

GN2012

GaAs N-Channel IC

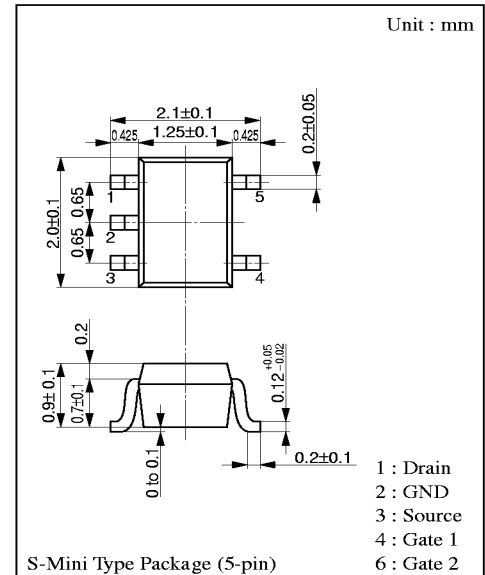
For UHF band mixer

■ Features

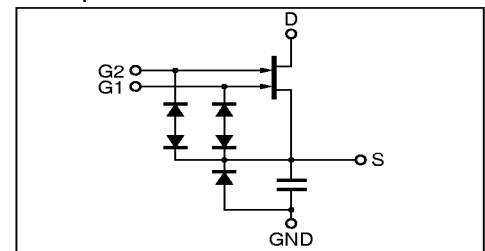
- Large-capacitance capacitor built-in (external bypass capacitor not necessary)
- Low distortion (IP3=12dBm)
- High conversion gain (CG=12dB)
- Small package : S-mini type 5-pin package

■ 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	μ A
Allowable power dissipation	P_D	150	mW
Channel temperature	T_{ch}	150	°C
Storage temperature	T_{stg}	- 55 to +150	°C



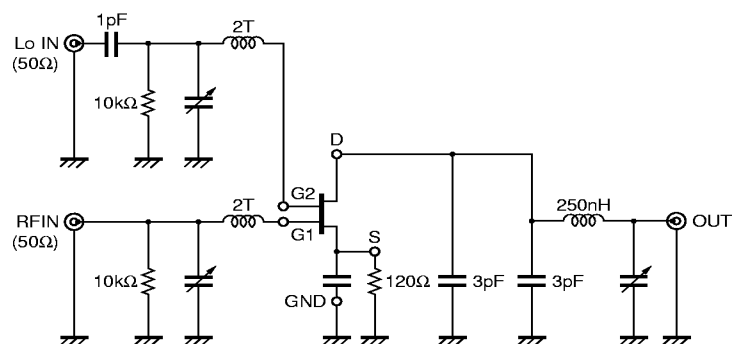
■ Equivalent Circuit



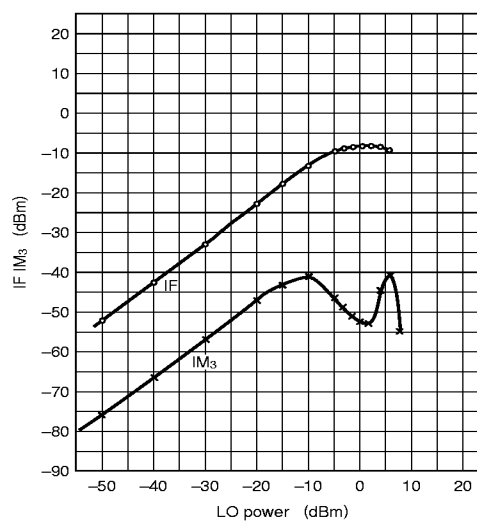
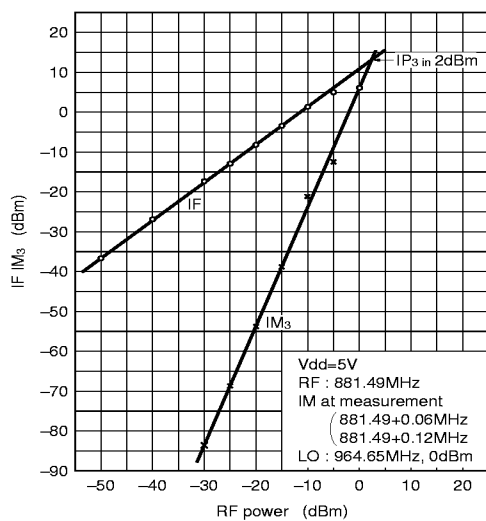
■ Electrical Characteristics (Ta = 25°C)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Drain cut-off current	I_{DSX}	$V_{DS}=10V, V_{G1S}=-3.5V, V_{G2S}=0$			50	μ A
1st gate cut-off current	I_{G1SS}	$V_{DS}=V_{G2S}=0, V_{G1S}=-6V$			- 20	μ A
2nd gate cut-off current	I_{G2SS}	$V_{DS}=V_{G1S}=0, V_{G2S}=-6V$			- 20	μ A
2nd gate-Drain current	I_{G2DO}	$V_{G2D}=-10V, (G1, S= OPEN)$			50	μ A
Drain current	I_{DSS}	$V_{DS}=5V, V_{G1S}=V_{G2S}=0V$	10		30	mA
Source-Ground current	I_{SGND}	$V_{SGND}=5V$			50	μ A
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

