

35-45GHz Single Side Band Mixer Self biased

Preliminary

GaAs Monolithic Microwave IC

Description

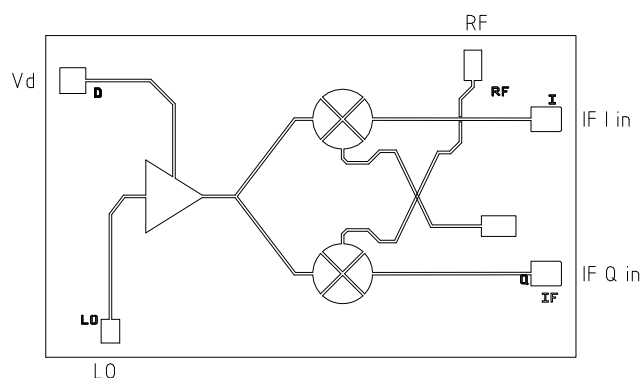
The MFC_PO10892 is a multifunction chip (MFC) which integrates a self biased LO buffer amplifier and a sub-harmonically balanced diode mixer for 2LO suppression and image rejection. It is usable both for up-conversion and down-conversion.

It is designed for a wide range of applications, typically commercial communication systems for broadband local access. The backside of the chip is both RF and DC grounded. This helps to simplify the assembly process.

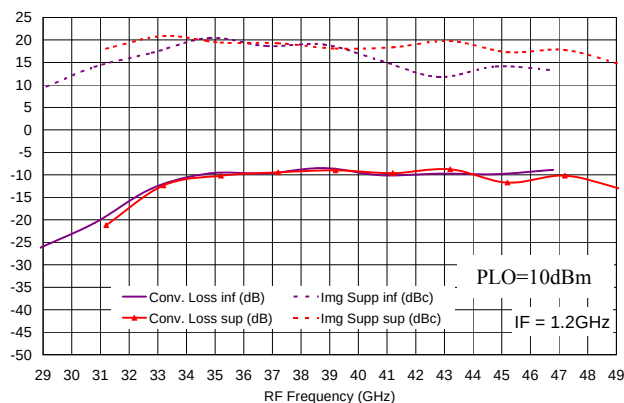
The circuit is manufactured with a P-HEMT process, 0.25 μ m gate length. It is available in chip form.

Main Features

- Broadband performances : 35-45GHz
- 11dB conversion Loss
- 15dBc image rejection
- +10dBm LO input power
- +0dBm input power (1dB gain comp.)
- Power consumption 60mA@4V
- Chip size : 2.06 x 1.25 x 0.10 mm



Up converter in Infradyne & supradyn mode



Main Characteristics

Tamb. = 25°C

	Parameter	Min	Typ	Max	Unit
F_{RF}	RF frequency range	35		45	GHz
F_{LO}	LO frequency range	16		24	GHz
F_{IF}	IF frequency range	DC		3	GHz
L_c	Conversion Loss		11		dB

ESD Protection : Electrostatic discharge sensitive device. Observe handling precautions !

Electrical Characteristics for Broadband OperationT_{amb} = +25°C*Preliminary*

Symbol	Parameter	Min	Typ	Max	Unit
F _{LO}	LO frequency range	16		24	GHz
F _{IF}	IF frequency range	DC		3	GHz
L _c	Conversion Loss		11		dB
P _{LO}	LO Input power		+10		dBm
2xLO Leak	2xLO Leakage (for P _{LO} =+10dBm)		-35	-	dBm
Img Rej	Image Rejection (1)		15		dBc
P1dB	Input power at 1dB compression		+0		dBm
LO Match	LO VSWR*		2.0:1		
RF Match	RF VSWR*		2.0:1		
IF Match	IF VSWR*		2.0:1		
V _d	Drain bias supply		4		V
I _d	Bias current		60		mA

(1) With external quadrature hybrid coupler (reference on request). The minimal value depends on the quality of the external quadrature combiner.

* A bonding wire of typically 0.1 to 0.15 nH will improve the accesses matching.

