The MRFIC Line

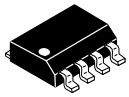
900 MHz Downconverter (LNA/Mixer)

MRFIC2001

900 MHz DOWNCONVERTER LNA/MIXER SILICON MONOLITHIC INTEGRATED CIRCUIT

The MRFIC2001 is an integrated downconverter designed for receivers operating in the 800 MHz to 1.0 GHz frequency range. The design utilizes Motorola's advanced MOSAIC 3 silicon bipolar RF process to yield superior performance in a cost effective monolithic device. Applications for the MRFIC2001 include CT-1 and CT-2 cordless telephones, remote controls, video and audio short range links, low cost cellular radios, and ISM band receivers. A power down control is provided to minimize current drain with minimum recovery/turn-on time.

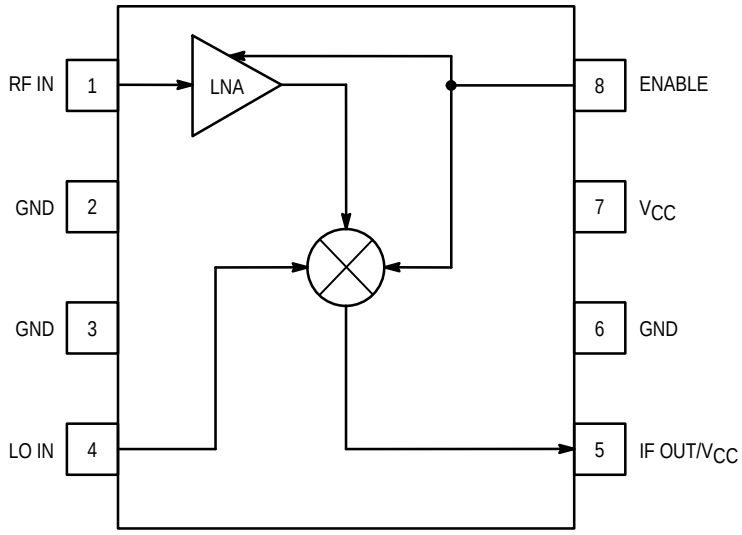
- Conversion Gain = 23 dB (Typ)
- Supply Current = 4.7 mA (Typ)
- Power Down Supply Current = 2.0 μA (Max)
- Low LO Drive = –10 dBm (Typ)
- LO Impedance Insensitive to Power Down
- No Image Filtering Required
- No Matching Required for RF IN Port
- All Ports are Single Ended
- Order MRFIC2001R2 for Tape and Reel.
  R2 suffix = 2,500 Units per 12 mm, 13 inch Reel.
- Device Marking = M2001



CASE 751-05
(SO-8)

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C unless otherwise noted)

Rating	Symbol	Value	Unit
Supply Voltage	V_{CC}	5.5	Vdc
Control Voltage	ENABLE	5.0	Vdc
Input Power, RF and LO Ports	P_{RF}, P_{LO}	+10	dBm
Operating Ambient Temperature	T_A	–35 to + 85	°C
Storage Temperature	T_{stg}	–65 to +150	°C



Pin Connections and Functional Block Diagram

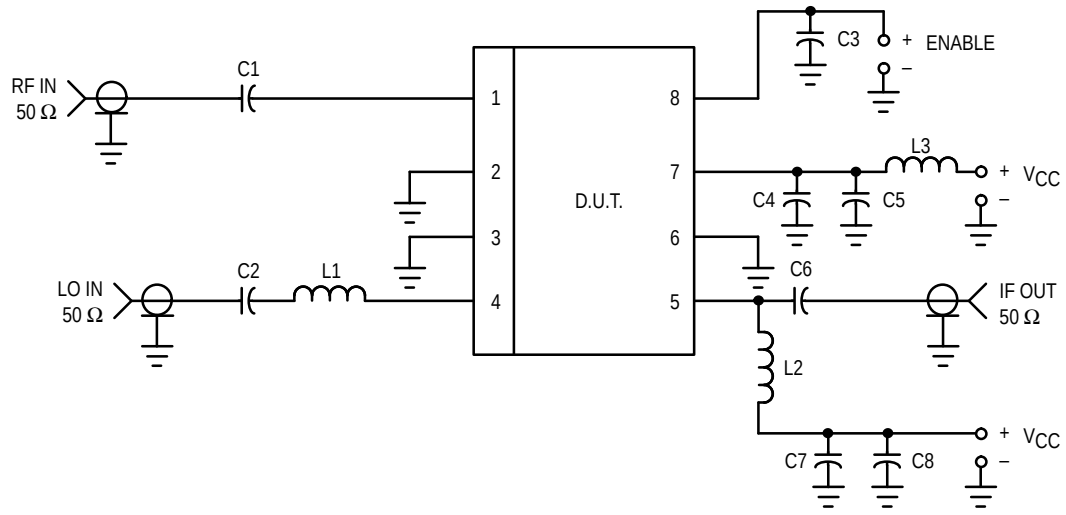
RECOMMENDED OPERATING RANGES

Parameter	Symbol	Value	Unit
Supply Voltage Range	V_{CC}	2.7 to 5.0	Vdc
Control Voltage Range	ENABLE	0 to 5.0	Vdc
RF Port Frequency Range	f_{RF}	500 to 1000	MHz
IF Port Frequency Range	f_{IF}	0 (dc) to 250	MHz

ELECTRICAL CHARACTERISTICS (V_{CC}, ENABLE = 3.0 V, T_A = 25°C, RF @ 900 MHz, LO @ 1.0 GHz, P_{LO} = –7.0 dBm, IF @ 100 MHz unless otherwise noted)

Characteristic (1)	Min	Typ	Max	Unit
Supply Current: On-Mode	—	4.7	5.5	mA
Supply Current: Off-Mode (ENABLE < 1.0 Volts)	—	0.1	2.0	μA
ENABLE Response Time	—	1.0	—	μs
Conversion Gain	20	23	26	dB
Input Return Loss (RF IN Port)	—	13	—	dB
Single Sideband Noise Figure	—	5.5	—	dB
Input 3rd Order Intercept Point	– 26	– 22.5	—	dBm
Output Power at 1.0 dB Gain Compression	—	–10	—	dBm
LO – RF Isolation (1.0 GHz)	—	37	—	dB
LO – IF Isolation (1.0 GHz)	—	33	—	dB
RF – IF Isolation (900 MHz)	—	4.0	—	dB
RF – LO Isolation (900 MHz)	—	19	—	dB

NOTE:
1. All Electrical Characteristics measured in test circuit schematic shown in Figure 1 below:



C1, C2, C4, C7 — 100 pF Chip Capacitor
C3, C5, C8 — 1000 pF Chip Capacitor
C6 — 6.8 pF Chip Capacitor
L1 — 8.2 nH Chip Inductor
L2 — 270 nH Chip Inductor
L3 — 150 nH Chip Inductor
RF Connectors — SMA Type
Board Material — Epoxy/Glass ε_r = 4.5,
Dielectric Thickness = 0.014″ (0.36 mm)

Figure 1. Test Circuit Configuration