

# MAXIM

## MAX3930 Evaluation Kit

### General Description

The MAX3930 evaluation kit (EV kit) is an assembled demonstration board that provides electrical evaluation of the MAX3930 10.7Gbps laser driver. The output of the evaluation board is interfaced to an SMA connector that can be connected to a 50Ω terminated oscilloscope.

### Features

- ◆ Fully Assembled and Tested
- ◆ Fully Matched for Best Return Loss

### Ordering Information

| PART         | TEMP. RANGE    | IC PACKAGE    |
|--------------|----------------|---------------|
| MAX3930EVKIT | -40°C to +85°C | Chip On Board |

### Component List

| DESIGNATION                  | QTY | DESCRIPTION                                                                                                                      |
|------------------------------|-----|----------------------------------------------------------------------------------------------------------------------------------|
| C1, C2, C3, C6, C7, C17, C18 | 7   | 1000pF ±10% ceramic capacitors (0201)<br>Murata GRM33X3R102K016A                                                                 |
| C4, C5                       | 2   | 0.01μF ±10% ceramic capacitors (0201)<br>Panasonic EJC-ZEBOJ103K                                                                 |
| C8, C10, C12, C13, C14       | 5   | 0.01μF 10% ceramic capacitors (0402)<br>Murata GRM36X7R103K016A                                                                  |
| C9, C11                      | 2   | 10μF ±10% tantalum capacitors<br>AVX TAJB106K010                                                                                 |
| C15                          | 1   | 100pF ±10% ceramic capacitor (0201)<br>Murata GRM33X7R101K010A                                                                   |
| C16                          | 0   | Not installed                                                                                                                    |
| R1                           | 1   | 2kΩ variable resistor<br>Bourns 3296W-202 or<br>Digi-Key 3296W-202-ND                                                            |
| R2, R3, R9, R10              | 4   | 4.99kΩ ±1% resistors (0402)                                                                                                      |
| R4, R11                      | 2   | 15kΩ ±1% resistors (0402)                                                                                                        |
| R5, R12                      | 2   | 200kΩ variable resistors<br>Bourns 3296W-204 or<br>Digi-Key 3296W-204-ND                                                         |
| R6                           | 1   | 15Ω ±1% resistor (0402)                                                                                                          |
| R7, R8                       | 2   | 66.5Ω ±1% resistors (0402)<br><b>Note:</b> R7 and R8 will be installed with resistive material facing down on the circuit board. |
| R13, R14                     | 2   | 49.9Ω ±1% resistors (0402)                                                                                                       |
| R15, R16                     | 0   | Not installed                                                                                                                    |

| DESIGNATION               | QTY | DESCRIPTION                                             |
|---------------------------|-----|---------------------------------------------------------|
| R17, R18                  | 2   | 100Ω ±1% resistors (0402)                               |
| L1, L2                    | 2   | 220nH inductors<br>Coilcraft 0805CS-221XKBC             |
| U1                        | 1   | MAX3930E/D (die) 81X46                                  |
| U2, U3                    | 2   | MAX480ESA 8-pin SOs                                     |
| U4                        | 1   | MAX6190AES 8-pin SO                                     |
| J3-J7                     | 5   | SMA connectors (edge-mount)                             |
| TP1, TP3-TP12, J1, J2, J8 | 14  | Test points<br>Digi-Key 5000K-ND                        |
| JU1, JU2                  | 2   | 1x2 pin headers (0.1in centers)<br>Digi-Key S1012-36-ND |
| JU1, JU2                  | 2   | Shunts<br>Digi-Key S9000-ND                             |
| None                      | 1   | MAX3930 Rev C EV kit circuit board                      |
| None                      | 1   | MAX3930 EV kit data sheet                               |
| None                      | 1   | MAX3930 data sheet                                      |

### Component Suppliers

| SUPPLIER  | PHONE        | FAX          |
|-----------|--------------|--------------|
| AVX       | 843-444-2863 | 843-626-3123 |
| Coilcraft | 847-639-6400 | 847-639-1469 |
| Digi-Key  | 218-681-6674 | 218-681-3380 |
| EFJohnson | 402-474-4800 | 402-474-4858 |
| Murata    | 415-964-6321 | 415-964-8165 |

