

MAXIM

MAX3786 Evaluation Kit

Evaluates: MAX3786

General Description

The MAX3786 evaluation kit (EV kit) is an assembled demonstration board that provides easy evaluation of the MAX3786 serial-ATA multiplexer/buffer. All high-speed inputs and outputs have SMA or SATA connectors and on-board AC-coupling capacitors to allow direct connection to 50Ω test equipment or SATA devices.

Component List

DESIGNATION	QTY	DESCRIPTION
C1–C12, C17*, C18*, C20	15	0.1μF ±10% ceramic capacitors (0402)
C13–C16	4	0.01μF ±10% ceramic capacitors (0402)
C21	1	33μF ±10% tantalum capacitor AVX TAJB336K010R
C38, C39	2	Not installed
L1	1	56nH inductor Coilcraft 0805CS-560XKBC
J1–J14*	14	SMA connectors (edge-mount, round pin) EF JOHNSON 142-0701-801
J1–J3**	3	SATA connectors (edge-mount) Molex 67490-9220
JP1–JP6	6	2-pin headers (0.1in centers)
JP1–JP6	6	Shunts Digi-Key S9000-ND
TP1–TP3, J17, J18	5	Test points
U1	1	MAX3786UTJ, 32-pin Thin QFN
None	1	MAX3786 EV kit circuit board, Rev A*
None	1	MAX3786SATA EV kit circuit board, Rev A**
None	1	MAX3786 datasheet

*Included only with MAX3786EVKIT

**Included only with MAX3786SATAEVKIT

Features

- ◆ Fully Assembled and Tested
- ◆ SMA or SATA Connectors for High-Speed I/Os
- ◆ On-board AC-Coupling Capacitors
- ◆ Operational Mode Select Pins
- ◆ Single +3.3V Power-Supply Operation

Ordering Information

PART	TEMP RANGE	IC PACKAGE
MAX3786EVKIT	0°C to +85°C	32 Thin QFN
MAX3786SATAEVKIT	0°C to +85°C	32 Thin QFN

Component Suppliers

SUPPLIER	PHONE	FAX
AVX	843-448-9411	843-626-3123
Coilcraft	847-639-6400	847-639-1469
Digi-Key	800-344-4539	218-681-3380
EF Johnson	402-474-4800	402-474-4858
Molex	800-786-6539	630-968-8356
Murata	770-436-1300	770-436-3030

Note: Please indicate that you are using the MAX3786 when ordering from these suppliers.

Quick Start

- 1) Remove the shunts from JP1–JP6.
- 2) Apply +3.3V to the VCC test point (J17). Connect power-supply ground to the GND test point (J18).

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- 3) Connect 1.5Gbps differential data through 50Ω cables to the RX± inputs (J9 and J10). Adjust differential data amplitude to 500mV_{P-P}.
- 4) Connect OUT1± (J3 and J4) to a 50Ω oscilloscope.

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- 5) Connect a SATA hard drive to the RX±/TX± port (J1) with a SATA cable.
- 6) Connect a SATA controller to the IN1±/OUT1± port (J3) with a SATA cable.

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Detailed Description

The MAX3786 EV kit is a fully assembled and factory tested demonstration board that enables testing of all MAX3786 functions.

Input and Output Terminations

All data inputs and outputs have on-board AC-coupling capacitors and can be directly connected to 50Ω test equipment or SATA devices. Outputs may be viewed single-ended by terminating the other side of the output with 50Ω to ground.

Common Mode Points

Test points TP2 and TP3 provide access to the common-mode pins CM0 and CM1 of inputs IN0 and IN1. See Figure 1 of the MAX3786 datasheet. CM0 and CM1 are normally left unconnected; however capacitors up to 1.0μF may be soldered at C38 and C39, providing a low-impedance AC common-mode path to V_{CC}.

Control Lines

Jumpers JP1–JP6 are provided to set the LVCMOS control lines. Shorting these jumpers pulls the corresponding control line low. When a jumper is open the corresponding control line is internally pulled high through a 40kΩ resistor.

