ACOUSTIC CONTROL SYSTEMS

Ultrasonic piezoelectric transducer D1771

DATA SHEET

Main technical specifications

|	
Transducer type:	Contact straight beam double
Nominal frequency:	4 MHz
Nominal echo pulse duration:	0.6 μs
Nominal relative band width:	90 %
Nominal sensitivity:	-60 dB
Piezoelement diameter:	12 mm
Nominal echo pulse delay in protector:	0.15 μs
Nominal piezoelement capacity:	1500 $\pm$ 150 pF
Connector type:	LEMO 00.250
Operation temperature range:	from -30 to +50 $^\circ$C
Dimensions:	23$\times$44$\times$15 mm
Weight:	22 g

Measurement conditions and used equipment

Excitation: Rectangular pulse with amplitude 20 V and duration **125 ns**, equal to half-period of nominal frequency oscillations.

Reciever: Amplifier with 0.01-15 MHz bandwidth and 400 Ω input impedance. Effective noise level, normalized to the amplifier input level, is less than 20 μV.

Damping resistor: 100 Ω (connected in parallel to the transducer).

Cable: Single LEMO-LEMO with wave resistance 50 Ω and 1.2 m length.

Calbration blocks: Standard parallel-sided steel samples, ultrasonic longitudinal wave velocity 5910 m/s, with thickness 100 mm, 50 mm, 30 mm, 20 mm, 10 mm, 2.5 mm, 1.5 mm, 1 mm, 0.7 mm.
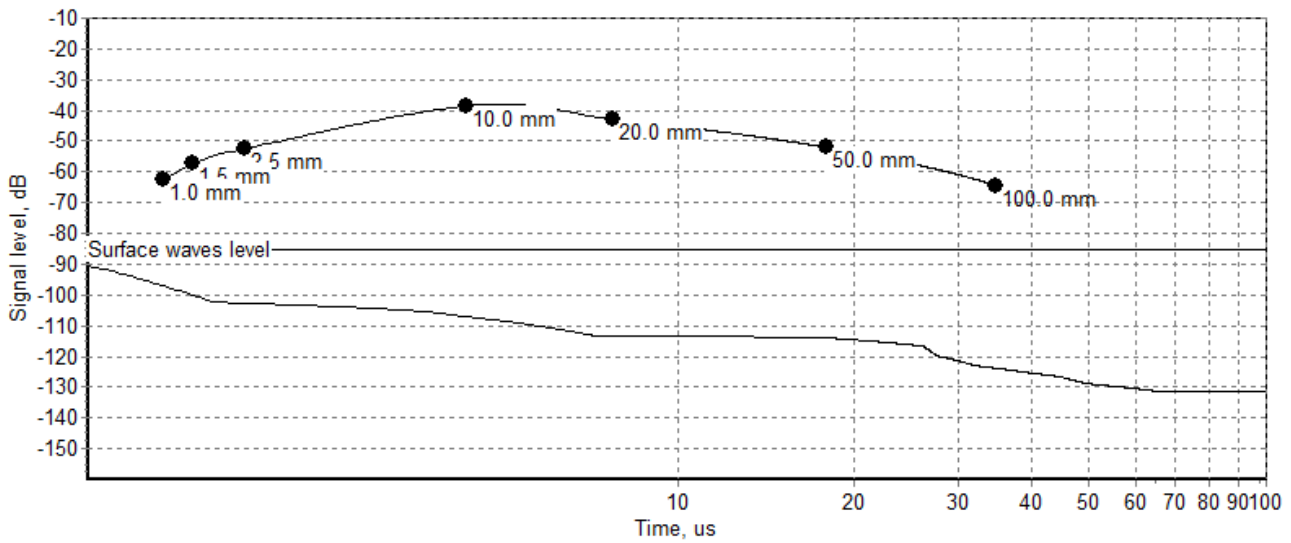
Measurement results

Backwall echo pulse for 20 mm thickness and its spectrum
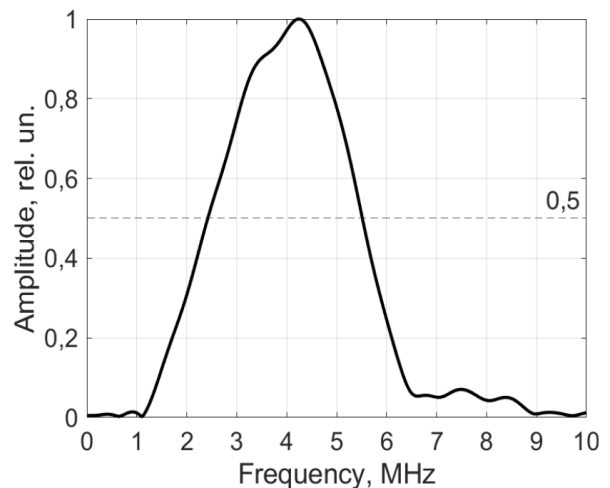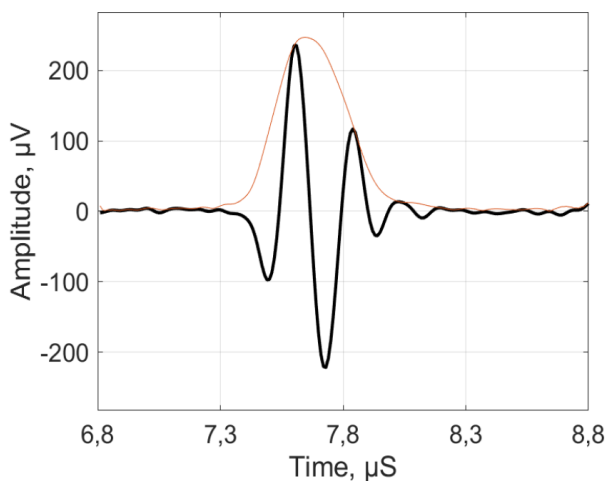
Reverberation noise characteristics (RNC) for the transducer without acoustic load and the curve of backwall echo signal level for steel samples of different thickness
The level of 0 dB corresponds to the excitation pulse amplitude.

Calculated parameters and acceptance results

Parameter	Value	Tolerance	Result
Work frequency (Mean of border spectrum frequencies) **, MHz**	4.1	3.2 – 4.8	**+**
Echo pulse duration (at -20 dB level from maximum) **, μs**	0.41	<= 0.6	**+**
Relative spectrum bandwidth (at -6 dB level) **, %**	85	70 – 110	**+**
Sensitivity (bottom echo pulse and excitation pulse amplitudes' ratio), **dB**	-39	>= -60	**+**
Echo pulse amplitude, mV	211	—	
Delay, μs	2.3	—	
Spectrum maximum frequency, MHz	4.1	—	
Lower spectrum frequency (at -6 dB level) **, MHz**	2.4	—	
Upper spectrum frequency (at -6 dB level) **, MHz**	5.8	—	
Spectrum bandwidth (at -6 dB level) **, MHz**	3.5	—	