ACOUSTIC CONTROL SYSTEMS

Electromagnetic acoustic transducer S3950 2.5A0D15ES

DATA SHEET

MAIN TECHNICAL SPECIFICATION

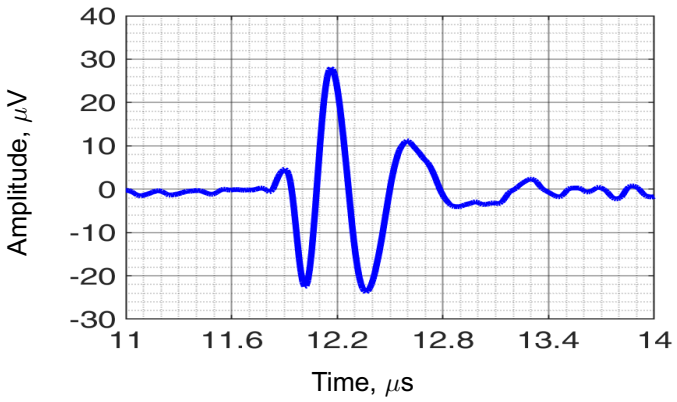
Transducer type:	**straight-beam, coupled, shear waves, with radial polarization, with pulsed magnetic bias**
Nominal frequency:	**2,5 MHz**
Effective transducer aperture:	**15 mm**
Maximal excitation pulse voltage:	**500 V**
Maximal voltage of pulse magnetization:	**20 V**
Duration of magnetization pulse:	**1.5 ms**
Maximal pulse repetition rate:	**10 Hz**
Direct current resistance of signal inductor:	**2.8 $\pm$ 0.1 Ohm**
Operating temperature range:	**-30 to 60 °C**
Overall dimensions:	**31x42 mm**
Type of socket:	**LEMO FGG.2K.810.CLAC851**
Weight:	**250 g**

MEASUREMENT CONDITIONS AND EQUIPMENT

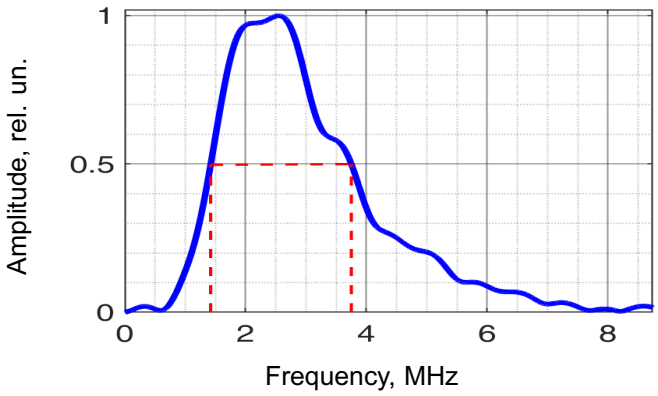
Reference excitation signal: unipolar square pulse with amplitude 400 V $\pm$ 30 V, pulse duration 100 $\pm$ 15 ns by 50% of the maximum voltage amplitude. Pulsed magnetic bias voltage 12 V, magnetic bias pulse duration 730 μs, delay of excitation from magnetic bias 600 μs.
Reference block: RB103, steel 40PI13, serial number 108001 longitudinal wave velocity 6080 m/s, shear waves velocity 3360 m/s.
Measured pulse: echo pulse from the backwall of reference block, depth 20 mm.
Induced noise: white thermal noise with 2 mV effective amplitude, generated in inductor coil placed adjacent to the protector of the transducer.

