



An ultrasonic transducer is a device used to convert some other type of energy into an ultrasonic vibration. The ultrasonic transducer uses the piezoelectric effect of the piezoelectric ceramic with the same resonant frequency to convert electrical energy into mechanical vibration. Ultrasonic wave is usually generated by ultrasonic generators, which are converted into mechanical vibration by the high-frequency ultrasonic transducer, and then ultrasonic waves can be generated by ultrasonic export devices and ultrasonic receiving devices.

FEATURES

- ⦿ Ultrasonic transducers operate at specific frequencies.
- ⦿ The range of frequencies over which the transducer can operate effectively.
- ⦿ The maximum power that the transducer can handle without damage.
- ⦿ The materials used in constructing the transducer can affect its performance and durability.
- ⦿ The transducer's impedance should be matched to the electrical circuit it's connected to for optimal energy transfer and efficiency.

ADVANTAGES

1. **Precision Measurement:** Ultrasonic transducers are used for precise distance and thickness measurements in applications such as level sensing, object detection, and industrial process control.
2. **Real-time Imaging:** In medical and industrial applications, ultrasonic transducers provide real-time imaging capabilities, allowing practitioners and operators to observe dynamic processes as they occur. This real-time feedback is invaluable for guiding procedures, assessing changes, and making immediate adjustments.
3. **Sensitivity and Resolution:** Ultrasonic transducers offer high sensitivity and resolution, making them suitable for detecting small features or changes in materials. This makes them valuable for applications requiring detailed imaging or detection of subtle variations, such as flaw detection in materials or small-scale measurements in scientific research.

APPLICATION

- ◆ **Medical Imaging :** Ultrasonic transducers are extensively used in medical ultrasound imaging for imaging internal organs, tissues, and blood flow. They are employed in applications such as obstetrics, cardiology, urology, and musculoskeletal imaging.

- ◆ **Non-destructive Testing (NDT)** : In industries like aerospace, automotive, manufacturing, and construction, ultrasonic transducers are used for NDT to detect defects, cracks, thickness variations, and material properties without causing damage to the tested components.
- ◆ **Level Sensing and Measurement** : Ultrasonic transducers are used for non-contact level sensing and measurement of liquids and solids in industries such as chemical processing, water treatment, and food and beverage manufacturing.
- ◆ **Material Processing** : Ultrasonic transducers are used in processes such as ultrasonic welding, cutting, soldering, and atomization. They provide precise control and energy delivery, making them valuable in industries like automotive, electronics, packaging, and textiles, electronics, packaging, and textiles.
- ◆ **Research and Development** : Ultrasonic transducers are used in various research and development activities, including material characterization, acoustic microscopy, fluid dynamics studies, and ultrasonic spectroscopy



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