TriQuint SEMICONDUCTOR

CMY212
Datasheet

Ultra-linear Mixer with Integrated IF Amp and LO Buffer

Description

CMY212 is a general purpose down-converter device designed for multiple applications such as cellular and PCS mobile phones, ISM bands, GPS receivers, L-band satellite terminals, WLAN and pagers. Due to its excellent intermodulation characteristics and its high conversion gain, CMY212 is particularly suited for CDMA receiver applications.
The device combines an ultra-linear mixer with LO - driver and a single stage IF-amplifier in a very small SCT598 package. The mixer section of CMY212 combines low conversion losses and excellent intermodulation characteristics with low requirements of LO - and DC-power. The internal level controlled LO-Buffer enables a good performance over a wide LO level range. The input and output matching of the IF amplifier can be adapted externally within a frequency range from 45 to 250 MHz.

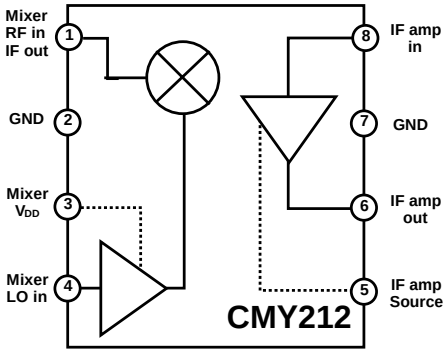
Features

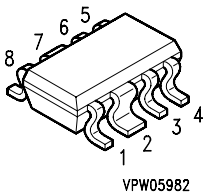
- Typical overall performance at cellular frequencies (for P_{LO} = -4dBm operation conditions: 3V, 11 mA; f_{RF} = 881 MHz; f_{LO} = 966 MHz):
  - Gain 10 dB
  - Input IP3 9 dBm
  - Noise figure 8 dB
- RF-frequency range 0.5 - 2.5 GHz
- Operating voltage range: 2.6 to 5V
- Small SCT598 plastic package

Applications

- Down Converter for Multiple Wireless Applications
- Cellular and PCS Mobile Phones
- Particularly Suited for CDMA Receivers
- ISM and WLAN Receivers
- GPS Receivers

Package Outline and Pin Configuration, SCT598





Maximum Ratings

Parameter	Port	Symbol	Value		Unit
			min	max	
Supply Voltage	3,6	V_{DD}	0	5	V
DC-Voltage at LO Input	4	V_6	-3	0,5	V
DC-Voltage at Mixer RF-IF Port	1	V_8	- 0,5	+ 0,5	V
Power into Mixer RF Port	1	P_{RF}		10	dBm
Power into LO Input	4	$P_{in,LO}$	-10	10	dBm
Channel Temperature		T_{Ch}		150	°C
Operating Temperature		T_{op}	-30	85	°C
Storage Temperature		T_{stg}	-55	150	°C

Thermal Resistance*				
Channel to Soldering Point (GND)	R_{thChS}	260		K/W

Electrical Characteristics

Parameter,	Comment	min	typ	max	Unit
RF - frequency range	external match	0.5	-	2.5	GHz
LO - Frequency range	external match	0.5	-	2.5	GHz
IF Frequency range	external match	45		250	MHz

Typical performance at cellular frequencies*:
T_a = 25°C; V_{DD}= 3V, f_{RF} = 881MHz; f_{LO} = 966MHz; P_{LO} = -4dBm; f_{IF} = 85MHz,
Z_S= Z_L = 50 Ohm; unless otherwise specified

Parameter, Test Conditions	Symbol	Min	typ	max	Unit
Total operating Current (Mixer + IF amplifier)	I_{op}	-	11	-	mA
Conversion Gain	G_c	-	10	-	dB
SSB Noise Figure	F_{ssb}	-	8	-	dB
RF Input -/ IF Output return loss (external matching required)	RFIrl / IFOrl	-	10	-	dB
3rd Order Input Intercept Point	IIP3	-	10	-	dBm

