



LTC5541

1.3GHz to 2.3GHz High Dynamic Range Downconverting Mixer

FEATURES

- Conversion Gain: 7.8dB at 1950MHz
- IIP3: 26.4dBm at 1950MHz
- Noise Figure: 9.6dB at 1950MHz
- Configurable for 13dBm Input P1dB
- 3.3V Supply, 630mW Power Consumption
- Shutdown Pin
- 50Ω Single-Ended RF and LO Inputs
- LO Inputs 50Ω Matched when Shutdown
- High Isolation LO Switch
- 0dBm LO Drive Level
- High LO-RF and LO-IF Isolation
- Small Solution Size
- 20-Lead (5mm × 5mm) QFN package

APPLICATIONS

- Wireless Infrastructure Receivers (LTE, W-CDMA, TD-SCDMA, UMTS, GSM1800)
- High Dynamic Range Downmixer Applications

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DESCRIPTION

The LTC[®]5541 is part of a family of high dynamic range passive downconverting mixers covering the 700MHz to 4GHz frequency range. **The LTC5541 is optimized for 1.3GHz to 2.3GHz RF applications. The LO frequency must fall within the 1.4GHz to 2.0GHz range for optimum performance.** A typical application is a LTE or W-CDMA receiver with a 1.7GHz to 2.2GHz RF input and low-side LO.

The LTC5541 is designed for 3.3V operation, however; the IF amplifier can be powered by 5V for the highest P1dB. An integrated SPDT LO switch with fast switching accepts two active LO signals, while providing high isolation.

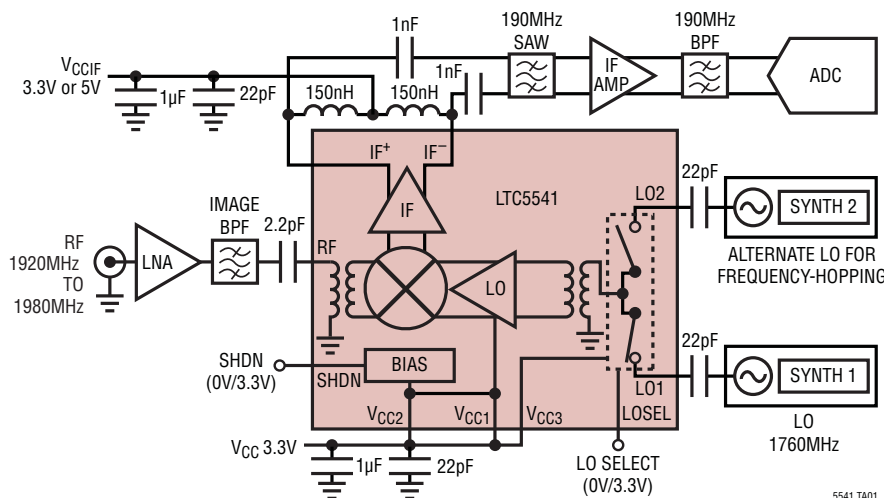
The LTC5541's high conversion gain and high dynamic range enable the use of lossy IF filters in high-selectivity receiver designs, while minimizing the total solution cost, board space and system-level variation.

High Dynamic Range Downconverting Mixer Family

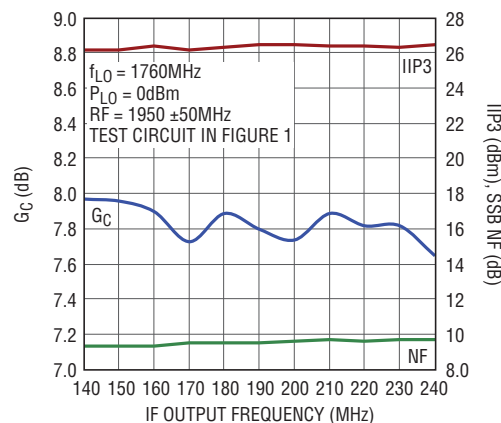
PART#	RF RANGE	LO RANGE
LTC5540	600MHz – 1.3GHz	700MHz – 1.2GHz
LTC5541	1.3GHz – 2.3GHz	1.4GHz – 2.0GHz
LTC5542	1.6GHz – 2.7GHz	1.7GHz – 2.5GHz
LTC5543	2.3GHz – 4GHz	2.4GHz – 3.6GHz

