

# MAXIM

## MAX3691 Evaluation Kit

Evaluates: MAX3691

### General Description

The MAX3691 evaluation kit (EV kit) simplifies evaluation of the MAX3691 622Mbps, SDH/SONET 4:1 serializer. This EV kit requires a single +3.3V supply and includes the external components necessary to observe the PECL serial-data output on a 50Ω input oscilloscope.

The serial-data output termination can be modified easily to suit other logic interfaces, such as 3.3V PECL, high impedance, or ECL inputs. To evaluate the MAX3691's basic functioning, connect the board directly to the outputs of an LVDS device (such as an overhead-generation circuit) or to a signal generator.

### Component List

DESIGNATION	QTY	DESCRIPTION
C1	1	33μF, 16V tantalum capacitor AVX TAJC336M016 or Sprague 293D336X0016D
C2	1	1μF ceramic capacitor
C3, C5, C7, C10, C12, C15, C18, C19, C20	9	0.1μF ceramic capacitors
C4, C6, C8, C9, C11, C13, C14, C16	8	100pF ceramic capacitors
JP1	1	2-pin header (0.1" centers)
L1, L3, C17	3	0Ω resistors
L2, L4, L5	3	56nH inductors Coilcraft 0805HS-560TKBC
R1	1	1.5kΩ 1% resistor
R2, R6	2	24kΩ 5% resistors
R3, R7	2	27kΩ 5% resistors
R4, R8	2	130kΩ 5% resistors
R5, R9	2	220kΩ 5% resistors
R10	1	24.9kΩ 1% resistor
RCLK+, RCLK-, PCLKI+, PCLKI-, PD0+, PD0-, PD1+, PD1-, PD2+, PD2-, PD3+, PD3-, SDO+, SDO-, PCLKO+, PCLKO-	16	SMA PC edge-mount connectors
U1	1	MAX3691ECJ 32-pin TQFP
None	1	MAX3691 data sheet

### Features

- ◆ Single +3.3V Supply
- ◆ Output Terminated for Interfacing with a 50Ω Oscilloscope Input
- ◆ Fully Tested and Assembled

### Ordering Information

PART	TEMP. RANGE	BOARD TYPE
MAX3691EVKIT-SO	-40°C to +85°C	Surface Mount

### Component Suppliers

SUPPLIER	PHONE	FAX
AVX	803-946-0690	803-626-3123
Coilcraft	847-639-6400	847-639-1469
Sprague	603-224-1961	603-224-1430

**Note:** Please indicate that you are using the MAX3691 when contacting these component suppliers.

# MAX3691 Evaluation Kit

## Detailed Description

The MAX3691 evaluation kit (EV kit) operates from a single +3.3V supply and includes the external components necessary to observe the PECL serial-data output on a 50 $\Omega$  input oscilloscope.

Each MAX3691 LVDS input (PCLKI+, PCLKI-, RCLK+, RCLK-, PD\_+, and PD\_-) is internally terminated with a 100 $\Omega$  differential input resistance. Ensure that LVDS devices driving these inputs are not redundantly terminated.

LVDS parallel-clock outputs (PCLKO+, PCLKO-) must be differentially terminated with 100 $\Omega$ . When terminating these outputs into 50 $\Omega$  loads, use AC coupling (see the section *Connecting Parallel-Clock LVDS Outputs to 50 $\Omega$  Input Oscilloscopes*).

The EV kit serial-data output (SDO+, SDO-) termination network allows the outputs to be connected directly to a high-speed oscilloscope's 50 $\Omega$  input. This termination provides the serial data outputs with a Thevenin equivalent of 50 $\Omega$  to V<sub>CC</sub> - 2V when connected to a 50 $\Omega$  load. This provides a 2-times output signal attenuation. If only one of the serial data outputs is connected to an oscilloscope, ensure that the other is still properly terminated. Keep in mind that the resistor networks at each output provide proper termination only when they are terminated through 50 $\Omega$  to ground. See the *Alternative PECL Output Termination* section for other logic interfaces.

