19-2773; Rev 2; 05/04

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*
		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.

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.

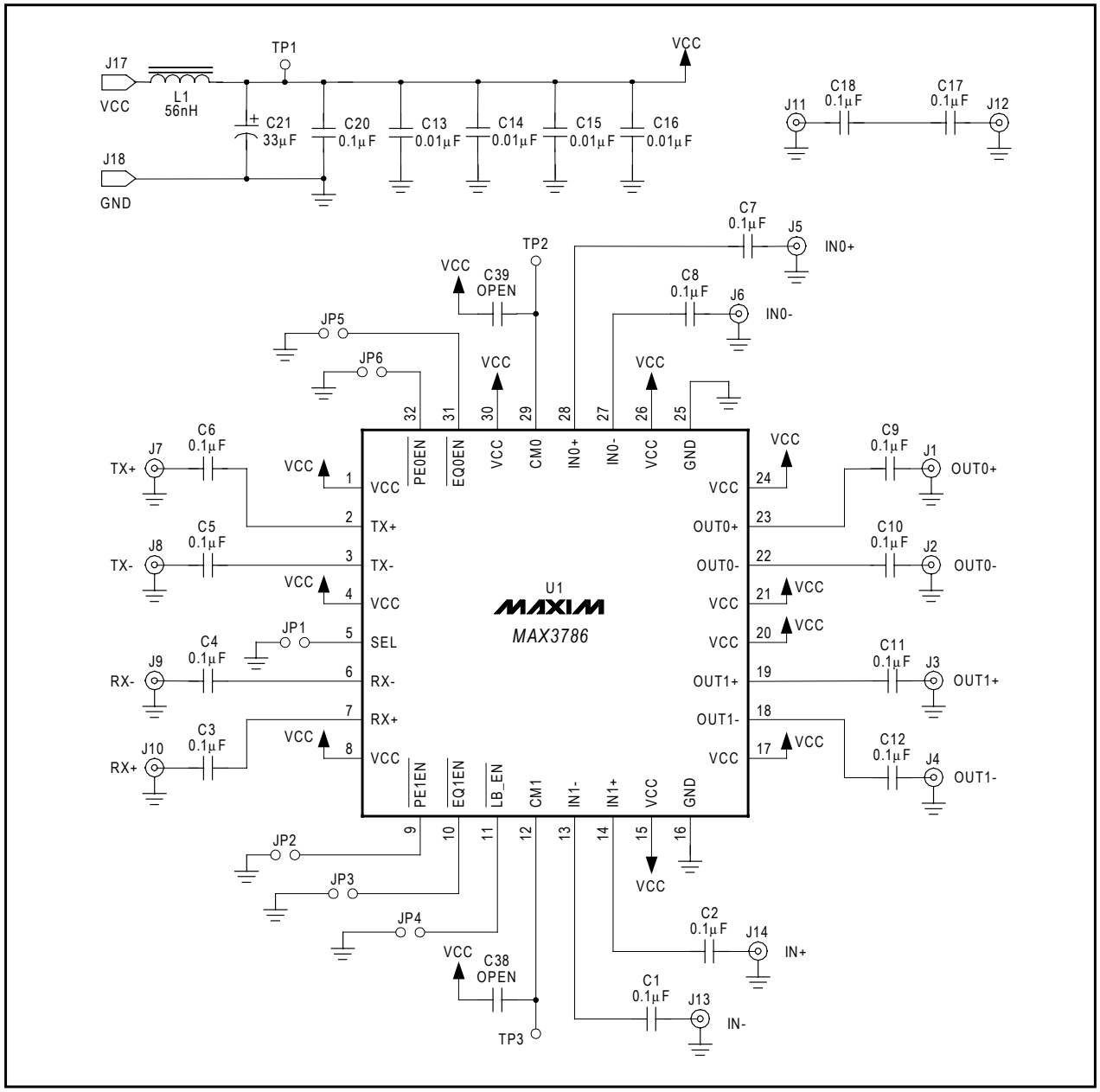

Figure 1. MAX3786 EV Kit Schematic

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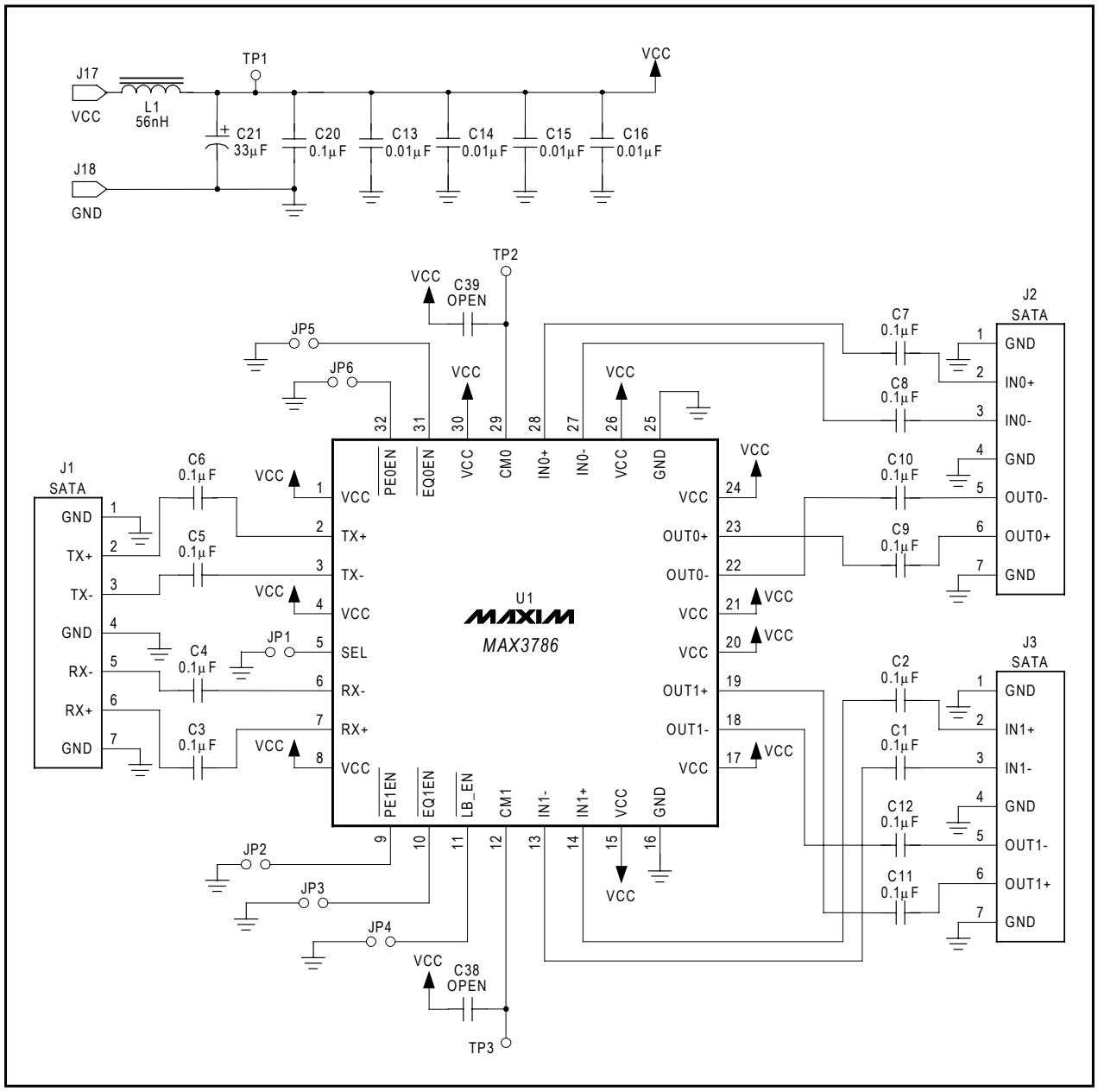

