

## 1 Scope

The pulse/tone burst transducer is designed for echo ranging systems requiring a shorter ringing characteristic when comparing to our standard type transducers. This transducer, with a built-in temperature compensating capacitor, is specifically designed with an asymmetric beam patterns for car reversing systems to minimize unwanted wave reflection from the ground.

## 2 Part Number

400EP14D-CBPN Pulse Transit Enclosed Type Ultrasonic Transducer

## 3 Dimension

As per Figure 4

## 4 Specification

(rated at temperature  $25\pm 3^{\circ}\text{C}$ , 45 to 60% RH, unless otherwise noted)

	Items	Specification	Remarks
4-1	Center Frequency	40KHz $\pm$ 1KHz	HP4192A Impedance analyzer
4-2	Sound Pressure Level	103dB (min.)	at resonant frequency; 0dB re 0.0002 $\mu$ bar per 10Vrms at 30cm 10Vrms sine wave input detail see attached Figure 1
4-3	Sensitivity	-78dB (min.)	at resonant frequency; 0dB re 1Volt/ $\mu$ bar detail see attached Figure 2
4-4	Ringing	5mV (max.)	at 1.7ms, detail see attached Figure 3 L 2nd wind of IFT sets at 5.2mH (Adj.)
4-5	Bandwidth	1.0KHz (min.)	-6dB (Figure Of Merit)
4-6	Capacitance	3200pF	$\pm$ 20%, measured at 1KHz
4-7	Beam Angle (TYP.)	130° (TYP.)	-6dB round side
		80° (TYP.)	-6dB cutting side
4-8	Max. Driving Voltage	20Vrms	cont.
		100Vp-p	20bursts maximum, 25ms repetition rate
4-9	Housing Material	aluminum	black
4-10	Operation Temperature	-30°C to +70°C	
4-11	Storage Temperature	-40°C to +80°C	

## **5 Environmental Characteristics**

- 5-1 Overall echo sensitivity shall not change by more than  $\pm 3\text{dB}$  in the temperature range of  $-30^{\circ}\text{C}$  to  $70^{\circ}\text{C}$ , at a relative humidity of  $\pm 50\%$
- 5-2 Overall echo sensitivity shall not change by more than  $\pm 3\text{dB}$  in the humidity range of 10% to 90% at the temperature of  $25^{\circ}\text{C}$
- 5-3 Overall echo sensitivity shall be within  $\pm 3\text{dB}$  of the specified values after the device is subjected to any or all of the below
  - 5-3-1 Operation at 90% relative humidity and  $40^{\circ}\text{C}$  for 100 hours, followed by a normalization period of 24 hours at 30% and  $25^{\circ}\text{C}$
  - 5-3-2 Storage at  $-40^{\circ}\text{C}$  to  $+80^{\circ}\text{C}$  for 24 hours followed by a normalization period of an hour at  $25^{\circ}\text{C}$
  - 5-3-3 Vibration at 10 to 55Hz, 1.5mm amplitude. 1 minute sweep. X, Y, Z, 3 each axis for 3 hours.
  - 5-3-4 Shock: After impact of 50G is applied following. X, Y, Z, 3 axis /3 cycle / each direction.

## **6 Mechanical Characteristics**

Lead strength

To pull longitudinally 1.0 kgf min.

To push longitudinally 1.0 kgf min.

## **7 Warranty**

- 7-1 Warranty period is one year after delivery
- 7-2 Defective transducers attributable to manufacturer's responsibility shall be replaced for free, during the warranty period. However, following cases are out of the this replacement.
  - 7-2-1 Unsuitable handling or misuse by user.
  - 7-2-2 Modification or repair by user.
  - 7-2-3 Any other cases not responsible for manufacturer such as natural calamity, accident, etc.

**This warranty covers only replacement. Any loss derived from failure or malfunction of the transducer, or cost to replace is excluded from this warranty.**

