MAX35104EVKIT2 Evaluation Kit　　　　　　Evaluates: MAX35104

General Description

The MAX35104EVKIT2 is an Arduino®-compatible shield that features the MAX35104 time-to-digital converter. The board is stackable with other MAX35104EVKIT2's to facilitate multi-axis distance and gas flow applications.

The PCB exposes many signals for easy analysis with an oscilloscope. Hardware configuration experimentation is facilitated by jumpers.

The kit is designed to be used with Arduino-compatible controller boards, such as the MAX32625MBED# but can be adapted to use with any host microcontroller architecture.

Features

- Easy Evaluation of the MAX35104 in an Embedded Environment

- Two Audiowell 200kHz Ultrasonic Transducers Included

- Arm® Mbed™ Development Environment Supported Through the MAX32625MBED# Board

Ordering Information **appears at end of data sheet.**

MAX35104EVKIT2 and Transducers
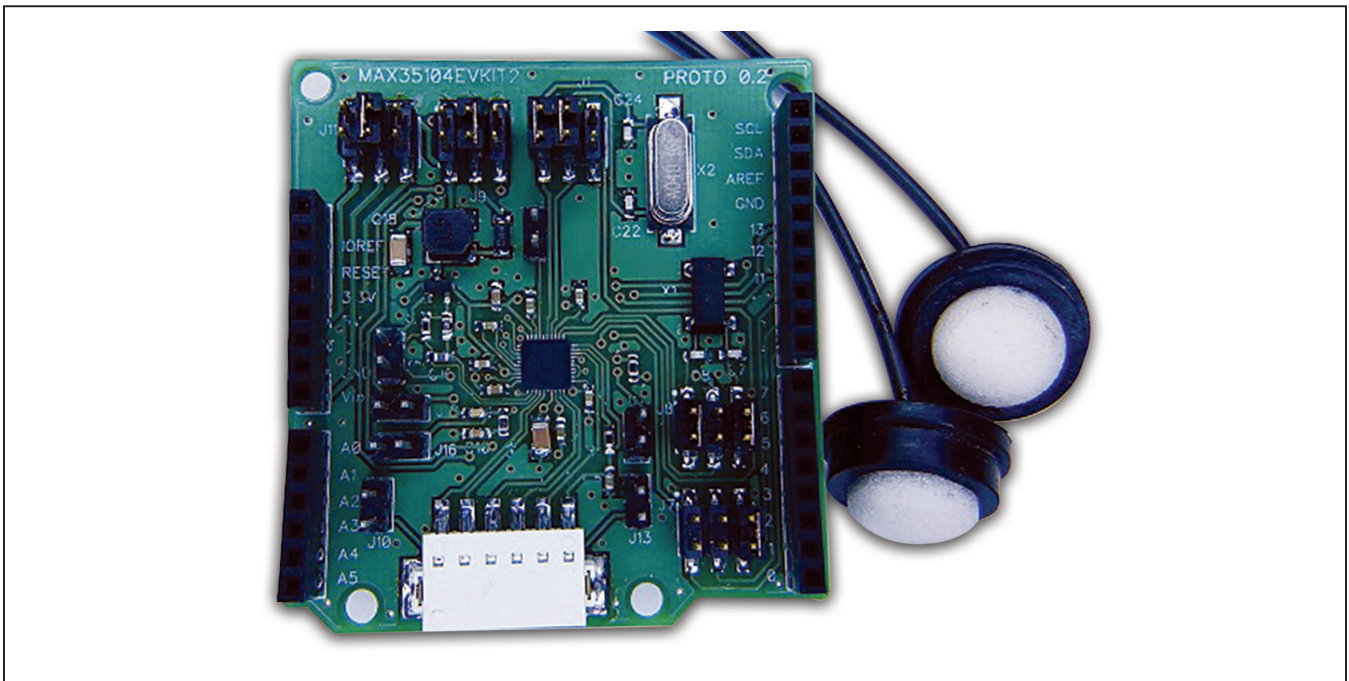
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Detailed Description

The MAX35104EVKIT2 is an ultrasonic time-to-digital convertor Arduino-compatible shield. The EV kit includes two 200kHz air/gas transducers for distance and flow experimentation. The PCB contains a MAX35104 time-to-digital converter, two crystal clock sources, and a high-voltage boost circuit.

