Application Note 007

S-series 75 MHz Transducers

Introduction

Sonix™ is pleased to offer a new line of S-series 75 MHz transducers that provide improved spatial resolution and more robust performance than our MSIC-series 75 MHz transducers.

The S-series transducers are delay line transducers which have been modified using Sonix™ proprietary technology to reduce delay lines while maintaining signal strength and improving image resolution.

A new style cable has also been developed to minimize electrical resonances that can contaminate the A-scan signal.

A description of how to use the S-series transducers in pulse echo (PE), through transmission (TT), and simultaneous pulse echo through transmission (PETT) modes follows.

PE Inspection

The S-series 75 MHz operates in a similar fashion to the MSIC series 75 MHz. The transducer is screwed into the transducer collar and dropped into place (or on older systems is screwed into the search tube), and the cable is then used to connect the transducer to the H series remote pulser.

As with the MSIC series, the transducer is focused by moving the z-axis until the reflection of interest is maximized. However, the time position of the focus will be different due to the delay line, which will add approximately 9µs to the focus position as compared to the MSIC series. However, it is important to still optimize the focus position using the z-axis to obtain the highest image quality.

Figures 1 and 2 show the PE results obtained from a TQFP sample using the MSIC-series and S-series 75's respectively. Figure 2 clearly shows the improved resolution possible with the S-series 75 MHz. Figures 3 and 4 show the respective A-scans.

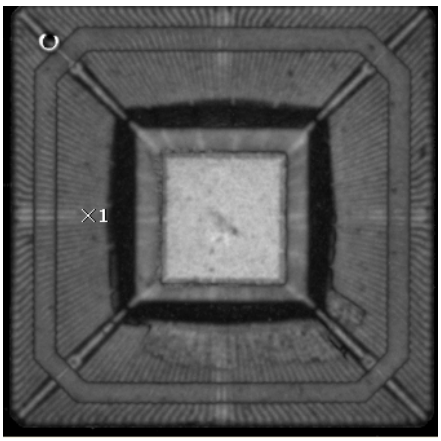

Figure 1: MSIC-series 75 MHz PE image

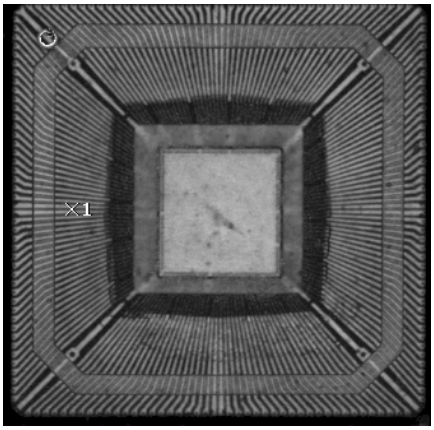

Figure 2: S-series 75 MHz PE image showing improved resolution

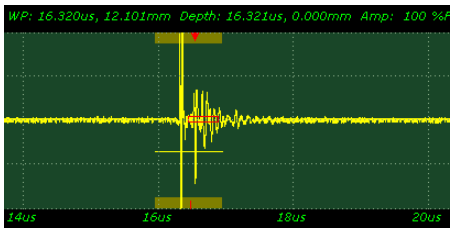

Figure 3: MSIC-series 75 MHz A-scan

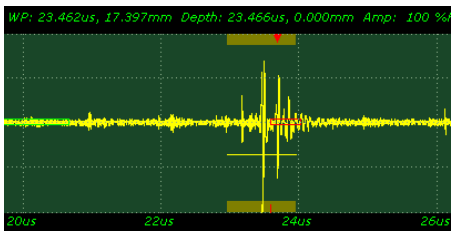

Figure 4: S-series 75 MHz A-scan

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TT Inspection

As with the MSIC-series, an appropriate TT receiver wand should be mounted on the system and connected to the Through connector on the H series remote pulser. The user should first focus on the interfaces of interest in Echo mode and then switch to Through mode using the Instruments tab in WinIC™.

Although the S-series 75 MHz is a delay line transducer, no delay line signals will appear in the A-scan since we are looking at the signal received by the TT wand. However, the time will still be increased by approximately 4µs due to the one way travel thought the delay line.

