

MAXIM

MAX3892 Evaluation Kit

General Description

The MAX3892 evaluation kit (EV kit) is an assembled surface-mount demonstration board that provides easy evaluation of the MAX3892 2.7Gbps 4:1 serializer with clock synthesis and low-voltage differential signal (LVDS) inputs.

Features

- ◆ 3.3V Single Supply
- ◆ Selectable Reference Clock Frequencies:
622.08MHz, 155.52MHz, 77.76MHz, 38.88MHz
666.51MHz, 166.63MHz, 83.31MHz, 41.66MHz
- ◆ Selectable Parallel Input Clock Rate:
622.08MHz/311.04MHz, 666.51MHz/333.26MHz
- ◆ Fully Assembled and Tested Surface-Mount Board

Ordering Information

PART	TEMP RANGE	IC PACKAGE
MAX3892EVKIT	-40°C to +85°C	44 QFN

Component List

DESIGNATION	QTY	DESCRIPTION
C1–C8, C10, C21, C23–C31	19	0.1µF ±10%, 10V ceramic capacitors (0402)
C9, C22	2	10µF ±10%, 10V tantalum capacitors
C11–C20	10	Short
D1, D2	2	Red LEDs T1
J1–J6	6	SMA connectors, edge-mount, tab center EFJohnson 142-0701-851
J7, J8, J21, J26	4	Test points
J9–J20, J22, J23	14	SMB connectors, PC mount EFJohnson 131-1701-201
J24, J25	2	SMA connectors, PC mount EFJohnson 142-0701-201
JU1, JU2, JU3, JU11, JU12, JU17, JU21, JU25, JU29, JU33, JU37, JU41, JU45, JU56	14	1 × 3-pin headers, 0.1in centers Digi-Key S1012-36-ND

DESIGNATION	QTY	DESCRIPTION
JU1, JU2, JU4, JU8, JU13, JU17, JU21, JU25, JU29, JU33, JU37, JU41, JU45, JU53, JU56	15	Shunts
JU4, JU8, JU9, JU10, JU13, JU53, JU54, JU55	8	1 × 2-pin headers, 0.1in centers Digi-Key S1012-36-ND
JU11, JU12, JU17, JU21, JU25, JU29, JU33, JU37, JU41, JU45	10	1 × 1-pin headers, 0.1in centers Digi-Key S1012-36-ND
L1, L2, L3	0	DO NOT INSTALL
R1–R6	0	DO NOT INSTALL
R7, R8	2	768Ω ±1% resistors (0402)
R10, R57	2	30kΩ ±5% resistors (0402)
R11, R18, R20, R21, R24, R25, R26, R28, R29, R42	10	2kΩ ±1% resistors (0402)

Evaluates: MAX3892



MAX3892 Evaluation Kit

Component List (continued)

DESIGNATION	QTY	DESCRIPTION
R12–R17, R19, R22, R23, R27	10	0Ω ±1% resistors (0402)
R54, R56	2	100Ω ±5% resistors (0402)
R55	1	165Ω ±1% resistor (0402)
U1	1	MAX3892EGH 44-pin QFN
U2	1	MAX4429ESA 8-pin SO
None	1	MAX3892 evaluation circuit board, rev A
None	1	MAX3892 EV kit data sheet
None	1	MAX3892 data sheet

Component Suppliers

SUPPLIER	PHONE	FAX
AVX	843-444-2863	843-626-3123
Murata	415-964-6321	415-964-8165
Venkel	800-950-8365	512-794-0087

Note: Please indicate that you are using the MAX3892 when contacting these component suppliers.

