

Advance Information

The MRFIC Line

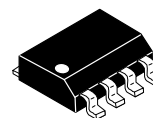
Balanced Transmit Mixer

The MRFIC0931 is a balanced Gilbert cell mixer with LO buffer amplifier intended for transmit upmixer application. The device is usable for Industrial, Scientific and Medical (ISM), Cellular and PCS applications and is packaged in a low-cost surface mount package.

- Usable 500–2000 MHz
- High Output Power @ 1 dB Gain Compression, 3.6 Volts
0.9 dBm (Typ) @ 900 MHz
–2 dBm (Typ) @ 1800 MHz
- 2.7–4.8 Volts Operation
- Balanced Design for Good LO Rejection
- 47 mA (Max) Current @ 4.5 Volts
45 mA (Max) Current @ 3.6 Volts
- Low Cost Surface Mount Package
- Order MRFIC0931R2 for Tape and Reel.
R2 suffix = 2,500 Units per 12 mm, 13 inch Reel.
- Device Marking = M0931

MRFIC0931

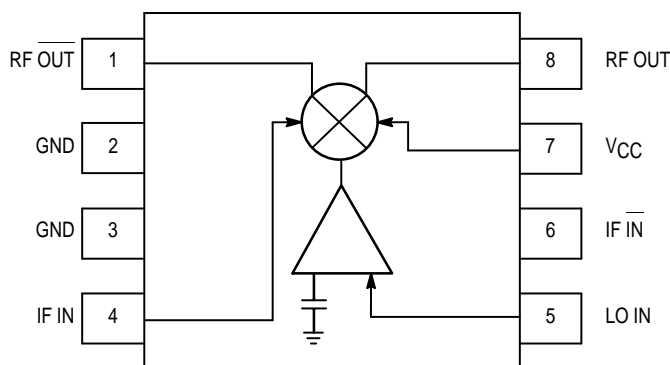
**BALANCED TRANSMIT
MIXER SILICON
MONOLITHIC
INTEGRATED CIRCUIT**



**CASE 751-05
(SO-8)**

ABSOLUTE MAXIMUM RATINGS

Ratings	Symbol	Value	Unit
Supply Voltage	V_{CC}	5	Vdc
Input Power, IF and LO	P_{IF}, 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 CONDITIONS

Parameter	Symbol	Value	Unit
Supply Voltages	V_{CC}	2.7 to 4.5	Vdc
RF Frequency Range	f_{RF}	500 to 2000	MHz
IF Frequency Range	f_{IF}	0 to 250	MHz

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$, measured in circuit shown in Figure 1 or 2 as frequency indicates)

Parameter	Min	Typ	Max	Unit
RF Output Power ($f_{IF} = 88\text{ MHz}$, $f_{LO} = 815\text{ MHz}$, $P_{LO} = -10\text{ dBm}$, $P_{IF} = -20\text{ dBm}$, $V_{CC} = 4.5\text{ V}$)	2	4	8	dBm
LO Feed Through ($f_{IF} = 88\text{ MHz}$, $f_{LO} = 815\text{ MHz}$, $P_{LO} = -10\text{ dBm}$, $P_{IF} = -20\text{ dBm}$, $V_{CC} = 4.5\text{ V}$)	—	—	-16	dBc
Undesired Sideband Output ($f_{IF} = 88\text{ MHz}$, $f_{LO} = 815\text{ MHz}$, $P_{LO} = -10\text{ dBm}$, $P_{IF} = -20\text{ dBm}$, $V_{CC} = 4.5\text{ V}$)	—	—	-25	dBc
Small Sigal Conversion Gain ($f_{IF} = 100\text{ MHz}$, $P_{IF} = -25\text{ dBm}$, $V_{CC} = 3.6\text{ V}$) 900 MHz ($P_{LO} = -10\text{ dBm}$) 1800 MHz ($P_{LO} = -5\text{ dBm}$)	— —	25 20	— —	dB dB
Power Output at 1 dB Gain Compression ($f_{IF} = 100\text{ MHz}$, $P_{IF} = -25\text{ dBm}$, $V_{CC} = 3.6\text{ V}$) 900 MHz ($P_{LO} = -10\text{ dBm}$) 1800 MHz ($P_{LO} = -5\text{ dBm}$)	— —	0.9 -2	— —	dBm dBm
Supply Current $V_{CC} = 4.5\text{ V}$ $V_{CC} = 3.6\text{ V}$	— —	38 30	47 45	mA mA

