

748MHz VCO

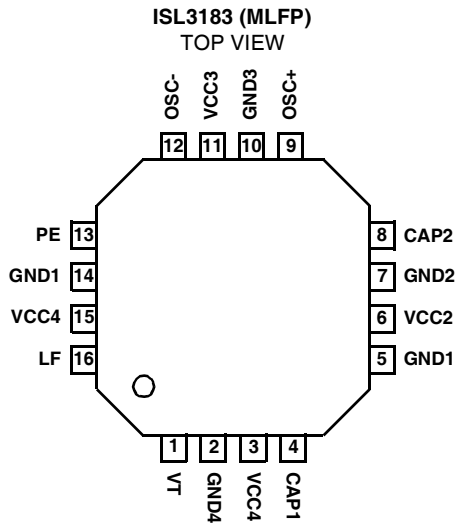


The ISL3183 is a 748MHz monolithic VCO designed to simplify and reduce the cost and size of the VCO function for PRISM[®] WLAN applications.

This fully integrated VCO does not require external elements such as inductors and varactors. Load pull rejection is excellent, eliminating the need for an external buffer amplifier. A differential design provides inherent rejection of spurious signals which simplifies the PCB layout.

The ISL3183 is housed in a 16 lead MLFP package well suited for PCMCIA board applications.

Pinout



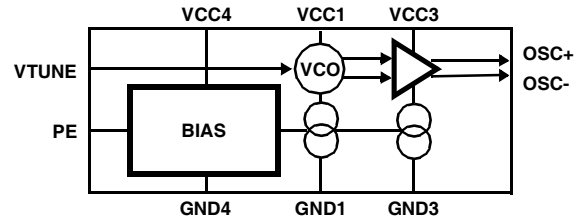
Features

- Single Supply 2.7V to 3.0V
- Frequency 748MHz
- Fully integrated / No External Varactors or Resonators Required
- High Isolation Output Buffer / Reduced Load Pulling
- Differential Design / Reduced Spurs
- Digitally Controlled Power Down Mode

Applications

- Systems Targeting IEEE802.11b, 11Mbps Standard
- Wireless Local Area Networks
- PCMCIA Wireless Transceivers
- TDMA Packet Protocol Radios

Simplified Block Diagram



Ordering Information

| PART NUMBER | TEMP. RANGE (°C) | PACKAGE | PKG. NO. |
|-------------|------------------|---------------|----------|
| ISL3183IR | -40 to 85 | 16 Ld MLFP | L16.4x4 |
| ISL3183IR96 | -40 to 85 | Tape and Reel | |

Pin Descriptions

| PIN NUMBER | NAME | DESCRIPTION |
|------------|------|---|
| 1 | VT | Tuning Voltage. |
| 2 | GND4 | DC and RF Ground. |
| 3 | VCC4 | Power Supply. |
| 4 | CAP1 | Bypass Capacitor 1. |
| 5 | GND1 | DC and RF Ground. |
| 6 | VCC2 | Power Supply. |
| 7 | GND2 | DC and RF Ground. |
| 8 | CAP2 | Bypass Capacitor 2. |
| 9 | OSC+ | VCO Output +. |
| 10 | GND3 | DC and RF Ground. |
| 11 | VCC3 | Power Supply. |
| 12 | OSC- | VCO Output -. |
| 13 | PE | Digital input control pin to enable operation of the Power Amplifier. Enable logic level is high. |
| 14 | GND1 | DC and RF Ground. |
| 15 | VCC1 | Power Supply. |
| 16 | LF | Low Pass Filtering. |

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Absolute Maximum Ratings

Supply Voltage 3.6V
 Voltage on Any Other Pin -0.3 to V_{CC} +0.3V
 V_{CC} to V_{CC} Decouple -0.3 to +0.3V
 Any GND to GND -0.3 to +0.3V

Thermal Information

Thermal Resistance (Typical, Note 1) θ_{JA} (°C/W)
 MLFP Package 42
 Maximum Junction Temperature (Plastic Package) 150°C
 Maximum Storage Temperature Range -65°C to 150°C
 Maximum Lead Temperature (Soldering 10s) 300°C

Operating Conditions

Temperature Range -40 to 85°C
 Supply Voltage Range 2.7V to 3.0V

CAUTION: Stresses above those listed in "Absolute Maximum Ratings" may cause permanent damage to the device. This is a stress only rating and operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied.

