

Air Transmission Ultrasonic Sensor



Shanghai
Nicera



Shanghai Nicera Sensor Co., Ltd.

888 Wen Shui East Rd., Shanghai China

TEL 86-021-65928117 FAX 86-021-65928167

E-mail nicera@china-sns.com

URL <http://www.china-sns.com>

Features

Air transmission ultrasonic sensors using piezo ceramic elements transmit or receive ultrasonic sound in air. They have wide application in measurement and communications. Nippon Ceramic can offer a wide range of standard products or can provide optimal solutions to your specific requirements.

Type

• OPEN APERTURE TYPE

High sound pressure, high sensitivity sensor with unimorph and radial cone construction. Open aperture is especially for air medium application.

Low reverberation type is also available for pulsed driving.

Standard housing size : $\Phi 10$, $\Phi 12$, $\Phi 16$ [mm]

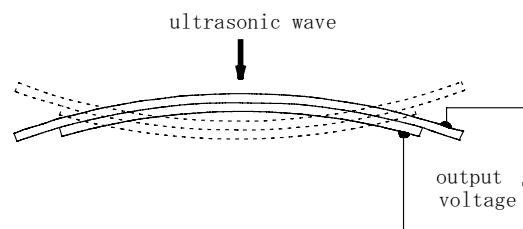
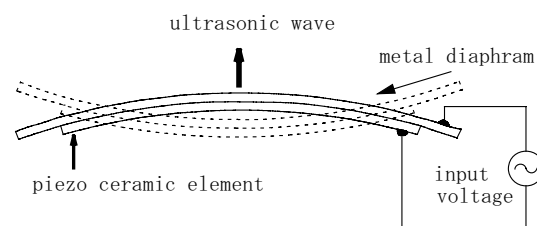
Standard frequency : 25, 32, 40[kHz]

Application

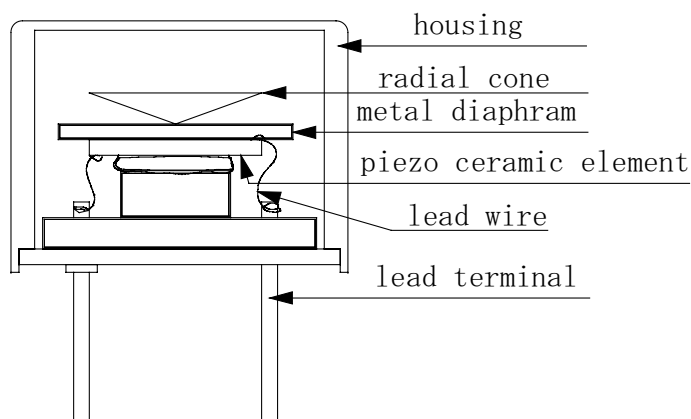
No.	Application	Method
1	Car alarm system	Doppler
2	Lighting control	"
3	Parking aid sensor	Pulse burst
4	Automatic door control	"
5	Liquid level measurement	"
6	Distance measurement	"
7	Traffic signal control	"
8	Robot	"

Principle of operation

When driven from an alternating voltage source of suitable frequency, the polarized piezoelectric element mechanically distorts in proportion to the applied voltage generating a sound field. Conversely an element subjected to such a sound field will generate a voltage proportional to its intensity. The effect can be enhanced by gluing the element to a metal diaphragm, which is known as unimorph structure. When signal voltage is applied to this unimorph vibrator it creates a bending vibration. When the signal frequency meets the mechanical resonance frequency the vibrator transmits ultrasound most efficiently. This operation is used as a transmitter. When incoming ultrasound vibrates the vibrator at resonance frequency the mechanical bending vibration efficiently generates electric voltage between the vibrator electrodes. This operation is used as a receiver.



