

# MAXIM

## MAX3804 Evaluation Kit

**Evaluates: MAX3804**

### General Description

The MAX3804 DC-coupled evaluation kit (EV kit) simplifies evaluation of the MAX3804 12.5Gbps settable equalizer. The EV kit enables full testing of the device functions including all equalization settings. SMA connectors with 50Ω controlled-impedance transmission lines to the MAX3804 are provided for all CML input and output ports.

### Ordering Information

PART	TEMP RANGE	IC PACKAGE
MAX3804EVKIT	-40°C to +85°C	16 QFN

### Component List

DESIGNATION	QTY	DESCRIPTION
C1–C5	5	0.1μF ±10% ceramic capacitors (0402)
C6	1	0.1μF ±10% ceramic capacitor (0603)
C7–C10	4	33μF ±10% tantalum capacitors (case-B)
J1–J4	4	SMA connectors, tab contact
JP1, JP2, JP3	3	2-pin headers, 0.1in centers
JPEQ1, JPEQ2, JPEQ3	3	3-pin headers, 0.1in centers
R3	1	10kΩ resistor (0402)
R4	1	12kΩ resistor (0402)
R5	1	8kΩ resistor (0402)
GND, VCC, VCC1, VCC2, VEE, TP4, TP5	7	Test points
U1	1	MAX3804ETE
None	5	Shunts
None	1	MAX3804 EV board
None	1	MAX3804 data sheet

### 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

### Features

- ◆ DC-Coupled Evaluation Kit
- ◆ SMA Connectors for All High-Speed Inputs and Outputs
- ◆ Fully Assembled and Tested

### Quick Start

**Note:** The MAX3804 EV kit is a DC-coupled evaluation board. Care must be taken to ensure that no direct short between the supply voltage and supply ground exists. Use external coupling capacitors on the input and output when AC-coupling is desired. DC-coupled operation with positive VCC supplies normally causes permanent damage to laboratory test equipment (typical oscilloscope, BERT). The MAX3804 EV kit must be operated from a negative VEE supply when DC-coupled to normal laboratory equipment.

- 1) Connect a -3.3V power supply to TP3 (VEE). Connect the power-supply ground to TP2 (GND) and J6 (VCC). Install shunts in JP2 and JP3, and remove shunt from JP1.
- 2) Install shunts across pins 2 and 3 of JPEQ1, JPEQ2, and JPEQ3 for minimal equalization (0, 0, 0). See Table 1 for the relationship between nominal path loss and FR-4 microstrip path length.
- 3) Apply a differential input signal (400mVp-p to 1200mVp-p) between SMA connectors J1 and J2 (SDI+ and SDI-).
- 4) Attach a differential high-speed oscilloscope with a 50Ω input to SMA connectors J3 and J4 (SDO+ and SDO-) to observe the output of the equalizer.

**Table 1. Relationship Between Nominal Path Loss and FR-4 Microstrip Path Length**

JPEQ3	JPEQ2	JPEQ1	NOMINAL 6-mil FR-4 MICROSTRIP LENGTH (in)
0	0	0	2
0	0	1	6
0	1	0	10
0	1	1	14
1	0	0	18
1	0	1	22
1	1	0	26
1	1	1	30

**Note:** 0 refers to pins 2 and 3 shunted.  
1 refers to pins 1 and 2 shunted.

# MAX3804 Evaluation Kit

## Adjustment and Control Descriptions (see Quick Start)

COMPONENT	NAME	FUNCTION
JPEQ1	EQ1	Equalizer boost control logic input LSB
JPEQ2	EQ2	Equalizer boost control logic input
JPEQ3	EQ3	Equalizer boost control logic input MSB

## Alternative Supply Configurations

### AC-Coupled Operation with $V_{CC1} = V_{CC2} = +1.65V$

Connect a +3.3V power supply to J6 ( $V_{CC}$ ). Connect a +1.65V power supply to TP1 ( $V_{CC1}$ ) and J5 ( $V_{CC2}$ ). Connect the power-supply ground to TP2 (GND). Remove shunts JP2 and JP3. Install shunt JP1. Use external AC-coupling for connecting to external laboratory equipment (typical oscilloscope, BERT).

### DC-Coupled Operation with Laboratory Equipment

Connect a +1.85V power supply to J6 ( $V_{CC}$ ). Connect a -1.65V power supply to TP3 ( $V_{EE}$ ). Connect the power-supply ground to TP2 (GND). Install shunts JP2 and JP3. Remove shunt JP1. With this setup the part can be DC-coupled to external laboratory equipment (typical oscilloscope, BERT).

