MAX11410 EMC Evaluation Board

Evaluates: MAX11410

General Description

Analog-to-digital converters (ADCs) provide accurate measurement and conversion of signals to digital format for sensing in many electronic applications such as industrial, medical, and sensor systems. The MAX11410 is a high-speed, 24-bit Delta-Sigma ADC.

The MAX11410 EMC evaluation board is a test platform for rapid prototyping and EMC evaluation of the MAX11410 (a 24-bit, 1.9ksps, Delta-Sigma ADC). The MAX11410 EMC EV kit includes an Arduino™-compatible microcontroller system, which performs stand-alone data logging. It also comes with schematics, design files, and firmware for immediate use and forking to future projects.

The board comes with firmware already loaded (source code is provided). The board's firmware can be customized and loaded using the standard Arduino tools.

The board comes with MAX11410ATI+ installed.

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

Quick Start

Required Equipment

- MAX11410EMCEVKIT# EMC evaluation kit
- Computer with USB and web access
- A serial terminal emulator software such as teraterm, realterm, picocom, minicom, or equivalent

The procedures below describe the quick start process

MAX11410_EMC DataLogger Firmware

The "DataLogger" program is an interactive, menu-driven test program that is controlled through a serial communications port, using a terminal emulator, supporting quick discovery, and evaluation of device features for testing functionality.

The EMC evaluation board is fully assembled, tested, and is already loaded with the DataLogger Firmware.

The firmware uses a USB serial port to communicate. Typing "?" halts data logging and prints a menu of supported device commands. The data logging firmware automatically configures the MAX11410 and captures data, reporting in a format that can be saved directly to a CSV (comma-spaced-value) table format.

When the board is plugged into USB the first time, the computer may need about a minute to install its device drivers.

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Use the following steps to verify board operation:

1) Connect a USB micro B cable from computer to MAX11410EMCEVKIT USB port. (Windows may require some time to install its device driver.)
2) Locate the newly arrived USB serial device COM port, and use a serial terminal emulator (such as teraterm, realterm, picocom, minicom, or equivalent). Baud rate is 115200.
3) Connect input voltages to AIN inputs. Note if nothing is connected to the analog inputs, the value can float to an unspecified, arbitrary value.

Use the following steps to reload or upgrade the board's firmware:

1) Connect a USB micro B cable from computer to MAX11410EMCEVKIT USB port. (Windows may require some time to install its device driver.)
2) In a web browser, navigate to **https://create.arduino.cc/editor/whismanoid/7dc62181-0bb7-4578-995d-2fa7a8477763/preview** and click **Add to my Sketchbook**.
3) If this is your first time using Arduino Create online, you may be prompted to install Arduino Create Agent to connect with the hardware. The MAX11410 EMC EV kit hardware is equivalent to an Arduino UNO microcontroller board driving a MAX11410 BOB analog breakout board, with advanced EMC considerations.
4) Compile the program with the **Upload and Save** button.
5) Connect input voltages to AIN inputs. Note if nothing is connected to the analog inputs, the value can float to an unspecified, arbitrary value.
6) Locate the newly arrived USB serial device COM port, and use a serial terminal emulator (such as teraterm, realterm, picocom, minicom, or equivalent). Baud rate is 115200.
7) The program behavior can be changed by modifying the DataLogger_MAX11410.cpp source code and repeating the compile-build-upload cycle.

Capturing Data with a Serial Console

A serial terminal emulator software (such as teraterm, realterm, putty, picocom, minicom, or equivalent) must be installed to communicate with the example firmware. Various terminal programs connect in various ways and have different user interfaces, but they all share a common set of basic features:

- Connecting to a specific serial port device by name, such as COM4 or /dev/ttyACM0
- Settings such as baud rate 9600, 8 bits/No parity/1 Stop bit, no flow control
- Typing at the keyboard transmits to the firmware through the serial port
- Messages received from the firmware are displayed on the screen
- A special keyboard command or menu item exits the terminal program

Refer to **https://os.mbed.com/handbook/Terminals** for more details.

More resources:

- **https://learn.sparkfun.com/tutorials/terminal-basics/tera-term-windows**
- **https://learn.sparkfun.com/tutorials/terminal-basics/real-term-windows**
- **https://learn.sparkfun.com/tutorials/terminal-basics/yat---yet-another-terminal-windows**
- **https://learn.sparkfun.com/tutorials/terminal-basics/coolterm-windows-mac-linux**
- **https://learn.adafruit.com/windows-tools-for-the-electrical-engineer/serial-terminal**
- **https://www.putty.org/**

In Windows™, install a terminal emulator such as teraterm, realterm, or putty. Find the serial port name and COM port number in Control Panel View devices and printers. The Mbed board appears as USB Serial Device or mbed Serial Port. Refer to **https://os.mbed.com/handbook/Windows-serial-configuration** and **https://os.mbed.com/docs/mbed-os/v5.11/tutorials/windows-serial-driver.html** for troubleshooting. Start the terminal emulator and use the menu to connect to the serial port that belongs to the board. Pressing ENTER displays the firmware's banner message (see example session).

In linux, install a terminal emulator such as minicom or picocom. For example, under Debian or Ubuntu linux, use

<PRE>

```
sudo apt-get install picocom
```

</PRE>

In linux (Debian), find the serial port name as follows:

<PRE>

```
# with the board not connected, get list of tty device names
ls -1 /dev/tty* >dev_tty_baseline
# now connect the device to USB and find the new tty device name (such as /dev/ttyACM0)
ls -1 /dev/tty* | diff dev_tty_baseline -
```

</PRE>

The picocom terminal emulator runs from the tty console. The tty device name must be given on the command line when starting picocom. See man picocom for more details.

<PRE>

```
picocom /dev/ttyACM0 --baud 9600
```

</PRE>

Pressing ENTER displays the firmware's banner message (see example session). Pressing CTRL+A and then CTRL+X exits picocom.

Example Serial Console Session

The firmware uses a USB serial port to communicate. Typing "?" prints a menu of supported device commands. The data logging firmware automatically configures the MAX11410 and captures data, reporting in a format that can be saved directly to a CSV (comma-spaced-value) table format.

<PRE>

```
MAX11410_EMC
MAX11410 Init failed; retry at SPI SCLK frequency 2000000 Hz
*SOURCE=0xA
*MUX_CTRL1=0xF0
v_filter = 0x34
v_pga = 0x0
v_ctrl = 0x42
“Configuration:”,”AIN0”,”Datalog disabled; enable with LS0V or with LS0L”
“Configuration:”,”AIN1”,”v_filter = 0x34”,”v_ctrl = 0x42”,”v_pga = 0x0”
“Configuration:”,”AIN2-3_BIP”,”v_filter = 0x34”,”v_ctrl = 0x2”,”v_pga = 0x0”
“Configuration:”,”AIN3”,”v_filter = 0x34”,”v_ctrl = 0x42”,”v_pga = 0x0”
“Configuration:”,”AIN4”,”v_filter = 0x34”,”v_ctrl = 0x42”,”v_pga = 0x0”
```

```
<PRE>
"Configuration:","AIN5","v_filter = 0x34","v_ctrl = 0x42","v_pga = 0x0"
"Configuration:","AIN6","v_filter = 0x34","v_ctrl = 0x42","v_pga = 0x0"
"Configuration:","AIN7","v_filter = 0x34","v_ctrl = 0x42","v_pga = 0x0"
"Configuration:","AIN8-9_BIP","v_filter = 0x34","v_ctrl = 0x2","v_pga = 0x0"
"Configuration:","AIN9","Datalog disabled; enable with LS9V or with LS9L"
"AIN1_LSB","AIN2-3_BIP_LSB","AIN3_LSB","AIN4_LSB","AIN5_LSB","AIN6_LSB","AIN7_
LSB","AIN8-9_BIP_LSB","PART_ID"
3112223,1010247,2086751,9090510,7215996,1370162,11063736,1731085,"OK"
3507015,1010246,2086725,8002958,6276872,1008816,10862625,1725624,"OK"
3845514,1010238,2086779,7590851,5920568,1020920,10834730,1726029,"OK"
4142733,1010235,2086724,7439439,5784519,1033754,10812599,1728546,"OK"
4405185,1010246,2086764,7385394,5729801,1046211,10793988,1732002,"OK"
4636832,1010244,2086748,7366544,5706573,1056357,10778432,1735561,"OK"
4841783,1010247,2086737,7361883,5694989,1064934,10764894,1739209,"OK"
5023635,1010234,2086721,7361697,5688261,1072067,10753835,1742601,"OK"
5185260,1010236,2086745,7363851,5683377,1077323,10743785,1745910,"OK"
5328768,1010240,2086752,7366025,5677292,1083485,10735863,1749192,"OK"
5456405,1010227,2086734,7368071,5673086,1087691,10728894,1752194,"OK"
5570018,1010239,2086731,7370231,5669784,1091109,10722633,1755070,"OK"
5671544,1010229,2086689,7373237,5665673,1095122,10717952,1757964,"OK"
5761820,1010229,2086722,7375391,5662391,1097343,10713261,1760572,"OK"
5842661,1010220,2086725,7377362,5658708,1099442,10709418,1763248,"OK"
5914518,1010217,2086725,7379517,5657009,1102002,10706664,1765793,"OK"
5979033,1010208,2086740,7382133,5654298,1103514,10703720,1768107,"OK"
6036447,1010208,2086691,7384461,5652048,1104929,10701122,1770278,"OK"
6087645,1010218,2086688,7385687,5649540,1106904,10699815,1772379,"OK"
6133581,1010221,2086718,7387448,5646929,1108034,10697999,1774533,"OK"
</PRE>
```

