19-2643; Rev 0; 10/02

MAXIM

MAX3934 Evaluation Kit

Evaluates: MAX3934

General Description

The MAX3934 evaluation kit (EV kit) is an assembled demonstration board that provides electrical evaluation of the MAX3934 10.7Gbps compact laser driver. The die version mounted on the board is the MAX3934A, which contains a 12Ω internal damping resistor (R_D). 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**
- ♦ **On-Board Op Amps for Bias and Modulation Current Control**
- ♦ **Fully Matched for Best Input Return Loss**
- ♦ **Calibration Trace**

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 MAX3934 when contacting these component suppliers.*

Ordering Information

PART	TEMP RANGE	IC PACKAGE
MAX3934EVKIT	-40°C to +85°C	Chip on board

Component List

DESIGNATION	QTY	DESCRIPTION
C1, C2	2	150pF chip MIS capacitors Metelics Corporation, 35 mils × 35 mils MC2-S-150-35-35
C3–C9, C13, C14, C18, C19, C20	12	0.01µF ±15% ceramic capacitors (0201)
C10, C15	2	56pF ±15% ceramic capacitors (0201)
C11	1	10µF ±10% tantalum capacitor (0805) AVX TAJA106K010
C12	1	0.1µF ±15% ceramic capacitor (0603)
C32	1	33µF ±10% tantalum capacitor
J1, J2, J3, J6, J7	5	SMA connectors, edge mount EFJohnson 142-0701-851
J4, J5	2	Test points Digi-Key 5000K-ND
JU1	1	2-pin header, 0.1in centers Digi-Key S1012-36-ND
JU1	1	Shunt Digi-Key S9000-ND
L1	1	56nH inductor
L2	1	EMI ferrite bead Murata BLM18HA601SG

DESIGNATION	QTY	DESCRIPTION
R1, R2, R12, R13	4	39Ω ±5% resistors (0201)
R3	1	10kΩ ±1% resistor (0402)
R4	1	11.8kΩ ±1% resistor (0402)
R5	1	20kΩ ±1% resistor (0402)
R6	1	4.99kΩ ±1% resistor (0402)
R11	1	Not installed
TP5–TP10, TP12	7	Test points Digi-Key 5000K-ND
U1	1	MAX3934AE/D die
U2, U3	2	MAX480ESA, 8-pin SO
U4	1	MAX6190AESA,8-pin SO
VR1, VR2	2	200kΩ variable resistors Bourns 3296W-204
VR3, VR4	2	100kΩ variable resistors Bourns 3296W-104
None	1	Epoxy, conductive, for U1, C1, C2 Ablefilm 84-1 LMI
None	1	MAX3934 evaluation circuit board, rev A
None	1	MAX3934 EV kit data sheet
None	1	MAX3934 data sheet

Quick Start

1) Remove shunt from JU1 to maintain data polarity.
2) Adjust VR1 and VR2 to their full clockwise positions. A light clicking noise indicates the end of the adjustment range.
3) Apply a differential input signal (amplitude ≤800mV$_{P-P}$ single ended) to J2 and J3 (IN+ and IN-).
4) Attach a high-speed oscilloscope with 50Ω inputs to J1. For optimum performance, see the interconnect recommendations that follow.
5) Connect a -5V supply to J4 (VEE) and ground to J5 (VCC).
6) Adjust VR1 counterclockwise until the desired bias current is achieved:

$$I_{BIAS} = (V_{BIASMON} - V_{EE}) / R_{BIAS}$$

where $V_{BIASMON}$ is the measured voltage at TP7 and R_{BIAS} is 6Ω.

7) Adjust VR2 counterclockwise until the desired modulation current is achieved.

$$I_{MOD} = (V_{MODMON} - V_{EE}) / R_{MOD}$$

where V_{MODMON} is the measured voltage at TP8 and R_{MOD} is 3Ω.