**Table 1. Jumpers and Test Points**

NAME	TYPE	DESCRIPTION	NORMAL POSITION
JP1	2 pin	Disables the loop filter	Open
JP3–JP7	2 pin	Jumper locations (can be cut open if necessary)	Shorted

## Applications Information

### Alternative PECL Output Termination

Alternative PECL output termination methods can be used for different logic interfaces as long as they provide a DC Thevenin equivalent of 50 $\Omega$  to V<sub>CC</sub> - 2V. For example, to interface SDO+ with a PECL or high-impedance input, short resistors R2 and R3, and replace R5 with an 82 $\Omega$  resistor. To interface SDO+ with ECL input test equipment, which is internally terminated with 50 $\Omega$  to -2V, take the following steps:

- 1) Remove R4 and R5.
- 2) Short R2 and R3.
- 3) Place a bias-T in series between the MAX3691 and the test equipment. Connect the bias-T's RF and DC terminals to the SDO+ output and the RF terminal to the test equipment's ECL input. Then connect the DC terminal to a V<sub>CC</sub> - 2V termination voltage through a 50 $\Omega$  resistor.

### Connecting Parallel-Clock LVDS Outputs to 50 $\Omega$ Input Oscilloscopes

To monitor the parallel-clock LVDS signals (PCLKO+, PCLKO-) on a 50 $\Omega$  input oscilloscope, place a capacitor or DC block in series with each output and the instrument input. **Do not connect MAX3691 outputs directly to 50 $\Omega$  inputs or terminations to ground.** Choose a coupling capacitor (0.1 $\mu$ F recommended) large enough in value to prevent pattern-dependent distortion of the output signal.

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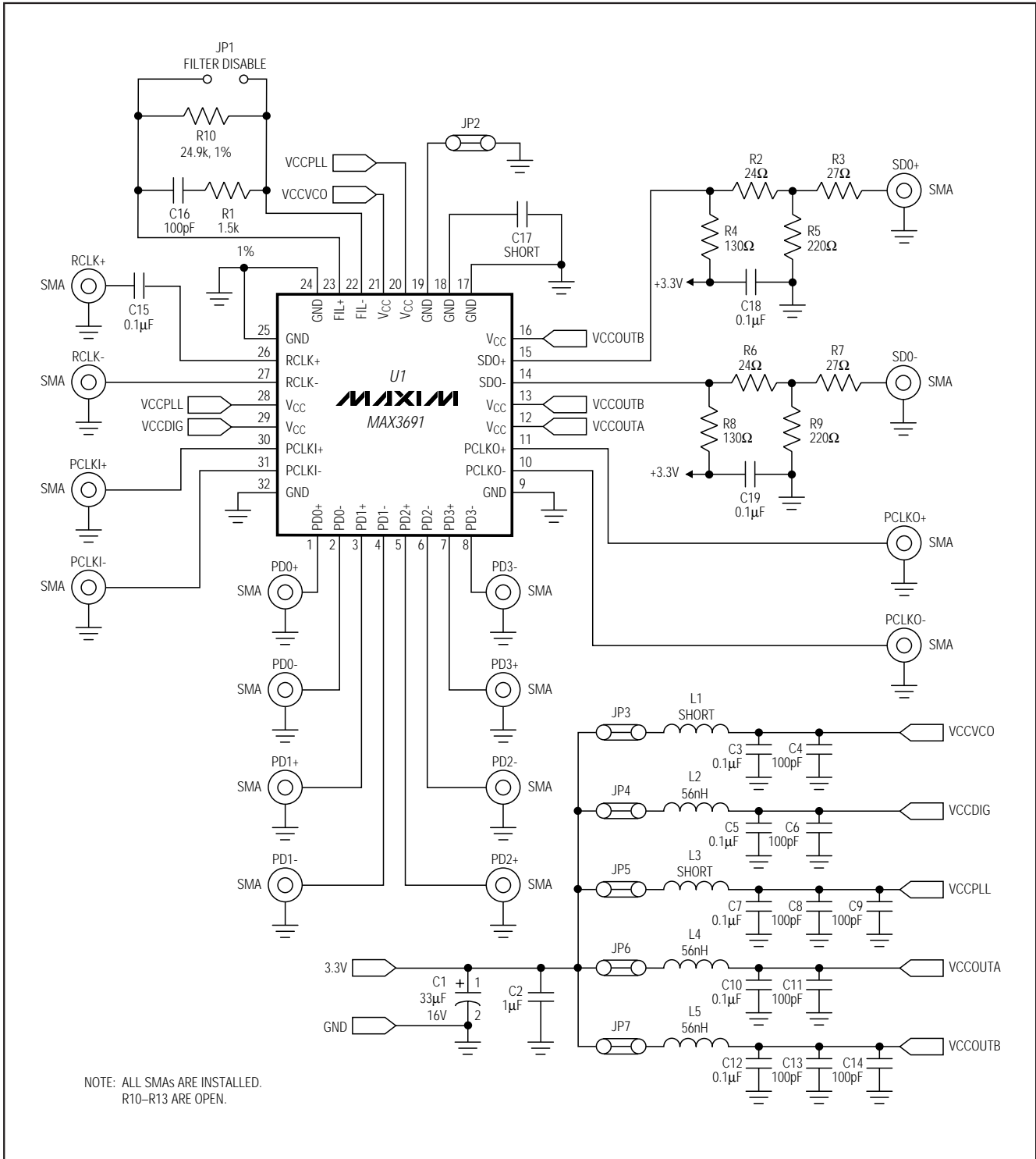


