



GENERATIONS AHEAD IN SONAR & ULTRASONIC TECHNOLOGY

TR-89/B Series Types: 23, 31, and 40

The TR-89/B Series Transducers are rugged electroacoustic devices designed for the efficient generation of ultrasonic energy in air. They are ideally suited for a wide variety of low power, general purpose applications such as ultrasonic intrusion alarms, proximity detection devices, remote control devices, and energy management systems.

The Transducers consist of a one piece housing with integral diaphragm. This provides a moisture-proof unit, suitable for both indoor and outdoor use when mounted so that the rear terminals are protected from exposure to the direct outdoor environment. The units operate at resonance on the first harmonic overtone. This affords greater efficiency (higher transmitting and receiving response) than an equivalent size device operating at its fundamental.

The standard TR-89/B, Type 23, provides peak untuned receiving response at 23 kHz +/- 2 kHz. The standard TR-89/B, Type 31 and Type 40, provide peak untuned receiving response at 31 and 40 kHz +/- 2 kHz respectively. The units provide different directional characteristics at the various frequencies and provide greater range at the lower frequencies due to the attenuation characteristics of sound in air. Thus, the TR-89/B family offers the user a choice of units whose characteristics will match any requirement. Special frequencies, matched transmitting and receiving pairs, and other custom features are available on special order (consult factory). There are several million TR-89/B transducers in use in a variety of applications throughout the world.

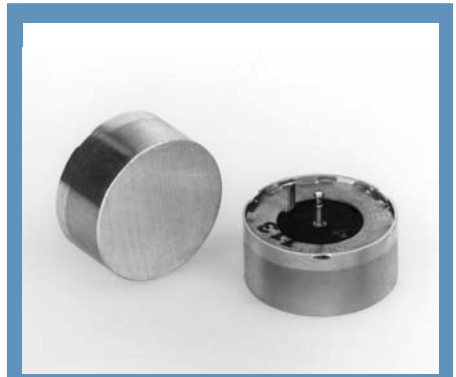
Massa Products Corporation is a leading designer and manufacturer of a wide variety of electroacoustic transducers and systems for use in air and under water, with over 60 years of specialized experience in this field.

For more information visit our web site at www.massa.com.

MASSA PRODUCTS CORPORATION

280 Lincoln St., Hingham, MA 02043 U.S.A.
Tel: 781-749-4800 Fax: 781-740-2045
Toll Free in USA: 800-962-7543
e-mail: sales@massa.com

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FEATURES

- Low Cost
- Rugged Packaging
- Moisture-Proof
- High Sensitivity

APPLICATIONS

- Robotics
- Liquid Level Control
- Intrusion Alarms
- Remote Controls
- Proximity Detection
- Solid Level Measurement
- Energy Managing Systems

SPECIFICATIONS

	Type 23	Type 31	Type 40
Frequency at Maximum Impedance (+/- 2 kHz)	23 kHz	31 kHz	40 kHz
Bandwidth Transmitting*			
Tuned	5 kHz	8 kHz	10 kHz
Untuned	3 kHz	3 kHz	5 kHz
Transmitting Sensitivity* dB vs 1 μ bar per volt at 1 foot (untuned)	+25	+25	+22
Receiving Sensitivity* dB vs 1 volt per μ bar (untuned)	-41	-41	-50
Rated Power	200mW	200mW	200W
Maximum Rated Power	35 Vp-p (Square Wave Input)	45 Vp-p (Sine Wave Input)	
Total Beam Angle* (-3 dB Points)	35°	25°	20°
Operating Temperature		-40° to 85° C	
Weight	0.2 oz	0.2 oz	0.2 oz

* See Performance Characteristics

All Specifications typical at 20°C and subject to change without notice.

ORDERING INFORMATION

Massa Model TR-89/B Sensor:
P/N XXXX

OPTIONS:

1. Closer Frequency Tolerances
2. Different Operating Frequencies
3. Matched Transmitting and Receiving Pairs
4. Watertight Unit with Integral Cable
5. Phono Connectors

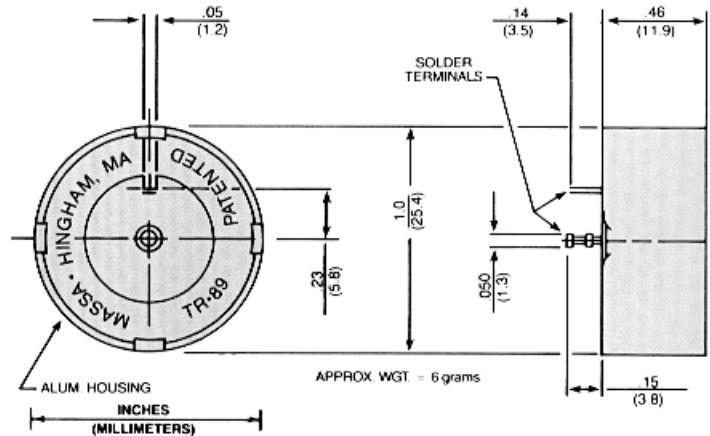
Custom configurations available for OEM quantities.

