



# MAX2900–MAX2904 Evaluation Kits

## General Description

The MAX2900–MAX2904 evaluation kits (EV kits) simplify testing of the MAX2900–MAX2904. The EV kits allow evaluation of the MAX2900–MAX2904's BPSK, OOK, ASK, and FM modulations; and fully integrated VCO, modulation filter, integrated frequency synthesizer, and power-management features.

The EV kits provide 50Ω SMA connectors for IF inputs and RF outputs. All critical peripheral components are included, and all EV kits are fully assembled and tested.

## Ordering Information

PART	TEMP RANGE	IC PACKAGE
MAX2900EVKIT	-40°C to +85°C	3 × 4 UCSP™
MAX2901EVKIT*	-40°C to +85°C	3 × 4 UCSP
MAX2902EVKIT	-40°C to +85°C	3 × 4 UCSP
MAX2903EVKIT	-40°C to +85°C	3 × 4 UCSP
MAX2904EVKIT	-40°C to +85°C	3 × 4 UCSP

\*Please order the MAX2900EVKIT.

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## Features

- ◆ Single-Supply Operation
- ◆ 50Ω SMA Connectors on all IF and RF Ports
- ◆ Baluns Included for Single-Ended RF Output
- ◆ Easy Evaluation of BPSK, OOK, ASK, and FM Modulations
- ◆ Digital Control Synthesizer Programming (MAX2900)
- ◆ Four Modes of Operation
  - Shutdown
  - Synthesizer
  - Transmit
  - Reference Only

## Component Suppliers

SUPPLIERS	PHONE	FAX	WEBSITE
AVX	843-448-9411	843-448-7139	www.avxcorp.com
Coilcraft	800-322-2645	847-639-1469	www.coilcraft.com
Murata	770-436-1300	770-436-3030	www.murata.com
Taiyo Yuden	800-368-2496	408-573-4159	www.t-yuden.com
Toko	847-297-0070	847-699-7864	www.tokoam.com

**Note:** Please indicate that you are using the MAX2900 when contacting these component suppliers.

## Component List MAX2900 EV Kit

DESIGNATION	QTY	DESCRIPTION
C1	1	Open
C2	1	3pF ±0.1pF, 50V ceramic capacitor (0603) Murata GRM39C0G030B050AD
C3	1	270pF ±10%, 50V ceramic capacitor (0603) Murata GRM188R71H271KD01
C4, C8	2	0.01μF ±10%, 50V ceramic capacitors (0603) Murata GRM39X7R103K050AD Murata GRM188R71E103KA01 Taiyo Yuden UMK107B103KZ-B

DESIGNATION	QTY	DESCRIPTION
C5, C25, C26, C28	4	1000pF ±10%, 50V ceramic capacitors (0603) Murata GRM39X7R102K050AD Murata GRM188R71H102KA01 Taiyo Yuden UMK107B102KZ-B
C6, C7, C9, C10, C27	5	100pF ±5%, 50V ceramic capacitors (0603) Murata GRM39C0G101J050AD Murata GRM1885C1H101JA01
C11	1	100pF ±5% ceramic capacitor (0402) Murata GRM36C0G101J050AQ Murata GRP1555C1H101J



# MAX2900–MAX2904 Evaluation Kits

## Component List MAX2900 EV Kit (continued)

Evaluate: MAX2900–MAX2904

DESIGNATION	QTY	DESCRIPTION
C12	1	0.01 $\mu$ F $\pm$ 10% ceramic capacitor (0402) Murata GRM36X7R103K016A Murata GRP155CR71C103K
C13, C14	2	10 $\mu$ F $\pm$ 20%, 10V tantalum capacitors, case A AVX TAJA106K010R
C15, C16	2	3.3pF $\pm$ 0.1pF, 50V ceramic capacitors (0603) Murata GRM39C0G3R3B050AD
C19, C20, C37	3	Open
C21, C31, C32	3	15pF $\pm$ 5%, 50V ceramic capacitors (0603) Murata GRM39C0G150J50 Murata GRM1885C1H150JZ01
C23	1	22pF $\pm$ 5%, 50V ceramic capacitor (0603) Murata GRM39C0G220J050AD Murata GRM1885C1H220JZ01
C24	1	10pF $\pm$ 0.1pF, 50V ceramic capacitor (0603) Murata GRM39C0G100B050AD
C29	1	0.1 $\mu$ F $\pm$ 10%, 16V ceramic capacitor (0603) Murata GRM39X7R104K016AD Murata GRM188R71C104KA01D Taiyo Yuden EMK107BJ104KA
C30	1	10 $\mu$ F $\pm$ 20%, 10V tantalum capacitor, case B AVX TAJB106M010R
C33, C34	2	1.6pF $\pm$ 0.1pF, 50V ceramic capacitors (0603) Murata GRM39C0G1R6B050AD Murata GRM1885C1H1R6B
C35	1	Open
C36	1	22 $\mu$ F $\pm$ 10%, 10V tantalum capacitor, case B AVX TAJB226K010R
C38, C39	2	1.8pF $\pm$ 0.1pF, 50V ceramic capacitors (0603) Murata GRM39C0G1R8B050AD Murata GRM1885C1H1R8B

DESIGNATION	QTY	DESCRIPTION
DIVOUT, GND, LD, TUNE, VASK, VCC	6	Test points Mouser 151-203
JU1, JU2, JU4, JU6, JU7, JU9	6	Jumpers, SIP3, 3-pin headers Digi-Key S1012-36-ND or equivalent
JU3, JU8	2	Jumpers, SIP2, 2-pin headers Digi-Key S1012-36-ND or equivalent
L1, L2	2	11nH $\pm$ 5% inductors (0603) Coilcraft 0603CS-11NXJBC
L3, L4	2	12nH $\pm$ 5% inductors (0603) Coilcraft 0603CS-12NTJBC
L5	1	8.2nH $\pm$ 5% chip inductor (0603) Murata LQG11A8N2J00
L6, L7	2	15nH $\pm$ 2% chip inductors (0603) Murata LQP11A15NG00 Murata LQP18MN15NG00
L8, L9	2	Open
R1	1	0 $\Omega$ resistor (0603)
R2	1	51k $\Omega$ $\pm$ 5% resistor (0603)
R3	1	1.6k $\Omega$ $\pm$ 5% resistor (0603)
R4	1	10k $\Omega$ $\pm$ 5% resistor (0603)
R5	1	68k $\Omega$ $\pm$ 5% resistor (0603)
R6, R7, R12, R13, R14	5	Open
R8	1	22k $\Omega$ $\pm$ 5% resistor (0603)
R9	1	0 $\Omega$ resistor (0603)
R10, R11	2	0 $\Omega$ resistors (0402)
R15	1	10 $\Omega$ resistor (0402)
REF, RF, VCO	3	SMA connectors, PC edge mount EFJohnson 142-0701-801 Digi-Key J502-ND
T1	1	Balun Toko B4F (617DB-1018)
U1*	1	MAX2900EGI
Y1	1	Open
None	8	Shunts, JU1–JU4, JU6–JU9 Digi-Key S9000-ND or equivalent
None	1	MAX2900 PC board
None	1	MAX2900 data sheet
None	1	MAX2900 EV kit data sheet

