

21-26.5GHz Integrated Down converter

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GaAs Monolithic Microwave IC

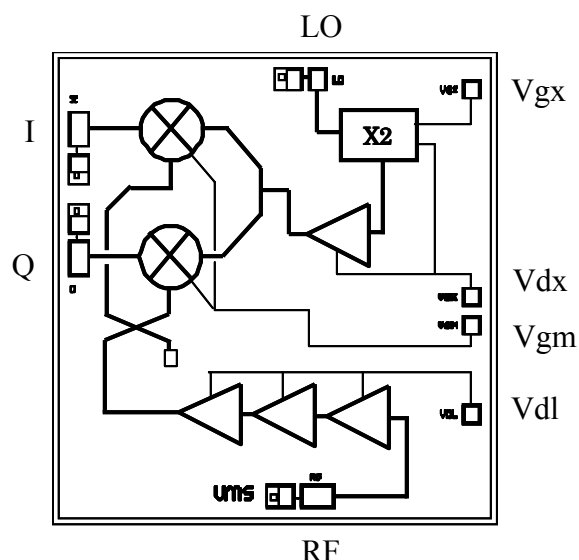
Preliminary

Description

The CHR3693 is a multifunction chip, which integrates a balanced cold FET mixer, a time two multiplier, and a RF self biased 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, 0.25 μ m gate length, via holes through the substrate and air bridges.

It is supplied in chip form.

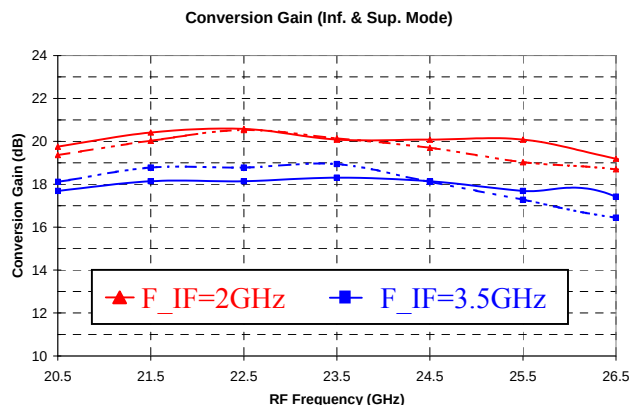


Main Features

- Broadband performance 21-26.5GHz
- 18dB gain
- -7dBm input IP3
- 18dB image rejection
- DC power consumption: 4V, 160mA
- 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	21		26.5	GHz
F_{LO}	LO frequency range	9		14	GHz
F_{IF}	IF frequency range	DC		3.5	GHz
G_c	Conversion gain		18		dB

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

Preliminary

Electrical Characteristics

Tamb=25°C, Vdx=Vdl = +4V, Vgx=-0.9V, Vgm=-0.7V

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Symbol	Parameter	Min	Typ	Max	Unit
F _{RF}	RF frequency range	21		26.5	GHz
F _{LO}	LO frequency range	9		14	GHz
F _{IF}	IF frequency range	DC		3.5	GHz
G _c	Conversion gain		18		dB
NF	Noise Figure		3.2		dB
P _{LO}	LO Input power			+5	dBm
Img Sup	Image Suppression (1)		18		dBc
IIP3	Input IP3		-7		dBm
LO VSWR	Input LO VSWR		2.0:1		
RF VSWR	Input RF VSWR (21 to 23.6GHz) Input RF VSWR (24.5 to 26.5GHz)		2.0:1 2.3:1		
I _d	Bias current (2)		160		mA

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

(2) Typically, I_{dl}= 90mA, I_{dx}=70mA

Absolute Maximum Ratings (1)

Tamb=+25°C

Symbol	Parameter	Values	Unit
V _d	Maximum drain bias voltage	4.5	V
I _d	Maximum drain bias current	230	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 anyone of these parameters may cause permanent damage.