Configuration Options

The PCB supports several jumpers to configure power and clocking options.

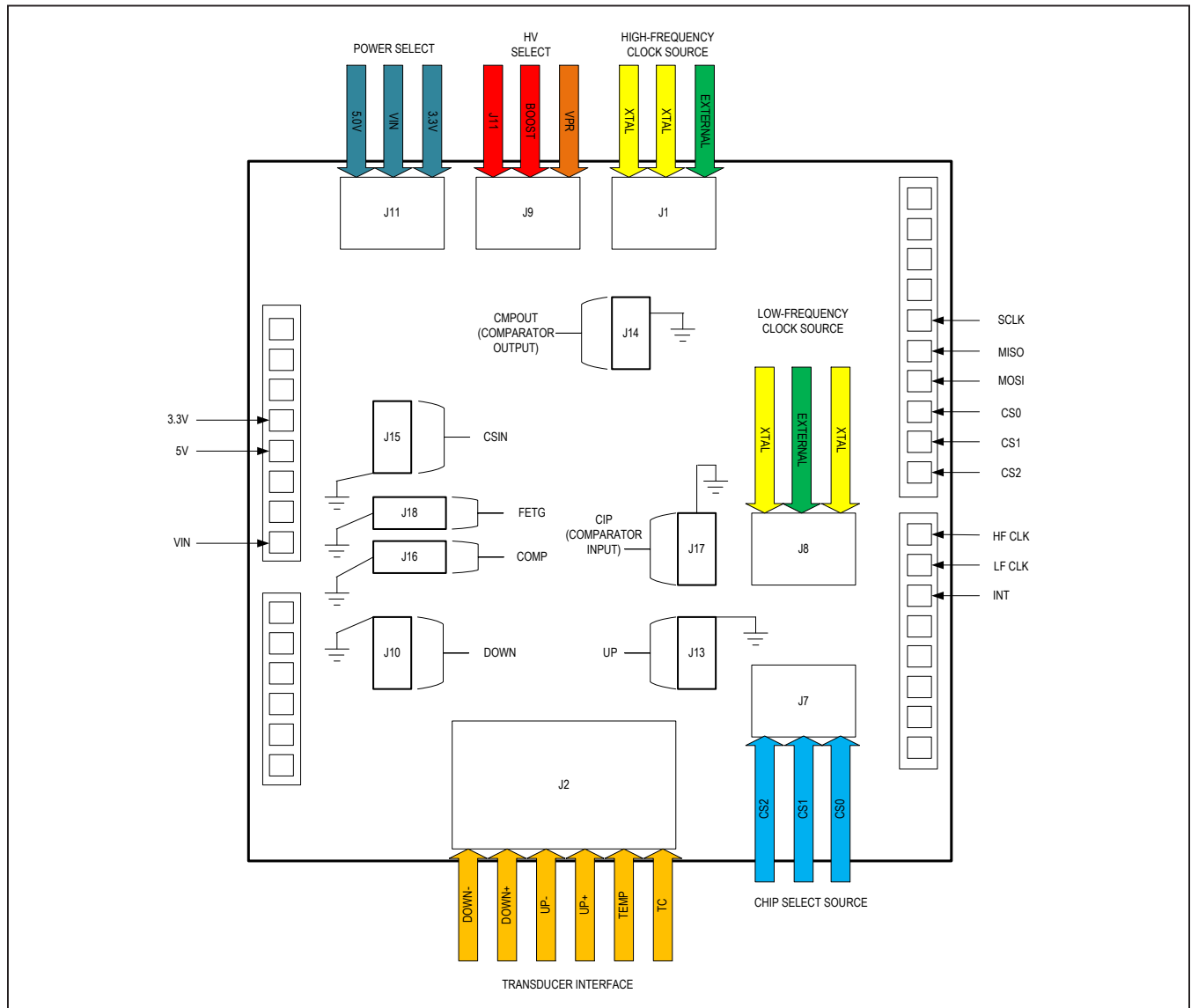Figure 1. Audiowell AW9Y0200K02Z-01 200kHz Gas Transducer
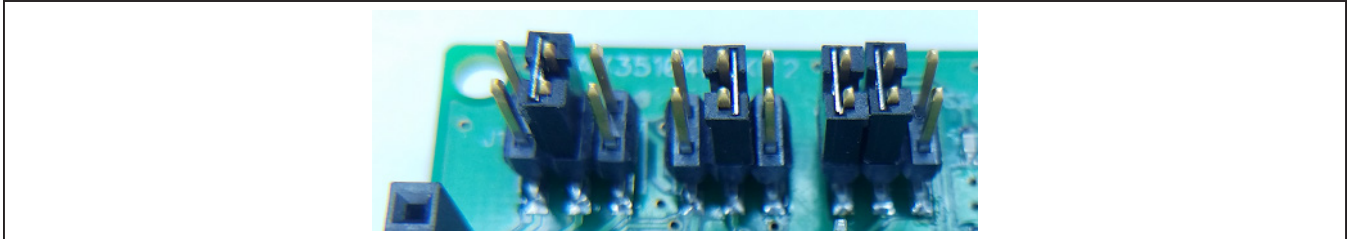