Quick Start

- 1) Set jumper JU56 to the ground position for the standard SONET 2.5Gbps data rate. Alternatively, this jumper may set the RATESET pin to VCC for an FEC 2.7Gbps data rate.
- 2) Install JU53 for a 622MHz reference clock at the RCLK pins. See Figure 1 for other reference clock frequencies. Install no jumper or install only one of jumpers JU53, JU54, or JU55, based on the reference clock frequency.
- 3) Apply a 622MHz clock to the RCLK inputs at J24 and J25. The LVPECL input voltage should be at least 300mV_{P-P} differential, but not more than 1900mV_{P-P} differential.
- 4) Install JU8 to select a 622MHz clock input to PCLKI for latching in the parallel data. This also enables the SCLKO for retiming the 2.5Gbps serial data. See Figure 1 for other states of the MODE pin. Install none or one of jumpers JU8, JU9, or JU10.
- 5) Connect PCLKO lines at J22 and J23 to PCLKI inputs at J12 and J11 (PCLKO+ is connected to PCLKI-). Alternatively, apply a 622MHz clock with LVDS levels of at least 100mV_{P-P} differential, but

not more than 2400mV_{P-P} differential to PCLKI. Adjust the data delay from the BERT to meet the setup and hold requirement.

- 6) Set jumper JU1 to ground the SLBPD pin. This powers down the loopback output buffer. Loopback output at the SLBO pins can be a 622MHz clock or 2.5Gbps data, depending on the state of JU2 (SLBEN). Set SLBEN to VCC for data and GND for clock output.
- 7) To automatically reset FIFOERROR, install JU4. This connects the FIFOERROR pin to RESET and resets the FIFO if the FIFO buffers' elasticity is exceeded. Leave jumper JU3 open.
- 8) For static data inputs, install jumper JU13 to allow setting a logic state. Set up a data pattern using jumpers JU17, JU21, JU25, JU29, JU33, JU37, JU41, and JU45. Connect data line PDI- to the opposite state of PDI+. If an external data pattern is to be applied, remove the respective jumpers for the data channel. The EV kit is shipped with the data lines DC-coupled to the SMA connectors, so the instantaneous input levels must be kept between 0V and 2.4V.
- 9) Connect the SDO and SCLK lines at J1 through J4 to a 50Ω terminated oscilloscope. Use matched cable lengths when making timing measurements.
- 10) Power up the EV kit with a 3.3V supply. Power to J21 is required only if AC-coupling capacitors C11–C20 are installed. To install C11–C20, cut the shorting strap first. The common-mode voltage at J21 is used when the external data inputs need a level shift to be LVDS-compatible.

MAX3892 Evaluation Kit

Detailed Description

Evaluates: MAX3892

Control Descriptions (see *Quick Start* first)

COMPONENT	NAME	FUNCTION
J1, J2	SCLKO±	Serial Clock Output, CML, Differential 2.5GHz/2.7GHz Clock
J3, J4	SDO±	Serial Data Output, CML, Differential 2.5Gbps/2.7Gbps Data
J5, J6	SLBO±	Serial Loopback/Data Output, CML, Data, or Clock
J7	V _{CC}	Supply Voltage
J8, J26	GND	Supply Ground
J9	RESET	External Reset Connection, TTL Input
J10	FIFOERROR	External FIFOERROR Connection, TTL Output
J11, J12	PCLKI±	Parallel Clock Input, LVDS
J13–J20	PDI±	Parallel Data Input, LVDS
J21	CMV	Common-Mode Voltage. Not required for DC-coupled LVDS inputs. Set to approximately 1.2V when C11–C20 are installed.
J22, J23	PCLKO±	Parallel Clock Output, LVDS
J24, J25	RCLK±	Reference Clock Input, LVPECL
JU1	SLBPD	Powers down the system loopback outputs when low. Loopback outputs are enabled when high.
JU2	SLBEN	Loopback Enable Input. SLBEN high enables serial data. SLBEN low enables a 622MHz/666MHz clock.
JU3	RESET	FIFO Error Reset. Pull high to unlatch FIFOERROR output, and center the FIFO in its elastic range.
JU4	FIFOERROR	FIFO Error Indicator. Connect FIFOERROR to RESET to reset the FIFO automatically.
JU8, JU9, JU10	MODE	Select PCLKI Frequency 622MHz/311MHz, and Enable/Disable SCLKO. Install only one jumper or leave open. See Figure 1.
JU13	STATIC DATA	Install JU13 when using the static data jumpers below.
JU17, JU21, JU25, JU29, JU33, JU37, JU41, JU45	PDI0± to PDI3±	Parallel Data Input Static Level Setup. Install PDI+ to the opposite state of PDI-.
JU53, JU54, JU55	CLKSET	Select RCLK Frequency (622MHz, 155MHz, 77MHz, 38MHz). Install one jumper or leave open. See Figure 1.
JU56	RATESET	SONET or FEC Data Rate Select. Set high for FEC or low for SONET.

