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Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

Email & Skype: info@chipsmall.com Web: www.chipsmall.com

Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China





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.

UCSP is a trademark of Maxim Integrated Products, Inc.

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 | 0.01μF ±10% ceramic capacitor (0402) Murata GRM36X7R103K016A Murata GRP155CR71C103K |
| C13, C14 | 2 | 10μF ±20%, 10V tantalum capacitors, case A AVX TAJA106K010R |
| C15, C16 | 2 | 3.3pF ±0.1pF, 50V ceramic capacitors (0603) Murata GRM39C0G3R3B050AD |
| C19, C20, C37 | 3 | Open |
| 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 |
| 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 | 1.6pF ±0.1pF, 50V ceramic capacitors (0603) Murata GRM39C0G1R6B050AD Murata GRM1885C1H1R6B |
| C35 | 1 | Open |
| C36 | 1 | 22μF ±10%, 10V tantalum capacitor, case B AVX TAJB226K010R |
| C38, C39 | 2 | 1.8pF ±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 ±5% inductors (0603) Coilcraft 0603CS-11NXJBC |
| L3, L4 | 2 | 12nH ±5% inductors (0603) Coilcraft 0603CS-12NTJBC |
| L5 | 1 | 8.2nH ±5% chip inductor (0603) Murata LQG11A8N2J00 |
| L6, L7 | 2 | 15nH ±2% chip inductors (0603) Murata LQP11A15NG00 Murata LQP18MN15NG00 |
| L8, L9 | 2 | Open |
| R1 | 1 | 0Ω resistor (0603) |
| R2 | 1 | 51kΩ ±5% resistor (0603) |
| R3 | 1 | 1.6kΩ ±5% resistor (0603) |
| R4 | 1 | 10kΩ ±5% resistor (0603) |
| R5 | 1 | 68kΩ ±5% resistor (0603) |
| R6, R7, R12, R13, R14 | 5 | Open |
| R8 | 1 | 22kΩ ±5% resistor (0603) |
| R9 | 1 | 0Ω resistor (0603) |
| R10, R11 | 2 | 0Ω resistors (0402) |
| R15 | 1 | 10Ω 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 Ω \pm 5% resistor (0603) |
| R15 | 1 | 10 Ω 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 μ 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 μ F \pm 10% ceramic capacitor (0402) Murata GRM36X7R103K016A Murata GRP155CR71C103K |
| C13, C14 | 2 | 10 μ 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 μ F \pm 10%, 16V ceramic capacitor (0603) Murata GRM39X7R104K016AD Murata GRM188R71C104KA01D Taiyo Yuden EMK107BJ104KA |
| C30 | 1 | 10 μ 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 μ 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 μ F \pm 10%, 16V ceramic capacitor (0603) Murata GRM39X7R104K016AD Murata GRM188R71C104KA01D Taiyo Yuden EMK107BJ104KA |
| C30 | 1 | 10 μ 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 μ 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 Ω \pm 5% resistors (0603) |
| R2 | 1 | 51k Ω \pm 5% resistor (0603) |
| R3 | 1 | 1.6k Ω \pm 5% resistor (0603) |
| R4 | 1 | 2.7k Ω \pm 5% resistor (0603) |
| R5 | 1 | 68k Ω \pm 5% resistor (0603) |
| R6, R7, R10–R14 | 7 | Open |
| R8 | 1 | 30k Ω \pm 5% resistor (0603) |
| R15 | 1 | 10 Ω \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

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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.