NOTE:

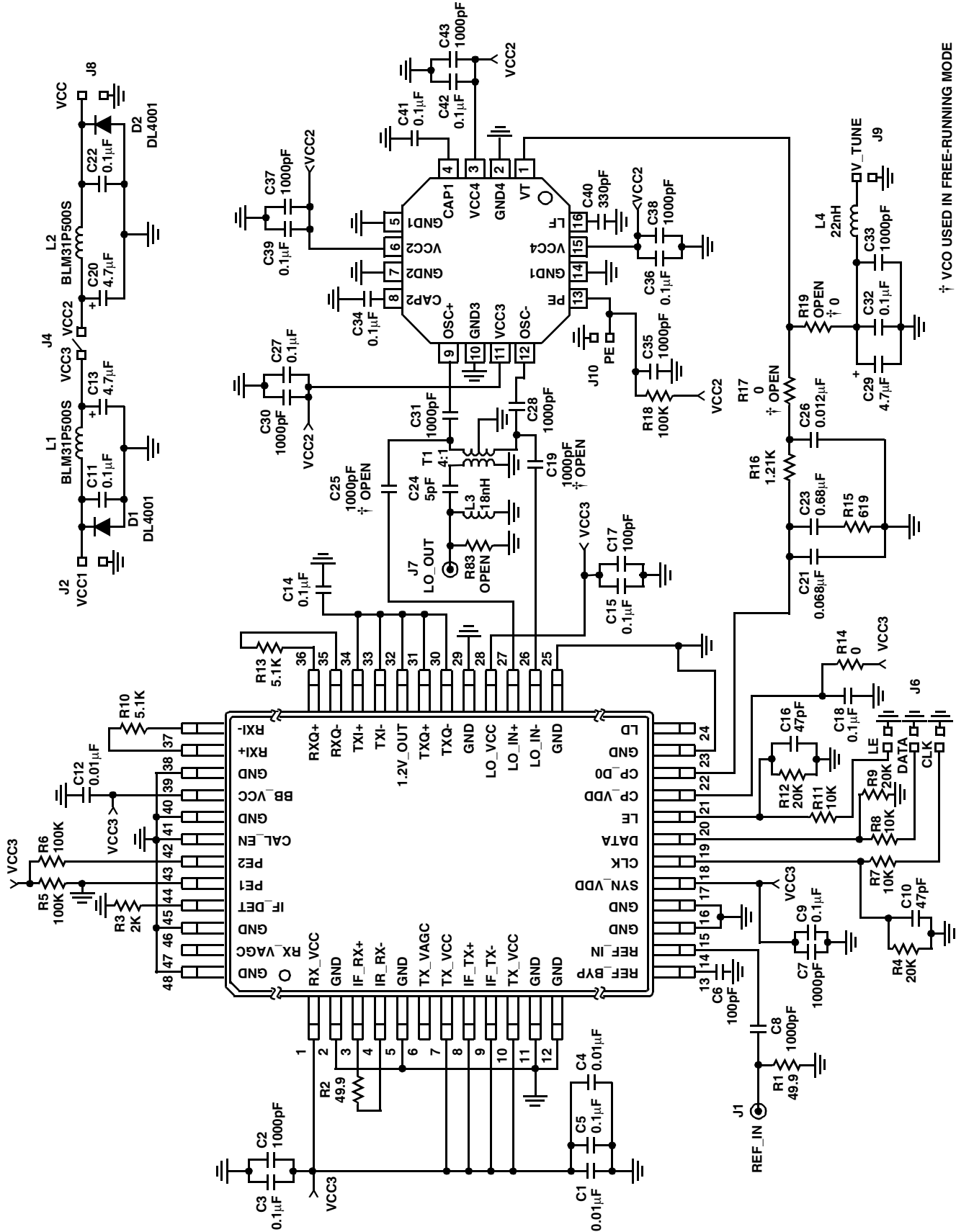
1. θ_{JA} is measured in free air with the component mounted on a high effective thermal conductivity test board with "direct attach" features. See Tech Brief TB379.

