19-2910; Rev 0; 7/03

MAX3841 Evaluation Kit

General Description

The MAX3841 DC-coupled evaluation kit (EV kit) simplifies evaluation of the MAX3841 12.5Gbps 2 × 2 CML crosspoint switch. The EV kit enables testing of all the MAX3841 functions. SMA connectors with 50Ω controlled-impedance transmission lines to the MAX3841 are provided for all CML inputs and outputs. The board includes additional transmission lines for calibration purposes.

Component List

DESIGNATION	QTY	DESCRIPTION
C1, C7, C13, C22, C27, C30	6	33µF ±10% tantalum capacitors (B case)
C2, C8, C12, C14, C26, C29	6	2.2µF ±10% ceramic capacitors (0805)
C3, C4, C6, C9, C10, C11, C16, C17, C23, C24, C25, C28	12	0.01µF ±10% ceramic capacitors (0201)
C5, C15, C18–C21	6	0.1µF ±10% ceramic capacitors (0402)
J1–J8, J10, J12, J14, J16	12	SMA connectors (edge mount, tab contact)
JU1, JU3, JU8, JU9	4	3-pin headers, 0.1in centers
JU2, JU4–JU7	5	2-pin headers, 0.1in centers
JU1–JU9	9	Shunts Digi-Key S9000-ND
L1–L6	6	56nH inductors Coilcraft 0805CS-560XKBC
TP5–TP10, J9, J11, J13, J15, J18, J19, J20	13	Test points Digi-Key 5000K-ND
U1	1	MAX3841ETG 24-pin Thin QFN
None	1	MAX3841 EV kit circuit board, Rev A

Component Suppliers

SUPPLIER	PHONE	FAX
AVX	843-448-9411	843-626-3123
Coilcraft	847-639-6400	847-639-1469
Digi-Key	800-344-4539	218-681-3380
Murata	770-436-1300	770-436-3030

***Note:** Please indicate that you are using the MAX3841 when ordering from these suppliers.*

Features

- ♦ **DC-Coupled Evaluation Kit**
- ♦ **Independent Power-Supply Connections**
- ♦ **Fully Assembled and Tested**
- ♦ **SMA Connectors for CML Inputs and Outputs**
- ♦ **Additional Transmission Lines for Calibration**

Ordering Information

PART	TEMP RANGE	IC PACKAGE
MAX3841EVKIT	-40°C to +85°C	24 Thin QFN

Quick Start

Caution: The MAX3841 EV kit is a DC-coupled evaluation board. Each CML input and output is terminated with 50Ω to the respective I/O supplies. DC-coupled operation with positive I/O supplies may cause permanent damage to laboratory test equipment (oscilloscope, BERT). The I/O supplies must be connected to ground and a negative supply connected to V_{EE} when DC-coupling to laboratory test equipment.

1) Connect the I/O supplies to ground and disconnect V_{EE} from ground by placing shunts on JU2, JU4, JU5, JU6, and removing the shunt from JU7.
2) Enable both outputs by placing shunts across pins 1 and 2 of JU8 and JU9.
3) Configure the crosspoint switch to route IN1 to both OUT1 and OUT2 by placing shunts across pins 2 and 3 of JU1 and across pins 1 and 2 of JU3.
4) Connect a +1.5V power supply to J13 (V_{CC}). Connect the power-supply ground to J19 (GND). Connect a -1.8V power supply to J20 (V_{EE}).
5) Apply a 10Gbps differential signal (150mV_{P-P} to 1200mV_{P-P}) to SMA connectors J1 (IN1+) and J2 (IN1-).
6) Connect an oscilloscope with 50Ω terminations to SMA connectors J5 (OUT1-), J6 (OUT1+), J7 (OUT2+), and J8 (OUT2-).