Test conditions at PCS frequencies:
T_a = 25°C; V_{DD}= 3V, f_{RF} = 1960MHz; f_{LO} = 1750MHz; P_{LO} = -4dBm; f_{IF} = 210MHz,
Z_S= Z_L = 50 Ohm; unless otherwise specified

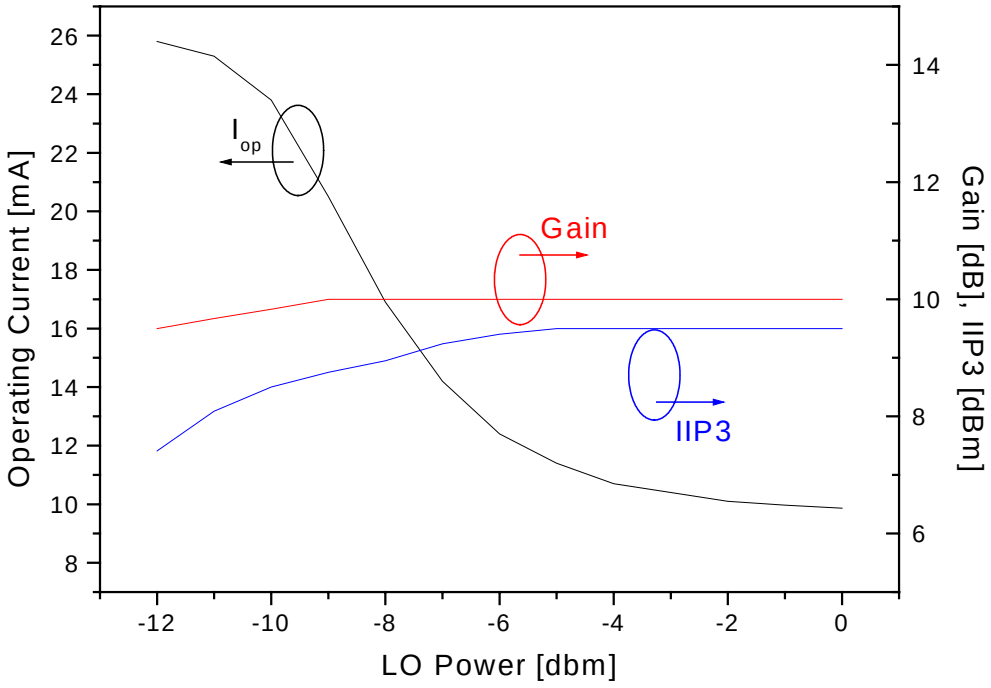
Parameter, Test Conditions	Symbol	Min	Typ	max	Unit
Total operating Current (Mixer + IF amplifier)	I_{op}	-	12	14	mA
Conversion Gain	G_c	8.5	9.5	-	dB
SSB Noise Figure	F_{ssb}	-	8.5	-	dB
RF Input -/ IF output return loss (external matching required)	RFIrl / IFOrl	-	10	-	dB
3rd Order Input Intercept Point	IIP3	10	11.5	-	dBm

* IMPORTANT NOTE:
During production, the RF performance at PCS frequencies is screened. The passed devices also achieve the specified RF performance at cellular frequencies.

Electrical Characteristics (cont)

