



## Ultrasonic piezoelectric transducer S5096 5.0A45D6CS DATA SHEET

### Main technical specifications

Transducer type:	Contact angle beam single
Nominal frequency:	5 MHz
Nominal beam angle:	45 °
Nominal echo pulse duration:	1.1 $\mu$ s
Nominal relative band width:	50 %
Nominal sensitivity:	-80 dB
Piezoelement diameter:	6 mm
Nominal piezoelement capacity:	1100 $\pm$ 100 pF
Connector type:	LEMO 00.250
Operation temperature range:	from -20 to +50 °C
Dimensions:	36 $\times$ 18 $\times$ 16 mm
Weight:	20 g

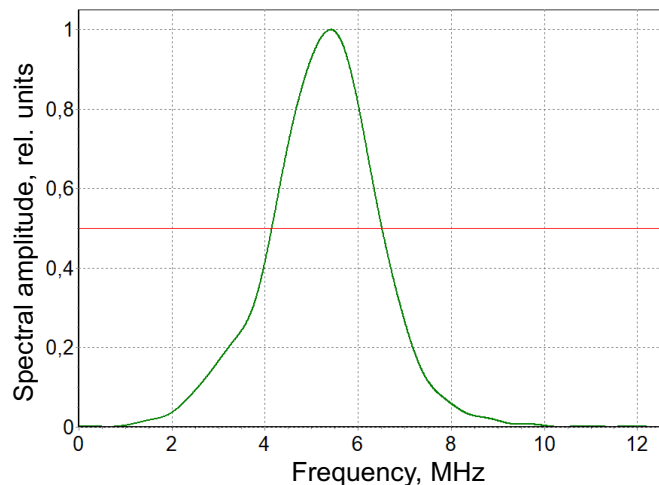
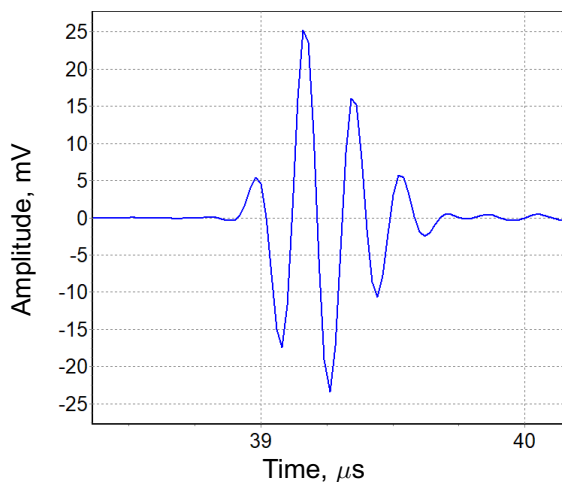


### Measurement conditions and used equipment

Excitation:	Rectangular pulse with amplitude 20 V and duration <b>200 ns</b> , equal to half-period of nominal frequency oscillations.
Receiver:	Amplifier with 0.01-15 MHz bandwidth and 400 $\Omega$ input impedance. Effective noise level, normalized to the amplifier input level, is less than 20 $\mu$ V.
Damping resistor:	100 $\Omega$ (connected in parallel to the transducer).
Cable:	Single LEMO-LEMO with wave resistance 50 $\Omega$ and 1.2 m length.
Samples:	1. Calibration block CO-3 from the set of ultrasonic calibration blocks 55724, serial number 190212; 2. Calibration block CO-2 from the set of ultrasonic calibration blocks 55724, serial number 190212; 3. Standard sample CO-1M of steel 20, ultrasonic shear wave velocity 3226 m/s.