Recommendations for Interconnect Between the MAX3934 EV Kit and an Oscilloscope

1) For optimum performance, use a high-bandwidth sampling oscilloscope, such as the Tektronix CSA8000 mainframe with an 80E01 50GHz sampling head. If a 50GHz sampling head is not available, use a 20GHz sampling head, such as the Tektronix 80E03 or 80E04.
2) A high-quality SMA attenuator (6dB or 14dB) is required to reduce the signal level for compatibility with the sampling head. Connect the attenuator 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 semirigid 50Ω coaxial cable with high-quality SMA connectors is recommended (for example, the Tektronix 015-1015-00).
4) The output of the EV kit can be AC- or DC-coupled to the oscilloscope. If AC-coupling is preferred, use a DC block rated for high-bandwidth signals and connect it between the output attenuator and the oscilloscope. If the board is DC-coupled to the oscilloscope, use low bias currents so the output voltage does not exceed the maximum voltage of the sampling head.

Adjustments and Control Descriptions

COMPONENT	NAME	FUNCTION
JU1	POLARITY SWITCH	Enables/disables the polarity switch. Remove shunt to maintain data polarity. Shunt to invert data polarity.
VR1	BIAS ADJUST	Adjusts the bias current.
VR2	MOD ADJUST	Adjusts the modulation current.
VR3	BIAS OP-AMP NULL	Adjustment to null the operational amplifier input offset.
VR4	MOD OP-AMP NULL	Adjustment to null the operational amplifier input offset.

