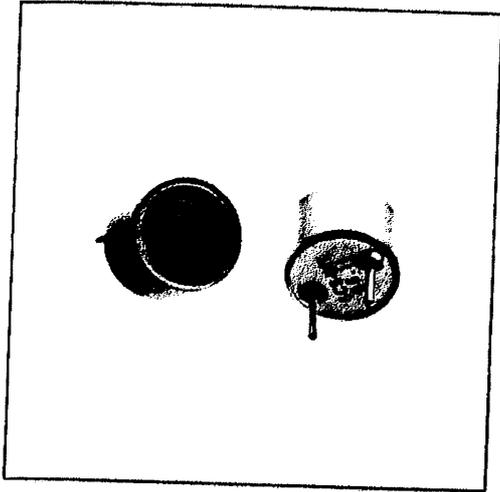
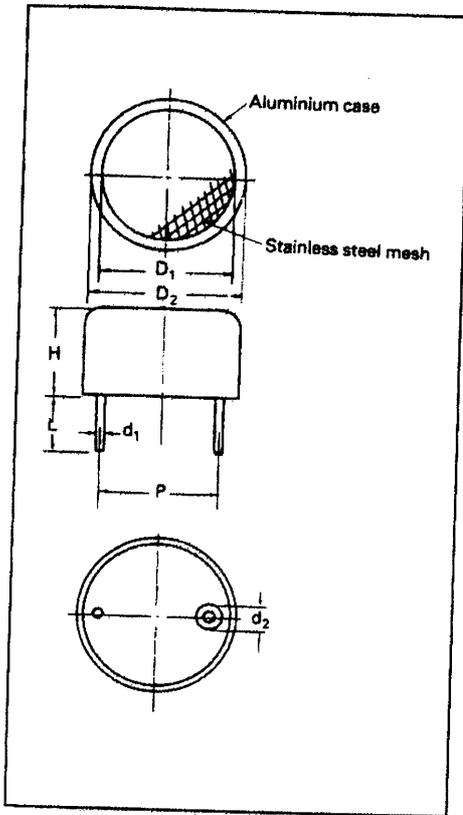


## SCS401T SCM401R Ultrasonic Sensors



- High-sensitivity ultrasonic transmitters and receivers are designed for sending and receiving ultrasonic sound through the air in the form of continuous wave or pulses. Typical applications are: burglar alarm systems, proximity switches, liquid level meters, anti-collision devices and counters for moving objects.

### Dimensions mm



Part number	$D_1$	$D_2$	H	L	P	$d_1$ dia.	$d_2$ dia.
SCS401T	16	13	12	10	10	2	1
SCM401R							

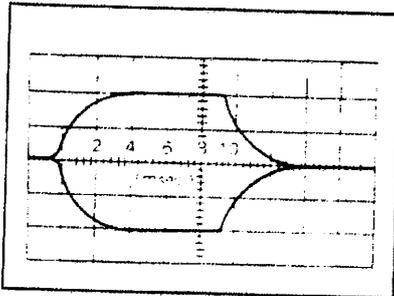
T—Transmitter. R—Receiver.

### Characteristics

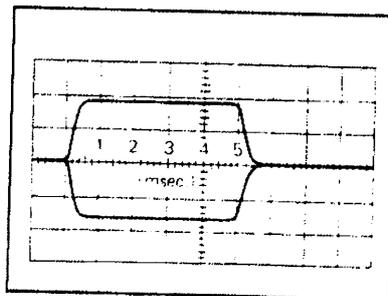
Item	—25T	—25R	—40T	—40R
Transmitting sensitivity (dB) <sup>1</sup>	18	—	65 <sup>5</sup>	—
Receiving sensitivity (dB) <sup>2</sup>	—	-44	—	106 <sup>6</sup>
Resonant frequency (transmitting) (kHz) <sup>3</sup> Frsv.	25	—	40 ± 1	—
Resonant frequency (receiving) (kHz) <sup>4</sup> Frmv.	—	25 ± 0.5	—	40 ± 1
Maximum input voltage (Vrms)	10	—	20	—
Temperature range °C	-15 to +65		-20 to +60	

- <sup>1</sup> OdB = 1  $\mu$ Bar/V/meter.
- <sup>2</sup> OdB = 1V/ $\mu$ Bar, measured with a shunt resistance of 47 k $\Omega$ .
- <sup>3</sup> Frequency where transmitting sensitivity is maximum.
- <sup>4</sup> Frequency where receiving sensitivity is maximum.
- <sup>5</sup> dB/V/ $\mu$ Bar at centre frequency.
- <sup>6</sup> OdB = 2 x 10<sup>-4</sup>  $\mu$ Bar at centre frequency.

