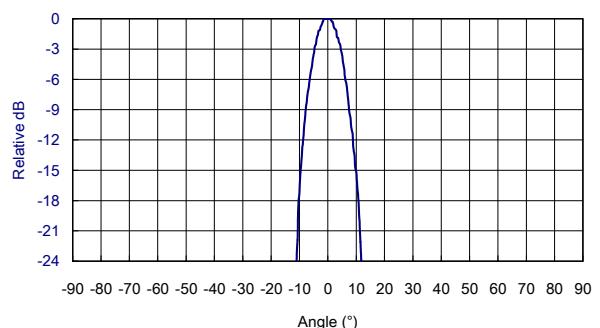


Echo Sensitivity/Ringing

Tested under 20Vp-p, 50 bursts, 10cm



Beam Angle: Tested at 314.0 KHz frequency

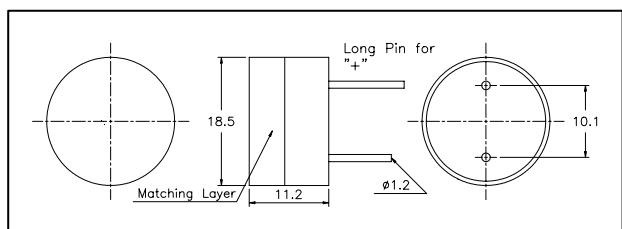


Air Ultrasonic Ceramic Transducers

200GE180



Dimensions: dimensions are in mm



Specification

200GE180	
Center Frequency	Transceiver 200.0±10Khz
Transmitting Sensitivity 0dB re 1µbar/1Vrms @ 30cm	20 dB
Receiving Sensitivity 0dB = 1Vrms/µbar	-75 dB
Figure of Merit (TS + RS)	-52 dB
Bandwidth (FOM)	10KHz
Nominal Impedance (Ohm)	700
Capacitance at 1Khz ±20%	580 pF
Max. Driving Voltage (Pulse)	50Vpp 10% duty cycle
Total Beam Angle	-6dB 10° typical
Matching Window	Resin with filler
Operation Temperature	-20 to 60°C
Storage Temperature	-30 to 70°C

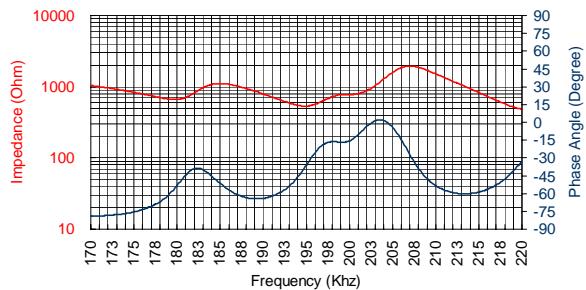
All specification taken typical at 25°C
Closer frequency tolerance, shorter ringing and wider bandwidth models can be supplied upon request.

Model available:

1	200GE180	Aluminum Housing
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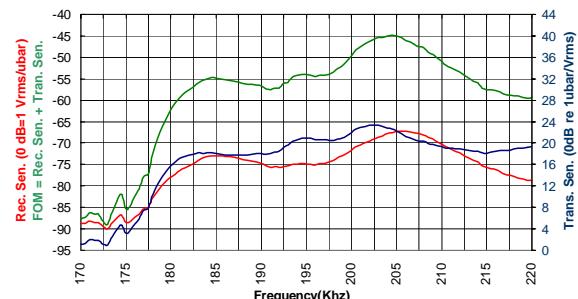
Impedance/Phase Angle vs. Frequency

Tested under 1Vrms Oscillation Level

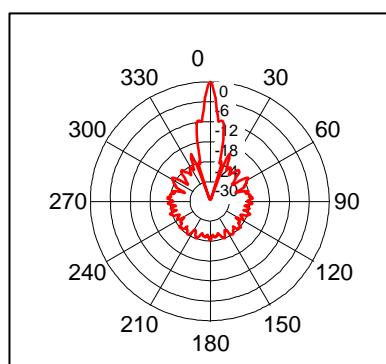


Receiving/Transmitting Sensitivity & Figure of Merit (RS + TS)

