19-2470; Rev 0; 5/02

MAXIM

MAX3782 Evaluation Kit

Evaluates: MAX3782

General Description

The MAX3782 evaluation kit (EV kit) is an assembled demonstration board that provides easy evaluation of the MAX3782 dual 1.25Gbps transceiver. The MAX3782 EV kit requires one +3.3V supply and includes an LED to indicate the lock status of MAX3782 PLLs.

Features

- **Fully Assembled and Tested**
- **+3.3V Operation**
- **Allows Easy Testing of Thermal Performance**
- **Easy Selection of Operating Modes**

Component Suppliers

SUPPLIER	PHONE	FAX
AVX	803-946-0690	803-626-3123
Coilcraft	847-639-6400	847-639-1469

Note: *Please indicate that you are using the MAX3782 when contacting these component suppliers*

Ordering Information

PART	TEMP RANGE	IC PACKAGE
MAX3782EVKIT	-5°C to +85°C	68 QFN-EP*

**Exposed pad*

Component List

DESIGNATION	QTY	DESCRIPTION
C1–C19, C22–C26, C34–C46	37	0.1µF ±10%, 10V (min) ceramic capacitors (0402)
C20	1	33µF ±10%, 16V (min) tantalum capacitor
C21	1	2.2µF ±10%, 16V (min) tantalum capacitor
C27, C28	2	0.01µF ±10%, 10V (min) ceramic capacitors (0402)
C29	0	Not installed
C30–C33	4	1µF ±10%, 10V (min) ceramic capacitors (0603)
C47	1	22pF ±5%, 10V (min) ceramic capacitor (0402)
D1	1	Red LED T-1 package
J1–J22, J33	23	SMB connectors, PC mount Digi-Key J467-ND
J23–J30	8	SMA Connectors, side mount Digi-Key J502-ND

DESIGNATION	QTY	DESCRIPTION
J31, J32, TP1, TP2	4	Test points
J34–J37, J45–J57	0	Not installed
J38, J39, J40	3	3-pin headers (0.1in centers)
J41–J44	0	Not installed
R1–R8	8	0Ω ±5% resistors (0603)
R9, R10, R11	3	10kΩ ±1% resistors (0603)
R12–R25	0	Not installed
R26	1	360Ω ±5% resistor (0402)
U1	1	MAX3782UGK 68-pin QFN-EP
U2	1	Inverter Digi-Key 296-1106-1, Texas Instruments SN74AHCT04PWR
None	1	MAX3782 EV kit circuit board, rev A
None	1	MAX3782 EV kit data sheet
None	1	MAX3782 data sheet

MAX3782 Evaluation Kit

Quick Start

1) Apply +3.3V to the VCC pin. Connect power supply ground to the GND pin.
2) Disable system loopback by shorting the VCC side of the $\overline{\text{LOOPEN}}$ jumper.
3) Apply 1.25Gbps data to the RX1± and RX2± inputs.
4) Apply a 125MHz reference clock to the REFCLK± inputs.
5) Apply 1.25Gbps LVDS data to the TDAT1± and TDAT2± inputs.
6) Apply 625MHz input clocks to the TCLK1± and TCLK2± inputs. The phase drift between TCLK and REFCLK must be <800ps after reset (refer to the MAX3782 data sheet).
7) Briefly short the GND side of the $\overline{\text{RESET}}$ jumper. Move the short to the VCC side for normal operation.
8) The LOCK LED should light, indicating that the transmitter and receiver are in lock.
9) The data from RX1± should be present at the RDAT1± output, with the recovered 625MHz clock at the RCLK1± output.
10) The data applied at the TDAT1± input should be present at the TX1± output.

Detailed Description

Interfacing to CML Inputs and Outputs

All CML inputs (RX1± and RX2±) and outputs (TX1± and TX2±) on the MAX3782 are AC-coupled to simplify testing. Differential input data should be between 370mV$_{P-P}$ and 2000mV$_{P-P}$ (185mV$_{P-P}$ and 1000mV$_{P-P}$ or measured single ended). The CML outputs are AC-coupled to allow for direct connection to 50Ω oscilloscopes.

