ACOUSTIC CONTROL SYSTEMS

Ultrasonic transducer S3745

DATA SHEET

Intended use

The ultrasonic single crystal transducer S3745 is used to perform the ultrasonic material testing and flaw detection in metallic, plastic and composite materials by transmitting and receiving ultrasonic longitudinal waves. The transducer can be used as a part of ultrasonic thickness gauges and flaw detectors in pulse-echo or through-transmission mode.

Main technical specifications

Type of transducer:	**Piezoelectric, single crystal**
Type of generated wave mode:	**Longitudinal**
Nominal frequency:	**500 KHz**
Effective aperture:	**30 mm**
Delay time in transducer protector:	**0.1 μs**
Piezo-element electric capacity:	**9.800 ± 2.000 pF**
Maximum excitation pulse voltage, V:	**± 200 V**
Operating temperature range	**–30...+50°C**
Connector type:	**LEMO00.250**
Dimensions:	**36.5 x ∅40 mm**
Weight:	**220 gr**

Measurement conditions and equipment used

Transmitting: square pulse with amplitude 200 V.
Pulse duration:
- **40 ns** when determining the shape and spectrum of the backwall echo-signal in a steel sample
- **100 ns** when measuring the signal amplitude in samples with different thickness and recording characteristics (calculated as a half period for the nominal transducer frequency)

Receiving: amplifier with the frequency bandwidth 0.01 to 15 MHz and the input impedance 1 kΩ. The effective noise level adjusted to the amplifier input, max. 20 μV

Damping resistor: 200 Ω (connected in parallel to the receiving piezoelement)

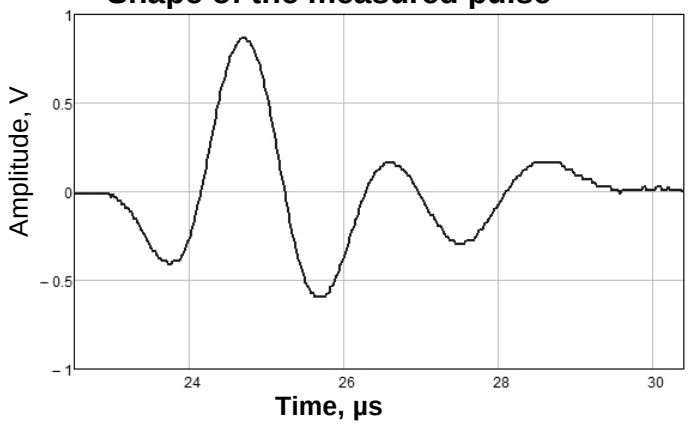
Cable: RG174 with wave impedance 50 Ω and 1 m length

Reference block: standard steel block, longitudinal wave velocity 5910 m/s, thickness 100 mm

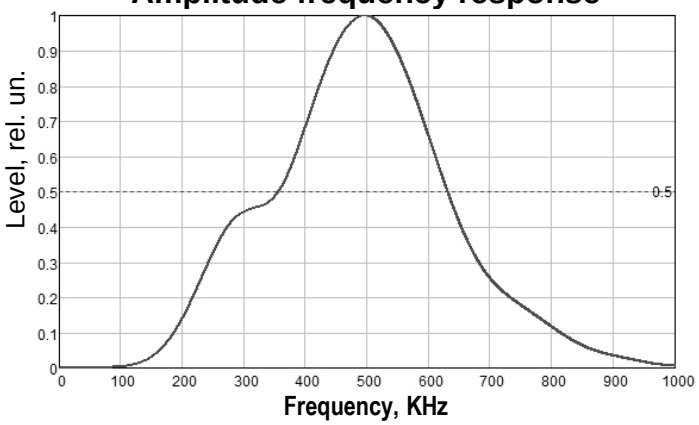
Ambient conditions Temperature 25ºC, rel. humidity 43%

Measured characteristics

Shape of the measured pulse



Amplitude frequency response



Time parameters

Echo signal duration at the –20 dB level	**5.8 μs**

Frequency parameters

Maximum spectrum frequency	**496 KHz**
Lower band frequency at –6 dB level	**356 KHz**
Upper band frequency at –6 dB level	**6 3 1 KHz**
Relative band at –6 dB level	**55.7%**