Open Aperture Type



◆ Model code description ◆

(example) (Z) (T) (40) - (16) (P)

※1 ※2 ※3 ※4 ※5

※ 1 : Z : Company Inner code

※ 2 : T : Transmitter

R : Receiver

C : Common

※ 3 : Center frequency [KHz]

※ 4 : Housing diameter [mm]

※ 5 : P : Plastic case

No Letter : Aluminum case

Specifications

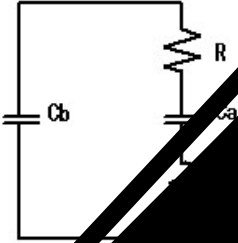
◆ Open Aperture

Item		Frequency (MHz)				Appearance
Type	Model	100	170	Ca(PF)	Ca(PF)	
Transmitter/Receiver	ST25-16	100	160	160	160	C
	SR25-16	170	160	160	160	
	AT40-10P	80	200	200	200	A
	AR40-10P	85	200	200	200	
	AT40-12P	100	160	160	160	B
	AR40-12P	108	160	160	160	
	ZT40-16	120	130	130	130	C
	ZR40-16	130	130	130	130	
	T32-16	800	120	130	130	D
	R32-16	800	130	130	130	
Common use	ZC40-16	1700	160	100	100	C

※1 : Reflectance

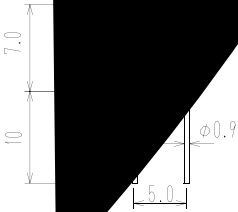
※2 : All products

(10Vrms
diameter)



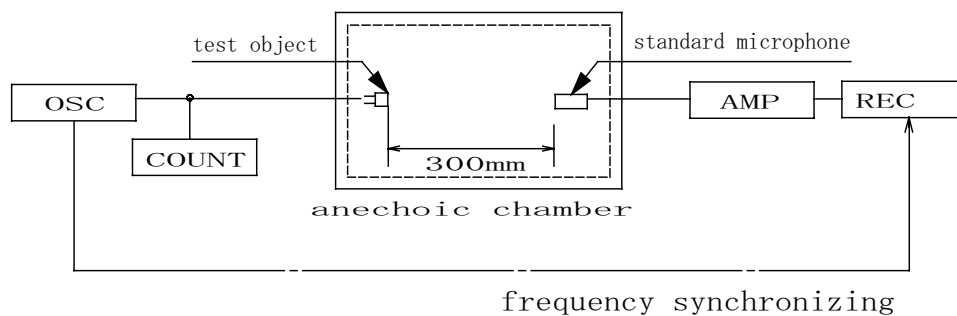
◆ Appearance

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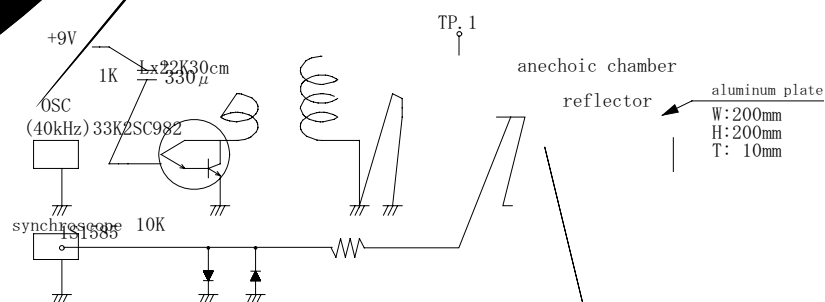
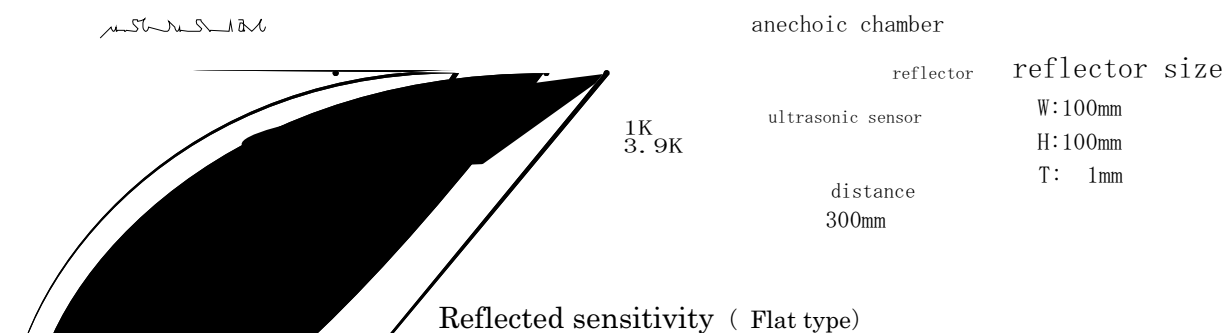
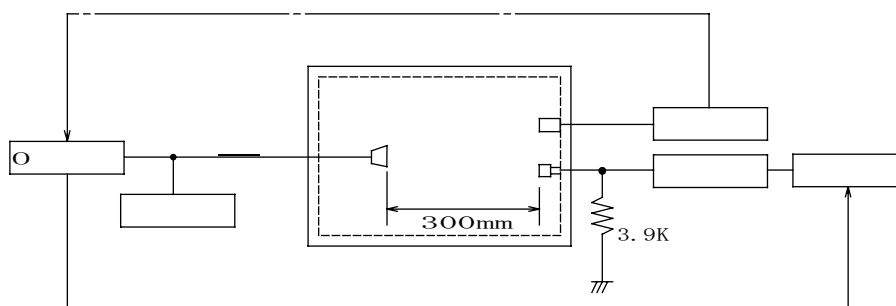