Table 1. Control Line Descriptions

COMPONENT	NAME	FUNCTION
JP1	SEL	Selects channel routing. Shunt to connect RX/TX to OUT0/IN0. Remove shunt to connect RX/TX to OUT1/IN1.
JP2	$\overline{\text{PE1EN}}$	Enables/disables pre-emphasis on OUT1. Shunt to enable pre-emphasis. Remove shunt to disable pre-emphasis.
JP3	$\overline{\text{EQ1EN}}$	Enables/disables equalization on IN1. Shunt to enable equalization. Remove shunt to disable equalization.
JP4	$\overline{\text{LB_EN}}$	Enable/disables loopback of non-selected channel. Shunt to enable loopback. Remove shunt to disable loopback.
JP5	$\overline{\text{EQ0EN}}$	Enables/disables equalization on IN0. Shunt to enable equalization. Remove shunt to disable equalization.
JP6	$\overline{\text{PE0EN}}$	Enables/disables pre-emphasis on OUT0. Shunt to enable pre-emphasis. Remove shunt to disable pre-emphasis.

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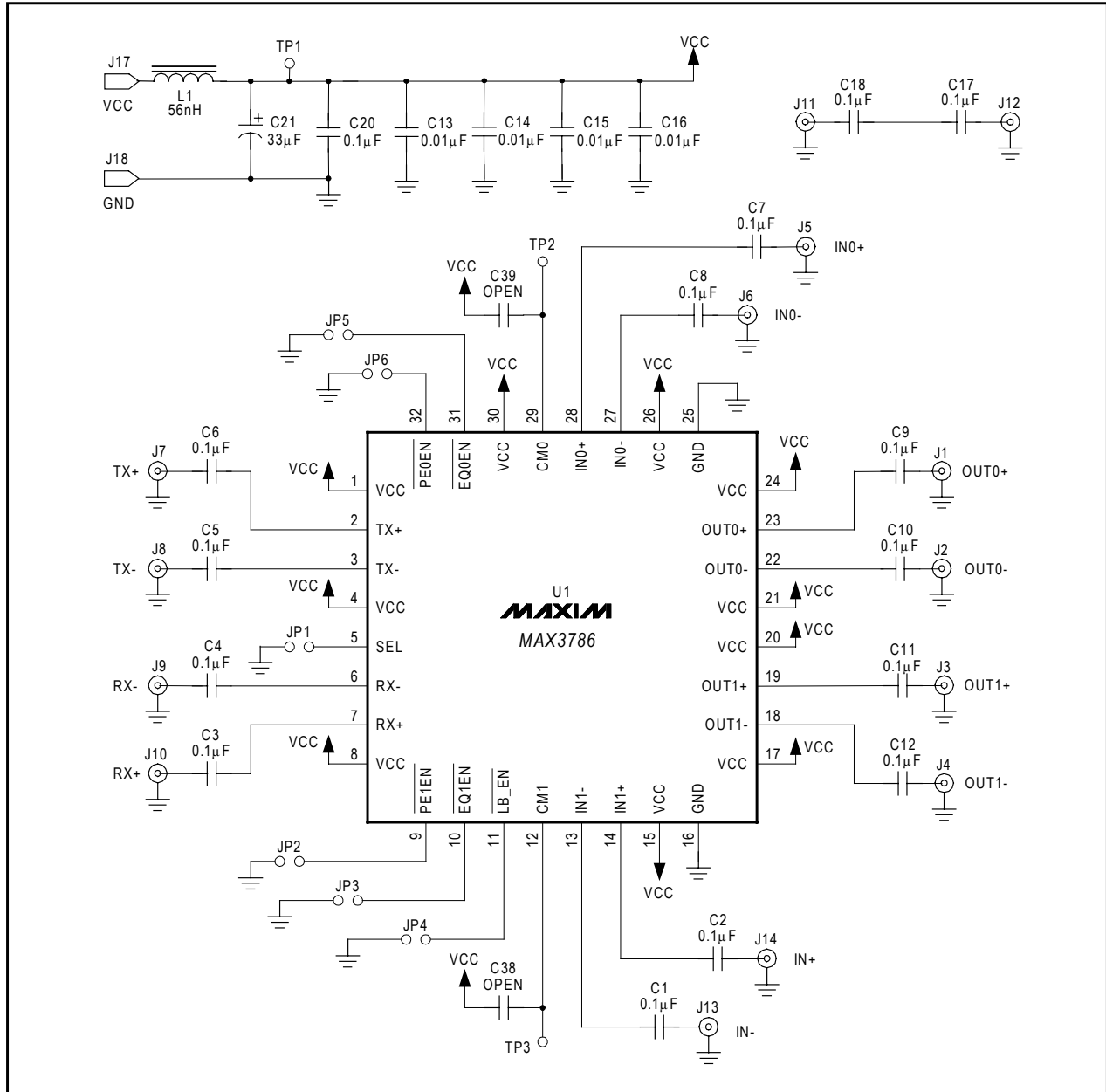


