

Distance measurement using Elmos E524.06 Ultrasonic Sensor IC

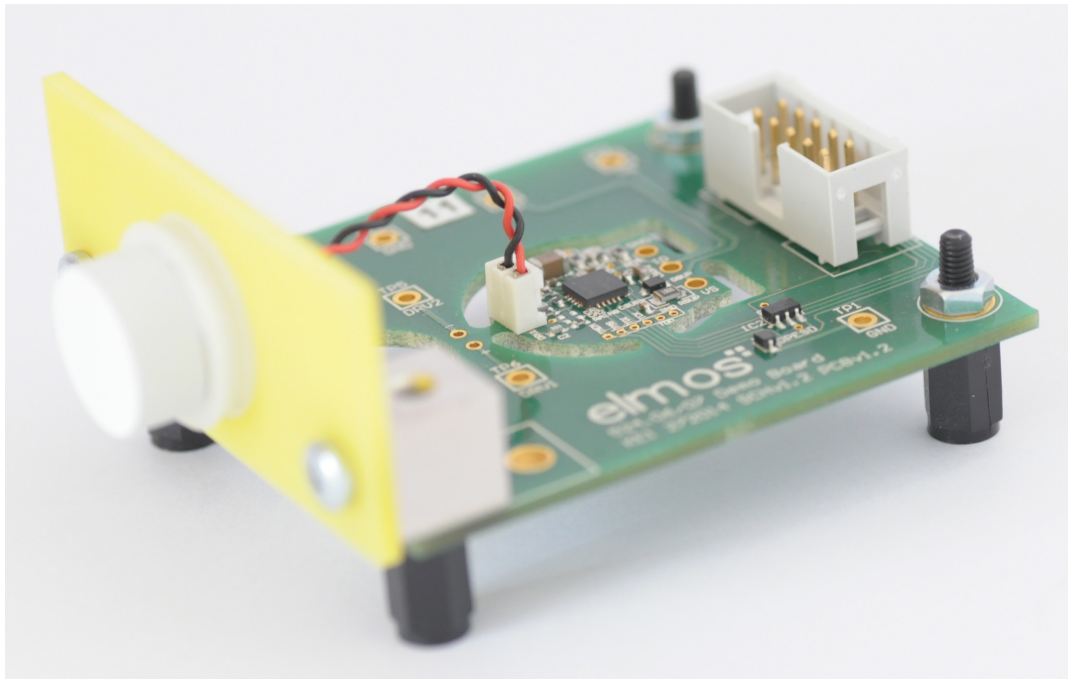


Figure 1: E524.06 Ultrasonic Sensor Board

Elmos E524.06 Ultrasonic Sensor Board

The E524.06 is part of the Elmos “Ultrasonic Direct Drive” IC-family. The ICs of this family provide a significant reduction of system costs and size by removing the transformer and other external components. A measurement cycle is initiated by the master ECU and the current echo information is sent back to the ECU by comparing the receiving signal with a configurable threshold line. The comparable interface to the standard family allows a quick evaluation and easy replacement of analog systems. The devices are free configurable and can be adapted to many different transducers.

May 15, 2015

1 What you get

- Elmos E524.06 Ultrasonic Sensor Board
- Murata Ultrasonic Transducer
- 10-wire ribbon cable (0.5m)

2 What you need in addition

- This Elmos E524.06 Ultrasonic Sensor Board is ready to be integrated in your own application. Just connect the supply and the communication interface to an existing application and start your own evaluation. Therefore the small circuit in the middle of the pcb can be separated. This allows a very easy integration in a standard sensor housing.
- In addition to this Sensor Board, Elmos offers a complete “Ultrasonic Park Assist” Demonstrator, which allows you to check out the performance of the device in detail. A complete system (1 Master Board and up to 4 Sensor Boards) offers the following options:
 - Visualization of envelope and threshold curves
 - Echo detection and distance measurement
 - Easy configuration and adjustment of all IC parameters
 - Non-volatile memory programming

2.1 Optional available Boards

	Document	Order Code	Description
[1]	25AN0150E.xx	K5240X-0001	“Ultrasonic Park Assist” Demonstrator (Master Board)
[2]	25AN0151E.xx	K52402-0002	E524.02 – Ultrasonic Sensor Board
[3]	25AN0152E.xx	K52403-0002	E524.03 – Ultrasonic Sensor Board
[4]	25AN0153E.xx	K52405-0002	E524.05 – Ultrasonic Sensor Board
[5]	25AN0154E.xx	K52406-0002	E524.06 – Ultrasonic Sensor Board

