

General Description

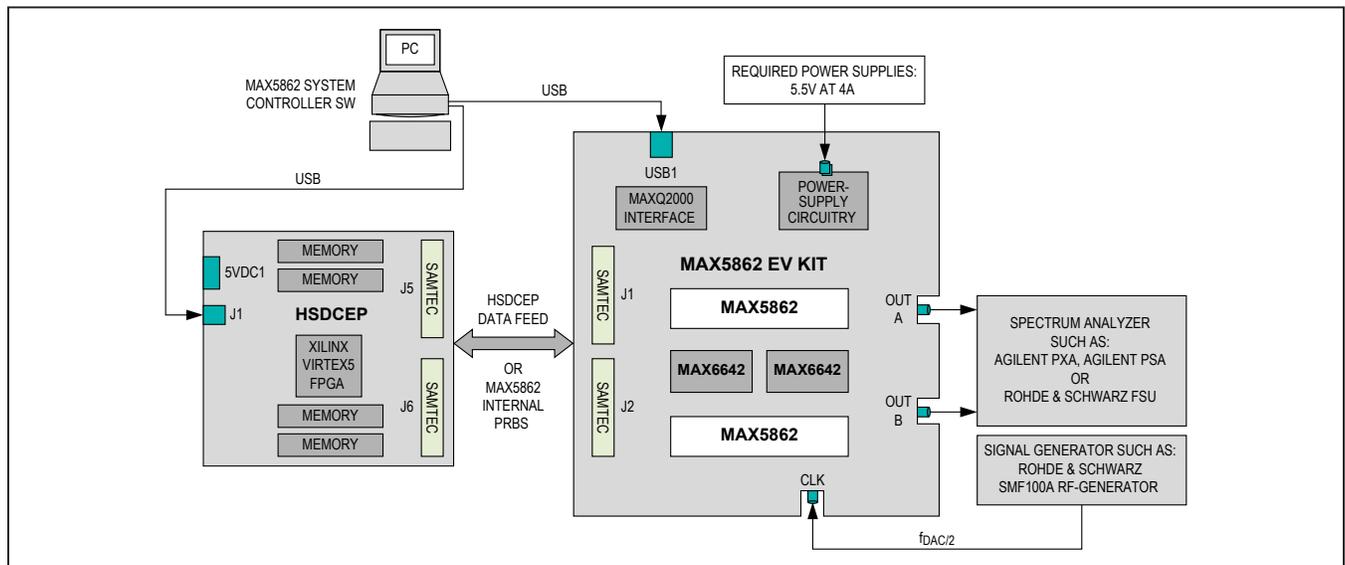
The MAX5862 evaluation kit (EV kit) contains two MAX5862 high-density downstream cable QAM modulators that each integrate a digital upconverter (DUC) and an RF digital-to-analog converter (RF-DAC). The device's DUC performs QAM mapping, pulse shaping, and digital RF upconversion of FEC-encoded data with full agility and then drives a 14-bit, 4.6Gsp/s RF-DAC. Each device digitally synthesizes RF signals with up to 32 DOCSIS®-compliant 6MHz or 8MHz QAM channels on a single RF port at frequencies from 47MHz to 1006MHz.

The EV kit provides a complete two-port system solution for high-density QAM modulation with very low power dissipation.

The EV kit includes Windows XP®, Windows Vista®, and Windows 7-compatible software that provides a simple graphical user interface (GUI) for configuration of all of the MAX5862 registers, control of the SPI interface, temperature monitoring, and for control of the high-speed data converter evaluation platform (HSDCEP) board. Software to control the MAX5862 registers and SPI is also Windows 7 compatible.

The EV kit provides two QSH Samtec connectors to interface to the HSDCEP for driving the IC's single input port and various control signals.

Block Diagram



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Features

- Evaluates the Two MAX5862s Up to 32 QAM Channels Each
- Single 5.5V Input Voltage Supply
- Maximum 4.6Gsp/s Update Rate
- Direct Interface with Maxim HSDCEP Data Source Board Using QSH Connectors (Order HSDCEP)
- Windows XP-, Windows Vista-, and Windows 7-Compatible Software
- On-Board SPI Interface Control for Both Ports of the MAX5862
- On-Board SMBus Interface Control for Both Ports of the MAX6642 Temperature Sensor
- GUI Controls for HSDCEP Operation
- Pseudorandom Bit Sequence (PRBS) Test Pattern Files
- Proven 14-Layer PCB Design
- Fully Assembled and Tested

Ordering Information appears at end of data sheet.

MAX5862 EV Kit Files

The installation file setup.exe installs the following files for use with the EV kit.

FILES	DESCRIPTION
setup.exe	Installs the EV kit files on your computer

FILES/FOLDERS	DESCRIPTION
MAX5862SystemController.exe	Application program
ConfigurationLoadFiles	Directory with sample PRBS patterns to load into the MAX5862 for evaluation, as well as HSDCEP targeted configuration files
USBDriver	Directory with USB supporting files
CDM20600.exe	Installs the USB device driver, located under the USB directory and launches if the "Launch this program" on the installation completion page is selected
USB_Driver_Help_200.pdf	USB driver installation help file under the USB driver directory
FTD2XX*.*	Multiple driver files for Windows XP OS
MAX5862ConfigurationScripts	Perl scripts and supporting files to generate configuration files to load into the MAX5862—see Readme.txt for details
max5862_regmap_complete.txt	Register definition file used by the MAX5862 System Controller software for register definition display
HSDCEP_090505.exe and hsdcep.bat	HSDCEP files used to control the board through the MAX5862 System Controller GUI
HSDCEPtoMAX5862UserGuide_rx.pdf	Information regarding interfacing the MAX5862 to the HSDCEP

Quick Start

Required Equipment

- Windows XP, Windows Vista, or Windows 7 PC with a spare USB port
- USB 2.0 cable, USB A male to B male
- 5.5V, 4A DC power supply
- Signal generator with low phase noise and low jitter for clock input signal to the RF-DAC (e.g., Rohde & Schwarz SMF100A)
- Bandpass filters for the RF-DAC clock input signal (optional)
- High-performance spectrum analyzer (e.g., Agilent PXA, Agilent PSA, or Rohde & Schwarz FSU)
- Maxim HSDCEP data source board with USB cable (optional)

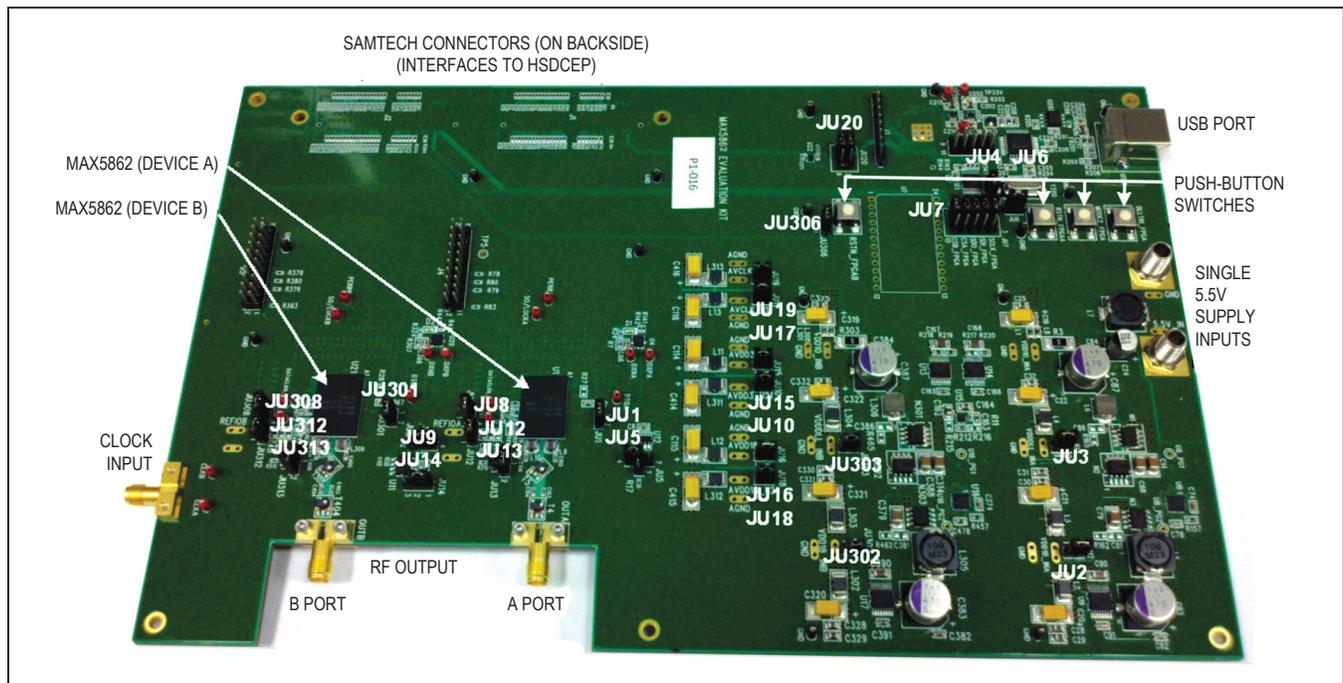
Procedure

Note: In the following sections, software-related items are identified by bolding. Text in **bold** refers to items directly from the EV system software. Text in **bold and underline** refers to items from the Windows operating system. The EV kit is fully assembled and tested. Follow the steps below to verify board operation. **Caution: Do not enable**

the outputs of the power supplies or signal sources until all connections are completed.

- 1) Verify that the EV kit jumpers are configured in their default state (see [Table 1](#)).
- 2) Set the DC power supply to 5.5V and disable the power-supply output.
- 3) Connect the 5.5V power-supply output to the EV kit 5.5V_IN and GND banana jack connectors.
- 4) Set the clock signal generator to the desired clock frequency and power level at 10dBm and disable the output.
- 5) Connect the clock generator to the CLK_IN SMA connector.
- 6) Connect the spectrum analyzer to the EV kit SMA connector labeled OUTA or OUTB.
- 7) Install the EV kit software on your computer by running the setup.exe program. For proper communication with the HSDCEP system calls, install the software into a directory path without spaces, such as C:\MaximIntegrated\MAX5862EVKIT. The program files are copied to the installation directory and icons are created in the Windows **Start | Programs** menu. On the **Installation Complete** window during the

MAX5862 EV Kit Board



installation, if the **Launch this program** checkbox is checked, the USB driver is installed.

- 8) Connect the USB cable from the PC to the MAX5862 EV kit board USB1. When installing the USB driver for the first time, a **Building Driver Database** window pops up in addition to a **New Hardware Found** message. If the system does not detect the USB connection, remove the USB cable from the board and reconnect it.
 - If the **New Hardware Found** message appears, follow the directions of the **Add New Hardware Wizard** to install the USB device driver. Choose the **Search for the best driver for your device** option. Specify the location of the device driver to be the installation directory using the **Browse** button. During device driver installation, Windows may show a warning message indicating that the device driver Maxim uses does not contain a digital signature. This is not an error condition and it is safe to proceed with installation. Refer to the USB_Driver_Help_200.pdf document included with the software for additional information.
- 9) Start the EV kit software by opening the icon in the **Start | Programs** menu under **Maxim Integrated**.



Figure 1. MAX5862 Evaluation System Controller Popup Window

The EV kit software window appears, as shown in [Figure 1](#).

- 10) Enable the EV kit DC power supply.
- 11) Enable the clock generator output.
- 12) Press the momentary switch buttons RSTN_A and RSTN_B on the EV kit board.
- 13) Press the momentary switch button DLLOFF on the EV kit board to reset the DAC DLL.

- 14) Press the **Run MAX5862 Evaluation System Controller Application** button and verify that the EV kit main window appears, similar to that shown in [Figure 2](#).
- 15) Select the **MAX5862 Register Control** tab to verify communication to the EV kit by typing 0 in the **Address** edit box and pressing the **Read Data** button. Verify that 3 appears in the edit box.
 - If the value read is 0x3333, there is probably not communication to the USB microcontroller:

This occurs when the USB cable has been disconnected and reconnected, but the GUI is not closed down—close the tabbed GUI and click the **Run MAX5862 Evaluation System Controller Application** button to reconnect.
 - If the value read is 0xFFFF, there is possibly not communication to the MAX5862:

This occurs when there is not power or clock to the MAX5862 device.
- 16) Select the MAX5862 port to evaluate by checking the **A** or **B** checkbox under the **Signal Path Selection** label at the top of the **MAX5862 Register Control** tab sheet.
- 17) Click the **Select File to Load** button and select a pseudo-random bit sequence (PRBS) file to load from the ConfigurationLoadFiles folder, such as

001SB256_5862_PRBS_4608M_600M.txt. The load files are in the ABC_D_E_FM_GM.txt format, where the format is defined as follows:

SYMBOL	DEFINITION
A	Number of QAM channel, 3 digits
B	Data rate—D for DDR and S for SDR
C	QAM mapping—A16, A32, A64, A128, A256, B64, B256, C64, or C256
D	Target of the configuration—5862 for MAX5862 or HSDCEP
E	Source of the data—PRBS for internal PRBS generator data or input for input interface data, such as from the HSDCEP
F	DAC frequency in MHz
G	DAC output data center frequency in MHz

- 18) A dialog box appears, as shown in [Figure 5](#), indicating that the read register values were written to the file MAX5862FileLdRegisterRead.txt. Click **OK**. When loading a large channel-count configuration, this could take a minute to appear while the numerous registers are written.
- 19) Observe the output of the selected port on the spectrum analyzer and adjust the signal generator and spectrum analyzer, if required.

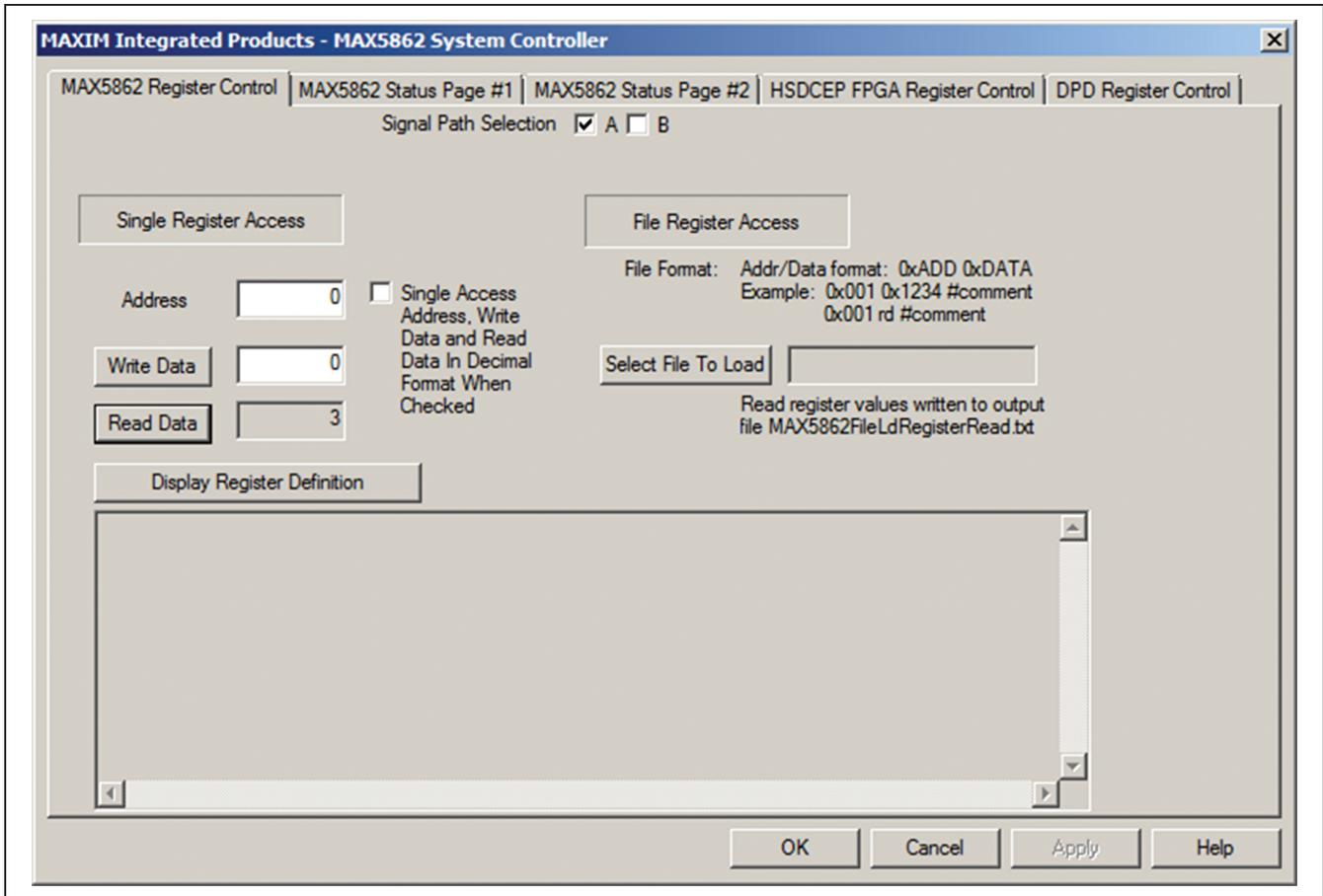


Figure 2. MAX5862 Evaluation System Controller Software GUI Window

The MAX5862 EV kit board is initially configured with jumpers installed in the positions shown in [Table 1](#).