Evaluate: MAX2900-MAX2904

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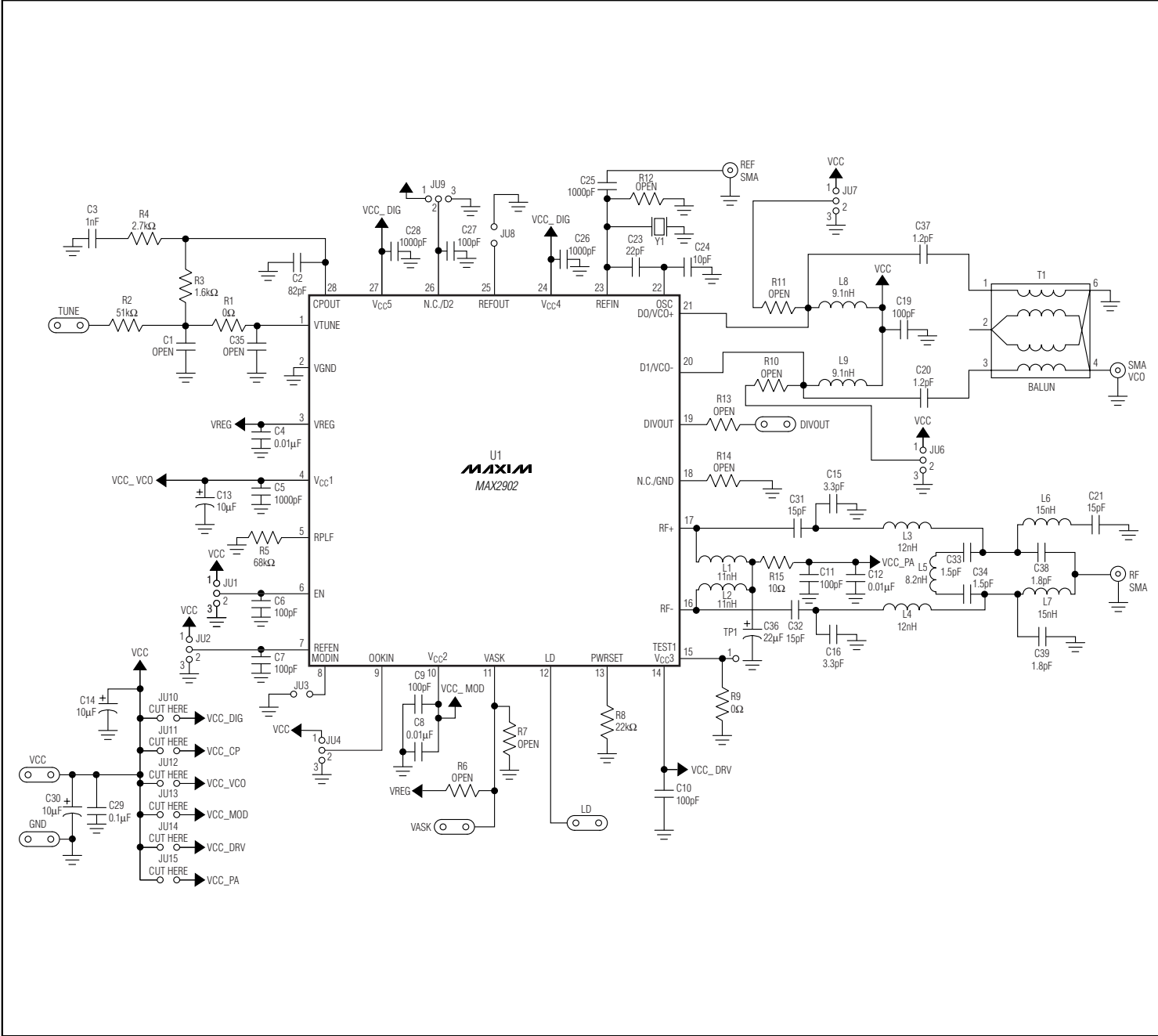
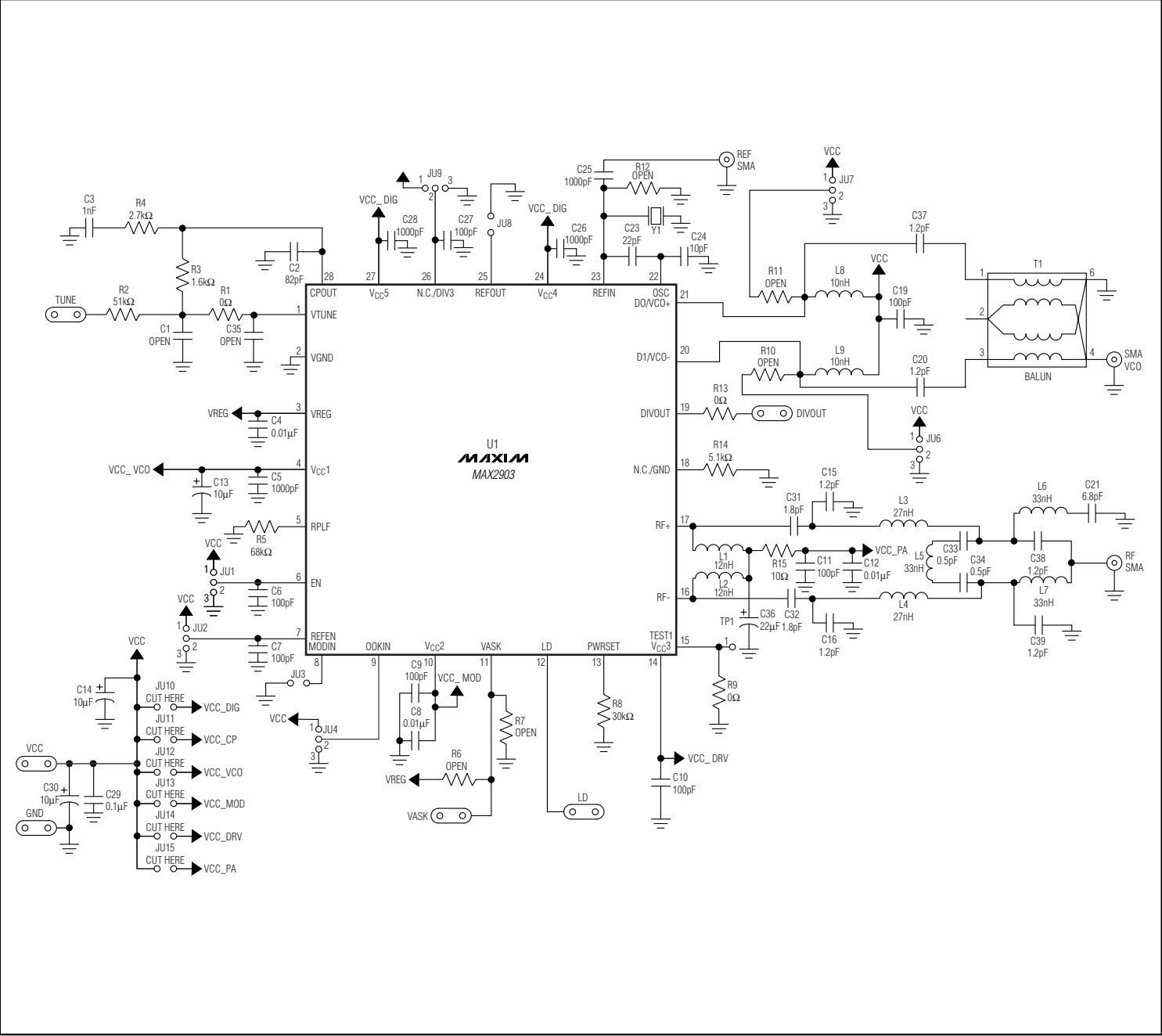