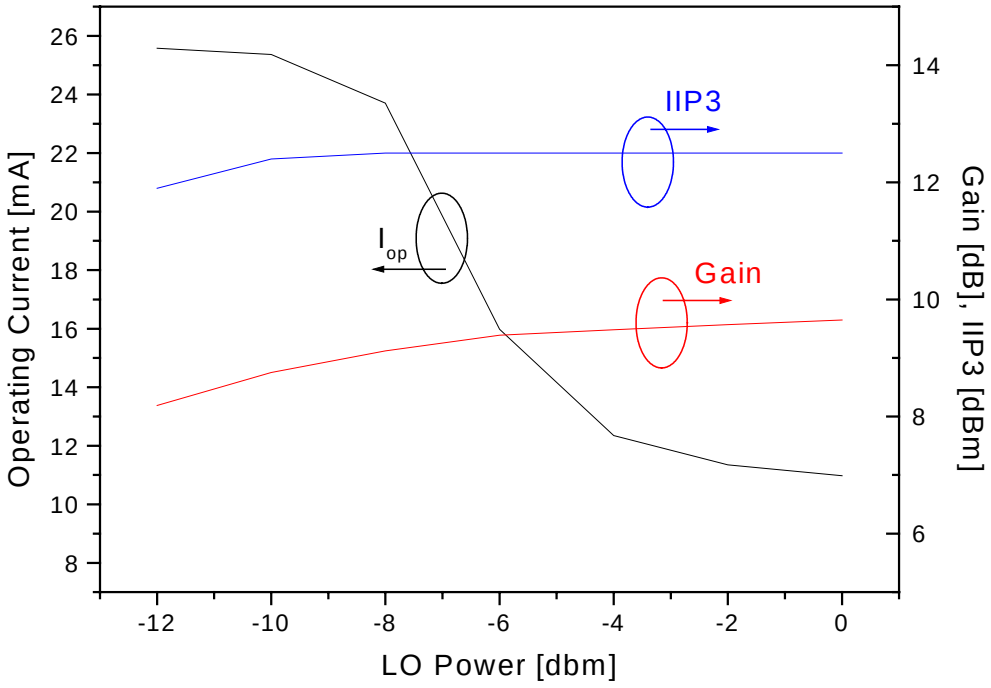
Typical device behavior at cellular frequencies:

T_a = 25°C; V_{DD}= 3V, f_{RF} = 881MHz; f_{LO} = 966MHz; f_{IF} = 85MHz;
Z_S= Z_L = 50 Ohm; unless otherwise specified



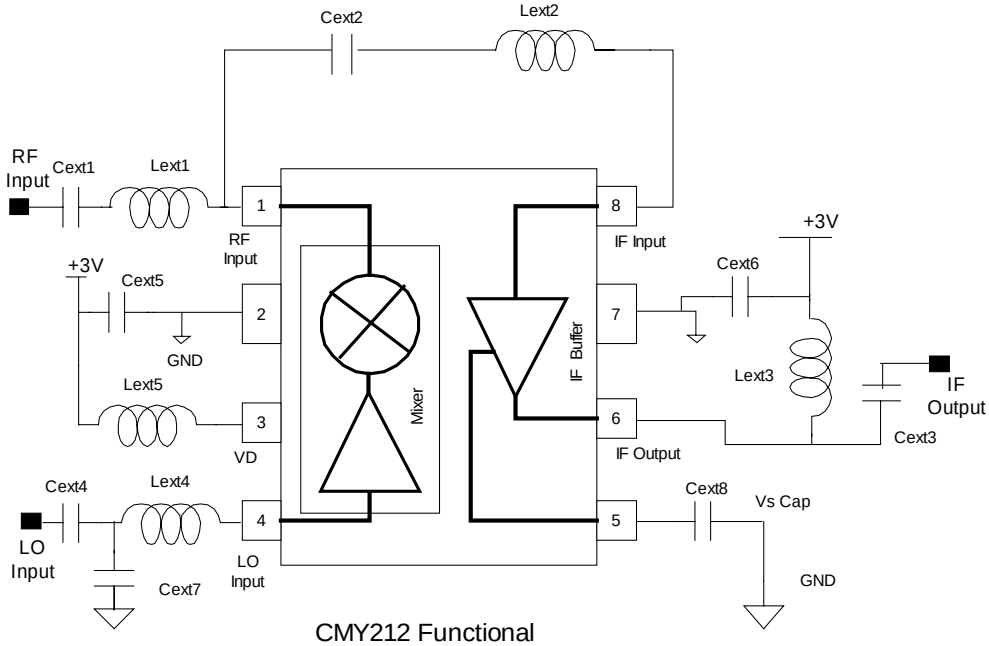
Typical device behavior at PCS frequencies:

T_a = 25°C; V_{DD}= 3V, f_{RF} = 1960MHz; f_{LO} = 1750MHz; f_{IF} = 210MHz;
Z_S= Z_L = 50 Ohm; unless otherwise specified



