

# MAXIM

## MAX555 Evaluation Kit

Evaluates: MAX555

### General Description

The MAX555 evaluation kit (EV kit) demonstrates the operation of the MAX555 12-bit, 300MHz DAC with ECL-compatible data and clock inputs. By supplying power, digital bit inputs, and a differential clock, the kit allows for quick evaluation of the MAX555's AC performance. The EV kit includes a MAX555.

### Features

- ◆ Fast and Easy Performance Testing
- ◆ Optimized PC Board Layout
- ◆ SMA Connectors for All Digital Input and Output Voltages
- ◆ Includes 50Ω Termination Resistors
- ◆ On-Board Voltage Reference and V<sub>TT</sub> Generators

### Ordering Information

PART	TEMP RANGE	IC PACKAGE
MAX555EVKIT	0° to +70°C	64 TQFP-EP*

\*EP = Exposed pad.

### Component List

DESIGNATION	QTY	DESCRIPTION
C1–C4, C7–10, C14–C18, C25, C26, C28	18	0.1μF ceramic capacitors
C19, C20	2	10μF tantalum capacitors, surface-mount
C21	1	22μF tantalum capacitor, surface-mount
C22	1	47μF tantalum capacitor, surface-mount
C23, C24	2	0.1μF ceramic capacitors
J1–J16	16	SMA connectors
R1–R13, R20, R21	15	51Ω, 5% resistors
R14	1	121Ω, 1% resistor
R16	1	82.5Ω, 1% resistor
R17	1	182Ω, 1% resistor
R18	1	68.1Ω, 1% resistor
R19	1	100Ω trim pot
U1	1	MAX555CCB
U2	1	LM337T
U3	1	MX580KH
U4	1	MAX410CPA

### Quick Start

- 1) Connect the power supply to the MAX555 EV kit. The power-supply input pads are located along the top edge of the board. The board requires a power supply that provides +5V and -5.2V with a common ground.
- 2) Connect 50Ω cables to the V<sub>OUT</sub> and  $\overline{VOUT}$  outputs with proper terminations.
- 3) Connect a word generator to the data inputs (D0–D11) and the clock inputs. All of these inputs are 100k ECL compatible.
- 4) Turn on the power-supply and signal sources.
- 5) Observe the output waveforms on V<sub>OUT</sub> and  $\overline{VOUT}$ .

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## Detailed Description

### Digital Inputs

The MAX555 EV kit board has high-frequency SMA connectors for the differential-clock and DAC data inputs. Each of these inputs has on-board  $50\Omega$  pull-down resistors terminated to -2V. The -2V supply is regulated down from the -5.2V power supply, as shown in Figure 1. The MAX555 is set up in clocked mode (BYPASS = logic 0) on the EV kit board, with a  $50\Omega$  resistor (R13) connected to -2V. Clocked-mode operation is recommended for all high-speed applications. Removing R13 and connecting the BYPASS pin of the MAX555 to ground selects transparent data mode, as described in the MAX555 data sheet.

### DAC Outputs

The MAX555 has complementary voltage outputs,  $\overline{VOUT}$  and  $VOUT$ . Both have  $50\Omega$  output impedances and must be terminated correctly to achieve the best performance. Applications requiring a single-ended output should use  $\overline{VOUT}$ , since it is trimmed to higher accuracy than  $VOUT$ . Both  $VOUT$  and  $\overline{VOUT}$  should always be terminated with  $50\Omega$  to ground for best performance. An alternative way to achieve a single-ended output is to drive a balun transformer with both  $VOUT$  and  $\overline{VOUT}$ . This reduces even-order harmonics in the output.

### Power Supplies

The EV kit requires a -5.2V supply (at 425mA nominal) for the DAC and  $50\Omega$  terminations, and a +5V supply (at 12mA nominal) for the on-board reference circuit, and ground.