\*Supplied by Maxim

# MAX2900-MAX2904 Evaluation Kits

## Component List MAX2902 EV Kit

Evaluate: MAX2900-MAX2904

DESIGNATION	QTY	DESCRIPTION
C1, C35	2	Open
C2	1	82pF ±5%, 50V ceramic capacitor (0603) Murata GRM39C0G820J050AD Murata GRM1885C1H820J
C3	1	1nF ±5%, 25V ceramic capacitor (0603) Murata GRM39X7R102J025AD GRM188R71H102J
C4, C8	2	0.01µF ±10%, 50V ceramic capacitors (0603) Murata GRM39X7R103K050AD Murata GRM188R71E103KA01 Taiyo Yuden UMK107B103KZ
C5, C25, C26, C28	4	1000pF ±10%, 50V ceramic capacitors (0603) Murata GRM39X7R102K050AD Murata GRM188R71E102KA01 Taiyo Yuden UMK107B102KZ-B
C6, C7, C9, C10, C27	5	100pF ±5%, 50V ceramic capacitors (0603) Murata GRM39C0G101J050AD
C11, C19	2	100pF ±10%, 50V ceramic capacitors (0402) Murata GRM36C0G101K50AD Murata GRP1555C1H101K
C12	1	0.01µF ±10% ceramic capacitor (0402) Murata GRM36X7R103K016A Murata GRP155CR71C103K
C13, C14	2	10µF ±20%, 16V tantalum capacitors, case A TAJA106M016R
C15, C16	2	3.3pF ±0.1pF, 50V ceramic capacitors (0603) Murata GRM39C0G3R3B050AD
C20, C37	2	1.2pF ±0.1pF, 50V ceramic capacitors GRM36C0G1R2B050AD GRP1555C1H1R2B
C21, C31, C32	3	15pF ±5%, 50V ceramic capacitors (0603) Murata GRM39C0G150J50 Murata GRM1885C1H150JZ01
C23	1	22pF ±5%, 50V ceramic capacitor (0603) Murata GRM39C0G220J050AD Murata GRM1885C1H220JZ01
C24	1	10pF ±0.1pF, 50V ceramic capacitor (0603) Murata GRM39C0G100B050AD

DESIGNATION	QTY	DESCRIPTION
C29	1	0.1µF ±10%, 16V ceramic capacitor (0603) Murata GRM39X7R104K016AD Murata GRM188R71C104KA01D Taiyo Yuden EMK107BJ104KA
C30	1	10µF ±20%, 10V tantalum capacitor, case B AVX TAJB106M010R
C33, C34	2	1.5pF ±0.1pF, 50V ceramic capacitors (0603) Murata GRM39C0G1R5B050AD Murata GRM1885C1H1R5B
C36	1	22µF ±10%, 10V tantalum capacitor, case B AVX TAJB226K010R
C38, C39	2	1.8pF ±0.1pF, 50V ceramic capacitors (0603) Murata GRM39C0G1R8B050 Murata GRM1885C1H1R8B
DIVOUT, GND, LD, TUNE, VASK, VCC	6	Test points Mouser 151-203
JU1, JU2, JU4, JU6, JU7, JU9	6	Jumpers, SIP3, 3-pin headers Digi-Key S1012-36-ND or equivalent
JU1-JU4, JU6-JU9	8	Shunts Digi-Key S9000-ND or equivalent
JU3, JU8	2	Jumpers, SIP2, 2-pin headers Digi-Key S1012-36-ND or equivalent
L1, L2	2	11nH ±5% inductors (0603) Coilcraft 0603CS-11NXJBC
L3, L4	2	12nH ±5% inductors (0603) Coilcraft 0603CS-12NXJBC
L5	1	8.2nH ±5% inductor (0603) Murata LQG11A8N2J00
L6, L7	2	15nH ±5% inductors (0603) Murata LQG11A15NJ00 Murata LQG18MN15NJ00
L8, L9	2	9.1nH ±0.1nH inductors (0402) Murata LQP10A9N1B00 Murata LQP15MN9N1B00
R1, R9	2	0Ω ±5% resistors (0603)
R2	1	51kΩ ±5% resistor (0603)
R3	1	1.6kΩ ±5% resistor (0603)
R4	1	2.7kΩ ±5% resistor (0603)
R5	1	68kΩ ±5% resistor (0603)
R6, R7, R10-R14	7	Open

# MAX2900–MAX2904 Evaluation Kits

## Component List MAX2902 EV Kit (continued)

DESIGNATION	QTY	DESCRIPTION
R8	1	22k $\Omega$ $\pm$ 5% resistor (0603)
R15	1	10 $\Omega$ resistor (0402)
REF, RF, VCO	3	SMA connectors, PC edge mount EFJohnson 142-0701-801 Digi-Key J502-ND
T1	1	Balun Toko B4F (617DB-1018)
U1*	1	MAX2902EGI
Y1	1	Open
None	1	MAX2902 PC board
None	1	MAX2902 data sheet
None	1	MAX2902 EV kit data sheet