Applications Information

Test Circuit:



CMY212 Functional Block Diagram

External components for cellular frequencies

f_{RF} = 875MHz; f_{LO} = 960MHz; f_{IF} = 85MHz

Capacitors	(Murata 0402)	Inductors	(Toko)
Cext1	2 pF	Lext1	18 nH *LL1005*
Cext2	1 nF	Lext2	270 nH *LL1608*
Cext3	20 pF	Lext3	220 nH *LL1608*
Cext4	100 pF	Lext4	12 nH *LL1005*
Cext5	1 nF	Lext5	15 nH *LL1005*
Cext6	1 nF		
Cext7	3.3 pF		
Cext8	100 nF	Lext8	22 nH *LL1005*

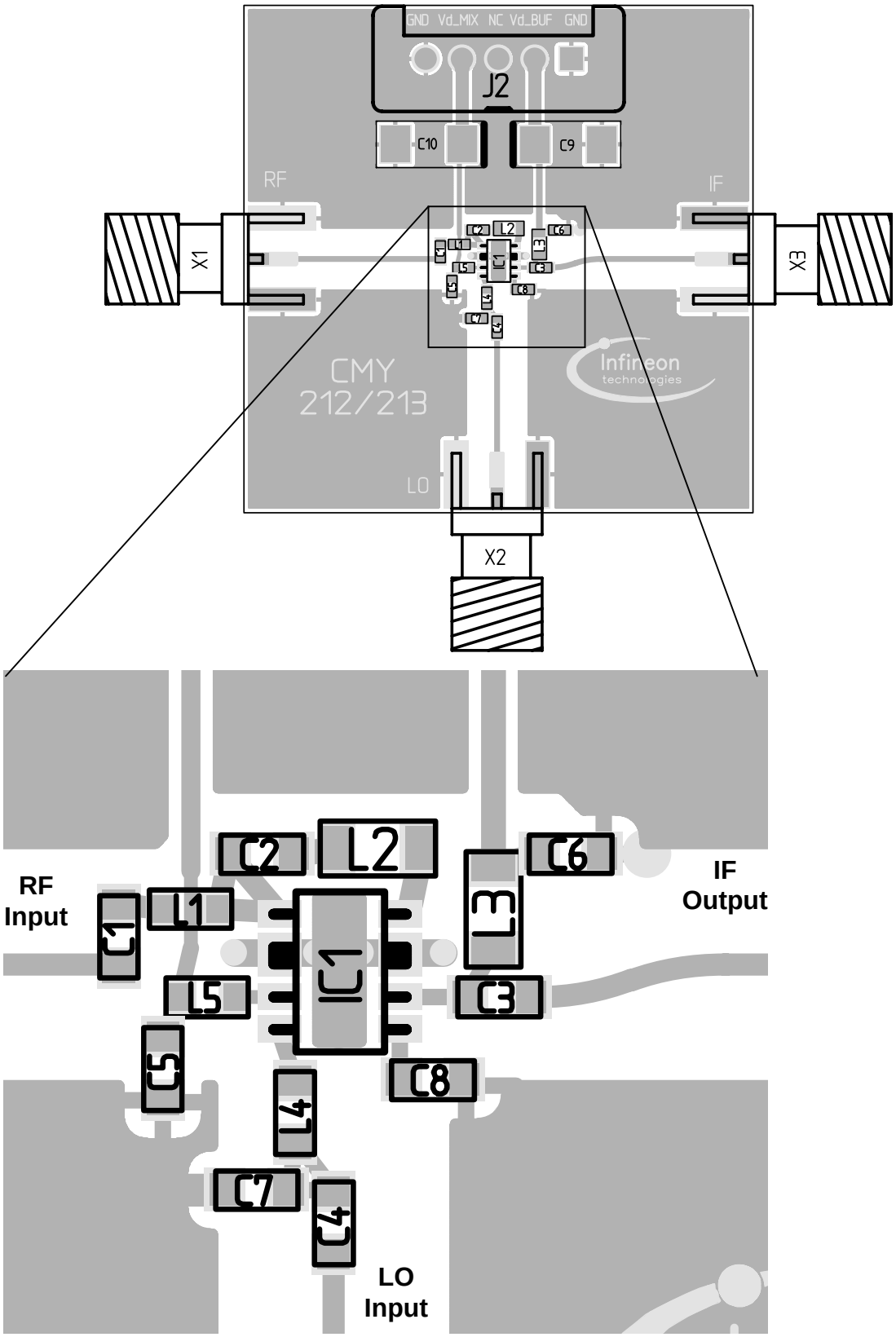
External components for PCS frequencies

f_{RF} = 1960MHz; f_{LO} = 1750MHz; f_{IF} = 210MHz

Capacitors	(Murata 0402)	Inductors	(Toko)
Cext1	1 pF	Lext1	5.6 nH *LL1005*
Cext2	1 nF	Lext2	68 nH *LL1608*
Cext3	8 pF	Lext3	68 nH *LL1608*
Cext4	22 pF	Lext4	4.7 nH *LL1005*
Cext5	1 nF	Lext5	4.7 nH *LL1005*
Cext6	1 nF		
Cext7	3 pF		
Cext8	100 nF		

Applications Information (cont)