Detailed Description of Hardware

The MAX11410 is a 24-bit, 1.9ksps, Delta-Sigma ADC. Connect analog inputs to the AIN0–AIN9 header pins. The MAX6126 provides the 2.5V analog reference voltage. The MAX8511 provides a low-dropout 3.3V supply. The MAX14935 digital isolator translates the external logic signals in the range of 1.71V to 5.5V for use with the MAX11410's 3.3V supply. For more information on these products, please visit:

- **https://www.maximintegrated.com/max11410**
- **https://www.maximintegrated.com/max14935**
- **https://www.maximintegrated.com/max1659**
- **https://www.maximintegrated.com/max256**
- **https://www.maximintegrated.com/max6126**
- **https://www.maximintegrated.com/max8511**

Ground Return Paths and EMI Reduction

To minimize both received and emitted EMI, the PCB layout minimizes the loop area of signal and ground returns. To provide isolation between the digital and sensitive analog circuitry, the microcontroller is on the back of the board while the analog-to-digital converter is on the front of the board.

There are three ground domains: analog ground, digital ground, and USB shield. The analog and digital grounds are connected through R14(4.3MΩ) and C10(4700pF), and the digital ground and USB shield are connected through R51(4.3MΩ) and C47(4700pF). The 4.3MΩ resistor provides a defined single path for DC leakage currents since it is large but still less than typical insulation resistance. Without this R14/R51 resistor, the leakage current would flow through any surface contaminations (such as fingerprints on the board surface) despite the very high resistance. Similarly, the C10/C47 capacitors provide a safe path for ESD/EMI transient return currents.

Transorbs for ESD Protection

Transorbs (bidirectional Zener diodes) such as D9 and D10 protect against ESD entering at the connectors, with low-inductance return paths to the ground plane nearest the connector.

3V Zener Protection

Inputs are further protected against overvoltage by Zener diode clamps such as D19/D20 and associated 510Ω series resistors R19, R20, R62, R31. The input voltage above 3V but too low to trigger the transorbs is clamped by the Zener diode.

Overvoltage/Undervoltage Schottky Clamp

Finally, Schottky diodes such as D42 and D43 (dual series-connected pair of Schottky diodes in SOT-23 package) protect against input voltages exceeding the MAX11410's analog supply rails AVDD (3V3ISO) and AGND (analog ground).

The reference inputs REF1P/REF1N and REF2P/REF2N are connected to the 2V5REF reference through 0Ω jumpers R38/R39 and R40/R41. Optionally, analog input pair A0/A1 can be used as a reference input by connecting 0Ω jumpers at R28 and R29 and using the appropriate register configuration.

Battery Powered Operation

The board supports battery-powered operation to support radiated emissions testing. Configure the board for battery-powered operation by removing the 0Ω jumpers from R53, R55, R56, and R57, and then installing a 0Ω jumper at R54. Apply external battery connection at BATT connector (battery voltage must be between 5.5V and 16.5V). Connect isolated 5V serial communications cable at header J2. Note that pin 2 TX output from the datalogger should drive the remote board's RX receiver input. These are CMOS/TTL level signals, not RS232 voltage levels.

USB Powered Operation

As shipped from the factory, the board supports USB-powered operation, with data logging to a standard FTDIchip.com USB comms port with settings of 115200 baud, 8 bits, no parity.

If the board was previously modified to select battery-powered operation, USB powered operation can be subsequently restored by disconnecting any battery and external comms, removing the 0Ω jumper from R54, and then replacing the 0Ω jumpers at R53, R55, R56, and R57.

Table 1. Connectors, Jumper Functions, and Configuration Options

JUMPER	STATE	FUNCTION
J1	–	USB connector
J2	–	Header for serial communications (+5V logic level)
J3	–	Header for firmware loading ATmega328 using external programmer
J4	–	Header for access to ATmega328 AREF analog reference (optional)
J5	1-2*	Enable on-board 5VISO isolated +5V power supply
J6	Open*	Header for optional MAX11410 digital GPIO1
J7	Open*	Header for optional MAX11410 digital GPIO0
J8	Open*	Terminal blocks for MAX11410 analog inputs A0 and A1
J9	Open*	Terminal blocks for MAX11410 analog inputs A2 and A3
J10	Open*	Terminal blocks for MAX11410 analog inputs A4 and A5
J11	Open*	Terminal blocks for MAX11410 analog inputs A6 and A7
J12	Open*	Terminal blocks for MAX11410 analog inputs A8 and A9
J13	Open*	Terminal blocks for MAX11410 analog reference inputs REF1P and REF1N
J14	Open*	Terminal blocks for MAX11410 analog reference inputs REF2P and REF2N
BATT	Open*	Terminal blocks for optional battery power input (5.5V < = BATT < = 16.5V)
R53	Open (not installed)	Board is powered by optional external battery power BATT (R54 must be open)
R54	0Ω installed	Board is powered from USB (R53 must be open)
R28	Open (not installed)	Analog reference input A0/REF0P is driven by on-board +2.5V reference (MAX6126)
R29	Open (not installed)	Analog reference input A1/REF0N ground reference
R38	0Ω installed	Analog reference input REF1P is driven by on-board +2.5V reference (MAX6126)
R39	0Ω installed	Analog reference input REF1N ground reference
R40	0Ω installed	Analog reference input REF2P is driven by on-board +2.5V reference (MAX6126)
R41	0Ω installed	Analog reference input REF2N ground reference
R27	0Ω installed	VDDREG supply is provided by on-board +3.3V regulator (MAX8511)
R30	0Ω installed	AVDD supply is provided by on-board +3.3V regulator (MAX8511)
R26	0Ω installed	VDDIO supply is provided by on-board +3.3V regulator (MAX8511)
R48	0Ω installed	2.5V reference force/sense connection point

**Default position*

Ordering Information

PART	TYPE
MAX11410EMCEVKIT#	EMC Evaluation Kit

#Denotes RoHS compliance.

