19-1447; Rev 2; 6/01

MAXIM

MAX3266/MAX3267 Evaluation Kits

Evaluate: MAX3266/MAX3267

General Description

The MAX3266 and MAX3267 evaluation kits (EV kits) simplify evaluation of the MAX3266 and MAX3267 transimpedance preamplifiers.

The EV kits include a circuit that emulates the high-speed, zero-to-peak current input signal that would be produced by a photodiode. The kit also includes a calibration circuit that allows accurate bandwidth measurements.

The MAX3266 and MAX3267 EV kits are fully assembled and tested.

Component List

DESIGNATION	QTY	DESCRIPTION
C1, C2, C4, C7, C10, C11	6	1000pF, 10% ceramic capacitors
C3, C5, C6, C12–C17	9	0.1µF, 25V min, 10% ceramic capacitors
C8, C9	2	33µF ±10%, 25V min tantalum capacitors AVX TAJE336K025
J1–J5	5	SMA connectors (Edge Mount)
J11–J14	4	Open
JU1, JU2	2	2-pin headers (0.1" centers)
None	2	Shunts for JU1, JU2
L1, L2	2	Ferrite beads Murata BLM11A601S
R1, R2, R9, R10	4	See *Table 1*
R3, R11	2	49.9Ω, 1% resistors
R4, R12	2	1kΩ, 5% resistors
R5	1	1kΩ potentiometer
R6, R8	2	10kΩ, 5% resistors
R7	1	10kΩ potentiometer
U1	1	MAX3266CSA or MAX3267CSA (8-pin SO)
U2	1	CMPT3906 PNP transistor
U3	1	MAX400CSA (8-pin SO)
U4	0	User-supplied optical module
U5	0	User-supplied optical module
VCC, +15V, GND	3	Test points
None	1	MAX3266/MAX3267 evaluation kit (rev. b) circuit board
None	1	MAX3266/MAX3267 data sheet

Features

- ♦ **Fully Assembled and Tested**
- ♦ **Includes Photodiode Emulation Circuit**
- ♦ **Calibration Circuit for Accurate Bandwidth Measurements**

Ordering Information

PART	TEMP. RANGE	IC PACKAGE
MAX3266EVKIT-SO	0°C to +70°C	8 SO
MAX3267EVKIT-SO	0°C to +70°C	8 SO

Component Suppliers

SUPPLIER	PHONE	FAX
AVX	843-444-2863	843-626-3123
Central Semiconductor	516-435-1110	516-435-1824
Murata	415-964-6321	415-964-8165
Zetex	516-543-7100	516-864-7630

Note: *Please indicate that you are using the MAX3266/MAX3267 when contacting these component suppliers.*

Quick Start

1) Connect a signal source to INPUT. Set the signal amplitude to 50mVp-p (this may require some attenuation between the source and the MAX3266 EV kit.) The signal should have data rate between 500Mbps and 1250Mbps.
2) Connect OUT+ and OUT- to the 50Ω inputs of a high-speed oscilloscope.
3) Remove shunts from jumpers JU1 and JU2.
4) Connect a +3.3V supply to the VCC terminal and ground to the GND terminal.
5) The differential signal at the oscilloscope should be between 50mVp-p and 100mVp-p.

Detailed Description

The MAX3266 is designed to accept a DC-coupled input from a high-speed photodiode, with an amplitude of 10µA to 1mA zero-to-peak. Unfortunately, high-speed current sources are not common laboratory equipment. Also, because the MAX3266 provides a DC bias for the photodiode, it cannot be DC coupled to signal sources.

To allow characterization without a photodiode, the MAX3266 EV kit provides a simple circuit that emulates a photodiode using common voltage output signal sources.

The connector at INPUT is terminated with 50Ω to ground. This voltage is then AC coupled to a resistance in series with the MAX3266's input, creating an input current. U2 and U3 form a simple DC current source that is used to apply a DC current to the input signal.

The values of the series resistive elements, R1 and R2, have been carefully selected not to change the bandwidth of the transimpedance amplifier. Surface-mount resistors have parasitic capacitance that reduces their impedance at frequencies above 1GHz. The user should carefully evaluate any changes to R1 and R2 using the calibration network provided on the EV kit. Table 1 shows the recommended resistor values.