TYPICAL APPLICATION

Wideband Receiver



Wideband Conversion Gain, IIP3 and NF vs IF Output Frequency

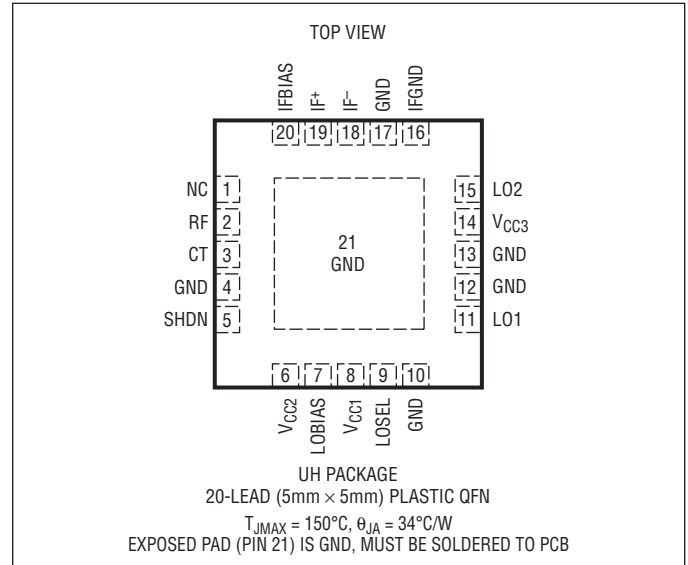


ABSOLUTE MAXIMUM RATINGS

(Note 1)

Mixer Supply Voltage (V_{CC1} , V_{CC2}).....	3.8V
LO Switch Supply Voltage (V_{CC3}).....	3.8V
IF Supply Voltage (IF^+ , IF^-)	5.5V
Shutdown Voltage (SHDN).....	-0.3V to $V_{CC} + 0.3V$
LO Select Voltage (LOSEL).....	-0.3V to $V_{CC} + 0.3V$
LO1, LO2 Input Power (1GHz to 3GHz).....	9dBm
LO1, LO2 Input DC Voltage	$\pm 0.5V$
RF Input Power (1GHz to 3GHz)	15dBm
RF Input DC Voltage.....	$\pm 0.1V$
Operating Temperature Range	-40°C to 85°C
Storage Temperature Range	-65°C to 150°C
Junction Temperature (T_J)	150°C

PIN CONFIGURATION



ORDER INFORMATION

LEAD FREE FINISH	TAPE AND REEL	PART MARKING	PACKAGE DESCRIPTION	TEMPERATURE RANGE
LTC5541IUH#PBF	LTC5541IUH#TRPBF	5541	20-Lead (5mm x 5mm) Plastic QFN	-40°C to 85°C

Consult LTC Marketing for parts specified with wider operating temperature ranges.
 Consult LTC Marketing for information on non-standard lead based finish parts.

For more information on lead free part marking, go to: <http://www.linear.com/leadfree/>
 For more information on tape and reel specifications, go to: <http://www.linear.com/tapeandree/>

AC ELECTRICAL CHARACTERISTICS

$V_{CC} = 3.3V$, $V_{CCIF} = 3.3V$, SHDN = Low, $T_A = 25^\circ C$, $P_{LO} = 0dBm$, unless otherwise noted. Test circuit shown in Figure 1. (Notes 2, 3, 4)

PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
LO Input Frequency Range			1400 to 2000		MHz
RF Input Frequency Range	Low-Side LO High-Side LO		1600 to 2300 1300 to 1800		MHz MHz
IF Output Frequency Range	Requires External Matching		5 to 500		MHz
RF Input Return Loss	$Z_0 = 50\Omega$, 1300MHz to 2300MHz		>12		dB
LO Input Return Loss	$Z_0 = 50\Omega$, 1400MHz to 2000MHz		>12		dB
IF Output Return Loss			>12		dB
LO Input Power	$f_{LO} = 1400MHz$ to 2000MHz	-4	0	4	dBm
LO to RF Leakage	$f_{LO} = 1400MHz$ to 2000MHz		<-32		dBm
LO to IF Leakage	$f_{LO} = 1400MHz$ to 2000MHz		<-31		dBm
LO Switch Isolation	LO1 Selected, 1400MHz < f_{LO} < 2000MHz LO2 Selected, 1400MHz < f_{LO} < 2000MHz		52 50		dB dB
RF to LO Isolation	$f_{RF} = 1300MHz$ to 2300MHz		52		dB
RF to IF Isolation	$f_{RF} = 1300MHz$ to 2300MHz		33		dB

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