ACOUSTIC CONTROL SYSTEMS

Ultrasonic transducer S1823

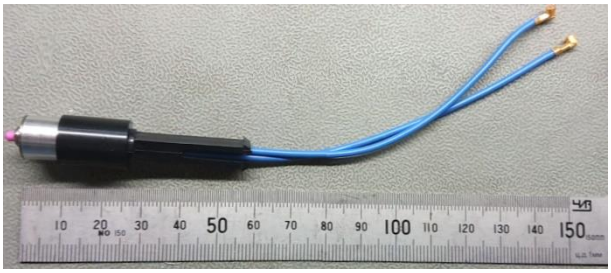
DATASHEET

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

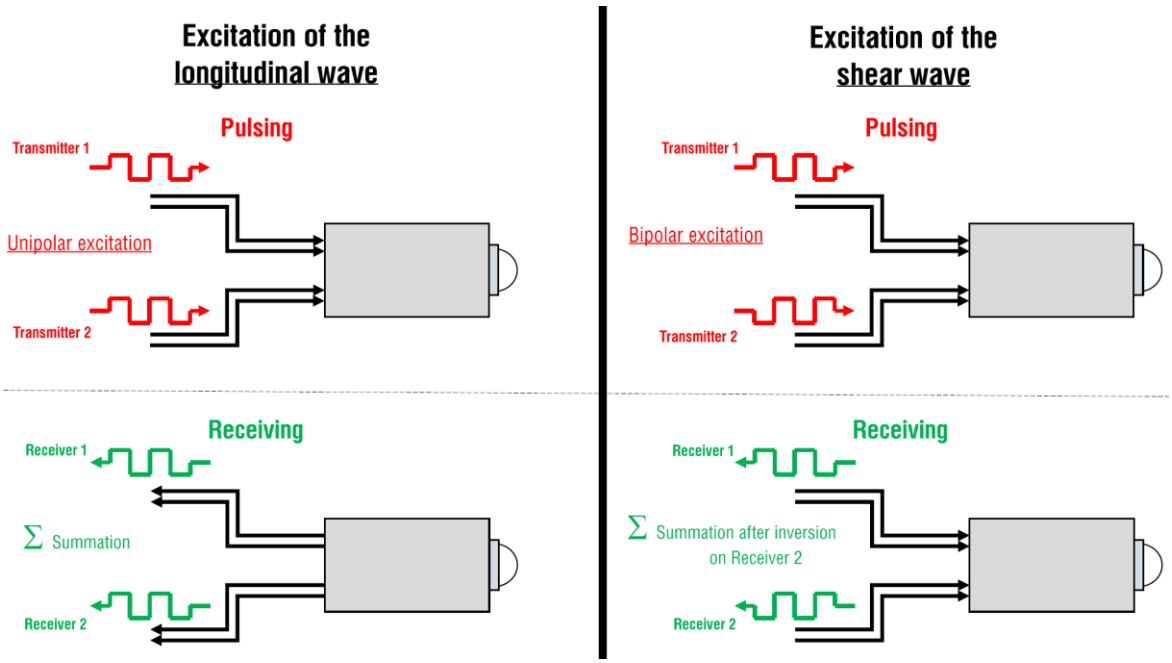
Type of transducer:	**Dry-point-contact**
Type of generated wave mode:	**Longitudinal or shear-horizontal**
Special properties:	**Couplant-free operation**
Nominal frequency:	**60 kHz**
Electric capacity of the piezoelectric element:	**1.400 ± 200 pF**
Maximum excitation pulse voltage, V:	**400 V**
Connector type:	**OSMT or LEMO00**
Overall dimensions:	**11x22.6 mm**
Weight:	**14 gr**



Measurement conditions and equipment used

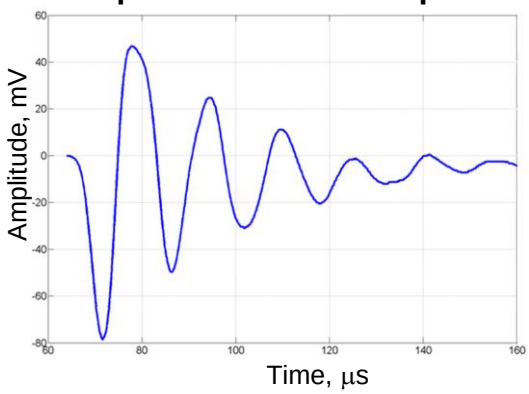
Temperature 25ºC, rel. humidity 43%
The method of passing of the ultrasonic waves through a tapered sample from fluoroplastic is used. The tested transducer operates in the transmission mode. As an ultrasonic pulse receiver, a broad-band single-crystal piezoelectric transducer with the operating frequency 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