\*Supplied by Maxim

## Component List MAX2903 EV Kit

DESIGNATION	QTY	DESCRIPTION
C1, C35	2	Open
C2	1	82pF $\pm$ 5%, 50V ceramic capacitor (0603) Murata GRM39C0G820J050AD Murata GRM1885C1H820J
C3	1	1nF $\pm$ 5%, 25V ceramic capacitor (0603) Murata GRM39C0G102J025AD
C4, C8	2	0.01 $\mu$ F $\pm$ 10%, 50V ceramic capacitors (0603) Murata GRM39X7R103K050AD Murata GRM188R71E103KA01 Taiyo Yuden UMK107B103KZ
C5, C25, C26, C28	4	1000pF $\pm$ 10%, 50V ceramic capacitors (0603) Murata GRM39X7R102K050AD Murata GRM188R71E102KA01 Taiyo Yuden UMK107B102KZ-B
C6, C7, C9, C10, C27	5	100pF $\pm$ 5%, 50V ceramic capacitors (0603) Murata GRM39C0G101J050AD
C11, C19	2	100pF $\pm$ 5%, 50V ceramic capacitors (0402) Murata GRM36C0G101J50AD Murata GRP1555C1H101J
C12	1	0.01 $\mu$ F $\pm$ 10% ceramic capacitor (0402) Murata GRM36X7R103K016A Murata GRP155CR71C103K
C13, C14	2	10 $\mu$ F $\pm$ 20%, 16V tantalum capacitors, case A TAJA106M016R

## Component List MAX2903 EV Kit (continued)

DESIGNATION	QTY	DESCRIPTION
C15, C16	2	1.2pF $\pm$ 5%, 50V ceramic capacitors (0603) Murata GRM39C0G1N2J050AD
C20, C37	2	1.2pF $\pm$ 0.1pF, 50V ceramic capacitors (0402) GRM36C0G1R2B050AD GRP1555C1H1R2B
C21	1	6.8pF $\pm$ 5%, 50V ceramic capacitor (0603) Murata GRM39C0G6R8J050 Murata GRM1885C1H6R8J
C23	1	22pF $\pm$ 5%, 50V ceramic capacitor (0603) Murata GRM39C0G220J050AD Murata GRM1885C1H220JZ01
C24	1	10pF $\pm$ 0.1pF, 50V ceramic capacitor (0603) Murata GRM39C0G100B050AD
C29	1	0.1 $\mu$ F $\pm$ 10%, 16V ceramic capacitor (0603) Murata GRM39X7R104K016AD Murata GRM188R71C104KA01D Taiyo Yuden EMK107BJ104KA
C30	1	10 $\mu$ F $\pm$ 20%, 10V tantalum capacitor, case B AVX TAJB106M010R
C31, C32	2	1.8pF $\pm$ 0.1pF, 50V ceramic capacitors (0603) Murata GRM39C0G040B050AD
C33, C34	2	0.5pF $\pm$ 0.1pF, 50V ceramic capacitors (0603) Murata GRM39C0G0R5C050AD
C36	1	22 $\mu$ F $\pm$ 10%, 10V tantalum capacitor, case B AVX TAJB226K010R
C38, C39	2	1.2pF $\pm$ 0.1pF, 50V ceramic capacitors (0603) Murata GRM39C0G1R2B050 Murata GRM1885C1H1R2B
DIVOUT, GND, LD, TUNE, VASK, VCC	6	Test points Mouser 151-203
JU1–JU4, JU6–JU9	8	Shunts Digi-Key S9000-ND or equivalent
JU1, JU2, JU4, JU6, JU7, JU9	6	Jumpers, SIP3, 3-pin headers Digi-Key S1012-36-ND or equivalent

# MAX2900-MAX2904 Evaluation Kits

## Component List MAX2903 EV Kit (continued)

DESIGNATION	QTY	DESCRIPTION
JU3, JU8	2	Jumpers, SIP2, 2-pin headers Digi-Key S1012-36-ND or equivalent
L1, L2	2	12nH ±5% inductors (0603) Coilcraft 0603CS-12NXJBC
L3, L4	2	27nH ±5% inductors (0603) Coilcraft 0603CS-24NXJBC
L5, L6, L7	3	33nH ±5% chip inductors (0603) Coilcraft 0603CS-33NXJB
L8, L9	2	10nH ±2% inductors (0402) Murata LQP10A10NG00
R1, R9	2	0Ω ±5% resistors (0603)
R2	1	51kΩ ±5% resistor (0603)
R3	1	1.6kΩ ±5% resistor (0603)
R4	1	2.7kΩ ±5% resistor (0603)
R5	1	68kΩ ±5% resistor (0603)
R6, R7, R10, R11, R12	5	Open
R8	1	30kΩ ±5% resistor (0603)
R13	1	0Ω ±5% resistor (0402)
R14	1	5.1kΩ resistor (0402)
R15	1	10Ω ±1% resistor (0402)
REF, RF, VCO	3	SMA connectors, PC edge mount EFJohnson 142-0701-801 Digi-Key J502-ND
T1	1	Balun Toko B4F (617DB-1018)
U1*	1	MAX2903EGI
Y1	1	Open
None	1	MAX2903 PC board
None	1	MAX2903 data sheet
None	1	MAX2903 EV kit data sheet

\*Supplied by Maxim

## Component List MAX2904 EV Kit

DESIGNATION	QTY	DESCRIPTION
C1, C35	2	Open
C2	1	82pF ±5%, 50V ceramic capacitor (0603) Murata GRM39C0G820J050AD Murata GRM1885C1H820J
C3	1	1nF ±5%, 25V ceramic capacitor (0603) Murata GRM39C0G102J025AD

## Component List MAX2904 EV Kit (continued)

DESIGNATION	QTY	DESCRIPTION
C4, C8	2	0.01μF ±10%, 50V ceramic capacitors (0603) Murata GRM39X7R103K050AD Murata GRM188R71E103KA01 Taiyo Yuden UMK107B103KZ
C5, C25, C26, C28	4	1000pF ±10%, 50V ceramic capacitors (0603) Murata GRM39X7R102K050AD Murata GRM188R71E102KA01 Taiyo Yuden UMK107B102KZ-B
C6, C7, C9, C10, C27	5	100pF ±5%, 50V ceramic capacitors (0603) Murata GRM39C0G101J050AD
C11, C19	2	100pF ±5%, 50V ceramic capacitors (0402) Murata GRM36C0G101J50AD Murata GRP1555C1H101J
C12	1	0.01μF ±10% ceramic capacitor (0402) Murata GRM36X7R103K016A Murata GRP155CR71C103K
C13, C14	2	10μF ±20%, 16V tantalum capacitors, case A TAJA106M016R
C15, C16	2	1.2pF ±0.25pF, 50V ceramic capacitors (0603) Murata GRM39C0G1N2J050AD
C20, C37	2	1.2pF ±0.1pF, 50V ceramic capacitors (0402) Murata GRM36C0G1R2B050AD Murata GRP1555C1H1R2B
C21	1	6.8pF ±5%, 50V ceramic capacitor (0603) Murata GRM39C0G6R8J050 Murata GRM1885C1H6R8J
C23	1	22pF ±5%, 50V ceramic capacitor (0603) Murata GRM39C0G220J050AD Murata GRM1885C1H220JZ01
C24	1	10pF ±0.1pF, 50V ceramic capacitor (0603) Murata GRM39C0G100B050AD

