MAXIM

MAX3741 Evaluation Kit

Evaluates: MAX3741

_____General Description

The MAX3741 evaluation kit (EV kit) is an assembled demonstration board that provides complete optical and electrical evaluation of the MAX3741 compact VCSEL driver.

The EV kit has an electrical test section and an optical test section. Electrically, the output of the evaluation board is interfaced to an SMA connector, which can be connected to a 50Ω terminated oscilloscope. Optically, the board can be configured to interface with a common-cathode VCSEL.

_____Component Suppliers

SUPPLIER	PHONE	FAX
AVX	803-946-0690	803-626-3123
Coilcraft	847-639-6400	847-639-1469
Murata	814-237-1431	814-238-0490
Zetex	516-543-7100	516-864-7630

Note: *When contacting these suppliers, please indicate that you are using the MAX3741.*

_____Features

♦ **Fully Assembled and Tested**

♦ **Single +3.3V Power-Supply Operation**

♦ **Allows Optical and Electrical Evaluation**

_____Ordering Information

PART	TEMP RANGE	IC PACKAGE
MAX3741EVKIT	-40°C to +85°C	16 Thin QFN (3mm x 3mm)

_____Component List

DESIGNATION	QTY	DESCRIPTION
C1, C2, C9, C10, C12, C13, C14	7	0.1µF ±10% ceramic capacitors (0402)
C3–C7	5	0.01µF ±10% ceramic capacitors (0402)
C8, C11	2	10µF ±10% tantalum capacitors, case B
GND, VCC, TP1–TP7, TP9, TP10	11	Test points
JU1	1	2-pin header, 0.1in center
J1, J2, J3, J6–J9	7	SMA connectors, tab contacts
L1	1	1µH inductor (805)
L2	1	600Ω ferrite bead (0603) Murata BLM18HD102SN1B
L3	1	600Ω ferrite bead (0603)* Murata BLM18HD102SN1B
R1	1	10kΩ potentiometer
R2, R3, R7, R8	4	Open

DESIGNATION	QTY	DESCRIPTION
R4	1	20kΩ potentiometer
R5, R9	2	49.9Ω resistors (0402)
R6	1	50kΩ potentiometer
R10	1	350Ω resistor (0402)
R11	1	120Ω resistor (0402)
R12	1	0Ω resistor (0402)*
U1	1	MAX3741ETE
None	1	Shunt
None	1	MAX3741 EV board
None	1	MAX3741 data sheet

*Not populated, but can be installed for optical evaluation.

_____Quick Start

Electrical Evaluation

To ensure proper operation in the electrical configuration, set up the evaluation board as follows:

1) To enable the outputs, connect TX_DISABLE to GND by placing a shunt on JU1.

   Note: When performing the following resistance checks, autoranging DMMs can forward bias the on-chip ESD protection and cause inaccurate measurements. To avoid this problem, manually set the DMM to a high range.

For pricing, delivery, and ordering information, please contact Maxim/Dallas Direct! at 1-888-629-4642, or visit Maxim's website at www.maxim-ic.com.

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2) Adjust R6, the $R_{BIASSET}$ potentiometer, for 1.7kΩ resistance between TP3 (BIASSET) and ground.

3) Adjust R4, the $R_{PEAKSET}$ potentiometer, for 20kΩ resistance between TP2 (PEAKSET) and ground to disable peaking.

4) Adjust R1, the R_{MODSET} potentiometer, for 10kΩ resistance between TP1 (MODSET) and ground.

5) Apply a differential input signal (250mV$_{P-P}$ to 2200mV$_{P-P}$) between SMA connectors J1 and J2 (IN+ and IN-).

6) Attach a high-speed oscilloscope with a 50Ω input to SMA connector J3 (OUT).

7) Connect a +3.3V supply between VCC and GND. Adjust the power supply until the voltage between TP10 and ground is +3.3V.

8) Adjust R6 ($R_{BIASSET}$) until the desired laser bias current is achieved.

$$I_{BIAS} = \frac{V_{TP6}}{120\Omega}$$

9) The BIAS current can be monitored at TP5 ($V_{BIASMON}$) using the equation below:

$$I_{BIAS} = \frac{9 \times V_{BIASMON}}{350\Omega}$$

10) Adjust R1 (R_{MODSET}) until the desired laser modulation current is achieved.

$$I_{MOD} = \frac{\text{Signal Amplitude (V)}}{50\Omega}$$

11) Adjust R14 ($R_{PEAKSET}$) until the desired amount of peaking is achieved.