### DAC Reference Options

The MAX555 uses an external +1V reference, which is supplied on the EV kit board using the circuit shown in Figure 1. This reference voltage can be adjusted to different values between 1.2V and 0.4V using potentiometer R19.  $VREF$  can be measured at the  $VREF$  pad. The MAX555 typically achieves its best spurious performance with  $VREF$  values in the 0.6V to 0.8V range, as described in the MAX555 data sheet. Experimentation with different  $VREF$  values is recommended to optimize the AC performance in your application.

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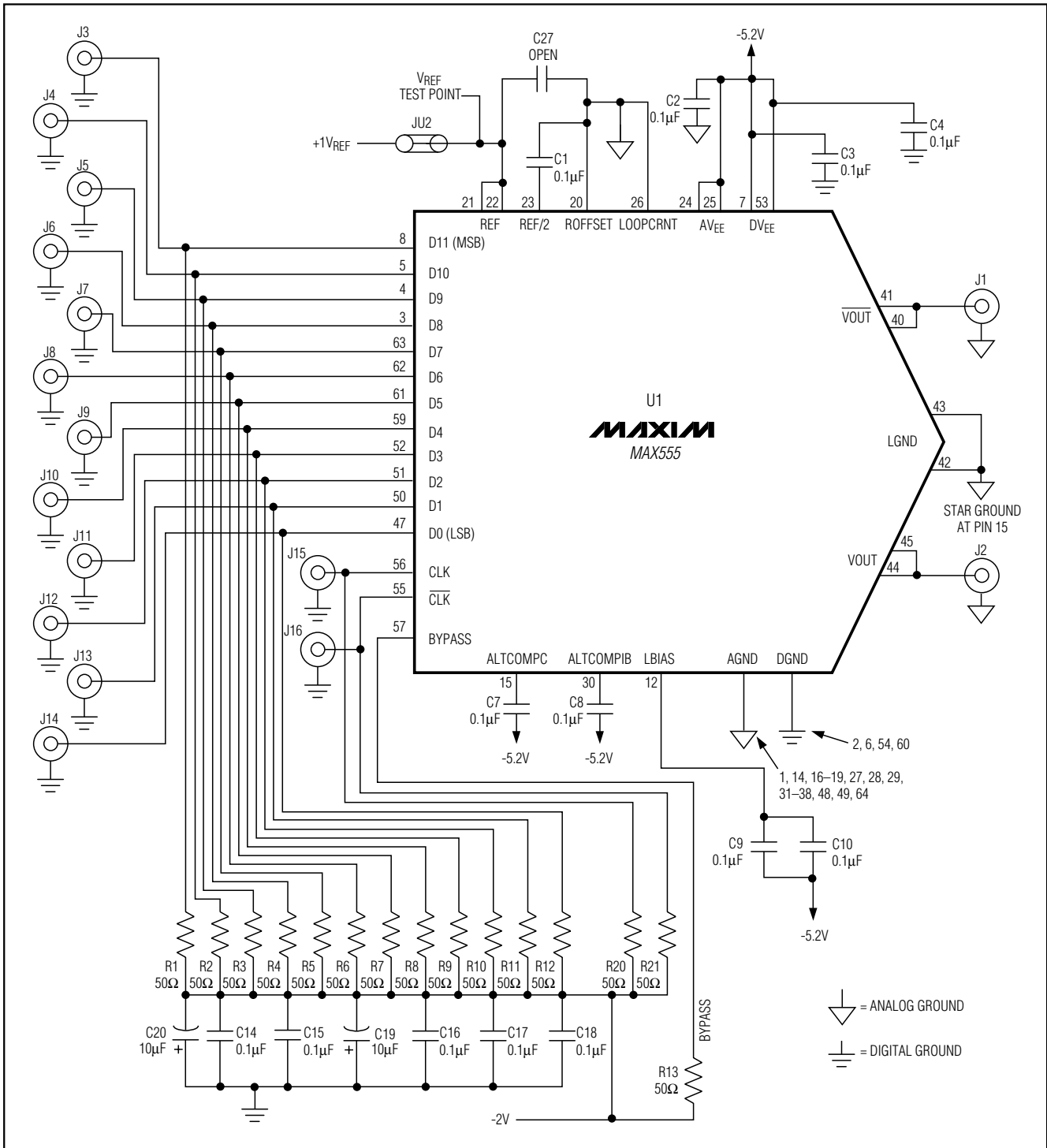