Figure 1. MAX3786 EV Kit Schematic

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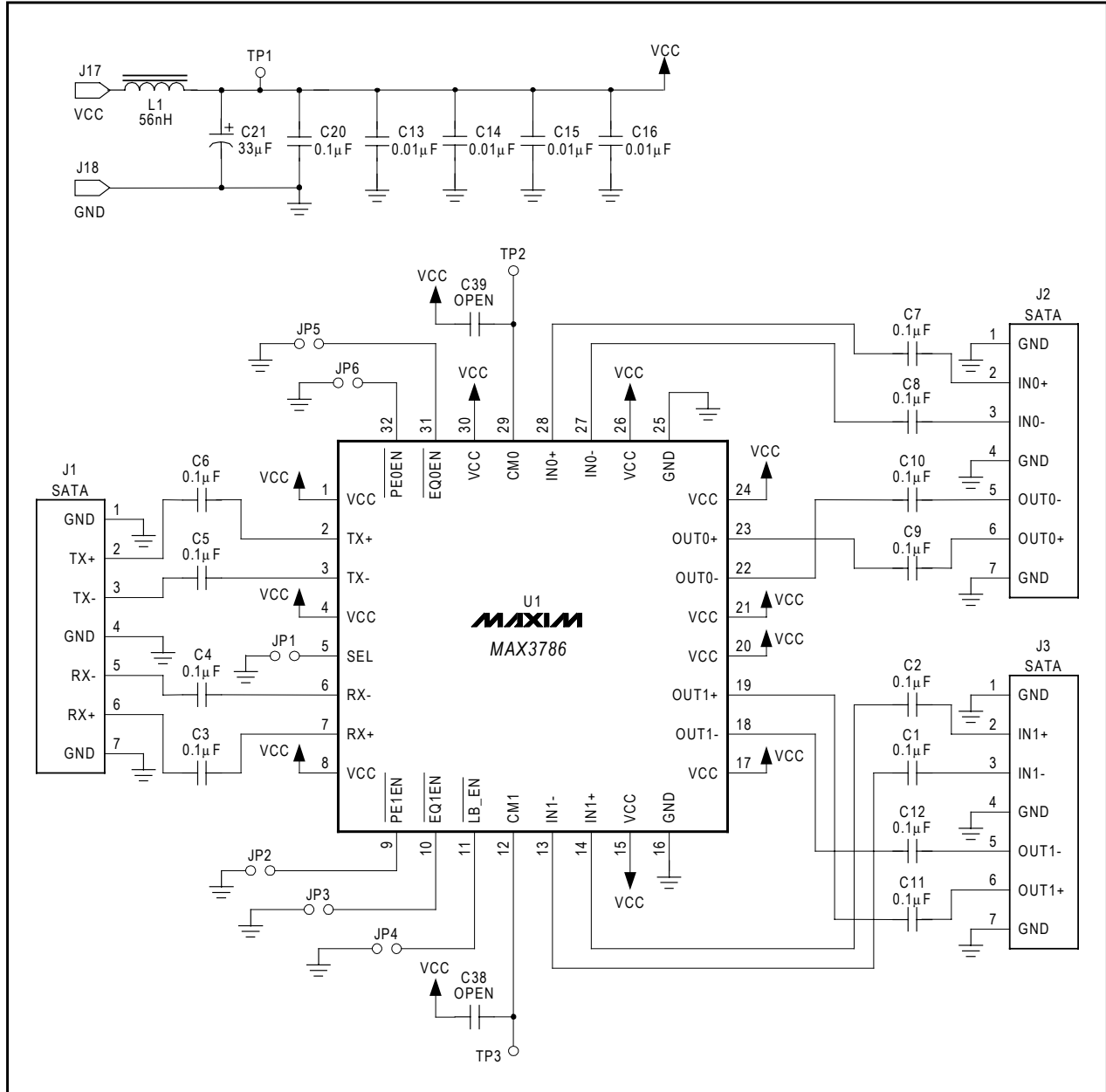