Photodiode Emulation

The following procedure can be used to emulate the high-speed current signal generated by a photodiode:

1) Select the desired optical power (P_{AVG} in dBm) and extinction ratio (r_e).
2) Calculate the average current (I_{AVG}), and adjust R7 and R5 to obtain it.

$$I_{AVG} = \frac{10^{(P_{AVG}/10)}\rho}{1000}$$

(ρ = photodiode responsivity in A/W)

3) Calculate the AC signal current, and adjust the signal generator to obtain it.

$$I_{INPUT} = 2 \times I_{AVG}(r_e - 1) / (r_e + 1)$$

For example:

1) Emulate a signal with an average power of -20dBm and an extinction ratio of 10.
2) -20dBm optical power will produce 10µA of average input current (assume photodiode responsivity of 1A/W). Install a current meter at JU1. Adjust R7 and R5 until the current is 10µA.
3) The signal amplitude is $2P_{AVG}(r_e - 1) / (r_e + 1)$ = 16µA. To generate this current through the 1500Ω input resistors, set the signal source to produce an output level of 16µA × 1500Ω = 24mVp-p.

Noise Measurement

Remove R2 before attempting noise measurements to minimize input capacitance. With R2 removed the total capacitance at the IN pin is approximately 0.5pF. Refer to the *Layout Considerations* section in the MAX3266/MAX3267 data sheet for more information.

Table 1. Recommended Resistor Values

EVALUATION KIT	R1, R9	R2, R10
MAX3266EVKIT-SO	1000Ω (0603)	510Ω (0603)
MAX3267EVKIT-SO	200Ω (0402)	1020Ω (composed of two 510Ω (0402) resistors)

Table 2. Connections, Adjustments, and Control

CONTROL	DESCRIPTION
VCC	Supply Voltage Connection (3.0 to 5.5V, 100mA current limit)
+15V	Supply Voltage Connection for Photodiode Emulator Circuit (+15V, 25mA)
GND	Connection for Ground
JU1	When shunted, the photodiode emulation circuit is active. This is a convenient location to measure the emulated photodiode current.
JU2	Test Pin. Shunting JU2 disables the MAX3266/MAX3267 DC cancellation amplifier.
R5	Potentiometer. Fine adjustment of the DC current input.
R7	Potentiometer. Coarse adjustment of the DC current input.
OUT+, OUT-	Connections for the MAX3266/MAX3267 Output Signal
INPUT	Input Connection for a Signal Generator