Interfacing to LVDS Inputs and Outputs

The LVDS outputs (RDAT_± and RCLK_±) are AC-coupled to allow direct interfacing to 50Ω oscilloscopes. The LVDS inputs (TDAT_± and TCLK_±) are DC-coupled. For these inputs to function, provide the proper AC and DC voltages. The LVDS inputs require DC biasing and therefore cannot be AC-coupled. For this reason, if the LVDS outputs are to be externally looped back to the LVDS inputs, the AC-coupling capacitors on the EV board (C1–C4 and C13–C16) must be replaced with 0Ω shorts.

Terminating Unused Outputs

If only one side of a differential signal is being observed on a 50Ω oscilloscope, balance the circuit by similarly terminating the other output.

Temperature Sensor

The MAX3782 has an integrated temperature sensor to indicate the temperature of the die. Independently power the temperature sensor circuit by applying 3.3V to the center pin of J39 and applying ground to the GND pin. Monitor the TEMPSENS output voltage at TP1 to allow calibration of the temperature sensor.

Exposed-Pad Package

The exposed-pad (EP), 68-pin QFN incorporates features that provide a very low thermal resistance path for heat removal from the IC. The pad is electrical ground on the MAX3782 and must be soldered to the circuit board for proper thermal and electrical performance.

Table 1. Controls, Test Points and LEDs

NAME	TYPE	PIN	DESCRIPTION
$\overline{\text{LOOPEN}}$ (JU38)	3-pin header	VCC	Short for normal operation
		GND	Short to enable loopback testing
VCCTEMP (JU39)	3-pin header	VCC	Short to connect VCC for the TEMPSENS circuit to the rest of the VCC network
		GND	Short to disable the TEMPSENS circuit
$\overline{\text{RESET}}$ (JU40)	3-pin header	VCC	Short for normal operation
		GND	Momentarily short to reset FIFO and receiver components
D1	LED	LOCK	D1 lights only when the transmitter PLL and both receiver PLLs are in lock
TP1	Test point	TEMPSENS	When JU3 is shorted to VCC, the voltage at TP1 is proportional to the die junction temperature
TP2	Test point	LOCK	TP2 can be used to monitor the voltage at the LOCK output