Tested at distance of 30cm



Beam Angle: Tested at 200.0Khz frequency

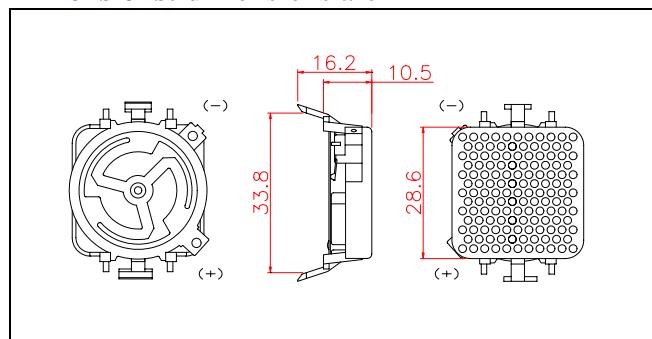


Electrostatic Ultrasonic Transducers

500ES290



Dimensions: dimensions are in mm



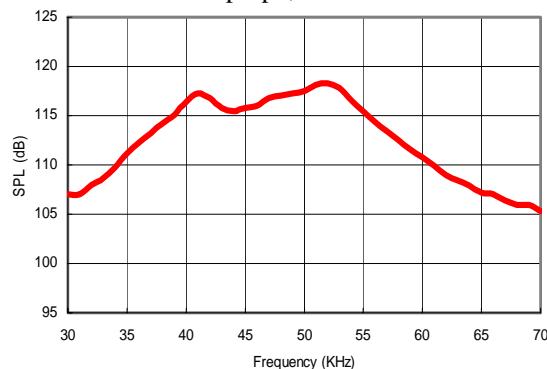
Specification

500ES290	
Center Frequency	Transceiver 50.0 ± 1.0Khz
Transmitting Sound Pressure Level	116.0 dB min.
at 50.0Khz; 0dB re 20μPa per 300Vac pk-pk, 200Vdc bias at 50 cm	
Receiving Sensitivity	-63.0 dB (-43.0 dB) at 50.0Khz, 200Vdc bias, 0dB = 1 volt/ubar (1 volt/Pa)
Capacitance at 1Khz	600 - 700 pF
Suggested DC Bias Voltage	200 V
Suggested AC Driving Voltage	300V pk-pk
Maximum Combined Voltage	400V
Total Beam Angle	-3dB
Operation Temperature	17° typical 0 to 60°C
Standard Finish	
Foil (Diaphragm):	
1. 500ES290-G	Gold
2. 500ES290-A	Aluminum
Housing	ABS

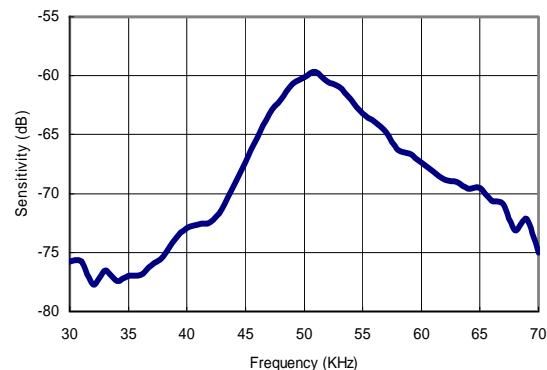
All specification taken typical at 25°C

Transmitting Sound Pressure Level

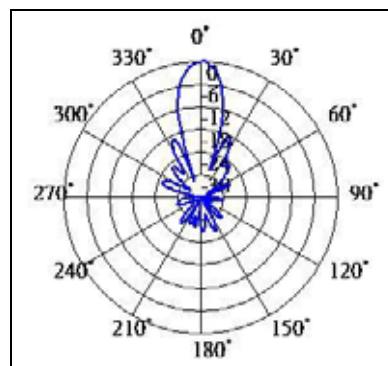
Tested under 300Vac pk-pk, 200Vdc bias @50 cm