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Supply Configurations

DC-Coupling to Lab Equipment

Place shunts on JU2, JU4, JU5, and JU6 to connect the I/O supplies to ground. Remove the shunt from JU7 to disconnect V_{EE} from GND. Connect a +1.5V supply to V_{CC} (J13), supply ground to GND (J19), and a -1.8V supply to V_{EE} (J20).

This supply configuration puts 3.3V on the core supply and 1.8V on all the I/O supplies. All the I/O supplies must have the same voltage when DC-coupled to lab equipment. Adjustment to the core and I/O supplies is done in two steps. First, adjust V_{EE} until the desired I/O supply voltage is achieved. Second, adjust V_{CC} until the desired core supply voltage is achieved. Adjustments to V_{EE} change both the I/O and core supplies, but adjustments to V_{CC} only change the core supply.

For example, to have a core supply voltage of 3.3V and an I/O supply voltage of 2.5V, adjust V_{EE} to -2.5V and V_{CC} to +0.8V.

AC-Coupling

Connect external AC-coupling capacitors to IN1± (J1, J2), IN2± (J3, J4), OUT1± (J5, J6), and OUT2± (J7, J8). Remove the shunts from JU2, JU4, JU5, and JU6 to disconnect the I/O supplies from one another and ground. Place a shunt on JU7 to connect V_{EE} to ground. Connect a +3.3V supply to V_{CC} (J13) and supply ground to GND (J19). Connect any voltage between +1.71V and V_{CC} to VCC1IN (J9), VCC2IN (J18), VCC1OUT (J11), and VCC2OUT (J15).

When the inputs and outputs are AC-coupled, each of the I/O supplies (VCC1IN, VCC2IN, VCC1OUT, VCC2OUT) are independent and do not need to be connected to the same voltage. The core supply is independent of the I/O supplies, but it must have a voltage between 3.0V and 3.6V for proper operation.

DC-Coupling Chip-to-Chip

Remove the shunts from JU2, JU4, JU5, and JU6 to disconnect the I/O supplies from one another and ground. Place a shunt on JU7 to connect V_{EE} to ground. Connect a +3.3V supply to V_{CC} (J13) and supply ground to GND (J19). Connect the input supplies (VCC1IN, VCC2IN) to the output termination voltages of the previous chip(s) (transmitters). Connect the output supplies (VCC1OUT, VCC2OUT) to the input termination voltages of the following chip(s) (receivers). Verify all the supplies have a common ground. Each of the I/O supplies can be at different voltages between +1.71V and V_{CC}.

Output Controls

Each of the LVCMOS control inputs (ENO1, ENO2, SEL1, SEL2) can be set high or low using the on-board 3-pin headers (JU1, JU3, JU8, JU9). Placing a shunt across pins 1 and 2 forces a control input low (V_{EE}), and placing a shunt across pins 2 and 3 forces a control input high (V_{CC}). See Table 1 for the setting options.

Table 1. Output Controls

ENO1	ENO2	SEL1	SEL2	OUT1	OUT2
0	0	0	0	IN2	IN1
0	0	0	1	IN2	IN2
0	0	1	0	IN1	IN1
0	0	1	1	IN1	IN2
0	1	0	X	IN2	Disabled
0	1	1	X	IN1	Disabled
1	0	X	0	Disabled	IN1
1	0	X	1	Disabled	IN2
1	1	X	X	Disabled	Disabled

0 = Pins 1 and 2 shunted.
1 = Pins 2 and 3 shunted.
X = Don't care.