Figure 2. Configuration Options

Figure 3. Configuration Example

J11—Power Select

This header selects which power source is used to create the high-voltage rail applied to the output amplifiers in the MAX35104. The options are: 3.3V, 5V, and VIN. Only one source should be jumpered. Misconfiguration of this header could damage the host board.

In Figure 3, the VIN is used as the voltage source.

J9—High-Voltage Select

This header performs two functions. The leftmost two positions select the voltage rail used to power the output transducer amplifiers in the MAX35104. The options are: the voltage source selected by J11, or the on-board high-voltage boost circuit controlled by the MAX35104. Only one voltage source should be selected. Misconfiguration of this header could damage the host board.

In Figure 3, the output of the boost circuit used to power the transducer amplifiers.

The rightmost header position allows for jumpering between VP and VPR. This selection is independent of the other J9 jumper options. Jumpering VP to VPR effectively disabled the high-voltage linear regular internal to the MAX35104. The application firmware should disable the regulator if this jumper exists. Refer to the MAX35104 data sheet for details.

J1—High-Frequency Clock Source

This header selects the clock source for the 4MHz input to the MAX35104. This can either be the 4MHz crystal (X2) or an external clock source from the host board or another shield. The normal configuration is to use the crystal that requires the two leftmost positions be jumpered.

Application firmware must configure the MAX35104 according to the signal selected. Refer to the MAX35104 data sheet for details.

In Figure 3, the crystal is selected as the source for the 4MHz clock.

J8—Low-Frequency Clock Source

This header selects the clock source for the 32.768kHz input to the MAX35104. This can either be the 32.768kHz crystal (X1) or an external clock source from the host board or another shield. The normal configuration is to use the crystal that requires the leftmost and the rightmost positions to be jumpered.

Application firmware must configure the MAX35104 according to the signal selected. Refer to the MAX35104 data sheet for details.

J7—Chip Select

This header selects which signal is used for the MAX35104 SPI chip select. This allows multiple shields to be installed for multi-axis measuring applications.

Reference Software

Reference software for this evaluation kit used in conjunction with the MAX32625MBED# evaluation kit is available at: **https://github.com/maxim-ic-flow/tdc_test**.