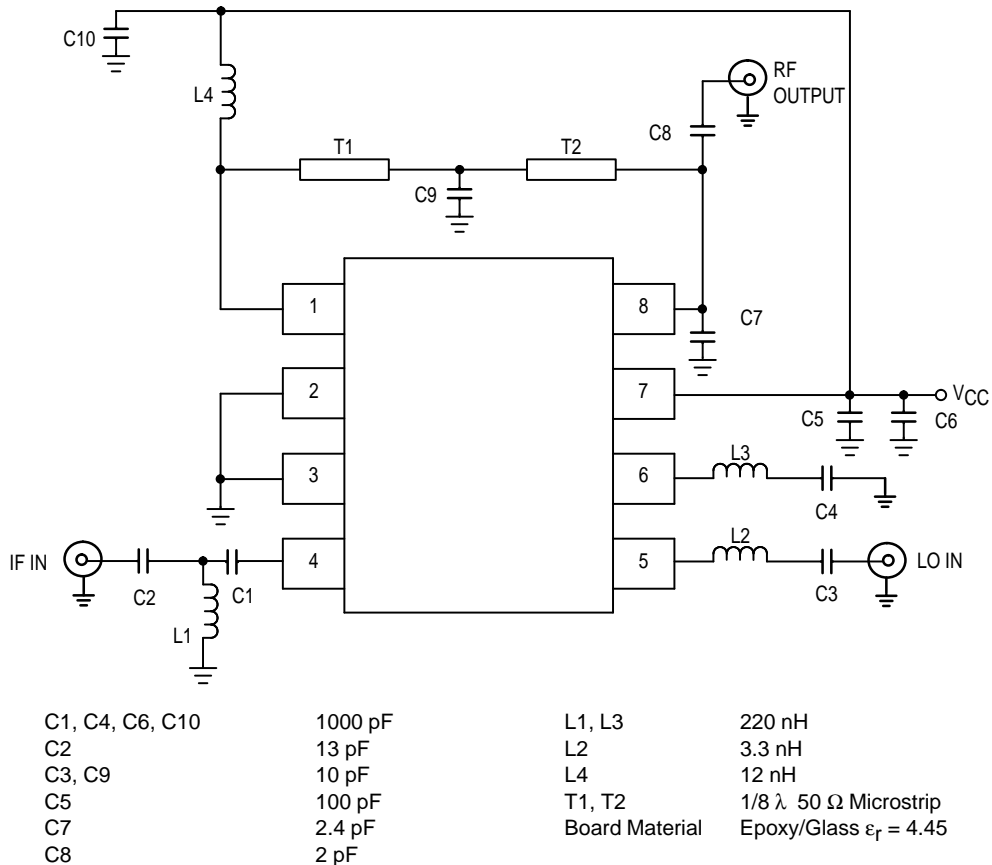
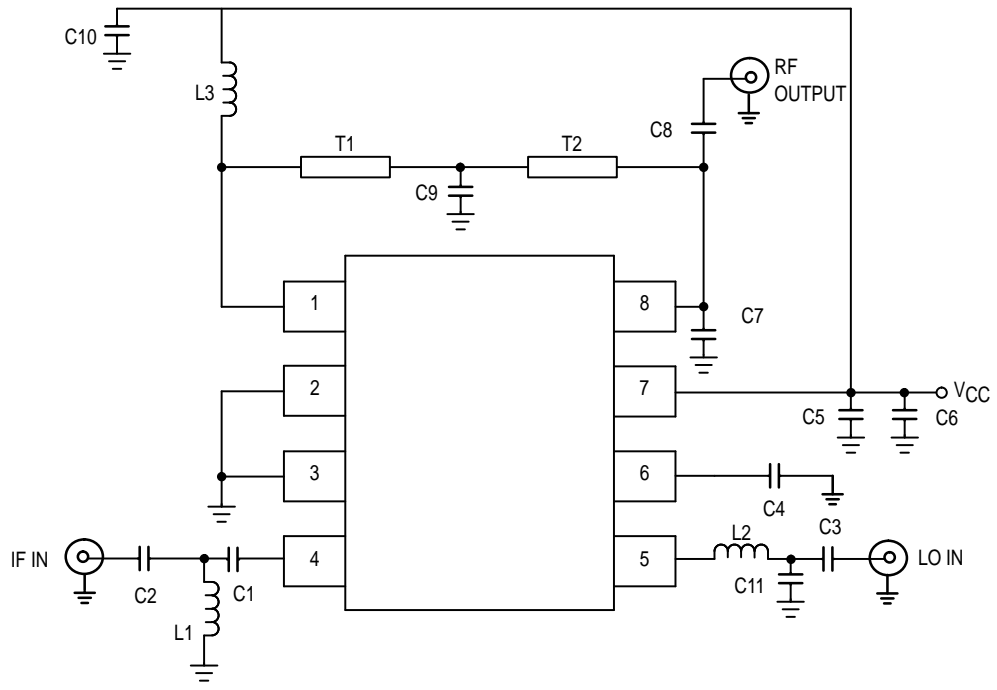