Absolute Maximum RatingsT_{amb.} = 25°C (1)

Symbol	Parameter	Values	Unit
V _d	Drain bias voltage	4.5	V
I _d	Drain bias current	90	mA
P _{LO}	Maximum LO input power	15	dBm
T _a	Operating temperature range	-40 to +85	°C
T _{stg}	Storage temperature range	-55 to +125	°C

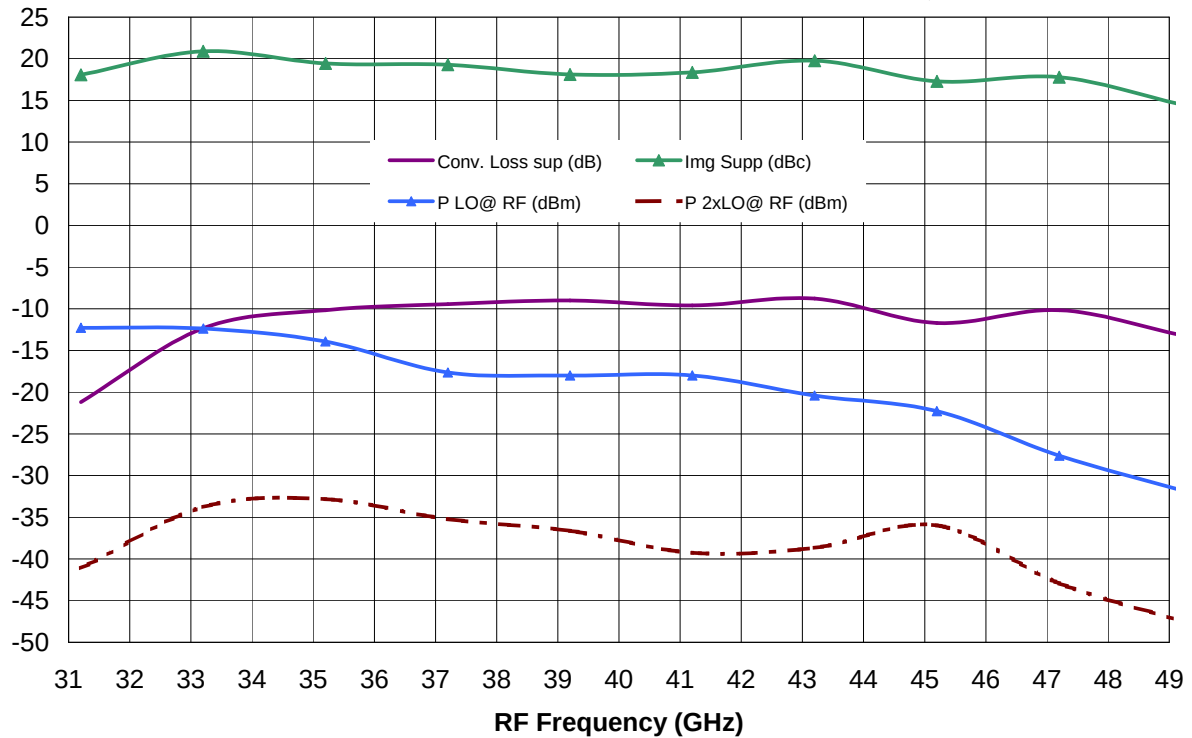
(1) Operation of this device above any one of these parameters may cause permanent damage.