Table 1. Jumper Configurations

JUMPER	SHUNT POSITION	EV KIT FUNCTION
JU1	Installed*	Normal operation
	Not installed	VDD10A sense voltage monitoring
JU2	Installed*	1.8V LDO powers the MAX5862 VDD18_INA input
	Not installed	External supply applied at the VDD18_INA and GND test points
JU3	Installed*	1.8V LDO powers the MAX5862 VDDLLA input
	Not installed	External supply applied at the VDDLLA and GND test points
JU4	Installed*	VCCA of the level translator connected to VDD18A
	Not installed	External supply applied at the JU4-2 pin for VCCA reference
JU5	1-2	MAX4644 NC pin for DLLOFF levels to AVDD18A
	1-3	MAX4644 NC pin for DLLOFF levels to resistor and GND
	1-4*	MAX4644 NC pin for DLLOFF levels to GND

Table 1. Jumper Configurations (continued)

JUMPER	SHUNT POSITION	EV KIT FUNCTION
JU6	Installed*	VCCA of level translator connected to VDD18A
	Not installed	External supply applied at the JU6-2 pin for VCCA reference
JU7	1-2, 4-5, 7-8, 10-11, 13-14*	SPI signals controlled from MAXQ2000 microcontroller
	2-3, 5-6, 8-9, 11-12, 14-15	SPI signals controlled from FPGA connectors J1 and J2
JU8	Installed*	Normal operation
	Not installed	GND sense voltage monitoring
JU9	1-2	MAX6161 GND reference from DACREFA
	1-3	MAX6161 GND reference from DACREFB
	1-4*	MAX6161 GND reference from the board GND
JU10	Installed*	AVDD3.3V powers the MAX5862 AVDD3B input
	Not installed	External supply applied at the AVDD3B and GND test points
JU12	Installed*	MAX6161 OUT pin to REFIOA
	Not installed	MAX6161 OUT not directly connected to REFIOA
JU13	1-2*	DELAYA to AVDD18A
	1-3	DELAYA to resistor to GND
	1-4	DELAYA to GND
JU14	1-2*	MAX6161 IN pin to AVDD3A
	2-3	MAX6161 IN pin to AVDD3B
JU15	Installed*	AVDD3.3V powers the MAX5862 AVDD3A input
	Not installed	External supply applied at the AVDD3A and GND test points
JU16	Installed*	AVDD1.8V powers the MAX5862 AVDD18A input
	Not installed	External supply applied at the AVDD18A and GND test points
JU17	Installed*	AVCLK powers the MAX5862 AVCLKA input
	Not installed	External supply applied at the AVCLKA and GND test points
JU18	Installed*	AVDD1.8V powers the MAX5862 AVDD18B input
	Not installed	External supply applied at the AVDD18B and GND test points
JU19	Installed*	AVCLK powers the MAX5862 AVCLKB input
	Not installed	External supply applied at the AVCLKB and GND test points
JU20	1-2, 4-5*	SMBus signals controlled from the MAXQ2000 microcontroller
	2-3, 5-6	SMBus signals controlled from FPGA connectors J1 and J2
JU301	Installed*	Normal operation
	Not installed	VDD10B sense voltage monitoring
JU302	Installed*	1.8V LDO powers the MAX5862 VDD18_INB input
	Not installed	External supply applied at the VDD18_INB and GND test points
JU303	Installed*	1.8V LDO powers the MAX5862 VDDDLLB input
	Not installed	External supply applied at the VDDDLLB and GND test points
JU306	Installed*	VCCA of level translator connected to VDD18B
	Not installed	External supply applied at the JU306-2 pin for VCCA reference

Table 1. Jumper Configurations (continued)

JUMPER	SHUNT POSITION	EV KIT FUNCTION
JU308	Installed*	Normal operation
	Not installed	GNDB sense voltage monitoring
JU312	Installed*	MAX6161 OUT pin to REFIOB
	Not installed	MAX6161 OUT not directly connected to REFIOB
JU313	1-2*	DELAYB to AVDD18A
	1-3	DELAYB to resistor to GND
	1-4	DELAYB to GND

Detailed Description of Software

The MAX5862 system controller software is designed to control the EV kit and the HSDCEP board. The MAX5862 system controller software includes USB circuitry that provides SPI and SMBus communication to control both ports of the MAX5862 and the MAX6642 interfaces, respectively. The software also controls the HSDCEP through system calls to the root HSDCEP controller software. The software gives the user the capability of accessing the IC’s 1818 internal registers in each device.

The two IC ports are differentiated by a **Signal Path Selection** checkbox as **A** or **B** shown in [Figure 2](#). With the appropriate checkbox selected, the registers in a port are written to and/or read from.

The EV kit software features five window tabs for operation of the MAX5862 system controller software and are defined below:

- **MAX5862 Register Control**
 - Single access read and write operations
 - File read/write loads and downloads
 - Register definition display
- **MAX5862 Status Page #1**
 - Reading channel registers to a file
 - Display of channel configuration summary
 - Display of the general chip configuration summary
- **MAX5862 Status Page #2**
 - Reading of the FIFO status, power monitor registers, and digital predistortion (DPD) configuration registers
 - Display the interrupt enables and status registers
 - Control of the MAX6642 temperature sensor IC
- **HSDCEP Transmit Register Control**
 - Reads or writes to the HSDCEP registers
 - File read/write loads and downloads

- Upload a data file into the memory and start or stop a memory pattern
- Load a bit file into the FPGA
- Power the HSDCEP up or down
- Read the FIFO status within the FPGA

- **DPD Register Control**
 - Manipulation of the DPD register set through easy-to-use slide bars

MAX5862 System Controller Software

The USB communication to the MAXQ2000 microcontroller’s SPI is verified when the button labeled **RunMAX5862SystemControllerApplication** is clicked ([Figure 1](#)). If the USB is not connected or communicating to the interface correctly, a popup window appears, as shown in [Figure 3](#).

If the USB has been disconnected, the communication link is lost and must be reinitialized by closing the main GUI window ([Figure 2](#)) and clicking on **Run MAX5862 System Controller Application** ([Figure 1](#)) to connect properly with the microcontroller.



Figure 3. Failed to Connect Popup Window

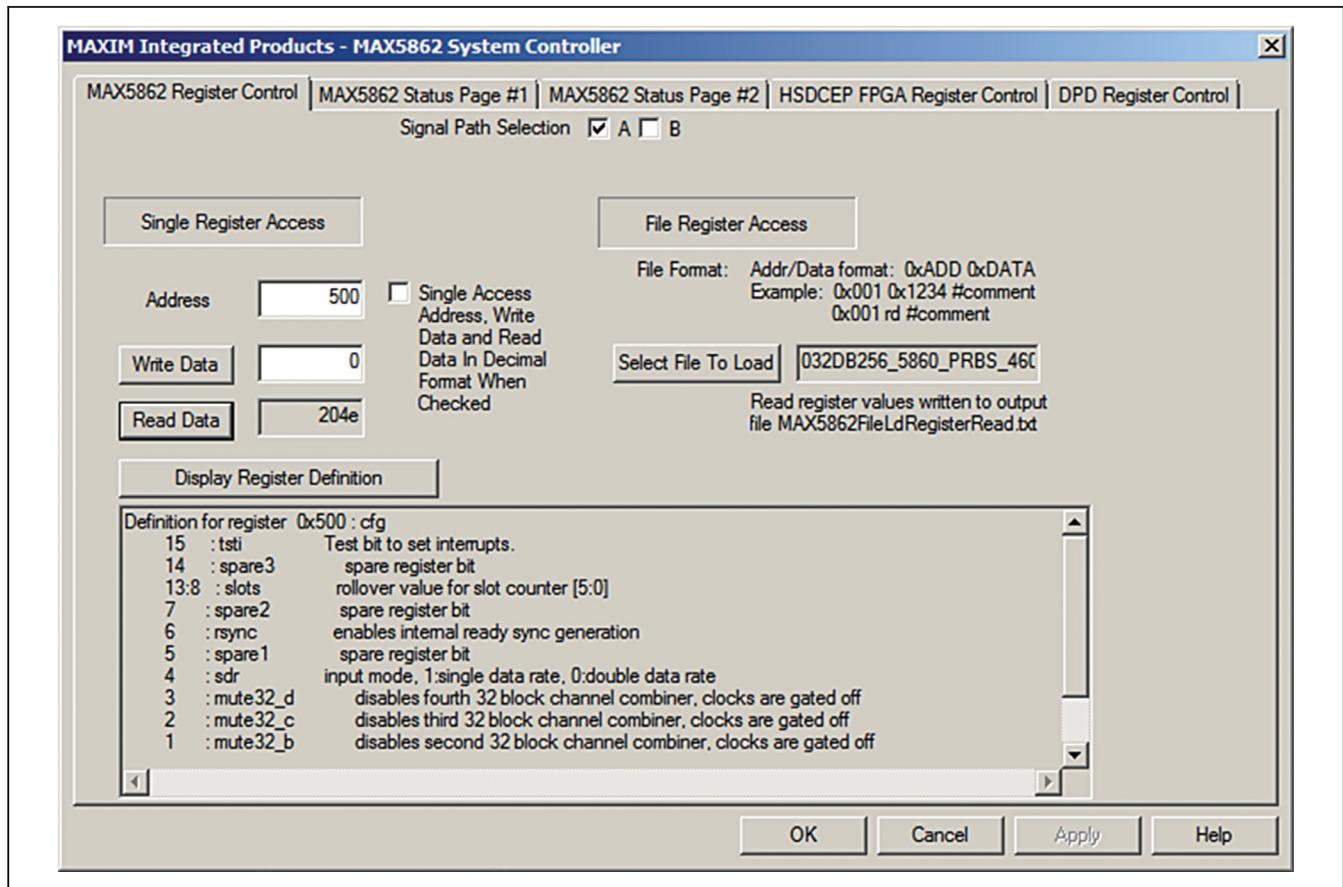


Figure 4. MAX5862 Register Control Tab

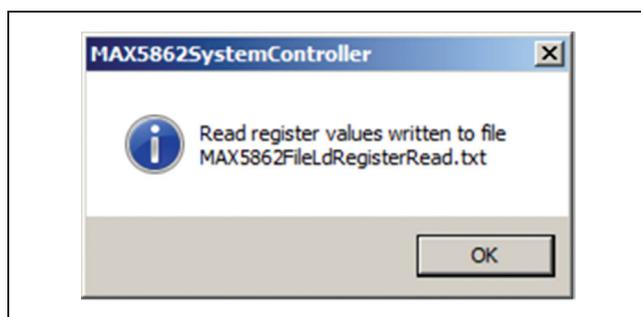


Figure 5. Transfer Complete Popup Window

MAX5862 Register Control Tab

Figure 4 displays the MAX5862 Register Control tab sheet. The IC register address and data are placed in the corresponding edit box. Reads and writes to the registers are updated when pressing the **Write Data** and **Read Data** buttons. The default data format for the **Address**, **Write Data**, and **Read Data** fields is

hexadecimal. A checkbox is available to display the register content in decimal format. The **Display Register Definition** displays the register definition but does not decode the current state (i.e., current bit state). Refer to the MAX5862 IC data sheet for register descriptions.

The **File Register Access** section allows text files with multiple entries to be written and/or read. The writes and reads occur one line at a time and the read results are written to an output file for viewing after the transfers are complete. A popup window (see Figure 5) appears when the transfers are complete. The write file format should be hexadecimal representation of 12 bits of address, followed by a space, followed by 16 bits of hexadecimal data (e.g., 0x500 0x2040). The format for the file reads should be 12 bits of hexadecimal address, followed by a space, followed by the letters “rd” (e.g., 0x500 rd). Comments should be preceded with a “#” symbol and can be on a separate line or following read or write commands. Reads and writes can be mixed in a file. On the reads, the read data outputs to a file.

The output file format of the file register access is consistent with the input data format to allow for future configurations. The load file can have the appropriate register reads to determine the current configuration. The resulting MAX5862FileLdRegisterRead.txt file can then be modified and used for future chip configuration. There are registers that command a load pulse or configuration order (i.e., hs-cfg, symif_x, or comb8_x registers) that must be addressed by the user as those bits are self-clearing.

MAX5862 Status Page #1 Tab

There are many status qualifiers of the IC. The evaluation system controller software attempts to display the feasible status in the MAX5862 Status Page #1 tab (Figure 6) and

MAX5862 Status Page #2 tabs. All registers associated with a single channel can be read to a file with the **Read Channel Registers To File** field. In the **Display Channel Summary** field, the registers associated with the channel entered in the **Channel** edit box are read and the current configuration is displayed in the window. This includes the single-channel register as well as the 8-channel combiner registers associated with the channel defined. For the information associated with the 32-channel or 128-channel combiner settings, press the **Display** button next to the **Display General Summary** field. The display field displays the G4 and G5 gain settings, the NCO settings, the SDR (single data rate) or DDR (double data rate) mode, and the number of slots per port currently set.

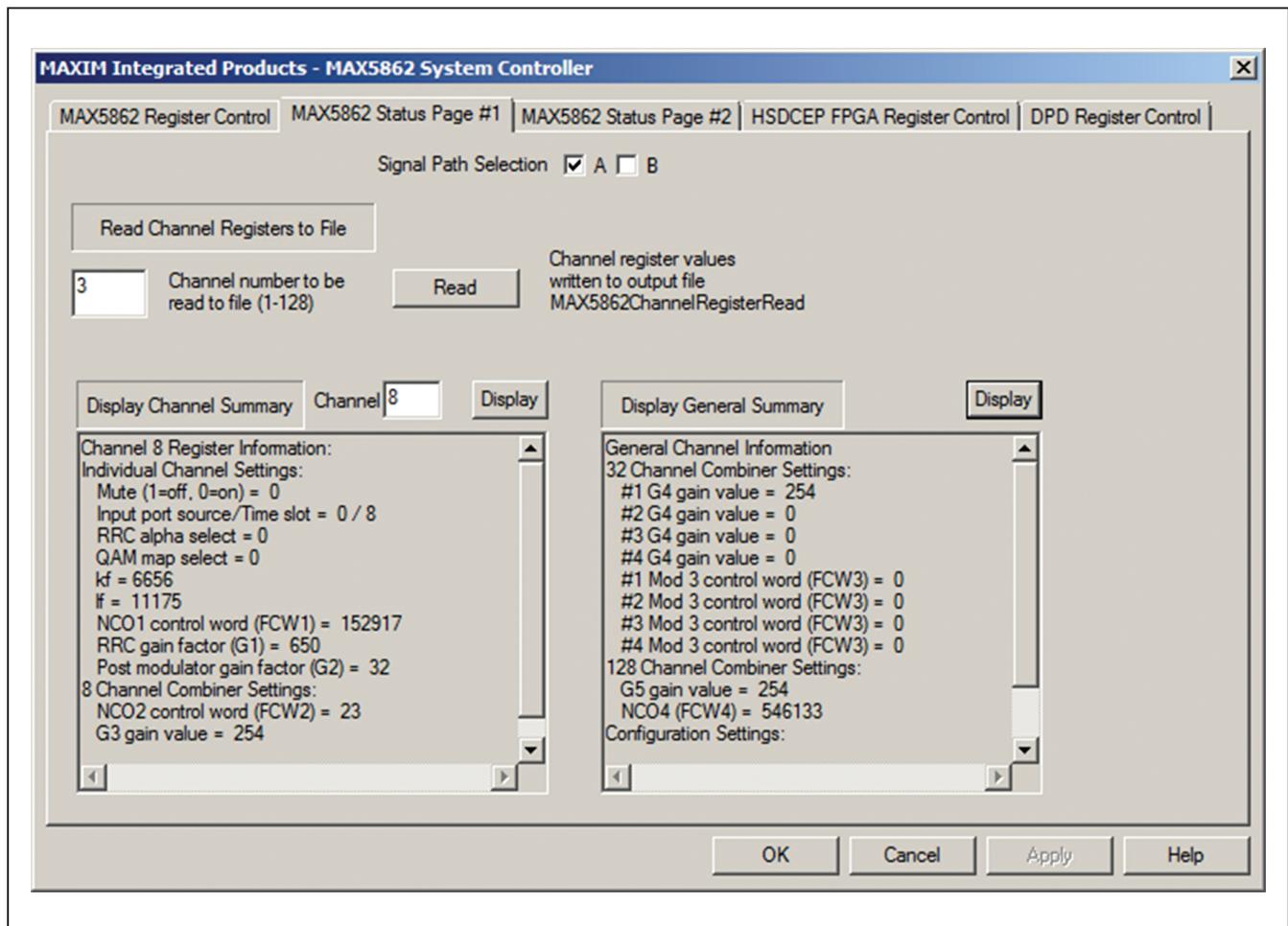


Figure 6. MAX5862 Status Page #1 Tab

MAX5862 Status Page #2 Tab

The **MAX5862 Status Page #2** tab (Figure 7) allows access to the FIFO status, G1 through G3 power monitor registers, interrupt enables and status, DPD registers, and the temperature sensor status and settings. The FIFO status displays a pass or fail state. In either case, the register reads are dumped to a file for examination upon failure. The power monitor registers can be read to a file for user evaluation by pressing the **Read** button under the **Read Power Data** label. Interrupt enables and status can be displayed in the output window for the user. The DPD registers can be read and written to an output file by pressing the **Read** button under the **Read DPD Registers** label.

The MAX6642 IC monitors the temperature of the MAX5862. The MAX6642 registers are read from/written to using the EV kit USB circuitry. Check the appropriate

port checkbox under the **Signal Path Selection** to set the MAX6642 to communicate. The high temperature threshold that asserts the IC $\overline{\text{ALERT}}$ logic output is set using the **Write High Limit** edit field and affects the assertion of the status LED D1 for signal path A and D2 for signal path B. The MAX5862 IC current temperature is read by clicking the **Read Temperature** button. An additional **Read Cmd Reg** button is available for reading the remaining MAX6642 registers. Reading from address 2 clears the $\overline{\text{ALERT}}$ and therefore turns off D1 for signal path A or D2 for signal path B if the threshold is not currently passed. The **Read Temperature** and **Write High Limit** buttons are the only registers required for most applications. However, the **Read Cmd Reg** button is available for reading the MAX6642 registers by entering the register address, in decimal format, in the edit box. Refer to the MAX6642 IC data sheet for additional registers information.