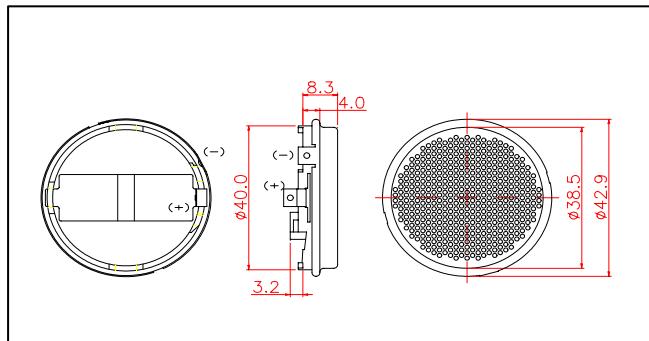
Receiving Sensitivity: Tested under 200Vdc bias



Beam Angle: Tested at 50.0Khz frequency



Dimensions: dimensions are in mm



Specification

500ES430	Transceiver
Center Frequency	$50.0 \pm 1.0\text{Khz}$
Transmitting Sound Pressure Level	119 dB min.
at 50.0Khz; 0dB re 20 μPa per 300Vac pk-pk, 200Vdc bias at 50 cm	
Receiving Sensitivity	-42 dB min.
at 50.0Khz, 200Vdc bias, 0dB = 1 volt/Pa (1 volt/ μbar)	(-62dB) min.
Capacitance at 1Khz	$\pm 20\%$
400 - 500 pF	
Suggested DC Bias Voltage	200 V
Suggested AC Driving Voltage	300V pk-pk
Maximum Combined Voltage	400V
Total Beam Angle	-3dB
Operation Temperature	12° typical
Standard Finish	-30 to 70°C
Foil (Diaphragm)	See below
Housing	See below

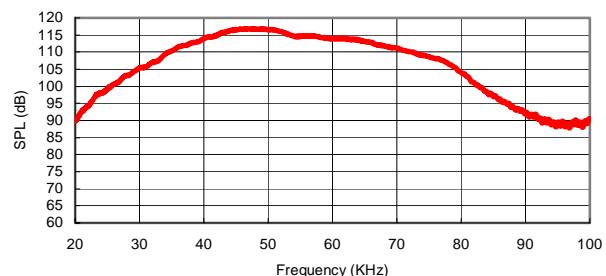
All specification taken typical at 25°C

Models available:

Model	Foil	Housing
500ES43AB	Aluminum	Black Painted Steel
500ES43AS	Aluminum	SUS 304
500ES43GB	Gold	Black Painted Steel
500ES43GS	Gold	SUS 304

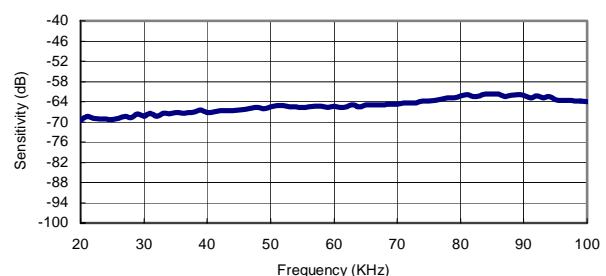
Transmitting Sound Pressure Level

Tested under 300Vac pk-pk, 150Vdc bias @ 100 cm



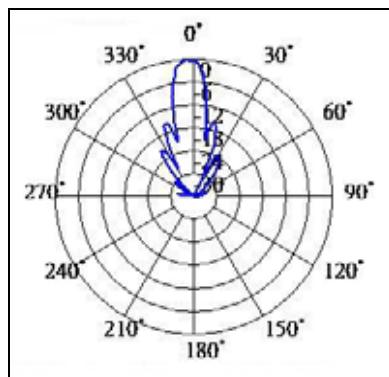
Receiving Sensitivity

Tested under 200Vdc bias



Beam Angle

Tested at 50.0Khz frequency

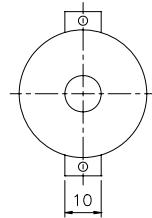
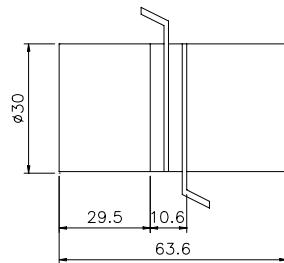


Bolt Clamped High Power Transducers



Dimensions

Model: 30402S



Features

- High efficiency & high output
- Large amplitude
- Low heat generation
- Durability & stability
- Easy connection