Evaluate: MAX2900-MAX2904

# MAX2900–MAX2904 Evaluation Kits

## Component List MAX2904 EV Kit (continued)

DESIGNATION	QTY	DESCRIPTION
C29	1	0.1 $\mu$ F $\pm$ 10%, 16V ceramic capacitor (0603) Murata GRM39X7R104K016AD Murata GRM188R71C104KA01D Taiyo Yuden EMK107BJ104KA
C30	1	10 $\mu$ F $\pm$ 20%, 10V tantalum capacitor, case B AVX TAJB106M010R
C31, C32	2	1.8pF $\pm$ 0.1pF, 50V ceramic capacitors (0603) Murata GRM39C0G040B050AD
C33, C34	2	0.5pF $\pm$ 0.1pF, 50V ceramic capacitors (0603) Murata GRM39C0G0R5C050AD
C36	1	22 $\mu$ F $\pm$ 10%, 10V tantalum capacitor, case B AVX TAJB226K010R
C38, C39	2	1.2pF $\pm$ 0.1pF, 50V ceramic capacitors (0603) Murata GRM39C0G1R2B050 Murata GRM1885C1H1R2B
DIVOUT, GND, LD, TUNE, VASK, VCC	6	Test points Mouser 151-203
JU1, JU2, JU4, JU6, JU7, JU9	6	Jumpers, SIP3, 3-pin headers Digi-Key S1012-36-ND or equivalent
JU1–JU4, JU6–JU9	8	Shunts Digi-Key S9000-ND or equivalent
JU3, JU8	2	Jumpers, SIP2, 2-pin headers, Digi-Key S1012-36-ND or equivalent
L1, L2	2	12nH $\pm$ 5% inductors (0603) Coilcraft 0603CS-12NXJBC

DESIGNATION	QTY	DESCRIPTION
L3, L4	2	27nH $\pm$ 5% inductors (0603) Coilcraft 0603CS-24NXJBC
L5, L6, L7	3	33nH $\pm$ 5% chip inductors (0603) Coilcraft 0603CS-33NXJB
L8, L9	2	10nH $\pm$ 2% inductors (0402) Murata LQP10A10NG00
R1, R9	2	0 $\Omega$ $\pm$ 5% resistors (0603)
R2	1	51k $\Omega$ $\pm$ 5% resistor (0603)
R3	1	1.6k $\Omega$ $\pm$ 5% resistor (0603)
R4	1	2.7k $\Omega$ $\pm$ 5% resistor (0603)
R5	1	68k $\Omega$ $\pm$ 5% resistor (0603)
R6, R7, R10–R14	7	Open
R8	1	30k $\Omega$ $\pm$ 5% resistor (0603)
R15	1	10 $\Omega$ $\pm$ 1% resistor (0402)
REF, RF, VCO	3	SMA connectors, PC edge mount EFJohnson 142-0701-801 Digi-Key J502-ND
T1	1	Balun Toko B4F (617DB-1018)
U1*	1	MAX2904EGI
Y1	1	Open
None	1	MAX2904 PC board
None	1	MAX2904 data sheet
None	1	MAX2904 EV kit data sheet

\*Supplied by Maxim

### Quick Start

The MAX2900–MAX2904 EV kits are fully assembled and factory tested. Follow the instructions in the *Connections and Setup* section.

### Test Equipment Required

This section lists the recommended test equipment to verify the operation of the MAX2900–MAX2904. It is intended as a guide only, and substitutions may be possible.

- One RF signal generator capable of delivering -7dBm of output power in the 10MHz to 50MHz frequency range (HP 8648A or equivalent) for the PLL reference frequency.
- An RF spectrum analyzer capable of measuring a 7GHz RF signal (Rohde and Schwarz FSEA20 or equivalent).

- An RF power meter capable of measuring 30dBm output power (HP 437B or equivalent) with an RF high-power sensor.
- A vector signal analyzer (AG 89441 or equivalent)
- An RF network analyzer (HP 8753E or equivalent)
- A power supply that can provide 250mA at +5.0V (AG E3631A or equivalent)
- Optionally, an additional voltage source for VCO tuning voltage
- A 20dB RF attenuator
- An arbitrary waveform generator (HP E4433B or equivalent)



# MAX2900–MAX2904 Evaluation Kits

**Table 1. Jumper Description**

JUMPER			NAME	DESCRIPTION
MAX2900	MAX2901/ MAX2903	MAX2902/ MAX2904		
1	1	1	EN	Chip Enable
2	2	2	REFEN	Reference Enable
3	3	3	MODIN	BPSK Modulation Input
4	4	4	OOKIN	OOK Modulation Input
6/7	—	—	D0/D1	Digital Synthesizer Programming Input
—	6/7	6/7	VCO+ / VCO-	VCO Output
8	8	8	REFOUT	REF Output
9	—	—	D2	Digital Synthesizer Programming Input
—	9	—	DIV63	Digital Synthesizer Programming Input
—	—	9	N.C.	Not Connected

### Connections and Setup

This section provides step-by-step instructions for getting the EV kits up and running in all operation modes.

- 1) Verify that shunts JU1, JU2, JU4, JU6, JU7, and JU9 are in place.
- 2) Set the power supply to +4V and turn it off.
- 3) Set the adjustable power supply to +2.1V and turn it off.
- 4) Connect the ground terminal to GND.
- 5) Connect the positive +4.0V terminal to VCC.
- 6) Connect the positive terminal of the adjustable power supply to VASK.
- 7) Set the IF generator to 14.56MHz and set the output level to 200mV. Keep the IF generator output off.
- 8) Use an SMA cable to connect the output of the IF generator to the REFIN on the MAX2900–MAX2904 EV kits.
- 9) Use an SMA cable to connect the RFOUT to the input of the spectrum analyzer.
- 10) Set the spectrum analyzer to view the output.
- 11) Turn on all power supplies and enable the signal generator.
- 12) Measure the supply current.
- 13) Observe the RF output frequency displayed on the spectrum analyzer.
- 14) Measure the RF output power.
- 15) The RF output power should be approximately 23dBm after accounting for cable and connector loss.