**Note:** Please indicate that you are using the MAX3930 when contacting these component suppliers.

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## Quick Start

- 1) If the data is to be latched, place shunt on JU1 to enable clock input; otherwise, leave JU1 open.
- 2) Install shunt JU2 to enable the outputs.
- 3) Adjust R5 and R12 to their full counter-clockwise positions.
- 4) Adjust R1 to the approximate center of the adjustment range.
- 5) Apply a differential input signal (max amplitude  $\leq 800\text{mV}$  per side, common-mode voltage = 0) to J3 and J4 (DATA+ and DATA-).
- 6) If the latch is enabled, apply a differential clock signal (max amplitude  $\leq 800\text{mV}$  per side, common-mode voltage = 0) to J5 and J6 (CLK+ and CLK-).
- 7) Attach a high-speed oscilloscope with  $50\Omega$  inputs to J7. For optimum performance, see the interconnect recommendations below.
- 8) Power up the board with a -5V supply and a -2V supply.
- 9) Adjust R5 clockwise until the desired laser modulation current is achieved.
- 10) Adjust R1 For 50% eye crossing:

$$I_{\text{MOD}} = \frac{\text{Output Amplitude (Volts)}}{20\Omega}$$

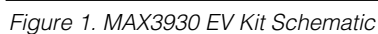
## Adjustment and Control Descriptions (see Quick Start first)

| COMPONENT | NAME               | FUNCTION                                                                                                           |
|-----------|--------------------|--------------------------------------------------------------------------------------------------------------------|
| JU1       | RETIMING ENABLE    | Enables/disables data retiming. Shunt to enable data retiming. Remove shunt for direct data transmission.          |
| JU2       | MODULATION ENABLE  | Enables/disables the modulation outputs. Shunt for normal operation. Remove shunt to switch modulation output off. |
| R1        | PULSE-WIDTH ADJUST | Pulse-Width Control. Adjusts the pulse width.                                                                      |
| R5        | MOD ADJUST         | Adjusts the laser modulation current.                                                                              |
| R12       | BIAS ADJUST        | Adjusts the laser bias current.                                                                                    |

## Recommendations for Interconnect Between the MAX3930 EV Kit and an Oscilloscope

- 1) Use a high-bandwidth sampling oscilloscope such as the Tektronix CSA8000 mainframe with an 80E01 50GHz sampling head. The 80E03 and 80E04 20GHz sampling heads are not recommended.
- 2) A high-quality SMA attenuator (14dB or 20dB) is required to reduce the signal level for compatibility with the sampling head. The attenuator should be connected directly to the output SMA connector on the EV kit to minimize transmission-line reflections.
- 3) The total path length from the EV kit to the oscilloscope must to be minimized. If possible, connect the female connector of the attenuator to the female input of the oscilloscope with an SMA adapter. If cables must be used, a 0.141in semi-rigid  $50\Omega$  coaxial cable with high-quality SMA connectors is recommended (example: Tektronix 015-1015-00).

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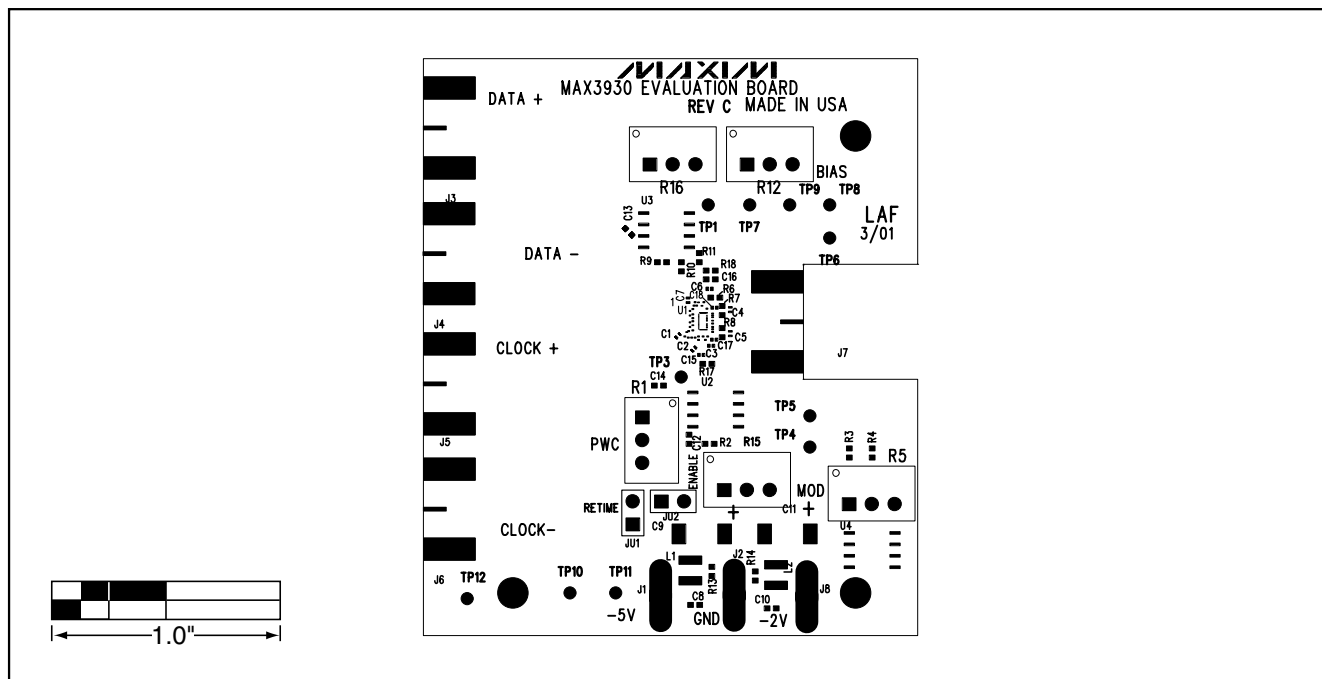