Figure 2. MAX3786 SATA EV Kit Schematic

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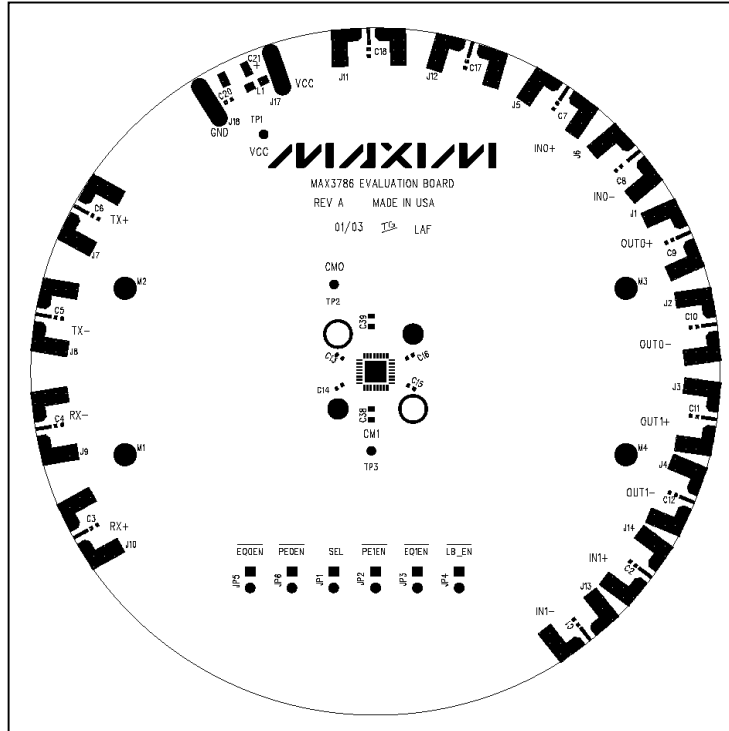