MASSA PRODUCTS CORPORATION

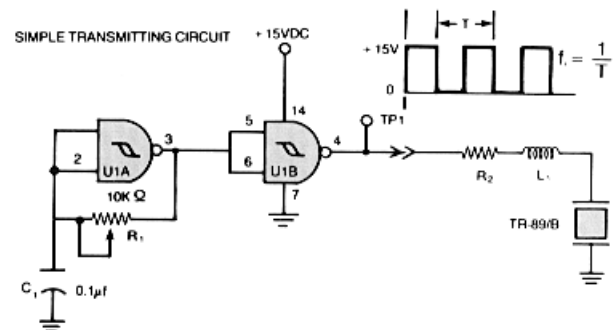
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TR-89/B Series

Outline Dimensions



Applications Circuit



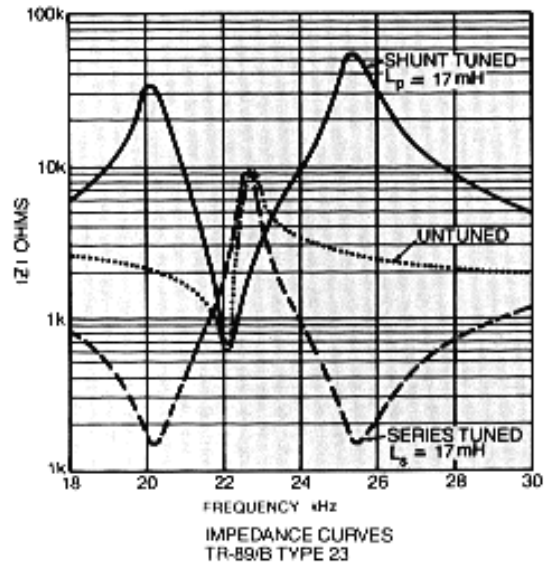
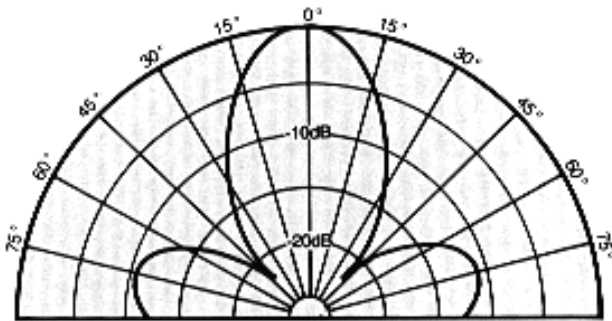
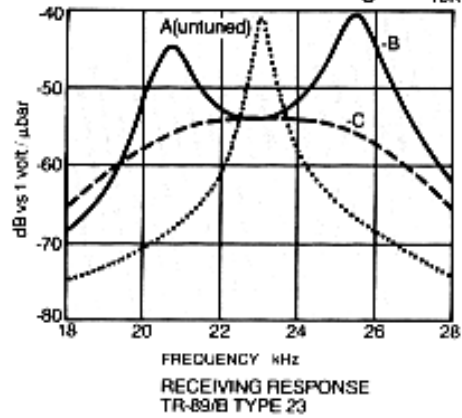
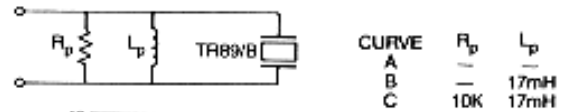
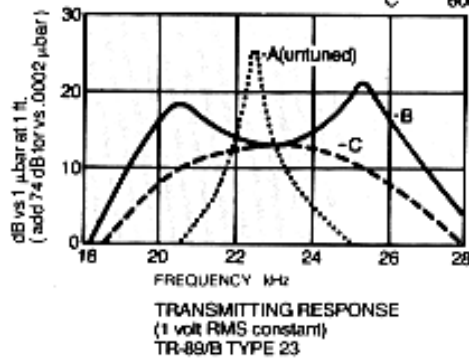
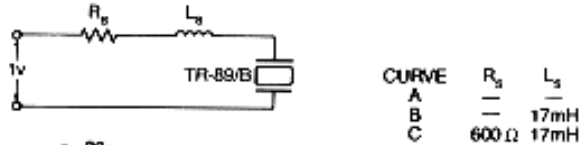
TRANSMITTING FREQUENCY	TRANSDUCER	R ₂	L ₁
23 kHz ± 2 kHz	TR-89/B TYPE-23	620 Ω	17mH
31 kHz ± 2 kHz	TR-89/B TYPE-31	510 Ω	12mH
40 kHz ± 2 kHz	TR-89/B TYPE-40	620 Ω	6.5mH

NOTES:

1. U1 is a National Semiconductor CD 4093B Quad 2 input NAND Schmitt Trigger or equivalent.
2. R1 must be a 10 turn wire wound precision potentiometer.
3. Adjust R1 for correct frequency (f_t) at TP1.