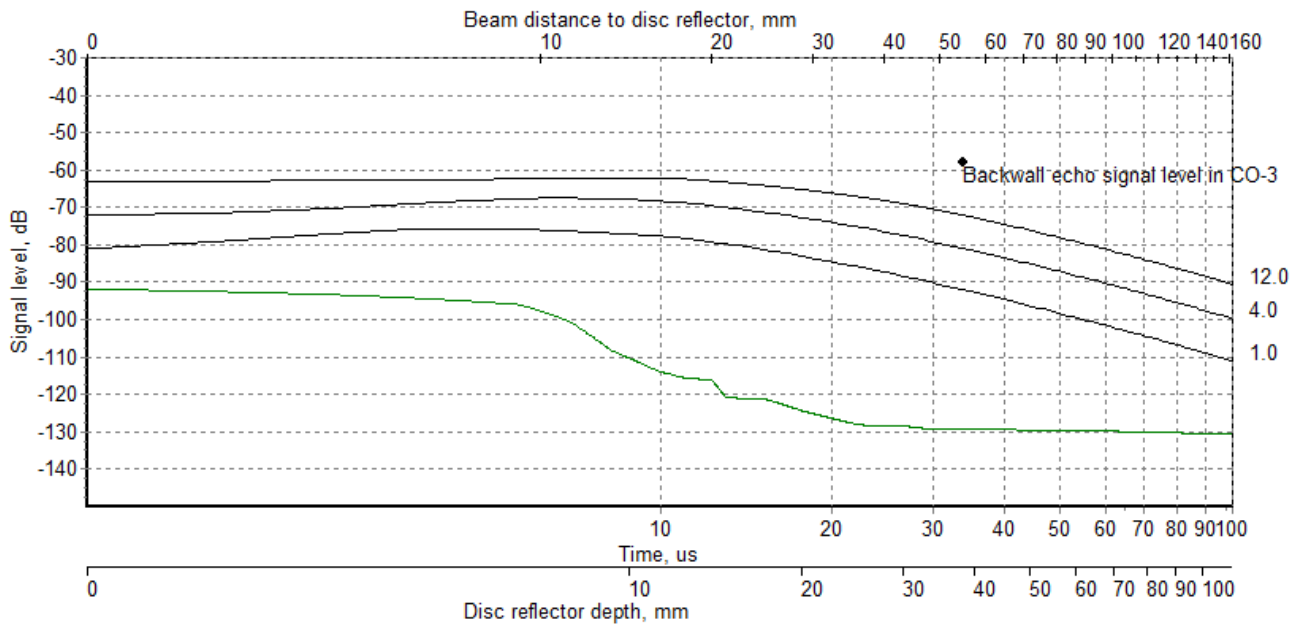
### Measurement results

Echo pulse for 50 mm thickness and its spectrum



**Reverberation-noise characteristics (RNC) of the transducer without acoustic load and DGS diagram for flat bottomed reflectors with area 1, 3 and 10 mm<sup>2</sup>**

The level of 0 dB corresponds to the amplitude of the transducer excitation pulse.



**Calculated parameters and acceptance results**

Parameter	Value	Tolerance	Result
<b>Work frequency</b> (Mean of border spectrum frequencies) , MHz	5.3	4 – 6	+
<b>Beam angle in steel</b> , °	46	43.5 – 46.5	+
<b>Echo pulse duration</b> (at -20 dB level from maximum) , μs	0.6	<= 1.1	+
<b>Relative spectrum bandwidth</b> (at -6 dB level) , %	44	30 – 70	+
<b>Sensitivity</b> (bottom echo pulse and excitation pulse amplitudes' ratio), dB	-58	>= -80	+
<b>Sensitivity margin above the RNC in the time interval 2 - 50 μs according to DGS for reflector area of 1 mm<sup>2</sup></b> , dB	71	>= 40	+
<b>Echo pulse amplitude</b> , mV	25	—	
<b>Transducer offset</b> , mm	7	—	
<b>Delay</b> , μs	5.3	—	
<b>Spectrum maximum frequency</b> , MHz	5.4	—	
<b>Lower spectrum frequency</b> (at -6 dB level) , MHz	4.1	—	
<b>Upper spectrum frequency</b> (at -6 dB level) , MHz	6.5	—	
<b>Spectrum bandwidth</b> (at -6 dB level) , MHz	2.4	—	