



# Data Sheet

# Ultrasonic transducers

**RS stock numbers 307-351, 307-367**

A range of two transducers operating at 40kHz approximately and designed for ultrasonic transmission and reception. The ultrasonic transmitter, 307-351 is capable of emitting 106dB (0dB =  $2 \times 10^{-4}$ µbar) and the receiver 307-367 has a sensitivity of -65dB (0dB = 1/µbar/V/metre).

These units can be used for the transmission of continuous wave ultrasonic sound or for pulsed sound applications

## Characteristics

Item	Unit	307-351	307-367	
Transmitting sensitivity	Sv	dB*1	106	-
Receiving sensitivity	Mv	dB*2	-	-65
Resonant frequency (transmitting)	Frsv	kHz*3	40±1	-
Resonant frequency (receiving)	Frmv	kHz*4	-	40±1
Directional angle	$\theta^{1/2}$	°	20	
Maximum input voltage	Vrms		20	-
Impedance	$\Omega$		Approx. 500	Approx. 30k
Capacitance	pF		1100±20%	
Pulse rise time	msec.		2.0	0.5
Maximum input voltage for pulse operation	Vp.p		60	-
Temperature range	°C		-20 to +60	
Transmitting selectivity	Qsv		Approx. 70	-
Receiving selectivity	Qmv			Approx. 60

\*1 0dB =  $2 \times 10^{-4}$ µbar

\*2 0dB = 1V/µbar

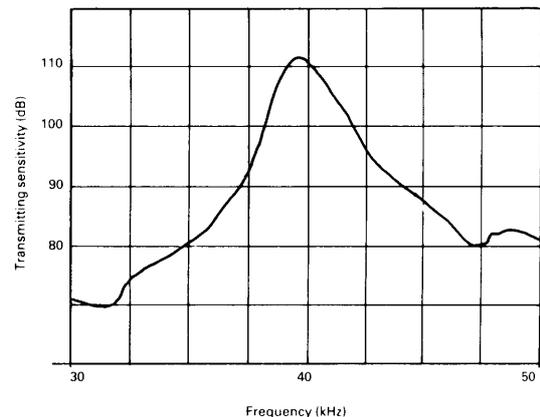
\*3 Frequency where transmitting sensitivity is maximum

\*4 Frequency where receiving sensitivity is maximum

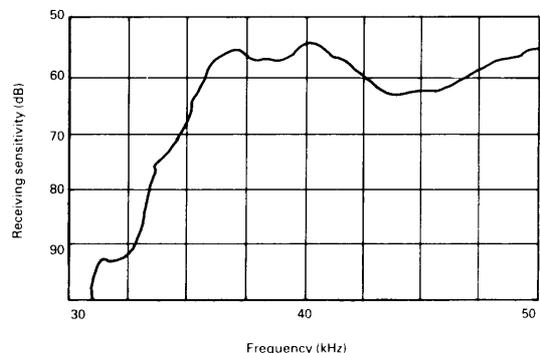
## Applications

- Burglar alarm systems
- Proximity switches
- Liquid level meters
- Anti-collision devices
- Counters for moving objects
- TV remote control systems.