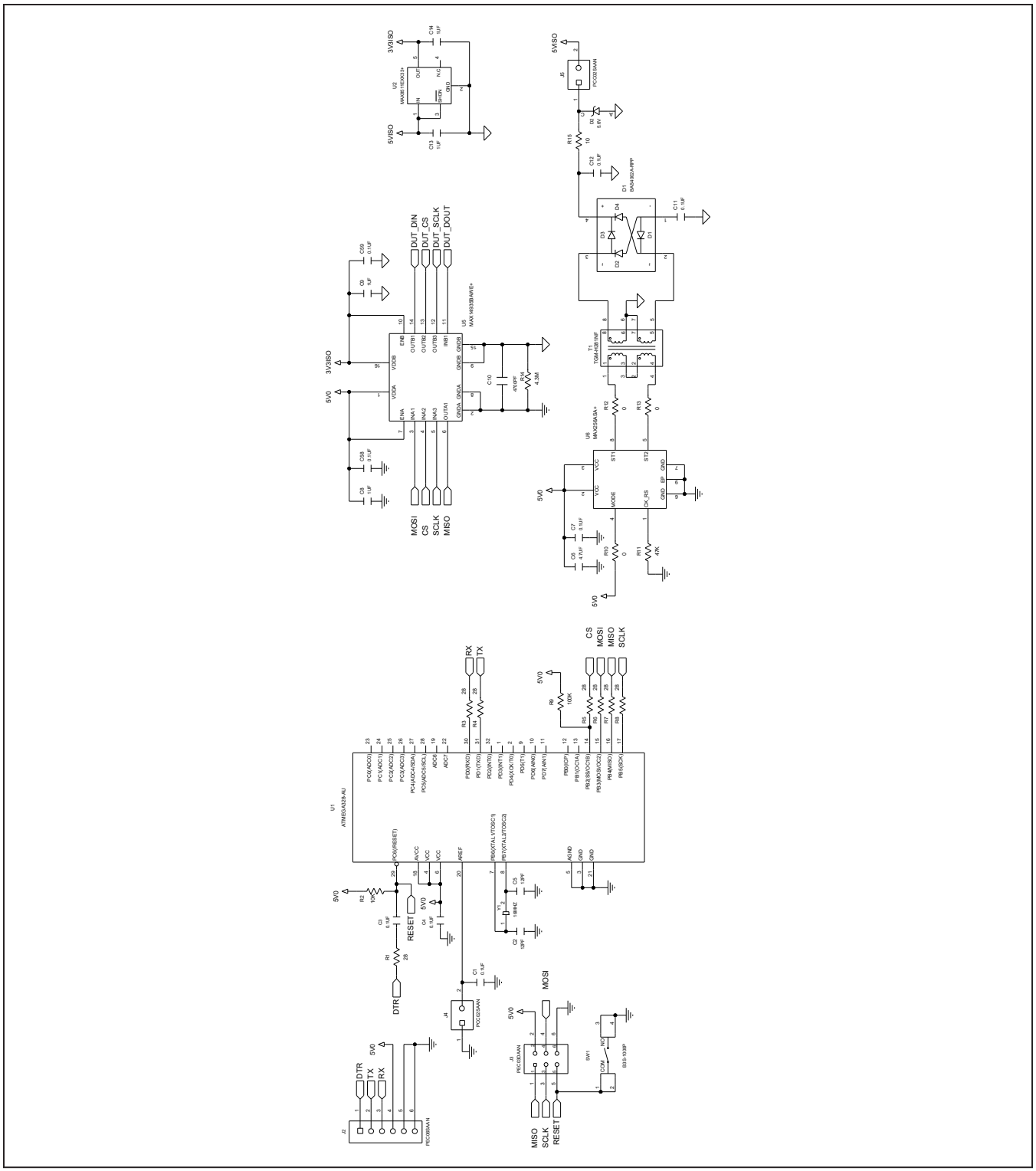
MAX11410 EMC EV Kit Bill of Materials

ITEM	REF_DES	DNI/DNP	QTY	MFG PART #	MANUFACTURER	VALUE	DESCRIPTION
1	BATT, J8-J14	-	8	1935161	PHOENIX CONTACT	1935161	CONNECTOR; FEMALE; THROUGH HOLE; GREEN TERMINAL BLOCK; STRAIGHT; 2PINS
2	BUMP1-BUMP4	-	4	SJ-5003(BLACK)	3M ELECTRONIC SOLUTIONS DIVISION	SJ-5003(BLACK)	BUMPER; BLACK-HEMISPHERICAL SHAPE EVKIT EH0231; 0.44D/0.2BH; RESILIENT ELASTOMER POLYURETHANE
3	C1, C3, C4, C7, C11, C12, C40-C46, C52, C54-C59	-	20	CC0603KRX7R0BB104; GRM188R72A104KA35; HMK107B7104KA; 06031C104KAT2A; GRM188R72A104K	YAGEO;MURATA; TAIYO YUDEN;AVX; MURATA	0.1UF	CAP; SMT (0603); 0.1UF; 10%; 100V; X7R; CERAMIC
4	C2, C5	-	2	GRM1555C1H120FA01	MURATA	12PF	CAP; SMT (0402); 12PF; 1%; 50V; C0G; CERAMIC
5	C6	-	1	C0603C475K8PAC; LMK107BJ475KA; CGB3B1X5R1A475K; C1608X5R1A475K080AC; CL10A475KP8NNN; C1608X5R1A475K080AE	KEMET;TAIYO YUDEN; TDK;TDK;SAMSUNG ELECTRONICS;TDK	4.7UF	CAP; SMT (0603); 4.7UF; 10%; 10V; X5R; CERAMIC
6	C8, C9, C13, C14, C36-C38	-	7	C0603C105K4RAC; C1608X7R1C105K080AC; EMK107B7105KA; CGA3E1X7R1C105K080AC; 0603YC105KAT2A	KEMET;MURATA;TDK; TAIYO YUDEN;TDK;AVX	1UF	CAP; SMT (0603); 1UF; 10%; 16V; X7R; CERAMIC
7	C10, C47	-	2	CC1812KKX7RDBB472	YAGEO	4700PF	CAP; SMT (1812); 4700PF; 10%; 2000V; X7R; CERAMIC
8	C15-C24, C30-C33	-	14	C0603C103K2RAC	KEMET	0.01UF	CAP; SMT (0603); 0.01UF; 10%; 200V; X7R; CERAMIC
9	C25-C29, C34, C35	-	7	GRM32DR72E104KW01	MURATA	0.1UF	CAP; SMT (1210); 0.1UF; 10%; 250V; X7R; CERAMIC
10	C39	-	1	GRM21B5C1H203JA01	MURATA	0.02UF	CAP; SMT (0805); 0.02UF; 5%; 50V; C0G; CERAMIC
11	C48-C51	-	4	GRM188R72A102KA01; C1608X7R2A102K080AA	MURATA;TDK	0.001UF	CAP; SMT (0603); 0.001UF; 10%; 100V; X7R; CERAMIC
12	C53	-	1	GRM21BR61E106K; C2012X5R1E106K085AC125AB; C2012X5R1E106K085AC; TMK212BBJ106KG; CL21A106KAFN3N	MURATA;TDK;TDK; TAIYO YUDEN;SAMSUNG	10UF	CAP; SMT (0805); 10UF; 10%; 25V; X5R; CERAMIC
13	D1	-	1	BAS4002A-RPP	INFINEON	BAS4002A-RPP	DIODE; SCH; SMT (SOT-143); PIV=40V; IF=0.2A
14	D2	-	1	MMSZ5232B-7-F	DIODES INCORPORATED	5.6V	DIODE; ZNR; SMT (SOD-123); Vz=5.6V; Izm=0.02A; 0 DEGC TO +150 DEGC
15	D3-D12, D23-D26	-	14	SMAJ33CA	VISHAY GENERAL SEMICONDUCTOR	33V	DIODE; TVS; SMA (DO-214AC); VRM=33V; IPP=7.5A
16	D13-D22, D27-D30	-	14	BZX84C3V0W-7-F	DIODES INCORPORATED	3V	DIODE; ZNR; SMT (SOT-323); VZ=3V; IZ=0.005A
17	D31	-	1	S2MR5	TAIWAN SEMICONDUCTOR	S2MR5	DIODE; RECT; SMB (DO-214AA); PIV=1000V; IF=2A
18	D32, D33	-	2	SMBJ26CA	ST MICROELECTRONICS	26V	DIODE; TVS; SMB (DO-214AA); VRM=26V; IPP=75A
19	D34-D47	-	14	CMPSH-3S	CENTRAL SEMICONDUCTOR	CMPSH-3S	DIODE; SCH; SMT (SOT-23); PIV=30V; IF=0.1A
20	J1	-	1	10103592-0001LF	FCI CONNECT	10103592-0001LF	CONNECTOR; FEMALE; SMT; MICRO USB B-TYPE REVERSE; RIGHT ANGLE; 5PINS
21	J2	-	1	PEC06SAAN	SULLINS ELECTRONICS CORP.	PEC06SAAN	CONNECTOR; MALE; THROUGH HOLE; BREAKAWAY; STRAIGHT; 6PINS
22	J3	-	1	PEC03DAAN	SULLINS ELECTRONICS CORP.	PEC03DAAN	CONNECTOR; MALE; THROUGH HOLE; BREAKAWAY; STRAIGHT THROUGH; 6PINS; -65 DEGC TO +125 DEGC
23	J4, J5	-	2	PCC02SAAN	SULLINS	PCC02SAAN	CONNECTOR; MALE; THROUGH HOLE; BREAKAWAY; STRAIGHT THROUGH; 2PINS; -65 DEGC TO +125 DEGC
24	L1	-	1	0805USB-502ML	COILCRAFT	0805USB-502ML	INDUCTOR; 0805; USB 2.0 COMMON MODE CHOKE; 1.42 KOHMS AT 1.1GHZ; 273NH; 0.5A
25	L2	-	1	DLW5BSM191SQ2	MURATA	DLW5BSM191SQ2	INDUCTOR; 2020; CHIP COMMON MODE CHOKE COIL; 190 OHM AT 100MHZ; 5A
26	L3	-	1	LI1206H151R-10	LAIRD TECHNOLOGIES	150	INDUCTOR; SMT (1206); FERRITE-BEAD; 150; TOL=25%; 0.8A
27	MH1-MH4	-	4	9032	KEYSTONE	9032	MACHINE FABRICATED; ROUND-THRU HOLE SPACER; NO THREAD; M3.5; 5/8IN; NYLON
28	R1, R3-R8, R43-R46, R55-R57	-	14	ERJ-3EKF28R0	PANASONIC	28	RES; SMT (0603); 28; 1%; +/-100PPM/DEGC; 0.1000W