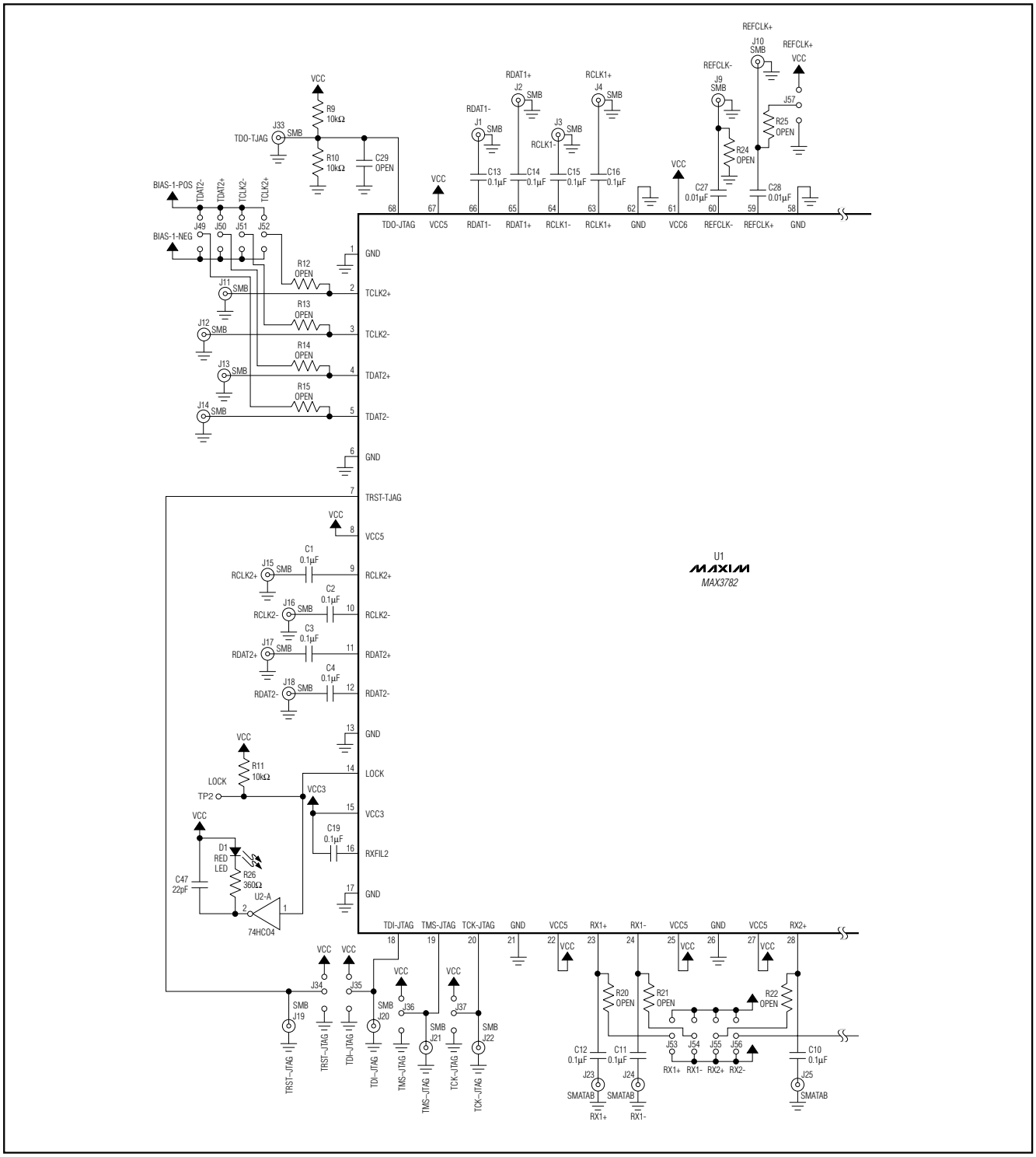

Figure 1. MAX3782 EV Kit Schematic (1 of 2)