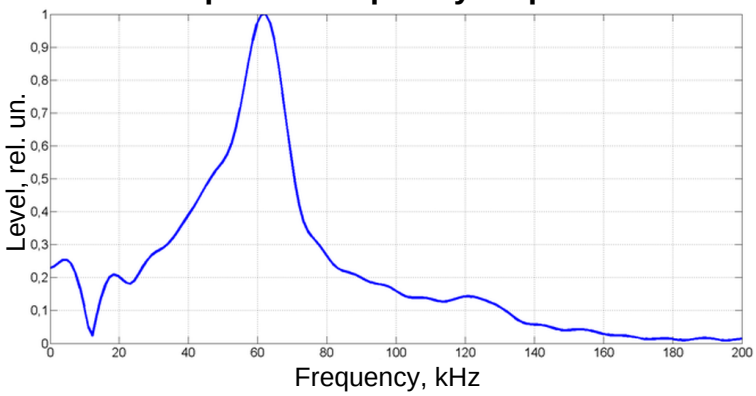


Measured characteristics in the longitudinal wave mode

Shape of the measured pulse



Amplitude frequency response

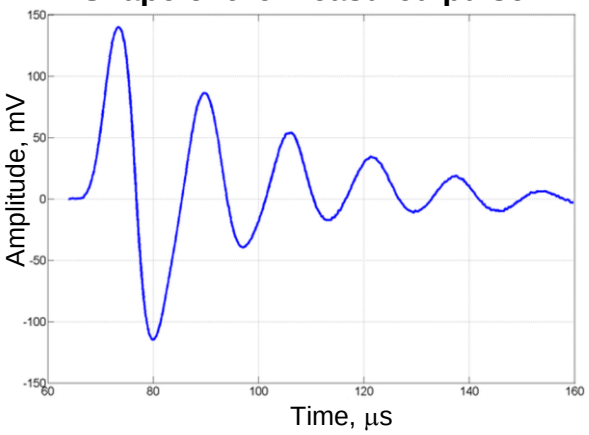


Signal parameters

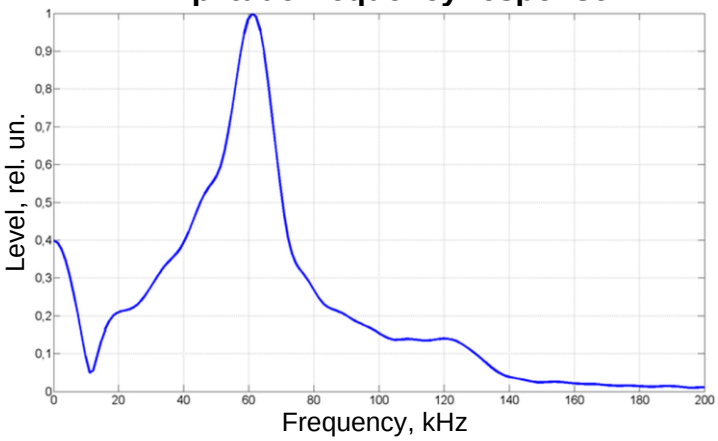
Maximum half-wave amplitude of the pulse, V	AL_{max} = 0.078	Lower band frequency at the -3 dB level, kHz	FL_1 = 55.0
Pulse duration at the -14 dB, msec	τL_{14dB} = 52.6	Upper band frequency at the -3 dB level, kHz	FL_2 = 67.8
Maximum spectrum frequency, kHz	FL_{max} = 62.3	Average band frequency at the -3 dB level, kHz	FL_c = 61.4
Relative frequency band at the -3 dB level, %	PL_{3dB} = 21	Average compound band frequency at the -3 dB level, kHz	FL_g = 61.1

Measured characteristics in the shear wave mode

Shape of the measured pulse



Amplitude frequency response



Signal parameters

Maximum half-wave amplitude of the pulse, V	AS_{max} = 140	Lower band frequency at the -3 dB level, kHz	FS_1 = 54.2
Pulse duration at the -14 dB, msec	τS_{14dB} = 54.3	Upper band frequency at the -3 dB level, kHz	FS_2 = 68.2
Maximum spectrum frequency, kHz	FS_{max} = 61.0	Average band frequency at the -3 dB level, kHz	FS_c = 61.0
Relative frequency band at the -3 dB level, %	PS_{3dB} = 23	Average compound band frequency at the -3 dB level, kHz	FS_g = 60.8