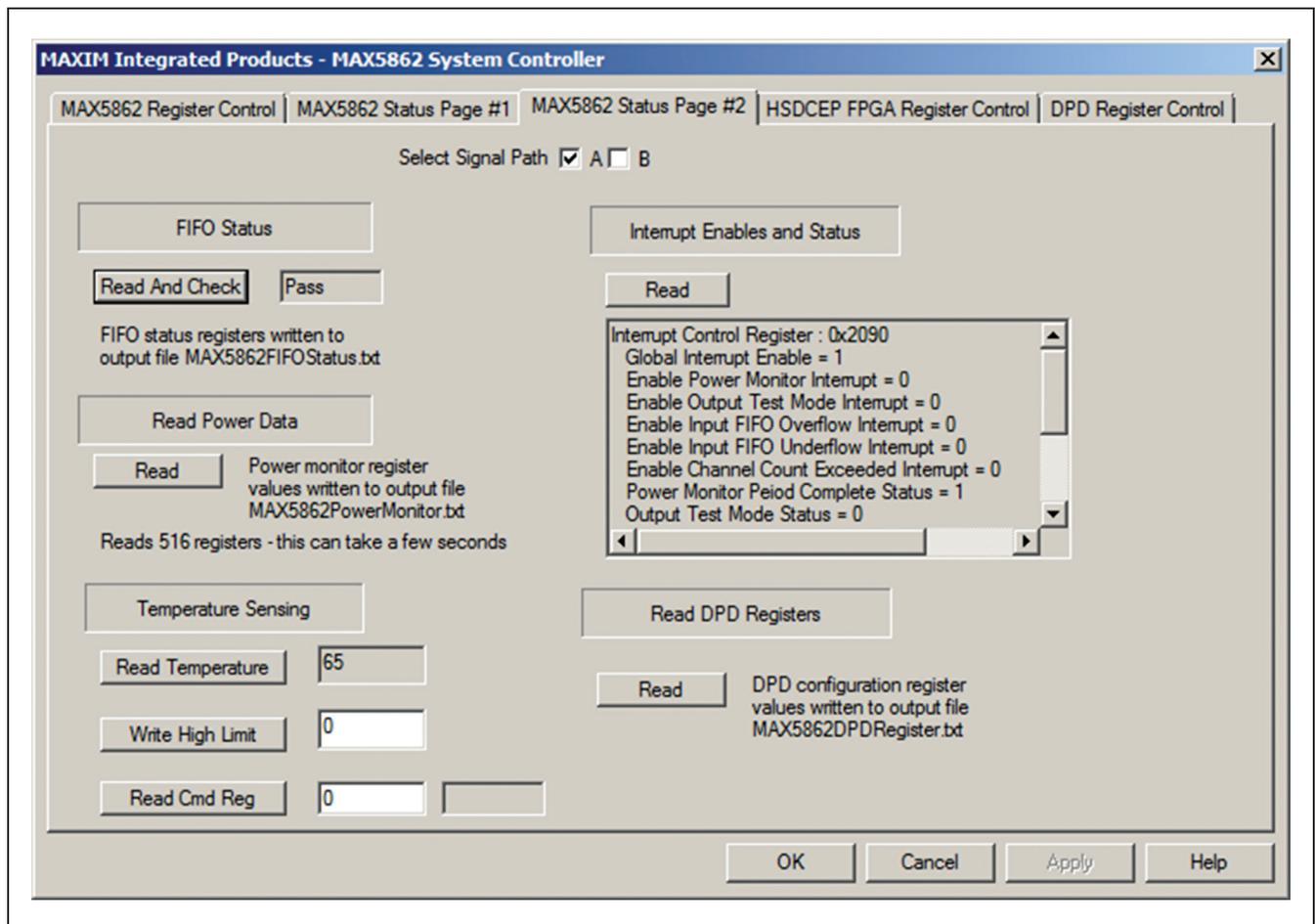


Figure 7. MAX5862 Status Page #2 Tab

HSDCEP FPGA Register Control Tab

The HSDCEP can be controlled using the **HSDCEP FPGA Register Control** tab, (see [Figure 8](#)). Single register reads or writes are performed using the **Address**, **Write Data**, and **Read Data** edit boxes, using hex format. A checkbox is available for entering data in decimal format. Various buttons are available for control such as file reads and writes, memory file loads, starting and stopping

the memory transfer, board power up and down, FPGA bit file load, and FIFO status for the transmit specific build.

Note: When operating the EV kit GUI using the **HSDCEP FPGA Register Control** tab functions, the load files and MAX5862 system controller executable file must be located in the same directory as the HSDCEP executable file for proper operation.

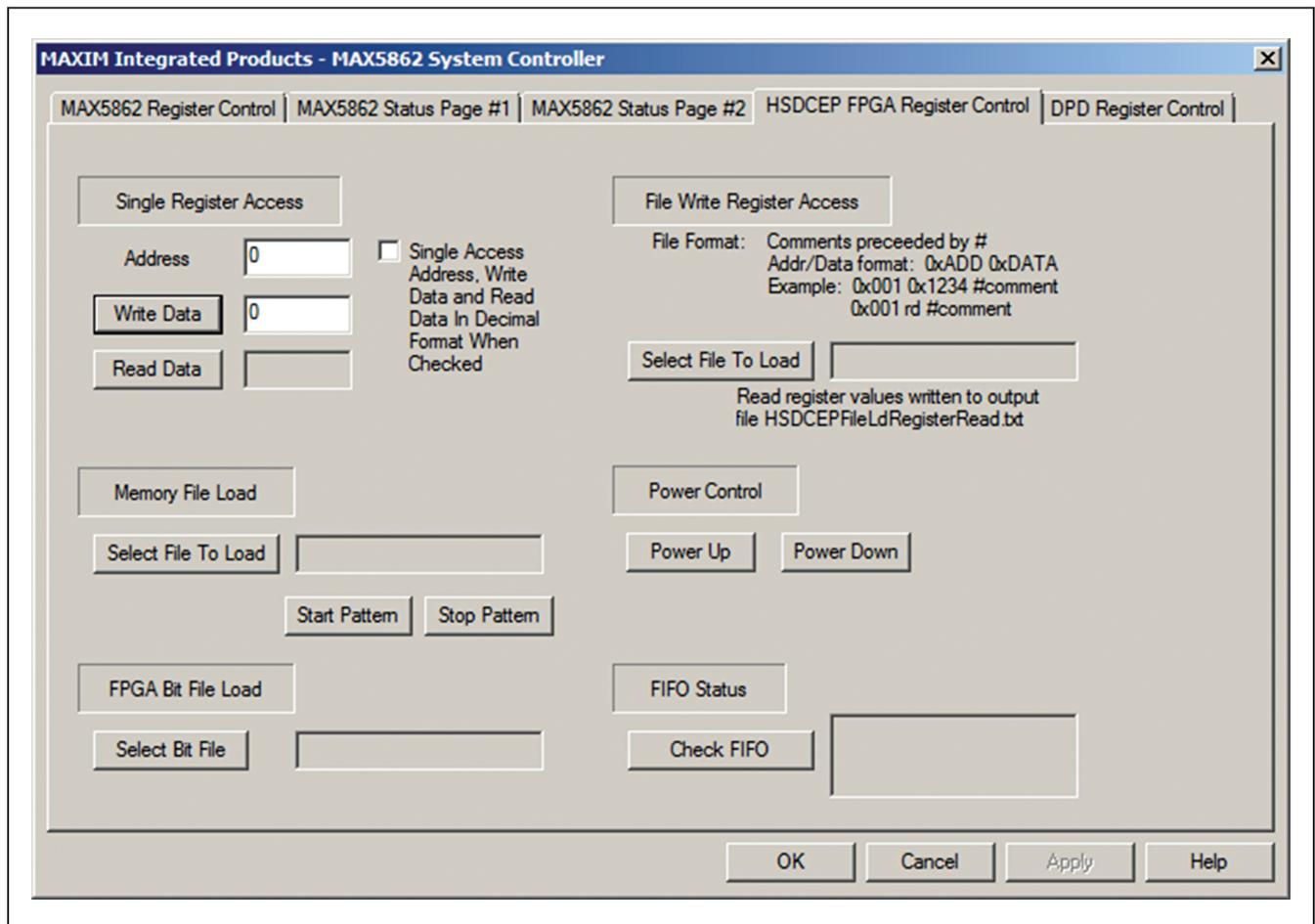


Figure 8. HSDCEP FPGA Register Control Tab

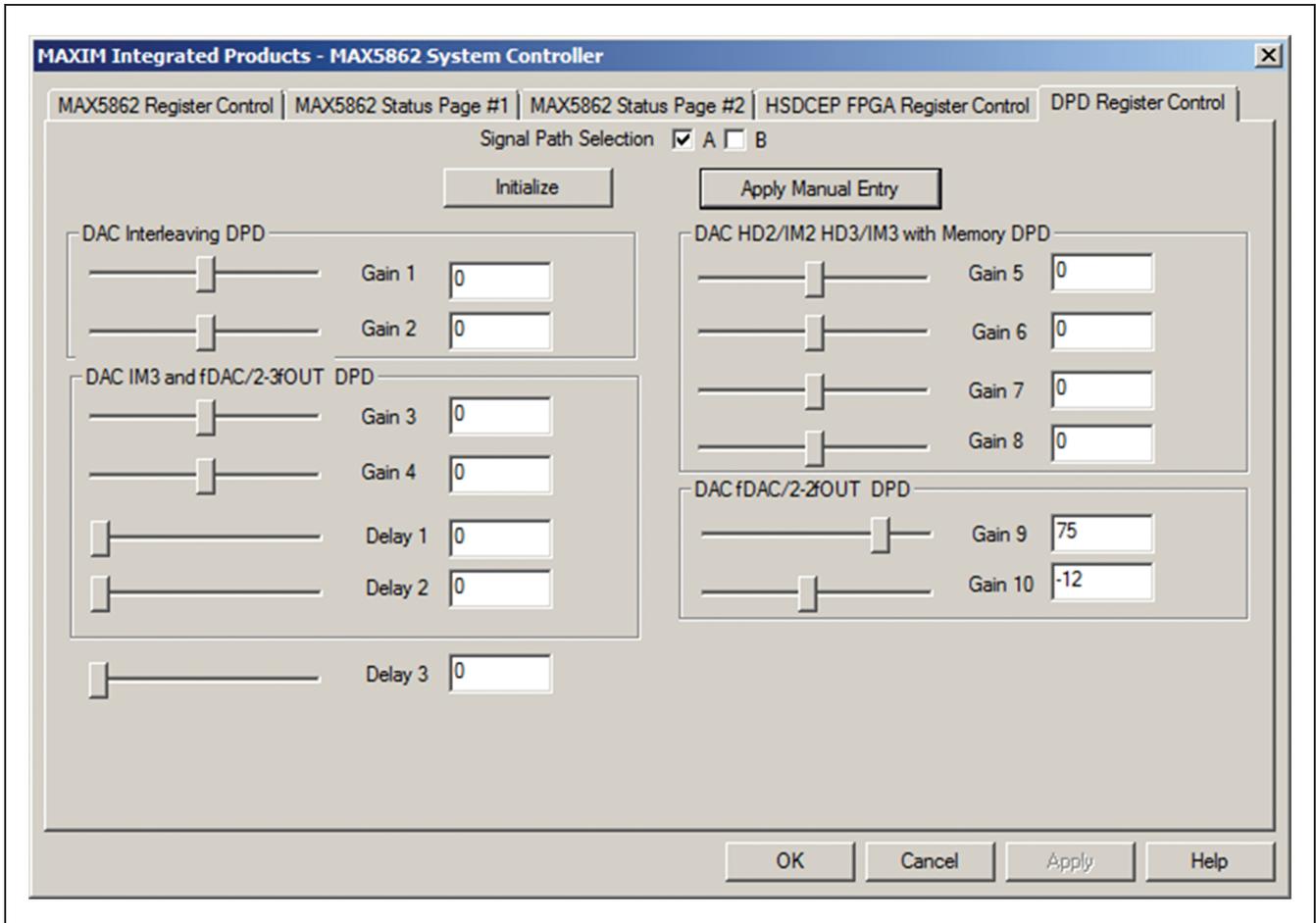


Figure 9. DPD Register Control Tab

DPD Register Control Tab

The **DPD Register Control Tab** (Figure 9) allows easy track bar control of the DPD gain registers. The **Initialize** button initiates connection between the track bar locations to the register values. Moving the track bars triggers register control of the selected gain. Results in the spectrum can be seen instantly using the slide bars. To control the values of the gain registers with the values entered into the checkboxes, press the **Apply Manual Entry** button.

Detailed Description of Hardware

The MAX5862 EV kit contains two MAX5862 high-density downstream cable QAM modulators that each drive an RF port. It is a fully assembled and tested PCB that contains all the components necessary for evaluating two

MAX5862 devices configured for 32 DOCSIS-compliant 6MHz or 8MHz QAM channels. The EV kit provides a complete system solution for high-density QAM modulation with very low power dissipation. The EV kit operates from a 5.5V/4A input power supply.

The IC performs QAM mapping, pulse shaping, and digital RF upconversion of FEC encoded data with full agility. The IC accepts data on one time-multiplexed input port of up to 32 digital streams per port, providing a very flexible DSP front-end.

The EV kit provides Samtec QTH connectors J1 and J2 to drive the IC input ports. The IC output is available for viewing at the OUTA and OUTB SMA connectors (see Figure 3).

The EV kit incorporates two MAX6642 devices for monitoring the two MAX5862 die temperatures. LEDs D1 and D2 turn on when the MAX5862 die temperature rises above the programmed high temperature threshold within the corresponding MAX6642. See the *MAX5862 Status Page #2 Tab* section for reconfiguring the high temperature threshold. Also refer to the MAX6642 IC data sheet for additional register information.

The EV kit provides on-board SPI and SMBus interfaces and is connected to the computer through USB connector USB1. The EV kit Windows XP-, Vista-, and Windows 7-compatible software provides a GUI for control of the MAX5862 and MAX6642 programmable features. Logic-level translators provide proper interface translation from the MAX5862 digital signals to the USB and HSDCEP circuitry.

Power Supplies

The EV kit operates from a single 5.5V/4A power supply applied at the 5.5V_IN and GND PCB pads. The MAX15023 dual synchronous step-down controller, MAX1793 LDO regulator, and MAX8902A low-noise LDO regulator provide power to the EV kit's power rails. The MAX15023 devices are configured to 1.1V and are used for on-board regulation of the MAX5862 core supply input, VDD10. The MAX1793 LDO regulators are configured to 1.8V and 3.3V and are used for on-board regulation of the MAX5862 VDDLL, VDD18, VDD18L, AVCLK, and AVDD3 supply inputs. The MAX8902A LDO regulators are configured to 1.8V and are used for on-board regulation of the AVDD18 supply inputs. The EV kit also provides the option of using external power supplies. When using an external supply for the VDD10 supply rail, remove resistors R3 and R303 and apply a 1V/5A power supply at each of the VDD10_INA and VDD10_INB relative to GND PCB pads. See [Table 1](#) for proper shunt settings for all the other EV kit power-supply inputs.

Test points are available at VDD10_INA, VDD10_INB, VDDLL_INA, VDDLL_INB, VDD18_INA, VDD18_INB, AVCLK_U1, AVCLK_U21, AVDD3_U1, AVDD3_U21, AVDD18_U1, AVDD18_U21, and GND for monitoring the EV kit power-supply voltages.

Jumpers JU1 and JU8 are provided for sensing the MAX5862 (signal path A) VDD10 voltage. Remove the shunts at jumper JU1 and JU8 and connect the voltmeter positive and negative terminals at JU1 pin 1 and JU8 pin 2, respectively, to monitor VDD10 voltage as monitored inside the MAX5862 (signal path A).

Jumpers JU301 and JU308 are provided for sensing the MAX5862 (signal path B) VDD10 voltage. Remove the shunts at jumper JU301 and JU308 and connect the voltmeter positive and negative terminals at JU301 pin 1 and JU308 pin 2, respectively, to monitor VDD10 voltage as monitored inside the MAX5862 (signal path B).

SPI and SMBus Interface Control

The EV kit communicates to the MAX5862 SPI interface using the on-board USB circuitry.

Place shunts across pins 1-2, 4-5, 7-8, 10-11, and 13-14 of jumper JU7 to control the SPI interface using the USB circuitry.

The EV kit communicates to the MAX6642 SMBus interface using the on-board USB circuitry. Place shunts across pins 1-2 and 4-5 of jumper JU20 to control the SMBus interface using the USB circuitry.

Global Reset

Momentary pushbutton switch RSTN_A is used as a global reset to clear all signal path A MAX5862 configuration registers. A global reset is required when uploading a new test configuration using the **Select File to Load** pushbutton on the **MAX5862 Register Control** tab. Press the RSTN_A switch to clear the registers before uploading a new test configuration file.

Momentary pushbutton switch RSTN_B is used as a global reset to clear all signal path B MAX5862 configuration registers. A global reset is required when uploading a new test configuration using the **Select File to Load** pushbutton on the **MAX5862 Register Control** tab. Press the RSTN_B switch to clear the registers before uploading a new test configuration file.

Test configuration files are available for loading into the MAX5862, through the SPI interface. The MAX5862 output is available for viewing at the external OUTA and OUTB SMA connector.

MODE2 Pushbutton Switch

Momentary pushbutton switch MODE2 is available for providing a low-to-high pulse at the MAX5862 MODE2 input when pressed.

The pushbutton switch is used to perform various functions within the MAX5862. Refer to the MAX5862 IC data sheet for additional information.