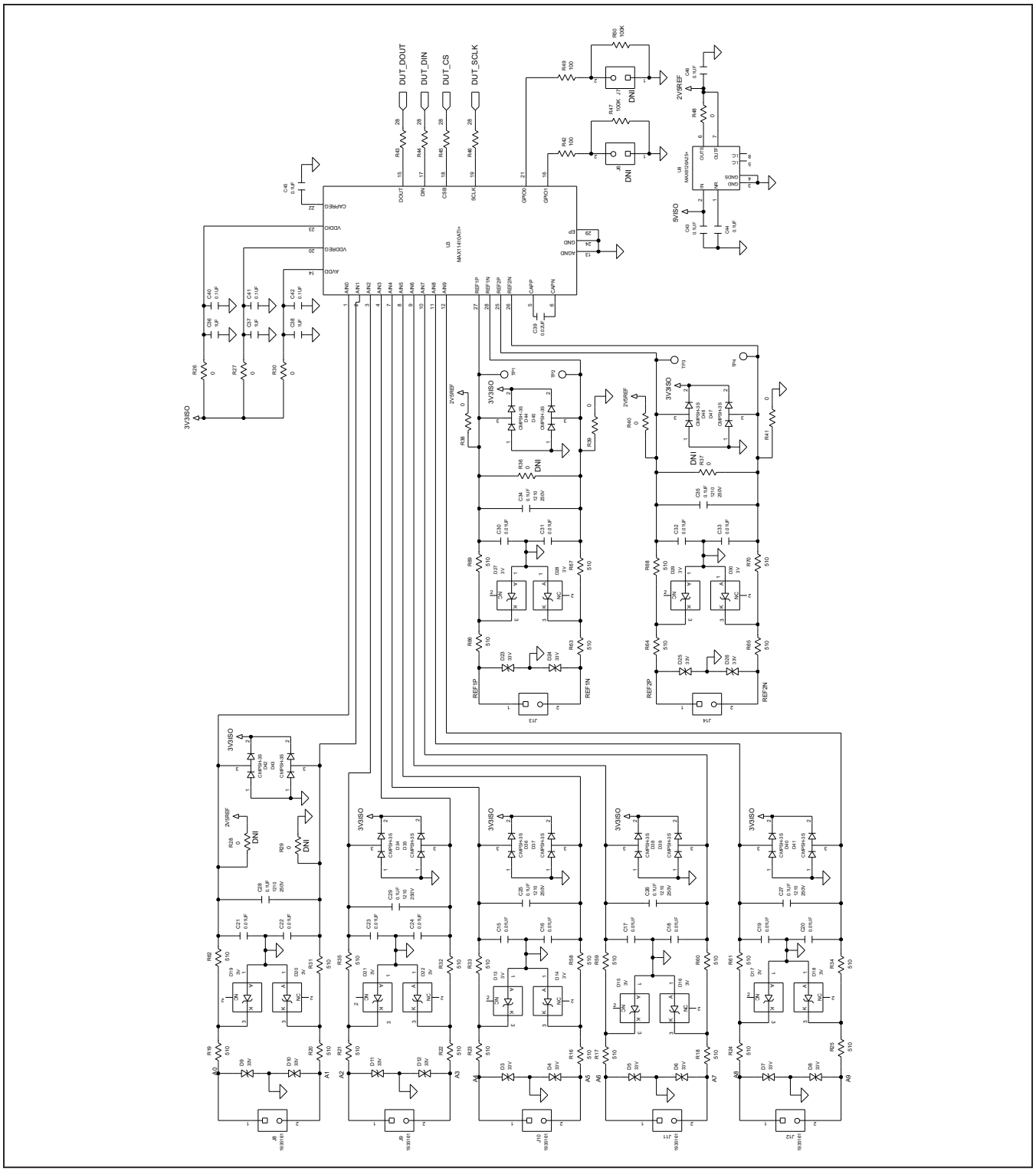
MAX11410 EMC EV Kit Bill of Materials (continued)