Figure 2. MAX3786 SATA EV Kit Schematic

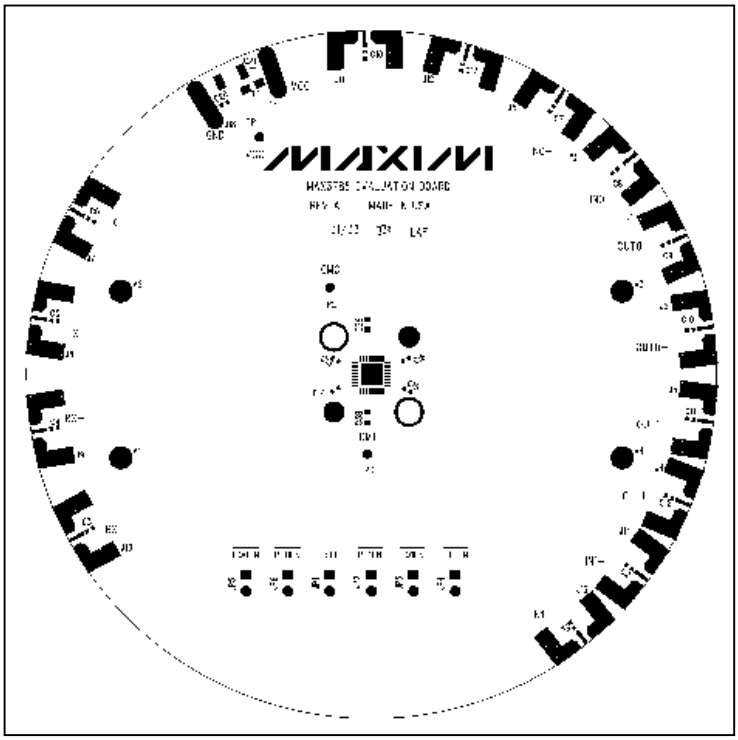

Figure 3. MAX3786 EV Kit Component Placement Guide—Component Side

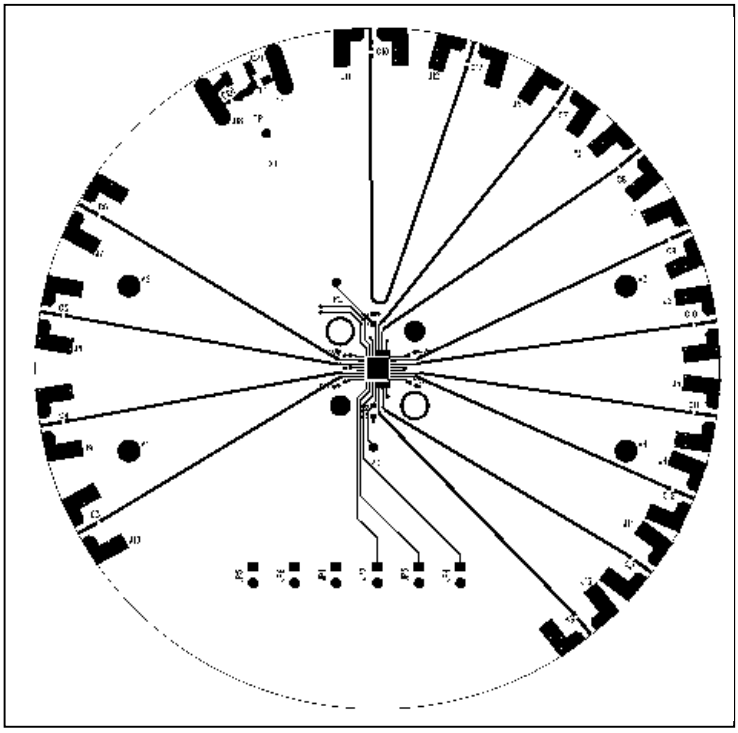

Figure 4. MAX3786 EV Kit PC Board Layout—Component Side

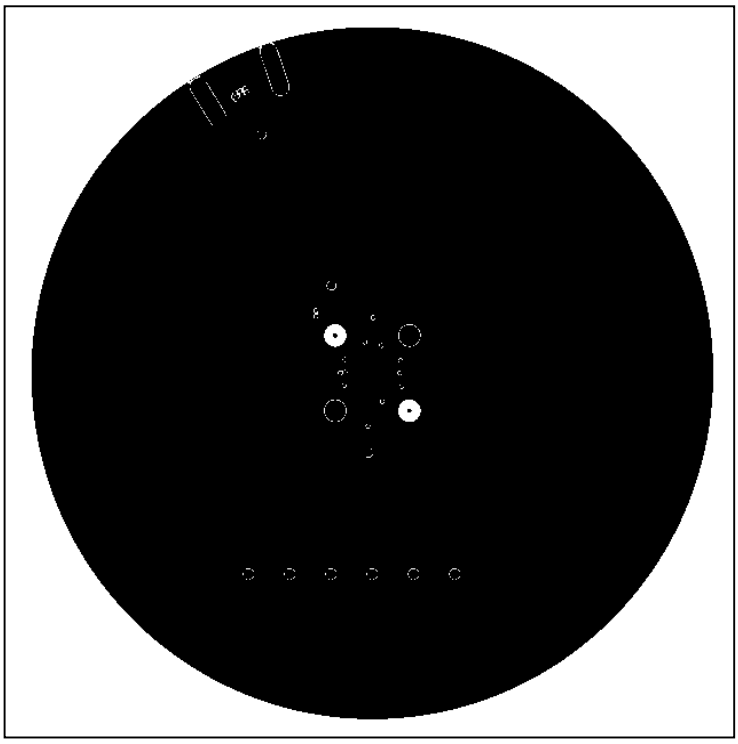

Figure 5. MAX3786 EV Kit PC Board Layout—Ground Plane

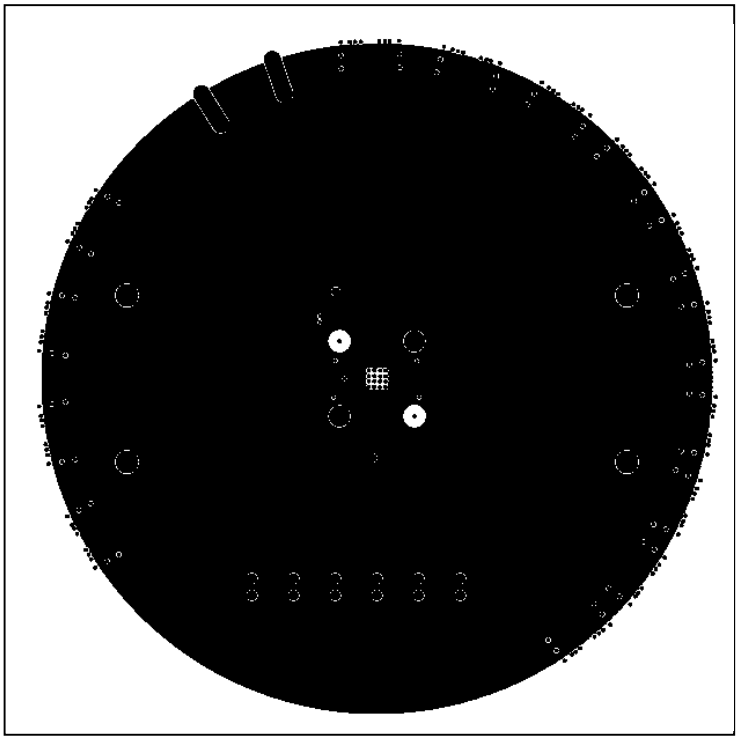