Figure 1. MAX555 EV Kit Schematic Diagram (Sheet 1 of 2)

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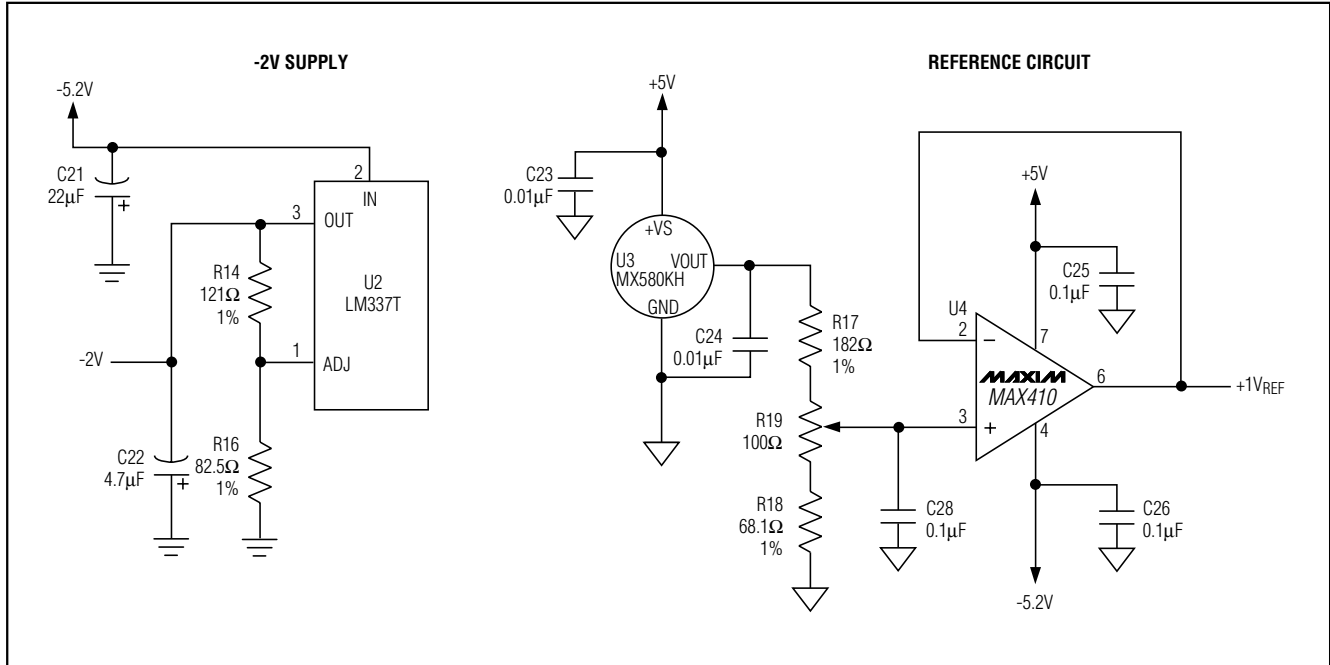


Figure 1. MAX555 EV Kit Schematic Diagram (Sheet 2 of 2)