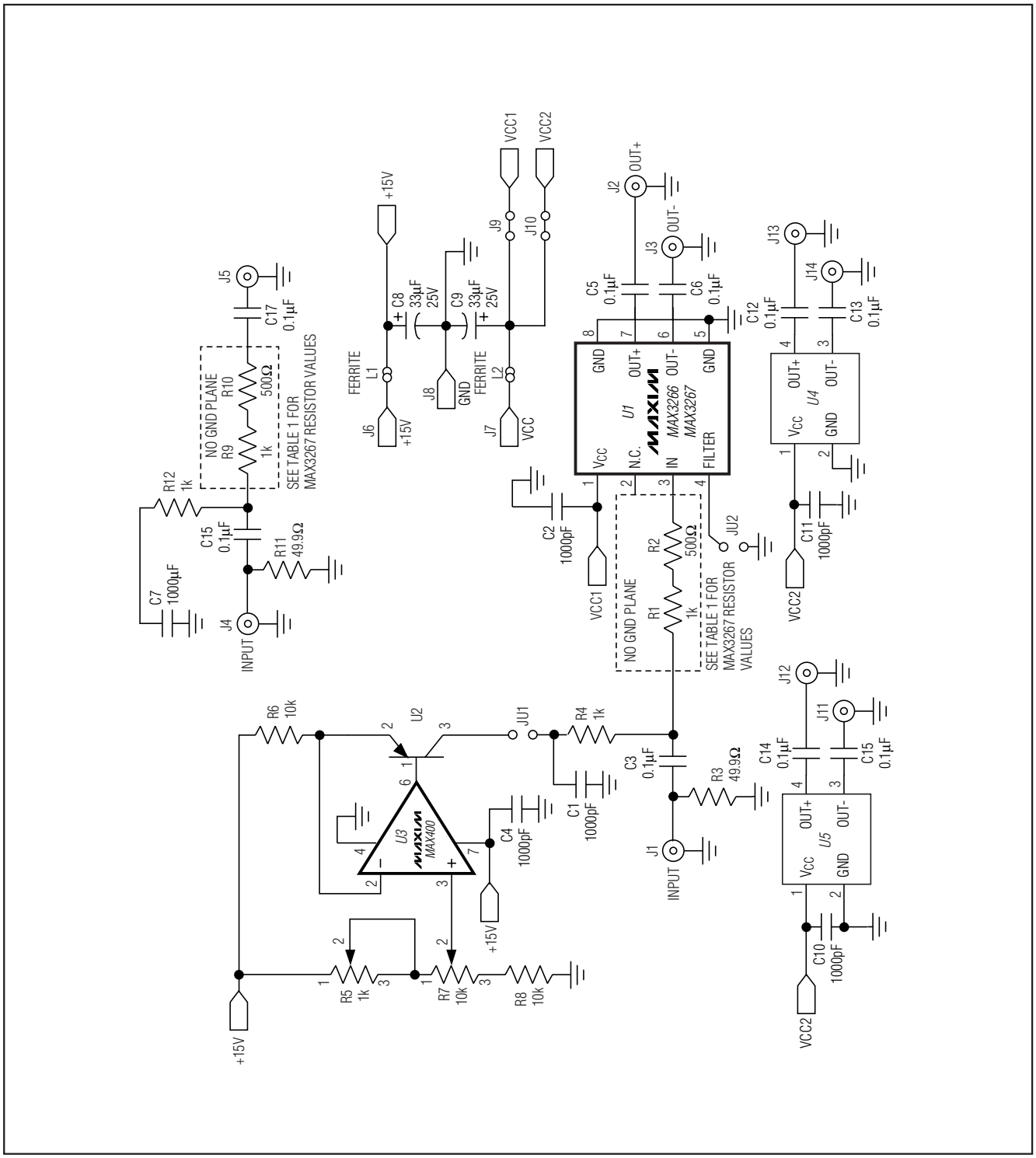

Figure 1. MAX3266/MAX3267 EV Kits Schematic

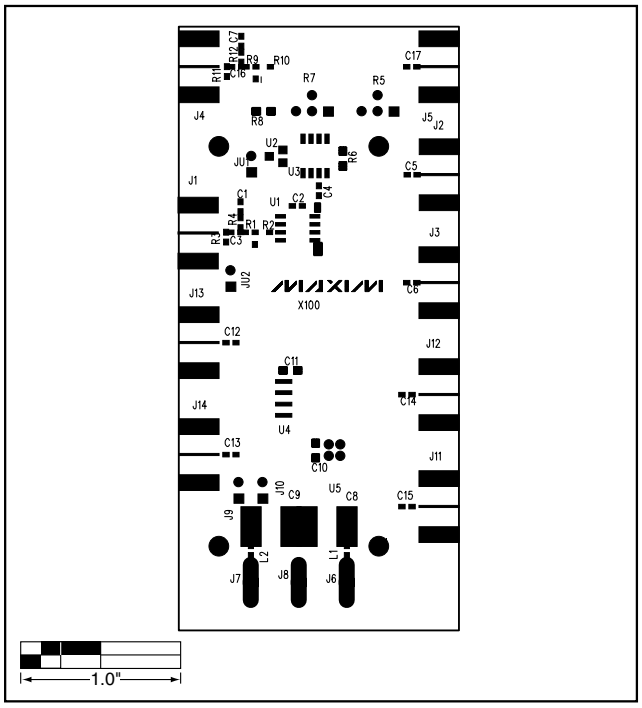

Figure 2. MAX3266 EV Kit Component Placement Guide

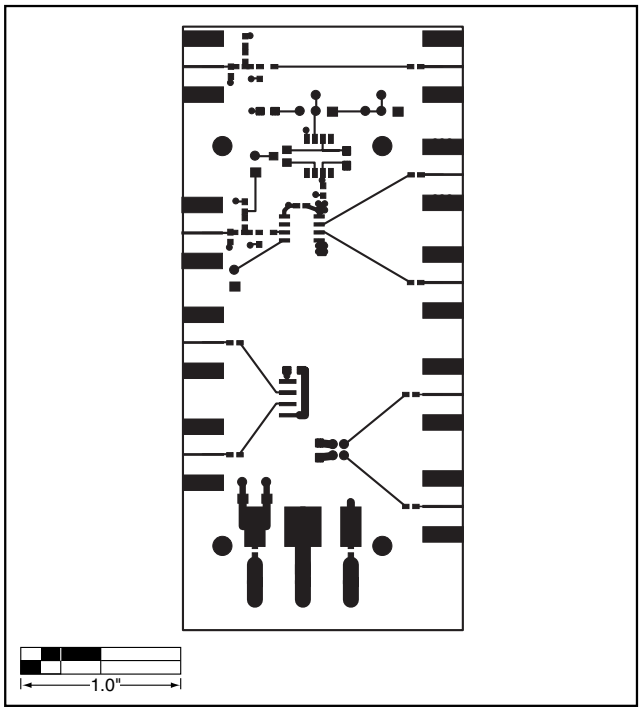

Figure 3. MAX3266 EV Kit PC Board Layout—Component Side