Figure 6. MAX3786 EV Kit PC Board Layout—Power Plane

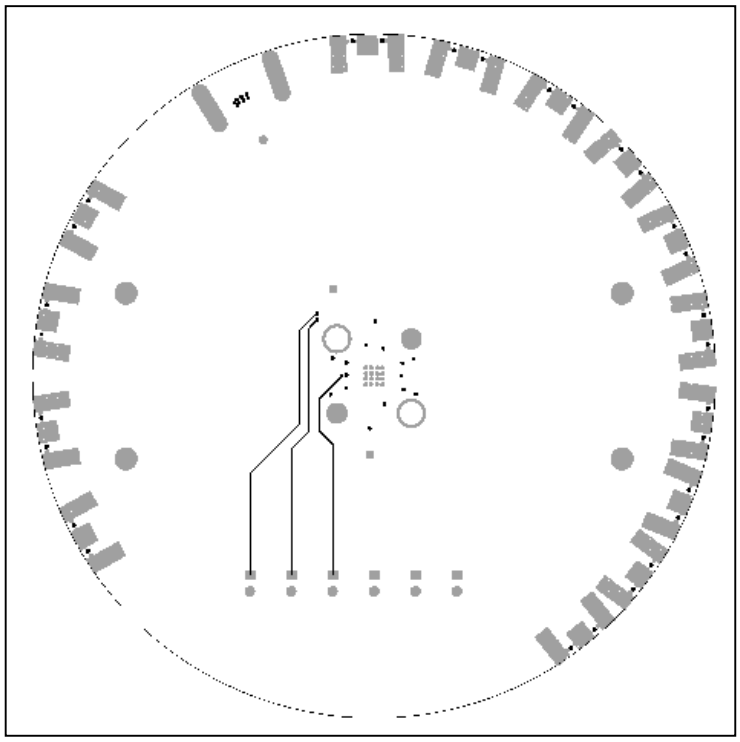

Figure 7. MAX3786 EV Kit PC Board Layout—Solder Side

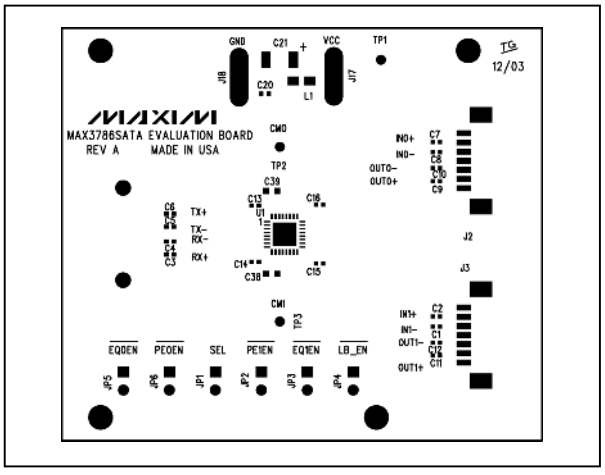

Figure 8. MAX3786 SATA EV Kit Component Placement Guide—Component Side

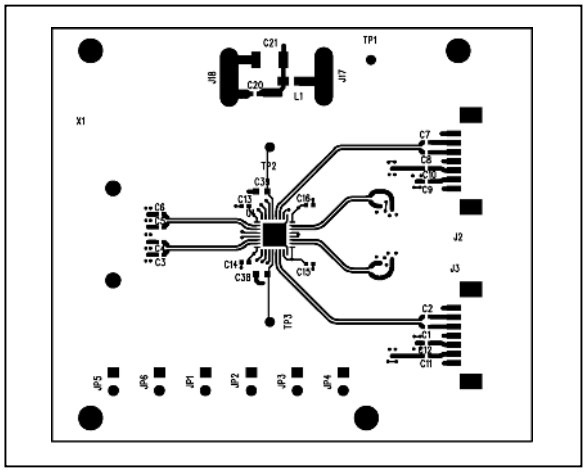

Figure 9. MAX3786 SATA EV Kit PC Board Layout—Component Side