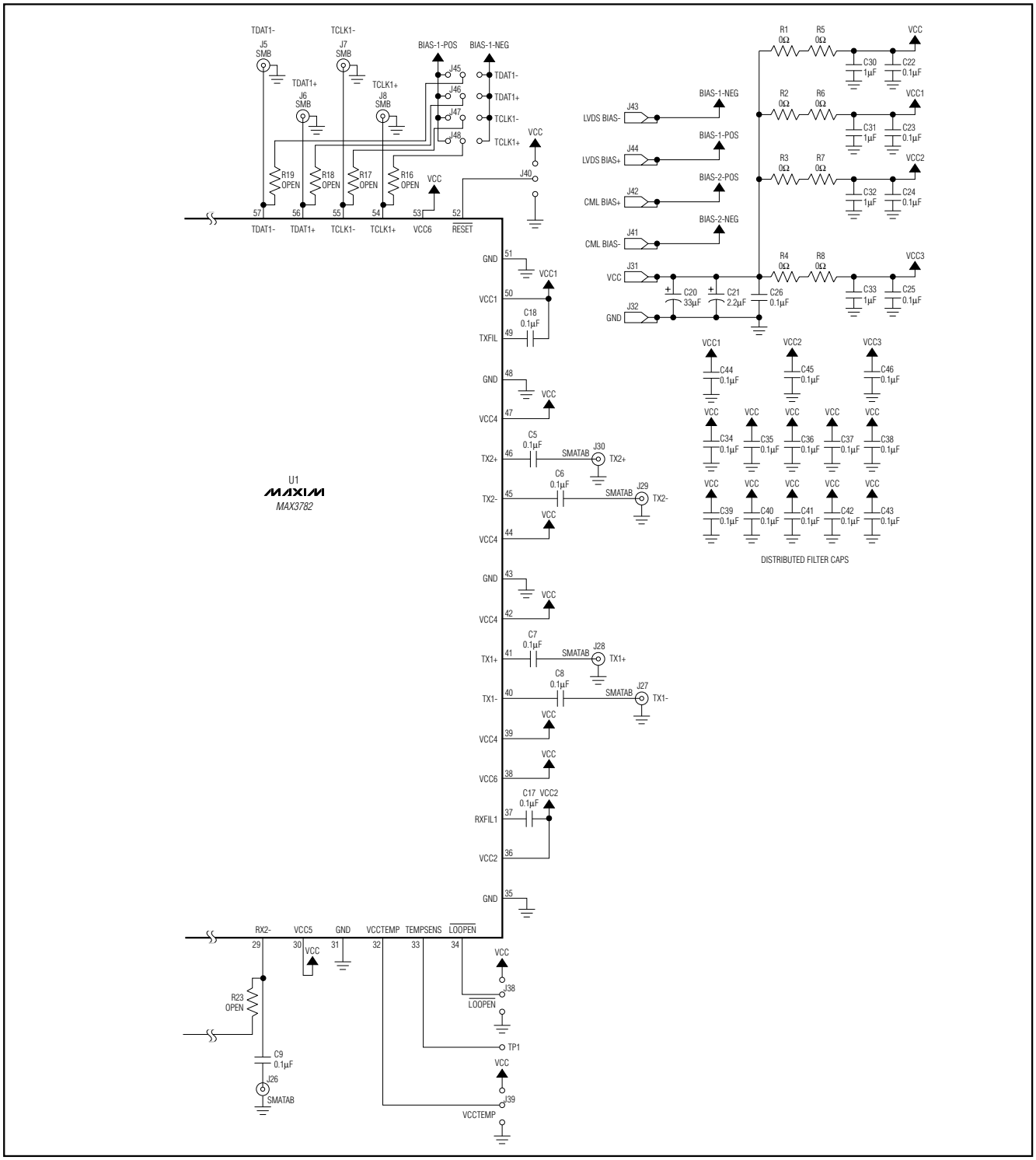

Figure 1. MAX3782 EV Kit Schematic (2 of 2)

