

Ultrasonic piezoelectric transducer D1471 DATA SHEET

Main technical specifications

Transducer type	contact straight beam double
Nominal frequency	4 MHz
Nominal echo pulse duration	0,8 μ s
Nominal relative band width	40 %
Nominal sensitivity	minus 60 dB
Piezoelement diameter	12 mm
Coordinating inductance	absent
Nominal piezoelement capacity	1500 \pm 150 pF
Connector type	2 x LEMO 00.250
Operation temperature range	from minus 30 to plus 50 °C
Dimensions	36 \times 24 mm
Weight	58 g

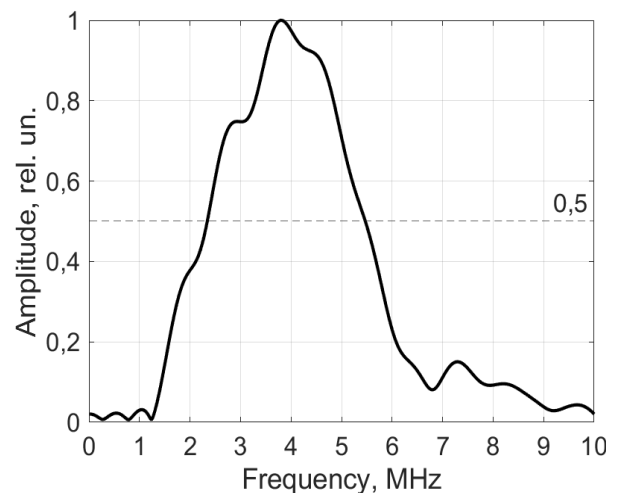
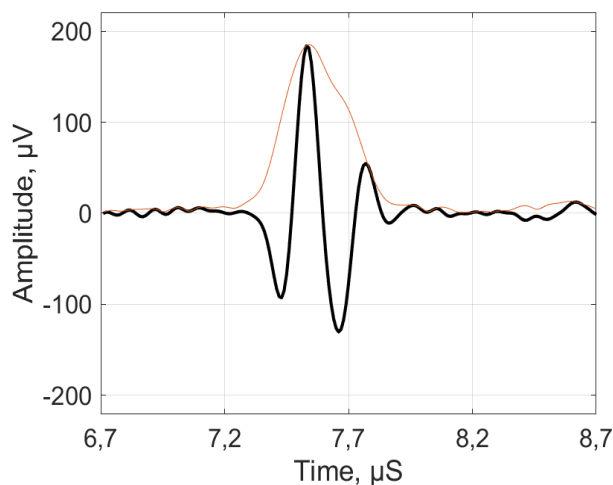


Measurement conditions and used equipment

Excitation	Rectangular pulse with amplitude 20 V and duration 50 ns, equal to half-period of nominal frequency oscillations.
Receiver	Amplifier with 0,01-15,00 MHz bandwidth and 3,6 k Ω input impedance. Effective noise level, normalized to the amplifier input level, is less than 20 μ V. Signals are pre-cleaned from low-frequency components using a digital bandpass filter with a bandwidth from 1 to 14 MHz.
Damping resistor	200 Ω (connected in parallel to the transducer).
Cable	Double LEMO-LEMO with wave resistance 50 Ω and 3 m length.
Calibration blocks	Standard parallel-sided steel samples, ultrasonic longitudinal wave velocity 5910 m/s, with thickness 0,7; 1,0; 1,5; 2,5; 10,0; 20,0; 30,0; 50,0; 100,0 mm.

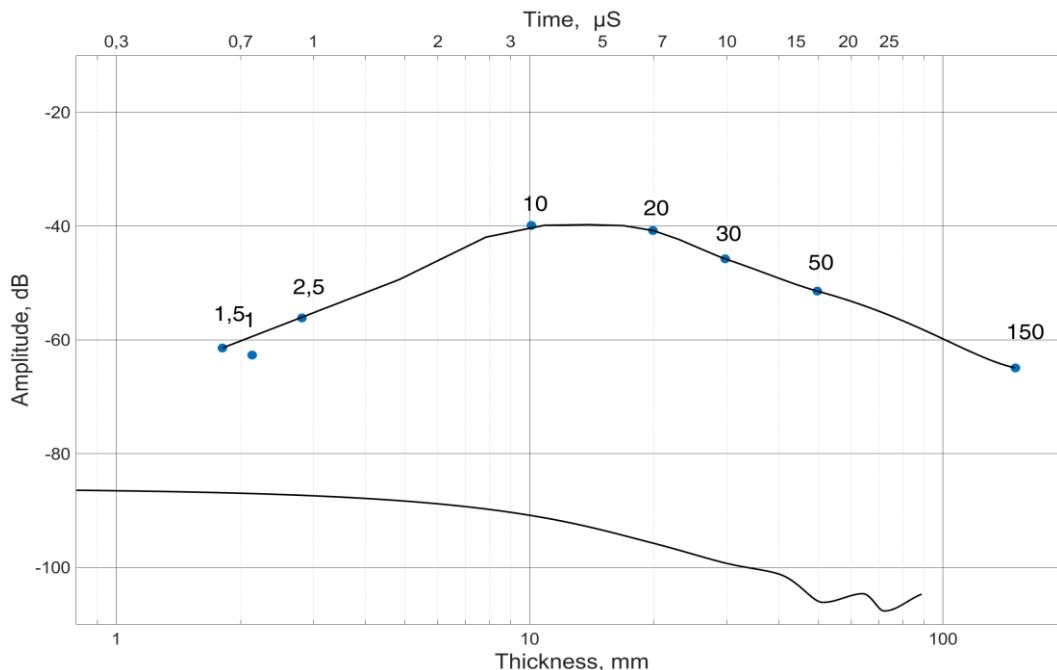
Measurement results

Backwall echo pulse for 20 mm thickness and its spectrum



Reverberation noise characteristics (RNC) for the transducer without acoustic load and the curve of backwall echo signal level for steel samples of different

The level of 0 dB corresponds to the excitation pulse amplitude.
The time and thickness axes are marked minus the ultrasound delay time in the prisms.



Calculated parameters and acceptance results

Parameters	Value	Tolerance	Result
Work frequency (mean of border spectrum frequencies), MHz	3,9	from 3,2 to 4,8 MHz	+
Echo pulse duration (at minus 20 dB level from maximum), μs	0,51	less than 0,8 μs	+
Relative spectrum bandwidth (at minus 6 dB level), %	80,0	more than 40%	+
Sensitivity (bottom echo pulse and excitation pulse amplitudes' ratio), dB	41,0	less than 60 dB	+
Difference between amplitude and RSH on a sample 20 mm thick	55,0	more than 26	+
Echo pulse amplitude, mV	185,0	–	
Spectrum maximum frequency, MHz	3,8	–	
Spectrum bandwidth (at minus 6 dB level), MHz	3,1	–	
Lower spectrum frequency (at minus 6 dB level), MHz	2,4	–	
Upper spectrum frequency (at minus 6 dB level), MHz	5,5	–	
Delay, μs	2,0	–	