### Adjustments and Control

#### Operation Modes

The EV kits support four modes of operation:

- SHUTDOWN mode—EN = REFEN = low. (Shunt pins 2 and 3 of JU1, JU2).
- SYNTH mode—EN = REFEN = high, OOKIN = low. (Shunt pins 1 and 2 of JU1, JU2; shunt pins 2 and 3 of JU4).
- TRANSMIT mode—EN = REFEN = OOKIN = high. (Shunt pins 1 and 2 of JU1, JU2, JU4).
- REFERENCE only mode—REFEN = high, EN = low. (Shunt pins 2 and 3 of JU1. Shunt pins 1 and 2 of JU2).

See Table 1 for jumper selection.

#### Modulations

The IC supports various modulation modes:

- BPSK is obtained through the MODIN pin (JU3).
- OOK is obtained digitally with the OOKIN pin (JU4).
- ASK is obtained through the VASK pin.
- FM is imposed on the VCO or the reference.

#### Synthesizer Programming (MAX2900/MAX2901/MAX2903)

The three pins D0, D1, D2 (JU6, JU7, and JU9) are used as digital entries to program the synthesizer division ratios (MAX2900). For MAX2901/MAX2903, pin DIV63 (JU9) is used to select the division ratio of 62 or 63. Refer to the MAX2900–MAX2904 data sheet for corresponding division ratios.

#### Modulation Filter and Power Management

The RLPF input controls the modulation filter center frequency. Pins PWRSET and VASK are analog inputs

# MAX2900–MAX2904 Evaluation Kits

used to control the power of the transmitter. Changing the values of the resistors  $R_{RLPF}$  and  $R_{PWRSET}$  vary the modulation filter characteristics and output power level, respectively. Refer to the MAX2900–MAX2904 data sheet for details.

## Output Power Adjustment

The MAX2900–MAX2904 EV kits are tuned for specific output powers. For example, the MAX2900 EV kit is tuned for 23dBm at a 4.5V supply voltage. If other output power levels are desired, the user must modify some EV kit components. This section, intended as a guide only, provides instructions for tuning the EV kits at different power levels.

To achieve a different output power, modify  $R_{PWRSET}$  (R8) first. This resistor sets the bias current, which also controls efficiency and output power. To decrease output power, increase the value of R8. For more information, refer to the MAX2900–MAX2904 data sheet.

The output-matching network also must be changed to appropriate output power levels. For lower power levels, increase C15 and C16 capacitor values. To main-

tain the same LC filter corner frequency, change L3, L4, C33, and C34 accordingly. To achieve optimum performance, all component values must be tuned in the lab. Use the EV kit schematics as a guideline.

## Layout Issues

A good PC board is an essential part of an RF circuit design. The EV kit PC board can serve as a guide for laying out a board using the MAX2900–MAX2904. Keep traces carrying RF signals as short as possible to minimize radiation and insertion loss. Use impedance control on all RF signal traces. The  $V_{CC}$  node on the PC board should have decoupling capacitors to the closest ground. Refer to the *Layout* section of the MAX2900–MAX2904 data sheet for more information.