Applications

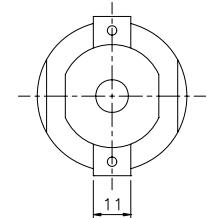
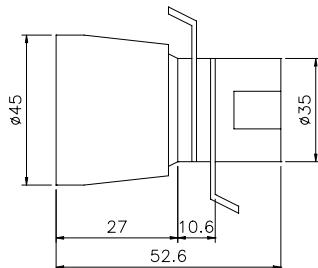
- Ultrasonic cleaners
- Ultrasonic welders
- Ultrasonic processing machines: bonding, drilling, etching, engraving and etc.

Specification

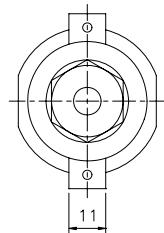
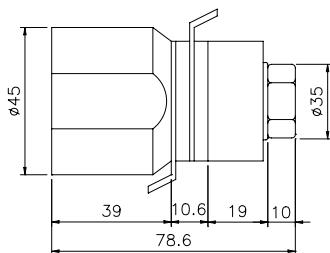
	30402S	45402H	45282H	60282H
Resonant frequency (KHz)	37.5	40.0	28.2	28
Motion Admittance (mMho)	35	15	50	40
Mechanic Q (Qm)	500	500	500	500
Capacitance (pF)	2700	4000	4000	4000
Allowable vibration rate (cm/sec.)	50	50	50	25

All specification taken typical at 25°C

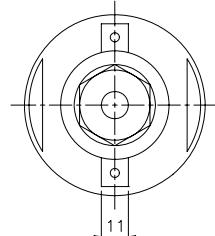
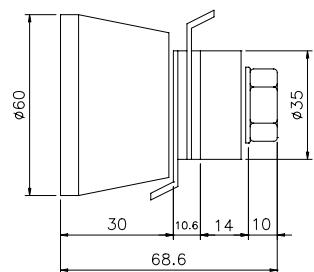
Model: 45402H



Model: 45282H



Model: 60282H

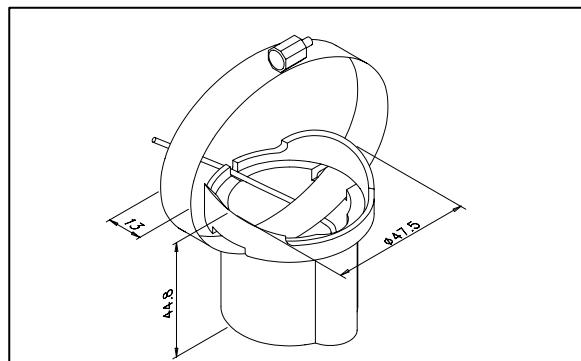


**S. Square Enterprise Company Limited
Pro-Wave Electronics Corporation**

P.O. Box 1-70 Chung Ho, Taiwan, ROC; E-mail: sales@pro-wave.com.tw; Tel: 886-2-22465101(5 lines), 22459774; Fax: 886-2-22465105
<http://www.s2.com.tw>; <http://www.prowave.com.tw>



Dimensions: dimensions are in mm



Specification

200LM450	Transceiver
Center Frequency	200±10.0Khz
Bandwidth (FOM -6dB)	25Khz
Transmitting Sound Pressure Level	160dB min. 0dB re 1μPa per 1Vrms at 100cm
Receiving Sensitivity	-180dB min. 0dB = 1 volt/μPa
Submerged Impedance (Ohm)	200
Capacitance at 1Khz	±20% 2000 pF
Input Power (Pulse Drive)	50 Watts
Total Beam Angle	-6dB 20°
Cable Length	4.5 m
Molded Connector	RCA Phono plug 90°
Housing Material	Plastic resin

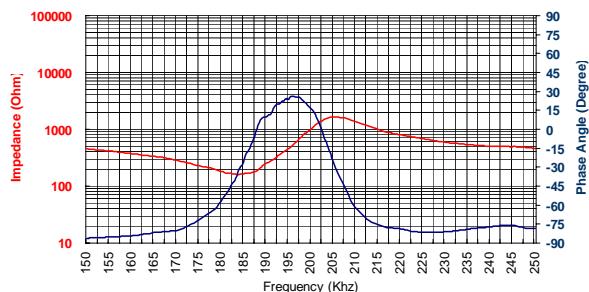
Closer frequency tolerance, shorter ringing and wider bandwidth models can be supplied upon request.