Optical Evaluation

For optical evaluation of the MAX3741, configure the evaluation kit as follows:

1) Remove component R11.

2) Install a 0Ω resistor at R12 and install a 600Ω ferrite bead at L3 (Murata BLM18HD102SN1).

3) To enable the outputs, connect TX_DISABLE to GND by placing a shunt on JU1.

4) Connect a common-cathode VCSEL as shown in Figure 1. Keep the leads short to reduce reflection.

Note: When performing the following resistance checks, autoranging DMMs can forward bias the on-chip ESD protection and cause inaccurate mea-surements. To avoid this problem, manually set the DMM to a high range.

5) Adjust R6, the $R_{BIASSET}$ potentiometer, for 1.7kΩ resistance between TP3 (BIASSET) and ground.

6) Adjust R4, the $R_{PEAKSET}$ potentiometer, for 20kΩ resistance between TP2 (PEAKSET) and ground to disable peaking.

7) Adjust R1, the R_{MODSET} potentiometer, for 10kΩ resistance between TP1 (MODSET) and ground.

8) Apply a differential input signal (250mV$_{P-P}$ to 2200mV$_{P-P}$) between SMA connectors J1 and J2 (IN+ and IN-).

9) Attach the laser-diode fiber connector to an optical/electrical converter.

10) Connect a +3.3V supply between VCC and GND. Adjust the power supply until the voltage between TP10 and ground is +3.3V.

11) Adjust R6 ($R_{BIASSET}$) until desired average optical power is achieved.

12) The BIAS current can be monitored at TP5 ($V_{BIASMON}$) using the equation below:

$$I_{BIAS} = \frac{9 \times V_{BIASMON}}{350\Omega}$$

13) Adjust R1 (R_{MODSET}) until the desired optical amplitude is achieved. Optical amplitude can be observed on an oscilloscope connected to an optical/electrical converter.

14) Adjust R14 ($R_{PEAKSET}$) until the desired amount of peaking is achieved.

Adjustment and Control Descriptions (see Quick Start)

COMPONENT	NAME	FUNCTION
JU1	TX_DISABLE	Enables/disables the output currents, install a shunt to enable output currents
R1	R_{MODSET}	Adjusts the laser modulation current
R4	$R_{PEAKSET}$	Adjusts the peaking for the falling edge of the VCSEL
R6	$R_{BIASSET}$	Adjusts the VCSEL bias current
TP5	BIASMON	Monitors the bias current

