

37-40GHz Integrated Down converter

GaAs Monolithic Microwave IC

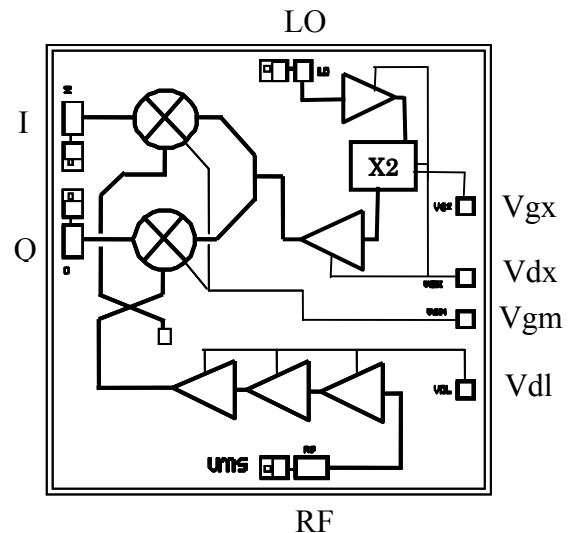
Preliminary

Description

The MFC-PO13811 is a multifunction chip, which integrates a balanced cold FET mixer, a time two multiplier, and a RF LNA. It is designed for a wide range of applications, typically commercial communication systems.

The backside of the chip is both RF and DC grounded. This helps to simplify the assembly process.

The circuit is manufactured with a PM-HEMT process, 0.25µm gate length, via holes through the substrate and air bridges.



It is supplied in chip form.

Main Features

- Broadband performance 37-40GHz
- 13dB gain
- 16dBc Image Frequency Rejection
- ESD protected
- DC power consumption: 4V, 140mA
- Chip size: 2,45 x 2,45 x 0,1mm

Main Characteristics

Tamb=25°C, Vd=4V

Symbol	Parameter	Min	Typ	Max	Unit
F _{RF}	RF frequency range	37		40	GHz
F _{LO}	LO frequency range	17.5		21	GHz
F _{IF}	IF frequency range	DC		3.5	GHz
G _c	Conversion gain		13		dB

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

Electrical CharacteristicsT_{amb}=25°C, V_{dx}=V_{dl} = 4V, Typical V_{gx} = -0.9V & V_{gm} = -0.7V

Symbol	Parameter	Min	Typ	Max	Unit
F _{RF}	RF frequency range	37		40	GHz
F _{LO}	LO frequency range	17.5		21	GHz
F _{IF}	IF frequency range	DC		3.5	GHz
G _c	Conversion gain		13		dB
P _{LO}	LO Input power		1		dBm
Img Sup	Image Suppression (1)		16		dBc
NF	Noise Figure		4.5		dB
IIP3	Input IP3		-5		dBm
LO VSWR	Input LO VSWR		2.0:1		
RF VSWR	Input RF VSWR		2.0:1		
I _d	Bias current (2)		140		mA

(1) With external I/Q 90° hybrid coupler

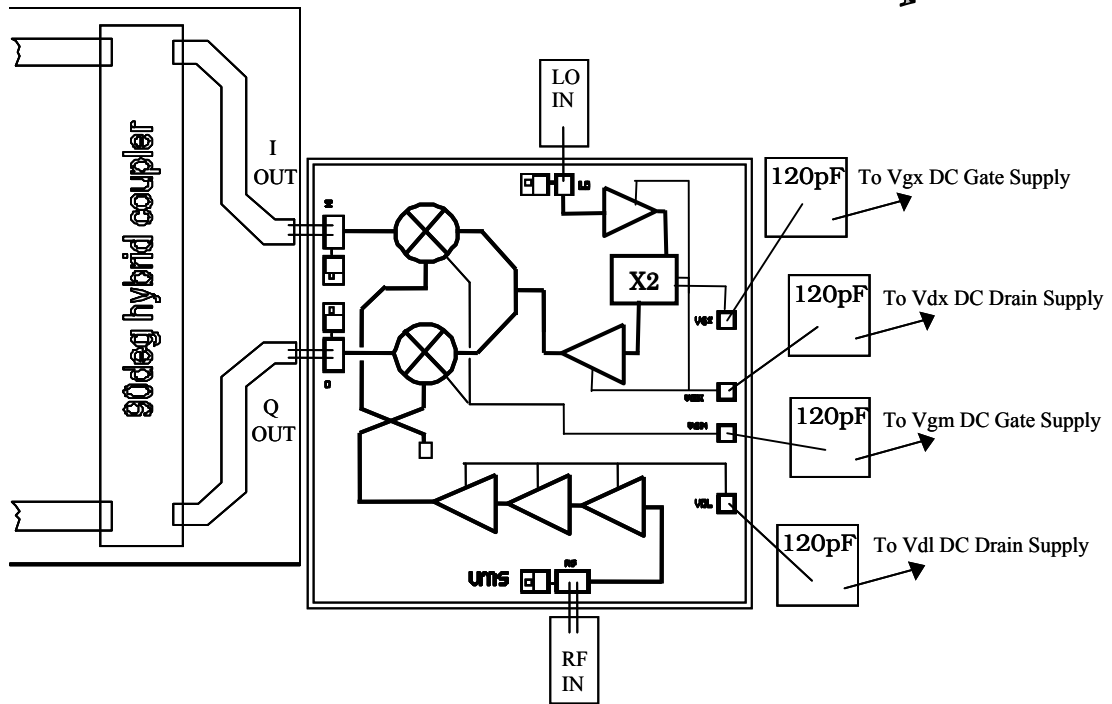
(2) Typically, I_{dl} = 60mA, I_{dx} = 80mA**Absolute Maximum Ratings (1)**T_{amb} = +25°C

