

GN2012

GaAs N-Channel IC

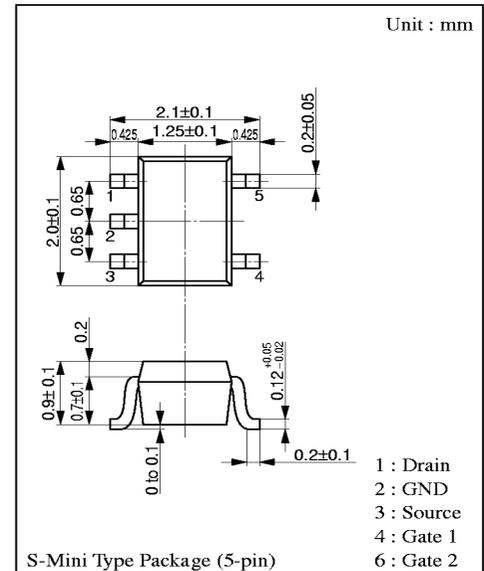
For UHF band mixer

■ Features

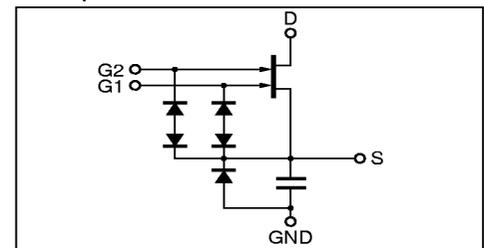
- Large-capacitance capacitor built-in (external bypass capacitor not necessary)
- Low distortion (IP3=12dBm)
- High conversion gain (CG=12dB)
- Small package : S-mini type 5-pin package

■ Absolute Maximum Ratings (Ta = 25°C)

Parameter	Symbol	Rating	Unit
Drain-Source voltage	V _{DS}	10	V
1st Gate-Source voltage	V _{G1S}	- 6	V
2nd Gate-Source voltage	V _{G2S}	- 6	V
Source-Ground voltage	V _{SGND}	5	V
Drain-Source current	I _{DS}	50	mA
1st gate current	I _{G1}	1	mA
2nd gate current	I _{G2}	1	mA
Source-Ground current	I _{SGND}	50	μA
Allowable power dissipation	P _D	150	mW
Channel temperature	T _{ch}	150	°C
Storage temperature	T _{stg}	- 55 to +150	°C



