

## Ultrasonic transducer S7394

### DATA SHEET

#### Intended use

A general-purpose electro-magnetic acoustic transducer S7392 for the couplant-free transmitting and receiving ultrasonic shear waves can be used for thickness measurements by A1270 EMAT.

#### Main technical specifications

Type of transducers:	normal beam, EMAT with a permanent magnet, shear-horizontal waves with linear polarization
Nominal frequency:	<b>2.5 MHz</b>
Effective transducer aperture diameter:	<b>10 mm</b>
Maximum excitation pulse voltage:	<b>500 V</b>
Direct current resistance of the signal inductor:	<b>1.5 ± 0.3 Ohm</b>
Operating temperature range:	<b>from -20 to+ 60 °C</b>
Overall dimensions:	<b>35x58 mm</b>
Weight:	<b>255 gr</b>



#### Measurement conditions and equipment used

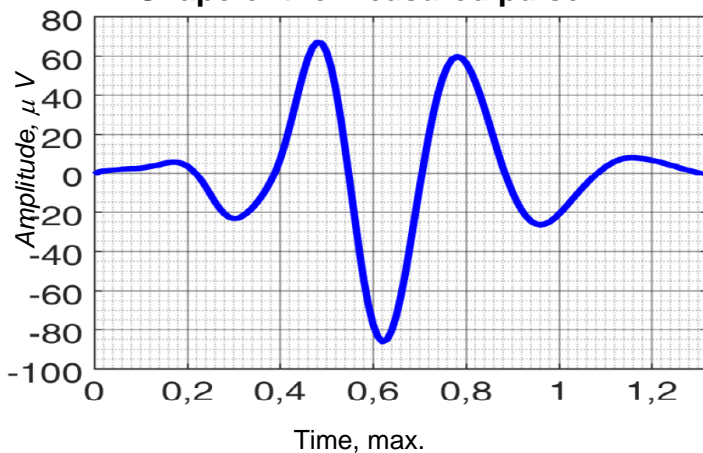
Temperature 24°C, rel. humidity 82%

Testing exciting signal: unipolar square pulse with amplitude 400 V ± 40 V, pulse duration 130 ns ± 13 ns by 50% of the max voltage amplitude.

Calibration sample: semicylinder CO-3, steel 20, radius 55 mm, longitudinal wave velocity 5930 m/s, transversal waves velocity 3247 m/s.

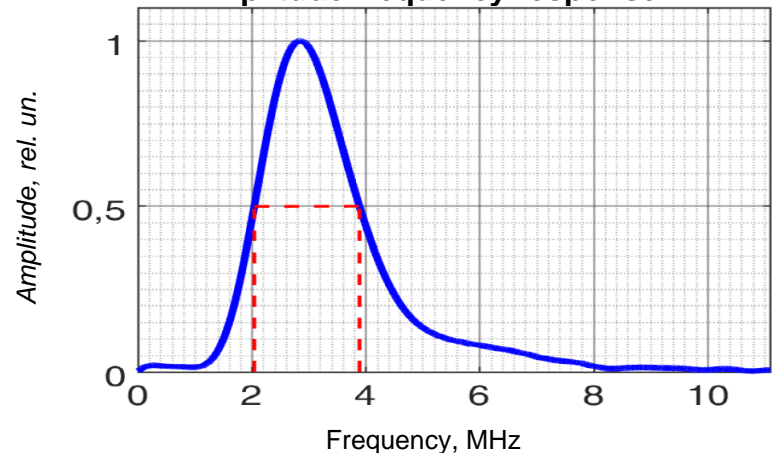
#### Measured characteristics

Shape of the measured pulse



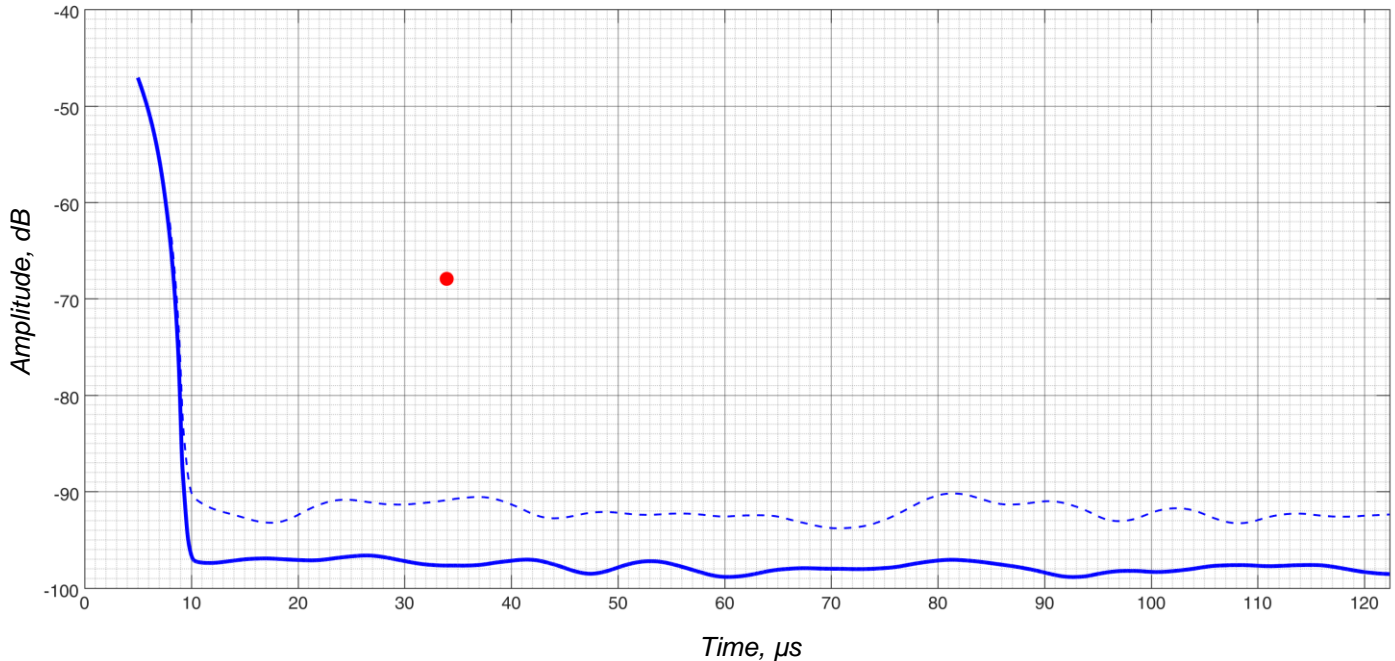
Duration of the echo pulse: **0.94 μs**  
 Echo-Pulse amplitude: **86.3 μV**  
 Band width: **1.8 MHz**  
 Relative band width: **66 %**

