TMF882X-Shield

Quick Start Guide

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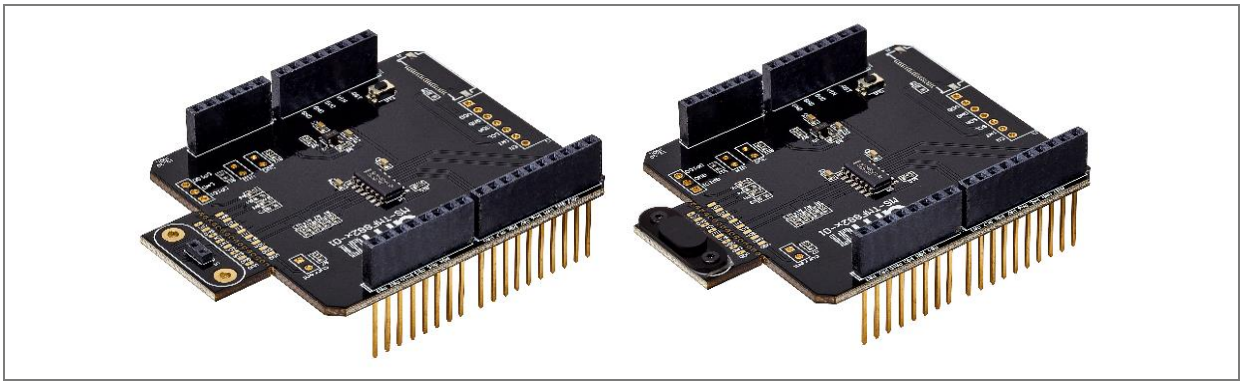
1 Out of the box

The TMF882X-SHIELD board is an Arduino UNO form factor development platform for quick evaluation of the TMF8820, TMF8821 & TMF8828 multi-zone dToF sensors.

Featuring a small (20 mm x 12 mm) sensor breakaway board, this kit can be easily integrated into custom, prototype hardware.

Several cover glass and air gap spacers are provided, this helps to evaluate the system for optimal optical performance.

Figure 1: TMF882X-SHIELD with and without airgap spacer & cover glass



No.	Item	Description
1	TMF882X-Shield	Main PCB with TMF8828 sensor breakaway board
2	x4 Cover Glass	0.5 mm / 0.6 mm / 0.7 mm / 0.8 mm - thickness
3	x4 Air gap spacers	0.17 mm / 0.25 mm / 0.38 mm / 0.5 mm - thickness
4	2 screws	Screws for securing cover glass to PCB
5	Screwdriver	Screwdriver for securing screws

2 Software

2.1 Overview

The TMF882X-Shield is designed to operate with a variety of MCU hardware platforms.

Please refer to the TMF8820 / TMF8821 / TMF8828 Arduino Demo Kit User Guide. This guide shows how to run the shield board with an Arduino Uno R3 or compatible. It is available on the ams OSRAM website: E.g. ams-osram.com/tmf8828 for TMF8828.

ams OSRAM also provides python software to control the TMF882X sensor on the TMF882X-SHIELD. Please note that you will need your own USB-to-I²C controller (e.g. FT232H based). The user guide included with the python software shows you how to set up an evaluation system.

2.2 Online resources

Table 1: Online resources

Resource	Web link
Arduino Firmware / Driver	ams-OSRAM-Group/tmf8820_21_28_driver_arduino
Python Software	ams-OSRAM-Group/tmf8820_21_28_driver_python
TMF882x tool for custom SPAD maps	ams-OSRAM-Group/tmf8820_21_28_tool_SPAD_maps
TMF882x post processing filter (de-scattering filter)	ams-OSRAM-Group/tmf8820_21_28_driver_descattering_filter

3 Hardware overview

The EVM includes an I²C level shifter and supply voltage regulator to allow the EVM to be used with input voltages up to 5V.