A portable MAX3510x API library is available at: **https://github.com/maxim-ic-flow/max3510x**.
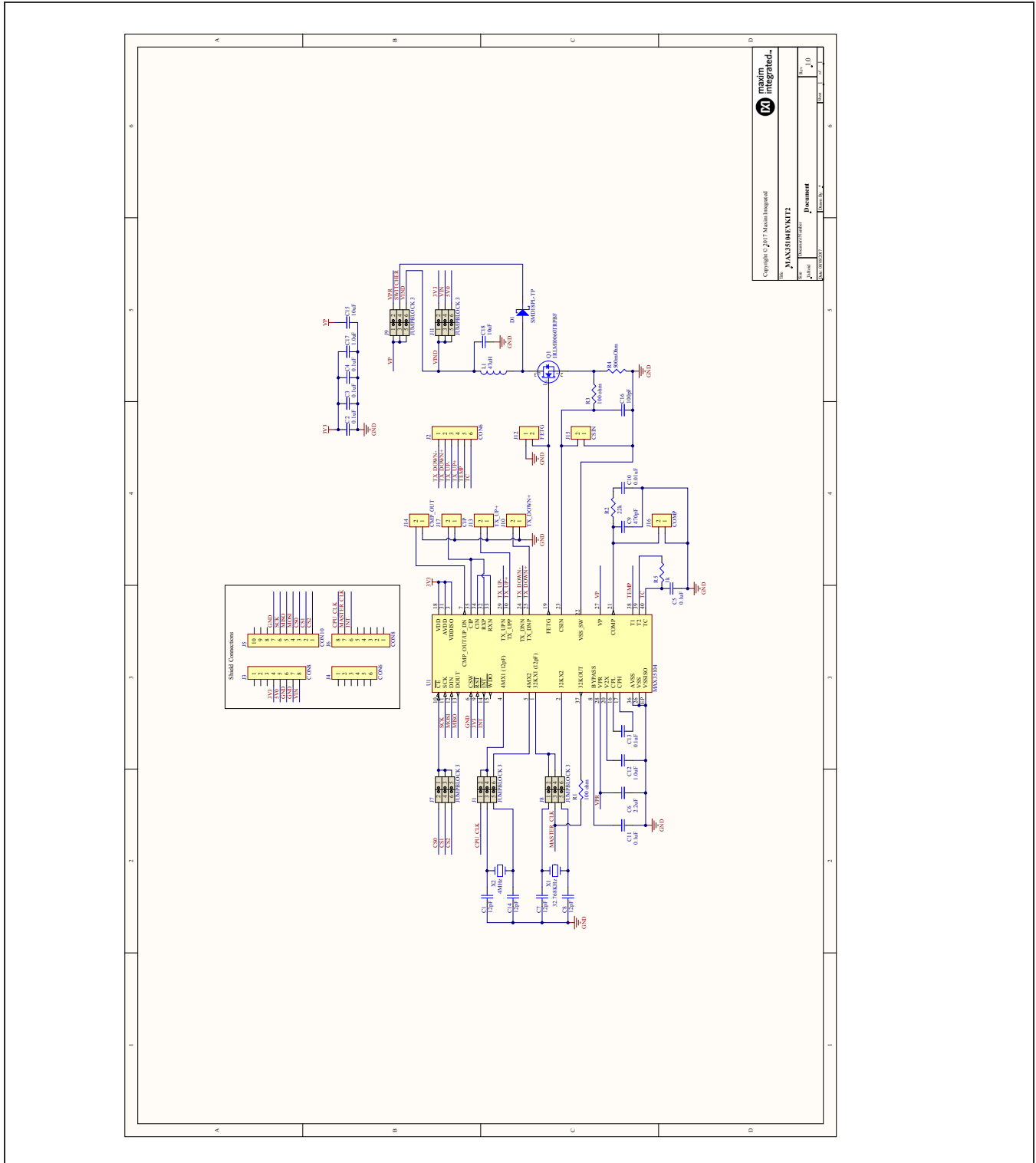
Ordering Information

PART	TYPE
MAX35104EVKIT2#	EV Kit

#Denotes RoHS compliant.