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3 Layout

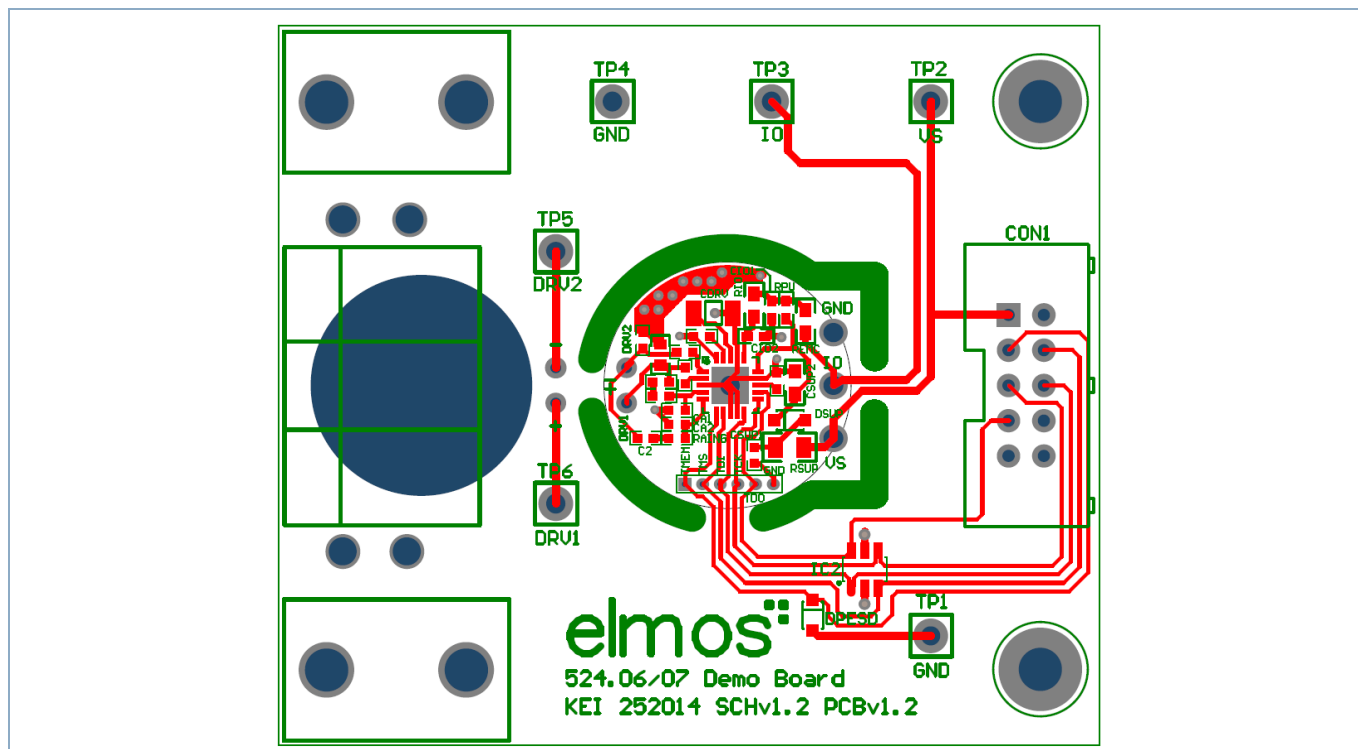


Figure 2: Top-Layout of E524.06 Sensor Board

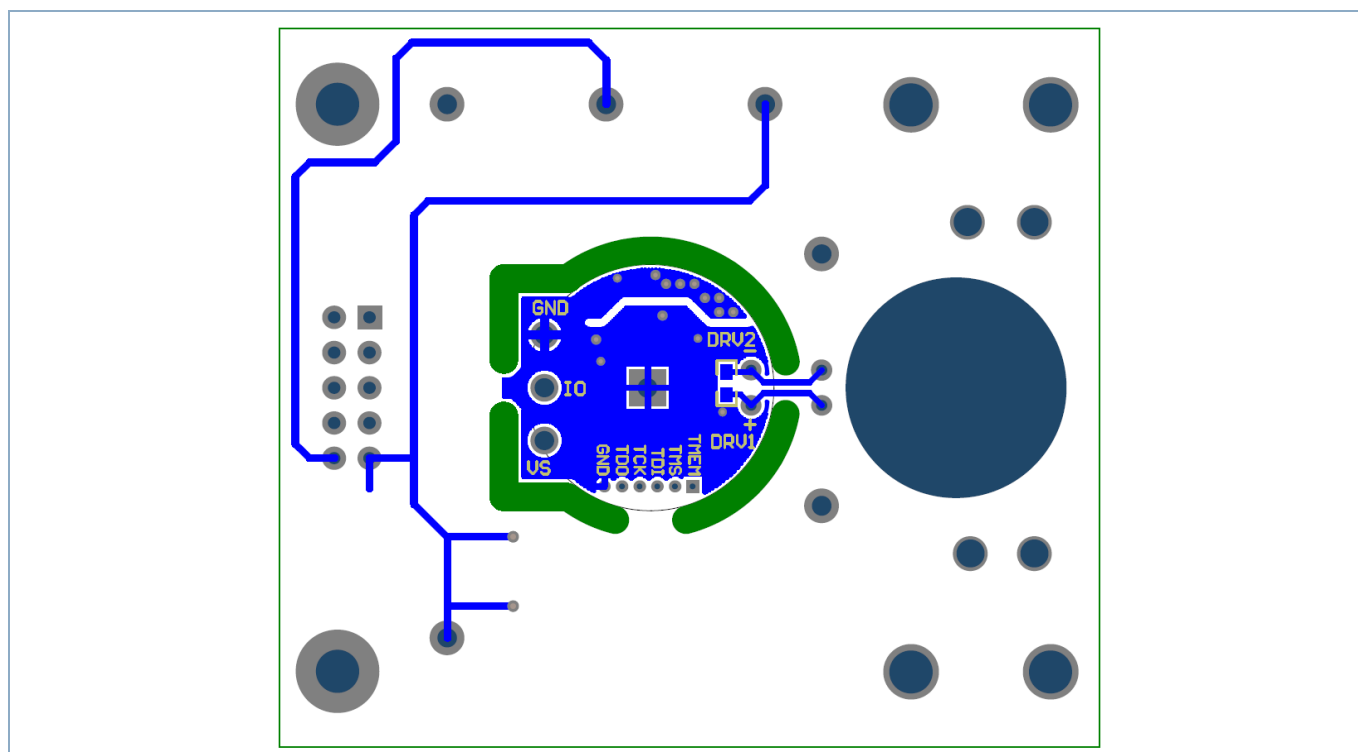


Figure 3: Bottom-Layout of E524.06 Sensor Board

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4 Schematic

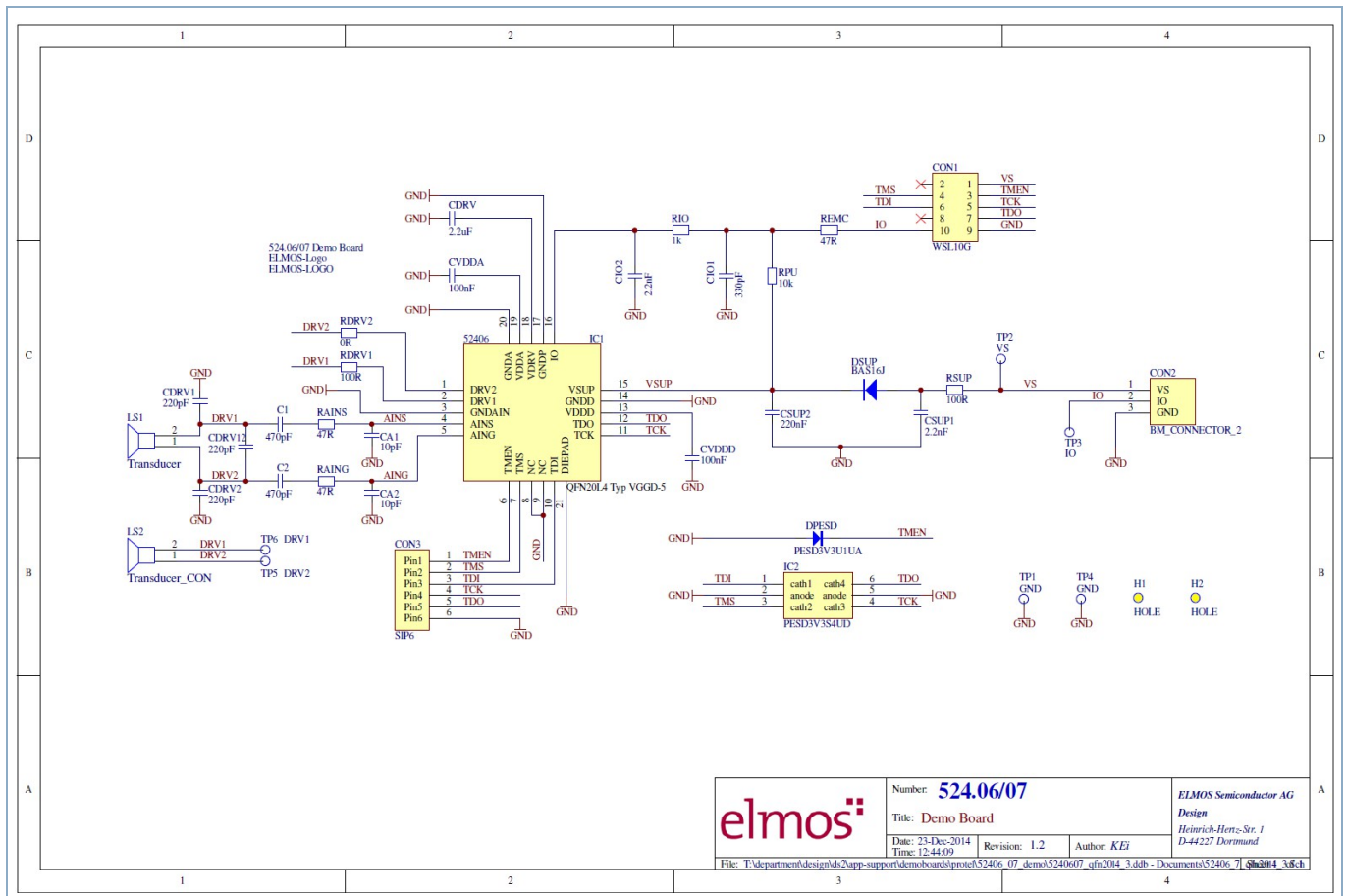


Figure 4: Schematic of E524.06 Sensor Board

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5 Bill of materials (BOM)

Pos.-No.	Value	Order-No.	Supplier	Remark	Manufacturer
RAING, RAINS	470hm, 1%	667-ERJ-2RKF47R0X	Mouser	0402, 1/10W	Panasonic – ECG
RDRV1	1000hm, 1%	667-ERJ-2RKF1000X	Mouser	0402, 1/10W	Panasonic – ECG
RDRV2	00hm	667-ERJ-2GE0R00X	Mouser	0402	Panasonic – ECG
RPU	10kOhm, 1%	667-ERJ-2RKF1002X	Mouser	0402, 1/10W	Panasonic – ECG
REMC	470hm, 1%	667-ERJ-3EKF47R0V	Mouser	0603, 1/10W	Panasonic – ECG