### DC-Coupled Operation with Oscilloscopes and BERTs

The MAX3804 is designed with DC-coupled inputs and outputs, implemented with internal  $50\Omega$  terminations to  $V_{CC1}$  ( $SDI\pm$ ) and  $V_{CC2}$  ( $SDO\pm$ ). Laboratory oscilloscopes and BERTs normally terminate their inputs and outputs with  $50\Omega$  to ground. When the MAX3804  $V_{CC}$ s are connected to a positive supply, a DC path exists from the power supply to the ports of the oscilloscope or BERT. This configuration can cause permanent damage to the oscilloscope or BERT.

When the MAX3804 EV kit is being used with normal oscilloscopes or BERTs, either external AC-coupling must be provided or  $V_{CC1}$  and  $V_{CC2}$  must be connected to ground (i.e., using a negative  $V_{EE}$  supply). Failure to do so may permanently damage laboratory equipment.

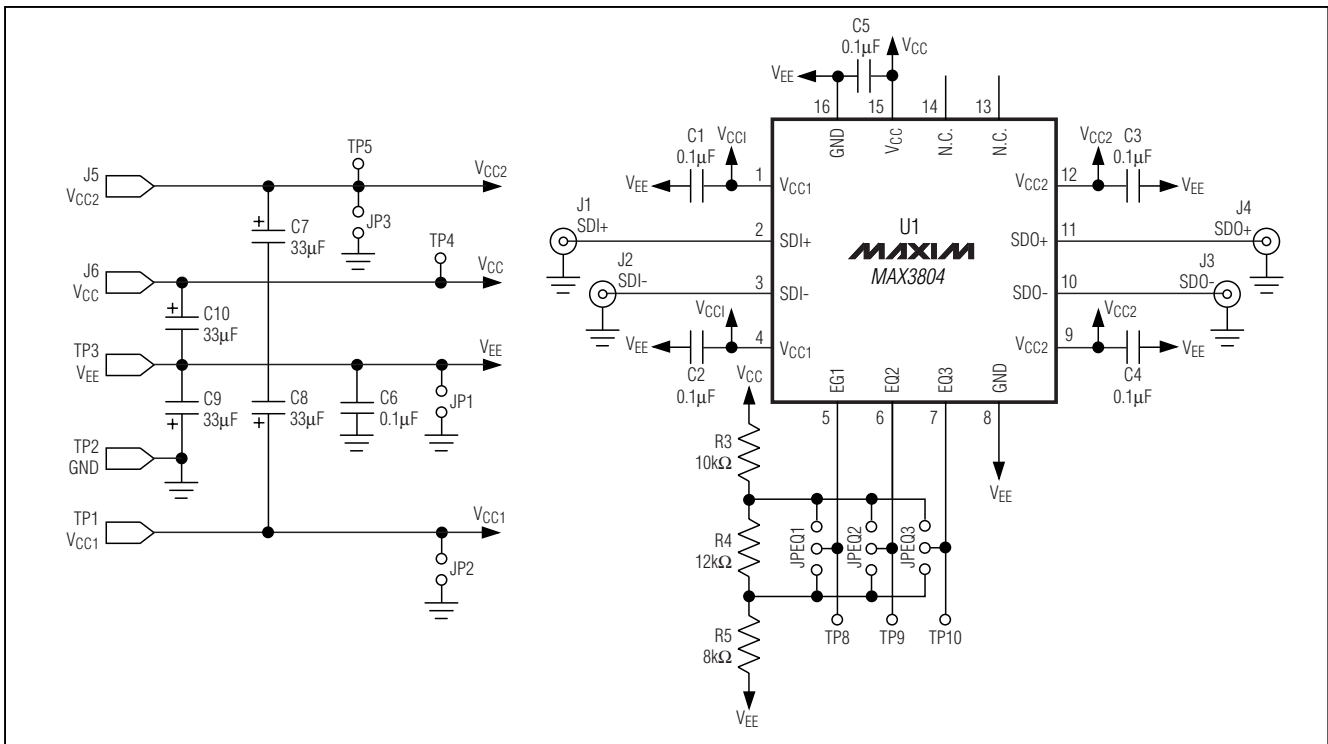


Figure 1. MAX3804 Schematic Diagram

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Evaluates: MAX3804

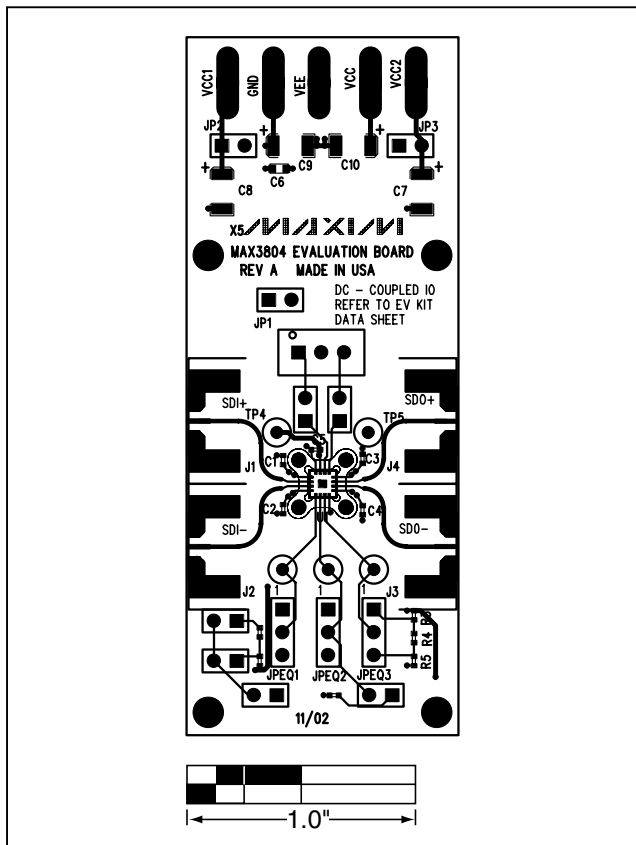


Figure 2. MAX3804 Component Placement Guide

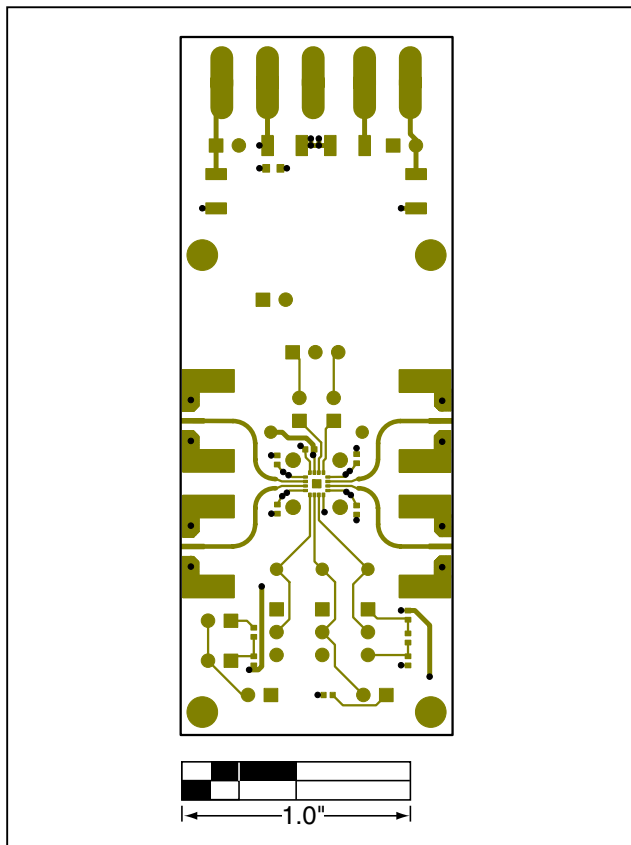


Figure 3. MAX3804 PC Board Layout—Component Side

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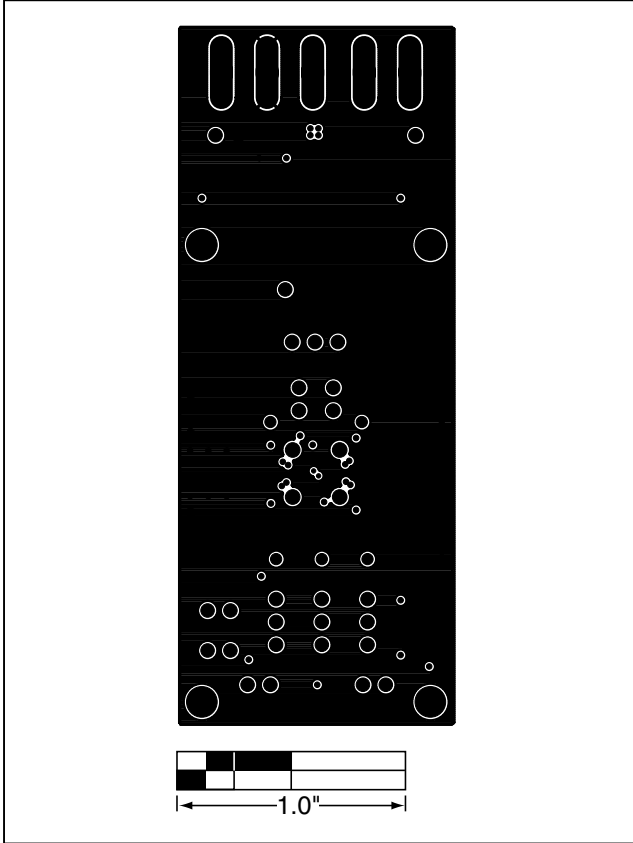