Figure 2. MAX2902 EV Kit Schematic

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Evaluate: MAX2900-MAX2904

Figure 3. MAX2903 EV Kit Schematic

Evaluate: MAX2900-MAX2904

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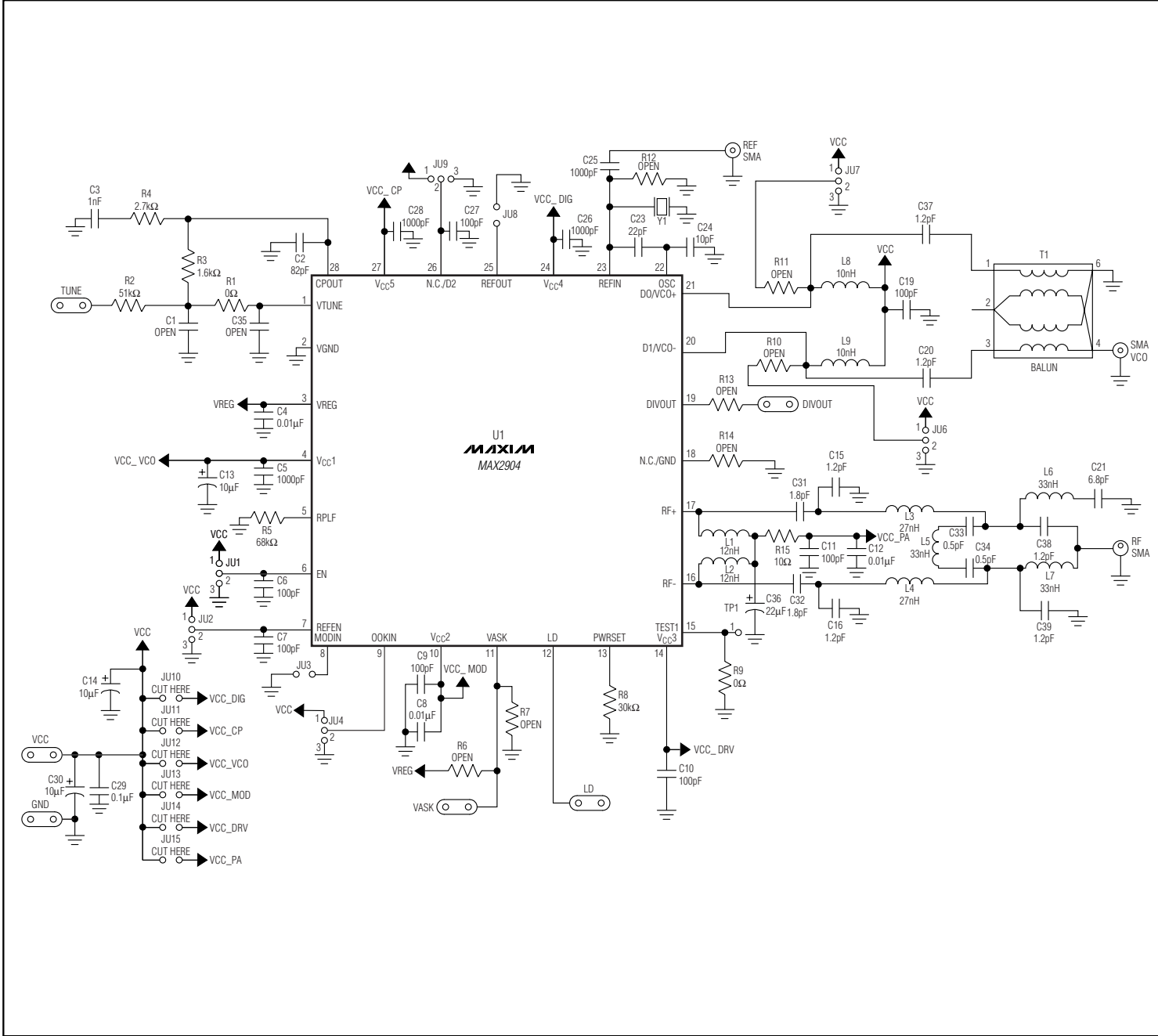