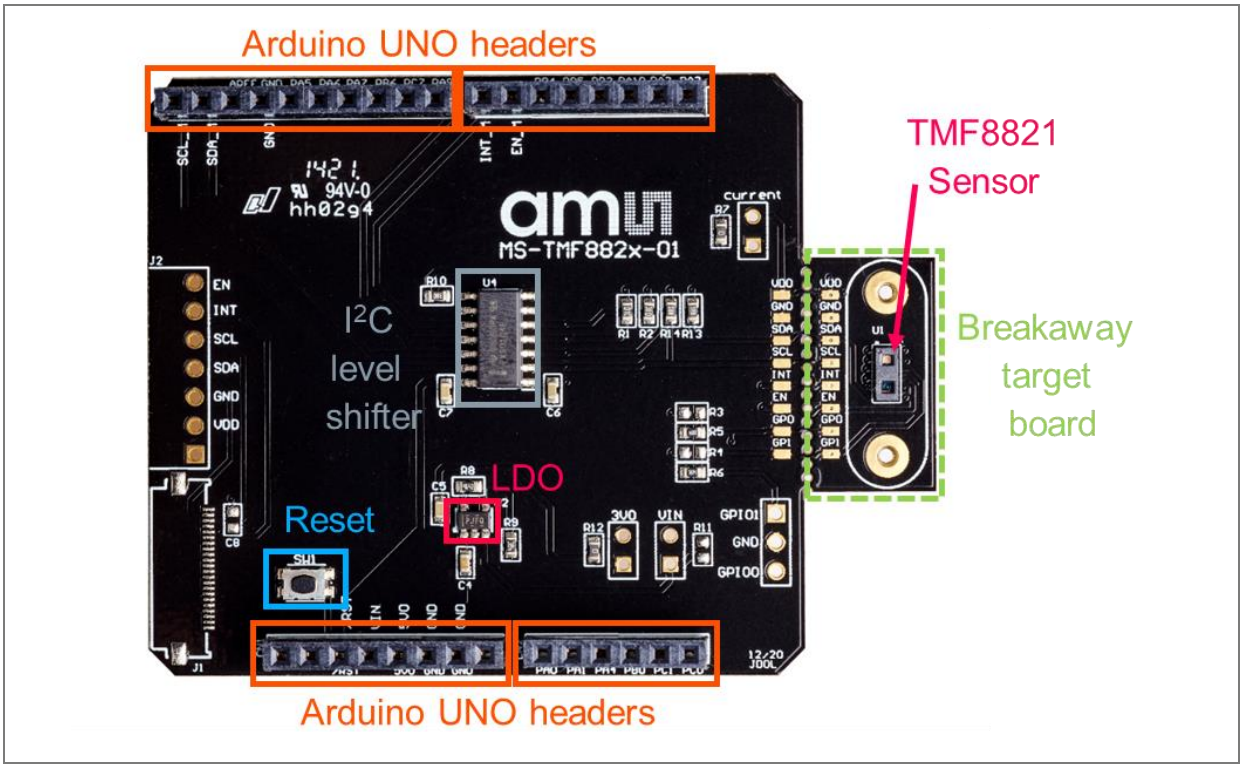
Key features

- Arduino UNO form factor development board
- TMF882X sensor mounted on a breakaway board
- Cover glass samples included 0.5 mm / 0.6 mm / 0.7 mm / 0.8 mm - thicknesses
- Air gap spacer samples included 0.17 mm / 0.25 mm / 0.38 mm / 0.5 mm - thicknesses
- Breakaway board V_{dd} current sense test point
- Reset button
- Onboard LDO and I²C level shifter

Information:

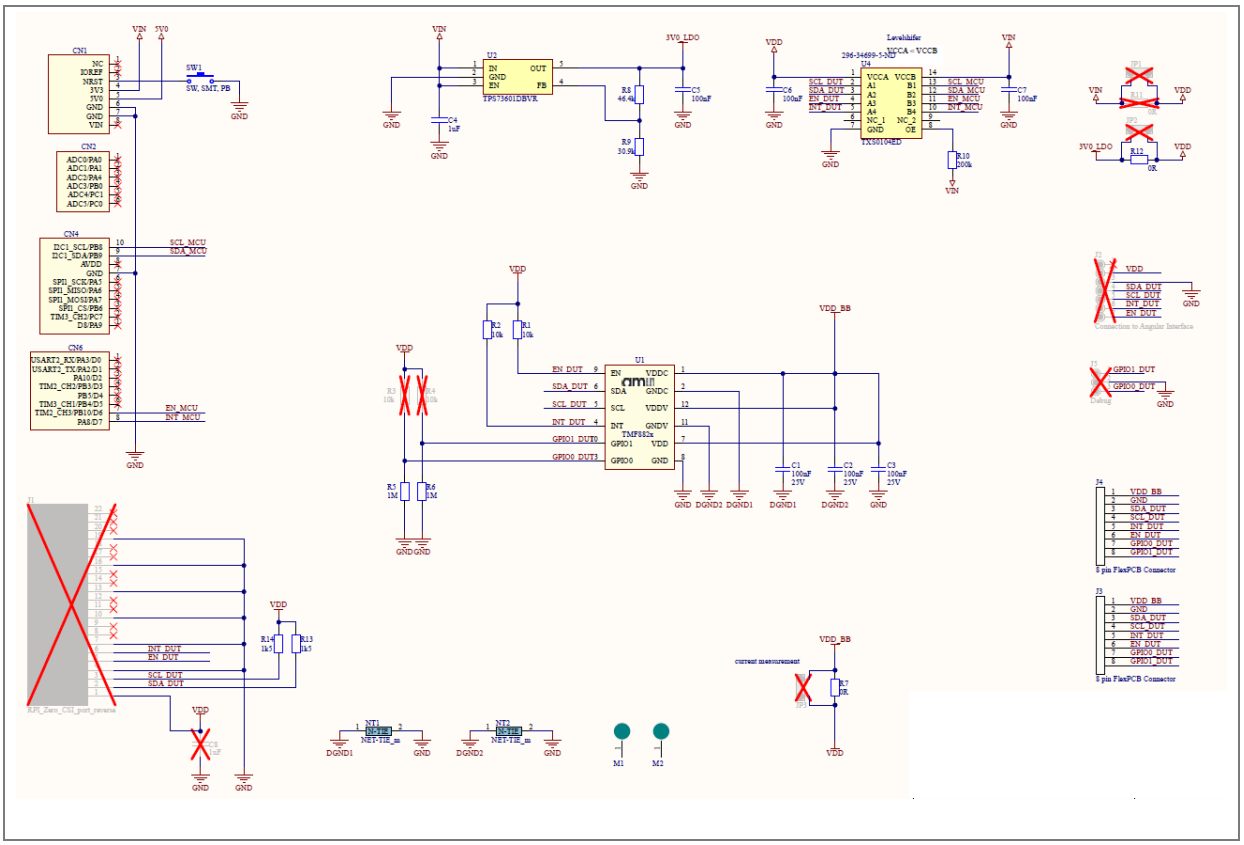
Please check latest TMF882X datasheet for maximum supply and IO voltages. Failure to adhere to these voltage levels may result in permanent damage to the TMF882X-Shield.

Figure 2: TMF882X-SHIELD hardware overview



4 Schematic

Figure 3: TMF882X-SHIELD schematic



5 Bill of materials

Figure 4: Bill of materials

Bill of Materials

TMF882x sensor shield

Source Data From: MS-TMF882x_Shield-01.PrjPcb
Project: MS-TMF882x_Shield-01.PrjPcb
Variant: Default Build