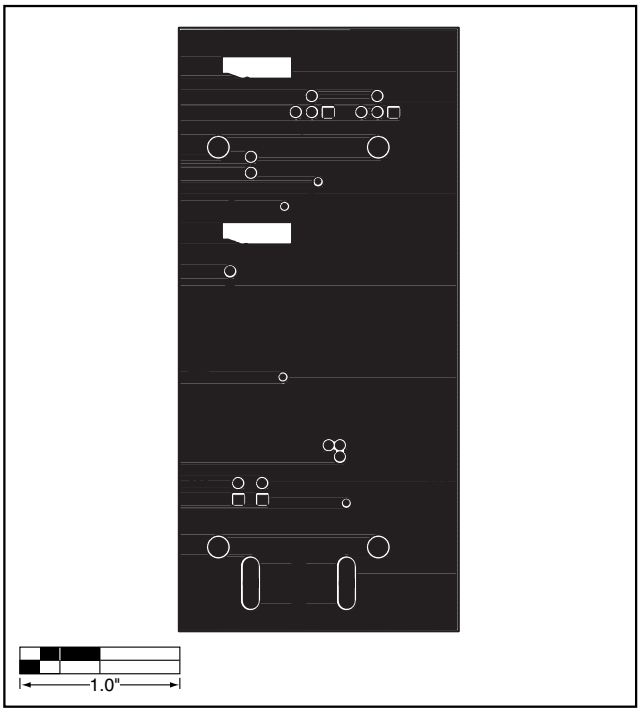

Figure 4. MAX3266 EV Kit PC Board Layout—Ground Plane

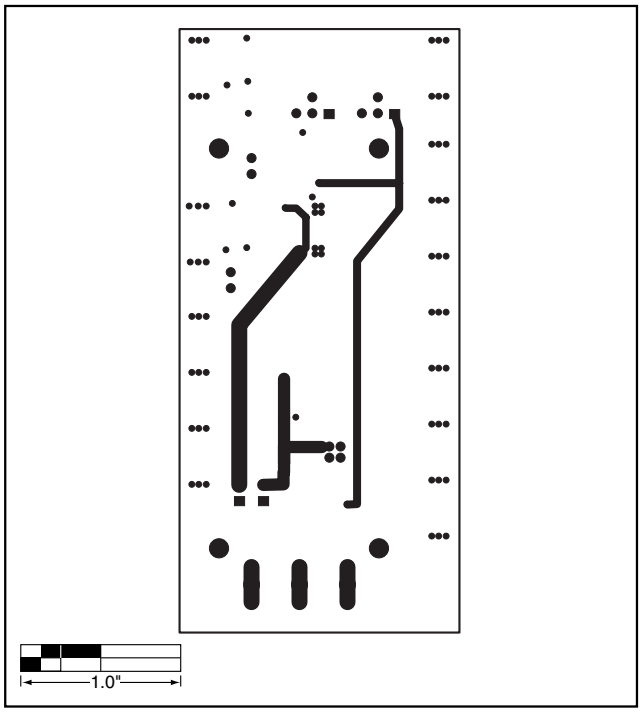

Figure 5. MAX3266 EV Kit PC Board Layout—Power Plane

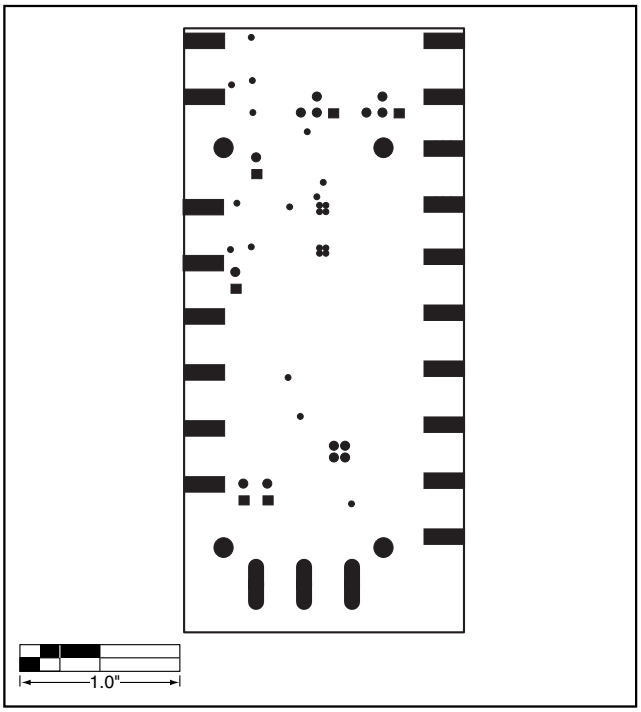

Figure 6. MAX3266 EV Kit PC Board Layout—Solder Side