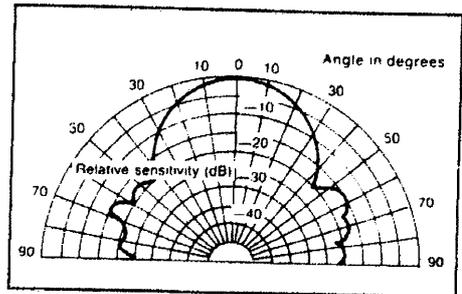
Pulse response (transmitting) SCS401T



Pulse response (receiving) SCM401R



Directional radiation pattern SCS401T



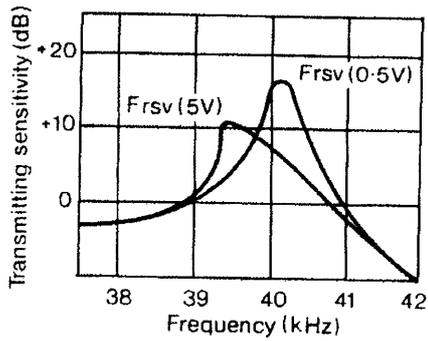
Sanwa Electric Co., Ltd.  
Tokyo, Japan

0493 8449111

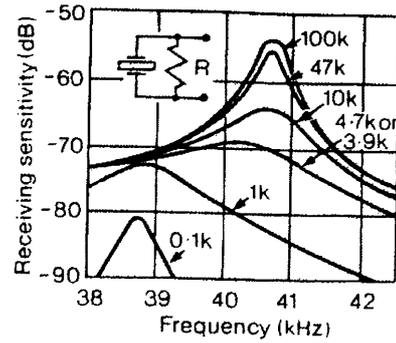
TRANSMITTER

RECEIVER

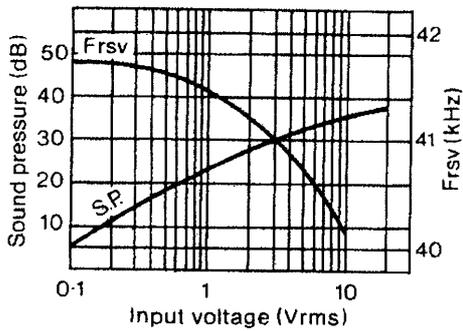
Frequency response (transmitting)



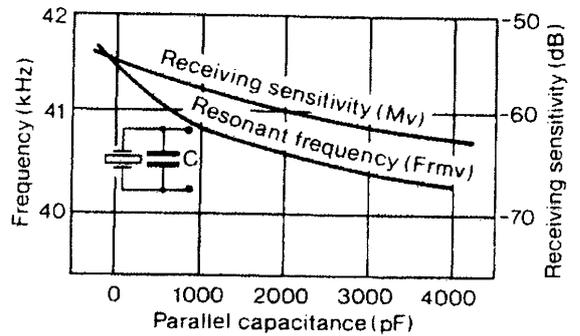
Frequency response (receiving) vs. shunt resistance



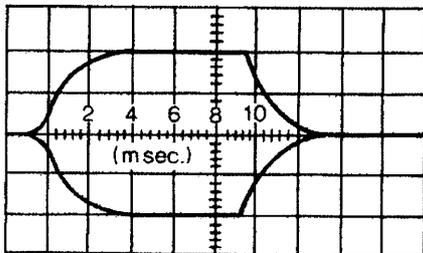
Sound pressure, resonant frequency vs. input voltage



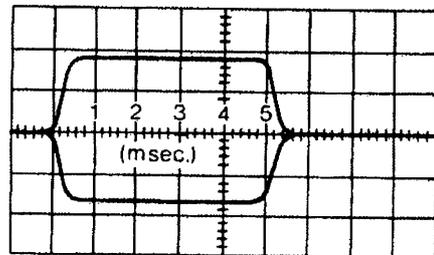
Effect of parallel capacitance



Pulse response (transmitting)