Figure 1. MAX3691 EV Kit Schematic

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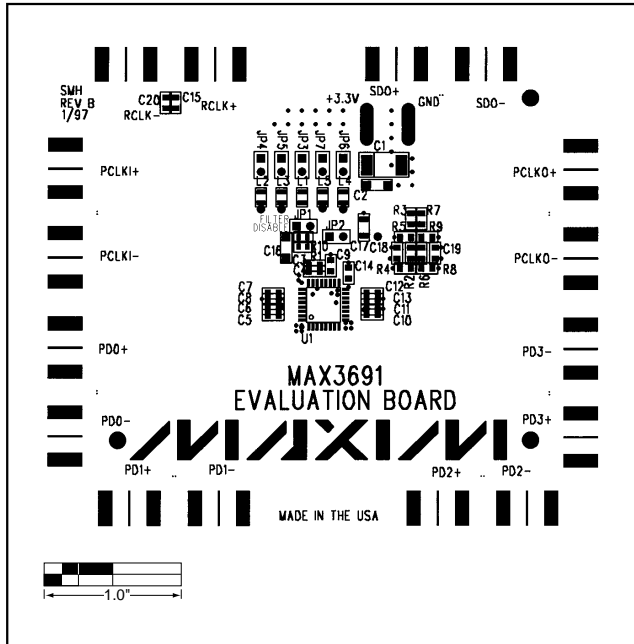