MAX35104EV2 Kit Bill of Materials

| DESIGNATION	MANUFACTURER	PART NUMBER	DESCRIPTION
C1, C7, C8, C14	Samsung Electro-Mechanics America	CL10C120JB8NNNC	CAP CER 12PF 50V C0G/NP0 0603
C2, C3, C4, C5, C11, C13	Samsung Electro-Mechanics America	CL10B104KO8NNNC	CAP CER 0.1µF 16V 10% X7R 0603
C6	Yageo	CC0603KRX5R5BB225	CAP CER 2.2µF 6.3V 10% X5R 0603
C9	Samsung Electro-Mechanics America	CL10C471JB8NNNC	CAP CER 470PF 50V C0G/NP0 0603
C10	Samsung Electro-Mechanics America	CL10B103KB8NCNC	CAP CER 10000PF 50V 10% X7R 0603
C12, C17	Taiyo Yuden	LMK107B7105KA-T	CAP CER 1µF 10V 10% X7R 0603
C15, C18	Samsung Electro-Mechanics America	CL31B106KBHNNNE	CAP CER 10µF 50V X7R 1206
C16	Samsung Electro-Mechanics America	CL10C101JB8NNWC	CAP CER 100PF 50V C0G/NP0 0603
D1	Micro Commercial Co	SMD18PL-TP	DIODE SCHOTTKY 80V 1A SOD123FL
J1, J7, J8, J9, J11	Harwin Inc.	M20-8760342	2X3POS DIL VERTICAL SMT HEADER
J2	Phoenix Contact	1814676	TERM BLOCK 6POS
J3, J6	Global Connector Technology	SP-140520-08-001	Stackable Header 8-pin connector
J4	Global Connector Technology	SP-140520-06-001	Stackable Header 6-pin connector
J5	Global Connector Technology	SP-140520-10-001	Stackable Header 10-pin connector
J10, J12, J13, J14, J15, J16, J17	Harwin Inc.	M22-2510205	2-pin Connector 2mm vertical
L1	Laird-Signal Integrity Products	TYS5040470M-10	FIXED IND 47µH 1A 272 MOHM SMD
Q1	Infineon Technologies	IRLML0060TRPBF	MOSFET N-CH 60V 2.7A SOT-23-3
R1, R3	Samsung Electro-Mechanics America	RC1608F101CS	RES SMD 100Ω 1% 1/10W 0603
R2	Yageo	RC0603FR-0722KL	RES SMD 22KΩ 1% 1/10W 0603
R4	Stackpole Electronics Inc.	CSR0603FKR500	RES SMD 0.5Ω 1% 1/8W 0603
R5	Yageo	RC0603FR-071KL	RES SMD 1KΩ 1% 1/10W 0603
U1	Maxim Integrated	MAX35104ETL+	MAX35104 Gas Flow Meter SoC
X1	ECS Inc.	ECS-.327-12.5-17X-C-TR	CRYSTAL 32.7680KHZ 12.5PF SMD
X2	Abracon LLC	ABLS-4.000MHZ-B2-T	CRYSTAL 4.0000MHZ 18PF SMD