# MAX2900-MAX2904 Evaluation Kits

Evaluate: MAX2900-MAX2904

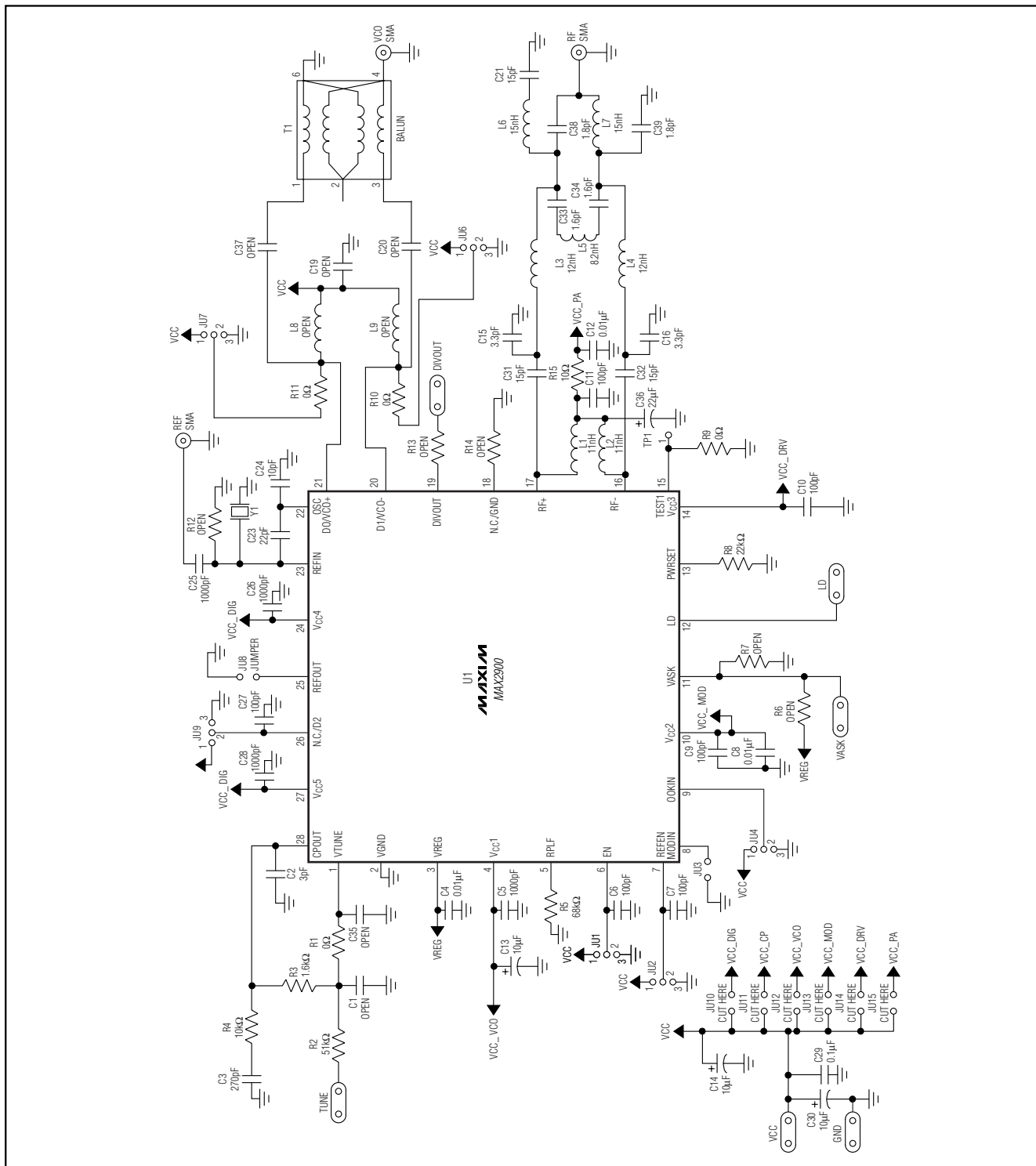


Figure 1. MAX2900 EV Kit Schematic

# MAX2900-MAX2904 Evaluation Kits

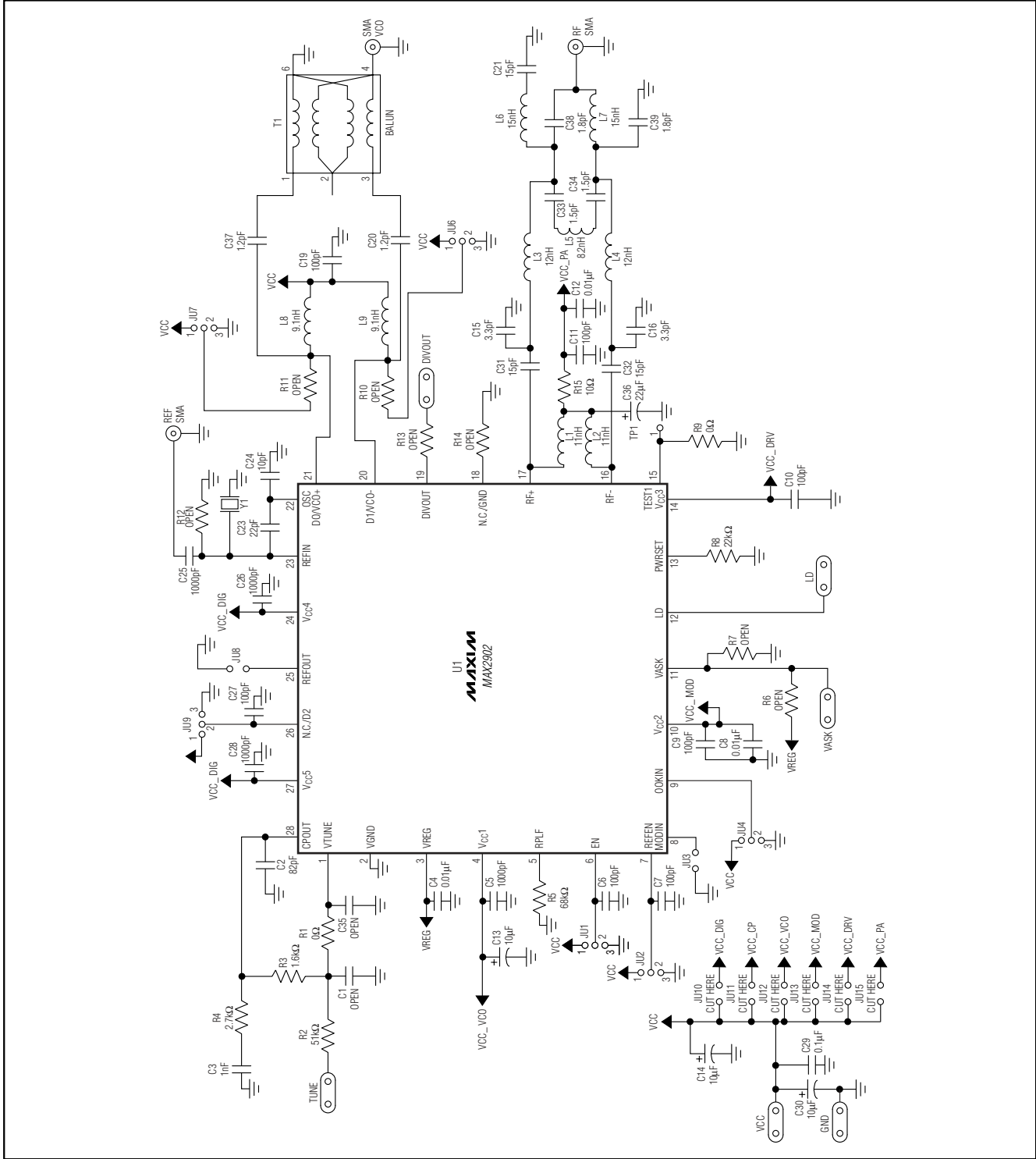


Figure 2. MAX2902 EV Kit Schematic

# MAX2900-MAX2904 Evaluation Kits

Evaluate: MAX2900-MAX2904

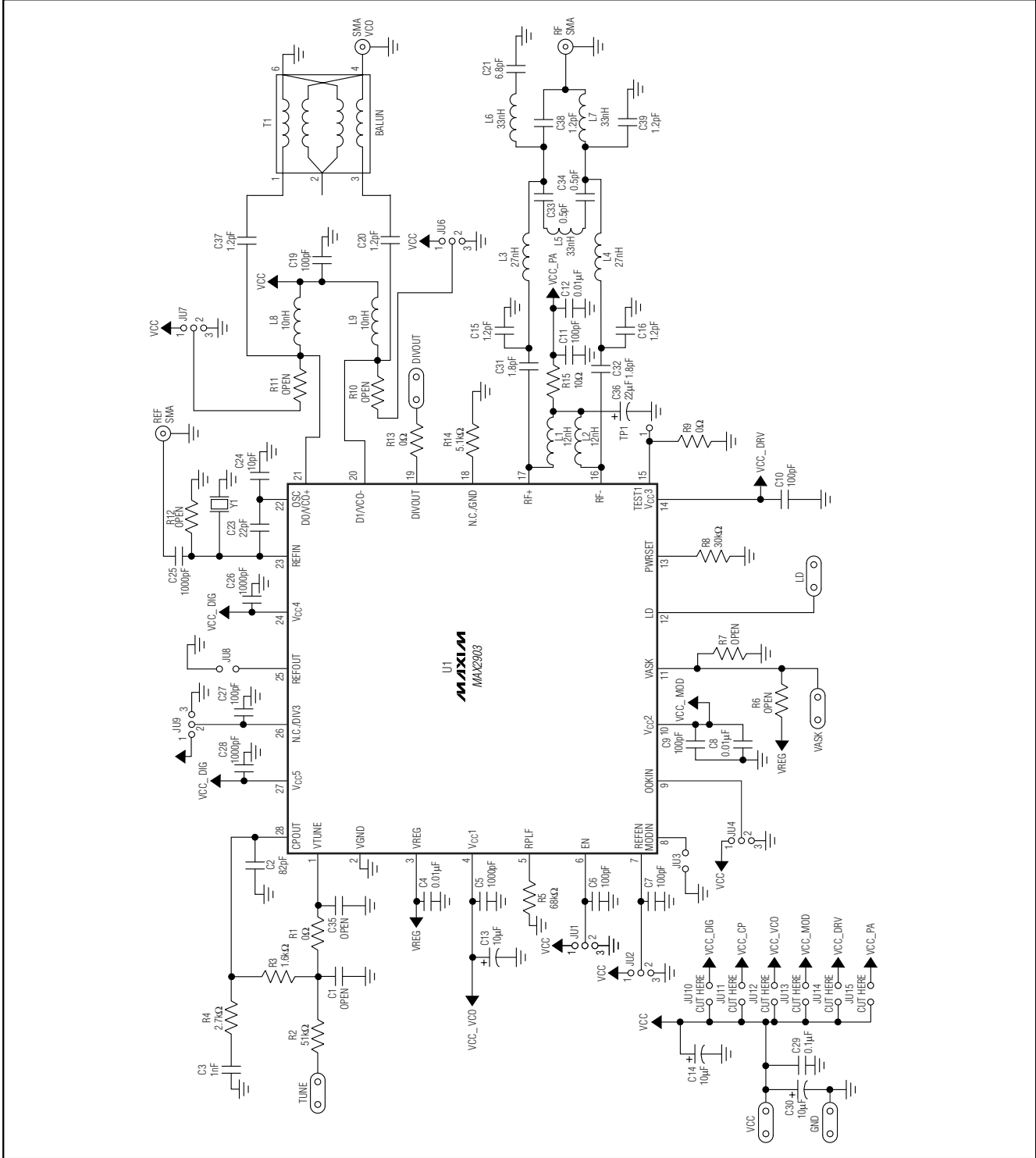