Amplitude frequency response



Maximum AFR frequency  $f_p$ : **2.9 MHz**  
 Lower AFR frequency  $f_l$ : **2 MHz**  
 Upper AFR frequency  $f_u$ : **3.9 MHz**  
 Operating AFR frequency  $f_c$ : **2.8 MHz**

## Reverberation noise curve (RNC)

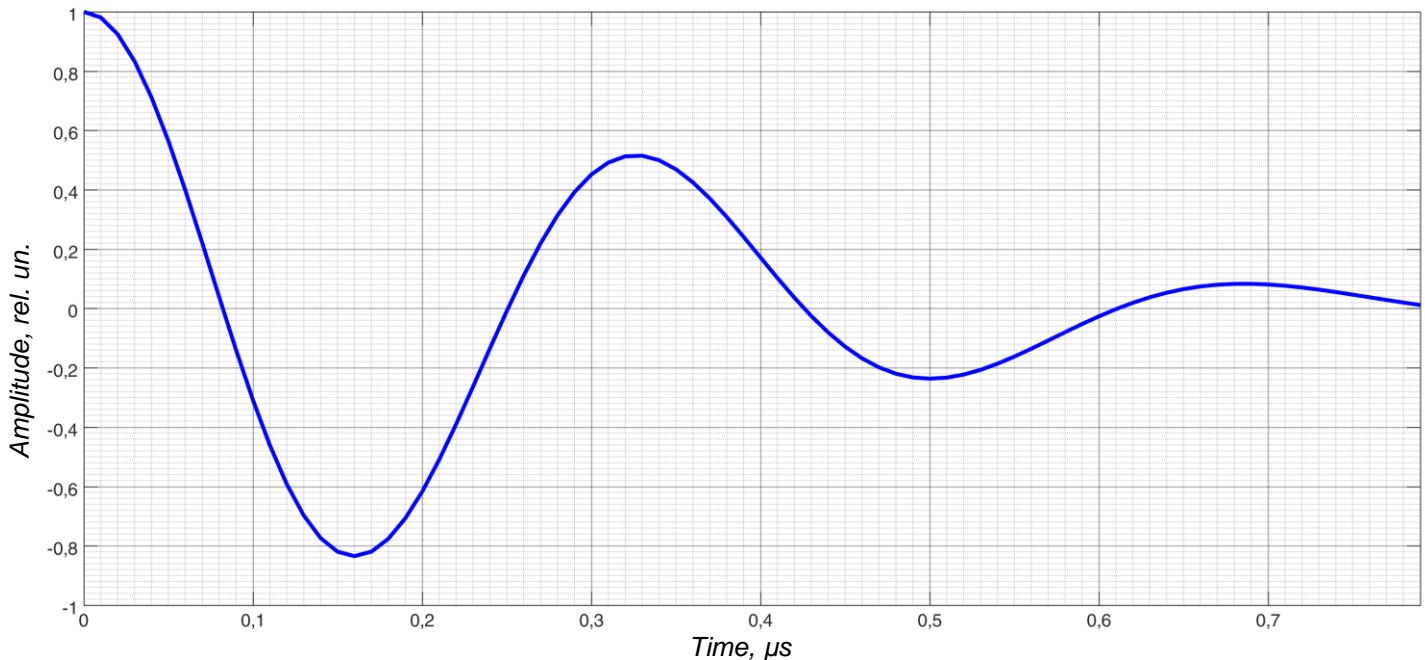


**Signal-to-Noise ratio ( $20 \lg A_e / RNC_{34\mu s}$ ) = 30 dB**

**Signal-to-Noise+Induced interference ratio ( $20 \lg A_e / RNC_{34\mu s}$ ) = 23 dB**

**Note: RNC is normalized to the amplitude of transmitter pulse and represented in logarithmic scale. The solid line represents the RNC. The dashed line represents the amplitude of induced interference (blank thermal noise). The red dot represents the amplitude of the backwall signal on CO-2 specimen.**

## Auto-correlation function (ACF)



**Main lobe maximum of ACF: 0.51**

**Time shift of the main lobe maximum of ACF: 0.33μs**