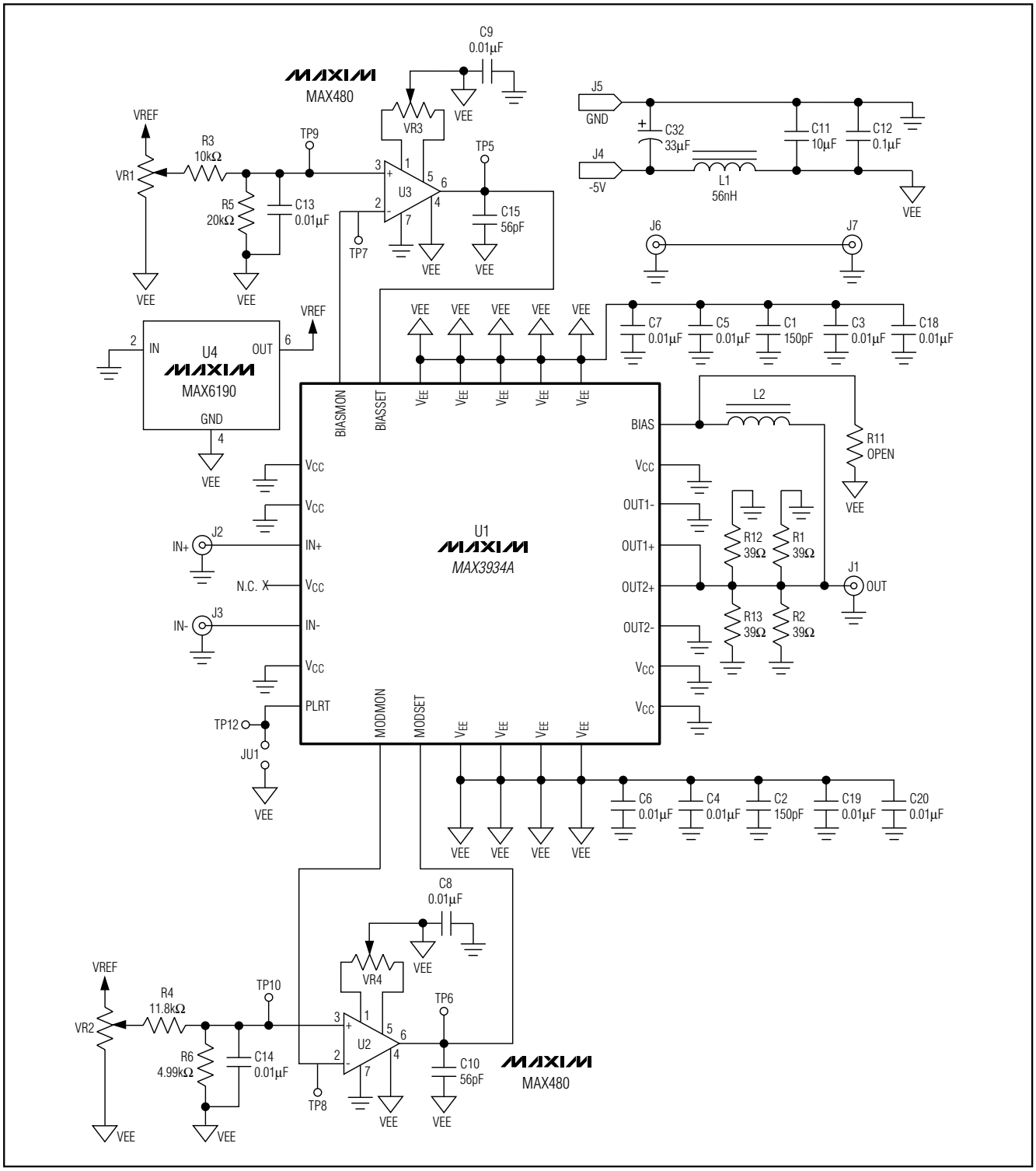

Figure 1. MAX3934 EV Kit Schematic

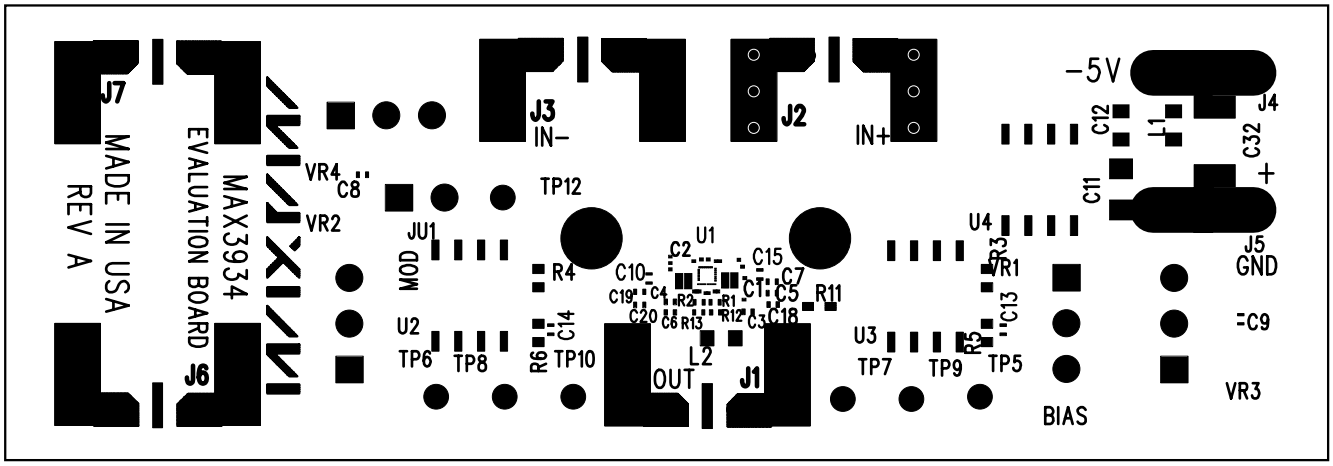

Figure 2. MAX3934 EV Kit Component Placement Guide—Component Side