Figures 5 and 6 show the TT results obtained from a TQFP sample using the MSIC-series and S-series 75's respectively. Figure 6 clearly shows the improved resolution possible with the S-series 75 MHz. Figures 7 and 8 show the respective A-scans.

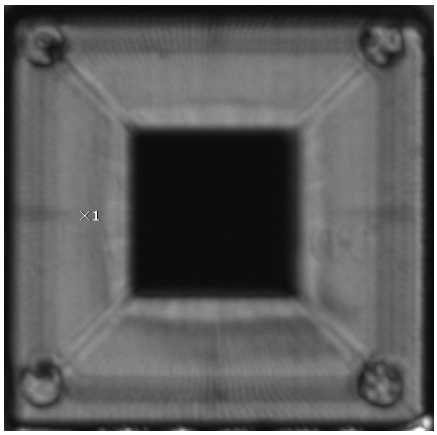

Figure 5: MSIC-series 75 MHz TT image

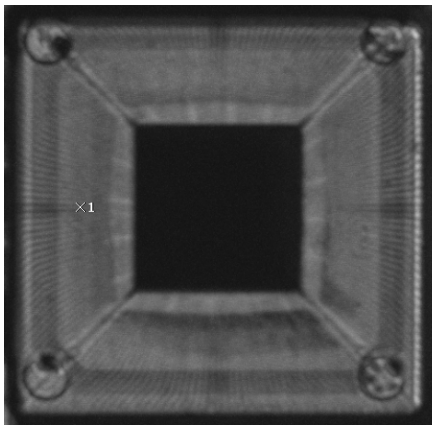

Figure 6: S-series 75 MHz TT image showing improved resolution

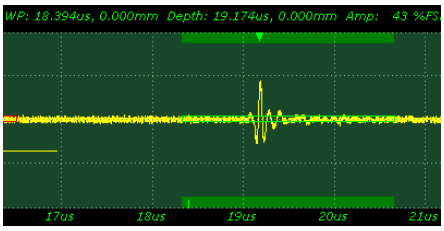

Figure 7: MSIC-series 75 MHz A-scan (TT)

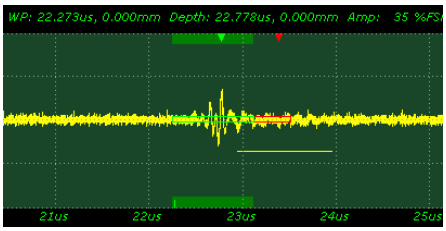

Figure 8: S-series 75 MHz A-scan (TT)

PETT Inspection

As with the MSIC-series, an appropriate TT receiver wand should be mounted on the system and the transmitter and receiver should be connected according to Application Note 001.

The resulting PE and TT images are as shown in Figures 1, 2, 5, and 6, which demonstrate that the S-series 75 MHz provides improved spatial resolution.

Figures 9 and 10 show the PETT A-scans for the MSIC-series and S-series transducers respectively. Since we are combining PE and TT signals, delay lines will be visible on the scope, although they will be minimal. Also, due to the delay line time effects, the TT signal for the S-series 75 will occur to the left of the PE signals.

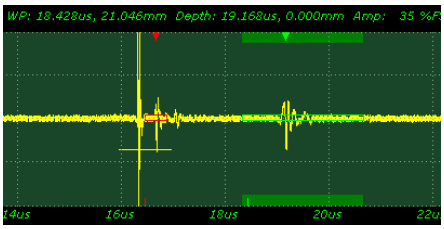

Figure 9: MSIC-series 75 MHz A-scan (PETT)

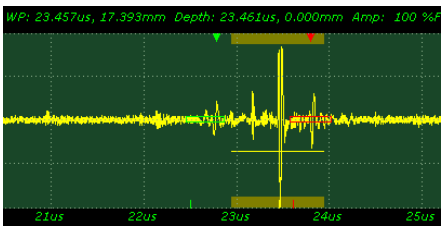

Figure 10: S-series 75 MHz A-scan (PETT)

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