Figure 3. MAX3786 EV Kit Component Placement Guide—Component Side

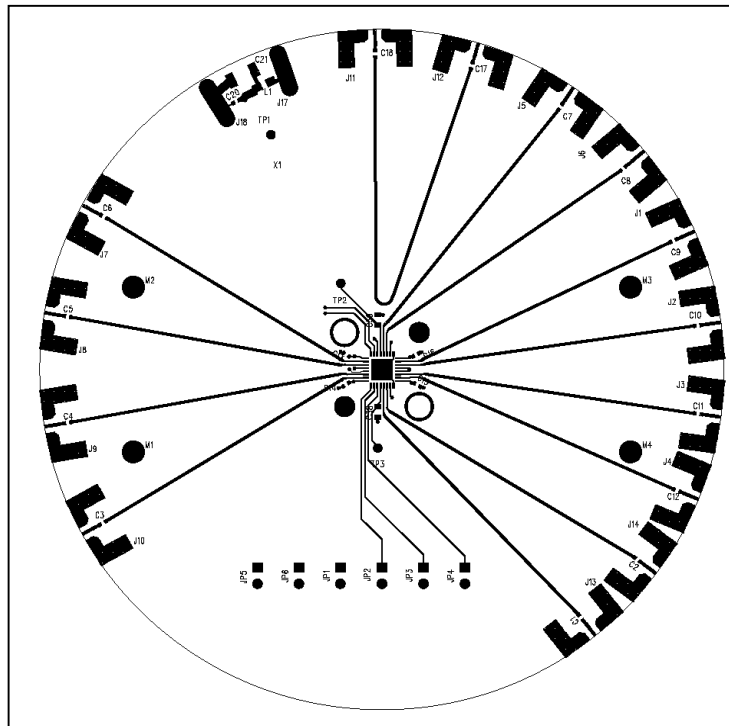


Figure 4. MAX3786 EV Kit PC Board Layout—Component Side

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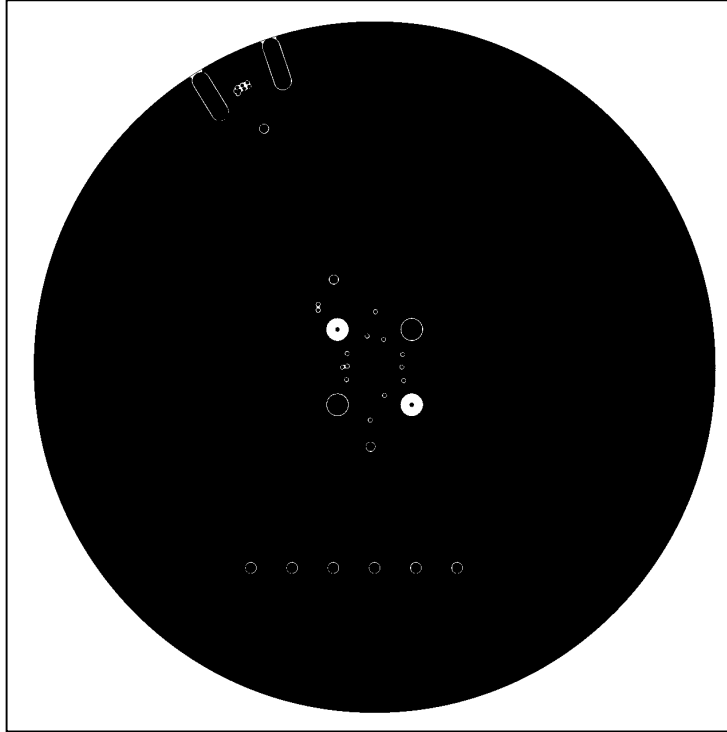