Resetting the MAX5882 DLL Frequency

Pushbutton switch DLLOFF is available for resetting the DAC DLL. To reset the frequency range, press and hold the DLLOFF button, reconfigure DELAY and DLLOFF jumpers, and then release the button.

The MAX5862 uses four level control inputs for controlling the delay and speed settings for the on-chip DLL. Each jumper has four possible positions as detailed in [Table 2](#).

Using the HSDCEP Data Source Board with the MAX5862 EV Kit

High-speed QSH connectors (J1 and J2) are available to interface the EV kit to Maxim's HSDCEP data source board. The high-speed data converter evaluation platform (HSDCEP) can be used as a data source for the EV kit. The HSDCEP drives the MAX5862 one multiplexed input ports, control signals, and monitors of the ready

logic outputs. The EV kit software provides the **HSDCEP FPGA Register Control** tab for controlling the HSDCEP.

The HSDCEP and EV kit boards can be connected using the provided hardware. See the *Block Diagram* for details in connecting the boards together. Alternatively, the two boards can be connected with coaxial ribbon cables (Samtec HQCD-060-06.00-STR-TBR-1). Note that it is necessary to use either the supplied hardware or cables to get a reliable electrical connection between the two boards.

The firmware previously developed for the MAX5880 can be used with the EV kit when using the ribbon cables. Only the J5 connector on the HSDCEP should be connected. This can be connected to either J1 or J2 on the EV kit connectors to drive either the MAX5862 (signal path A) or MAX5862 (signal path B), respectively.

Table 2. DLL Jumper Positions

DLLOFF JU5 SHUNT POSITION	DELAY JU13 or JU313 SHUNT POSITION	MAX5862 fCLK DLL LOCK RANGE (MHz)	OPERATION
1-2	1-2	—	DLL is Off One 1/fCLK Delay
1-2	1-4	—	DLL is Off No 1/fCLK Delay
1-4	1-2	2150 to 2304	DLL is On
1-4	Open	1900 to 2150	DLL is On
Open	1-4	1650 to 1900	DLL is On
Open	1-2	1400 to 1650	DLL is On
Open	Open	1250 to 1400	DLL is On
1-3	1-4	1100 to 1250	DLL is On
1-3	1-2	950 to 1100	DLL is On
1-3	Open	800 to 950	DLL is On

Component List

Refer to file "MAX5862_evkit_a_XY.xls" attached to this PDF for component information.

Component Suppliers

SUPPLIER	PHONE	WEBSITE
AVX Corporation	8430946-0238	www.avx.corp
Fairchild Semiconductor	888-522-5372	www.fairchildsemi.com
Hong Kong X'tals Ltd.	852-35112388	www.hongkongcrystal.com
Murata Americas	770-436-1300	www.murataamericas.com
Panasonic Corp.	800-344-2112	www.panasonic.com
SANYO Electric Co., Ltd.	619-661-6835	www.sanyo.com
Taiyo Yuden	800-348-2496	www.t-yuden.com
TDK Corp.	847-803-6100	www.component.tdk.com
Vishay	402-543-6866	www.vishay.com

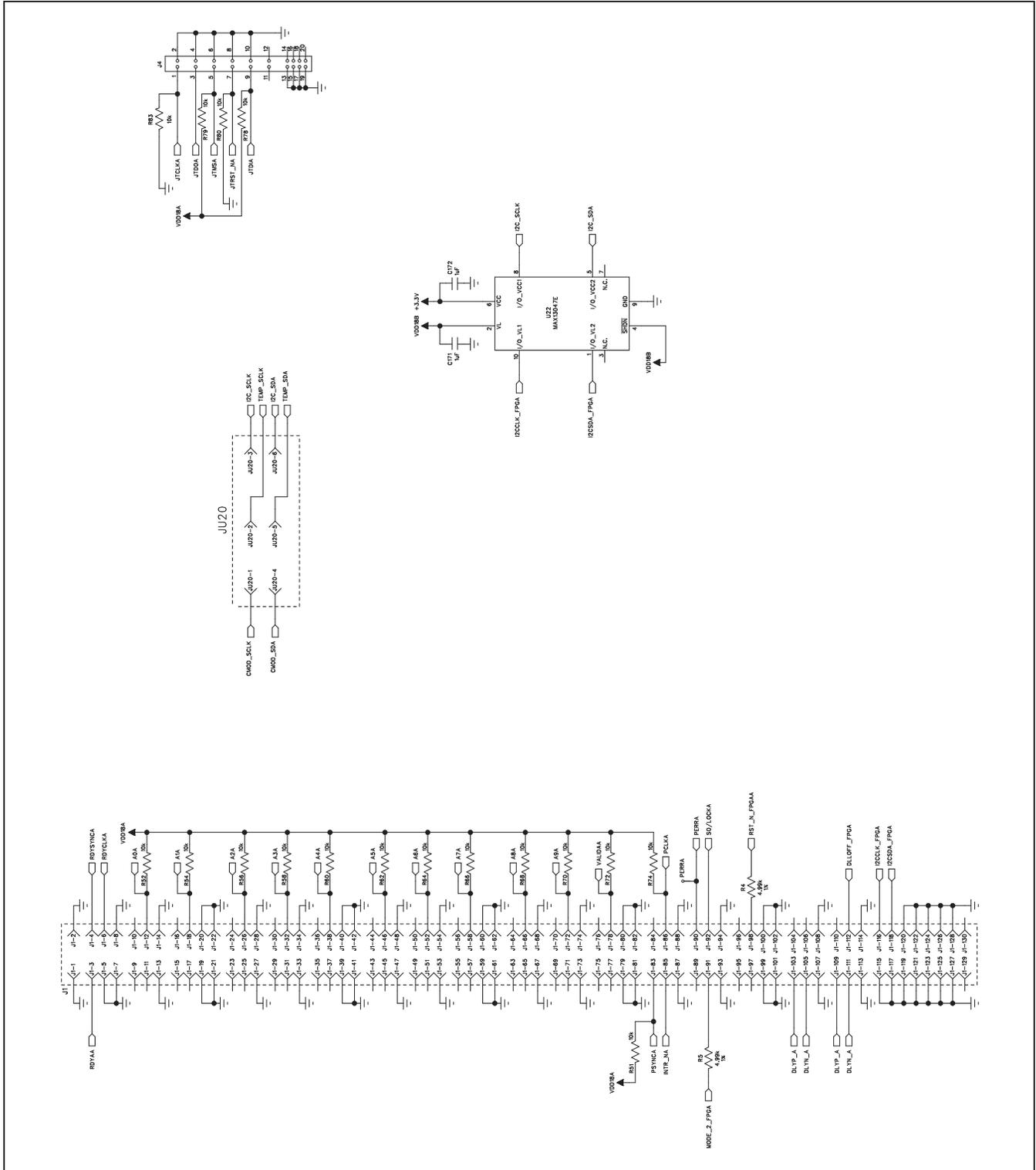


Figure 10d. MAX5862 EV Kit Schematic (Sheet 4 of 11)

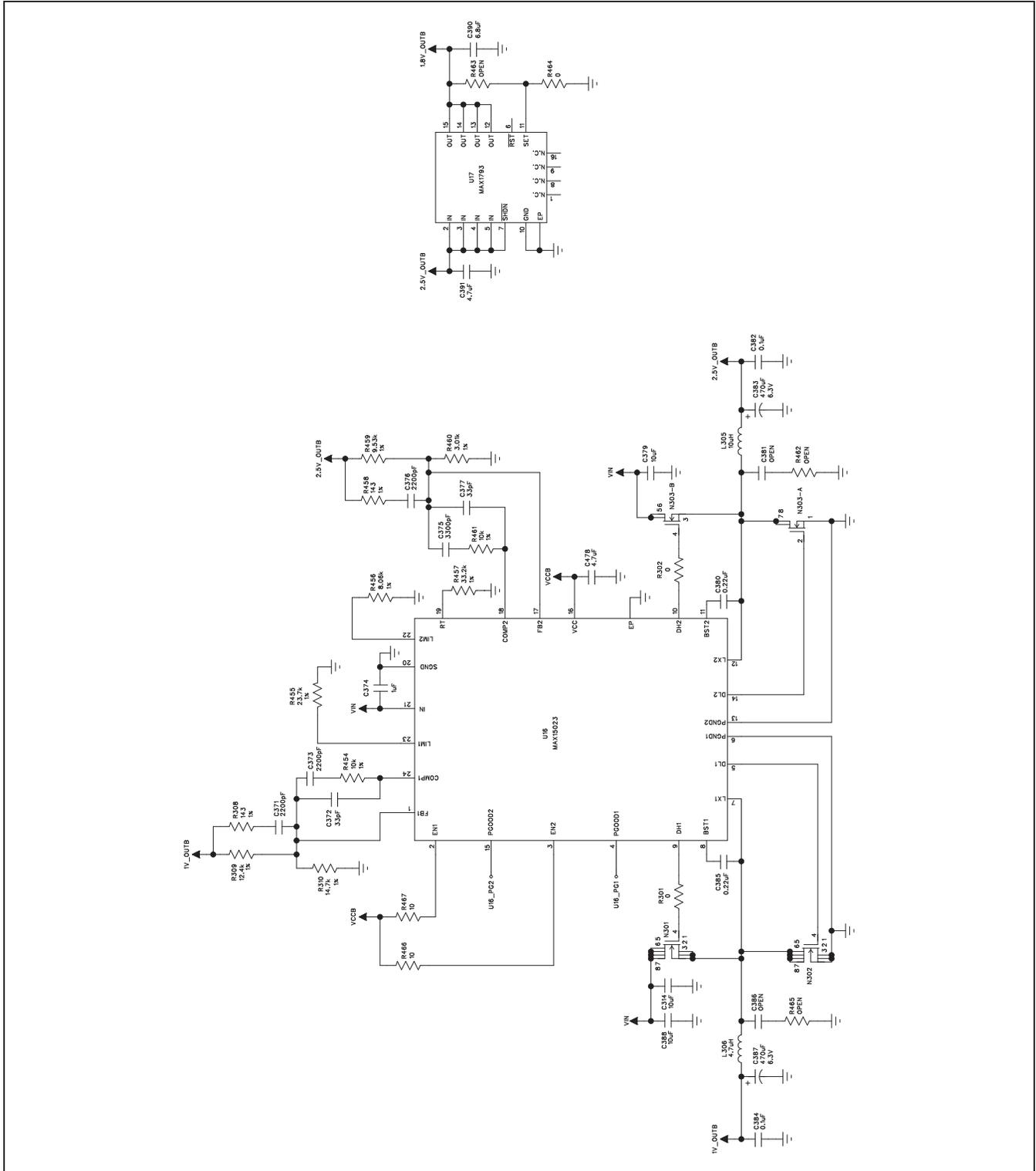


Figure 10e. MAX5862 EV Kit Schematic (Sheet 5 of 11)

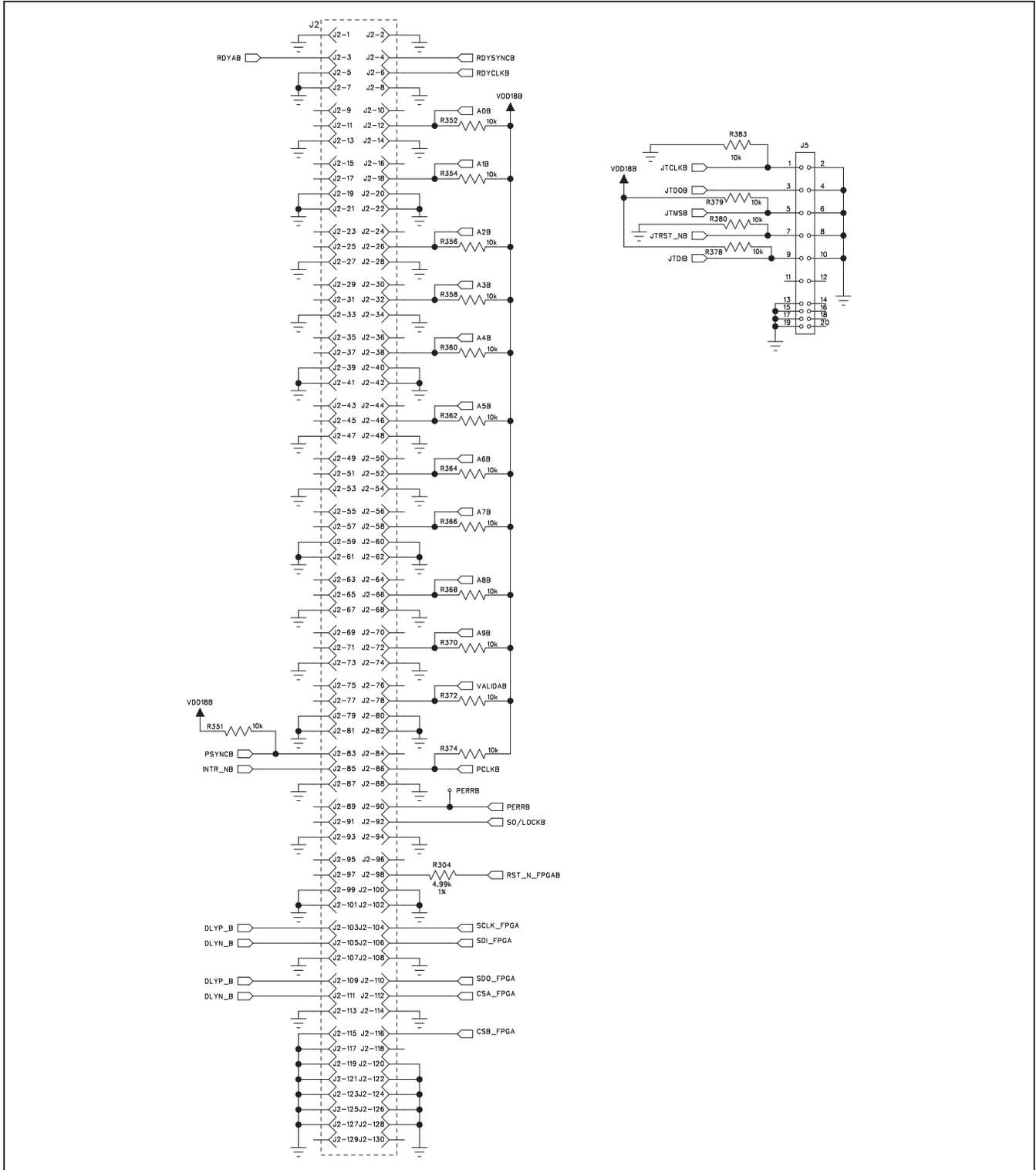


Figure 10h. MAX5862 EV Kit Schematic (Sheet 8 of 11)

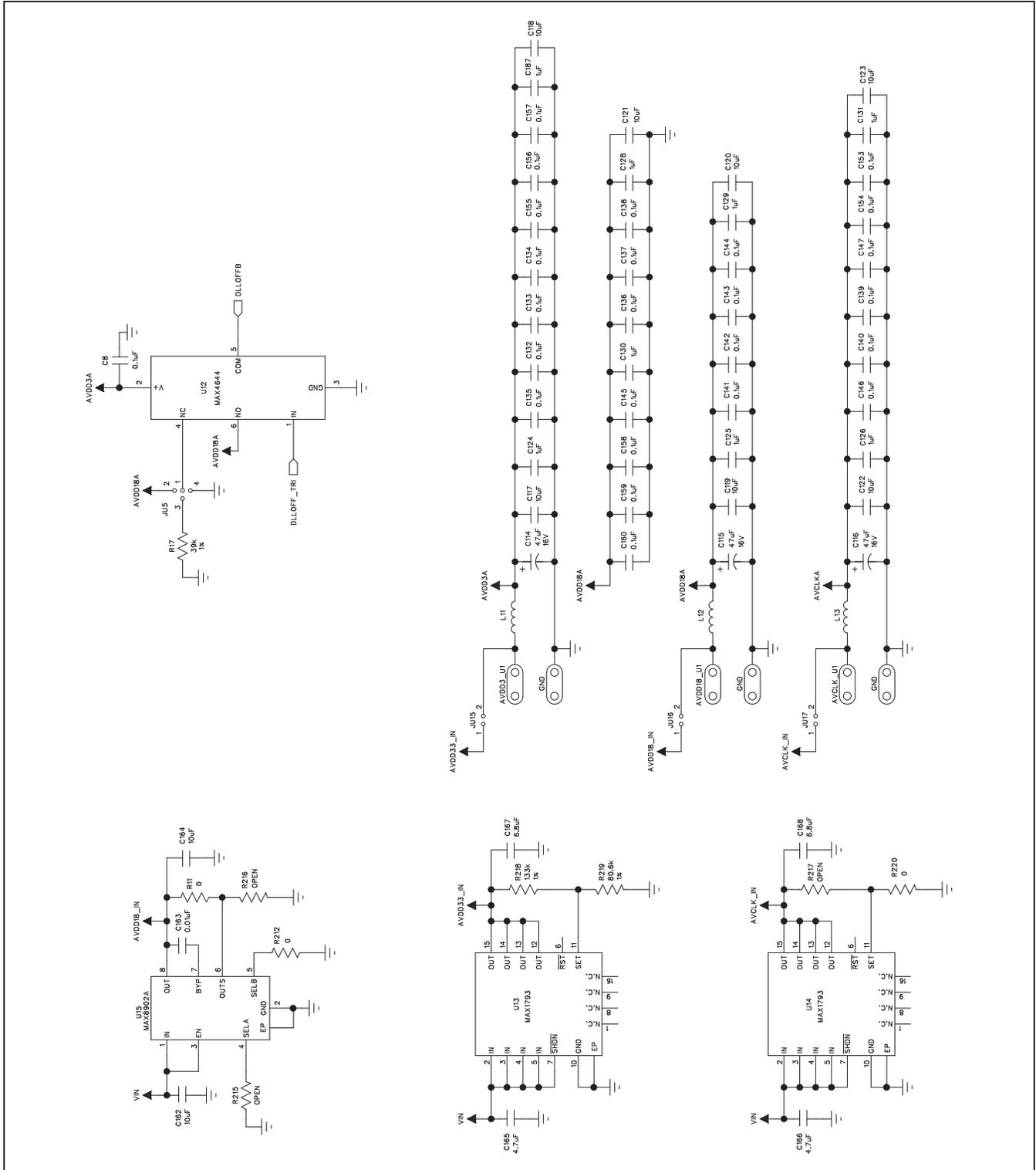


Figure 10i. MAX5862 EV Kit Schematic (Sheet 9 of 11)