Creation Date 11.03.2021 15:52
Print Date: 11-Mar-21 3:52:17 PM

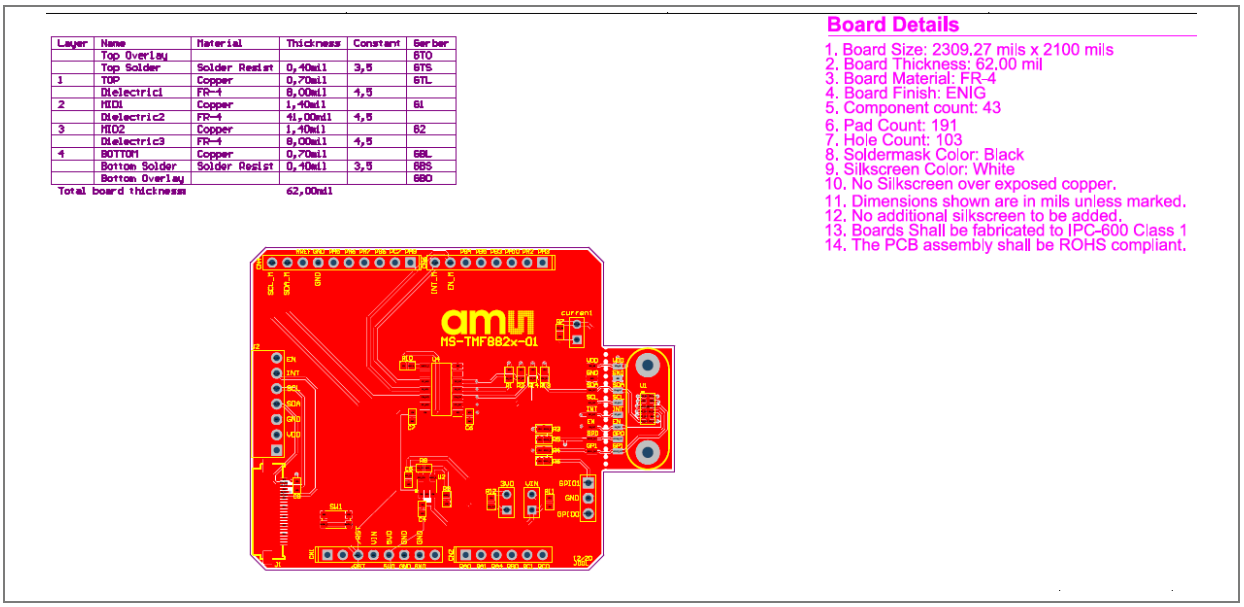
Designator	Comment	Manufacturer	Manufacturer Part Number	Description	h Name Error:'	Quantity
C1, C2, C3	0.1uF,6V3, 0402, 10%	Murata	GRM155R71E104KE14D	Cap Ceramic 0.1uF 25V X7R 10% SMD 0402 125C Paper T/R, GRM155R71E104KE14D		3
C4	1uF	Murata	GRM188R71A105KA61D	CAP CER 1UF 10V X7R 0603		1
C5, C6, C7	0.1uF	Murata	GRM188R72A104KA35D	Multilayer Ceramic Capacitors MLCC - SMD/SMT 0.1uF 6.3Volts X7R 10%		3
CN1, CN6	8Pin Arduino Conn	Samtec	SSQ-108-04-G-S	Conn Socket Strip SKT 8 POS 2.54mm Solder ST Thru-Hole		2
CN2	6Pin Arduino Conn	Samtec	SSQ-106-04-G-S	Conn Socket Strip SKT 6 POS 2.54mm Solder ST Thru-Hole		1
CN4	10Pin Arduino Conn	Samtec	SSQ-110-04-G-S	Conn Socket Strip SKT 10 POS 2.54mm Solder ST Thru-Hole		1
M1, M2	Mounting Hole	PennEngineering	SMTSO-M1.6-1ET	Mounting nut M1.6 thread, Mounting nut M1.6 thread		2
R1, R2	10k	Vishay	CRCW060310K0FKEA	VISHAY - CRCW060310K0FKEA - SMD Chip Resistor, 0603 [1608 Metric], 10 kohm, CRCW e3 Series, 75 V, Thick Film, 100 mW		2
R5, R6	1M	Vishay Dale	CRCW06031M00FKEAHP	VISHAY - CRCW06031M00FKEAHP - RES, AEC-Q200, THICK FILM, 1M, 0603		2
R7, R12	0R	Multicomp	MC0.063W06030R	MULTICOMP MC0063W06030R Chip SMD Resistor, MC Series, 0.063 W, 50 V, 0603 [1608 Metric]		2
R8	46.4k	Multicomp	MC0.063W06031%46K4FR	RESISTOR, 46K4, 0.063W, 1%, 0603, REEL		1
R9	30.9k	Vishay	CRCW060330K9FKEA	RES SMD 30.9K OHM 1% 1/10W 0603		1
R10	200k	Vishay	CRCW0201200KFNED	Res Thick Film 0201 200K Ohm 1% 1/20W ±200ppm/°C Molded SMD SMD Paper T/R		1
R13, R14	1k5	Vishay	CRCW06031K50FKEA	Res Thick Film 0603 1.5K Ohm 1% 0.1W(1/10W) ±100ppm/C Pad SMD Automotive T/R		2
SW1	SW, SMT, PB	ITT / C&K Components	KMR221GLFS	SW, SMT, PB, KMR221GLFS		1
U1	TOF	ams AG	TMF882x	TOF TMF882x		1
U2	TPS73601DBVR	TI	TPS73601DBVR	Adj Low Dropout Regulator		1
U4	TXS0104ED	Texas Instruments	TXS0104ED	TEXAS INSTRUMENTS - TXS0104ED - Voltage Level Translator, Bidirectional, 4 Input, 1 mA, 165 ns, 24 Mbps, 1.65 V to 3.6 V, SOIC-14		1
						28