Figure 4. MAX3804 PC Board Layout—Ground Plane

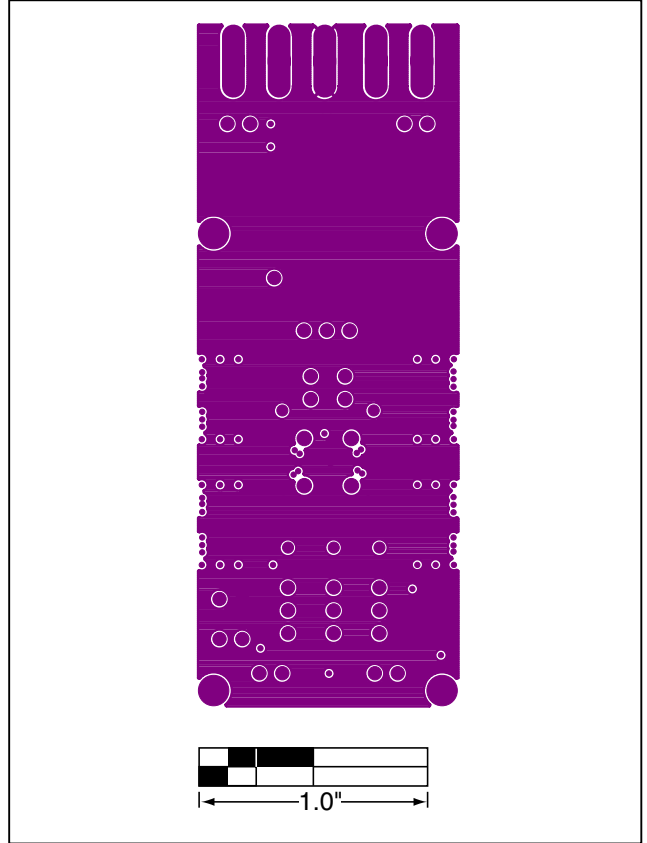


Figure 5. MAX3804 PC Board Layout—Power Plane

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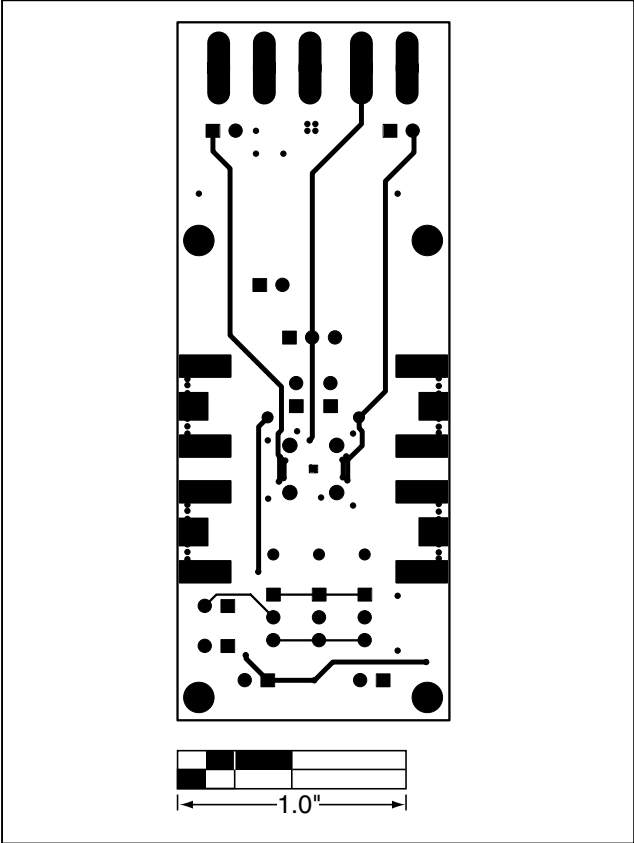


Figure 6. MAX3804 PC Board Layout—Solder Side

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