Figure 5. MAX3786 EV Kit PC Board Layout—Ground Plane

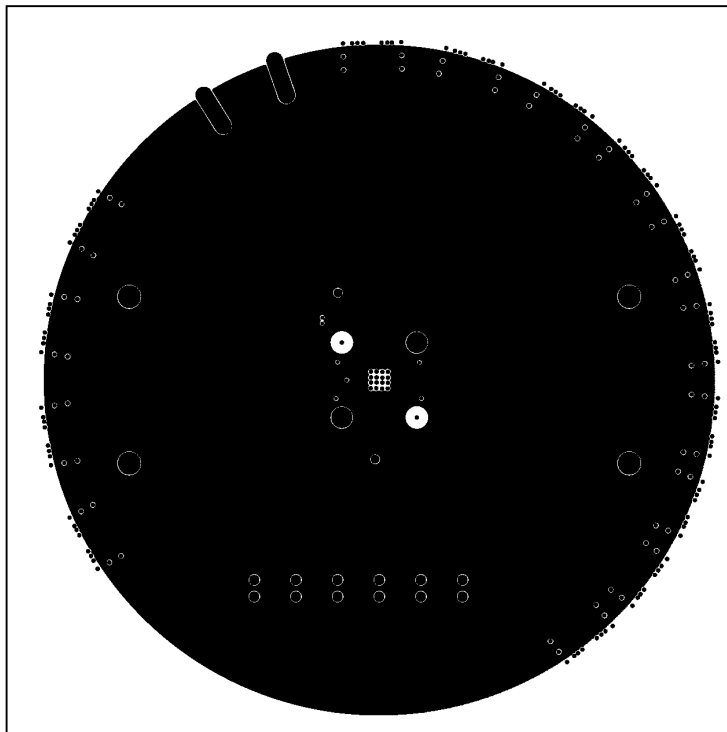


Figure 6. MAX3786 EV Kit PC Board Layout—Power Plane

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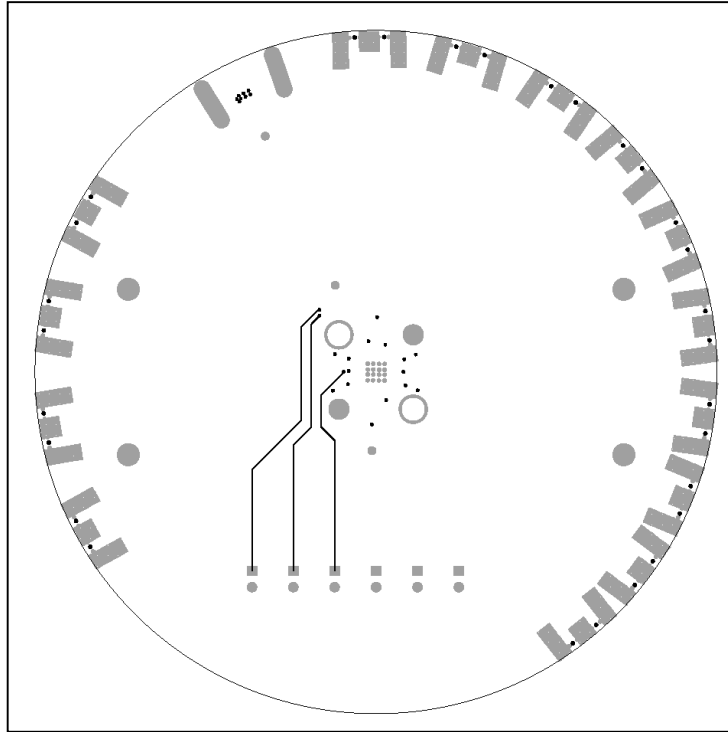


Figure 7. MAX3786 EV Kit PC Board Layout—Solder Side

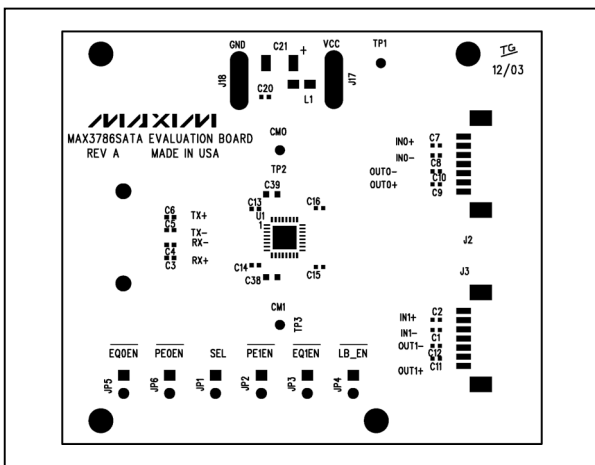
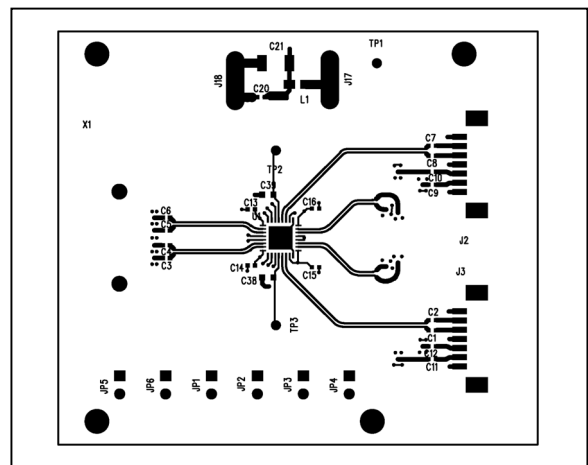