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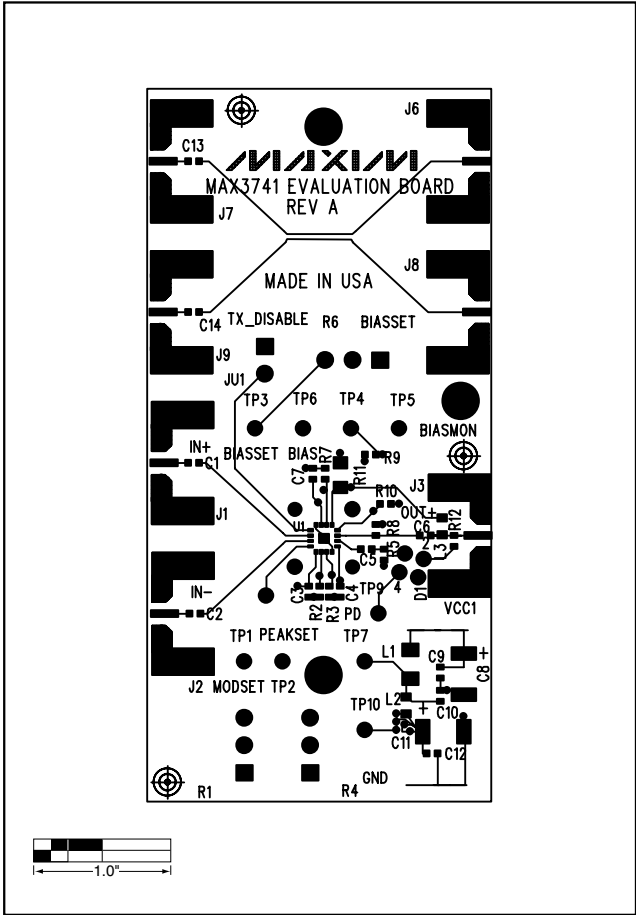Figure 1. MAX3741 EV Kit Schematic
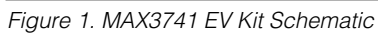
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Figure 2. MAX3741 EV Kit Component Placement Guide—Component Side
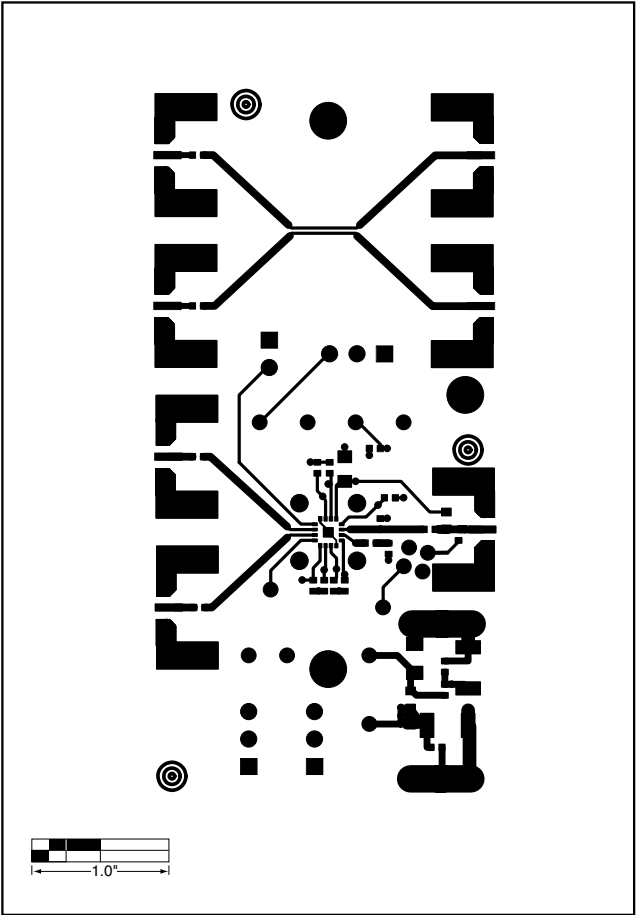
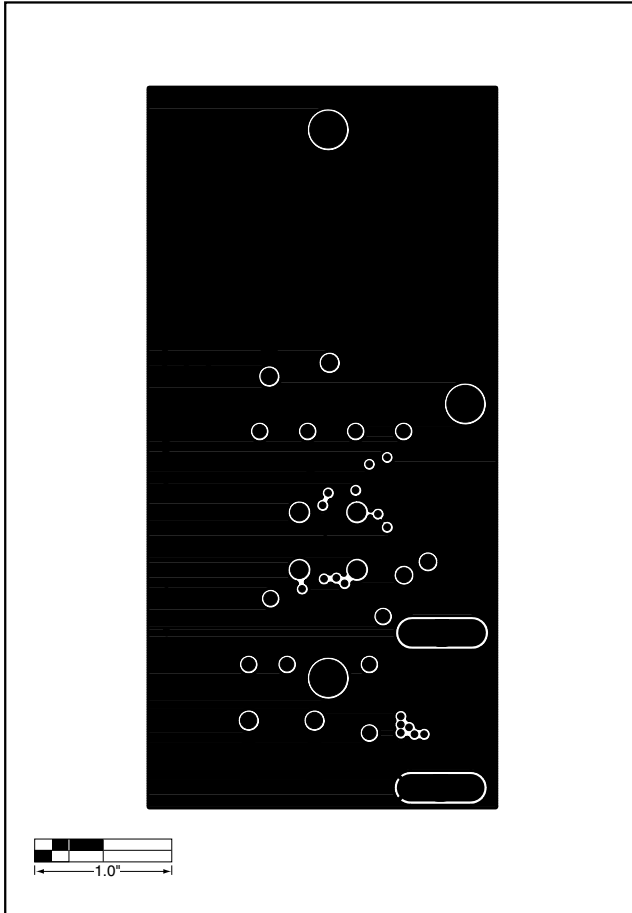Figure 3. MAX3741 EV Kit PC Board Layout—Component Side
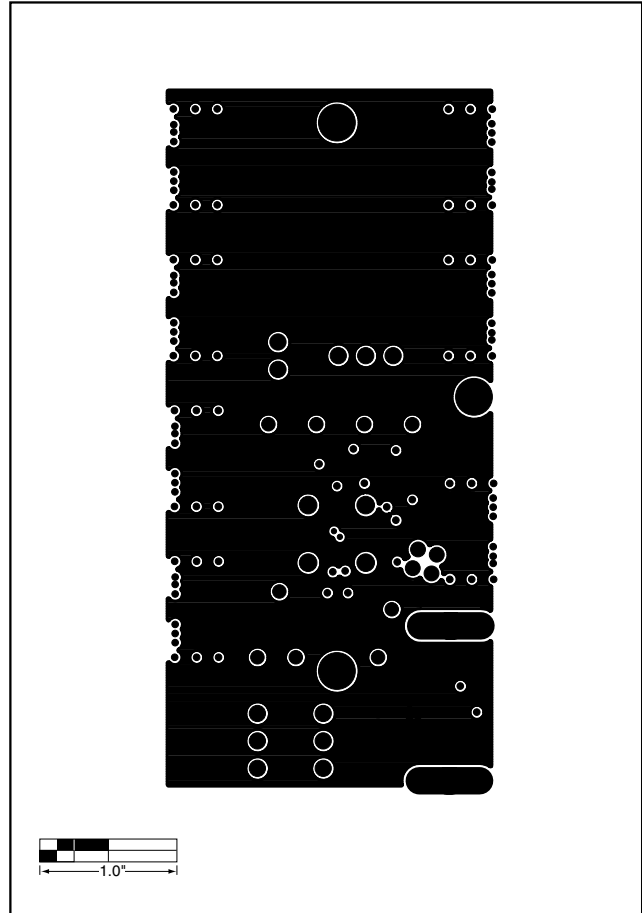
Figure 4. MAX3741 EV Kit PC Board Layout—Ground Plane