MAX3892 Evaluation Kit

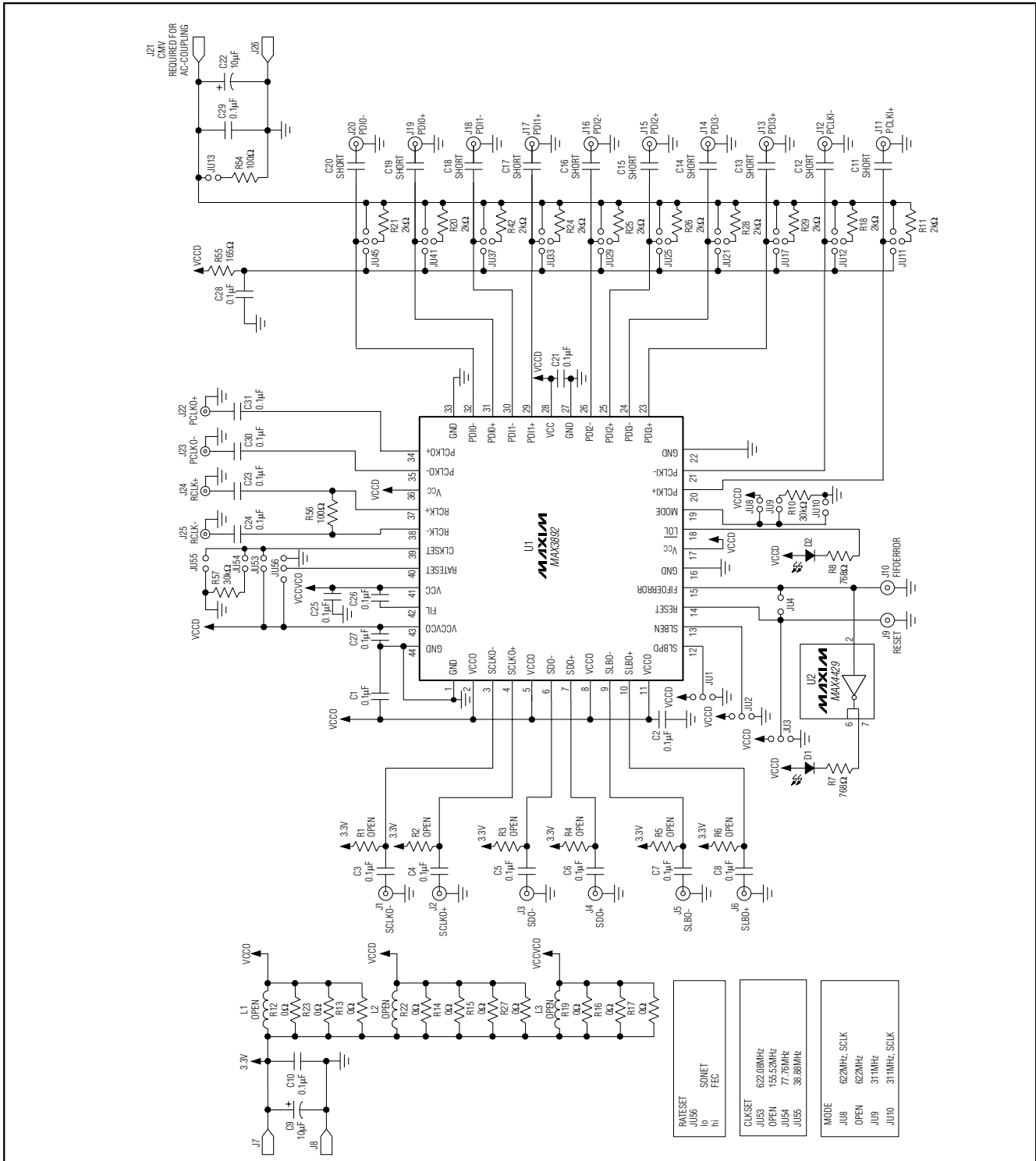


Figure 1. MAX3892 EV Kit Schematic

MAX3892 Evaluation Kit

Evaluates: MAX3892