Figure 4. MAX2904 EV Kit Schematic

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Evaluate: MAX2900-MAX2904

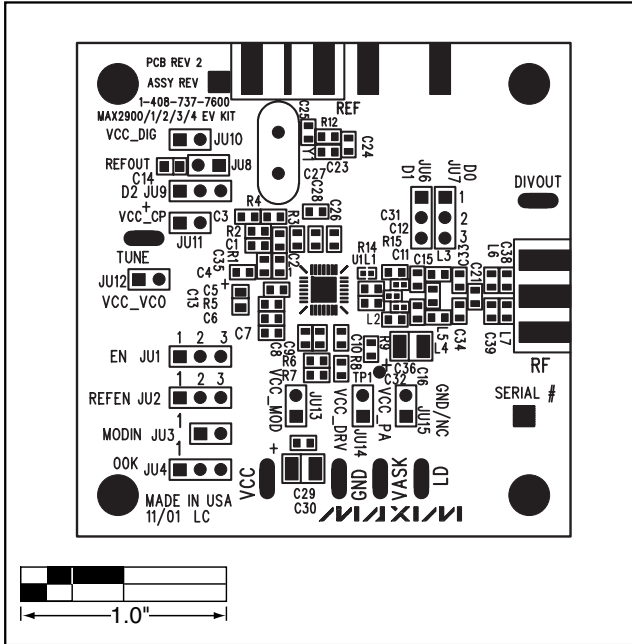


Figure 5. MAX2900-MAX2904 EV Kits—Top Silkscreen

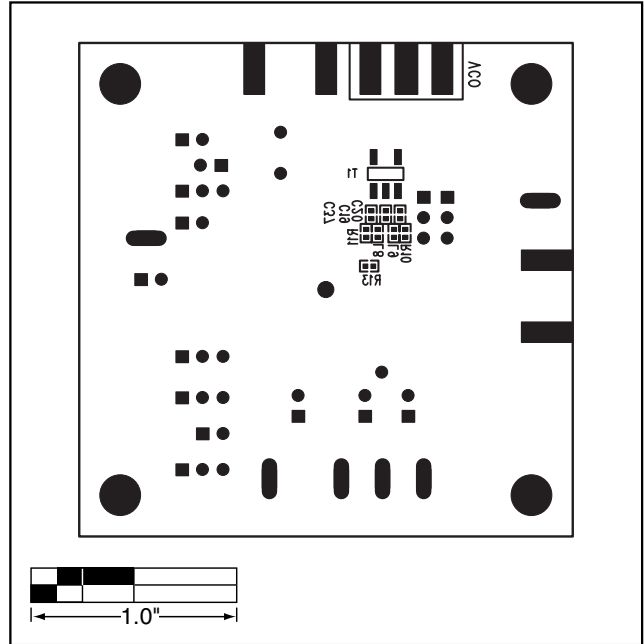


Figure 6. MAX2900-MAX2904 EV Kits—Bottom Silkscreen

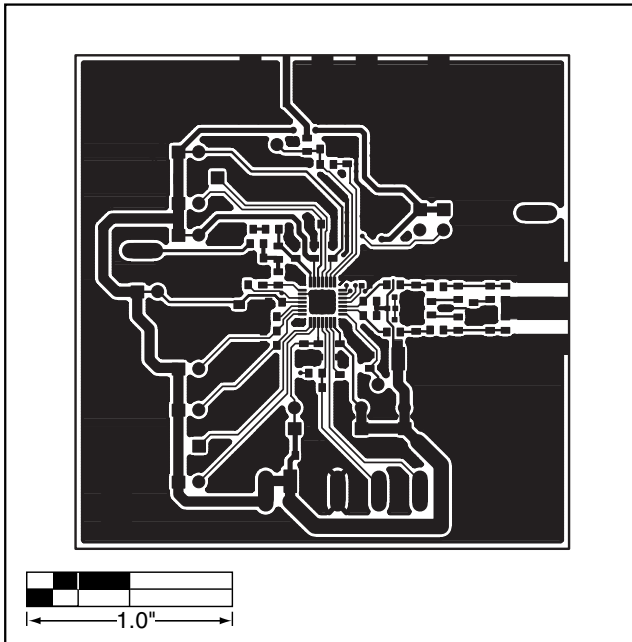


Figure 7. MAX2900-MAX2904 EV Kits PC Board Layout—Component Side

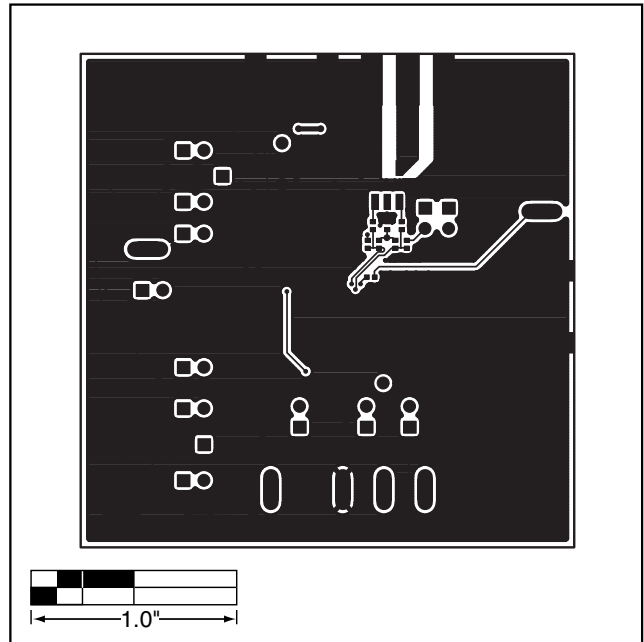


Figure 8. MAX2900-MAX2904 EV Kits PC Board Layout—Solder Side

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