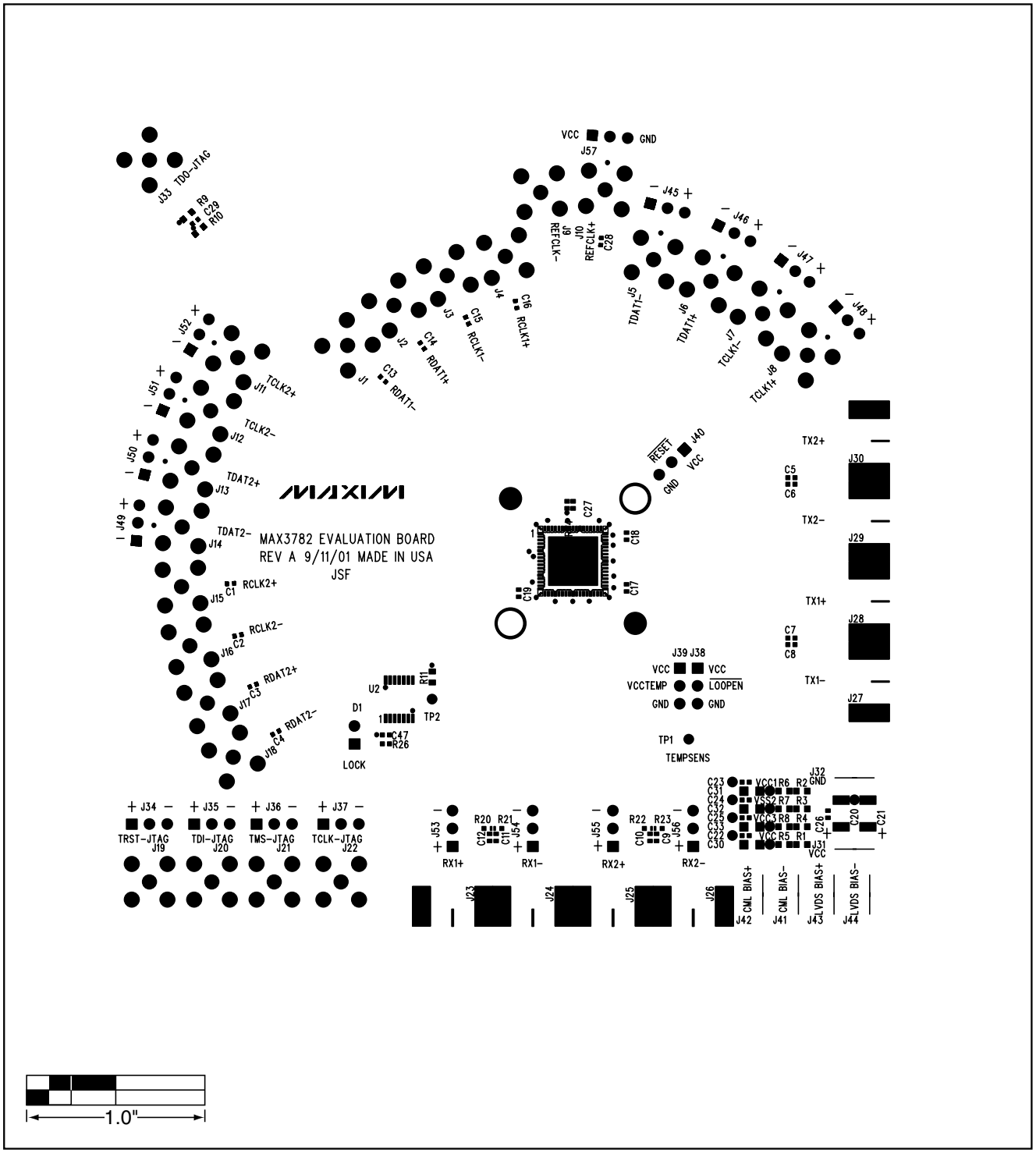

Figure 2. MAX3782 EV Kit Component Placement Guide—Component Side

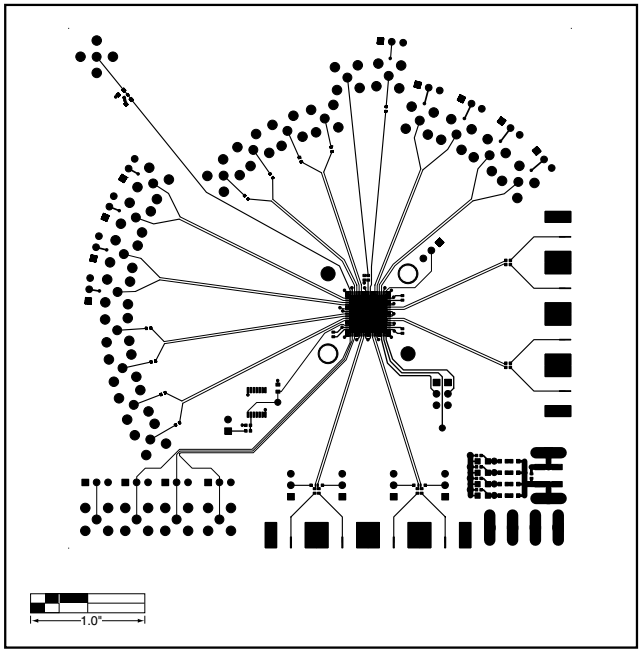

Figure 3. MAX3782 EV Kit PC Board Layout—Component Side