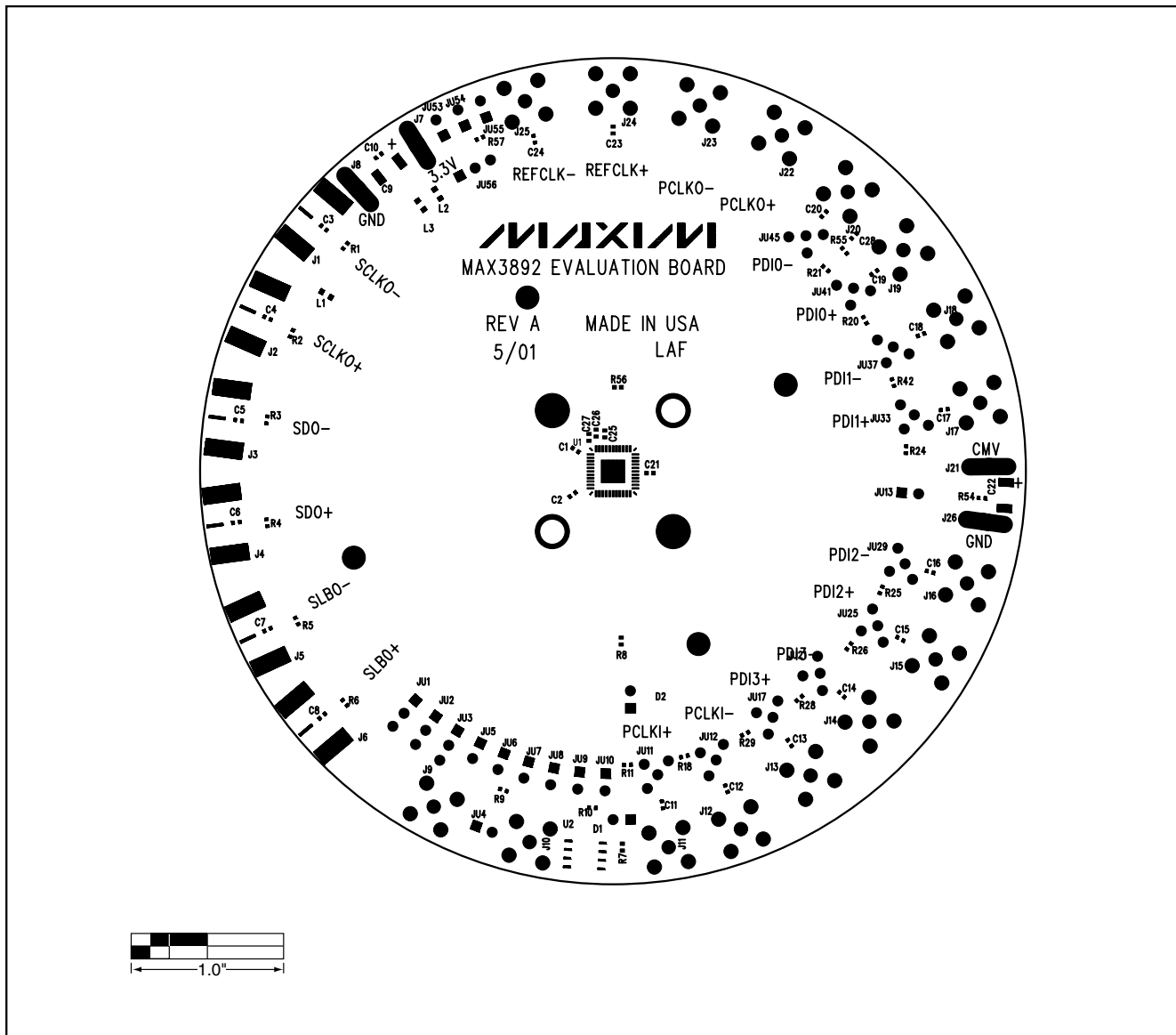


Figure 2. MAX3892 EV Kit Component Placement Guide—Component Side

MAX3892 Evaluation Kit

Evaluates: MAX3892

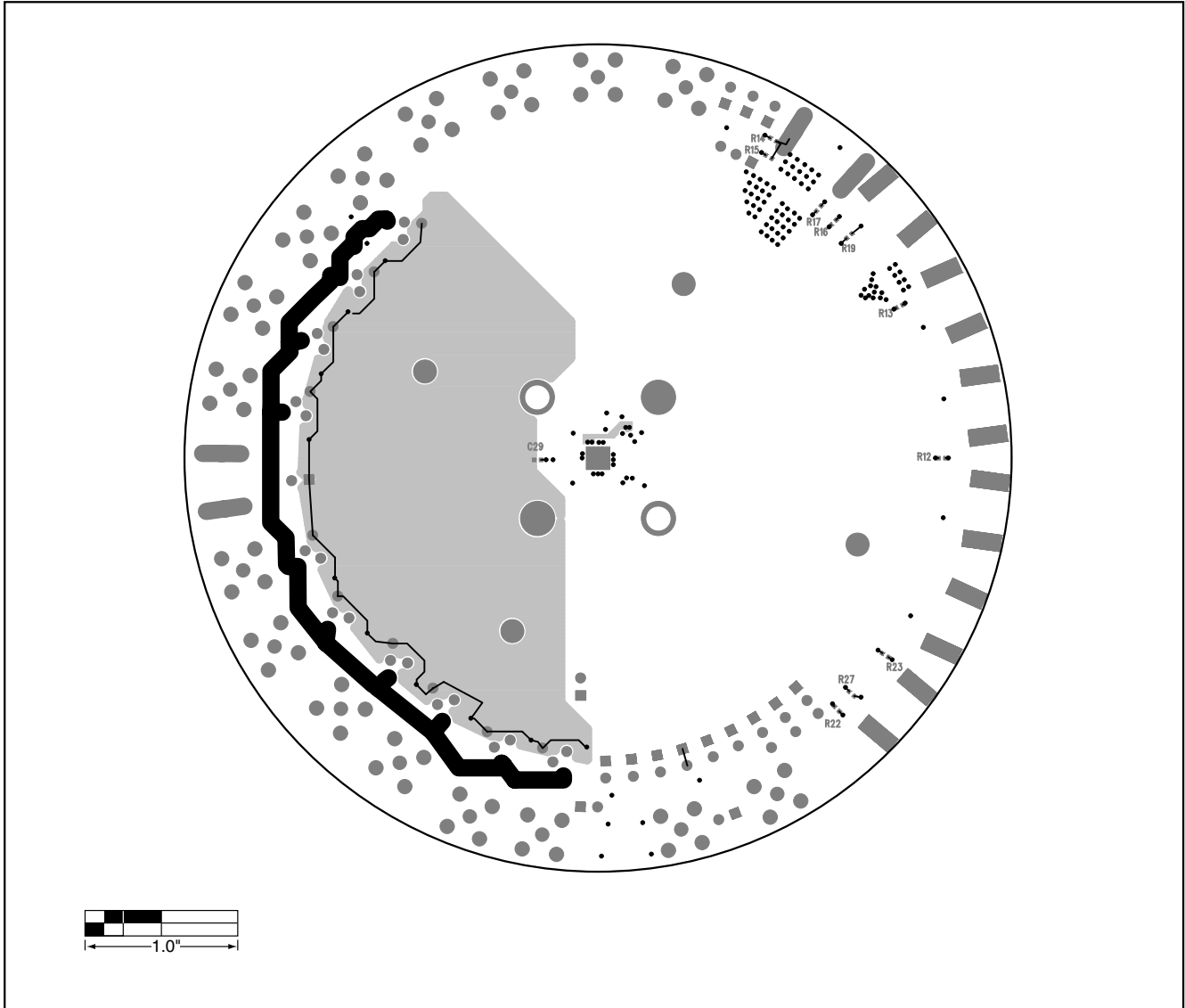