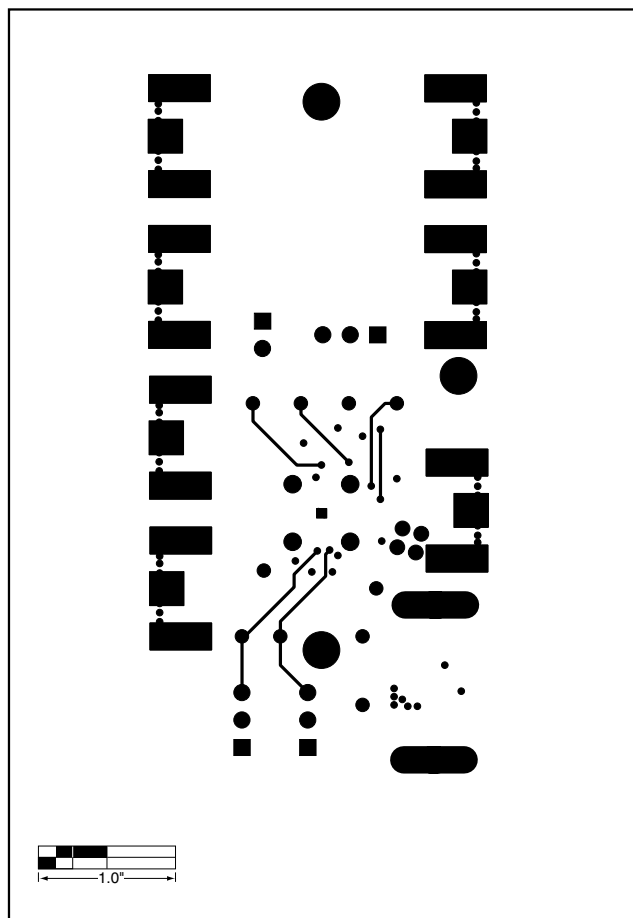Figure 5. MAX3741 EV Kit PC Board Layout—Power Plane

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Figure 6. MAX3741 EV Kit PC Board Layout—Solder Side