Figure 3. MAX2903 EV Kit Schematic

# MAX2900-MAX2904 Evaluation Kits

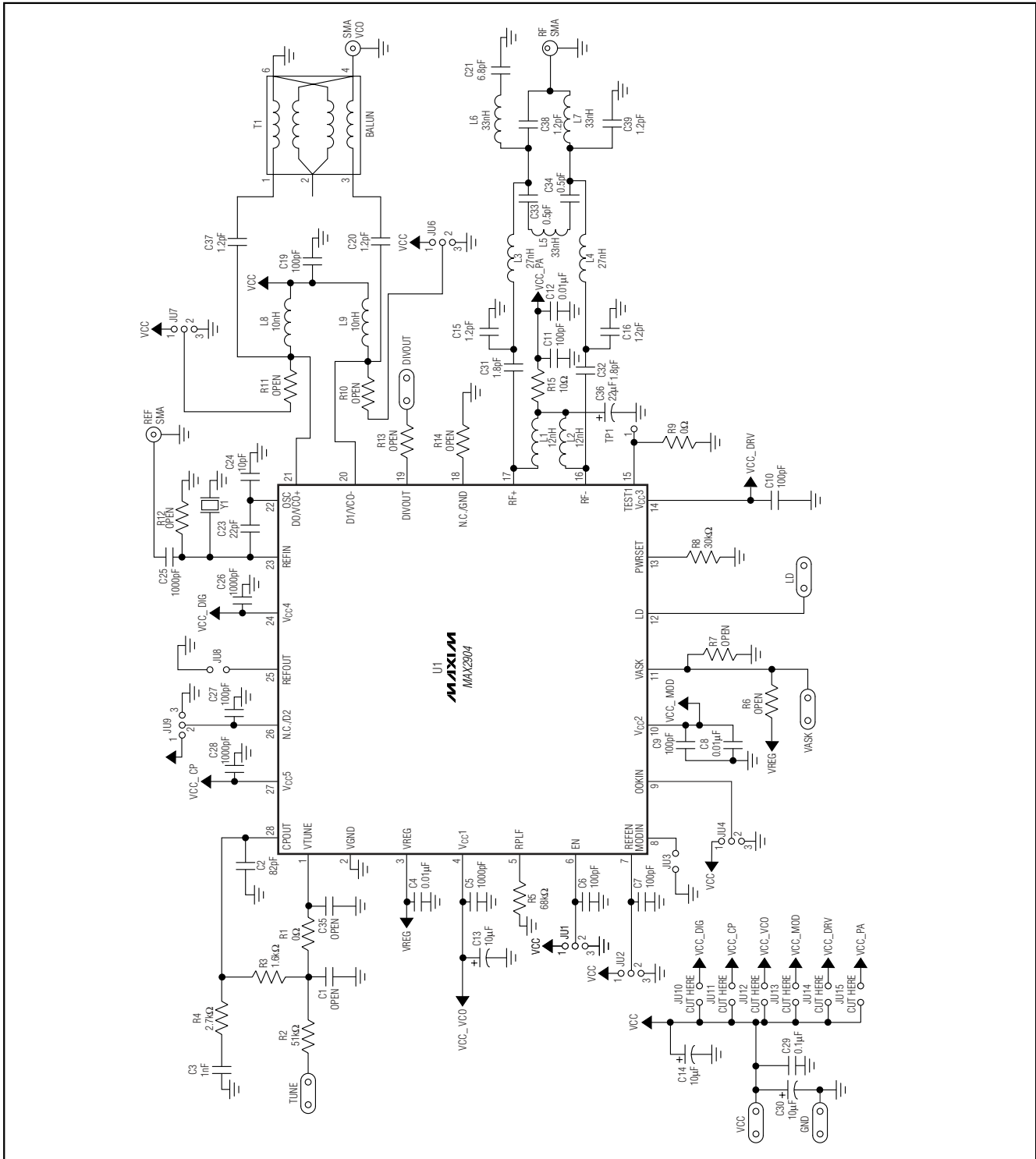


Figure 4. MAX2904 EV Kit Schematic

# MAX2900-MAX2904 Evaluation Kits

Evaluate: MAX2900-MAX2904

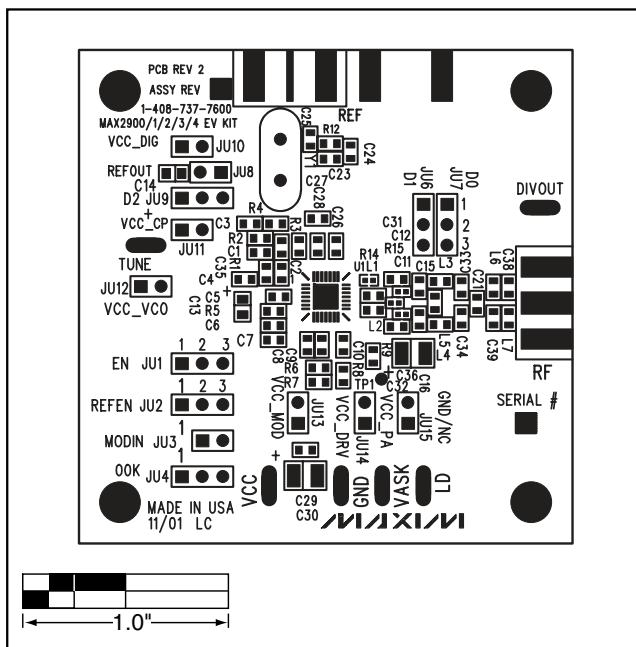


Figure 5. MAX2900-MAX2904 EV Kits—Top Silkscreen