General DC Electrical Specifications V_{CC} = 2.85V

| PARAMETER | TEMP. (°C) | MIN | TYP | MAX | UNITS |
|-------------------------------|------------|---------------------|------|---------------------|-------|
| Supply Voltage | 25 | 2.7 | 2.85 | 3.0 | V |
| Supply Current | 25 | - | 8.9 | 12 | mA |
| Power Down Supply Current | 25 | - | - | 180 | µA |
| Power Up Time | 25 | - | 1000 | - | µs |
| Power Down Time | 25 | - | 300 | - | µs |
| CMOS Low Level Input Voltage | 25 | - | - | 0.3*V _{DD} | V |
| CMOS High Level Input Voltage | 25 | 0.7*V _{DD} | - | - | V |

VCO AC Electrical Specifications V_{CC} = 2.85V, ISL3183EVAL used as a platform, Unless Otherwise Specified

| PARAMETER | TEST CONDITIONS | TEMP. (°C) | MIN | TYP | MAX | UNITS |
|--------------------|---|------------|-------|-----|-------|--------|
| RF Frequency Range | | 25 | 738 | - | 755 | MHz |
| Tuning Voltage | | 25 | 0.5 | 1.2 | 2.2 | V |
| VCO Gain | | Full | - | 33 | - | MHz/V |
| Phase Noise | Offset 10kHz | 25 | - | -78 | - | dBc/Hz |
| Harmonic Outputs | | Full | - | -20 | - | dBc |
| Output Power | Calibrated for Losses on the Board | 25 | -18.8 | -16 | -10 | dBm |
| Supply Pushing | V _{CC} = 2.7V - 3V | 25 | -0.2 | - | 0.2 | MHz |
| Load Pulling | VSWR = 2:1 (NOTE: Limits are Based on Characterization) | Full | -0.2 | - | 0.2 | MHz |
| Load Impedance | | Full | - | 300 | - | Ohms |
| Output VSWR | (NOTE: Limits are Based on Characterization) | Full | - | - | 2.2:1 | - |



† VCO USED IN FREE-RUNNING MODE

FIGURE 1. ISL3183EVAL BOARD SCHEMATIC

Typical Performance Curves

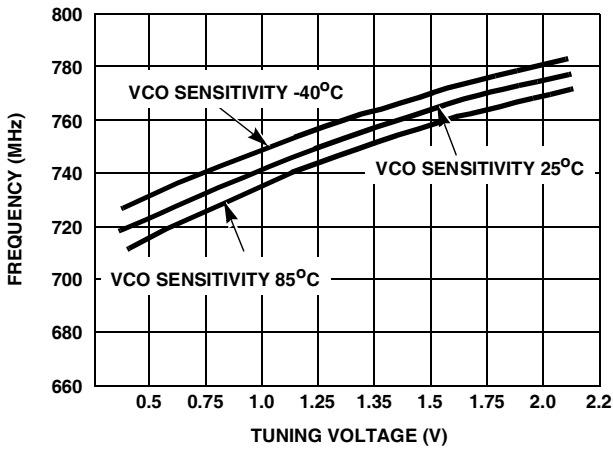


FIGURE 2. TYPICAL VCO SENSITIVITY (FR. OVER VT)