PCB Layout:
Size: 35 x 35 mm²

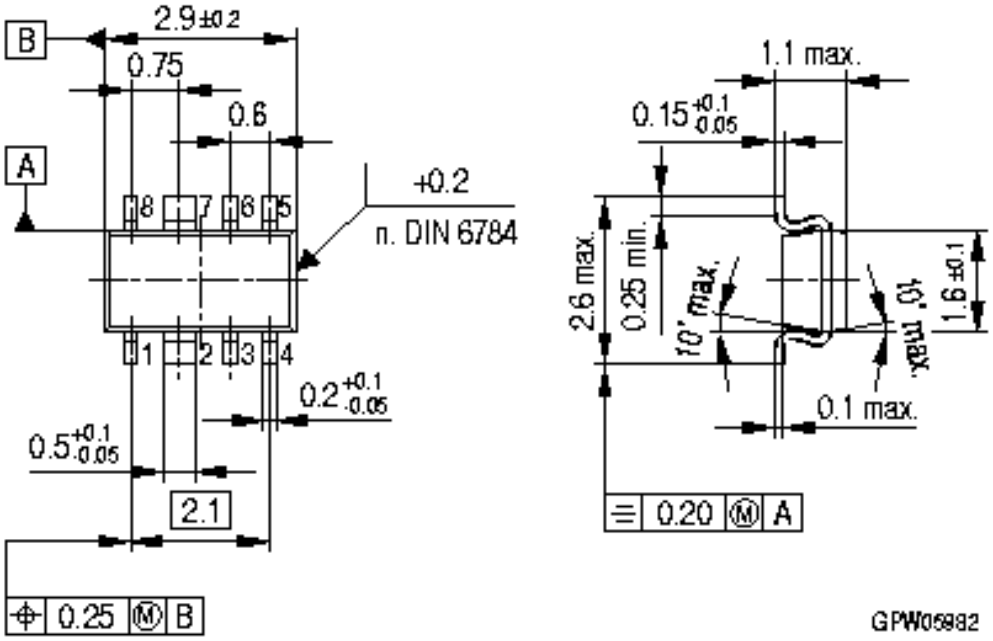


General description and notes

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Semiconductor Device Outline SCT598-8-1



Ordering Information

Type	Marking	Ordering code (tape and reel)	Package [1)]
CMY212	212	CMY212	SCT598-8-1

Additional Information

This part is compliant with RoHS directive (Restrictions on the Use of Certain Hazardous Substances in Electrical and Electronic Equipment).

The part is rated Moisture Sensitivity Level 1 at 260°C per JEDEC standard IPC/JEDEC J-STD-020.

ESD: **E**lectro**s**tatic **d**ischarge sensitive device. Observe handling Precautions.

For latest specifications, additional product information, worldwide sales and distribution locations, and information about TriQuint:

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