Typical on wafer measurement

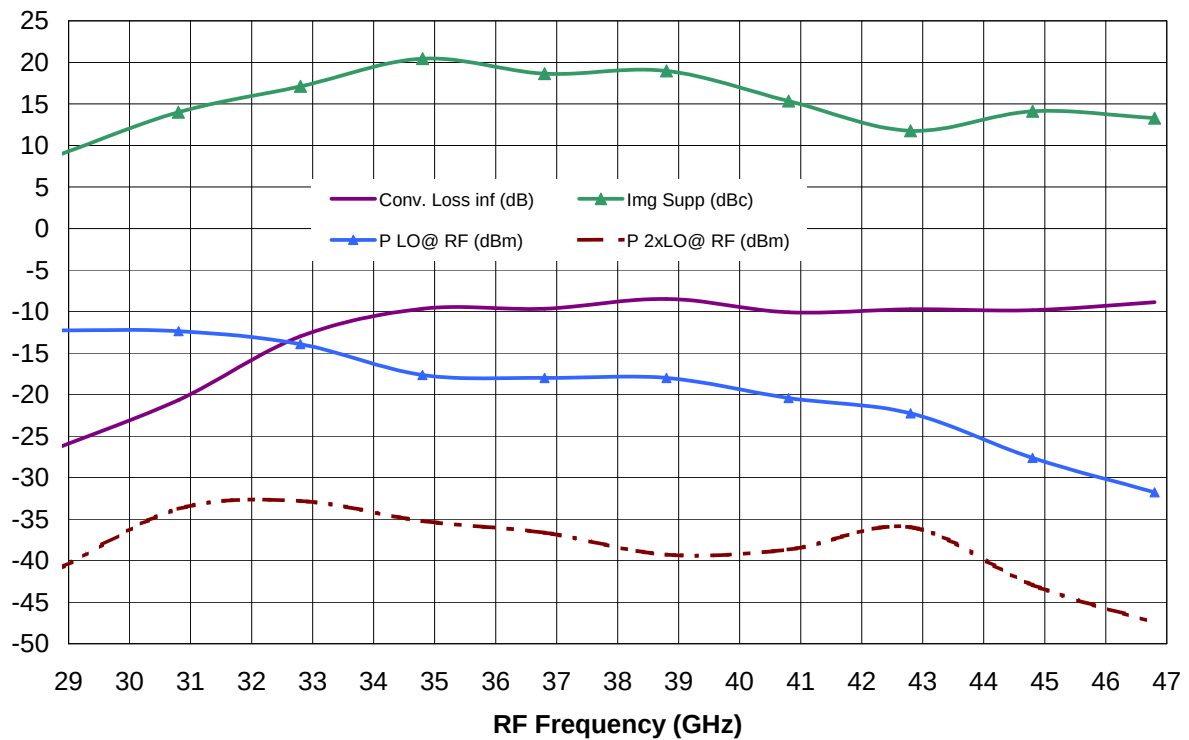
Tamb= 25°C, Vd=4V, Id=60mA, Freq IF=1.2GHz, P_LO=10 dBm