Model available:

1	200LM450	Plastic Housing
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Submerged Impedance/Phase Angle vs. Frequency

Tested under 1Vrms Oscillation Level



Receiving /Transmitting Sensitivity

Tested at distance of 100cm

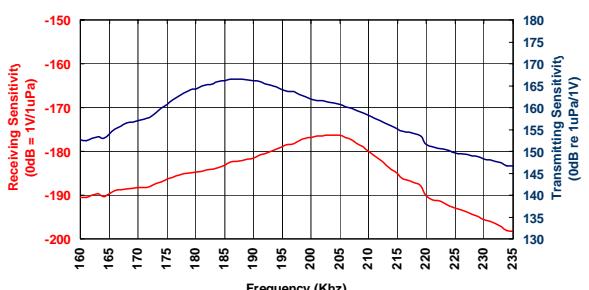
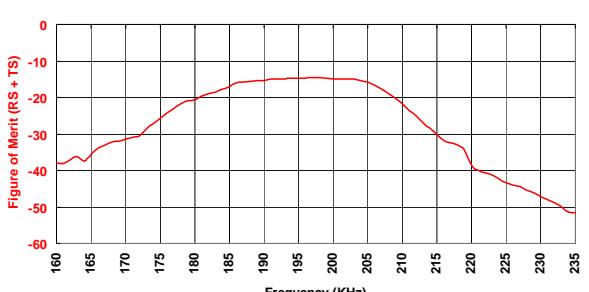
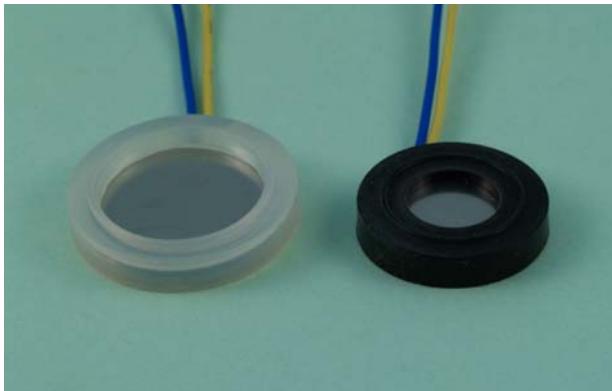


Figure of Merit

(Receiving Sensitivity + Transmitting Sensitivity)



Ultrasonic Atomizing Transducers

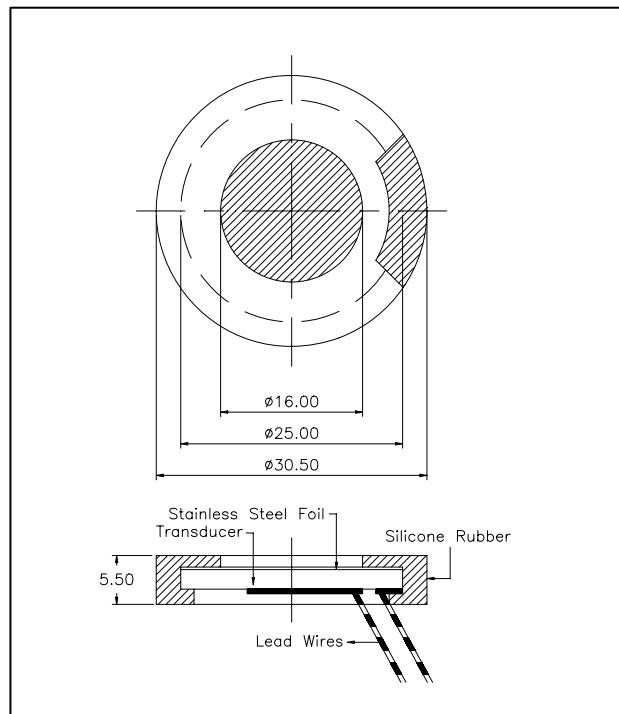


Specification

M165D25	25mm Dia.
Resonance Frequency	1.65±0.05Mhz
Resonance Impedance	2.0Ω max.
Capacitance at 1Khz ±20%	2,000 pF
Dissipation Factor at 1Khz	0.5% max.
Operation Duration (hour)	>6,000
Atomizing Quantity	400 cc/hr
Water Level	45 mm
Input Power (maximum)	30 Watt
Operation Temperature	0 to 45°C
Storage Temperature	-20 to 65°C

All specification is typical at 25°C.
Other frequency and diameter element can be supplied upon request.