MAX35104EV2 Kit Schematic

MAX35104EV2 PCB Layouts
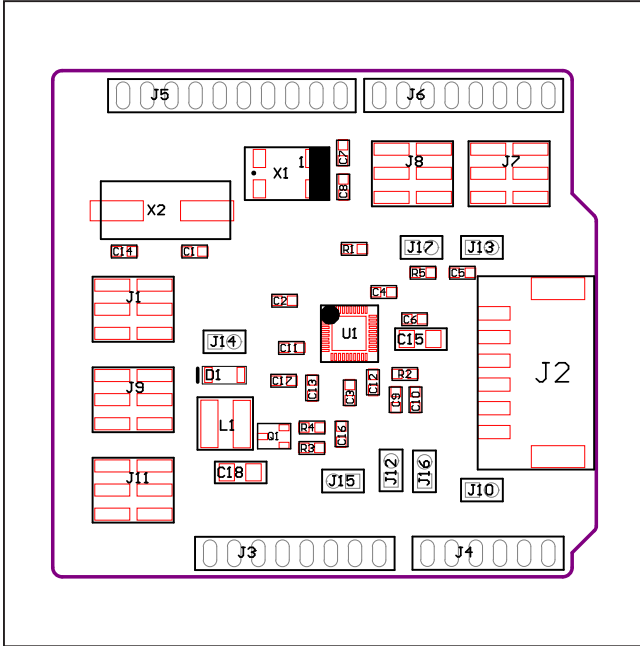
Assembly
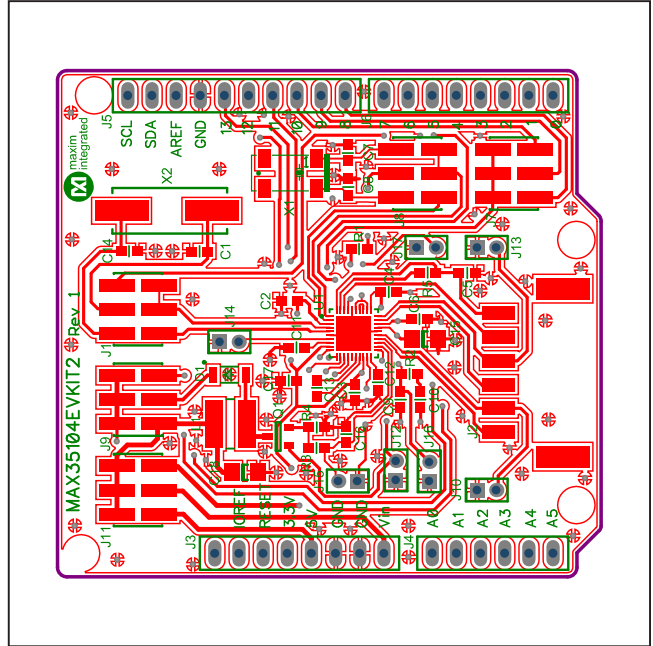
PCB Top
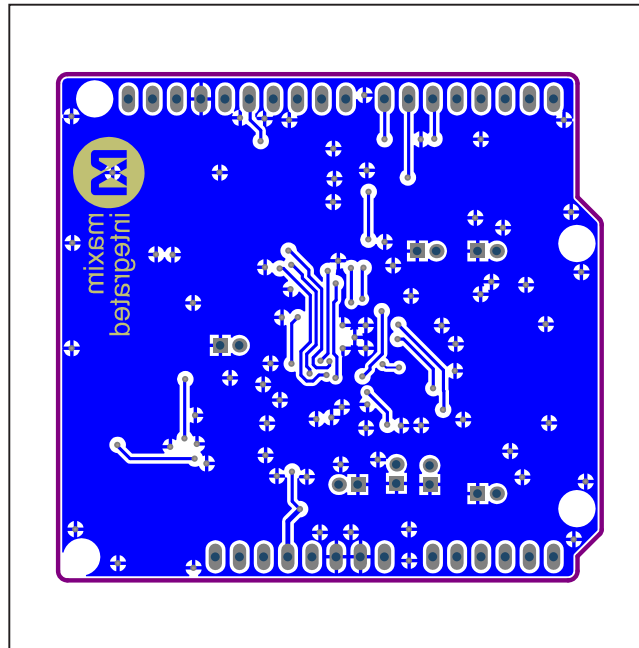
PCB Bottom

Revision History

REVISION NUMBER	REVISION DATE	DESCRIPTION	PAGES CHANGED
0	5/18	Initial release	—