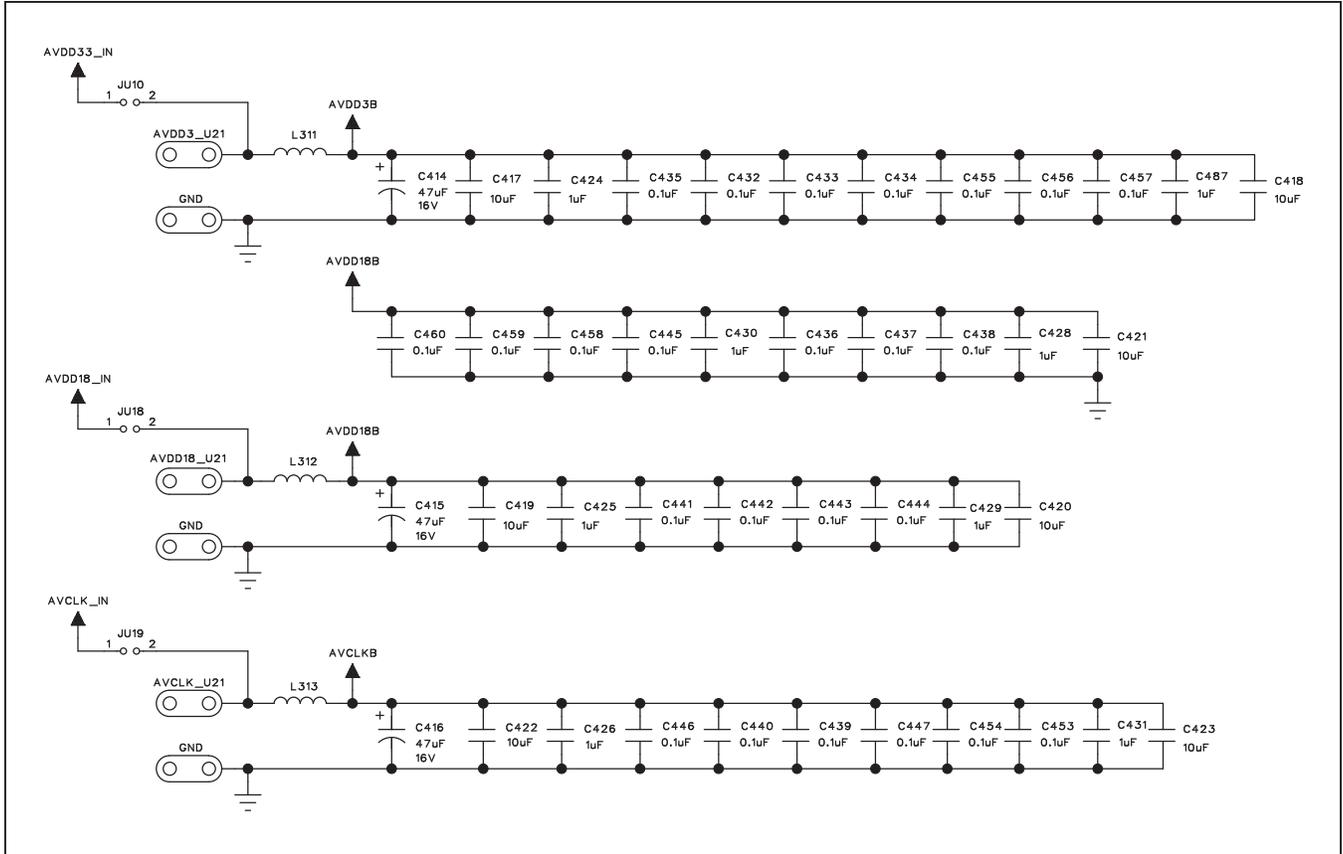


Figure 10j. MAX5862 EV Kit Schematic (Sheet 10 of 11)

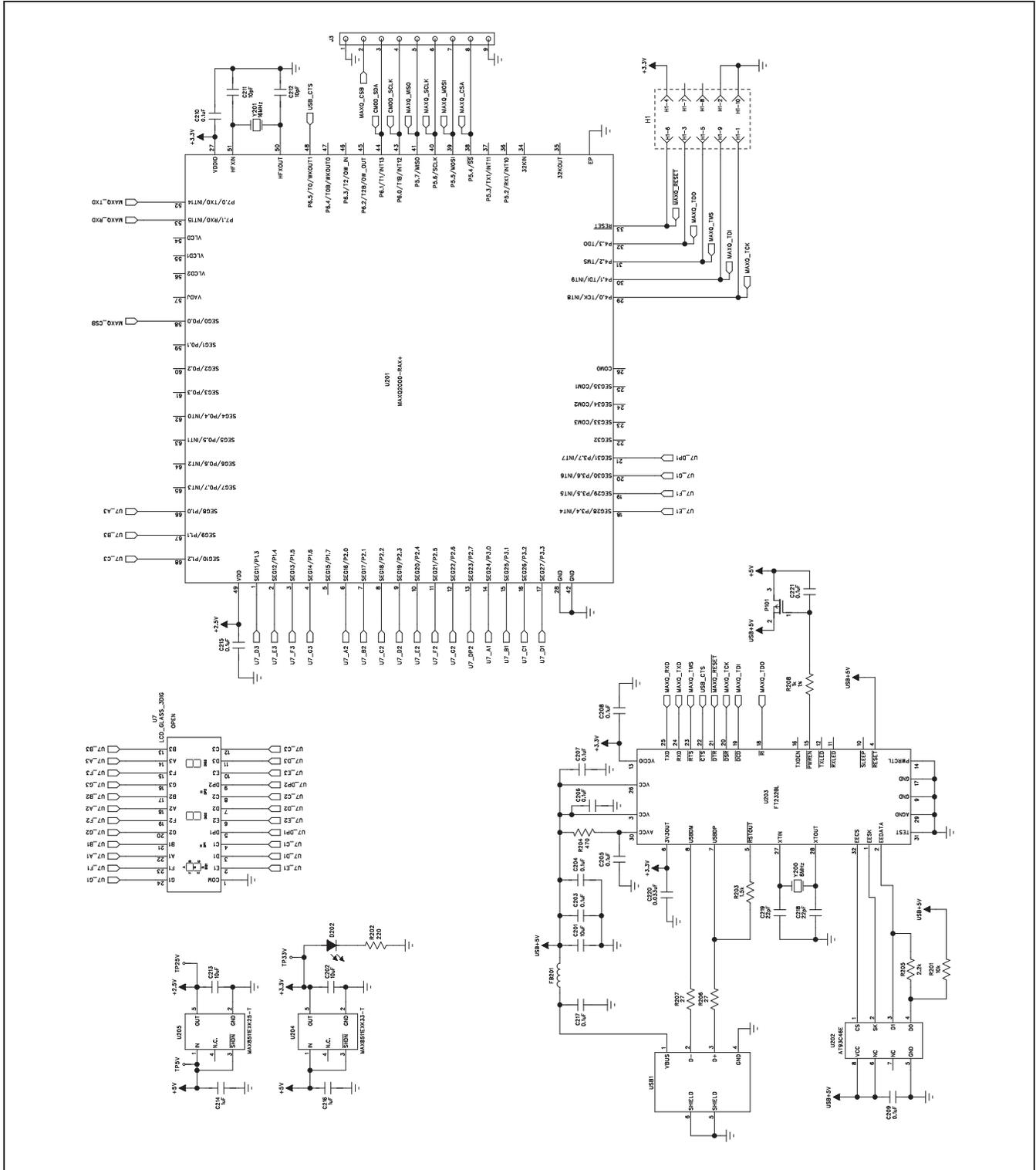


Figure 10k. MAX5862 EV Kit Schematic (Sheet 11 of 11)