Dimensions



Features

- Piezoelectric ceramic element clad with stainless steel for erosion resistance.
- Fine and consistent particle size of less than 3µm
- High atomizing efficiency >400 cc/hour
- Less power consumption
- High stability and durability

Applications

- Humidification in refrigerated food displays and storage, living environments, and air conditioning plants.
- Inhalation and disinfecting equipment
- Humidification in industrial process control for lubrication, coating and etc.

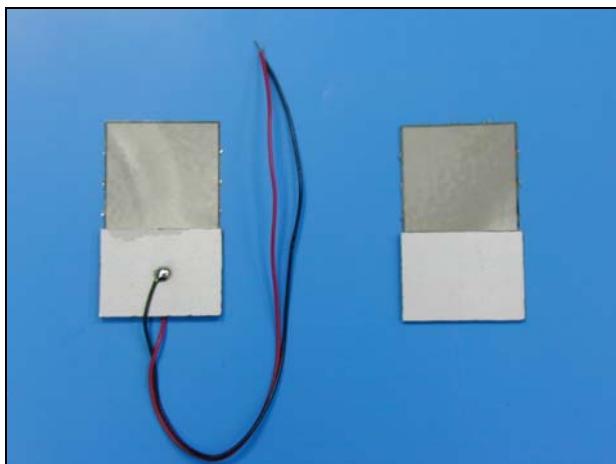


**S. Square Enterprise Company, Limited
Pro-Wave Electronics Corporation**

Ultrasonic Vibration Micro Nozzle

Applications

- Humidification in refrigerated food displays and storage, living environments, and air conditioning plants.
- Inhalation and disinfecting equipment
- Humidification in industrial process control for lubrication, coating and etc.
- Liquids dispensing systems



S. Square has dedicated in ultrasonic field over 21 years since 1980 and earned a worldwide reputation for his specialty, flexibility and sincerity in the past decades.

The ultrasonic vibration micro nozzle consists a piezoelectric ceramic and a metal foil, on which over thousands micro nozzles formed. Using the same principle as inkjet printer, this transducer atomizes water or liquids through a matrix of micro holes of around $7\text{--}10 \mu\text{m}$.

The micro nozzles ultrasonic atomizing transducer can use siphon to draw small amount liquids to the surface of metal foil and then to atomize, which is much efficiency than the conventional ultrasonic atomizer for which a liquid tank with high level liquid has to be always loaded on the surface of ultrasonic transducers.

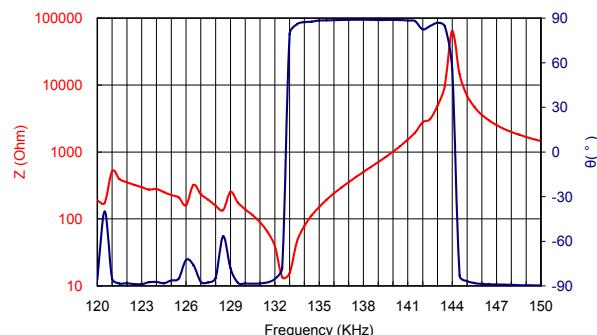
Features

- Fine and consistent misted particle size
- Adjustable misted particle size
- No loaded liquids require as comparing with conventional atomizers
- High atomizing efficiency
- Less power consumption
- High stability and durability

Specification:

Model Number	M2313500
Resonant Frequency	$135.0 \pm 5 \text{ KHz}$
Impedance	10 Ohm typ.
Capacitance	$2450 \pm 20\% \text{ pF}$
Dimensions	L: 29.20 mm W: 17.35 mm T: 1.0 mm (PZT Element) t: 50 μm (Metal)
Metal Material	Ni-Co Alloy
Nozzle size	7 – 10 μm

