ACOUSTIC CONTROL SYSTEMS

Ultrasonic transducer S1823

DATASHEET

Intended use

Dry point contact ultrasonic transducers S1823 with wave type switching and a are used to perform ultrasonic inspections of various non-metallic materials and products to determine their physical and mechanical properties.
The transducers are regularly used as a transmitter-receiver couple.

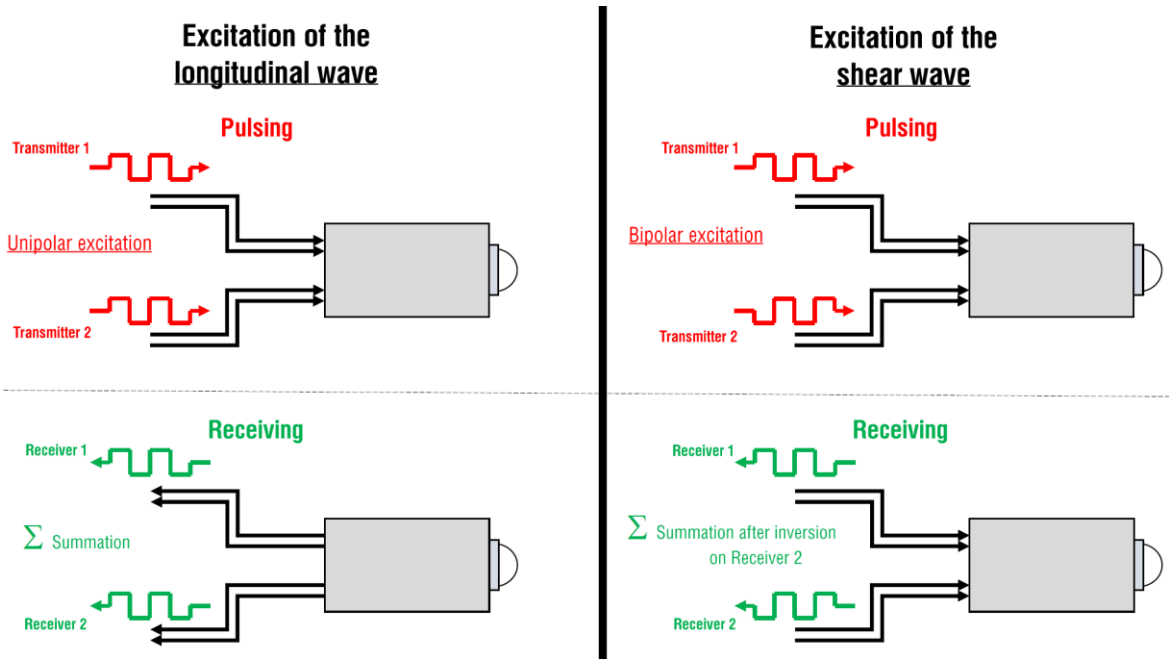
Main technical specifications

Type of transducer:	**Dry-point-contact**
Type of generated wave mode:	**Longitudinal or shear-horizontal**
Special properties:	**Couplant-free operation**
Nominal frequency:	**120 kHz**
Electric capacity of the piezoelectric element:	**1.400 ± 200 pF**
Maximum excitation pulse voltage, V:	**400 V**
Connector type:	**OSMT or LEMO00**
Overall dimensions:	**11x22.6 mm**
Weight:	**14 gr**

Measurement conditions and equipment used

Temperature 25ºC, rel. humidity 43%
The method of passing of the ultrasonic waves through a tapered sample from fluoroplastic is used. The tested transducer operates in the transmission mode. As an ultrasonic pulse receiver, a broad-band single-crystal piezoelectric transducer with the operating frequency 5 MHz and effective aperture 10 mm is used.
Generator transmitting signal: half-sine video pulse with 200 V amplitude and 2.0 mcs duration time at the -20 dB level from the maximum.
Receiving path parameters: the integrating amplifier AKS310 is used. The amplification is 400 at 100 kHz frequency, the band 2 is 250 kHz and the input impedance is 40 kOhm.
In the longitudinal wave generation and receiving mode, the piezoelectric elements of the tested transducer are connected in parallel and co-phasal. In the shear wave mode, they are connected antiphasal via the transformer with the interrupted ferrite core, the transformation ratio is 1:1 and the inductivity of each coil is 20 mH.