Approved

Notes
Parts with alternate marked as YES may be replaced by an equivalent with preapproval from AMS.
Parts from ams AG will be consigned

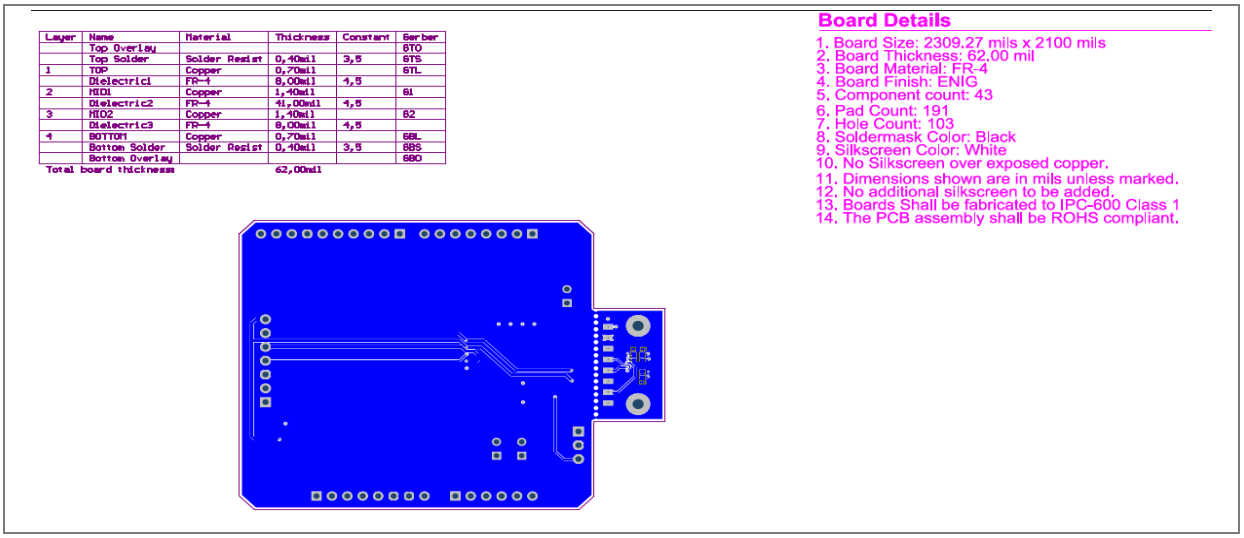
6 Layout

Figure 5: Layer 1[1]



(1) Full layout details can be found in TMF882x_AD001003_1-00.pdf.