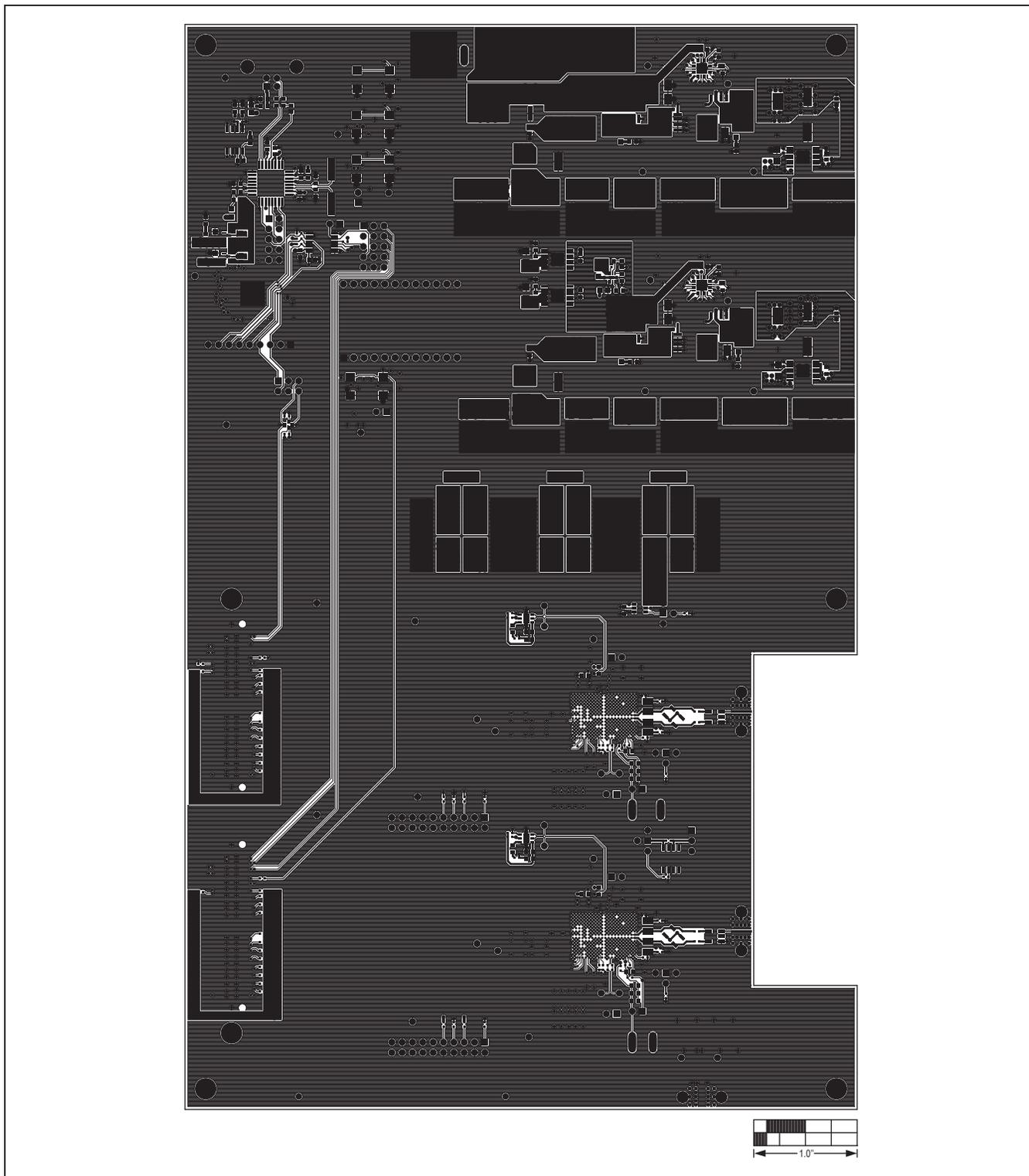


Figure 11. MAX5862 EV Kit PCB Layout—Top Side

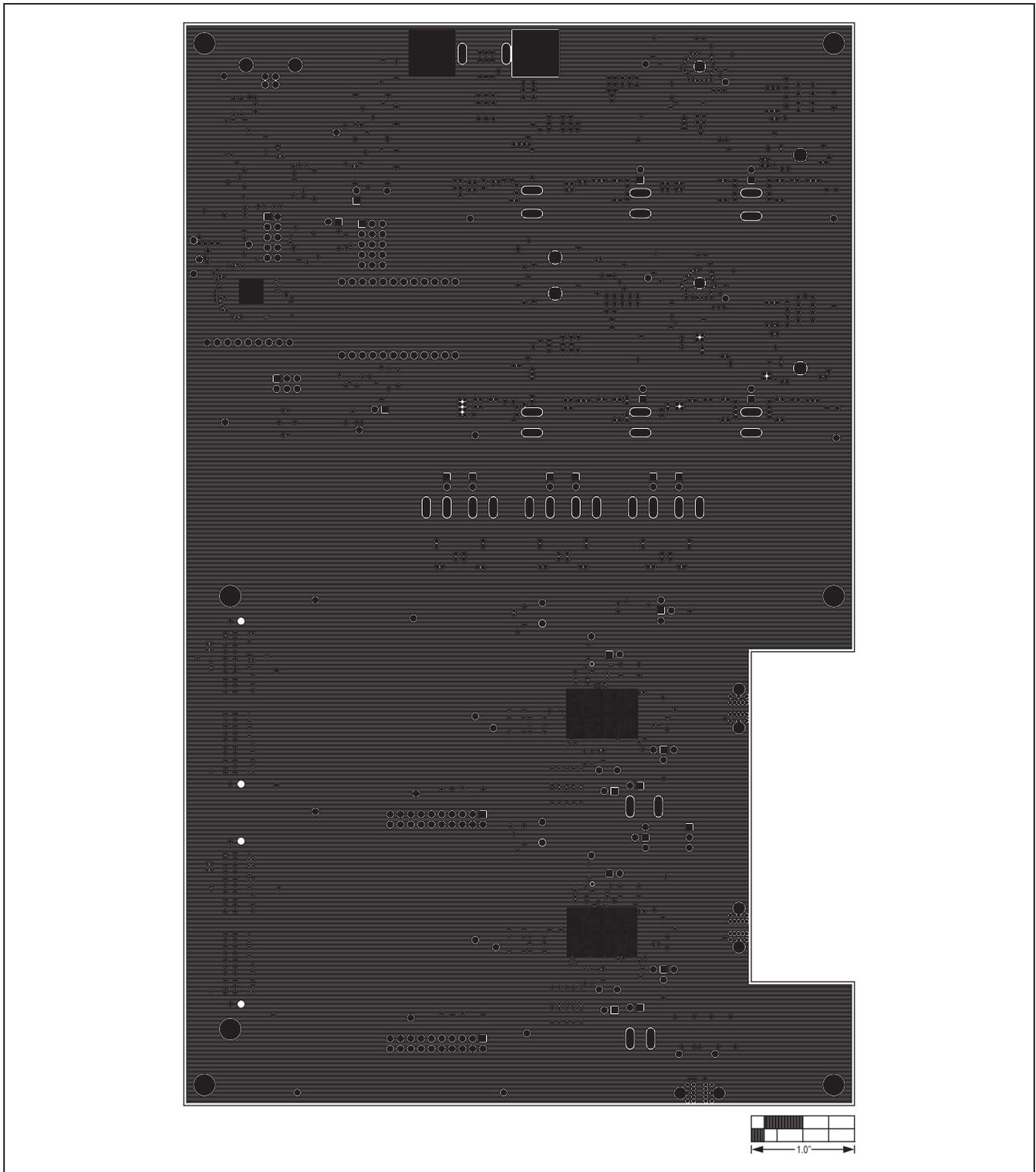


Figure 12. MAX5862 EV Kit PCB Layout—Inner Layer 2

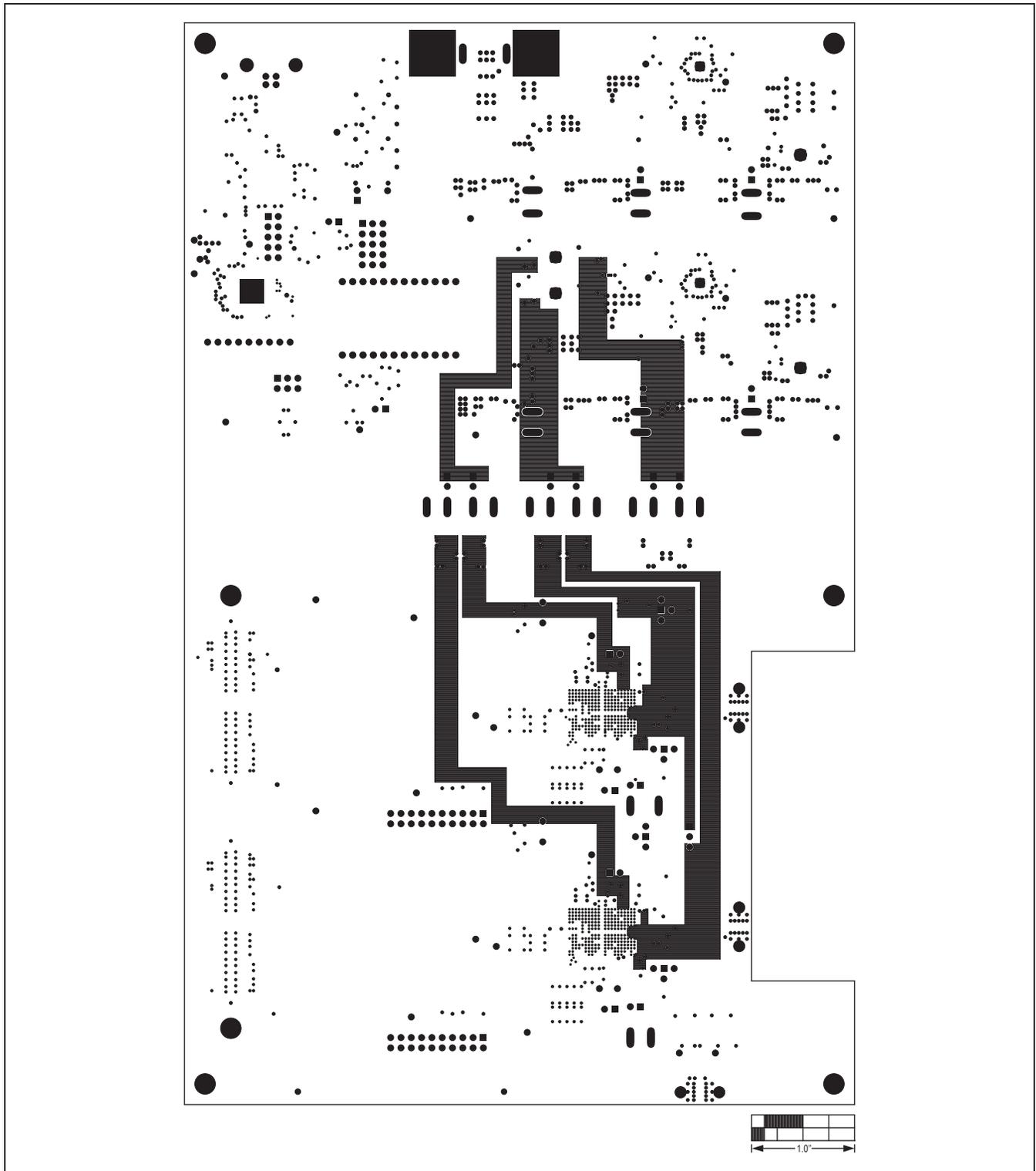


Figure 13. MAX5862 EV Kit PCB Layout—Inner Layer 3

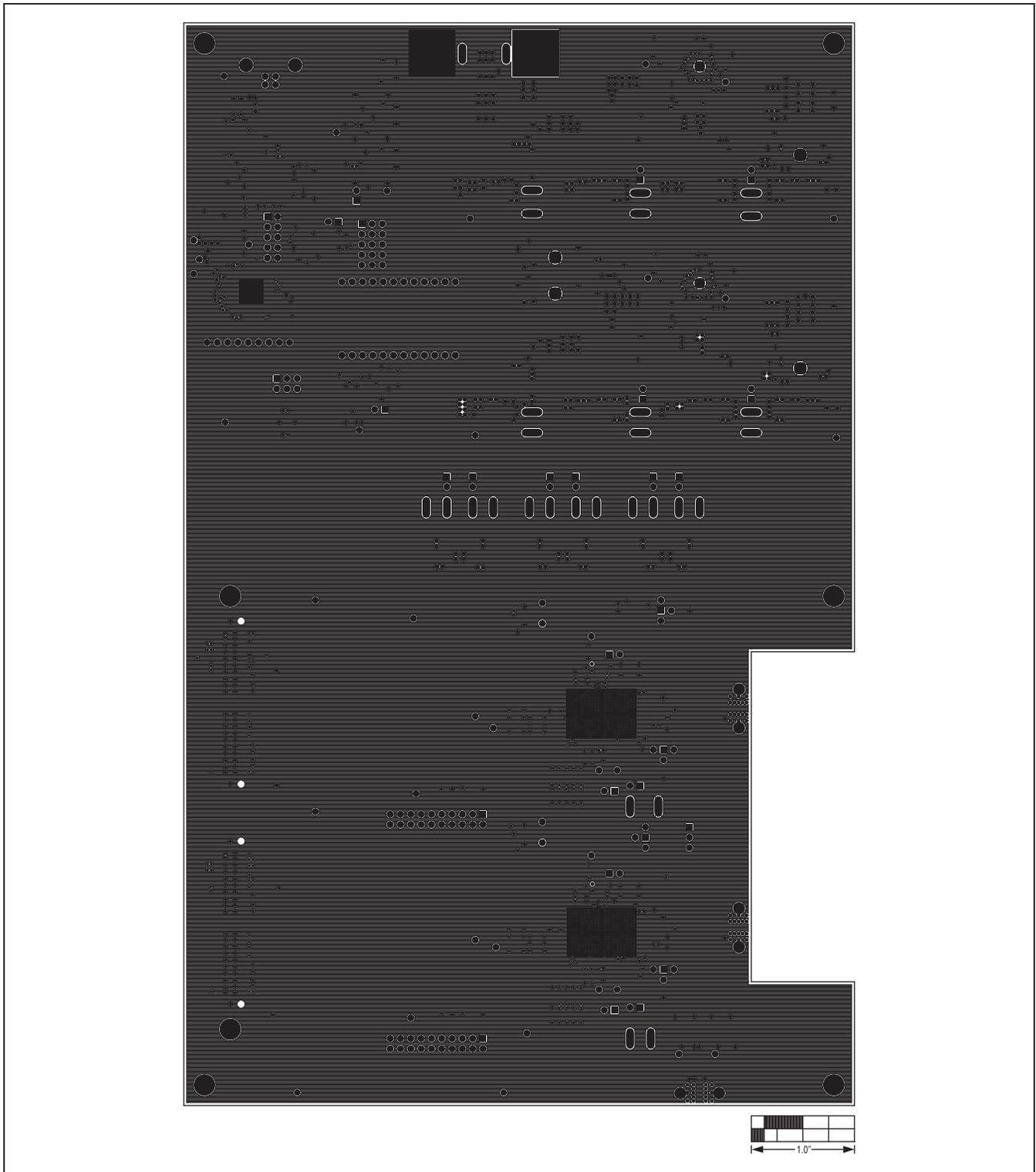


Figure 14. MAX5862 EV Kit PCB Layout—Inner Layer 4

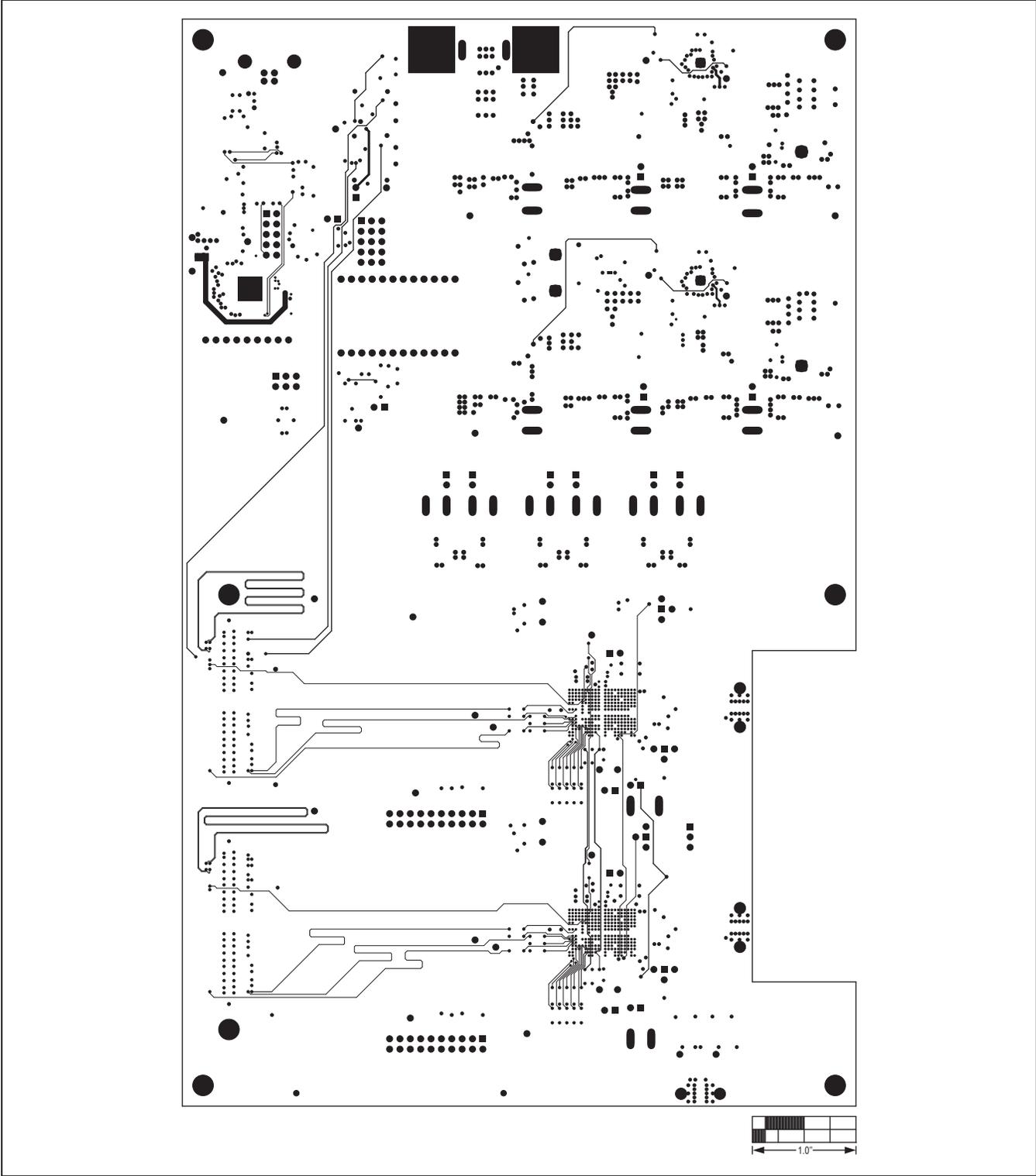


Figure 15. MAX5862 EV Kit PCB Layout—Inner Layer 5

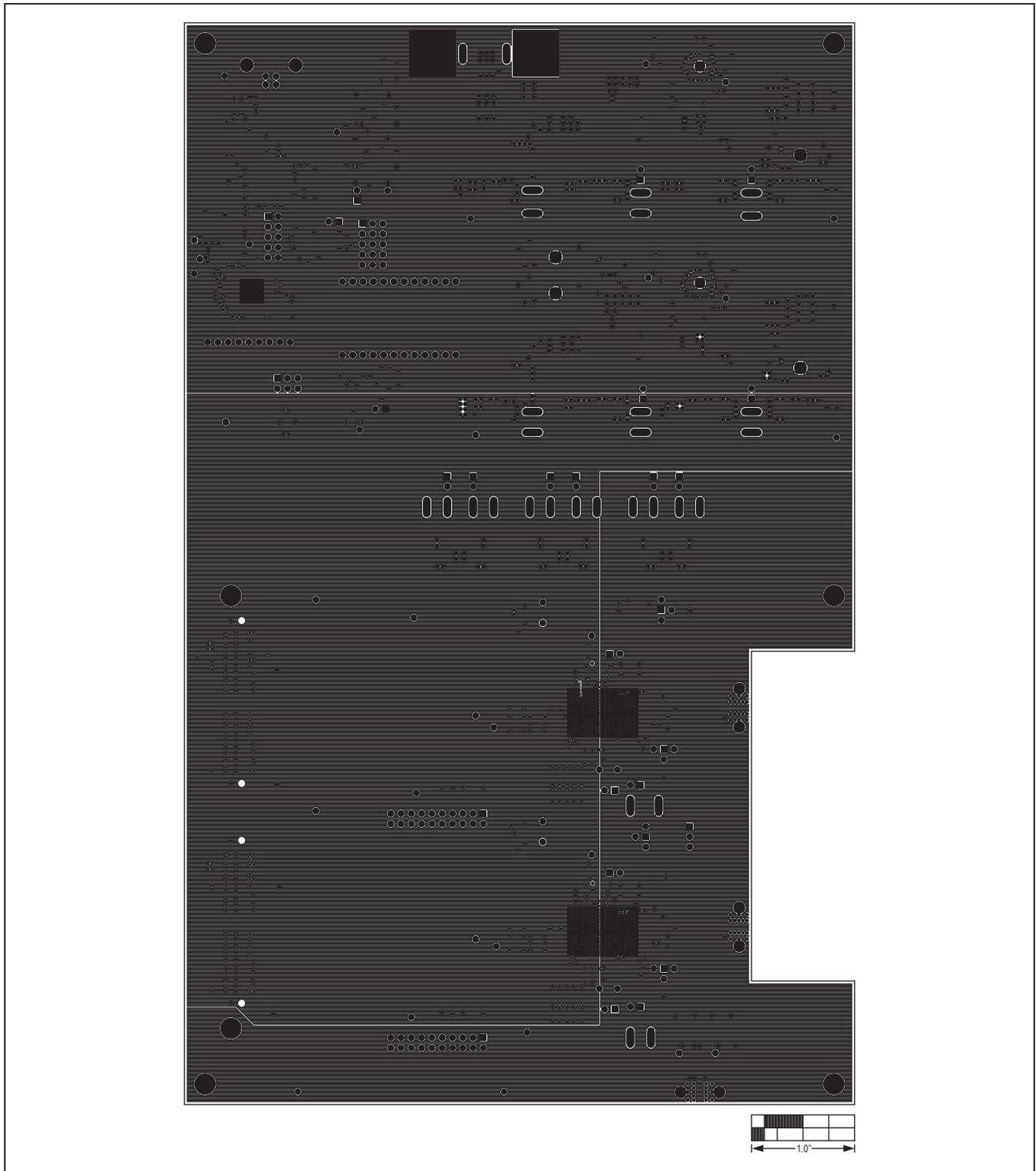


Figure 16. MAX5862 EV Kit PCB Layout—Inner Layer 6

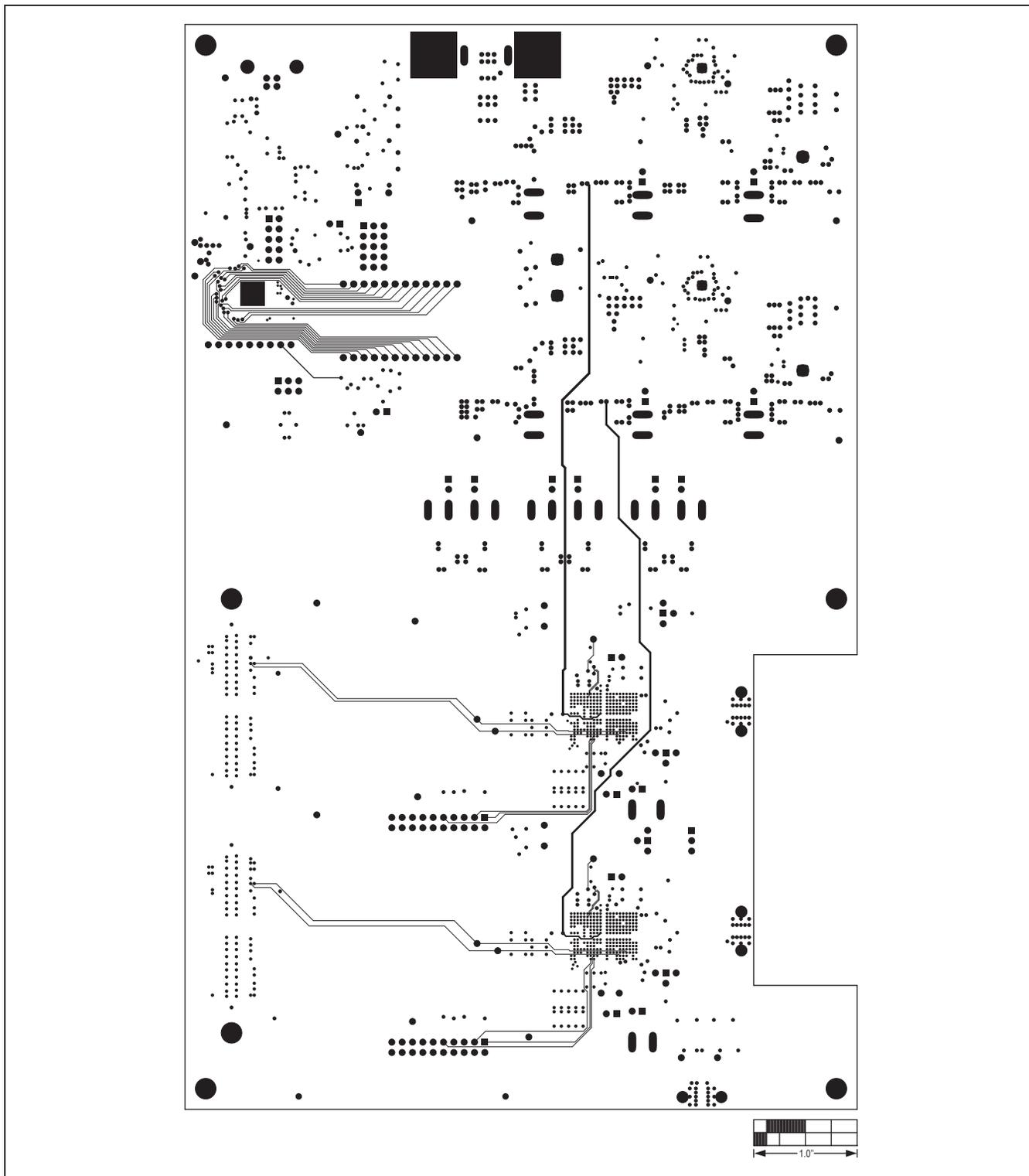


Figure 17. MAX5862 EV Kit PCB Layout—Inner Layer 7

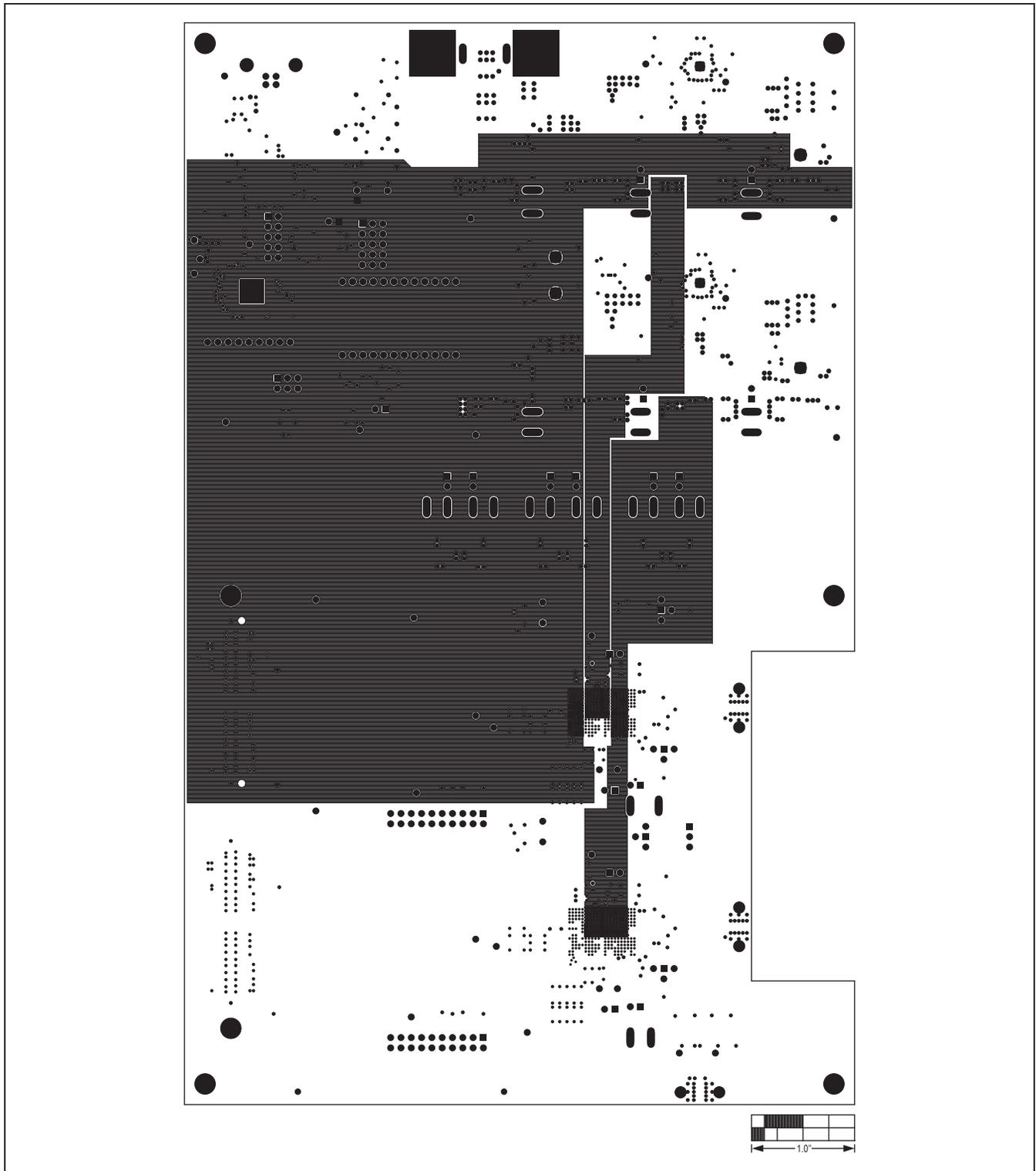