Typical On-Wafer Measured Performance

Tamb=25°C, Vdx=Vdl=4V, Typical Vgx=-0.9V & Vgm=-0.7 V

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Conversion Gain (Inf. & Sup. Mode)

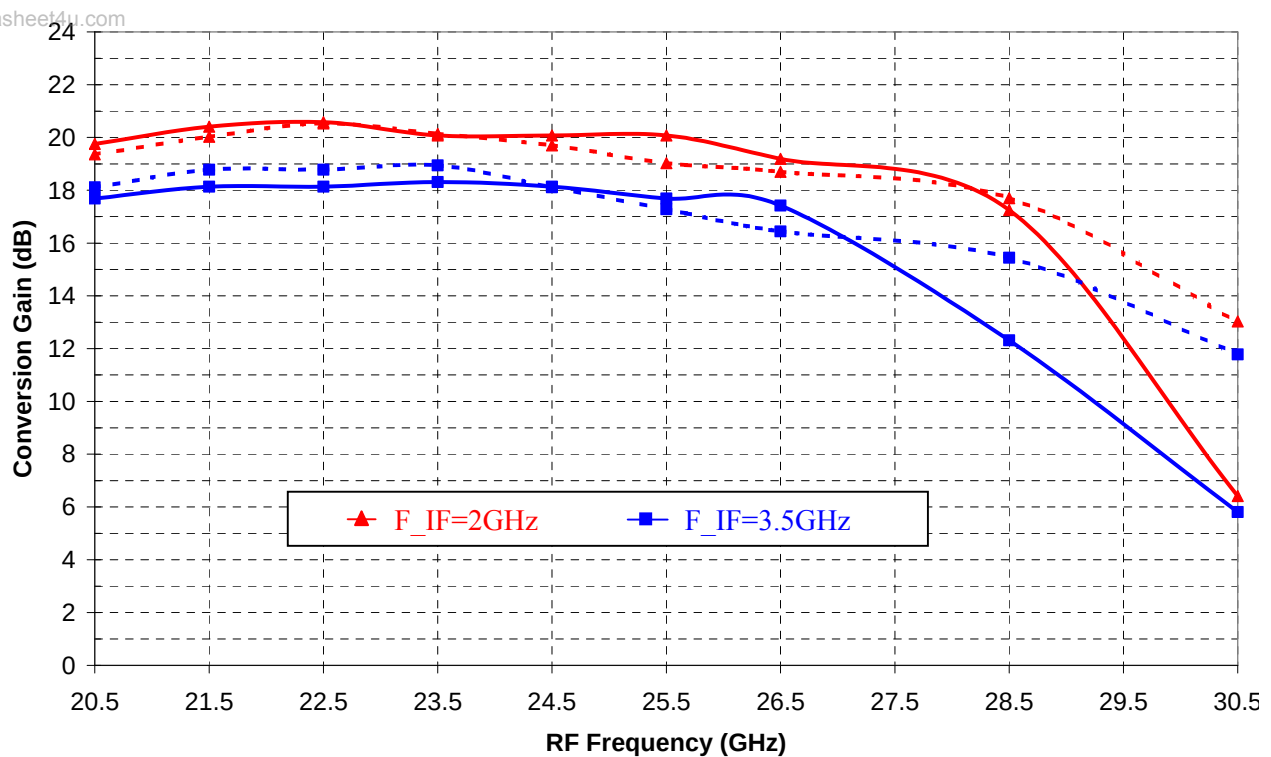
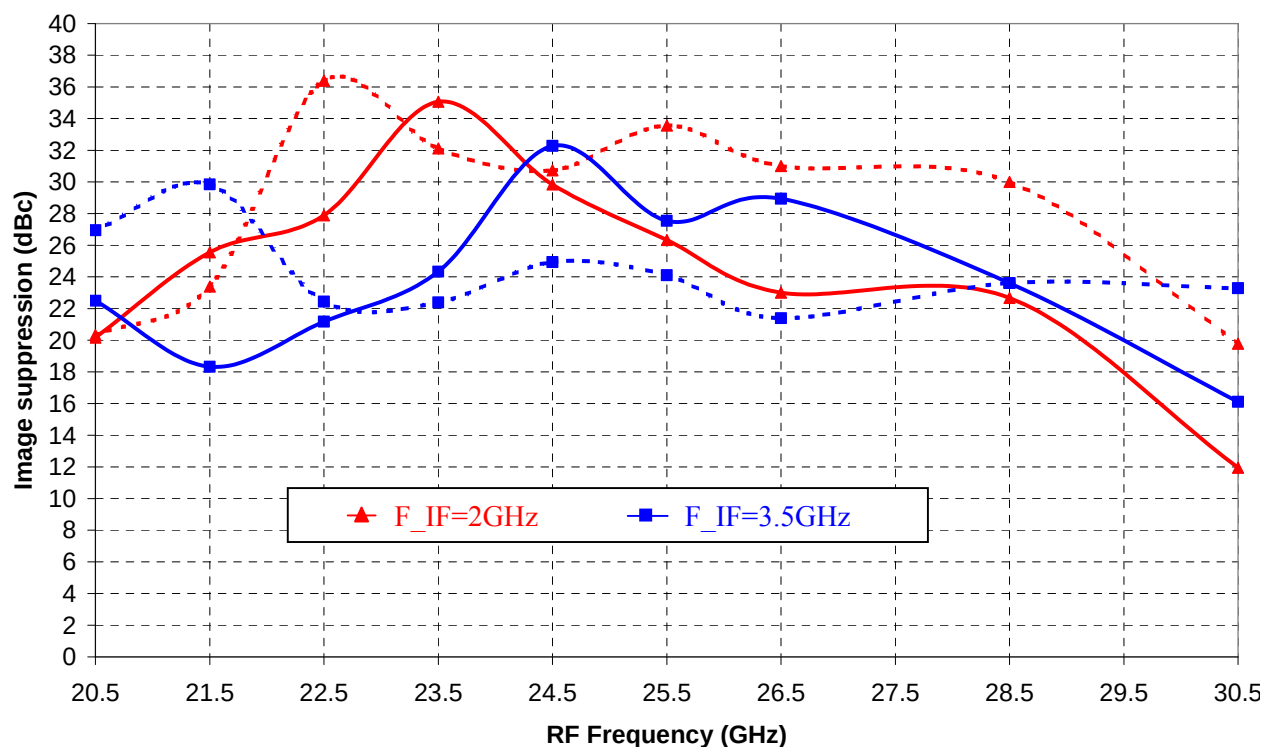
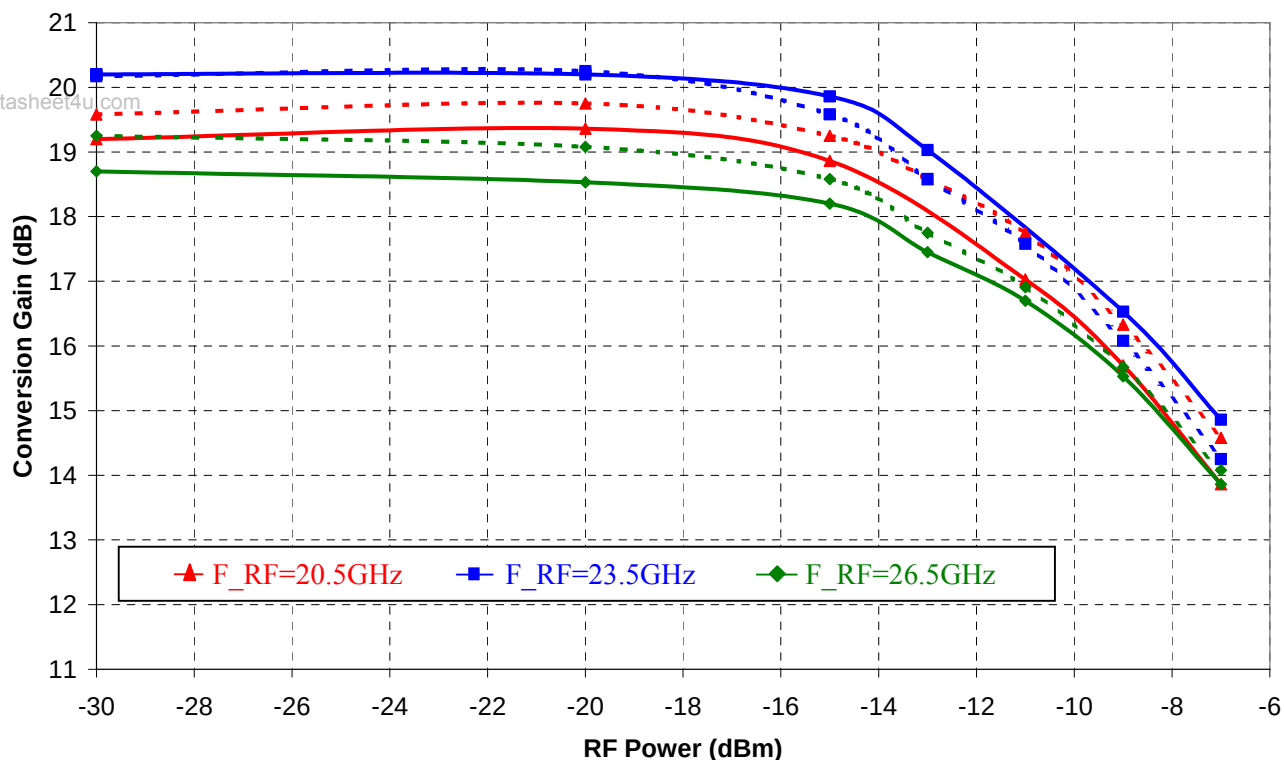