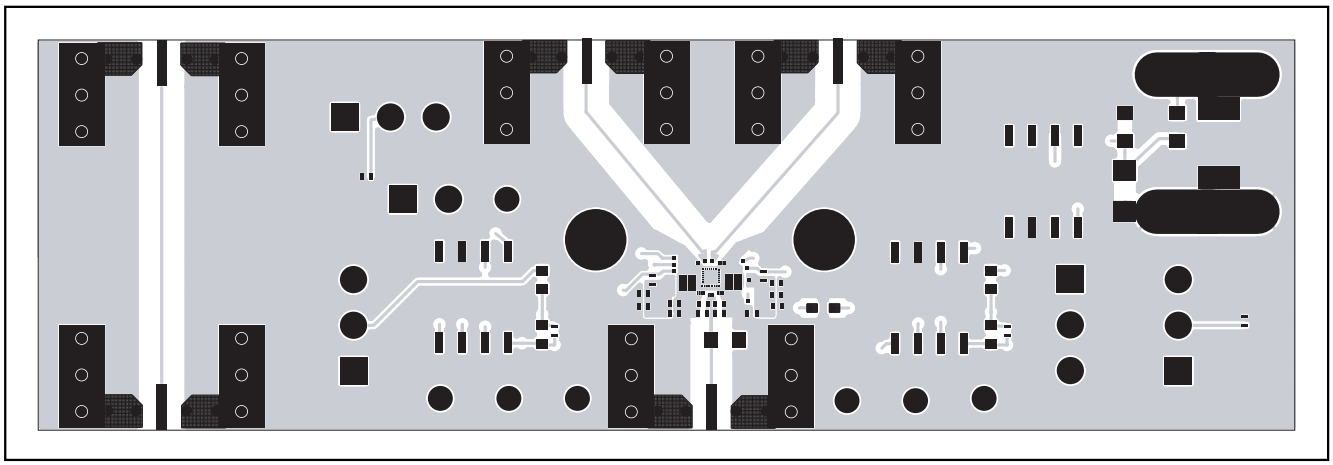

Figure 3. MAX3934 EV Kit PC Board Layout—Component Side

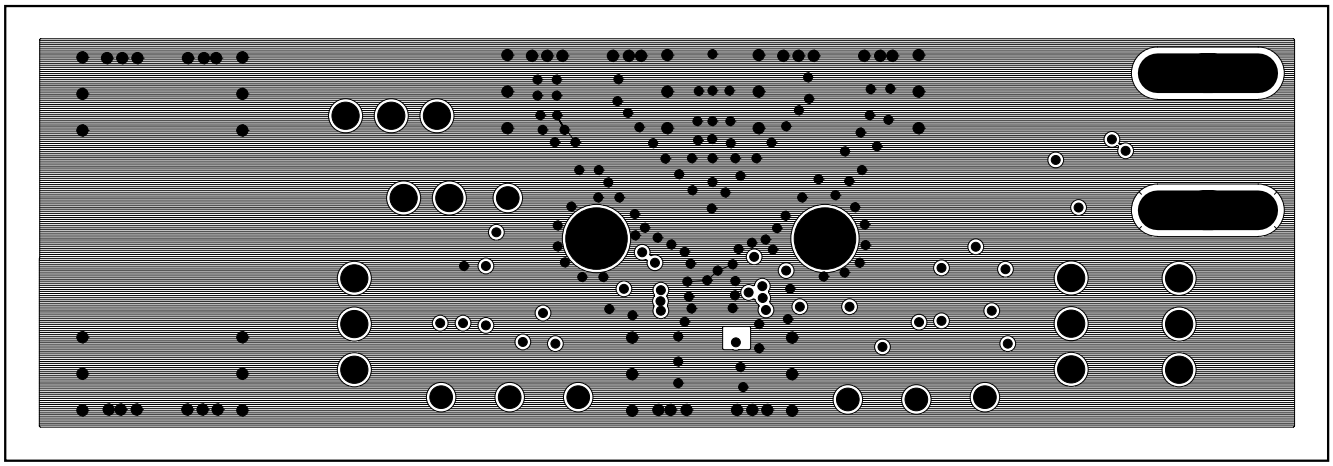

Figure 4. MAX3934 EV Kit PC Board Layout—Ground Plane