ITEM	REF_DES	DNI/DNP	QTY	MFG PART #	MANUFACTURER	VALUE	DESCRIPTION
29	R2	-	1	CRCW060310K0FK; ERJ-3EKF1002; AC0603FR-0710KL; RMCF0603FT10K0	VISHAY DALE; PANASONIC;YAGEO	10K	RES; SMT (0603); 10K; 1%; +/-100PPM/DEGC; 0.1000W
30	R9, R47, R50	-	3	CRCW0603100KFK; RC0603FR-07100KL; RC0603FR-13100KL; ERJ-3EKF1003; AC0603FR-07100KL	VISHAY DALE;YAGEO; YAGEO;PANASONIC	100K	RES; SMT (0603); 100K; 1%; +/-100PPM/DEGC; 0.1000W
31	R10, R12, R13, R26, R27, R30, R38-R41, R48, R54	-	12	CRCW06030000Z0EAHP	VISHAY DRALORIC	0	RES; SMT (0603); 0; JUMPER; JUMPER; 0.2500W
32	R11	-	1	CRCW060347K0FKEAHP	VISHAY DRALORIC	47K	RES; SMT (0603); 47K; 1%; +/-100PPM/DEGC; 0.2500W
33	R14, R51	-	2	HV733ATTE4304F	KOA SPEER ELECTRONICS INC	4.3M	RES; SMT (2512); 4.3M; 1%; +/-100PPM/DEGC; 1W
34	R15	-	1	CRCW060310R0FK; MCR03EZPFX10R0; ERJ-3EKF10R0	VISHAY DALE;ROHM	10	RES; SMT (0603); 10; 1%; +/-100PPM/DEGC; 0.1000W
35	R16-R25, R31-R35, R58-R70	-	28	CRCW0603510RFK	VISHAY DALE	510	RES; SMT (0603); 510; 1%; +/-100PPM/DEGC; 0.1000W
36	R42, R49	-	2	CRCW0603100RFK; ERJ-3EKF1000; RC0603FR-07100RL	VISHAY DALE;PANASONIC	100	RES; SMT (0603); 100; 1%; +/-100PPM/DEGC; 0.1000W
37	SU1	-	1	S1100-B;SX1100-B; STC02SYAN	KYCON;KYCON; SULLINS ELECTRONICS CORP.	SX1100-B	TEST POINT; JUMPER; STR; TOTAL LENGTH=0.24IN; BLACK; INSULATION=PBT;PHOSPHOR BRONZE CONTACT=GOLD PLATED
38	SW1	-	1	B3S-1000	OMRON	B3S-1000P	SWITCH; SPST; SMT; 24V; 0.05A; NORMALLY OPEN-SURFACE MOUNT TACTILE SWITCH; RCOIL= OHM
39	T1	-	1	TGM-H281NF	HALO ELECTRONICS, INC	TGM-H281NF	TRANSFORMER; SMT; 1:1:2.6:2.6; DC/DC CONVERTER ISOLATION MODULE
40	TP1, TP3	-	2	5000	KEYSTONE	N/A	TEST POINT; PIN DIA=0.1IN; TOTAL LENGTH=0.3IN; BOARD HOLE=0.04IN; RED; PHOSPHOR BRONZE WIRE SILVER PLATE FINISH;
41	TP2, TP4	-	2	5117	KEYSTONE	N/A	TEST POINT; PIN DIA=0.1IN; TOTAL LENGTH=0.3IN; BOARD HOLE=0.04IN; BLUE; PHOSPHOR BRONZE WIRE SILVER PLATE FINISH;
42	U1	-	1	ATMEGA328-AU	ATMEL	ATMEGA328-AU	IC; UCON; 8-BIT MICROCONTROLLER WITH 32KBYTES IN-SYSTEM PROGRAMMABLE FLASH; TQFP32
43	U2	-	1	MAX8511EXK33+	MAXIM	MAX8511EXK33+	IC; VREG; ULTRA-LOW-NOISE, HIGH PSRR, LOW-DROPOUT, LINEAR REGULATOR; SC70-5
44	U3	-	1	MAX11410ATI+	MAXIM	MAX11410ATI+	IC; ADC; 24-BIT MULTI-CHANNEL LOW-POWER 1.9KSPS DELTA-SIGMA ADC WITH PGA; TQFN28-EP
45	U4	-	1	ESDA6V1SC6	ST MICROELECTRONICS	ESDA6V1SC6	DIODE; TVS; SMT (SOT23-6); PIV=6.1V; IPP=18A
46	U5	-	1	MAX14935BAWE+	MAXIM	MAX14935BAWE+	IC; DISO; FOUR-CHANNEL; 25MBPS; 5KV DIGITAL ISOLATOR; WSOIC16 300MIL
47	U6	-	1	MAX256ASA+	MAXIM	MAX256ASA+	IC; DRV; 3W PRIMARY-SIDE TRANSFORMER H-BRIDGE DRIVER FOR ISOLATED SUPPLY; NSOIC8-EP 150MIL
48	U7	-	1	FT232RL	FUTURE TECHNOLOGY DEVICES INTL LTD.	FT232RL	IC; INFC; USB UART INTERFACE; SSOP28
49	U8	-	1	MAX6126A25+	MAXIM	MAX6126A25+	IC; VREF; ULTRA-HIGH PRECISION; ULTRA-LOW NOISE; SERIES VOLTAGE REFERENCE; UMAX8
50	U9	-	1	MAX1659ESA+	MAXIM	MAX1659ESA+	IC; VREG; LOW-DROPOUT LINEAR REGULATOR; NSOIC8
51	Y1	-	1	ATS16ASM-1	CTS	16MHZ	CRYSTAL; SMT; 16MHZ; 20PF; TOL = +/-30PPM; STABILITY = +/-50PPM
52	PCB	-	1	MAX11410EMC	MAXIM	PCB	PCB:MAX11410EMC
53	J6, J7	DNP	0	PCC02SAAN	SULLINS	PCC02SAAN	CONNECTOR; MALE; THROUGH HOLE; BREAKAWAY; STRAIGHT THROUGH; 2PINS; -65 DEGC TO +125 DEGC
54	R28, R29, R36, R37, R52, R53	DNP	0	CRCW06030000Z0EAHP	VISHAY DRALORIC	0	RES; SMT (0603); 0; JUMPER; JUMPER; 0.2500W
TOTAL			212				