Preliminary

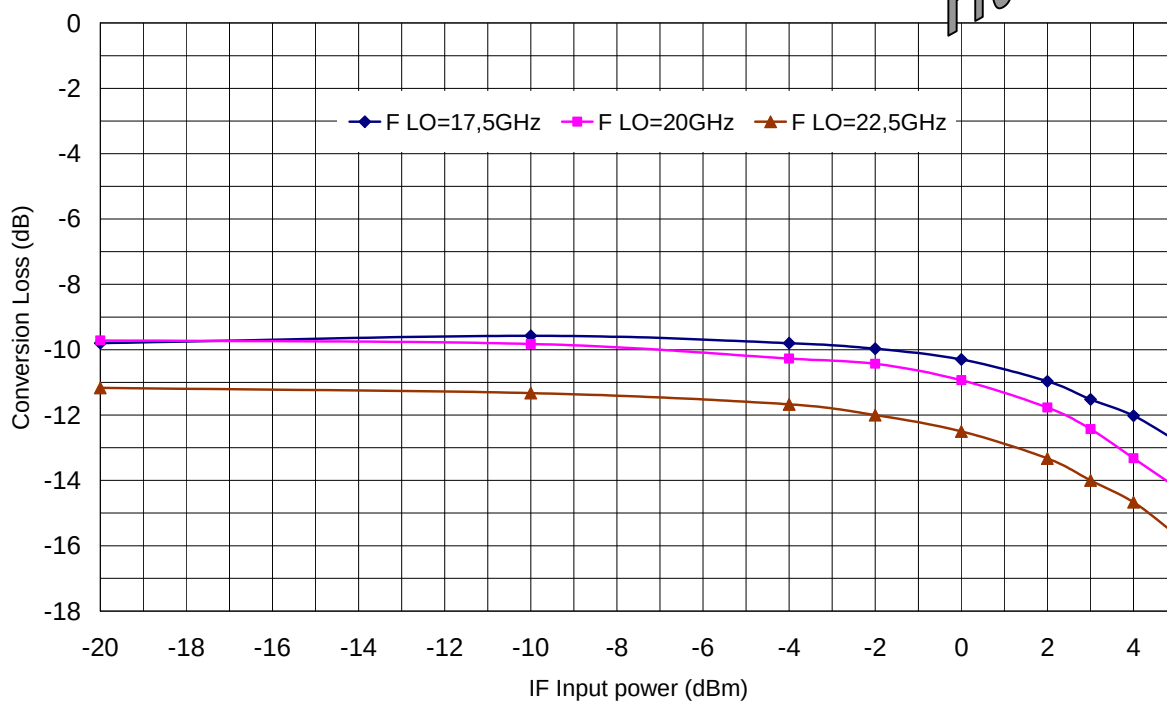
Up Converter in Supradyne mode



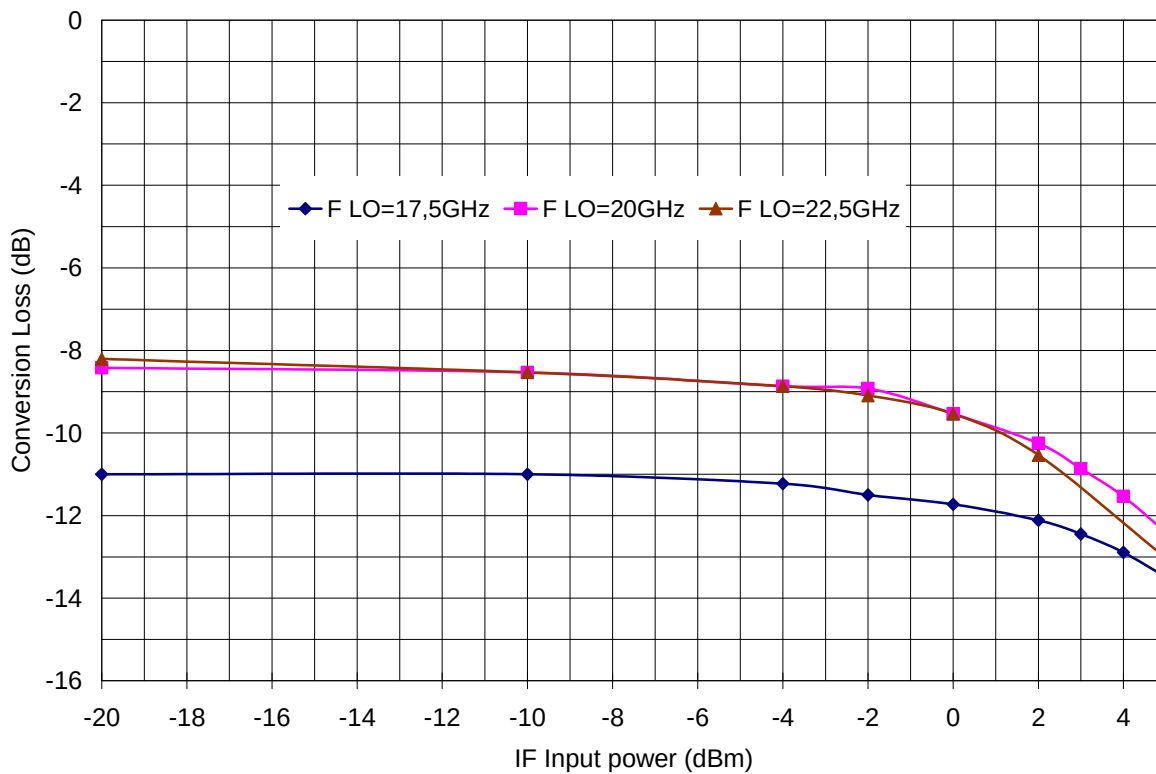
Up Converter in Infradyne mode



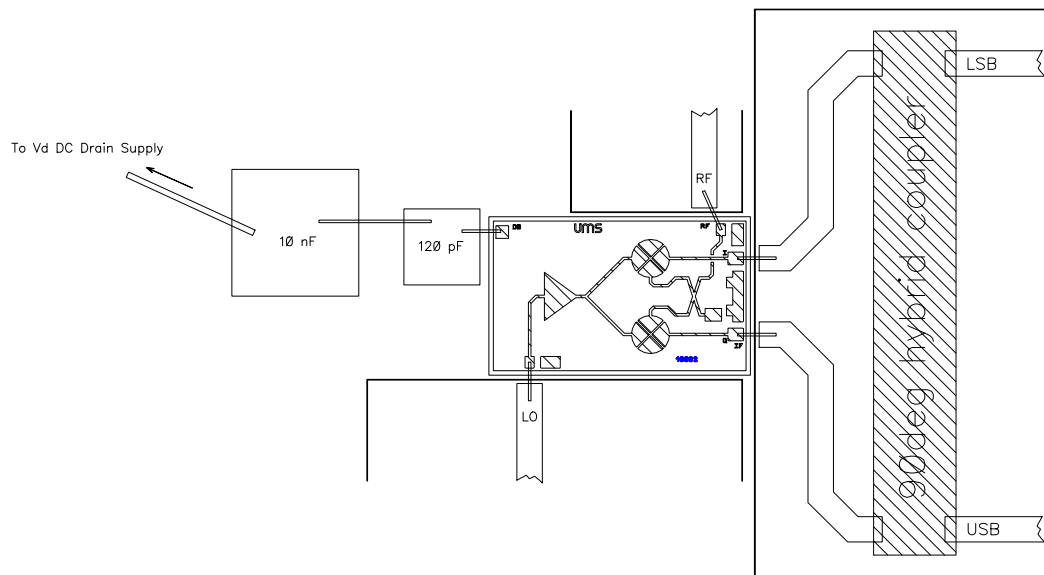
Up Converter compression in Supradyne mode

Preliminary

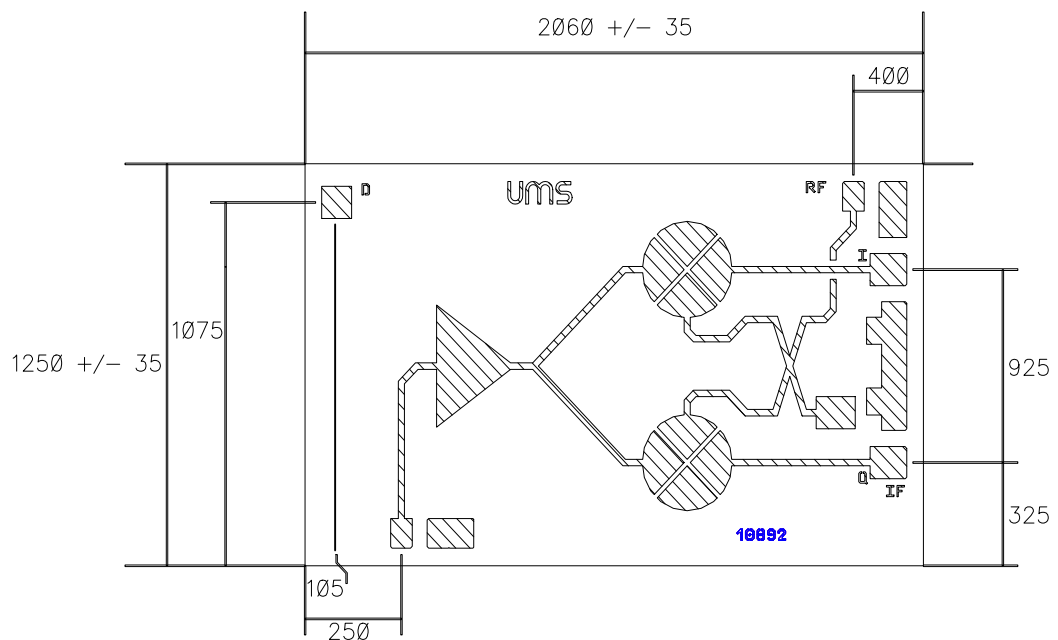
Up Converter compression in Infradyne mode



Chip Assembly and Mechanical Data



Note : Supply feed should be capacitively bypassed. 25µm diameter gold wire is recommended



Chip Mechanical Data and Pin references

(Chip thickness : 100µm. All dimensions are in micrometers)

Preliminary

Ordering Information

Chip form: MFC-PO10892-99F/00

Information furnished is believed to be accurate and reliable. However **United Monolithic Semiconductors S.A.S.** assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of **United Monolithic Semiconductors S.A.S.**. Specifications mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied. **United Monolithic Semiconductors S.A.S.** products are not authorised for use as critical components in life support devices or systems without express written approval from **United Monolithic Semiconductors S.A.S.**