

## Model TR-2404/150 Narrow Beam Ultrasonic Transducer

The Massa Model TR-2404 is a small ultrasonic air transducer that operates in the 150 kHz frequency region. A unique design feature results in the transducers having a narrow directional pattern completely free of all side lobes.

The transducer is typically used in non-contact echo ranging applications where a single TR-2404/150 is used to first transmit a short duration acoustic signal, and it then detects the echo reflected from a target; or two separate transducers are used, one to transmit and one to receive. The axis of maximum system response is along the line perpendicular to the face of the transducer. The electroacoustic response specifications of the transducer are shown on Page 2 of this datasheet.

Transducer responses are the electroacoustic characteristics of the sound pressure field transmitted by a transducer when an electrical signal is connected to it, or the voltages produced by a transducer when it is located within a sound pressure field. System responses are the electroacoustic characteristics of the transducer when it transmits a sound pulse and then receives the reflected echo from a target.

The Transducer Directional Response on Page 2 of this datasheet shows the relative reduction in sound pressure at different angles produced by a TR-2404 when it is transmitting, or the relative reduction in received voltage produced by the transducer as it rotates to different bearing angles relative to the position of an acoustic source of constant sound pressure. The System Directional Response on Page 2 shows the relative reduction in received voltage produced by the echo as the TR-2404 rotates to different bearing angles relative to the reflecting target.

When the TR-2404/150 is mounted into a holding fixture, it is desirable to acoustically isolate the transducer from the structure. To accomplish this, the TR-2404/150 can be ordered with a specially designed cylindrical rubber mounting bushing that fits around the body of the transducer. This bushing contains ribs on its outer surface which compress when the transducer is inserted into a mounting hole that is slightly smaller in diameter than the OD of the bushing. This provides for a good resilient mount.

For more information on ultrasonics, please visit us on the Web at [www.massa.com](http://www.massa.com), or call a Massa Applications Engineer at 781-749-4800.



Photograph Showing Transducer with and without Mounting Bushing

### FEATURES

- Low Cost
- High Frequency Operation
- Narrow Beam
- Small Size
- No Side Lobes

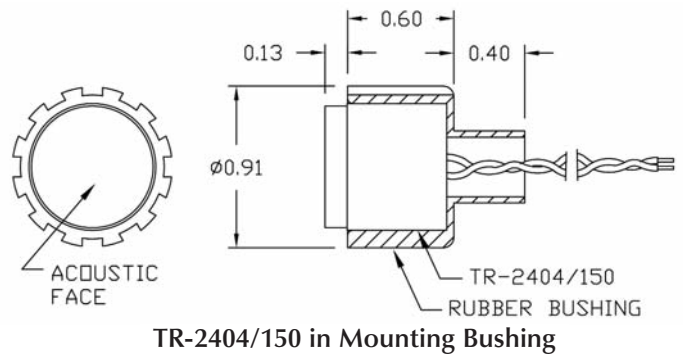
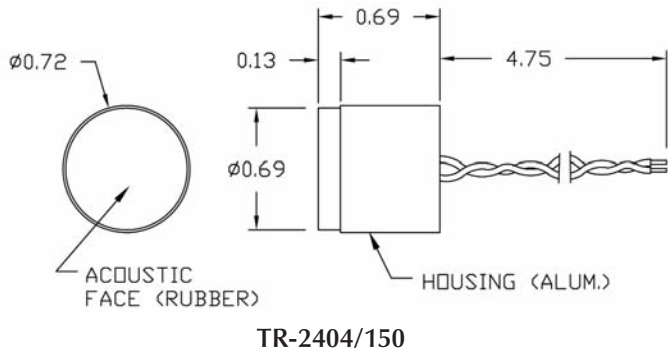
### APPLICATIONS

- Proximity Detection
- Robotics
- Level Measurement
- Mechanical Positioning
- Roll Diameter Measurement
- Web Loop Monitoring
- High Speed Counting
- Thickness Control
- Short Range Measurement

# Model TR-2404/150

## OUTLINE DIMENSIONS

(inches)



### ORDERING INFORMATION:

P/N 200252-506 ~ TR-2404/150

P/N 200252-503 ~ TR-2404/150 in Mounting Bushing

### SPECIFICATIONS

(Nominal at Frequency of Peak Response,  
22° C, and 50% RH)

Frequency of Peak Response: 150 kHz

Peak System Sensitivity: -60 dBV  
(Voltage of echo from flat target  
at 30 cm, 1 V drive pulse.)

Transducer Total Beam Angle: -3 dB 12°  
-6 dB 18°

System Total Beam Angle: -3 dB 10°  
-6 dB 12°

Transmitting Sensitivity: 120 dB  
(dB re 1 $\mu$ Pa/V at 30 cm)

Receiving Sensitivity: -174 dB  
(dB re 1V/ $\mu$ Pa)

Impedance Magnitude: 1,000  $\Omega$

Operating Temperature: 0° to 70°C

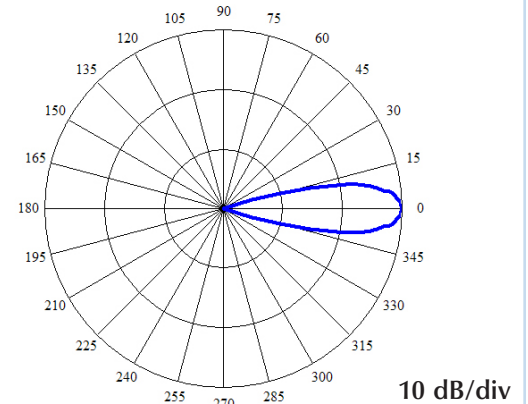
Relative Humidity: 0% to 90%  
(non-condensing)

Wires: black and red (red+),  
each #24 AWG  
tinned copper,  
Jacket PVC  
0.04" diameter min.

All Specifications subject to change without notice.

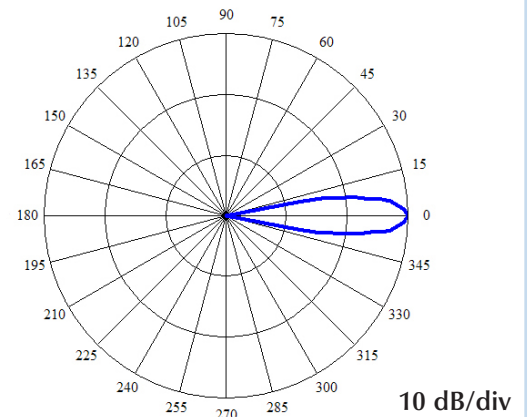
### Transducer Directional Response

(150 kHz)



### System Directional Response

(150 kHz)



# MASSA

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