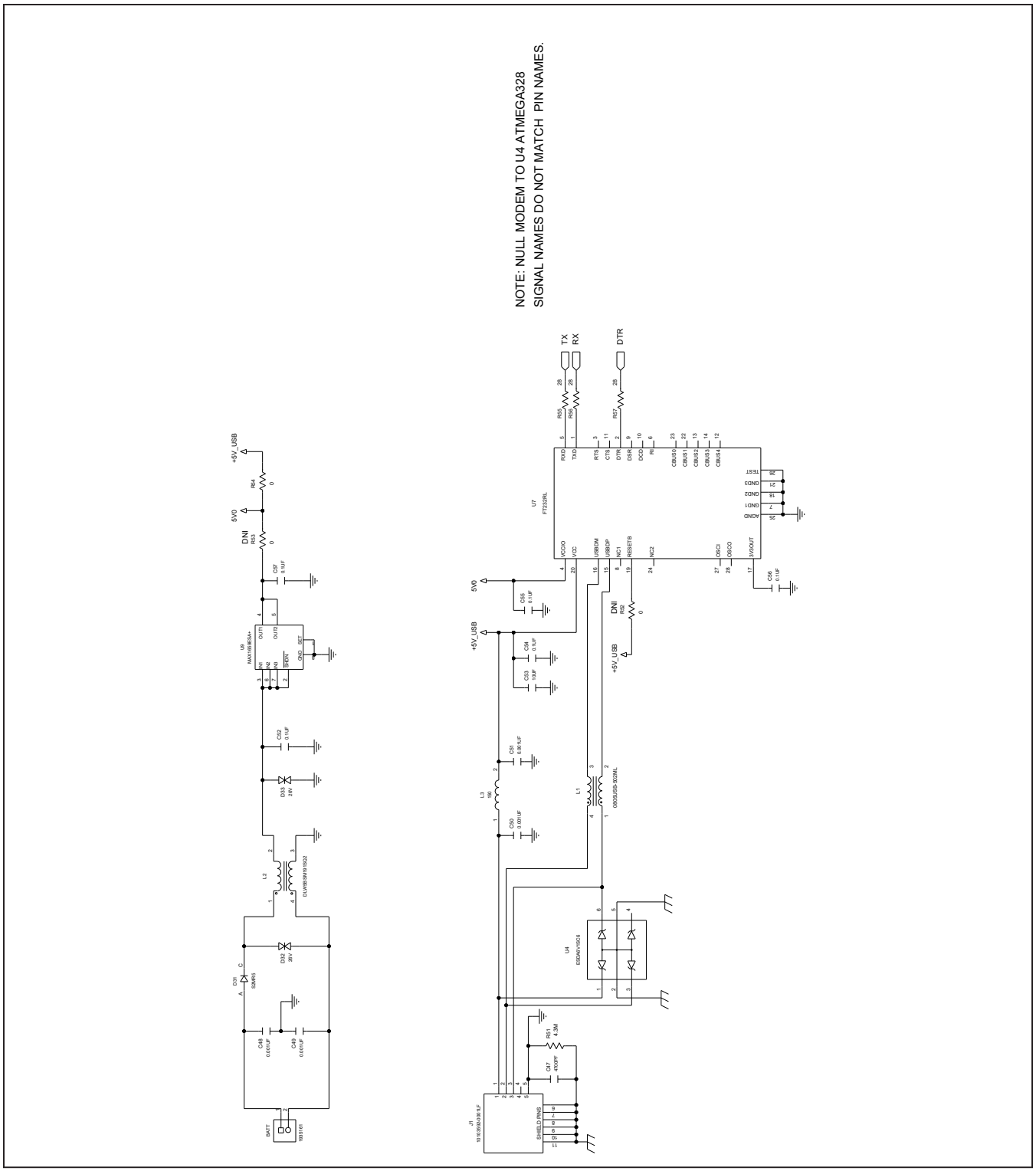
MAX11410 EMC EV Kit Schematics



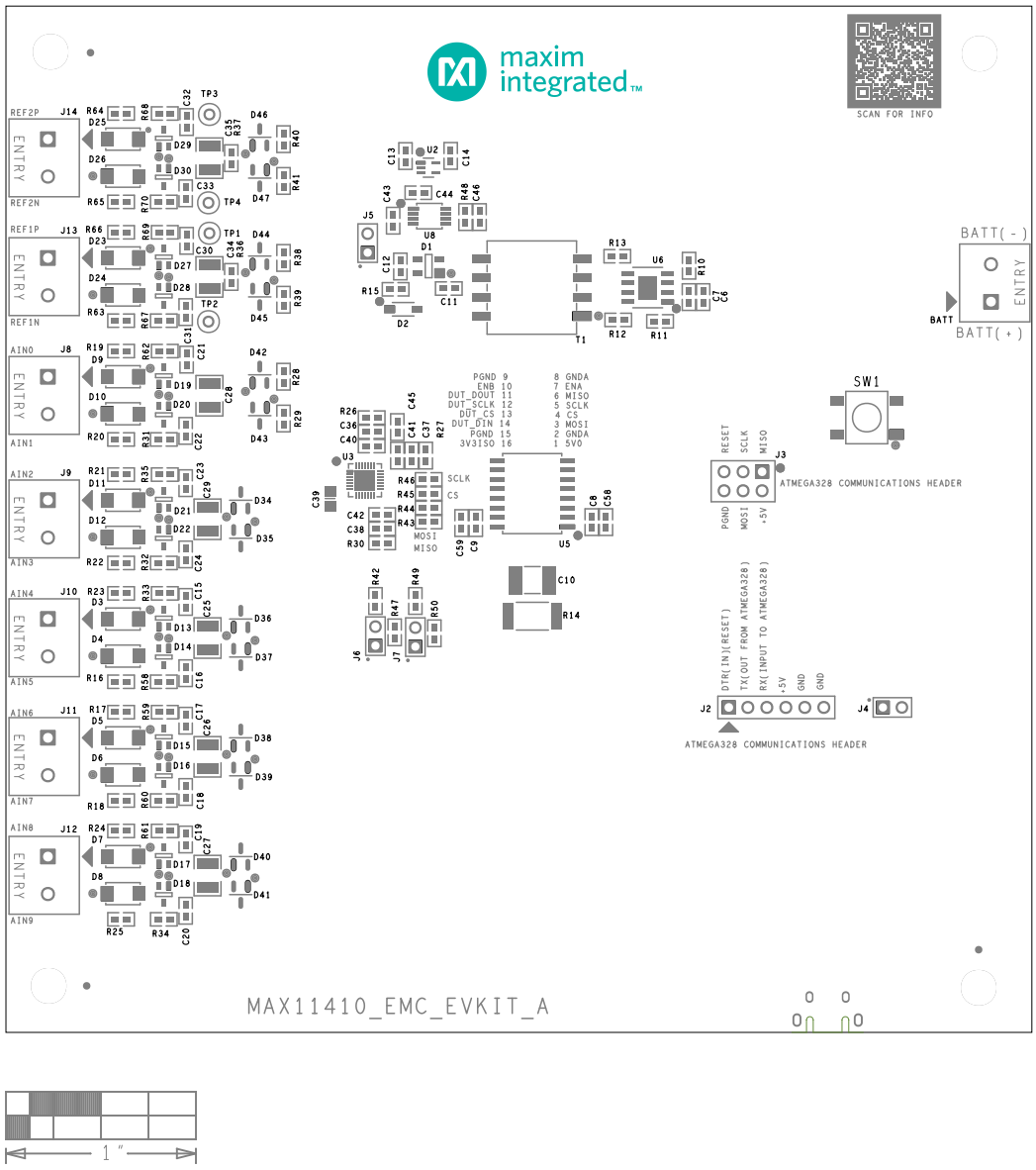
MAX11410 EMC EV Kit Schematics (continued)



MAX11410 EMC EV Kit Schematics (continued)