Figure 18. MAX5862 EV Kit PCB Layout—Inner Layer 8

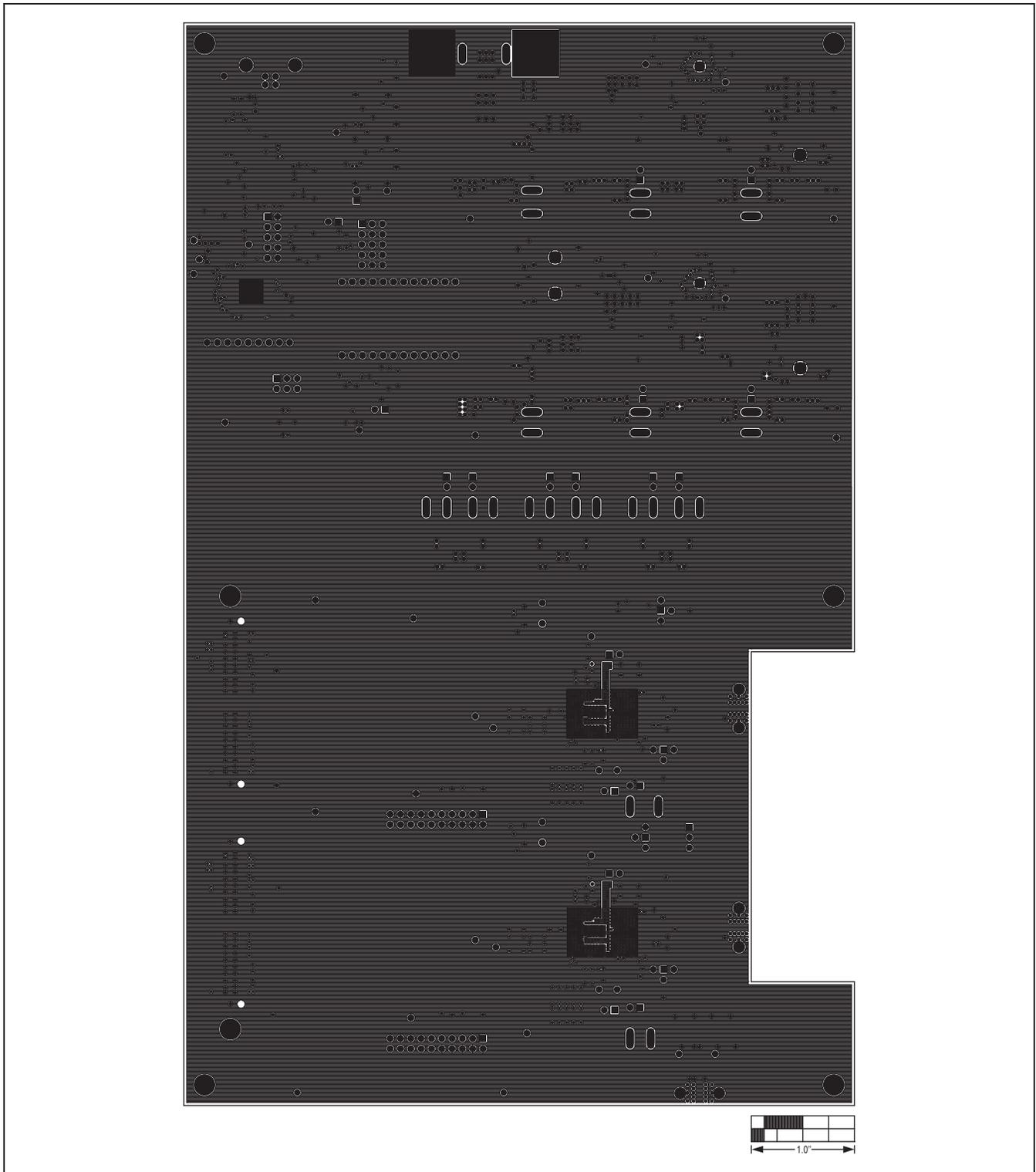


Figure 19. MAX5862 EV Kit PCB Layout—Inner Layer 9

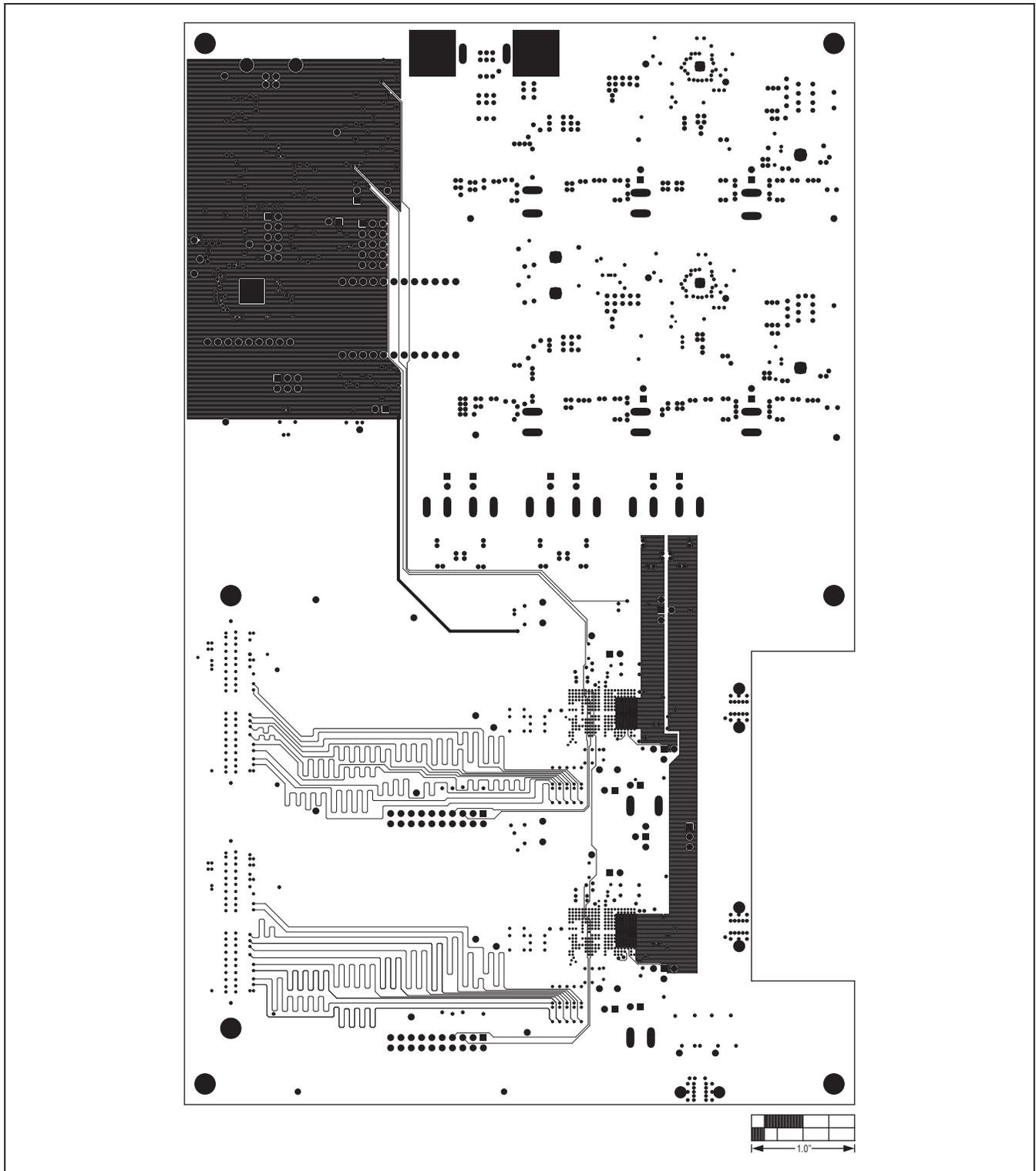


Figure 20. MAX5862 EV Kit PCB Layout—Inner Layer 10

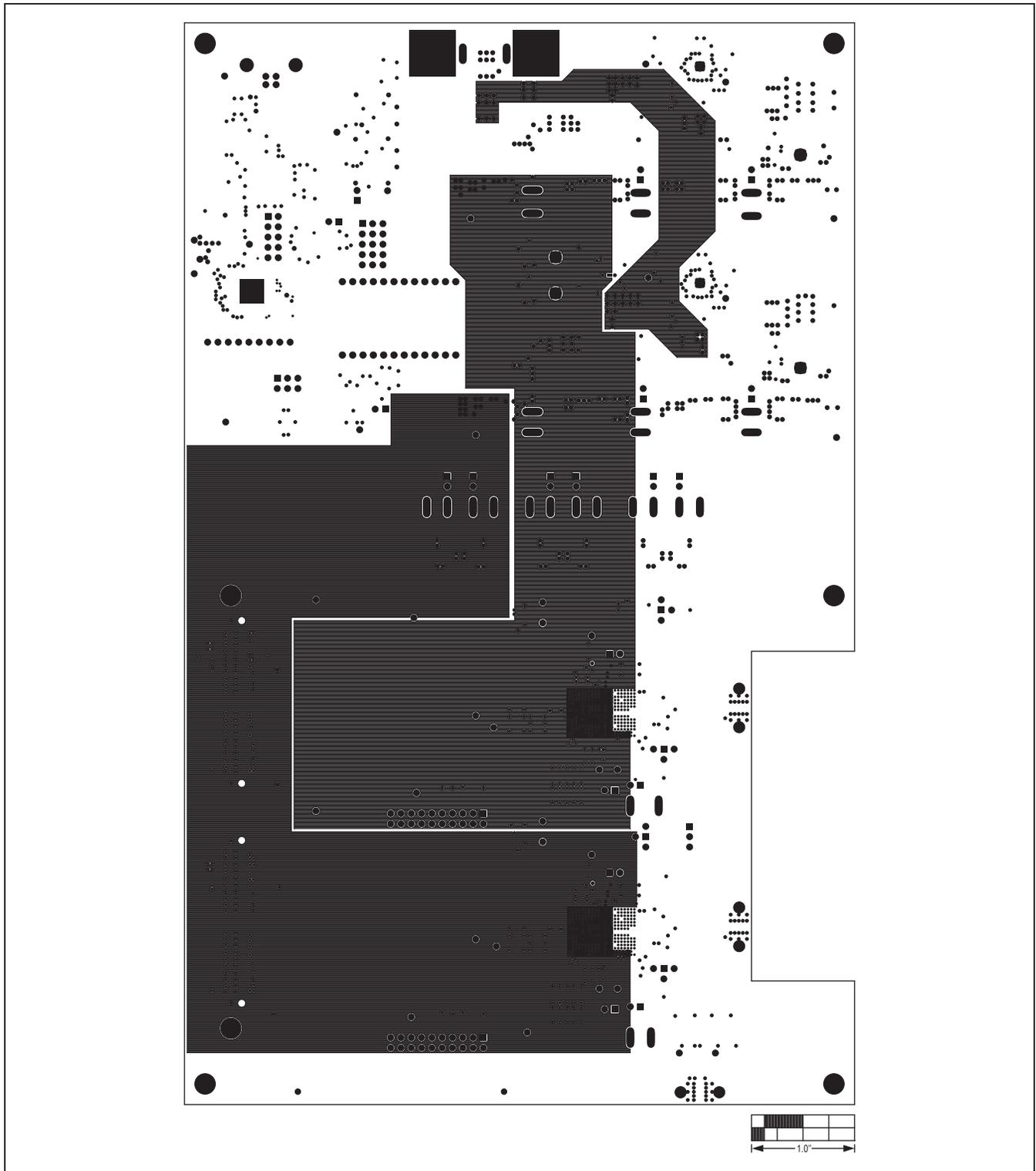


Figure 21. MAX5862 EV Kit PCB Layout—Inner Layer 11

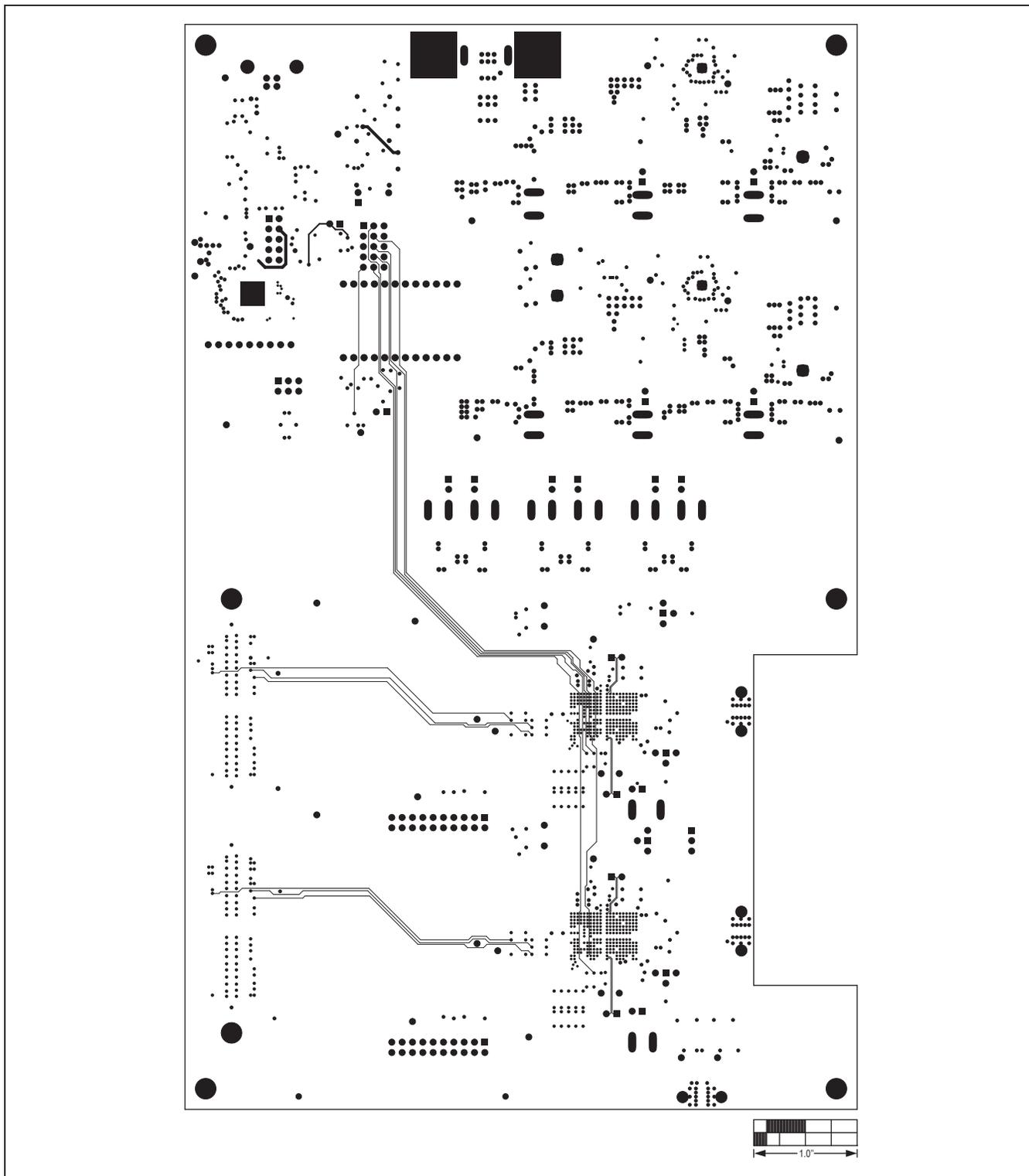


Figure 22. MAX5862 EV Kit PCB Layout—Inner Layer 12

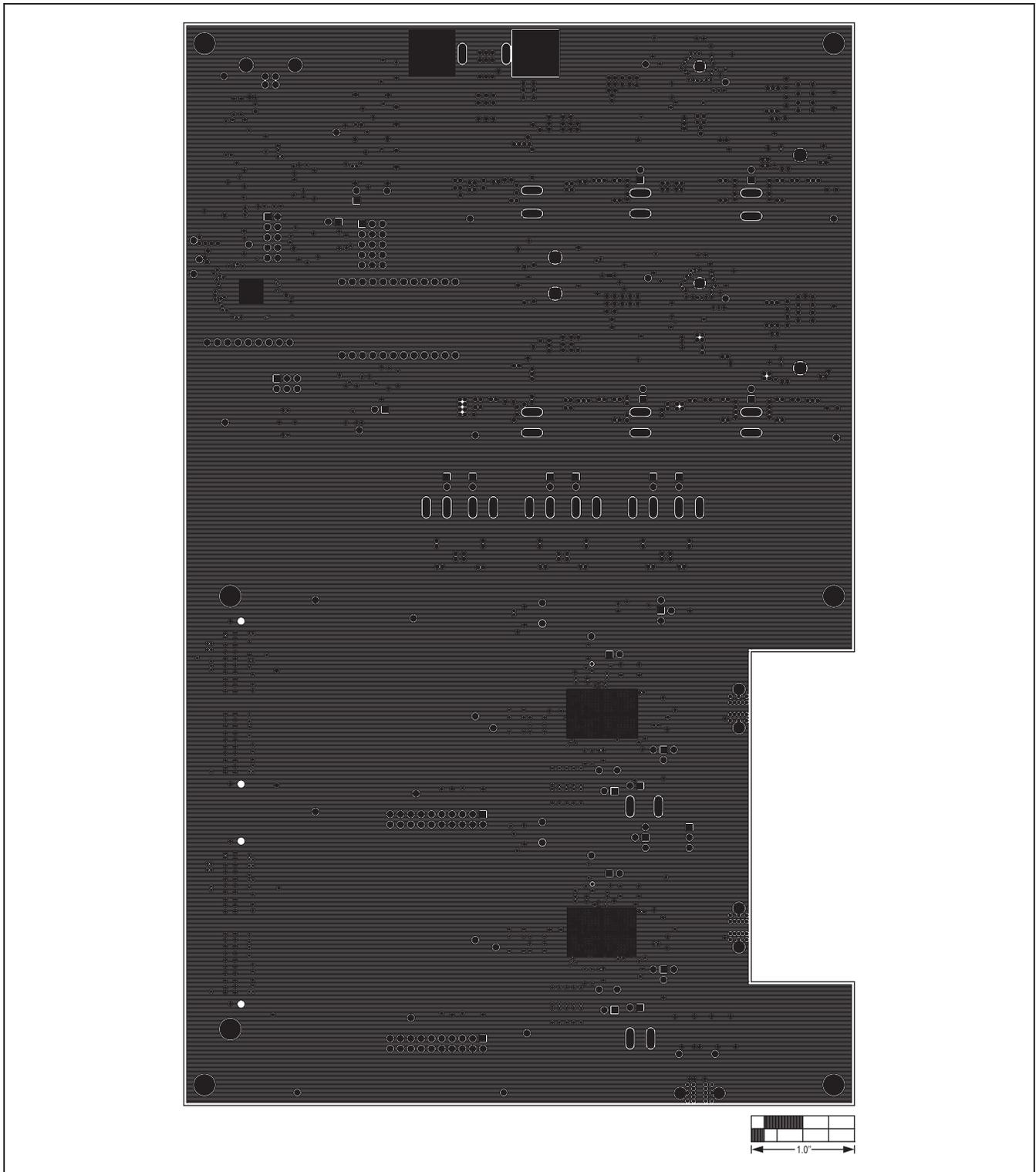


Figure 23. MAX5862 EV Kit PCB Layout—Inner Layer 13

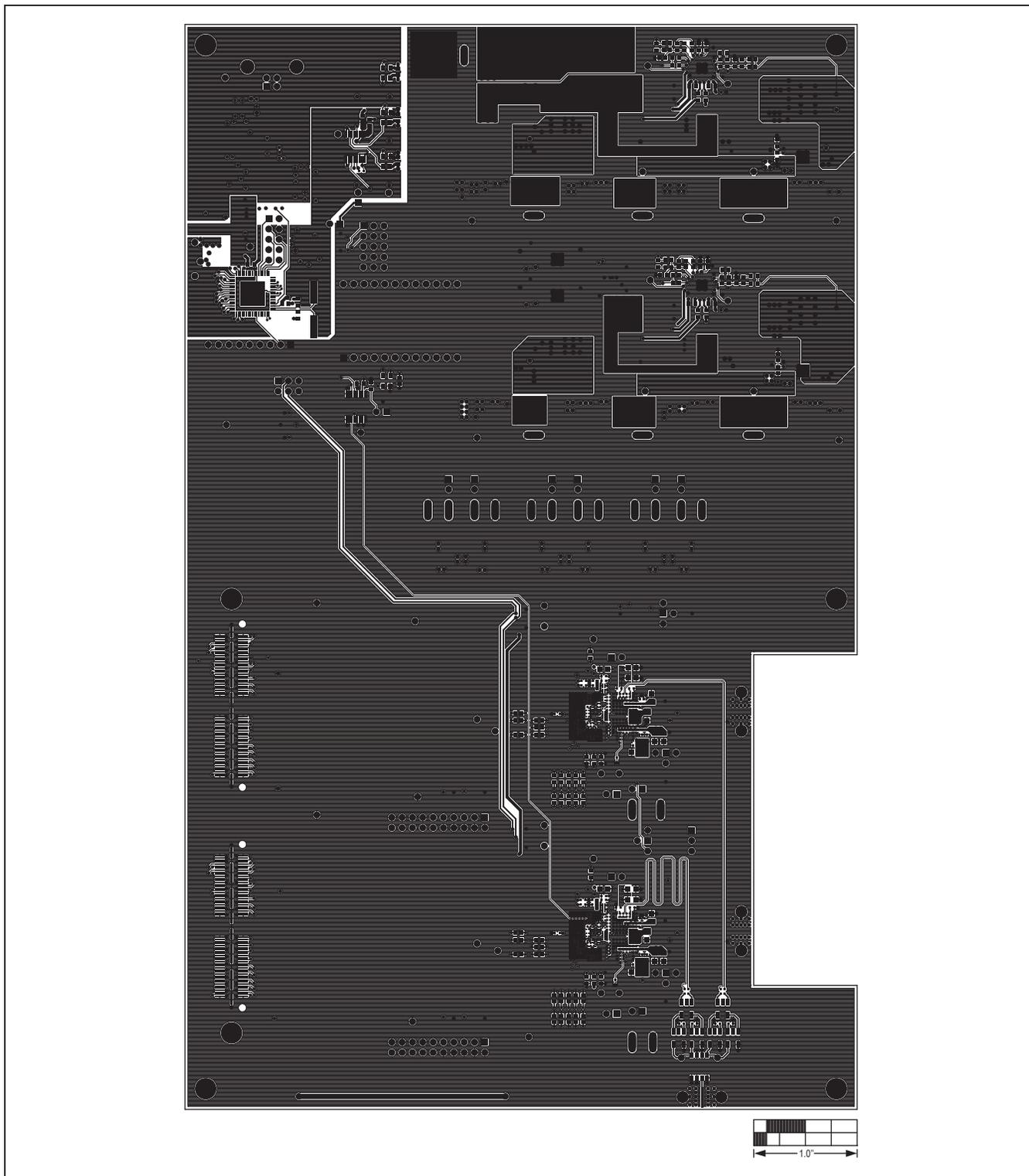


Figure 24. MAX5862 EV Kit PCB Layout—Bottom Side

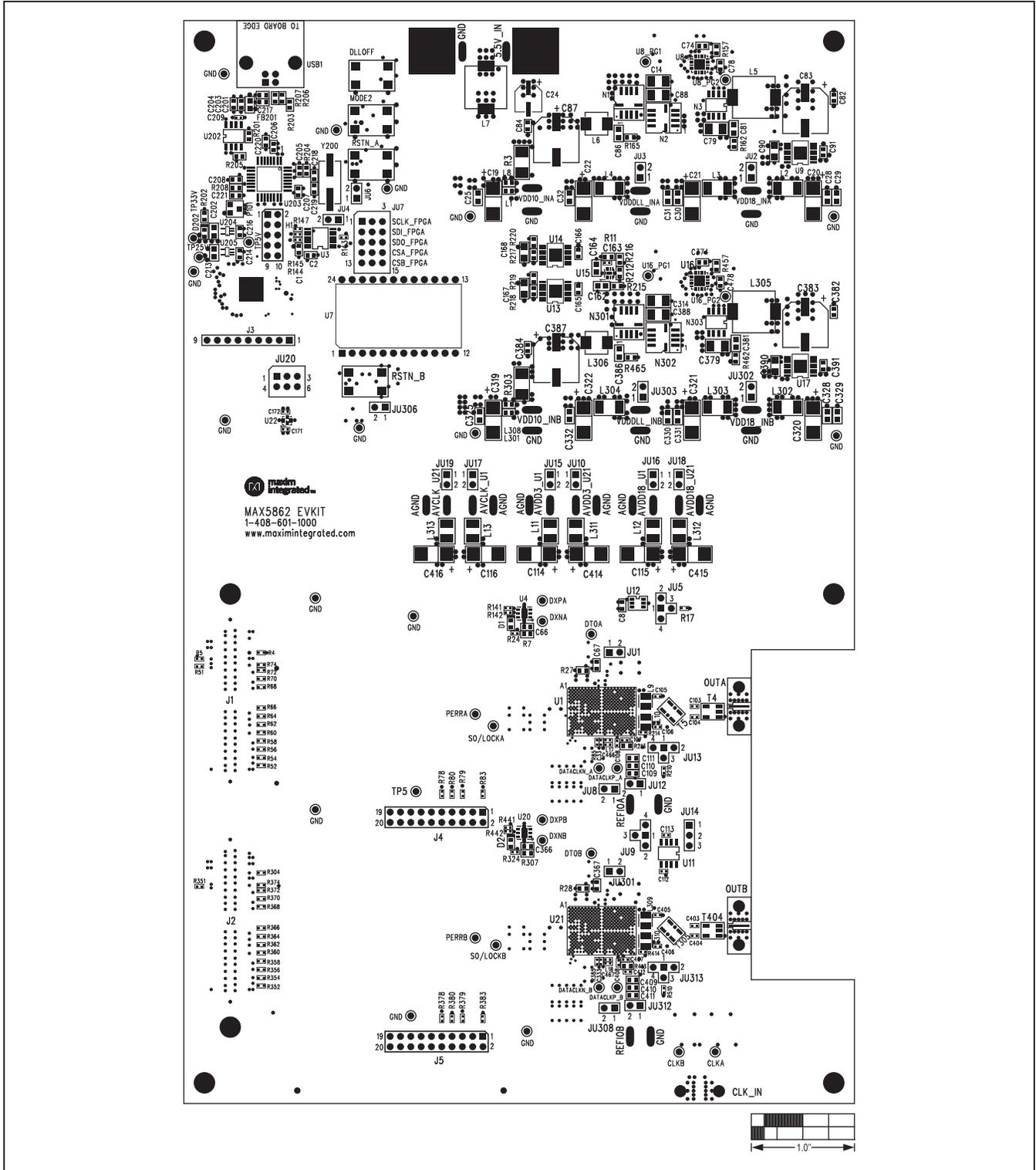


Figure 25. MAX5862 EV Kit Component Placement Guide—Silkscreen Top