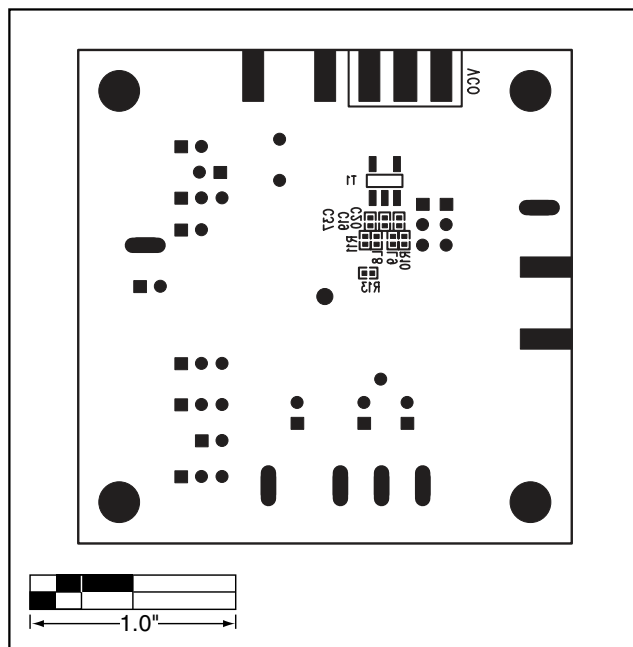


Figure 6. MAX2900-MAX2904 EV Kits—Bottom Silkscreen

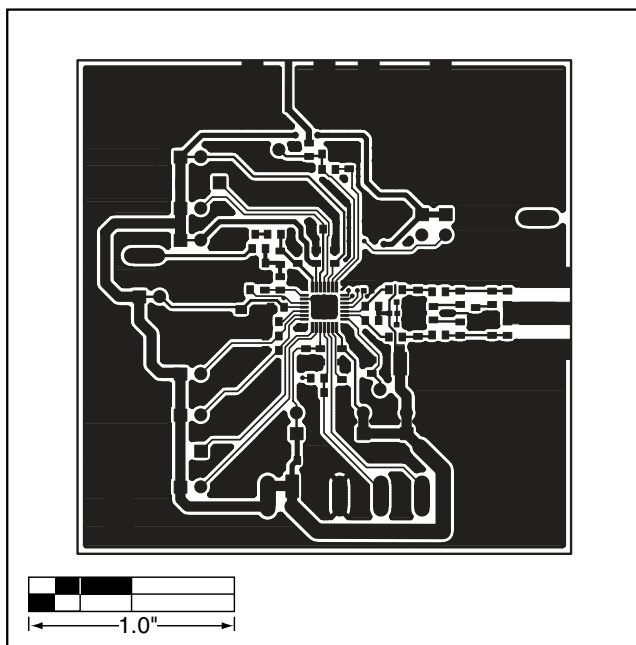


Figure 7. MAX2900-MAX2904 EV Kits PC Board Layout—Component Side

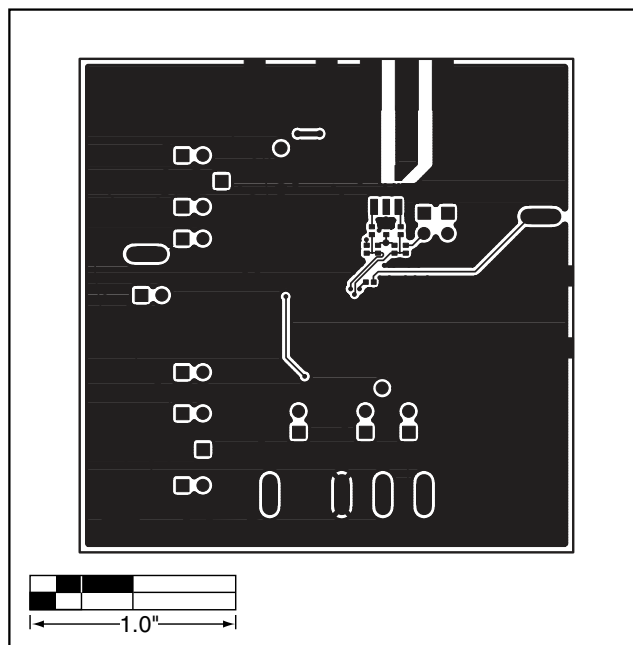


Figure 8. MAX2900-MAX2904 EV Kits PC Board Layout—Solder Side

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