**Sound Pressure Level measuring system:**

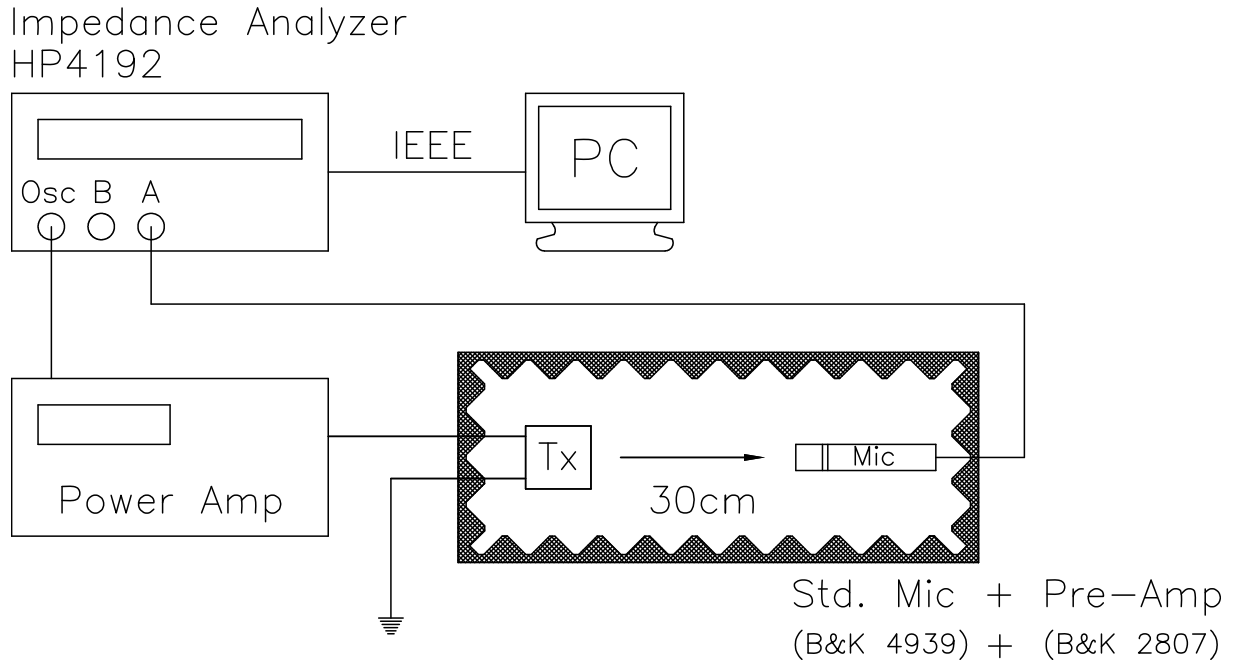


Figure 1

**Sensitivity measuring system:**

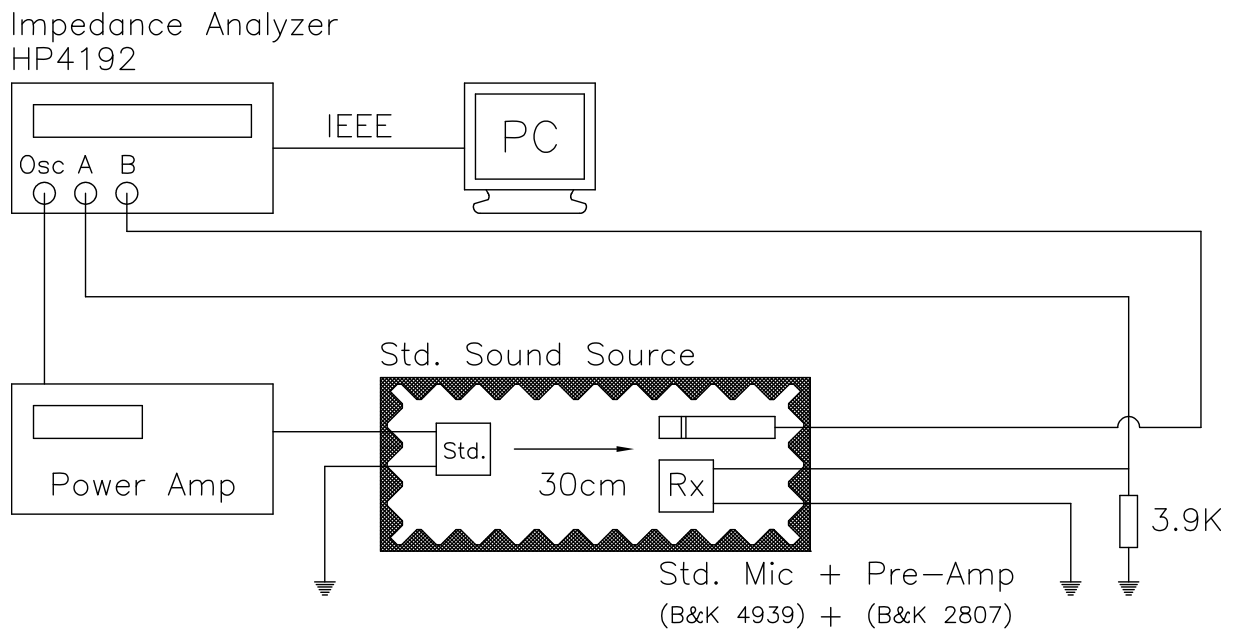


Figure 2