Figure 3. MAX3892 EV Kit Component Placement Guide—Solder Side

MAX3892 Evaluation Kit

Evaluates: MAX3892

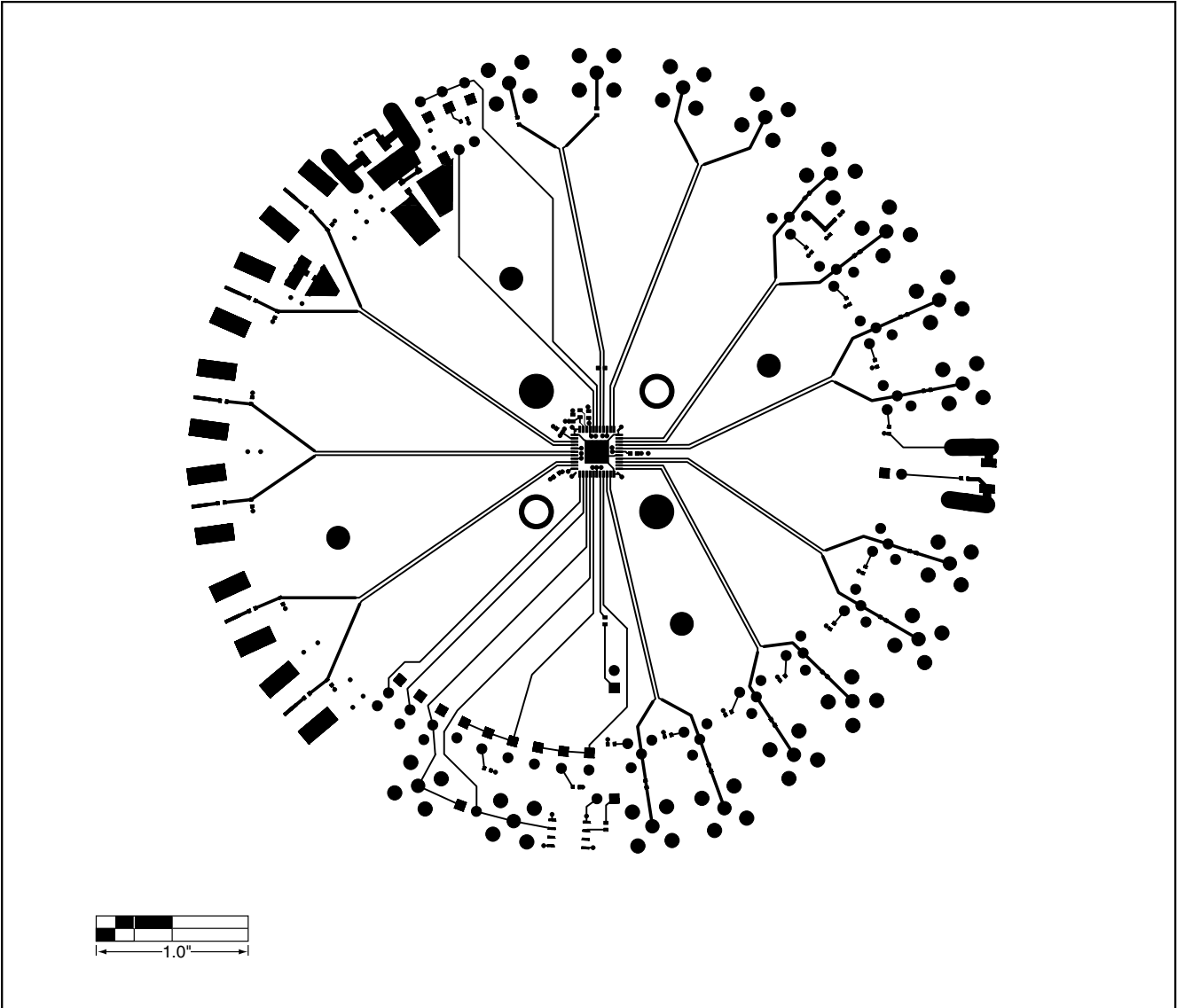


