

Advance Information

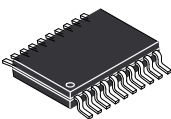
The MRFIC Line Quadrature Modulator

The MRFIC0001 is an integrated Quadrature Modulator designed for operation in the 50 to 260 MHz 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 include DQPSK for PDC, NADC, and PHS; GMSK for GSM and DCS1800; and QPSK for CATV.

- Linear I/Q Ports
- On Chip LO Phase Shifter
- I/Q Phase Imbalance = 2 degrees (Typ)
- I/Q Amplitude Imbalance = 0.3 dB (Typ)
- Gain Control = 30 dB (Typ)
- Single Source Low Operating Supply Voltage
- Low Power Consumption
- Low-Cost, Low Profile Plastic TSSOP Package
- Order MRFIC0001R2 for Tape and Reel.
R2 Suffix = 2,500 Units per 16 mm, 13 inch Reel.
- Device Marking = M001

MRFIC0001

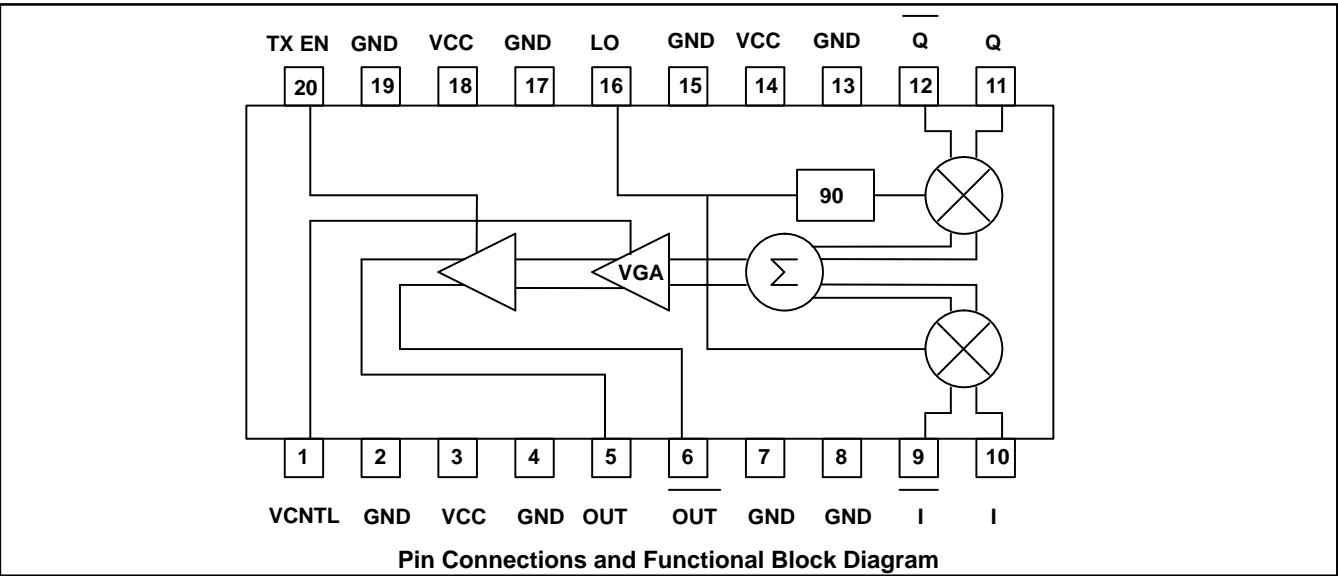
QUADRATURE
MODULATOR
INTEGRATED CIRCUIT



CASE 948D-03
(TSSOP-20)

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

Parameter	Symbol	Value	Unit
Supply Voltage	V _{CC}	6.5	Vdc
Control Voltages	TX EN, VCNTL	6.5	Vdc
LO Input Power	P _{LO}	0.0	dBm
Differential I/Q Input Voltage	V _D	2.0	V _{pp}
I, \bar{I} , Q, and \bar{Q} DC Bias Voltage	V _B	2.0	Vdc
Ambient Operating Temperature	T _A	-30 to +85	°C
Storage Temperature	T _{stg}	-65 to +125	°C



This document contains information on a new product. Specifications and information herein are subject to change without notice.

RECOMMENDED OPERATING CONDITIONS

Parameter	Symbol	Value	Unit
Supply Voltage	V_{CC}	2.7 to 5.5	Vdc
LO Input Power	P_{LO}	-10	dBm
LO Frequency	f_{LO}	50 to 260	MHz
Differential I/Q Input Voltage	V_D	0 to 1.0	Vdc
I, \bar{I} , Q, and \bar{Q} DC Bias Voltage	V_B	1.5 to 1.7	Vdc
Variable Gain Amplifier Control Voltage	V_{cntl}	0 to V_{CC}	Vdc
Transmit Enable Low Voltage	TX EN	0 to 0.2	Vdc
Transmit Enable High Voltage	TX EN	$V_{CC} - 0.2$ to V_{CC}	Vdc

ELECTRICAL CHARACTERISTICS ($V_{CC} = 3.0$ V, TX EN = 3.0 V, $V_{cntl} = 0.0$ V, $V_D = 0.8$ V_{PP}, $V_B = 1.6$ V, $P_{LO} = -10$ dBm, $f_{LO} = 248$ MHz, $f_D = 100$ kHz, $T_A = 25$ °C unless otherwise noted)

Characteristic	Min	Typ	Max	Unit
Supply Current	–	10	12	mA
Standby Current (TX EN = 0.0V)	–	40	100	μA
Single Sideband Output Power Level	-15	-13	–	dBm
Single Sideband Output Power 1dB Compression Point	–	-10	–	dBm
LO Leakage ⁽²⁾	–	-55	-45	dBm
Undesired Sideband Level	–	-35	-30	dBc
Output Level Dynamic Range ($V_{cntl} = 0$ to 2.2V) ⁽²⁾	–	30	–	dB
Turn-on/off Time	–	2	–	μs
I/Q Data				
Input 3dB Bandwidth	–	5	–	MHz
Amplitude Imbalance	–	0.3	–	dB
Phase Imbalance	–	2	–	degree

(1) All electrical characteristics measured in test circuit schematic shown in Figure 1.

V_B is the bias voltage on the input data ports.

V_D is the sinusoidal differential voltage on the input data ports when testing the part in a single sideband mode.

Above power levels are the single-ended output power.

(2) LO leakage power is unaffected by V_{cntl} setting.

EVALUATION BOARDS

Evaluation boards are available for RF Monolithic Integrated Circuits by adding a "TF" suffix to the device type. For a complete list of currently available boards and ones in development for newly introduced product, please contact your local Motorola Distributor or Sales Office.