Symbol	Parameter	Values	Unit
V _d	Maximum drain bias voltage	4.5	V
I _d	Maximum drain bias current	200	mA
V _g	Gate bias voltage	-2.0 to +0.4	V
P _{RF}	Maximum RF input power	10	dBm
P _{LO}	Maximum LO input power	10	dBm
T _{ch}	Maximum channel temperature	175	°C
T _a	Operating temperature range	-40 to +85	°C
T _{stg}	Storage temperature range	-55 to +125	°C

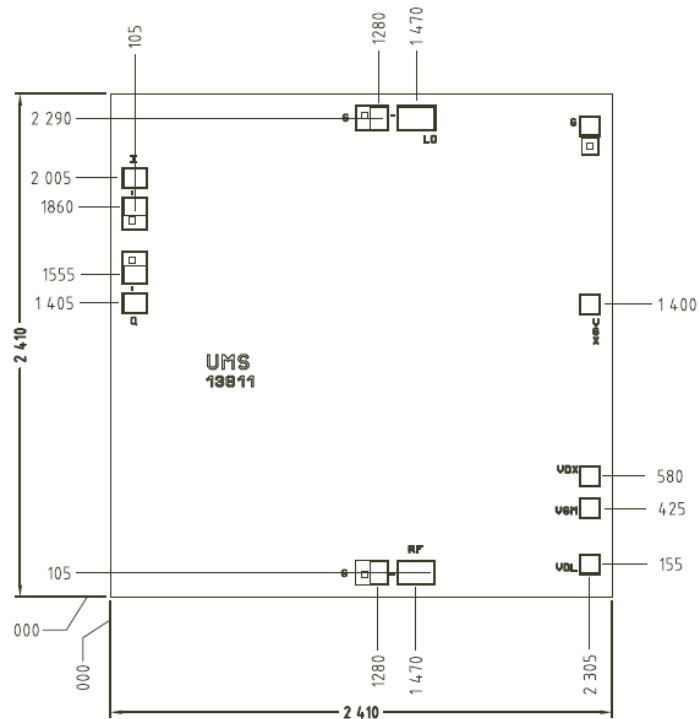
(1) Operation of this device above any one of these parameters may cause permanent damage.

Chip Assembly and Mechanical Data

Preliminary

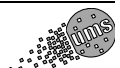


Note:
Supply feed should be capacitively bypassed. 25µm diameter gold wire is recommended.



UNITS : µm
Tol : ±35µm

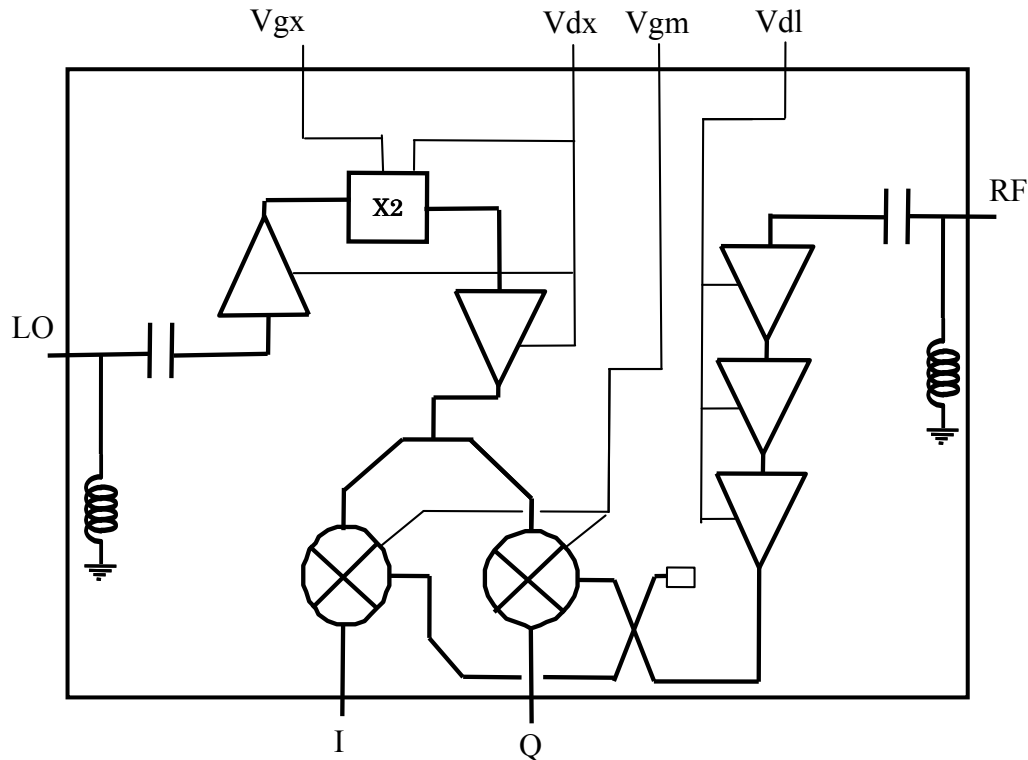
Bonding pad positions
(Chip thickness: 100µm. All dimensions are in micrometers)



Note :

Preliminary

Due to ESD protection, LO and RF accesses are DC grounded, an external capacitance might be requested to isolate the product from external voltage that could be present on the RF accesses.



ESD protections are also implemented on gate accesses : Vgx and Vgm.

Ordering Information

Chip form: MFC-PO13811-99F/00

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