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. A MAX555 is included in the EV kit.

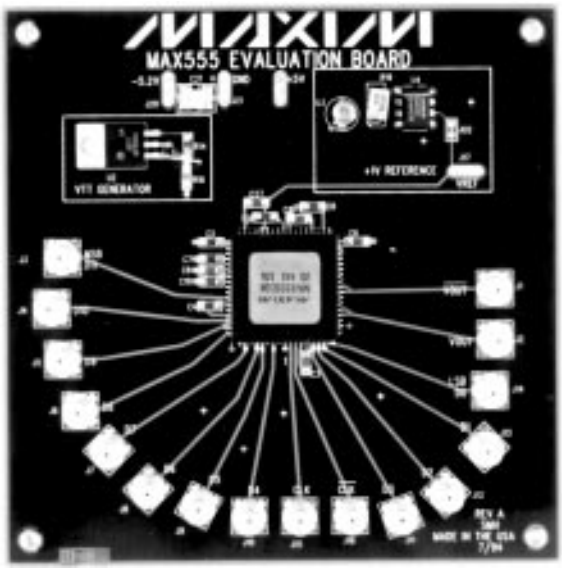
Features

- **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_{TT} Generators**

Ordering Information

PART	TEMP. RANGE
MAX555EVKIT	0°C to +70°C

EV Kit



Component List

DESIGNATION	QTY	DESCRIPTION
C1–C10, 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	0.01µF 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	MAX555CQK
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 VOUT 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 VOUT and $\overline{VOUT}$.

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 50Ω pull-down resistors 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 the clocked mode (BYPASS = logic 0) on the EV kit board, with a 50Ω 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 will select the transparent data mode, as described in the MAX555 data sheet.

DAC Outputs

The MAX555 has complementary voltage outputs, VOUT and $\overline{VOUT}$. Both have 50Ω 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 50Ω to ground for best performance. An alternative way to achieve a single-ended output is to drive a balun transformer with both VOUT and $\overline{VOUT}$. The balun connection will reduce the even-order harmonics in the output.

Power Supplies

The EV kit board requires a -5.2V supply (at 425mA nominal) for the DAC and 50Ω 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. The V_{REF} value can be measured at the V_{REF} pad. The MAX555 will typically achieve its best spurious performance with V_{REF} values in the 0.6V to 0.8V range, as described in the MAX555 data sheet. Experimentation with different V_{REF} values is recommended to maximize the AC performance in your application.