Impedance/Phase Angle:

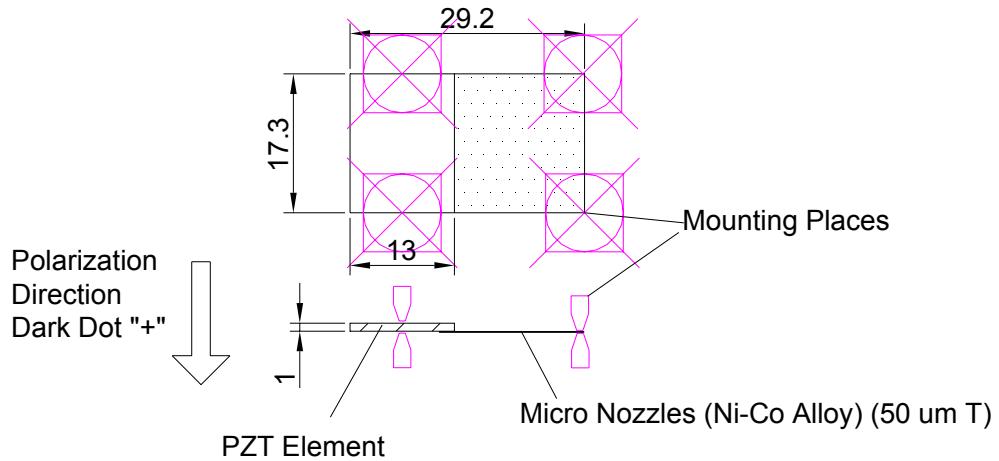


**S. Square Enterprise Company, Limited
Pro-Wave Electronics Corporation**

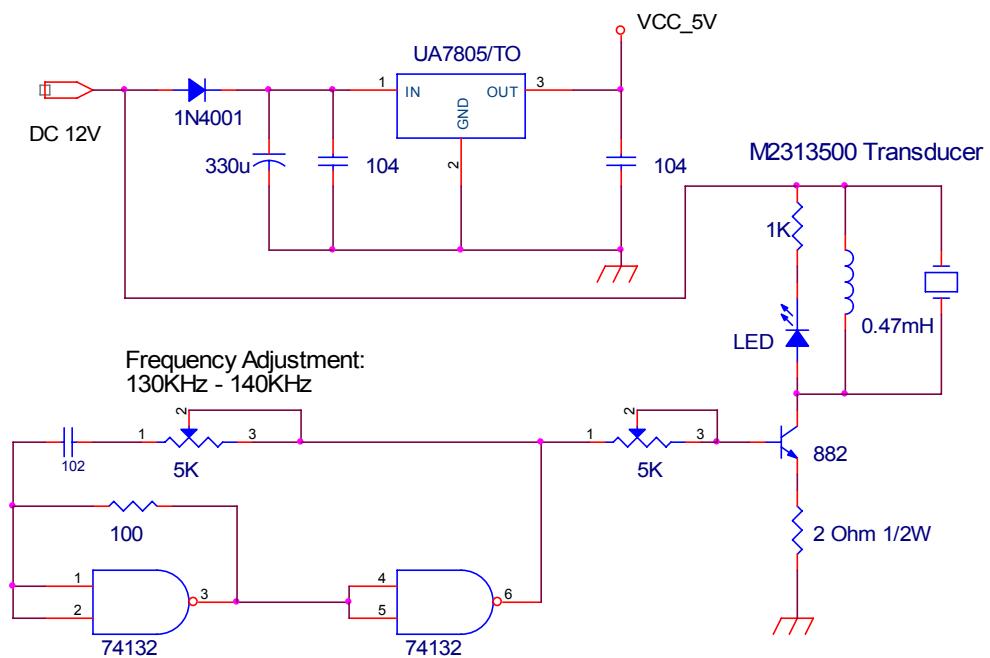
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Micro Nozzles Ultrasonic Atomizing Transducers

Construction:



Driving Circuit:



Remark: The negative side faces to the opening, the positive side faces to the liquid source, if driving circuit uses NPN transistor.