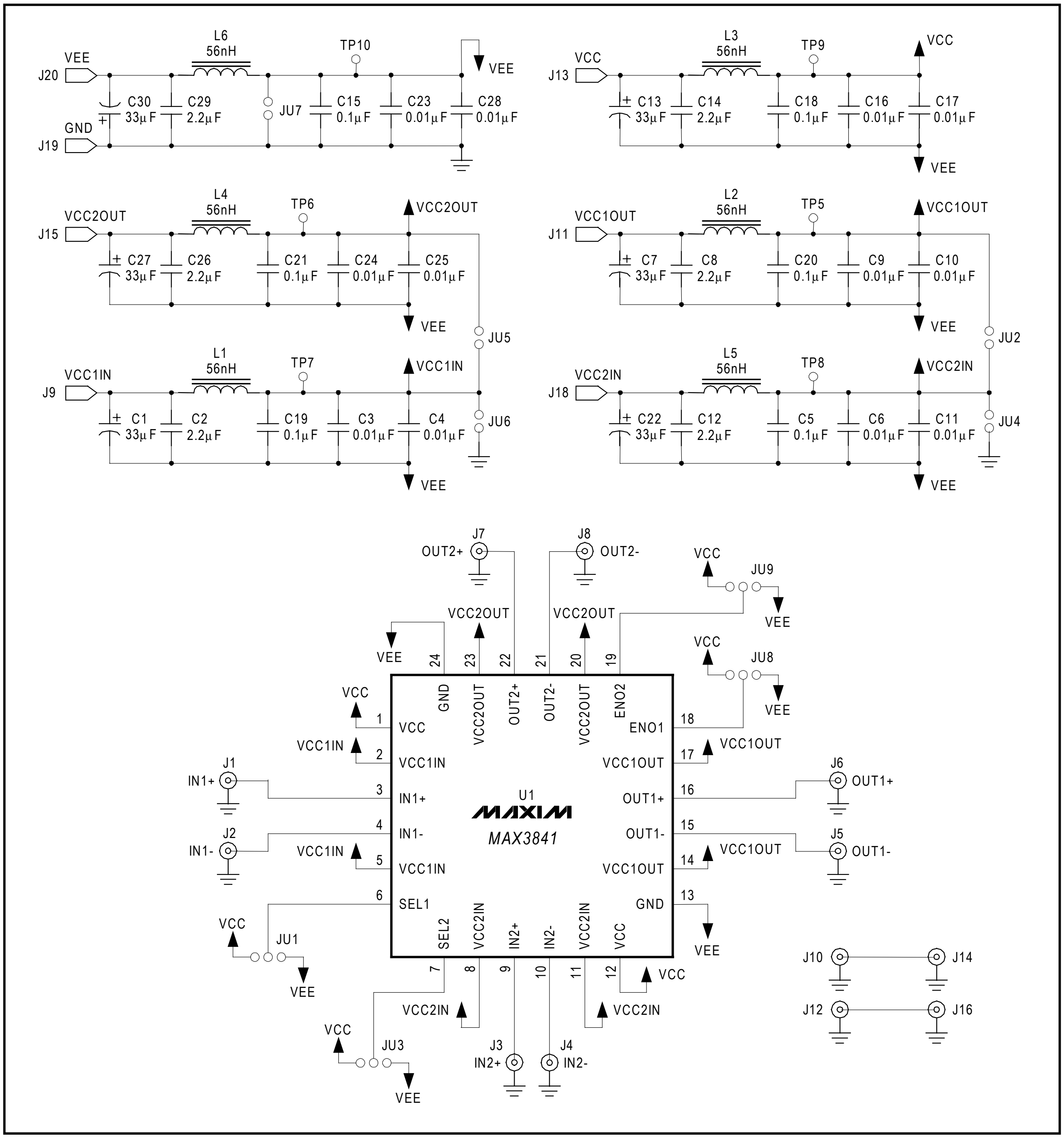

Figure 1. MAX3841 EV Kit Schematic Diagram

MAX3841 Evaluation Kit

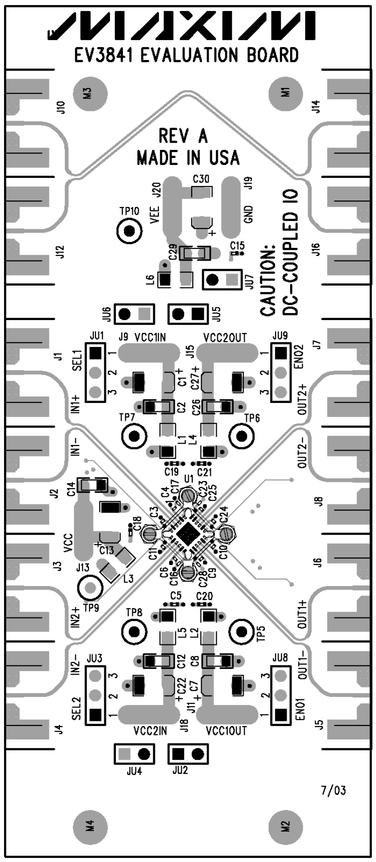

Figure 2. MAX3841 EV Kit Component Placement Guide—Component Side

