Advance Information

The MRFIC Line

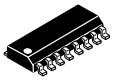
2.4 GHz Upmixer

MRFIC2406

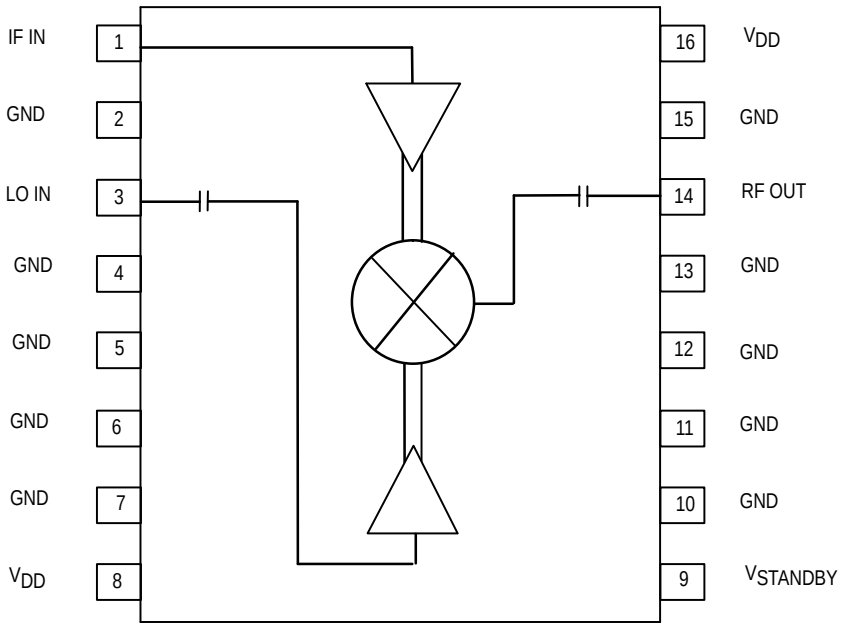
**2.4 GHz
INTEGRATED UPMIXER
GaAs MONOLITHIC
INTEGRATED CIRCUIT**

Designed primarily for use in Industrial, Scientific, Medical (ISM) frequency band applications, the MRFIC2406 is an active GaAs upmixer in a low–cost SOIC 16–lead, surface mount package. The integrated circuit has internal active Baluns and requires minimal off-chip matching. In STANDBY mode, the device draws less than 0.6 mA for low battery drain.

- Usable Frequency Range = 2 to 3 GHz
- Single Voltage Supply = 3 to 5 Volts
- Low Current Drain = 15 mA Max Supply Current
- IF to RF Conversion Gain = 6 dB Typical
- STANDBY Mode for Low Current Consumption
- No External Baluns Required
- Simple Off-Chip Matching for Maximum Flexibility
- Order MRFIC2406R2 for Tape and Reel.
  R2 Suffix = 2,500 Units per 16 mm, 13 inch Reel.
- Device Marking = M2406



**CASE 751B–05
(SO–16)**



Pin Connections and Functional Block Diagram

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

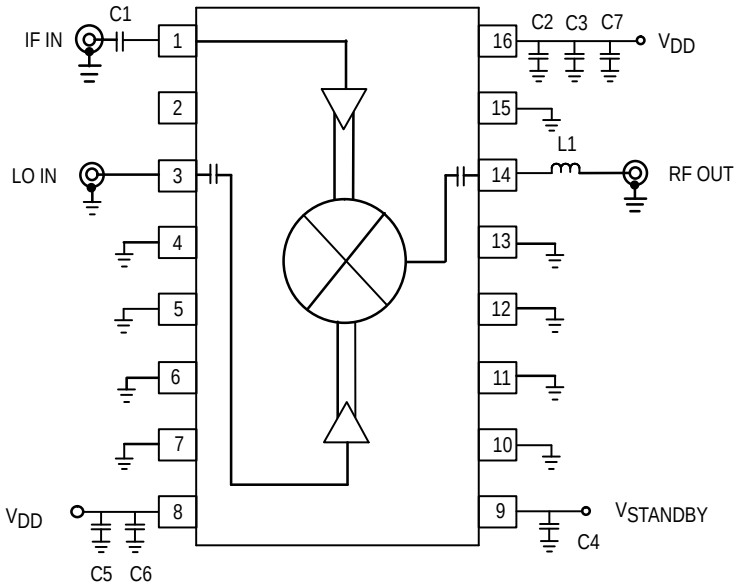
Rating	Symbol	Limit	Unit
Supply Voltage	V_{DD}	7	Vdc
Standby Voltage	$V_{STANDBY}$	7	Vdc
IF Input Power	IF IN	+10	dBm
LO Input Power	LO IN	+10	dBm
Storage Temperature Range	T_{stg}	– 65 to +125	°C
Ambient Operating Temperature	T_A	– 35 to +85	°C