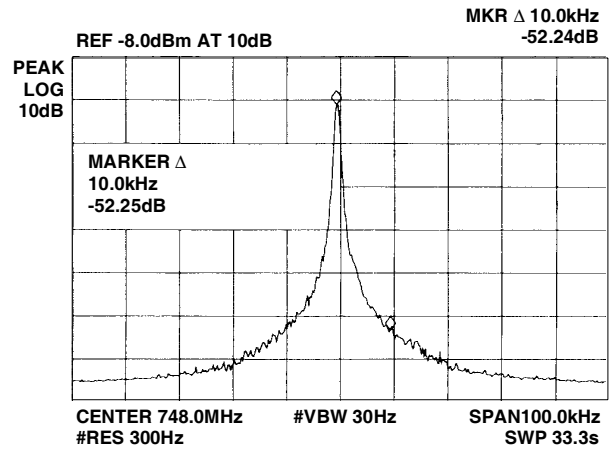


FIGURE 3. TYPICAL EVAL BOARD PHASE NOISE

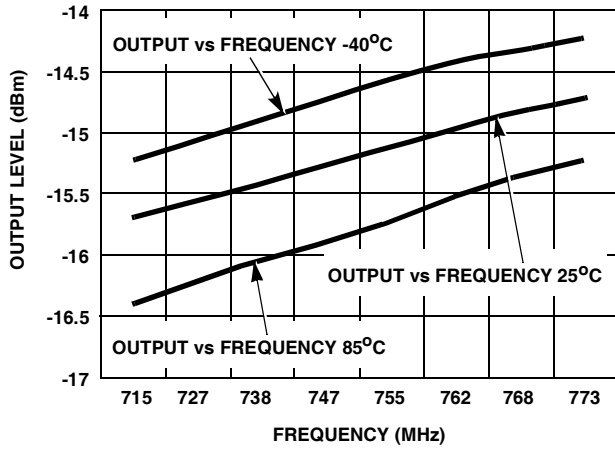


FIGURE 4. TYPICAL EVAL BOARD OUTPUT POWER vs FREQUENCY

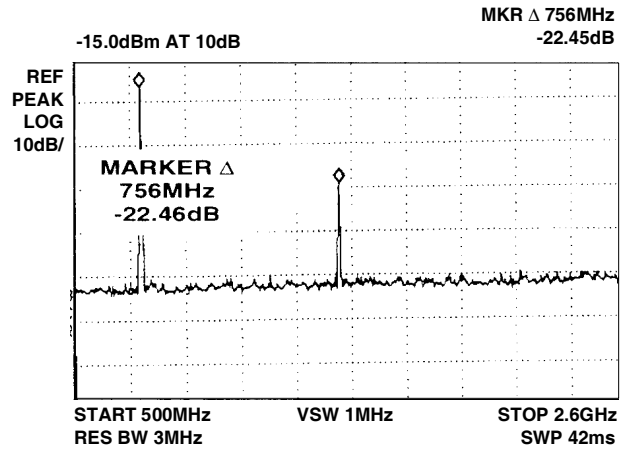


FIGURE 5. TYPICAL EVAL BOARD HARMONIC OUTPUTS

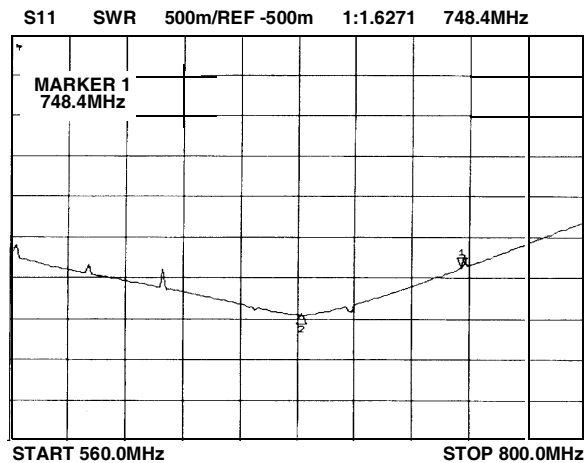
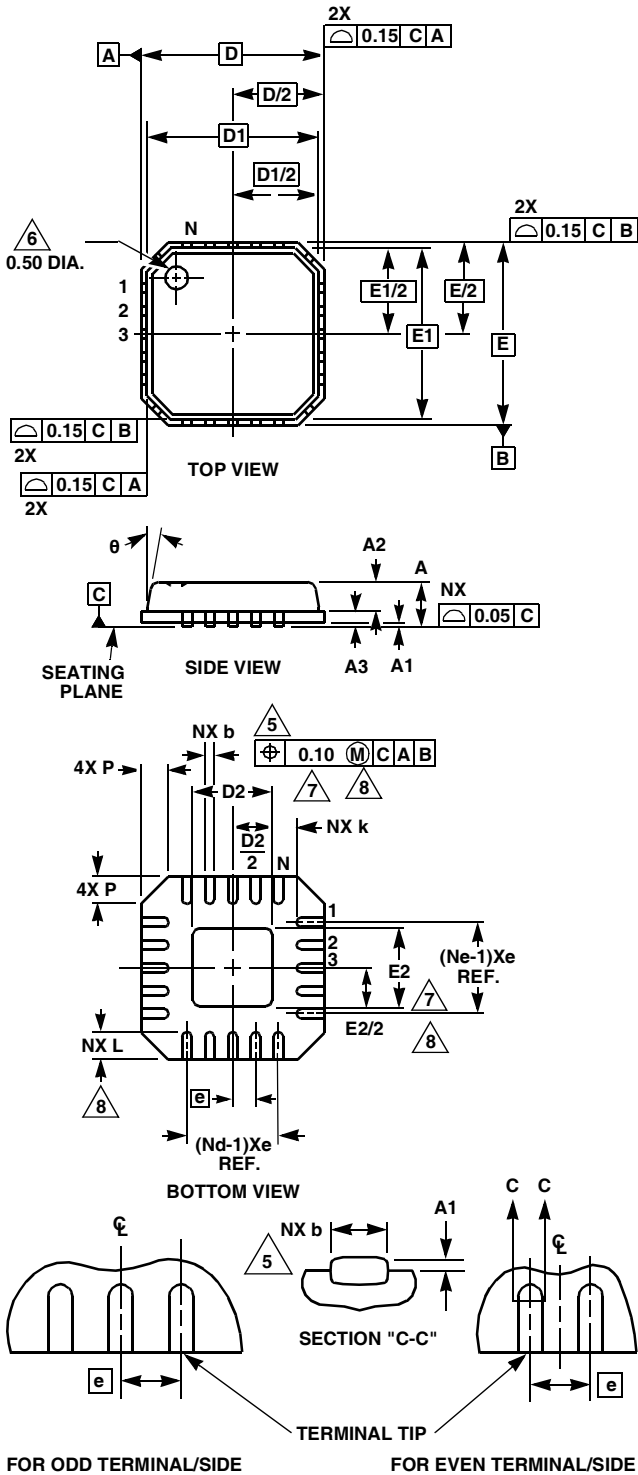


FIGURE 6. TYPICAL EVAL BOARD VSWR

Micro Lead Frame Plastic Package (MLFP)



L16.4x4
16 LEAD MICRO LEAD FRAME PLASTIC PACKAGE
(COMPLIANT TO JEDEC MO-220-VGGC ISSUE C)

| SYMBOL | MILLIMETERS | | | NOTES |
|--------|-------------|---------|------|-------|
| | MIN | NOMINAL | MAX | |
| A | - | - | 0.90 | - |
| A1 | - | - | 0.05 | - |
| A2 | - | - | 0.70 | - |
| A3 | 0.20 REF | | | - |
| b | 0.23 | 0.28 | 0.35 | 5,8 |
| D | 4.00 BSC | | | - |
| D1 | 3.75 BSC | | | - |
| D2 | 1.95 | 2.10 | 2.25 | 7,8 |
| E | 4.00 BSC | | | - |
| E1 | 3.75 BSC | | | - |
| E2 | 1.95 | 2.10 | 2.25 | 7,8 |
| e | 0.65 BSC | | | - |
| k | 0.25 | - | - | - |
| L | 0.50 | 0.60 | 0.75 | 8 |
| N | 16 | | | 2 |
| Nd | 4 | | | 3 |
| Ne | 4 | | | 3 |
| P | - | - | 0.60 | - |
| θ | - | - | 12 | - |

Rev. 3 6/01

NOTES:

1. Dimensioning and tolerancing per ASME Y14.5-1994.
2. N is the number of terminals.
3. Nd is the number of terminals in the X direction, and Ne is the number of terminals in the Y direction.
4. Controlling dimension: Millimeters. Converted dimensions to inches are not necessarily exact. Angles are in degrees.
5. Dimension b applies to the plated terminal and is measured between 0.20mm and 0.25mm from the terminal tip.
6. The Pin #1 identifier exists on the top surface as an indentation mark in the molded body.
7. Dimensions D2 and E2 are the maximum exposed pad dimensions for improved grounding and thermal performance.
8. Nominal dimensions provided to assist with PCB Land Pattern Design efforts, see Technical Brief TB389.

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