Figure 8. MAX3786 SATA EV Kit Component Placement Guide—Component Side



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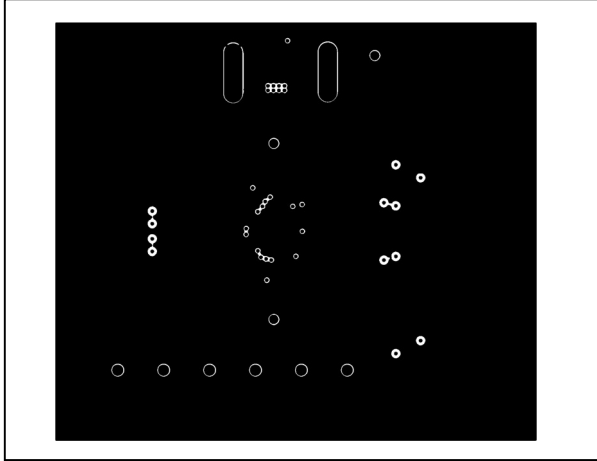


Figure 10. MAX3786 SATA EV Kit PC Board Layout—Ground Plane

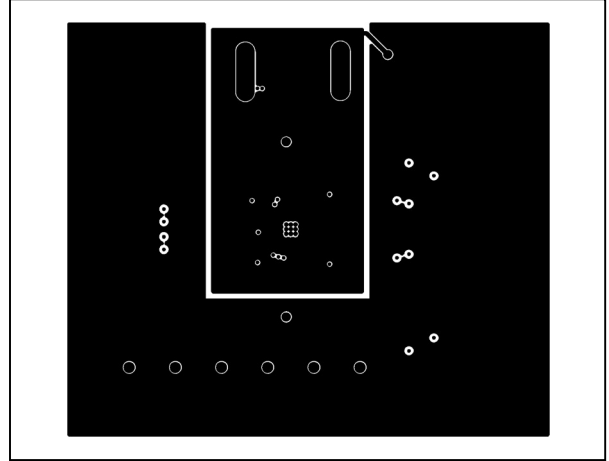


Figure 11. MAX3786 SATA EV Kit PC Board Layout—Power Plane

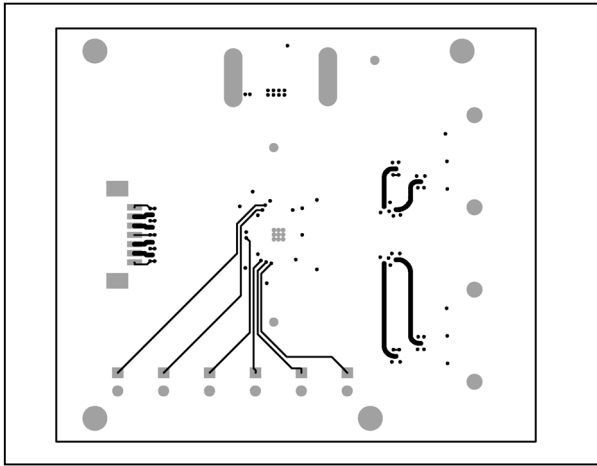


Figure 12. MAX3786 SATA EV Kit PC Board Layout—Solder Side

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