MEASURED CHARACTERISTICS

Shape of the measured echo pulse



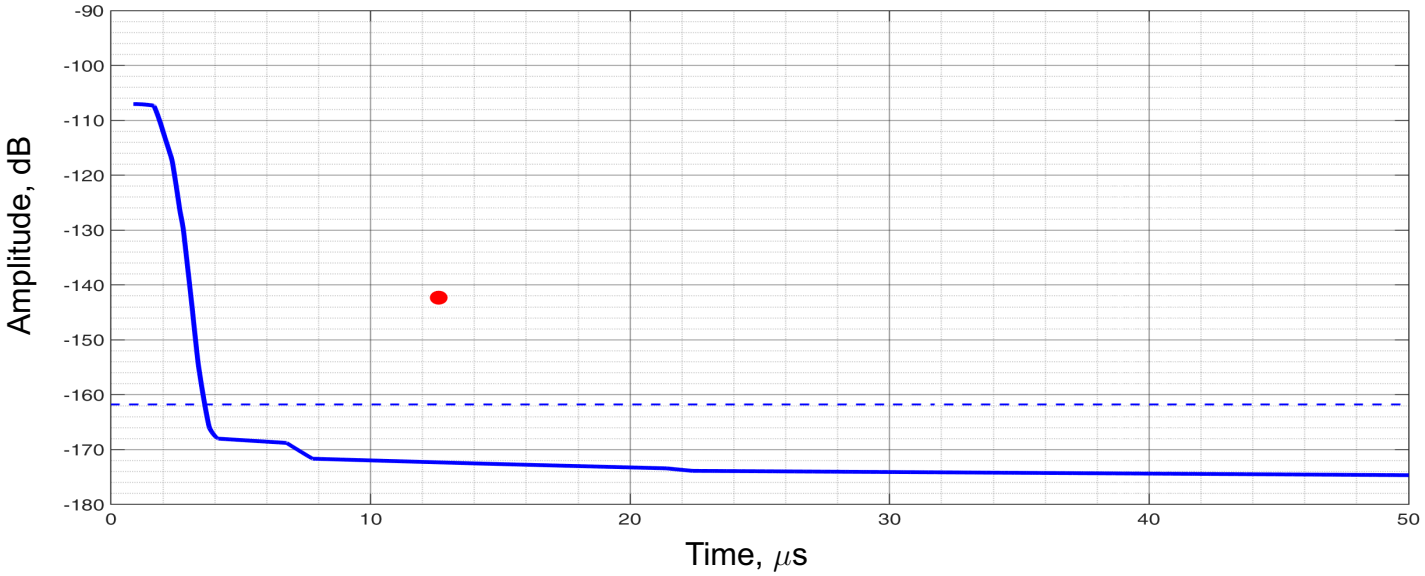
Amplitude frequency response



Echo pulse duration:	**1.42 μs**
Echo pulse amplitude A_e:	**28.5 μV**
Bandwidth Π:	**2.3 MHz**
Relative bandwidth B_w:	**90%**

Peak frequency f_p:	**2.5 MHz**
Lower cut-off frequency f_l:	**1.4 MHz**
Upper cut-off frequency f_u:	**3.8 MHz**
Centre frequency f_c:	**2.6 MHz**

Reverberation noise curve (RNC)

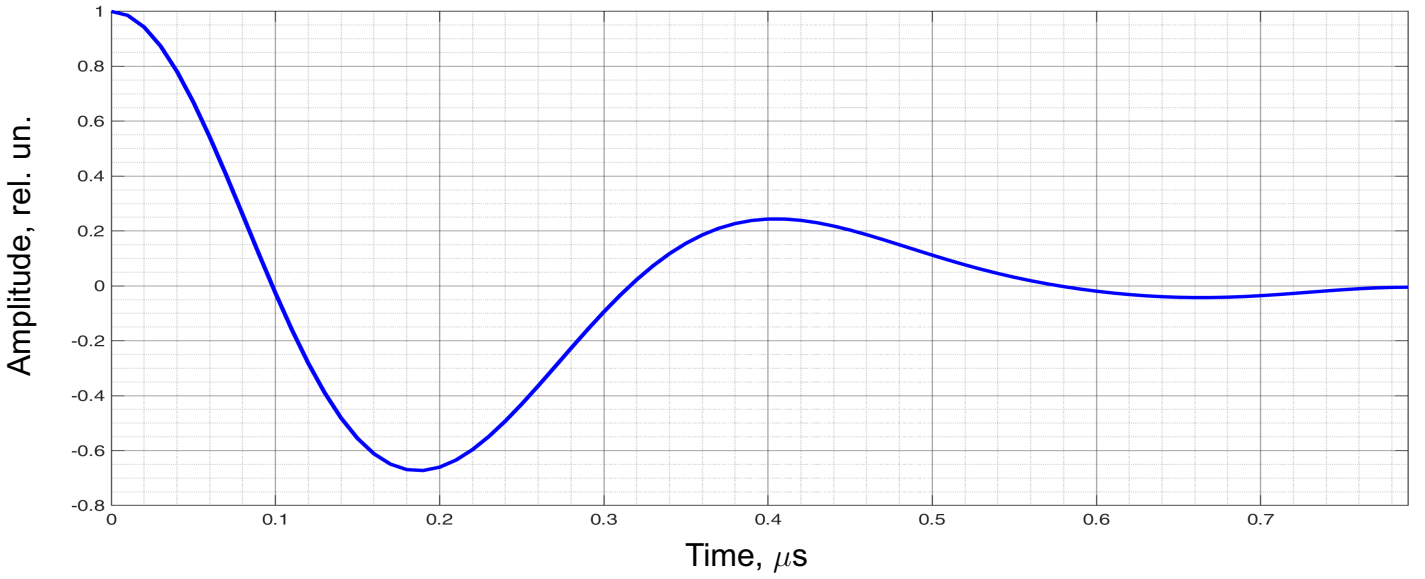


Signal-to-noise ratio between the backwall signal in the reference block and transducer self-noise: **30 dB**

Signal-to-noise ratio between the backwall signal in the reference block and transducer self-noise in presence of electromagnetic noise: **19 dB**

RNC level at 5 μs: **-168 dB**

Autocorrelation function (ACF)



Amplitude of the first maximum of ACF: **0.24**

Time position of the first maximum of ACF: **0.4 μs**

Note:

The RNC is normalized by test excitation signal amplitude and given in logarithmic scale. Transducer RNC is indicated by the solid line. The dash line shows the amplitude of induced noise in sum with the RNC. The dot indicates the echo pulse amplitude received on the CO-2 reference block.