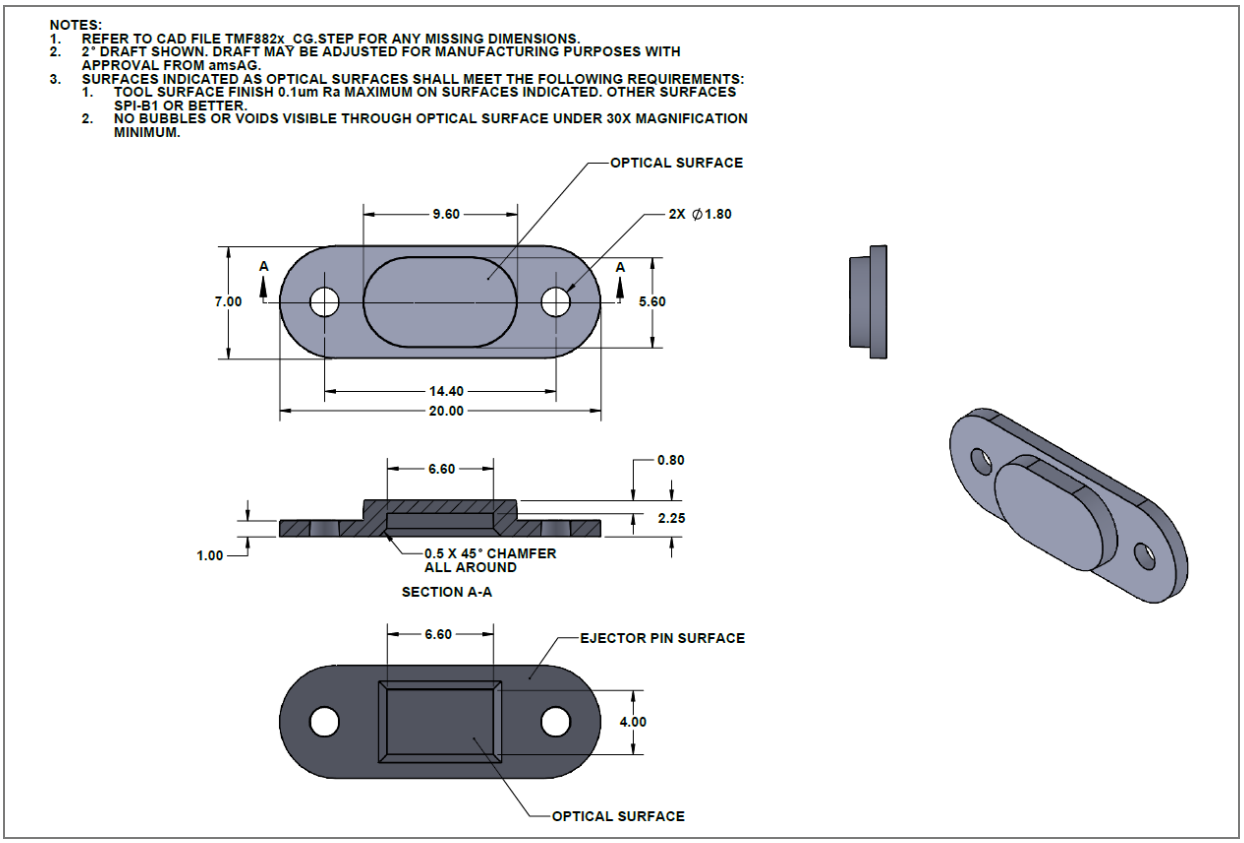
Figure 6: Layer 4[1]



(1) Full layout details can be found in TMF882x_AD001003_1-00.pdf.

7 Cover glass drawing

Figure 7: Cover glass mechanical drawing



8 Revision information

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Changes from previous released version to current revision v2-00	Page
Document contents transferred to ams OSRAM template	
Updated software description	4
Removed redundant text	5

- Page and figure numbers for the previous version may differ from page and figure numbers in the current revision.
- Correction of typographical errors is not explicitly mentioned.

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