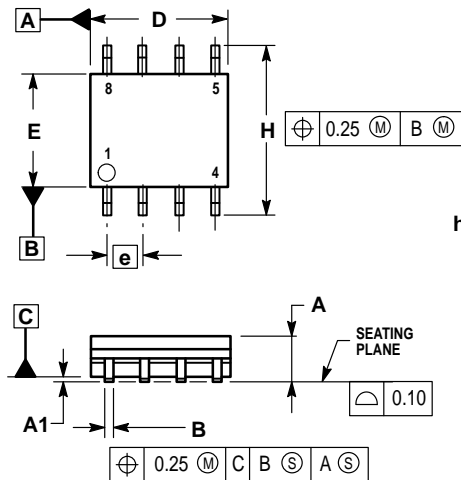
Figure 1. 903 MHz Configuration Test Circuit



C1, C6, C10	1000 pF
C2	10 pF
C3, C4, C5, C8	100 pF
C7	1.2 pF
C9	2.7 pF
C11	1 pF
L1,	180 nH
L2	3.3 nH
L3	2.7 nH
T1, T2	1/8 λ 50 Ω Microstrip
Board Material	Epoxy/Glass $\epsilon_r = 4.45$

Figure 2. 1800 MHz Applications Circuit

PACKAGE DIMENSIONS



NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. DIMENSIONS ARE IN MILLIMETERS.
3. DIMENSION D AND E DO NOT INCLUDE MOLD PROTRUSION.
4. MAXIMUM MOLD PROTRUSION 0.15 PER SIDE.
5. DIMENSION B DOES NOT INCLUDE MOLD PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.127 TOTAL IN EXCESS OF THE B DIMENSION AT MAXIMUM MATERIAL CONDITION.

MILLIMETERS		
DIM	MIN	MAX
A	1.35	1.75
A1	0.10	0.25
B	0.35	0.49
C	0.18	0.25
D	4.80	5.00
E	3.80	4.00
e	1.27 BSC	
H	5.80	6.20
h	0.25	0.50
L	0.40	1.25
θ	0°	7°

CASE 751-05 ISSUE S

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