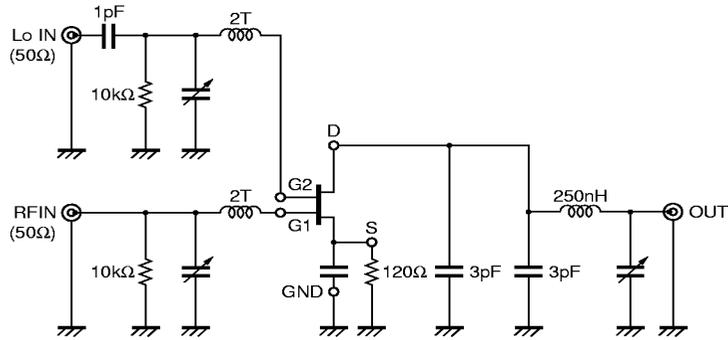
■ Equivalent Circuit



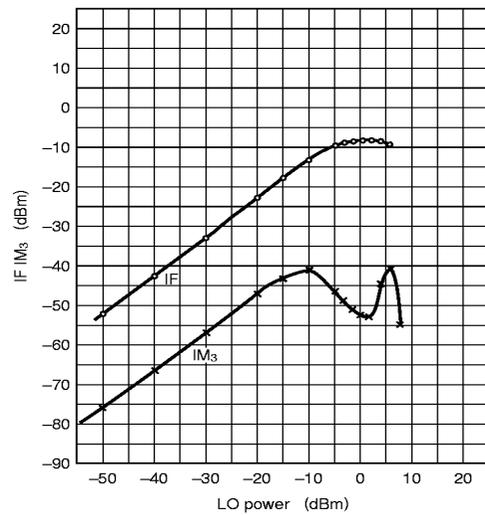
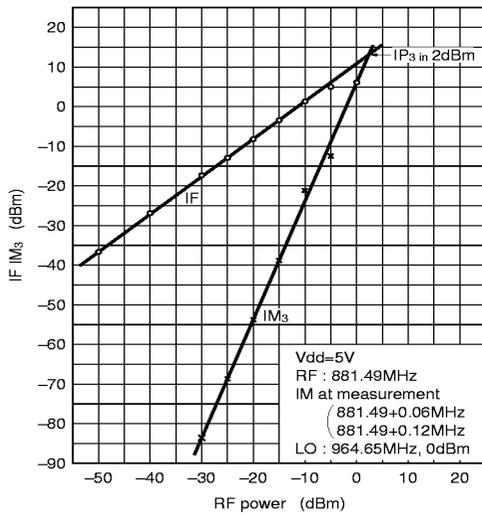
■ Electrical Characteristics (Ta = 25°C)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Drain cut-off current	I _{DSX}	V _{DS} =10V, V _{G1S} = - 3.5V, V _{G2S} = 0			50	μA
1st gate cut-off current	I _{G1SS}	V _{DS} =V _{G2S} = 0, V _{G1S} = - 6V			- 20	μA
2nd gate cut-off current	I _{G2SS}	V _{DS} = V _{G1S} = 0, V _{G2S} = - 6V			- 20	μA
2nd gate-Drain current	I _{G2DO}	V _{G2D} = - 10V, (G1, S= OPEN)			50	μA
Drain current	I _{DSS}	V _{DS} = 5V, V _{G1S} = V _{G2S} = 0V	10		30	mA
Source-Ground current	I _{SGND}	V _{SGND} = 5V			50	μA
1st gate-Source cut-off voltage	V _{G1SC}	V _{DS} = 5V, V _{G2S} = 0, I _D = 0.2mA			- 3.5	V
2nd gate-Source cut-off voltage	V _{G2SC}	V _{DS} = 5V, V _{G1S} = 0, I _D = 0.2mA			- 3.5	V
Forward transadmittance	Y _{fs}	V _{DS} = 5V, V _{G2S} =1.5V, I _D =10mA, f=1kHz	18	23		mS
Source-Ground capacitance	C _{SGND}	V _{SGND} =1V, f=1MHz		400		pF
Conversion gain	CG *	V _D = 3.7V, V _{G1} = V _{G2} = 0V f _{RF1} = 820MHz, P _{RF1} = - 20dBm f _{RF2} = 820.1MHz, P _{RF2} = - 20dBm	8	12		dB
Third harmonics mutual modulation distortion	IP3 *	f _{LO} = 950MHz, P _{LO} = 0 f _{IF} =130MHz, f _{M3} =129.9MHz	7	12		dBm

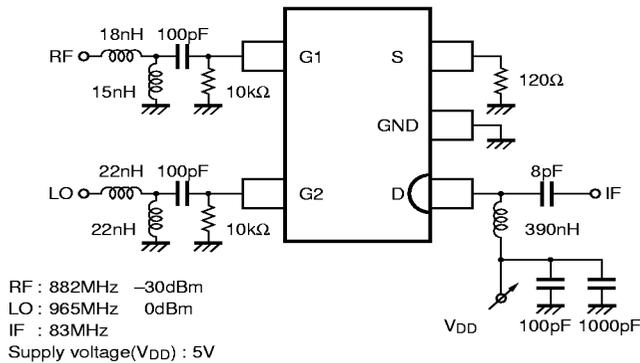
* CG, IP3 test circuit

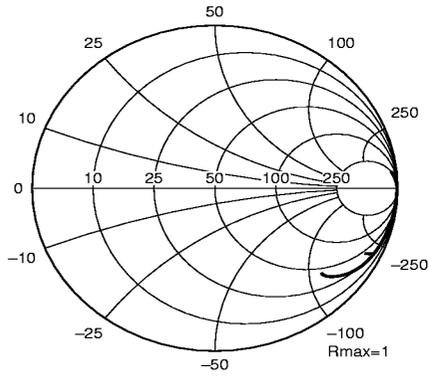


GN2012 mixer characteristics (measured example)