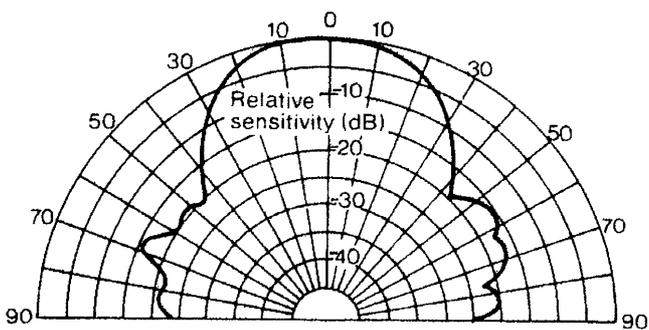


Pulse response (receiving)

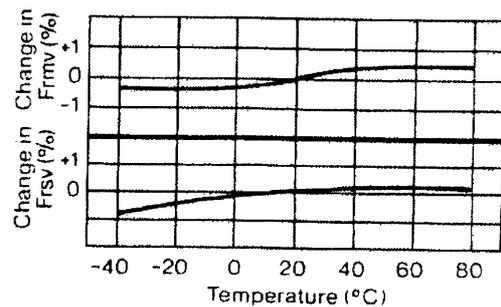


Directional radiation pattern

Angle in degrees



Temperature characteristics  
TRANSMITTER & RECEIVER

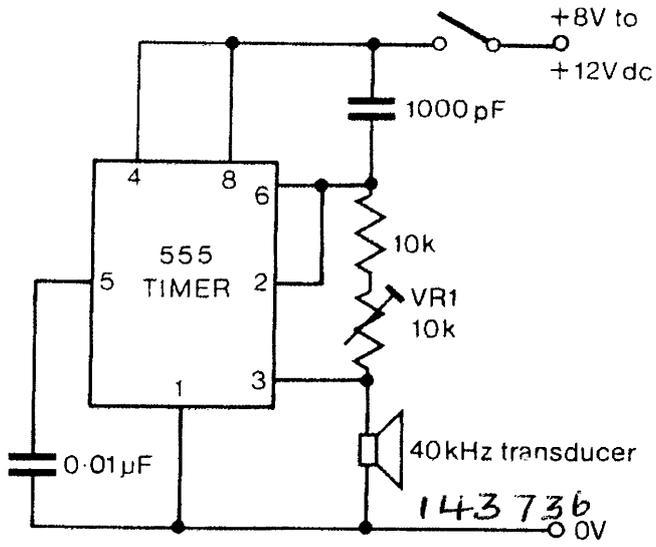


### Applications

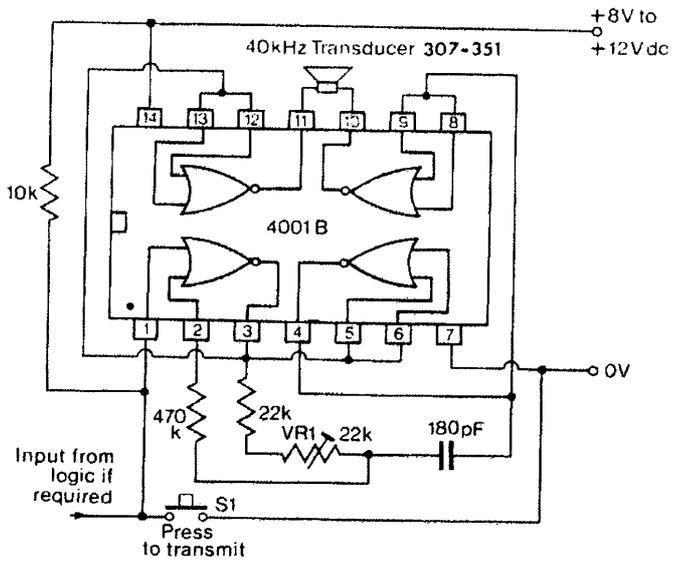
The following circuits show how the transducers may be used in remote control applications. Either of the transmitter circuits may be used with the receiver. The frequency of oscillation is adjusted by means of VR1 for maximum sensitivity. The CMOS circuit allows direct interfacing with logic circuitry.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