Figure 4. MAX3892 EV Kit PC Board Layout—Component Side

MAX3892 Evaluation Kit

Evaluates: MAX3892

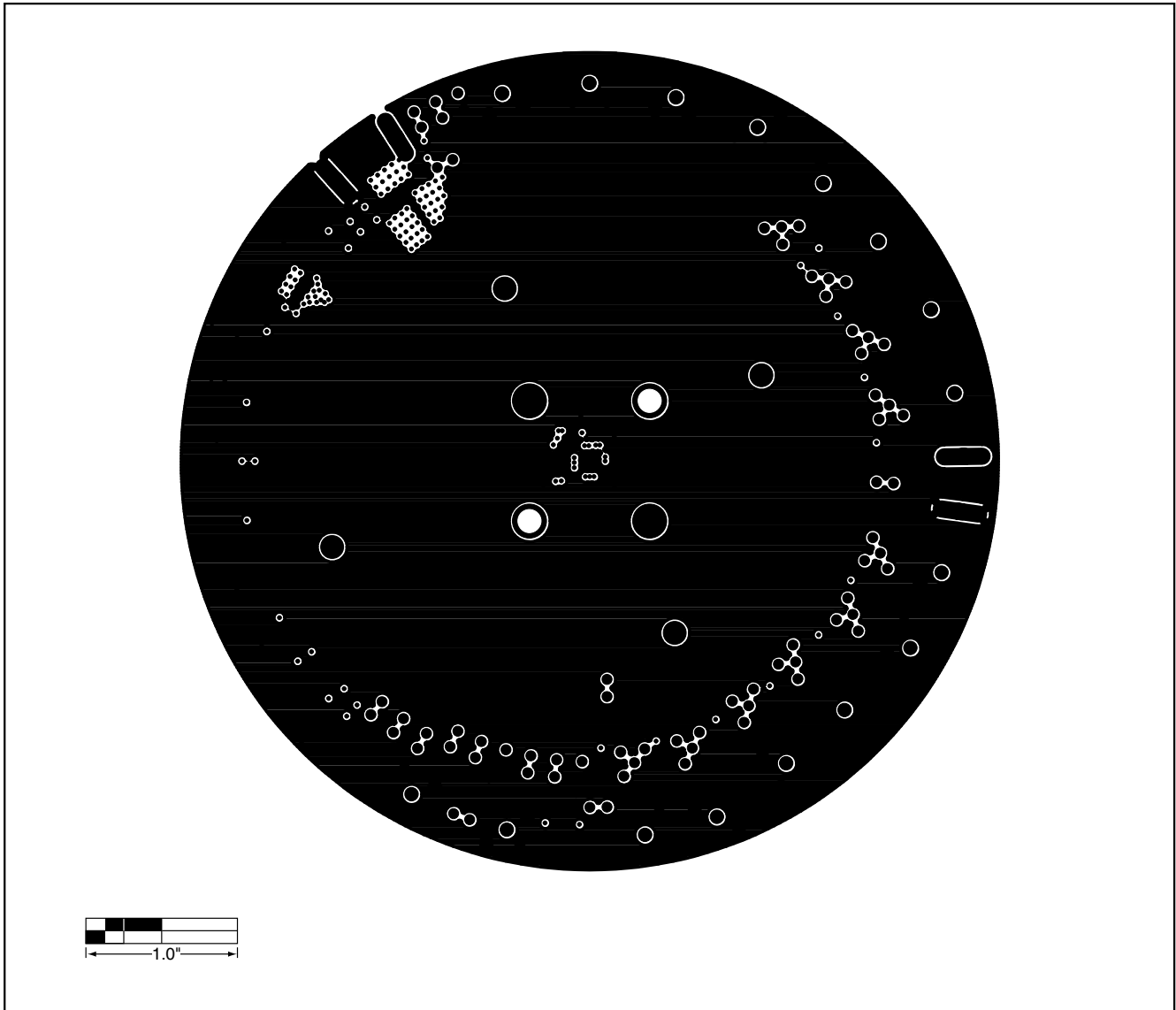