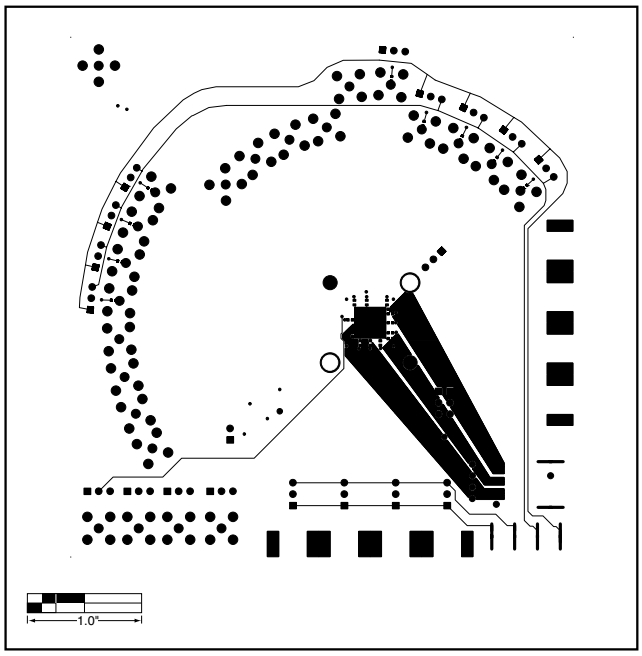

Figure 4. MAX3782 EV Kit PC Board Layout—Solder Side

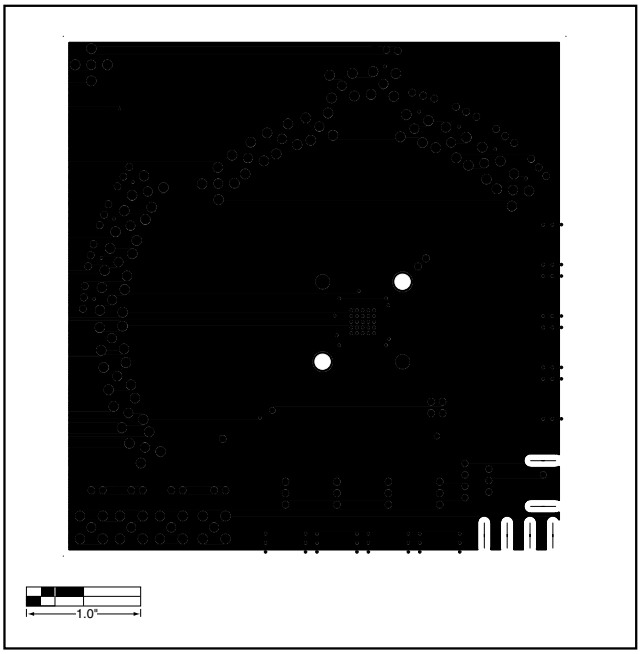

Figure 5. MAX3782 EV Kit PC Board Layout—Power Plane