RIO	1kOhm, 1%	667-ERJ-3EKF1001V	Mouser	0603, 1/10W	Panasonic – ECG
RSUP	1000hm, 5%	667-ERJ-6ENF1000V	Mouser	0805, 1/4W	Panasonic – ECG
CDRV2	220pF, 5%	81-GCM155R71H221K37D	Mouser	0402, X7R, 50V, AEC-Q200	Murata
CIO1	330pF, 5%	81-GCM1555C1H331J16D	Mouser	0402, NPO, 50V, AEC-Q200	Murata
C1 C2	470pF, 5%	81-GCM1555C1H471JA6D	Mouser	0402, NPO, 50V, AEC-Q200	Murata
CSUP1, CIO2	2.2nF, 10%	81-GCM155R71H222K37D	Mouser	0402, X7R, 50V, AEC-Q200	Murata
CVDDA, CVDDD	100nF, 10%	81-GCM155R71C104KA5D	Mouser	0402, X7R, 16V, AEC-Q200	Murata
CSUP2	220nF, 10%	81-GCM188R71E224K55D	Mouser	0603, X7R, 25V, AEC-Q200	Murata
CDRV	2.2uF, 10%	81-GCM31CR71H225KA5L	Mouser	1206, X7R, 50V, AEC-Q200	Murata
IC1	E524.06	E524.06	Elmos	IC for directly driven Ultrasonic Sensors	Elmos Semiconductor
IC2	PESD3V3S4UD	771-PESD3V3S4UDT/R	Mouser	DIODE ARRAY ESD 3.3V 6TSOP	NXP
DSUP	BAS16J	771-BAS16J135	Mouser	SMD-Si-Diode 100V 250mA SOD323F	NXP
DPESD	PESD3V3U1UA	771-PESD3V3U1UA-T/R	Mouser	DIODE ESD PROT UNI 3.3V SOD323-2	NXP
CON1	10 pin contact strip	PSB10	Schukat	10 pin contact strip in tub, gray	SPEED
LS1	Ultrasonic sensor	MA58AF14-ON or similar	Murata	58kHz transducer	Murata

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Usage Restrictions

Elmos Semiconductor AG provide the E524.06 Ultrasonic Sensor Board simply and solely for IC evaluation purposes in laboratory. The Kit or any part of the Kit must not be used for other purposes or within non laboratory environments. Especially the use or the integration in production systems, appliances or other installations is prohibited.

The pcb's are delivered to customer are for the temporary purpose of testing, evaluation and development of the Elmos IC's only. Elmos will not assume any liability for additional applications of the pcb.

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