Figure 2. MAX3930 EV Kit Component Placement Guide—Component Side

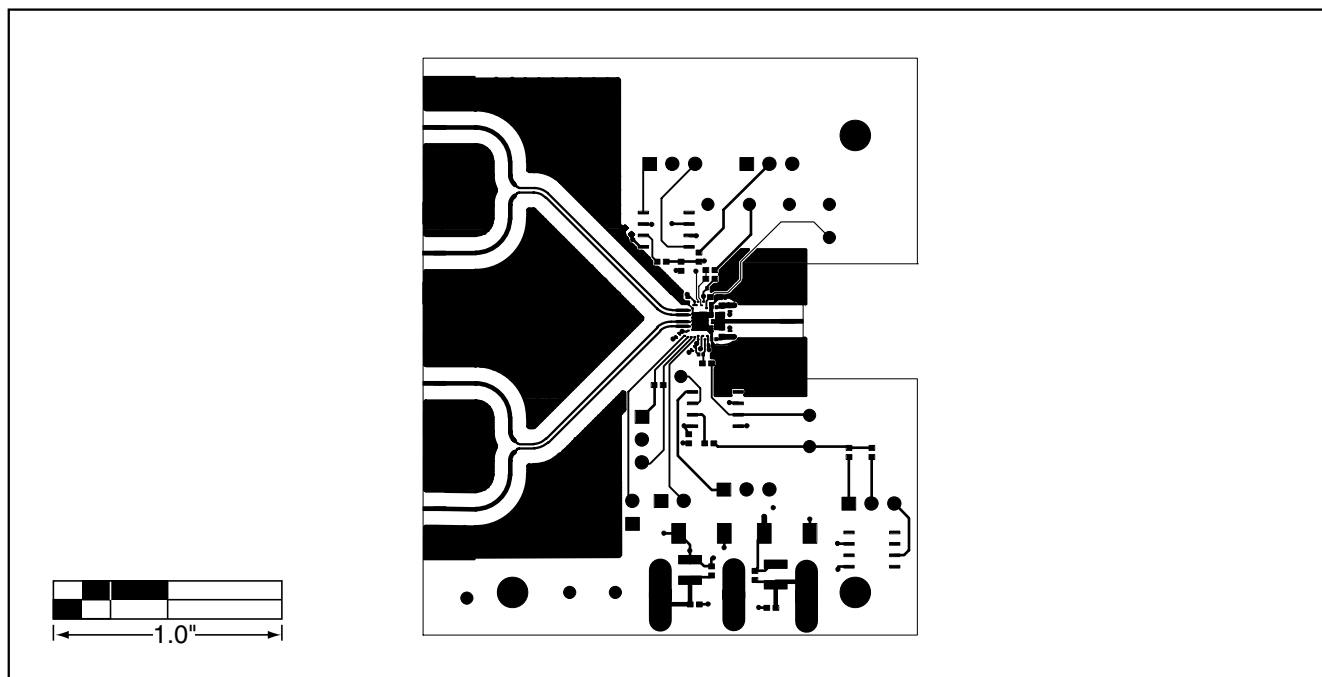


Figure 3. MAX3930 EV Kit PC Board Layout—Component Side

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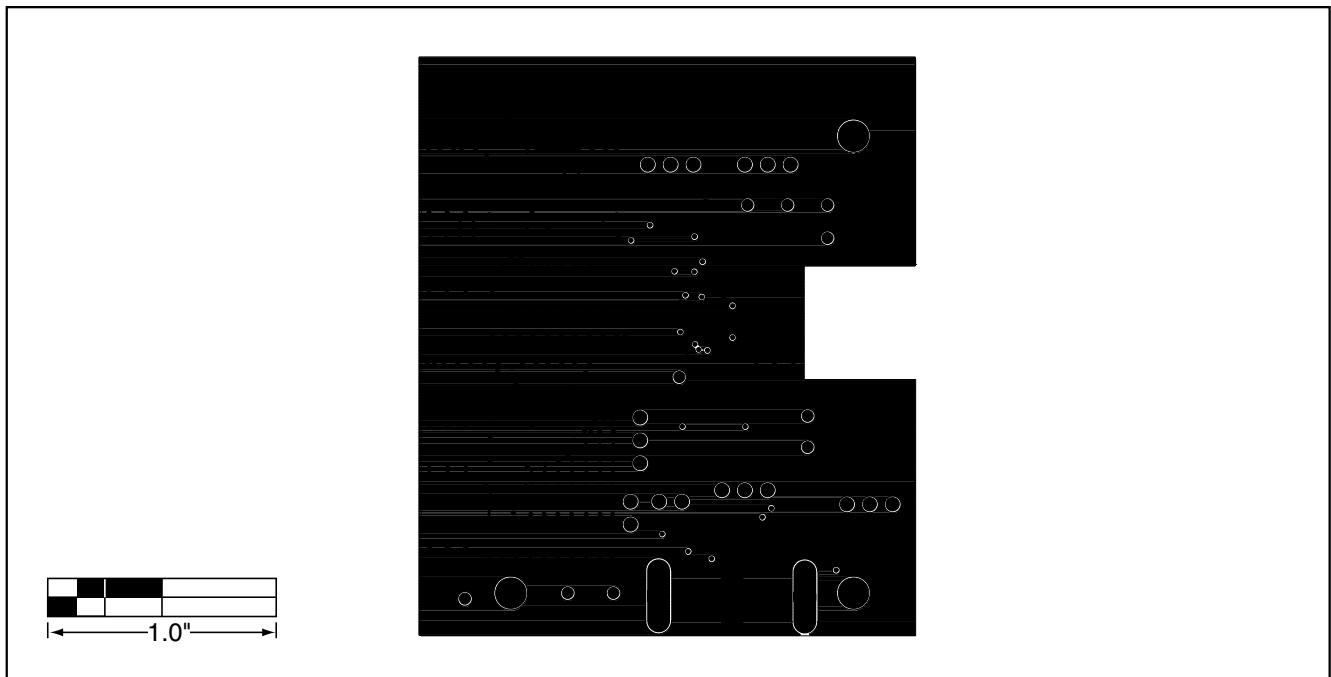