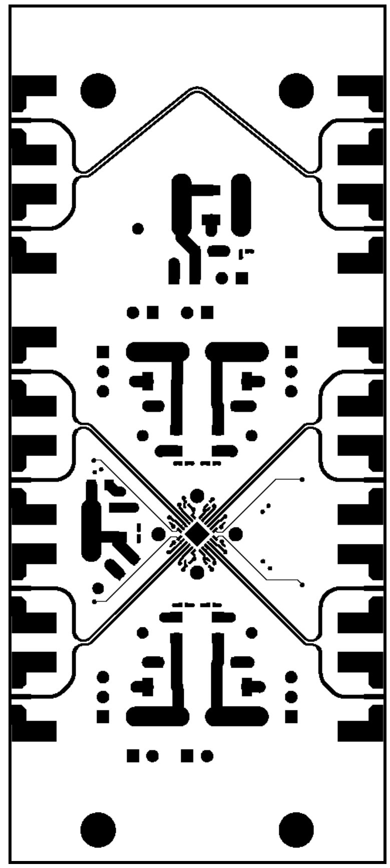

Figure 3. MAX3841 EV Kit PC Board Layout—Component Side

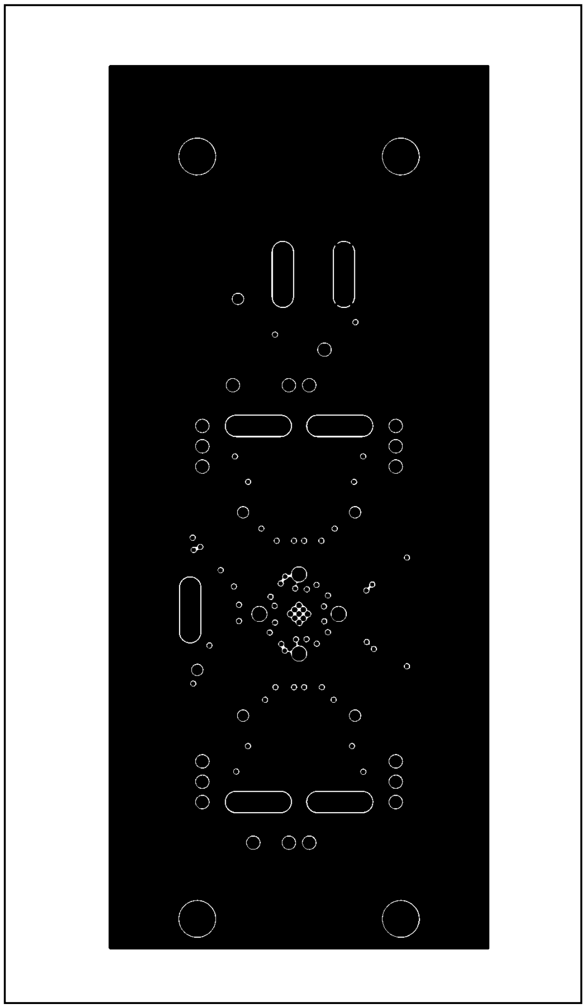

Figure 4. MAX3841 EV Kit PC Board Layout—Ground Plane