RECOMMENDED OPERATING RANGES

Parameter	Symbol	Value	Unit
RF Frequency	f_{RF}	2.4 to 2.5	GHz
IF Frequency	f_{IF}	100 to 370	MHz
LO Frequency	f_{LO}	2.03 to 2.4	GHz
Supply Voltage	V_{DD}	3 to 5	Vdc
Standby Voltage	$V_{STANDBY}$	0 to 3	Vdc

ELECTRICAL CHARACTERISTICS (V_{DD} = 3 V, T_A = 25°C, f_{RF} = 2.45 GHz, f_{IF} = 237 MHz, IF IN = –15 dBm, f_{LO} = 2.213 GHz, LO IN = –5 dBm, $V_{STANDBY}$ = 0 V, Tested in Circuit Shown in Figure 1)

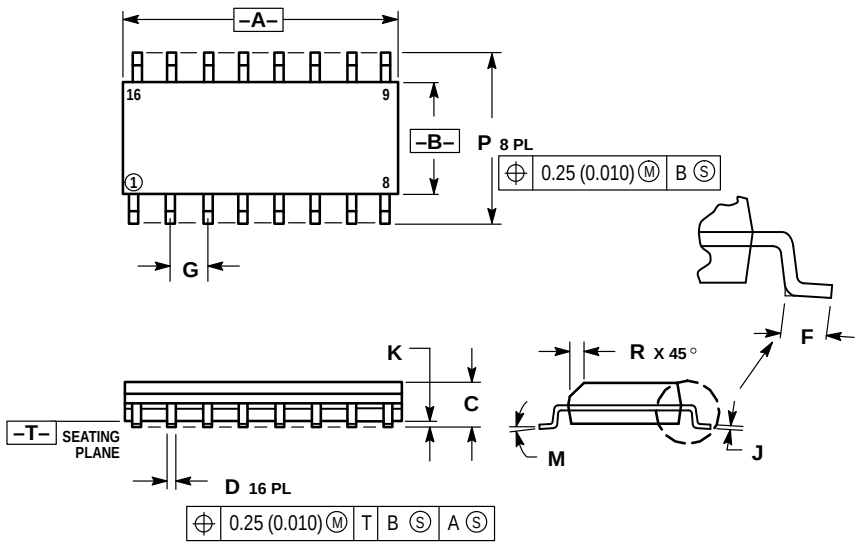
Characteristic	Min	Typ	Max	Unit
IF to RF Conversion Gain	4	6	—	dB
LO to RF Isolation	10	12	—	dB
Return Loss, All Ports, (Matching as shown in Figure 1)	–10	–12	—	dB
Spurious Output @ 2.4 – 2.5 GHz	—	—	–55	dBc
Output 1dB Gain Compression	—	–10	—	dBm
ON State Current, ($V_{STANDBY}$ = 0 V)		—	15	mA
OFF State Current, ($V_{STANDBY}$ = 3 V)	—	—	0.6	mA
$V_{STANDBY}$ Voltage (ON State)	—	—	0.1	V
$V_{STANDBY}$ Voltage (STANDBY State)	2.8	—	—	V
On/Off Switching Time	—	1	—	μsec



C1	240 pF
C2	1000 pF
C3, C4, C5, C8	15 pF
C6	100 pF
C7	10,000 pF
L1	2.2 nH

Figure 1. 2.45 GHz Applications Circuit Configuration

PACKAGE DIMENSIONS



NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETER.
3. DIMENSIONS A AND B DO NOT INCLUDE MOLD PROTRUSION.
4. MAXIMUM MOLD PROTRUSION 0.15 (0.006) PER SIDE.
5. DIMENSION D DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.127 (0.005) TOTAL IN EXCESS OF THE D DIMENSION AT MAXIMUM MATERIAL CONDITION.

	MILLIMETERS		INCHES	
DIM	MIN	MAX	MIN	MAX
A	9.80	10.00	0.386	0.393
B	3.80	4.00	0.150	0.157
C	1.35	1.75	0.054	0.068
D	0.35	0.49	0.014	0.019
F	0.40	1.25	0.016	0.049
G	1.27 BSC		0.050 BSC	
J	0.19	0.25	0.008	0.009
K	0.10	0.25	0.004	0.009
M	0°	7°	0°	7°
P	5.80	6.20	0.229	0.244
R	0.25	0.50	0.010	0.019

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ISSUE J

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