Test circuit

Frequency characteristic Transmitter(SPL) :0dB=0.0002 μ bar

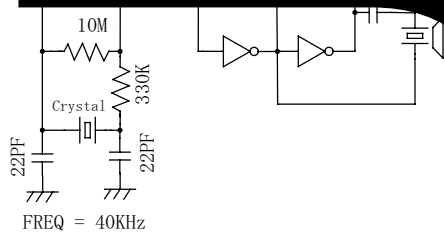


Frequency characteristic Receiver(sensitivity) :0dB=1V/ μ bar

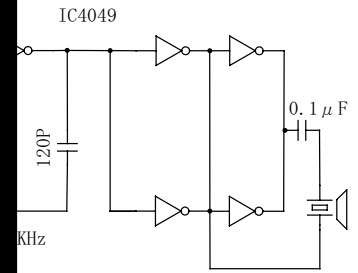


Reference circuit

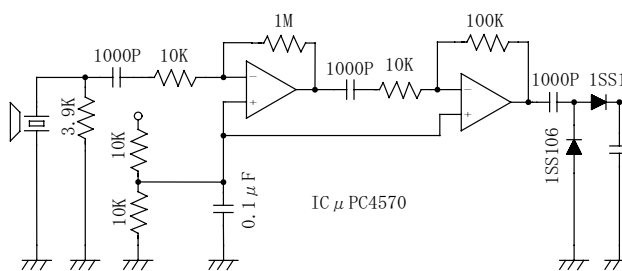
1. Crystal oscillator



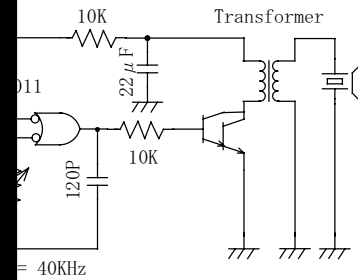
2. R-oscillating circuit



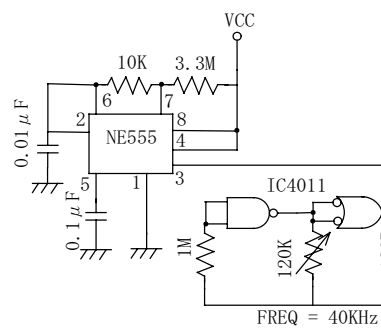
3. Receiver circuit



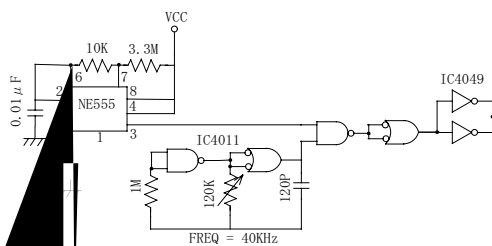
4. Voltage multiplier circuit



5. Pulse trans



6. Transmitter/ receiver circuit



on to be taken in use ※