Excitation scheme for longitudinal and shear wave generation



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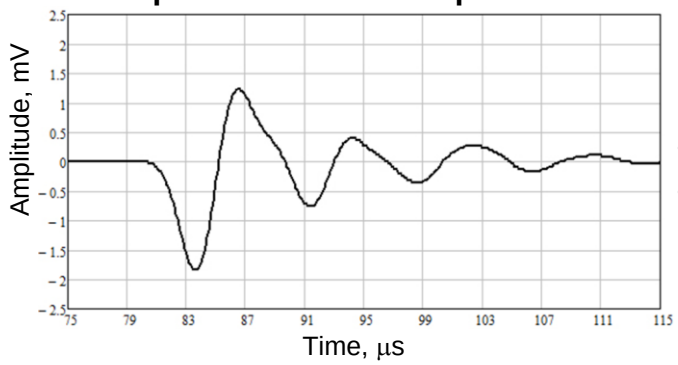
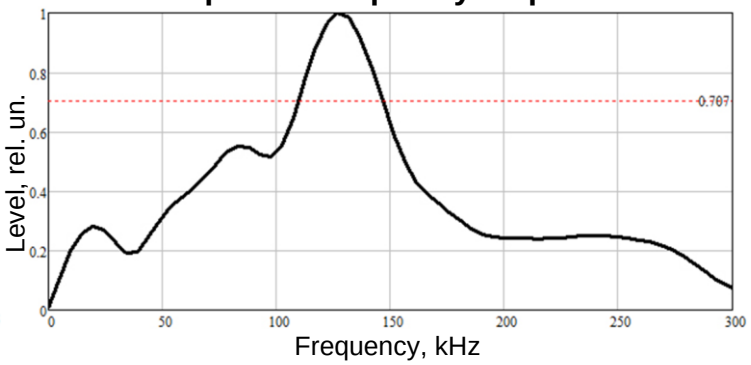
Measured characteristics in the longitudinal wave mode

Shape of the measured pulse



Amplitude frequency response

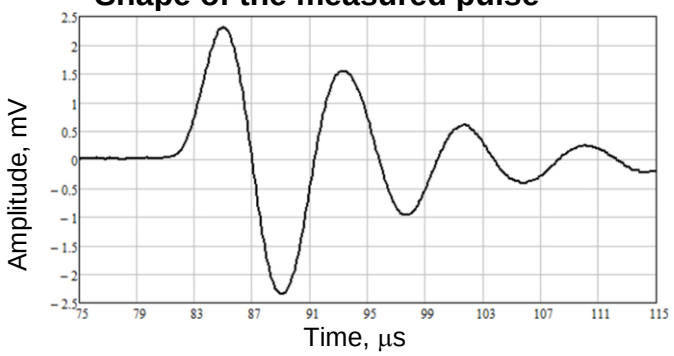


Signal parameters

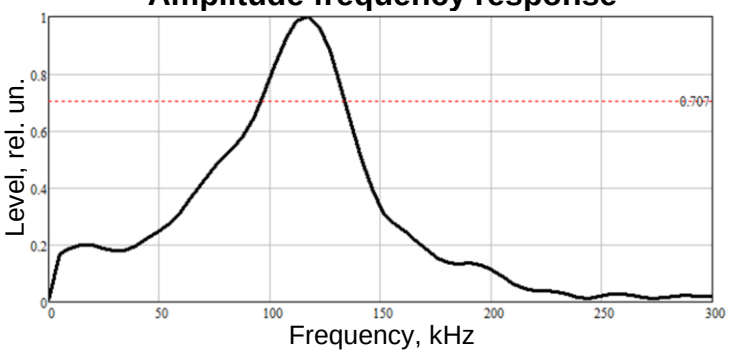
Maximum half-wave amplitude of the pulse, mV	AL_{max} = 1.9	Lower band frequency at the -3 dB level, kHz	FL_1 = 110
Pulse duration at the -14 dB, msec	τL_{14dB} = 170	Upper band frequency at the -3 dB level, kHz	FL_2 = 144
Maximum spectrum frequency, kHz	FL_{max} = 127	Average band frequency at the -3 dB level, kHz	FL_c = 127
Relative frequency band at the -3 dB level, %	PL_{3dB} = 26.9	Average compound band frequency at the -3 dB level, kHz	FL_g = 126

Measured characteristics in the shear wave mode

Shape of the measured pulse



Amplitude frequency response



Signal parameters

Maximum half-wave amplitude of the pulse, mV	AS_{max} = 2.3	Lower band frequency at the -3 dB level, kHz	FS_1 = 95.2
Pulse duration at the -14 dB, msec	τS_{14dB} = 200	Upper band frequency at the -3 dB level, kHz	FS_2 = 134
Maximum spectrum frequency, kHz	FS_{max} = 117	Average band frequency at the -3 dB level, kHz	FS_c = 115
Relative frequency band at the -3 dB level, %	PS_{3dB} = 34	Average compound band frequency at the -3 dB level, kHz	FS_g = 113

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