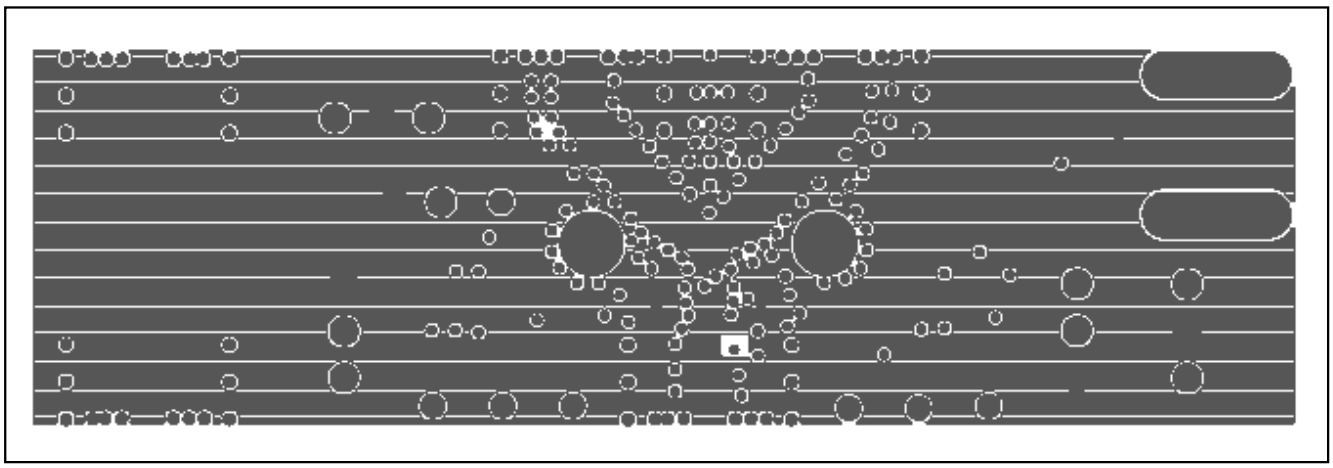

Figure 5. MAX3934 EV Kit PC Board Layout—Power Plane

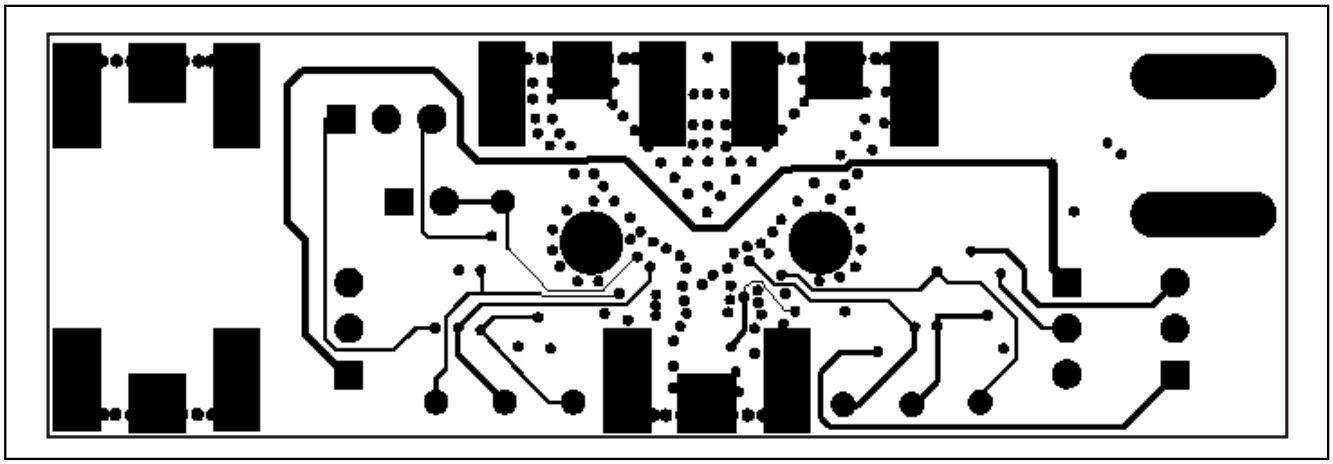

Figure 6. MAX3934 EV Kit PC Board Layout—Solder Side