Figure 4. MAX3930 EV Kit PC Board Layout—Ground Plane

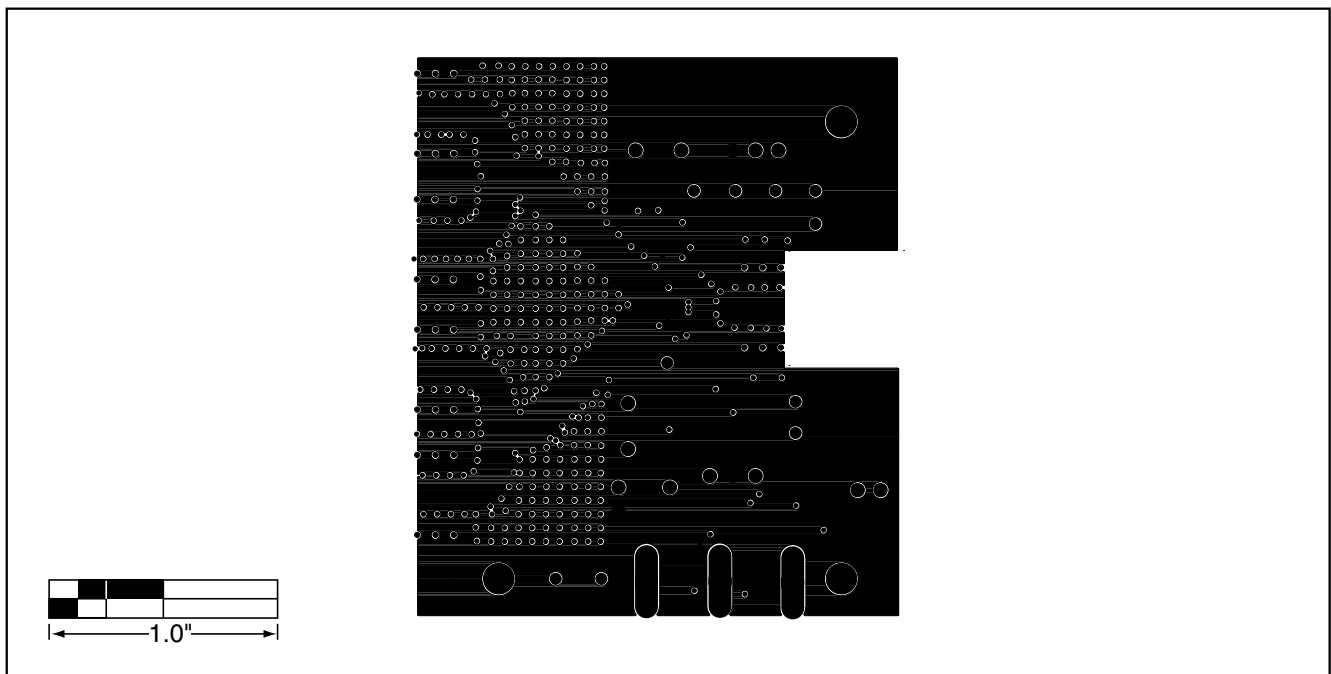


Figure 5. MAX3930 EV Kit PC Board Layout—Power Plane