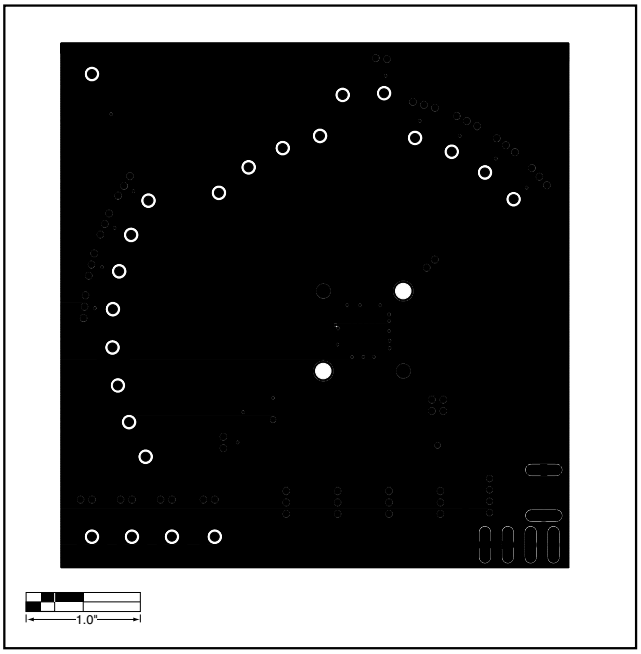

Figure 6. MAX3782 EV Kit PC Board Layout—Ground Plane

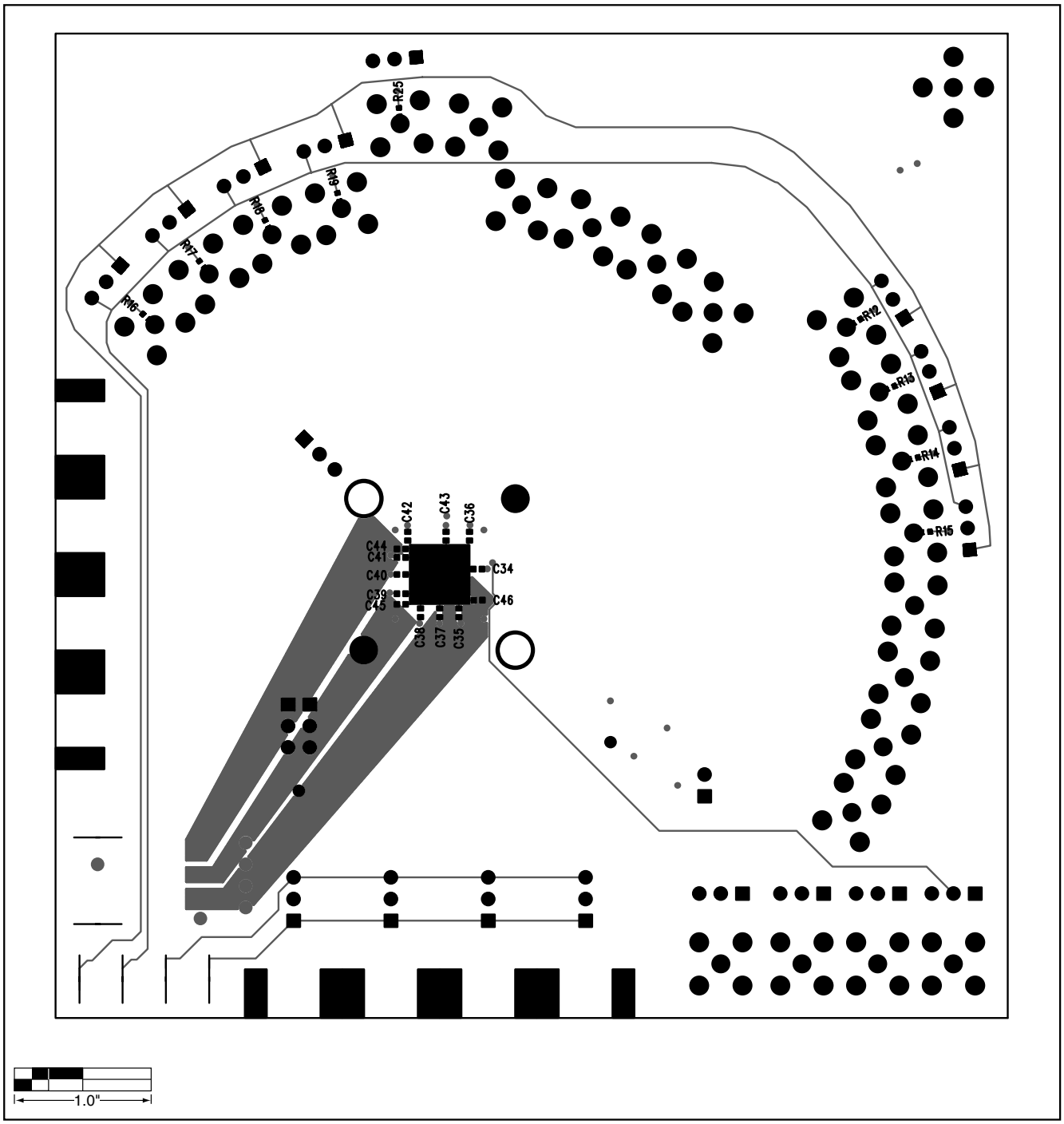

Figure 7. MAX3782 EV Kit Component Placement Guide—Solder Side