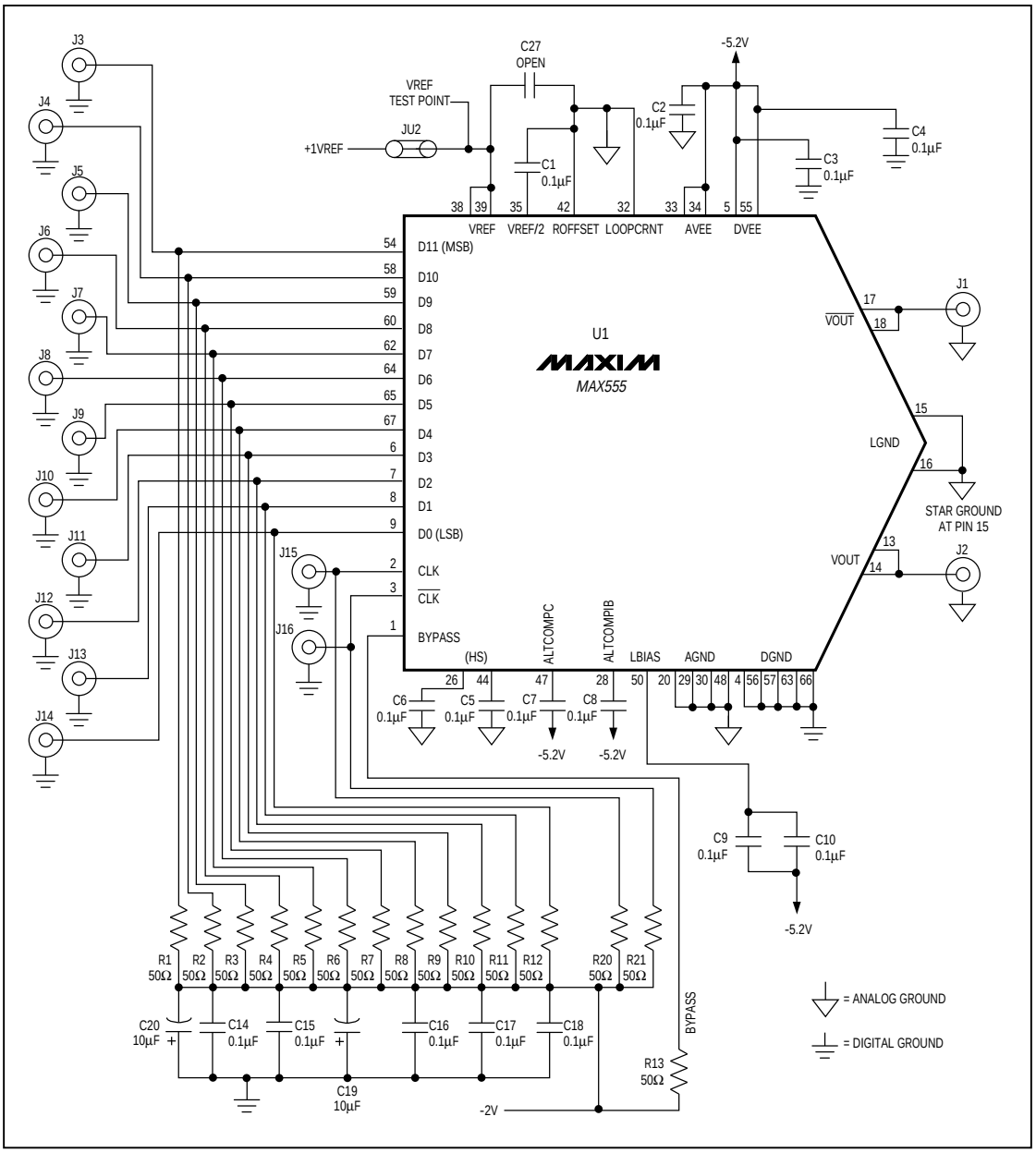


Figure 1. MAX555 EV Kit Schematic Diagram