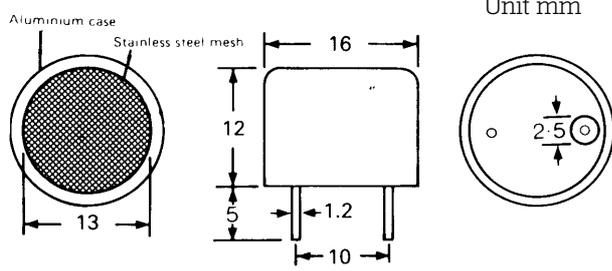
**Frequency response (transmitting)**



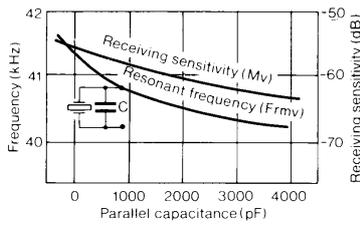
**Frequency response (receiving)**



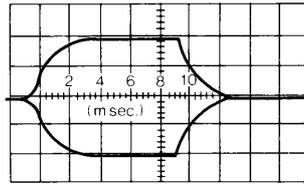
## Shape and dimensions



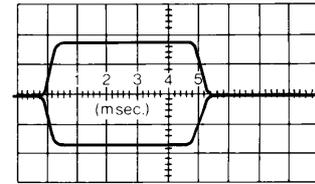
Effect of parallel capacitance



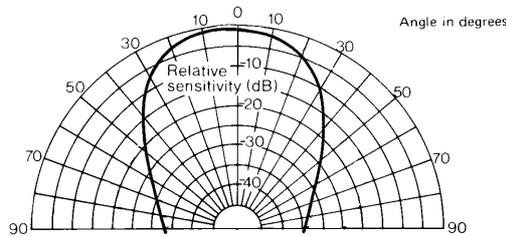
Pulse response (transmitting)



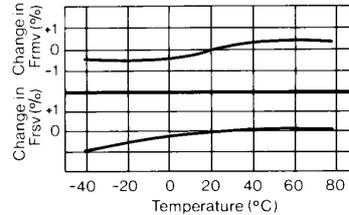
Pulse response (receiving)



Directional radiation pattern



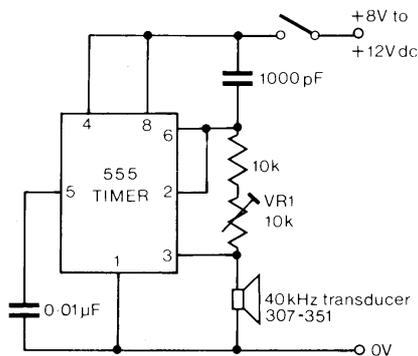
Temperature characteristics TRANSMITTER & RECEIVER



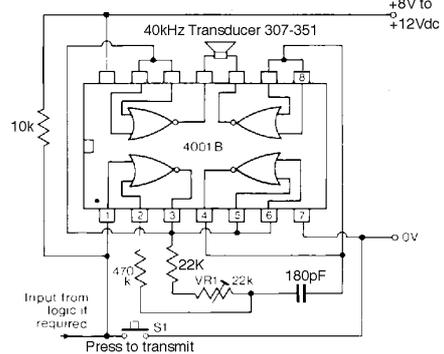
The following circuits show how the transducers may be used in remote control applications. Either of the transmitter circuits may be used with the receiver. The frequency of oscillation is adjusted by means of VR1 for maximum sensitivity. The CMOS circuit allows direct interfacing with logic circuitry. In the receiver VR2 is adjusted for maximum sensitivity.

**Note:** The relay energises when a signal is received from the transmitter.

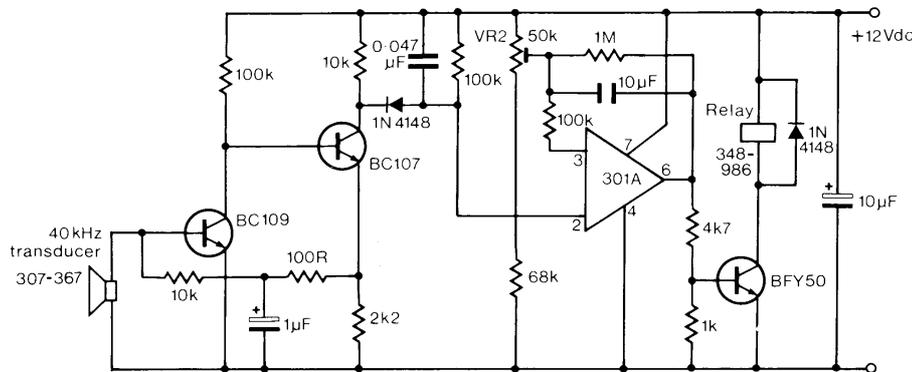
Transmitter using 555 timer i.c.



Transmitter using CMOS gate i.c. 4001B



Receiver



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