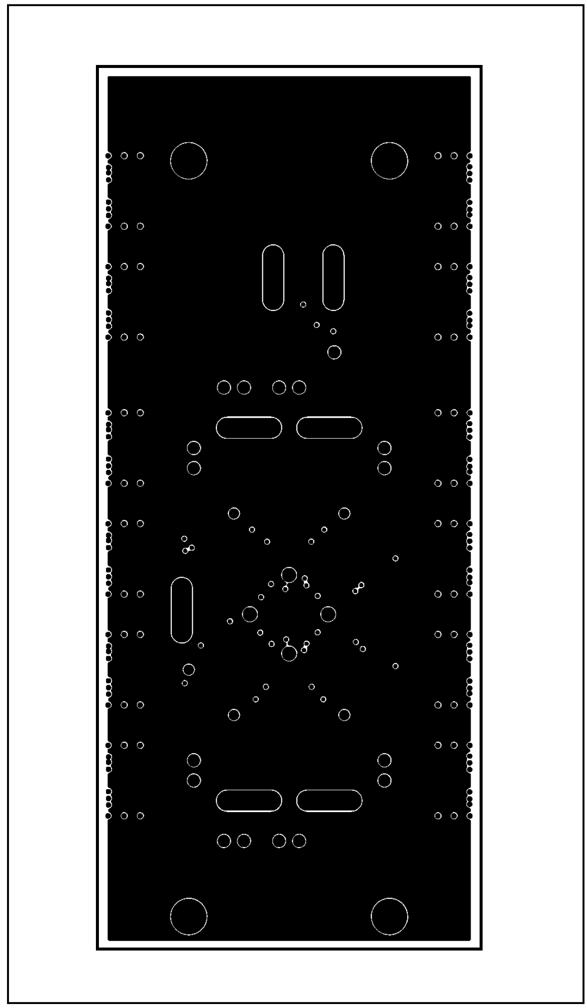

Figure 5. MAX3841 EV Kit PC Board Layout—Power Plane

MAX3841 Evaluation Kit

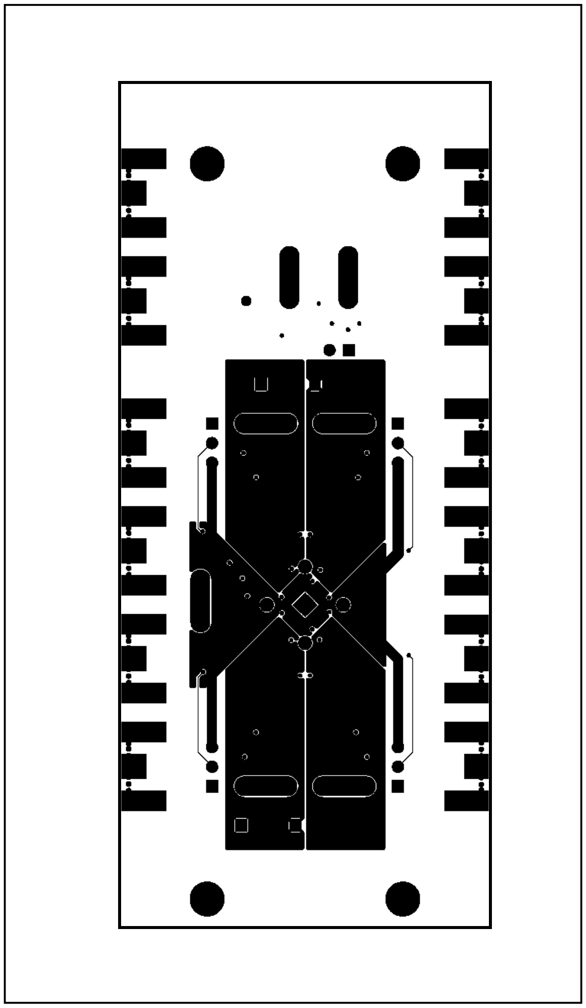

Figure 6. MAX3841 EV Kit PC Board Layout—Solder Side