Figure 5. MAX3892 EV Kit PC Board Layout—Ground Plane

MAX3892 Evaluation Kit

Evaluates: MAX3892

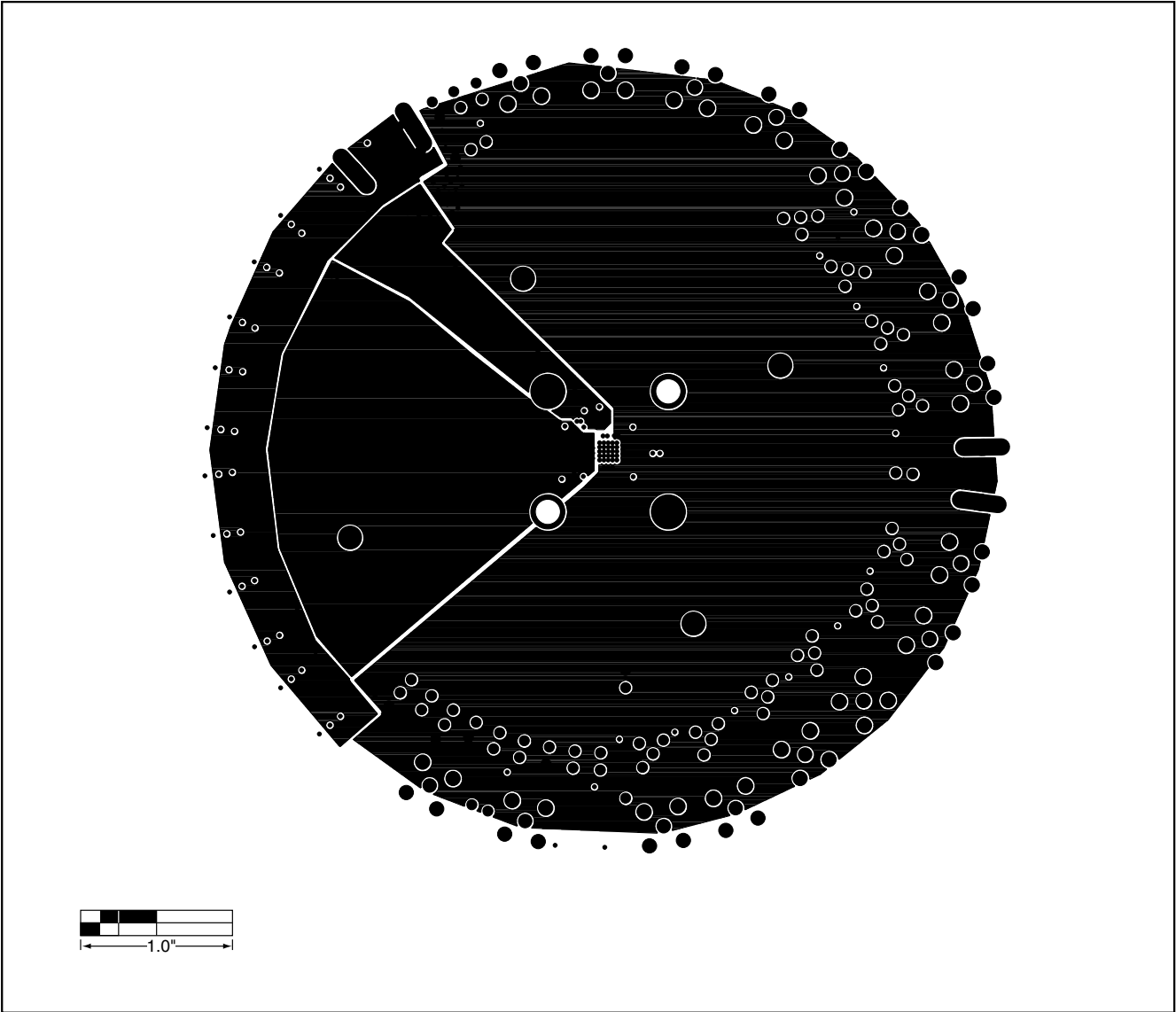


Figure 6. MAX3892 EV Kit PC Board Layout—Power Plane

MAX3892 Evaluation Kit

Evaluates: MAX3892



Figure 7. MAX3892 EV Kit PC Board Layout—Solder Side

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