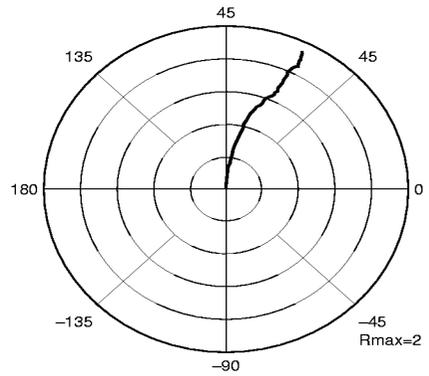


GN2012 evaluation circuit diagram

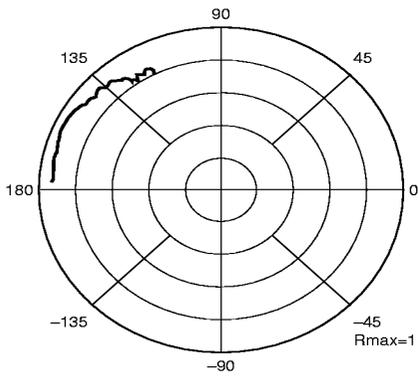




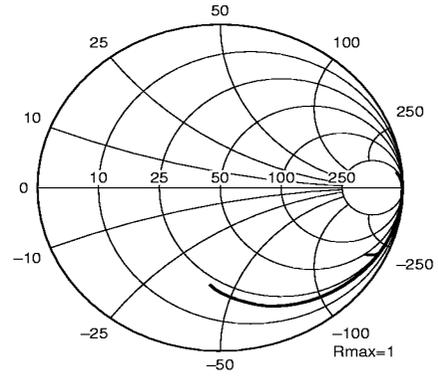
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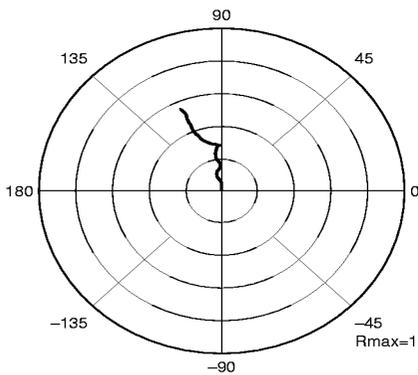
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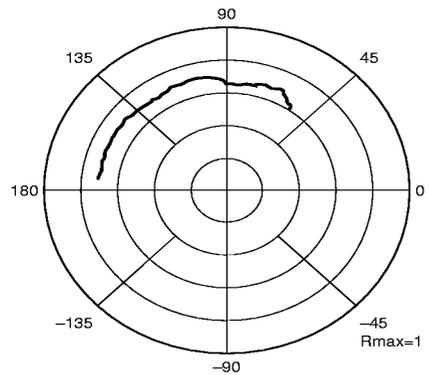
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S11

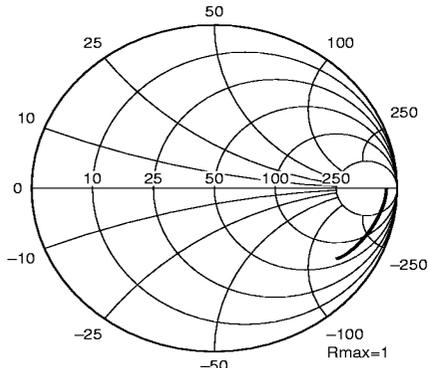


S13



S31

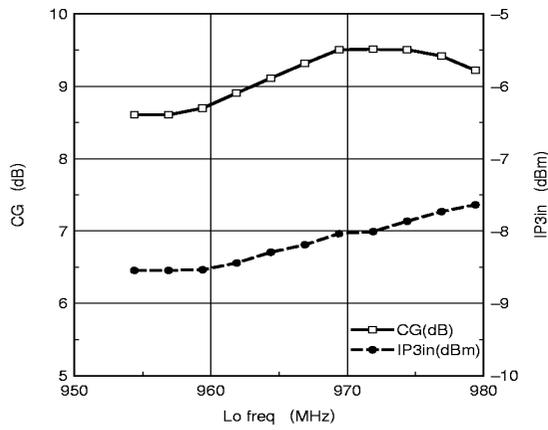
START 100MHz
STOP 2.6GHz



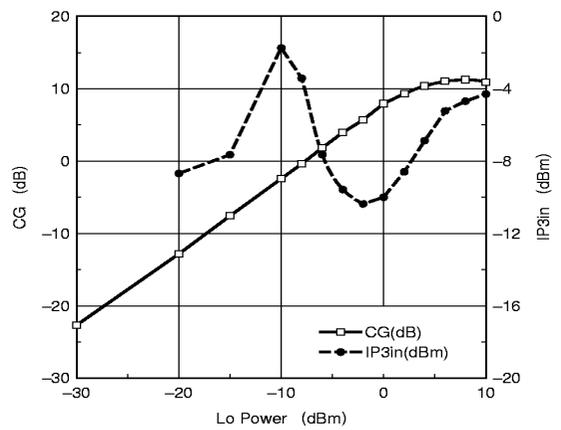
S33

START 100MHz
STOP 2.6GHz

Lo freq. – CG, IP3



Lo power – CG, IP3



V_D – CG, OIP3