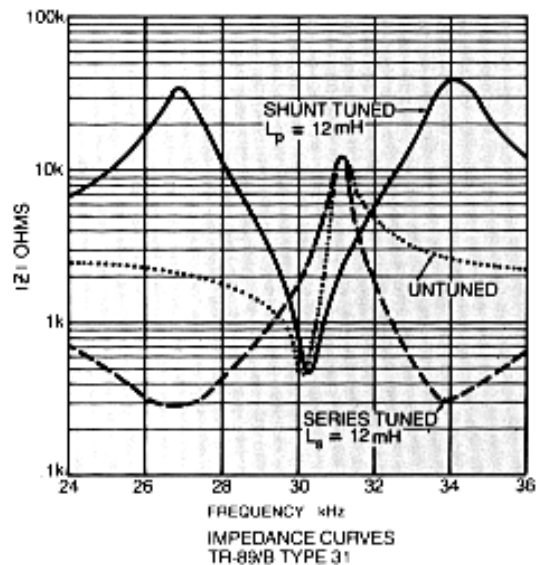
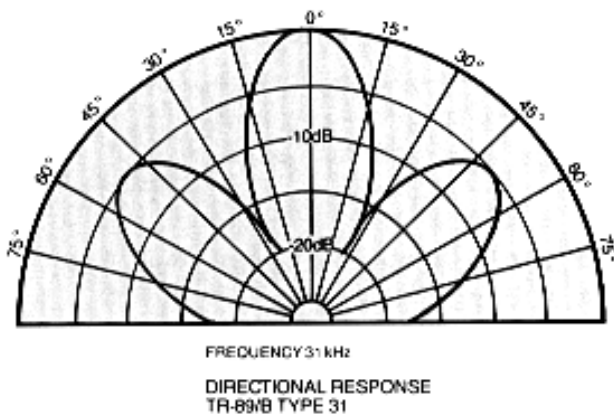
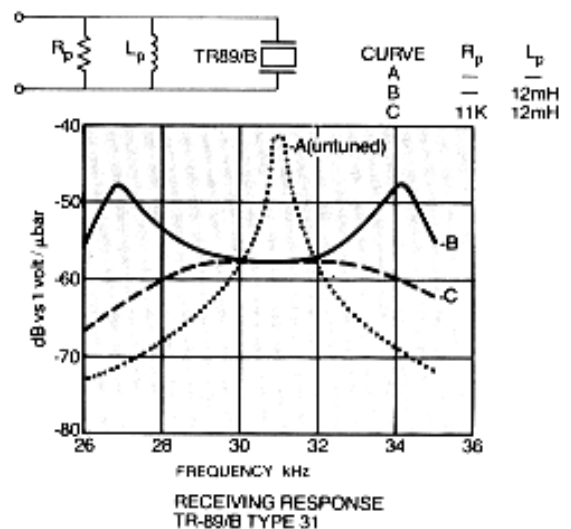
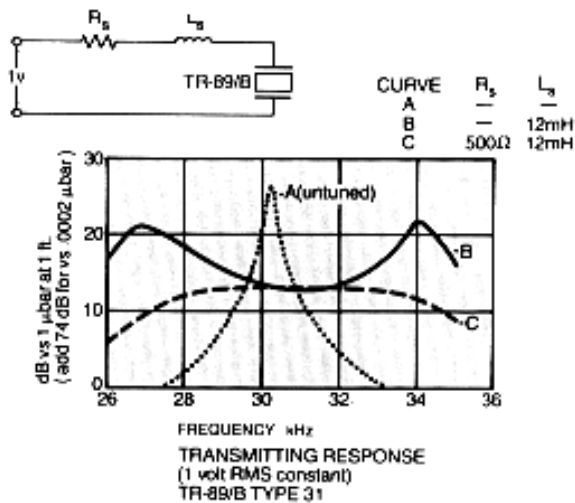
TR-89/B, Type 23

Nominal Performance Characteristics



TR-89/B, Type 31

Nominal Performance Characteristics



TR-89/B, Type 40

Nominal Performance Characteristics