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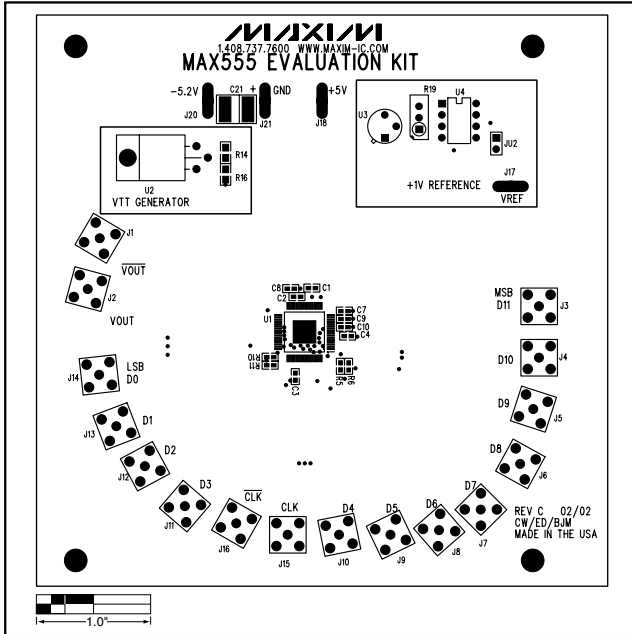