Image Frequency Rejection (Inf. & Sup. Mode)

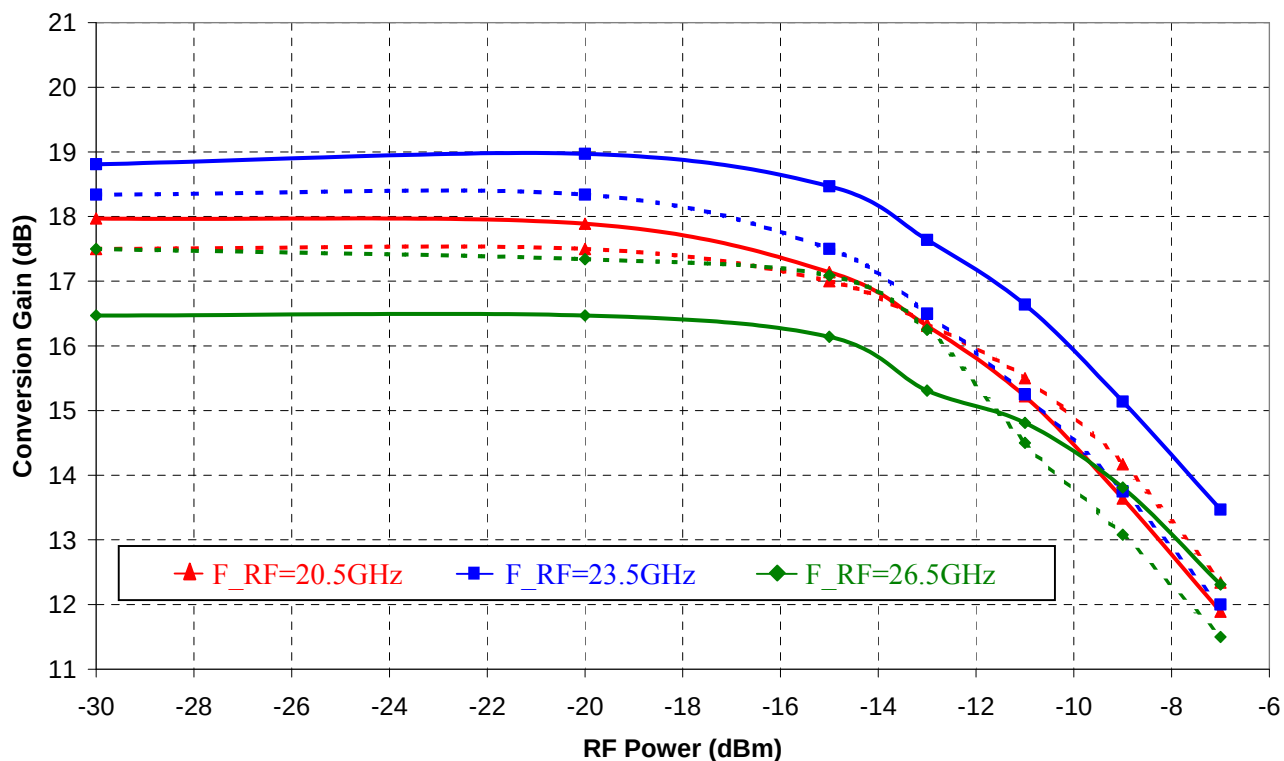


Compression vs RF Power (Inf. & Sup. Mode) @ $F_{IF}=2\text{GHz}$

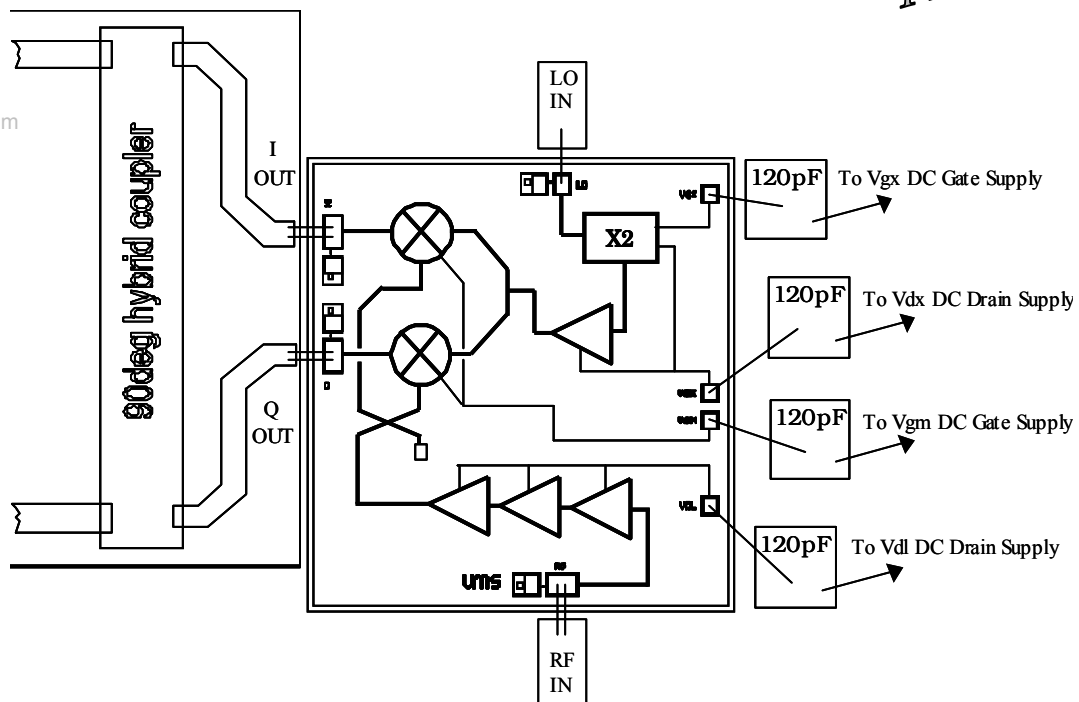
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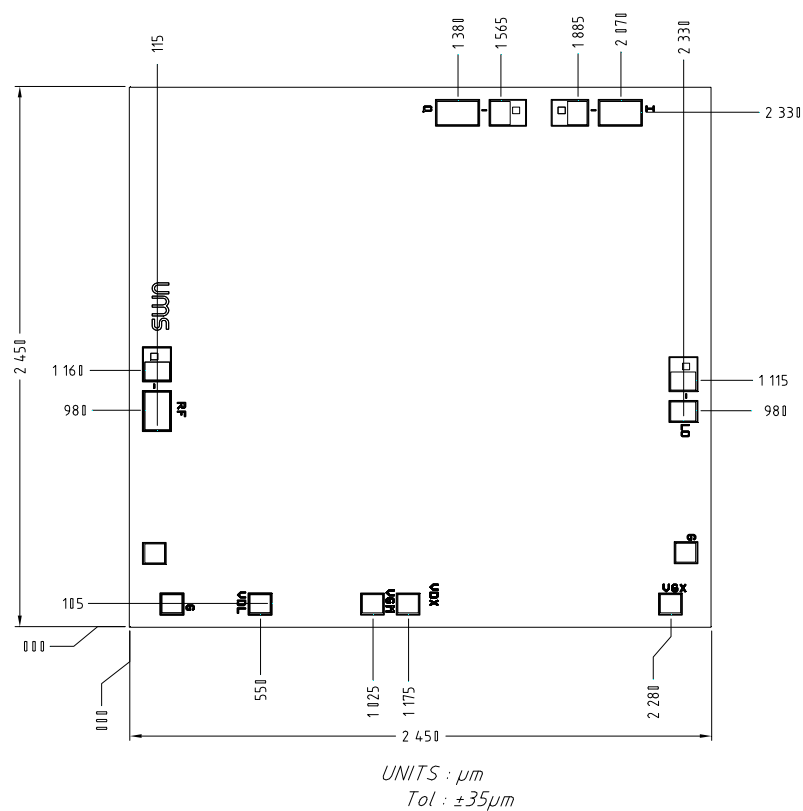
Compression vs RF Power (Inf. & Sup. Mode) @ $F_{IF}=3.5\text{GHz}$



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Supply feed should be capacitively bypassed. 25 μ m diameter gold wire is recommended.



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

Specifications subject to change without notice



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Ordering Information

Chip form: CHR3693-99F/00

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