## MAX3930 Evaluation Kit

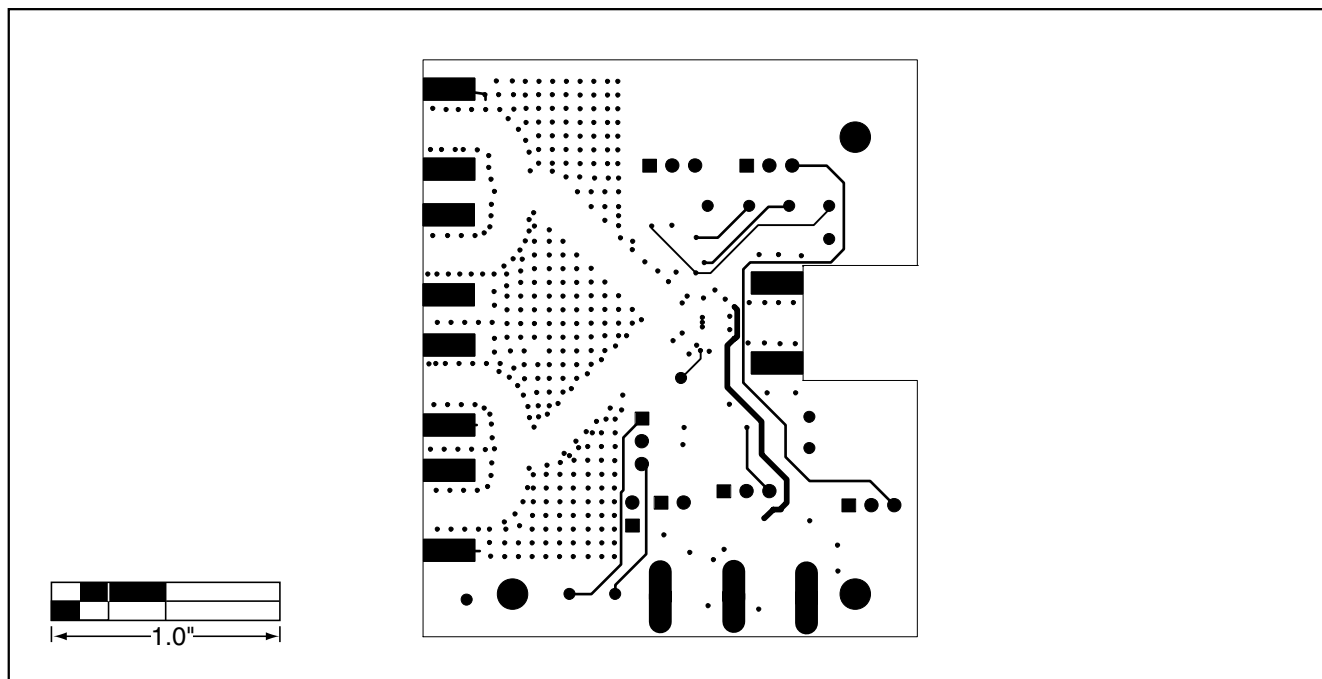


Figure 6. MAX3930 EV Kit PC Board Layout—Solder Side

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