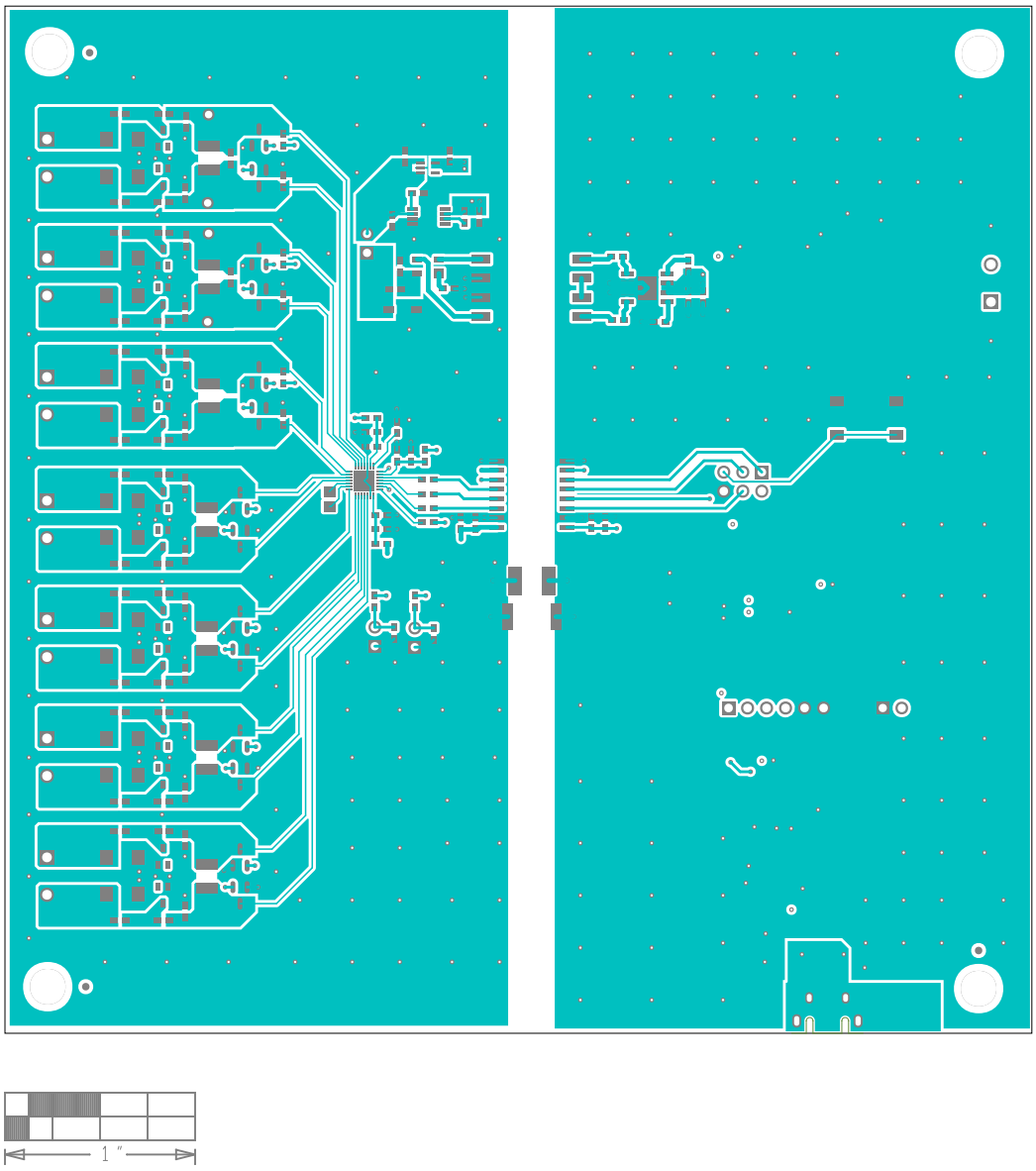


MAX11410 EMC EV Kit Layouts



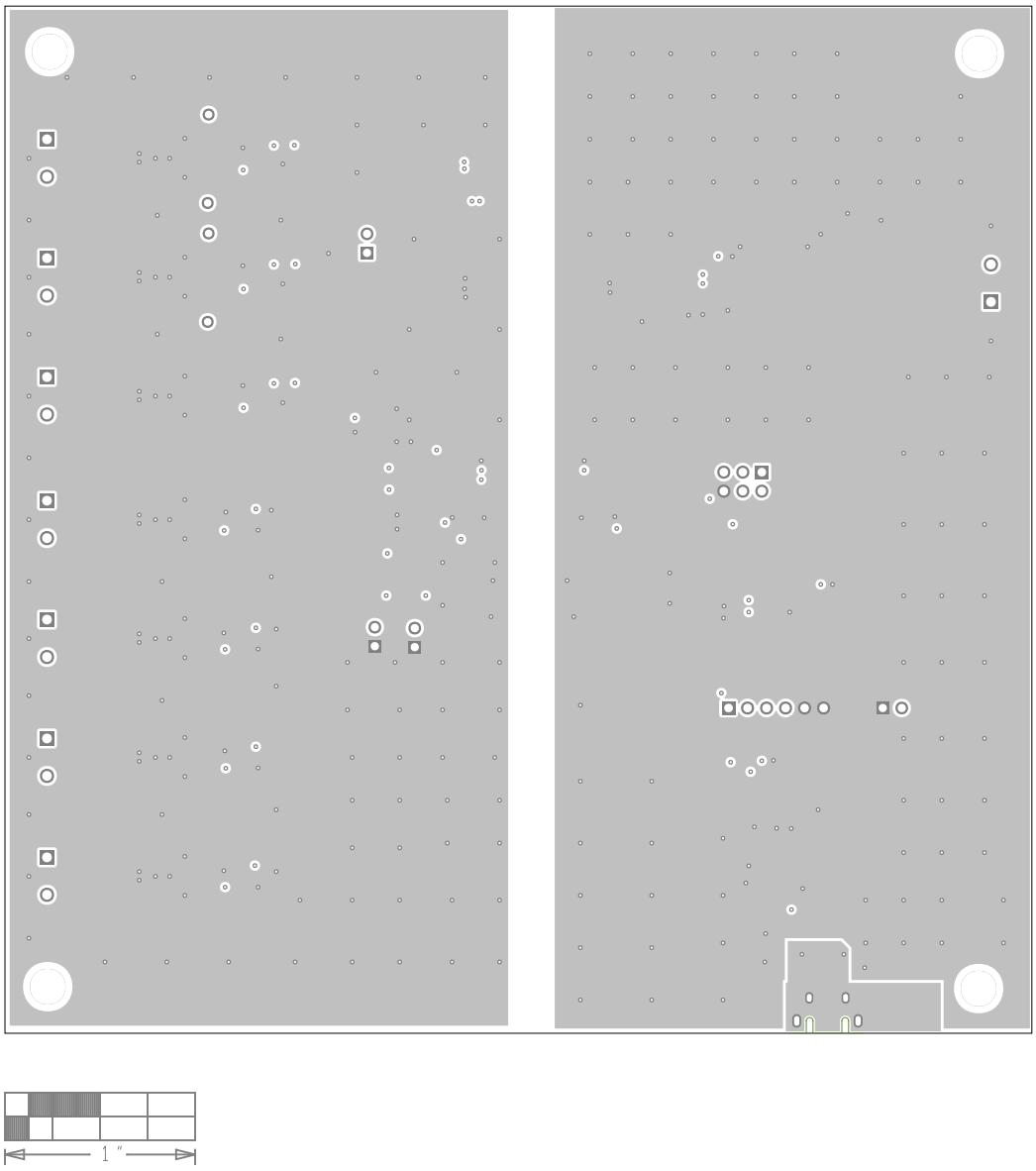
MAX11410 EMC EV Kit Component Placement Guide—Top Silkscreen

MAX11410 EMC EV Kit Layouts (continued)



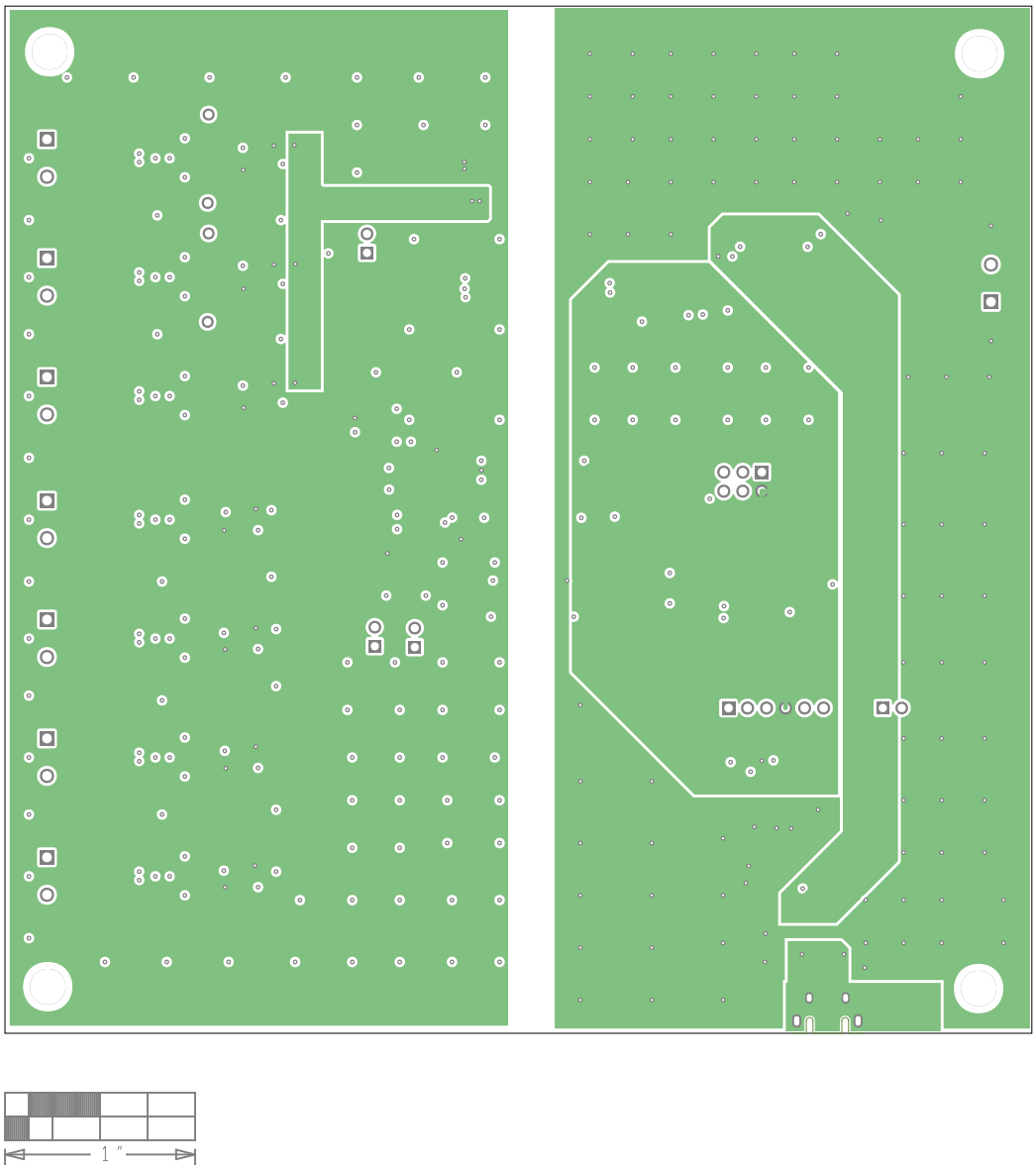
MAX11410 EMC EV Kit PCB Layout—Top

MAX11410 EMC EV Kit Layouts (continued)