**Echo Sensitivity Test Circuit:**

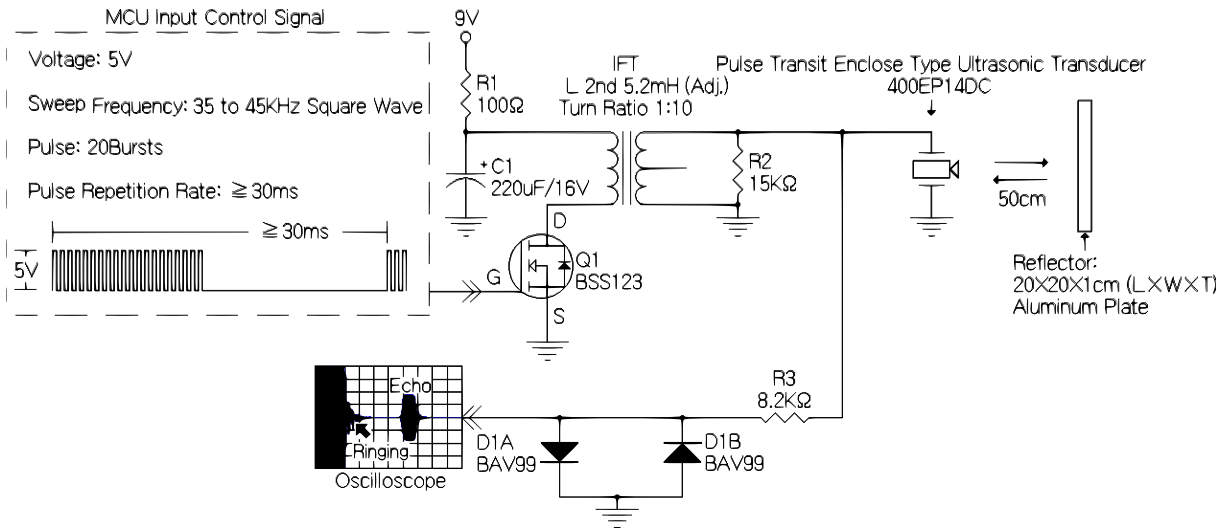


Figure 3

**Dimensions: unit mm**

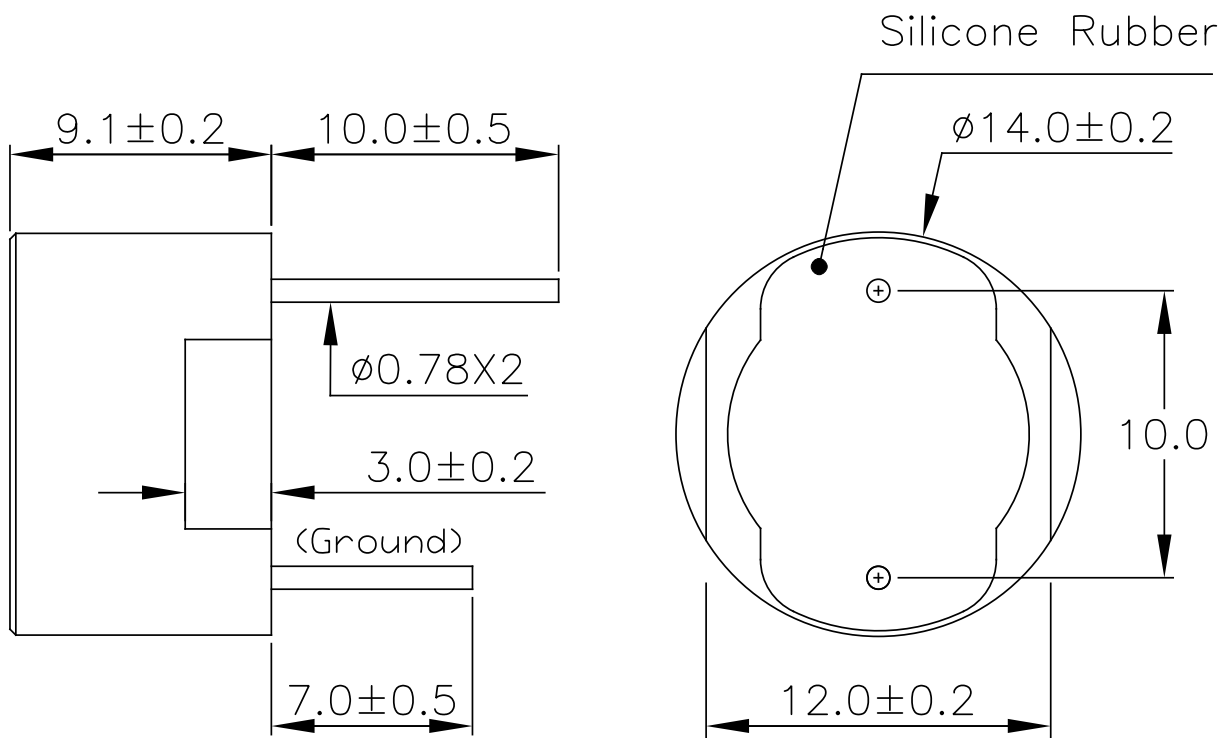


Figure 4

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