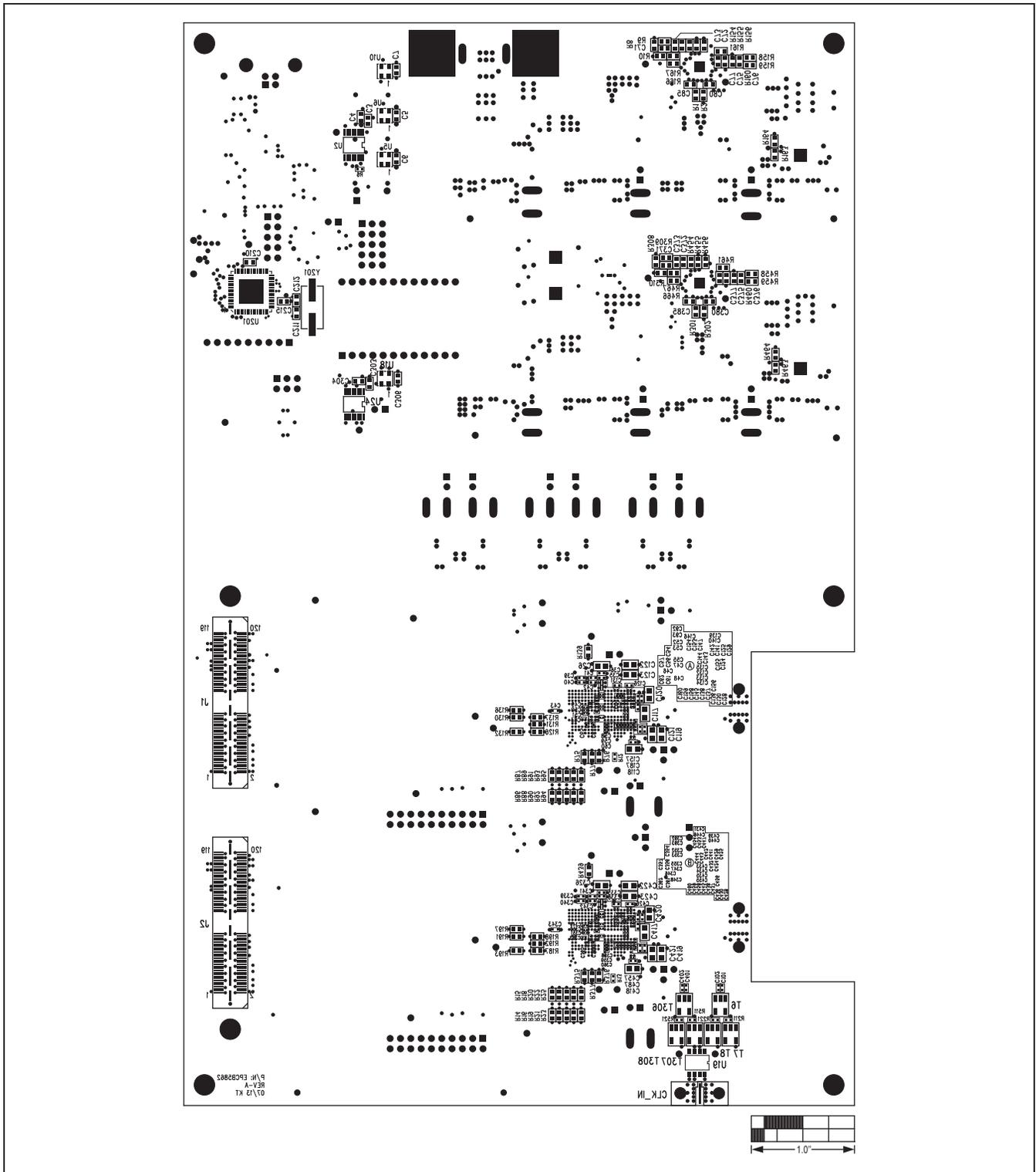


Figure 26. MAX5862 EV Kit Component Placement Guide—Silkscreen Bottom

Ordering Information

PART	TYPE	DESCRIPTION
MAX5862EVKIT#	EV Kit	Dual-Port 32-Channel Cable QAM Modulator
HSDCEP*	High-Speed Data Converter Evaluation Platform	FPGA Data Source Board

#Denotes RoHS compliant.

*Not compatible with Windows 7.

Revision History

REVISION NUMBER	REVISION DATE	DESCRIPTION	PAGES CHANGED
0	1/14	Initial release	—

For pricing, delivery, and ordering information, please contact Maxim Direct at 1-888-629-4642, or visit Maxim Integrated's website at www.maximintegrated.com.

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