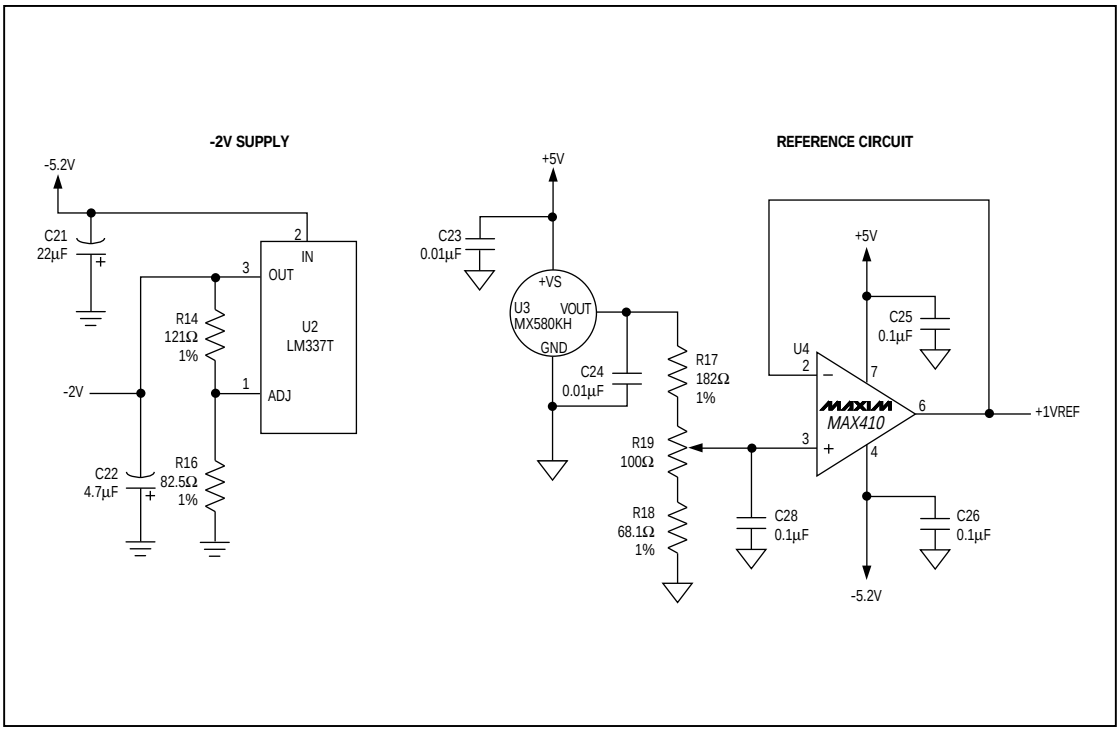


Figure 1. MAX555 EV Kit Schematic Diagram (continued)