Figure 2. MAX555 EV Kit Component Placement Guide—Component Side

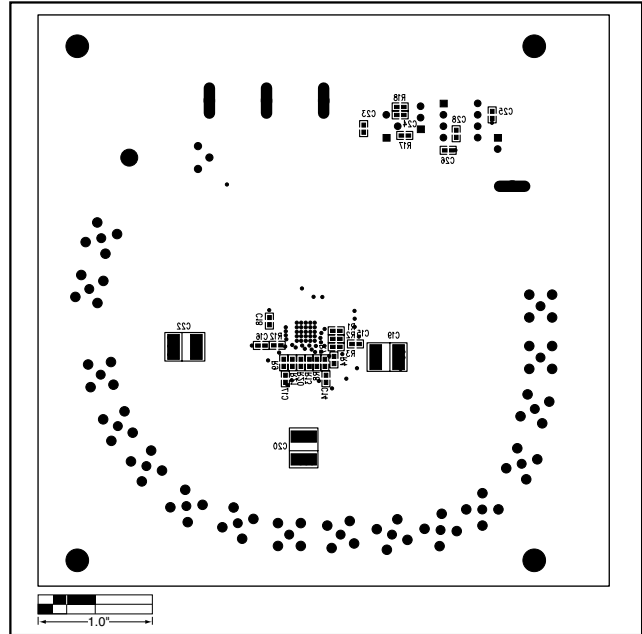


Figure 3. MAX555 EV Kit Component Placement Guide—Back Side

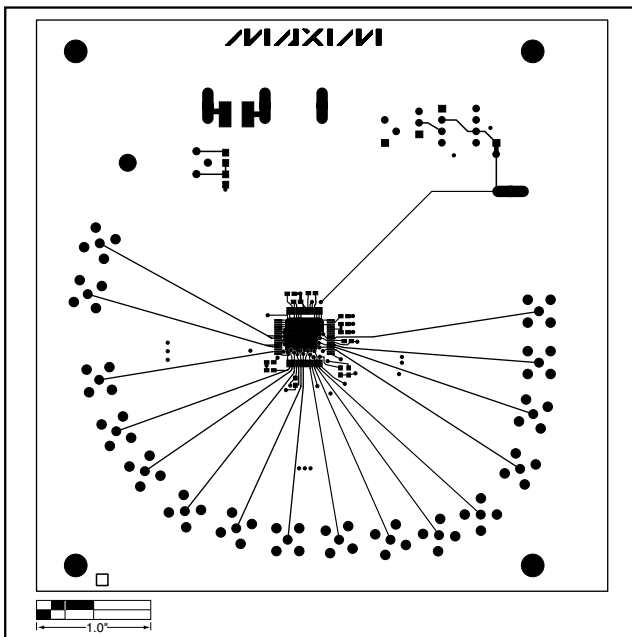


Figure 4. MAX555 EV Kit PC Board Layout—Component Side

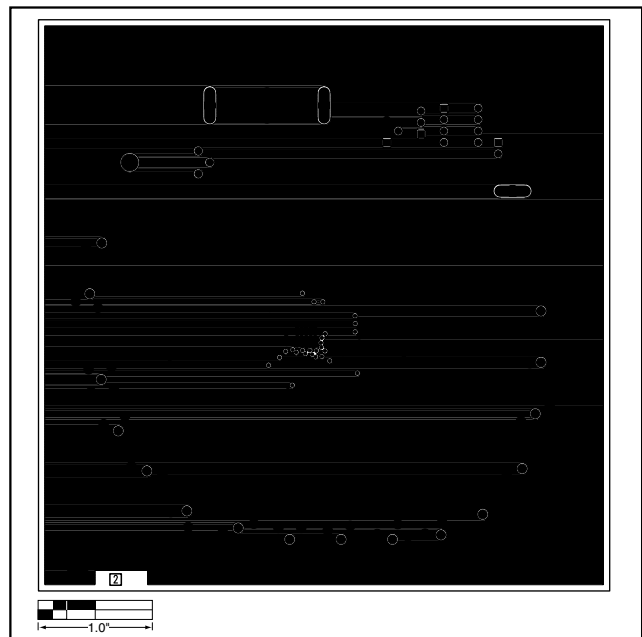


Figure 5. MAX555 EV Kit PC Board Layout—Layer 2 (Ground Layer)

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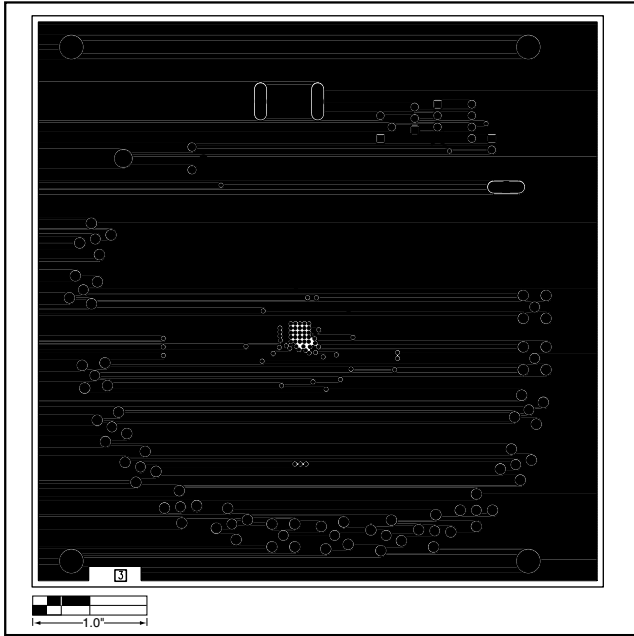


Figure 6. MAX555 EV Kit PC Board Layout—Back Side

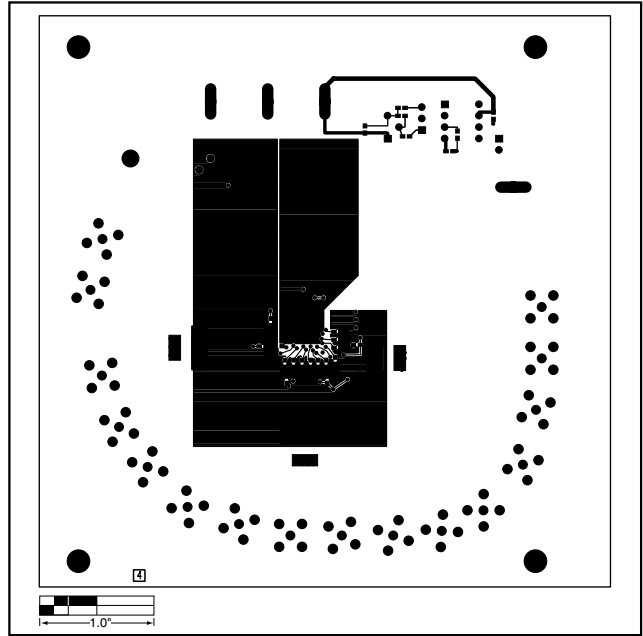


Figure 7. MAX555 EV Kit PC Board Layout—Back Side

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