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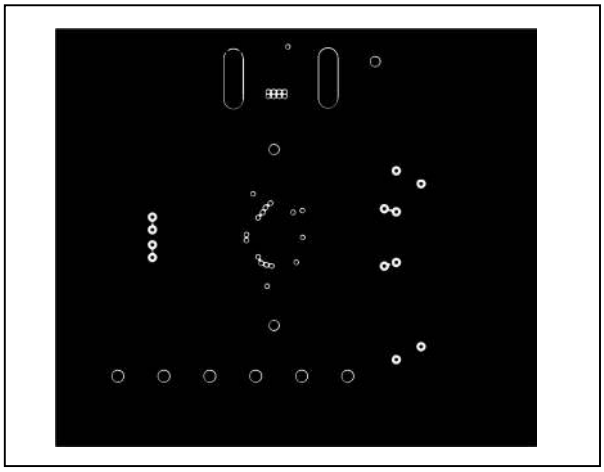

Figure 10. MAX3786 SATA EV Kit PC Board Layout—Ground Plane

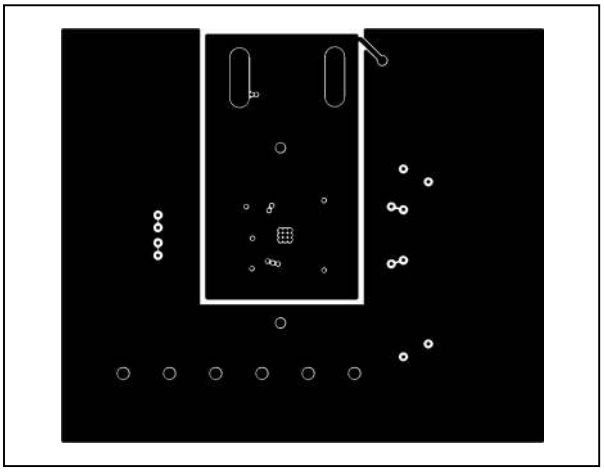

Figure 11. MAX3786 SATA EV Kit PC Board Layout—Power Plane

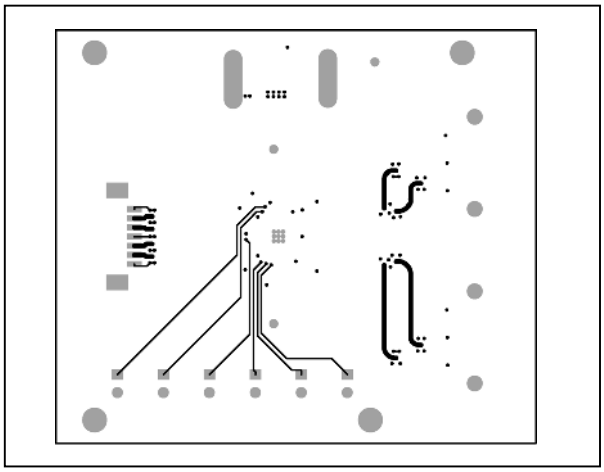

Figure 12. MAX3786 SATA EV Kit PC Board Layout—Solder Side