19-xxxx; Rev 0; 1/06

EVALUATION KIT AVAILABLE

High-Dynamic-Range, Direct Up-/Downconversion 750MHz to 1200MHz Quadrature Mod/Demod

MAX2021

General Description

The MAX2021 low-noise, high-linearity, direct upconversion/downconversion quadrature modulator/demodulator is designed for RFID handheld and portal readers, as well as single and multicarrier 750MHz to 1200MHz GSM/EDGE, cdma2000®, WCDMA, and iDEN® base-station applications. Direct conversion architectures are advantageous since they significantly reduce transmitter or receiver cost, part count, and power consumption as compared to traditional IF-based double conversion systems.

In addition to offering excellent linearity and noise performance, the MAX2021 also yields a high level of component integration. This device includes two matched passive mixers for modulating or demodulating in-phase and quadrature signals, two LO mixer amplifier drivers, and an LO quadrature splitter. On-chip baluns are also integrated to allow for single-ended RF and LO connections. As an added feature, the baseband inputs have been matched to allow for direct interfacing to the transmit DAC, thereby eliminating the need for costly I/Q buffer amplifiers.

The MAX2021 operates from a single +5V supply. It is available in a compact 36-pin thin QFN package (6mm x 6mm) with an exposed paddle. Electrical performance is guaranteed over the extended -40°C to +85°C temperature range.

Applications

RFID Handheld and Portal Readers

Single and Multicarrier WCDMA 850 Base Stations

Single and Multicarrier cdmaOne™ and cdma2000 Base Stations

GSM 850/GSM 900 EDGE Base Stations

Predistortion Transmitters and Receivers

WiMAX Transmitters and Receivers

Fixed Broadband Wireless Access

Military Systems

Microwave Links

Digital and Spread-Spectrum Communication Systems

cdma2000 is a registered trademark of Telecommunications Industry Association.

iDEN is a registered trademark of Motorola, Inc.

cdmaOne is a trademark of CDMA Development Group.

Features

- **750MHz to 1200MHz RF Frequency Range**
- **Scalable Power: External Current-Setting Resistors Provide Option for Operating Device in Reduced-Power/Reduced-Performance Mode**
- **36-Pin, 6mm x 6mm TQFN Provides High Isolation in a Small Package**

Modulator Operation:

- **Meets 4-Carrier WCDMA 65dBc ACLR**
- **+21dBm Typical OIP3**
- **+58dBm Typical OIP2**
- **+16.7dBm Typical OP_{1dB}**
- **-32dBm Typical LO Leakage**
- **43.5dBc Typical Sideband Suppression**
- **-174dBm/Hz Output Noise Density**
- **DC to 300MHz Baseband Input Allows a Direct Launch DAC Interface, Eliminating the Need for Costly I/Q Buffer Amplifiers**
- **DC-Coupled Input Allows Ability for Customer Offset Voltage Control**

Demodulator Operation:

- **+35.2dBm Typical IIP3**
- **+76dBm Typical IIP2**
- **> 30dBm IP_{1dB}**
- **9.2dB Typical Conversion Loss**
- **9.3dB Typical NF**
- **0.06dB Typical I/Q Gain Imbalance**
- **0.15° I/Q Typical Phase Imbalance**

Ordering Information

PART	TEMP RANGE	PIN-PACKAGE	PKG CODE
MAX2021ETX	-40°C to +85°C	36 Thin QFN-EP* (6mm x 6mm)	T3666-2
MAX2021ETX-T	-40°C to +85°C	36 Thin QFN-EP* (6mm x 6mm)	T3666-2
MAX2021ETX+	-40°C to +85°C	36 Thin QFN-EP* (6mm x 6mm)	T3666-2
MAX2021ETX+T	-40°C to +85°C	36 Thin QFN-EP* (6mm x 6mm)	T3666-2

**EP = Exposed paddle. + = Lead free.*
-T = Tape-and-reel package.

For pricing, delivery, and ordering information, please contact Maxim/Dallas Direct! at