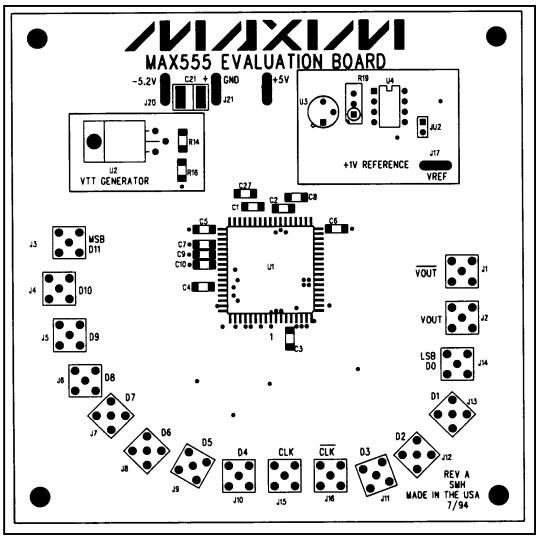


Figure 2. MAX555 EV Kit Component Placement Guide—Component Side

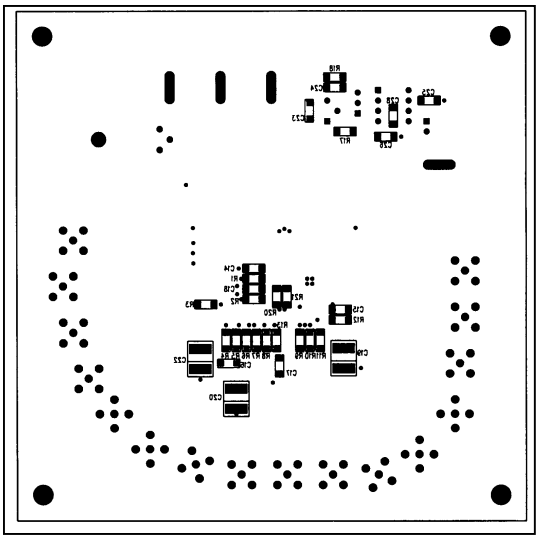


Figure 3. MAX555 EV Kit Component Placement Guide—Back Side

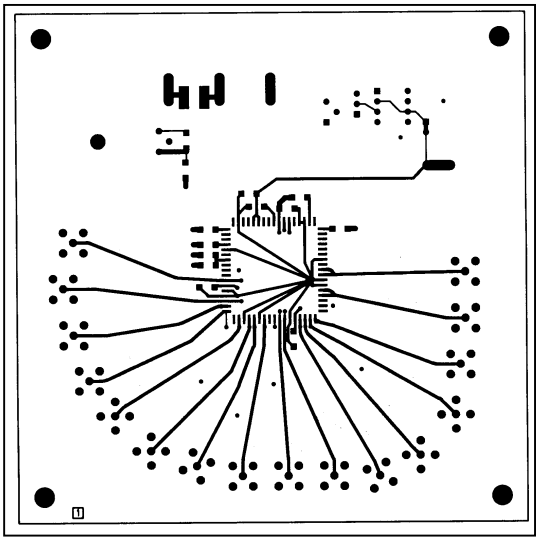


Figure 4. MAX555 EV Kit PC Board Layout—Component Side

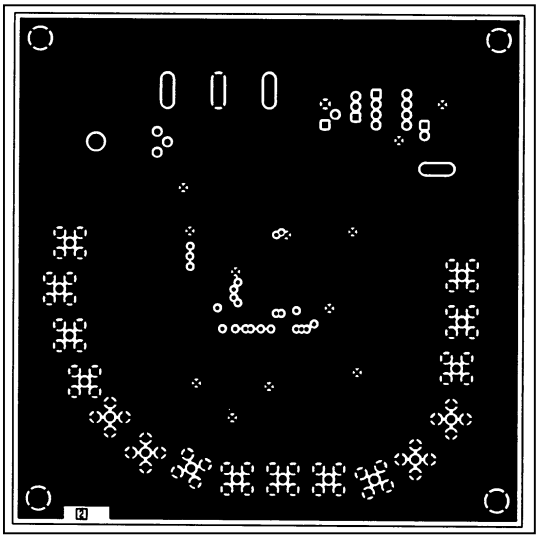


Figure 5. MAX555 EV Kit PC Board Layout—Layer 2 (Ground Layer)

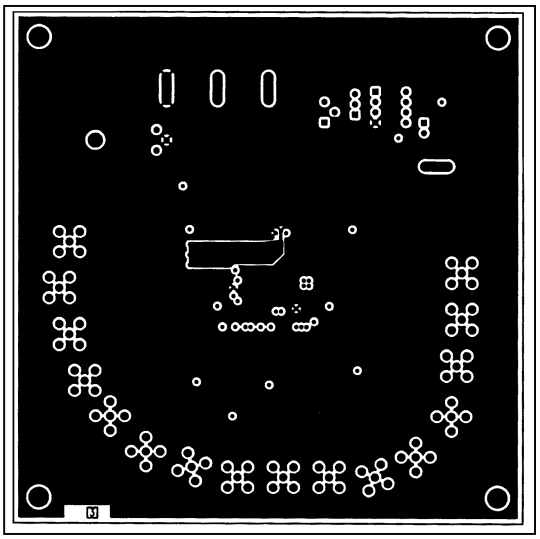


Figure 6. MAX555 EV Kit PC Board Layout—Layer 3 (Power Layer)

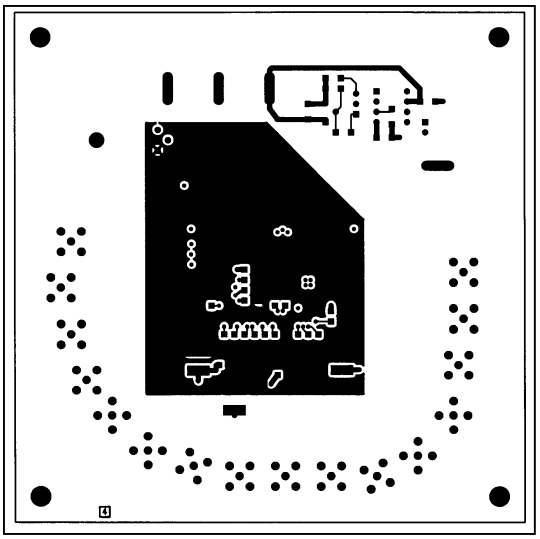


Figure 7. MAX555 EV Kit PC Board Layout—Back Side