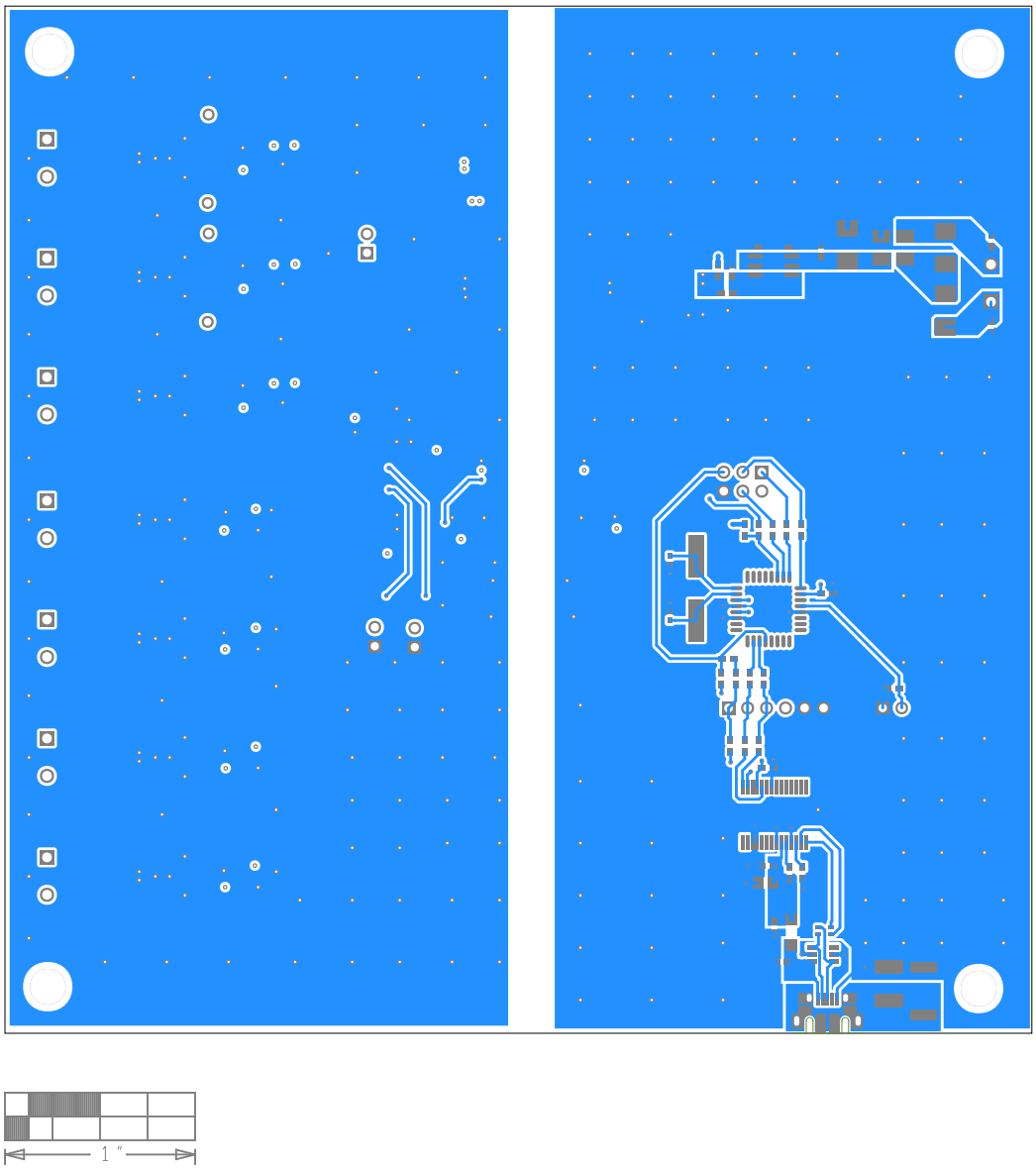
MAX11410 EMC EV Kit PCB Layout—Layer2

MAX11410 EMC EV Kit Layouts (continued)



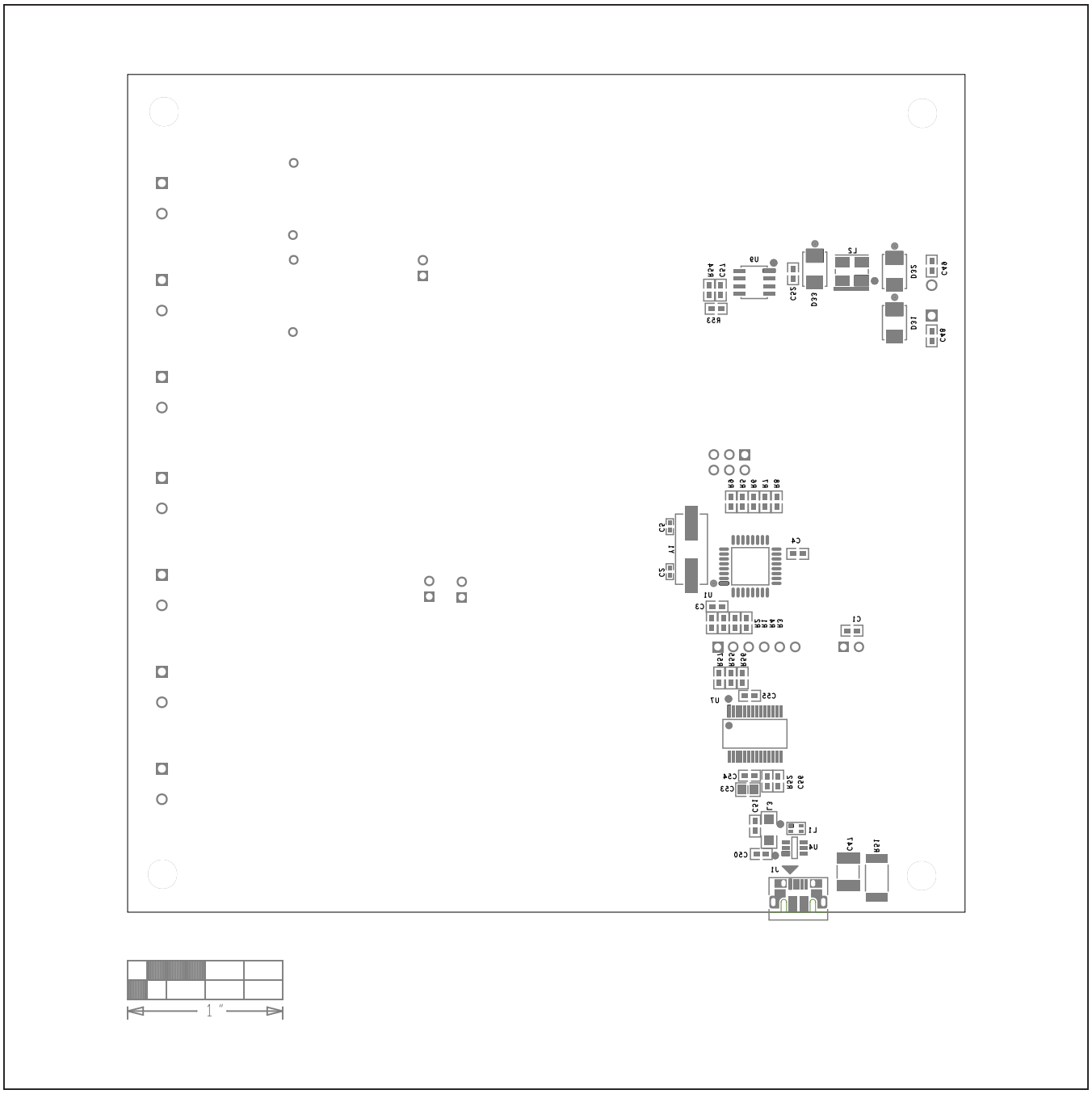
MAX11410 EMC EV Kit PCB Layout—Layer3

MAX11410 EMC EV Kit Layouts (continued)



MAX11410 EMC EV Kit PCB Layout—Bottom

MAX11410 EMC EV Kit Layouts (continued)



MAX11410 EMC EV Kit PCB Layout—Bottom Silkscreen

Revision History

REVISION NUMBER	REVISION DATE	DESCRIPTION	PAGES CHANGED
0	5/21	Initial release	—