Figure 2. MAX3691 EV Kit Component Placement Guide—Top Silk Screen

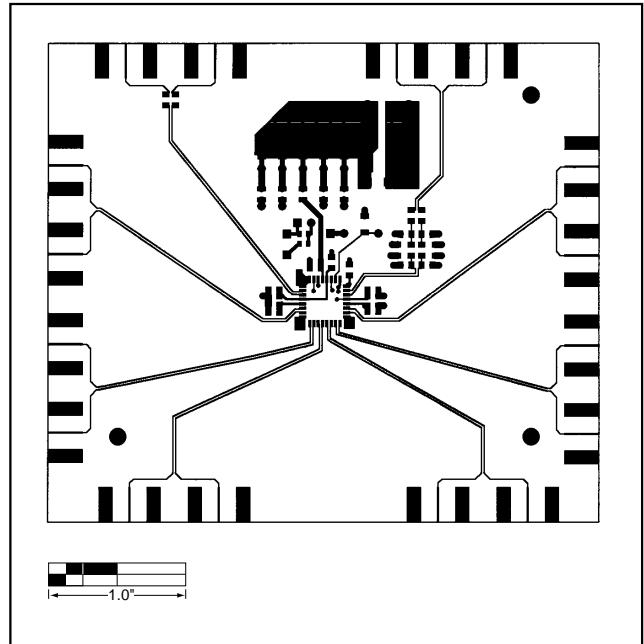


Figure 3. MAX3691 EV Kit PC Board Layout—Component Side

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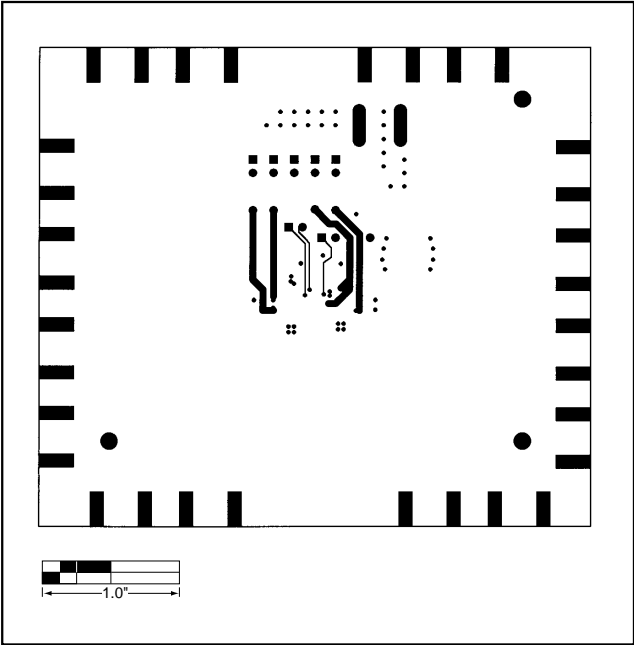


Figure 4. MAX3691 EV Kit PC Board Layout—Solder Side

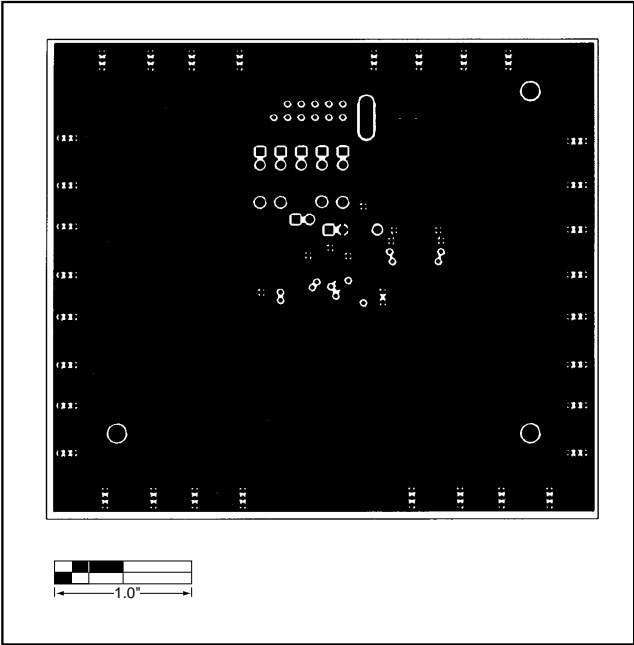


Figure 5. MAX3691 EV Kit PC Board Layout—GND Plane

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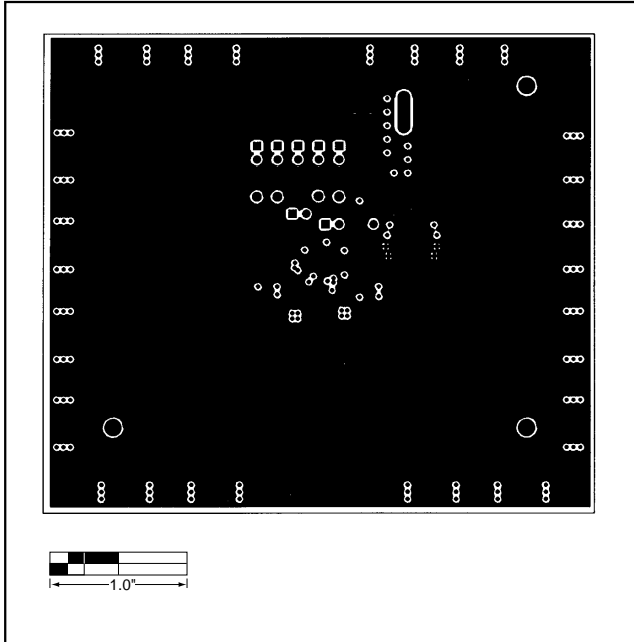


Figure 6. MAX3691 EV Kit PC Board Layout—Power Plane

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