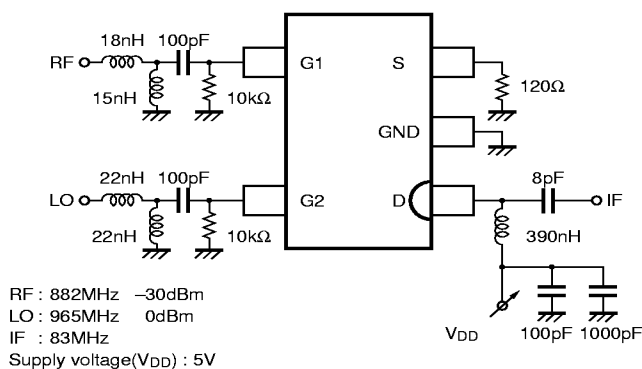
* CG, IP3 test circuit

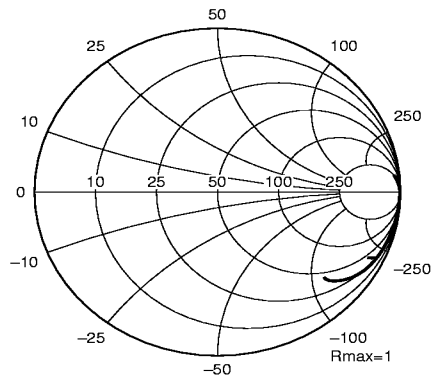
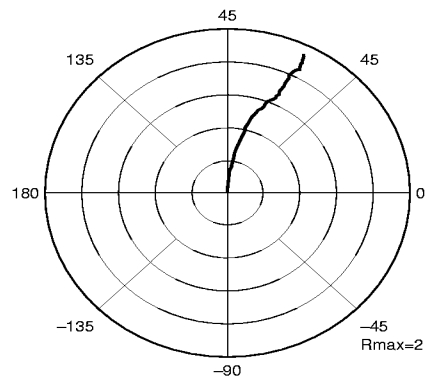
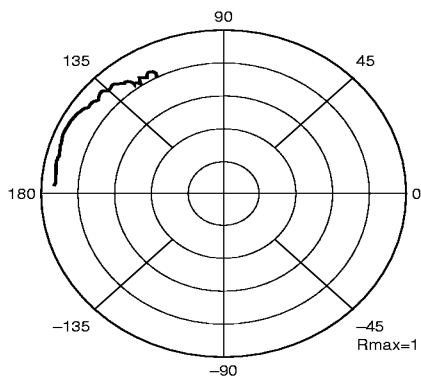
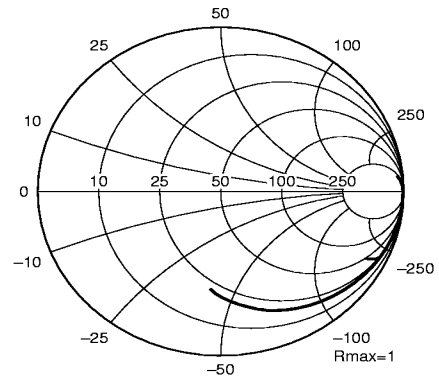
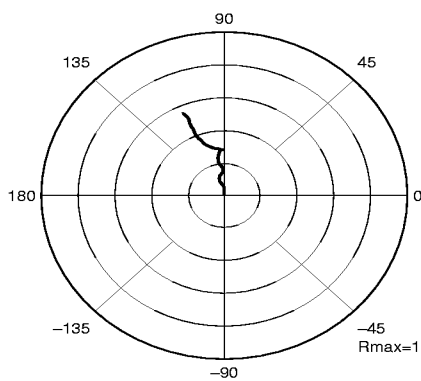
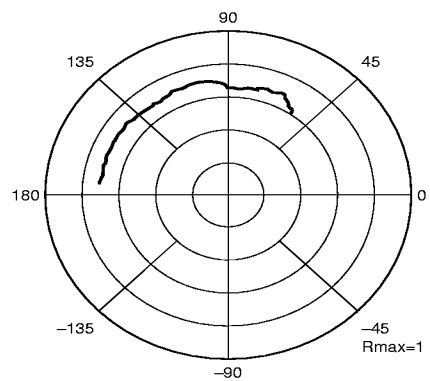


GN2012 mixer characteristics (measured example)

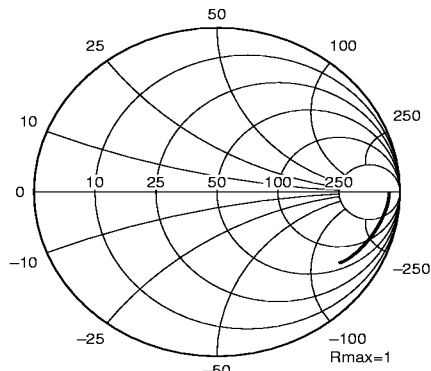


GN2012 evaluation circuit diagram



**S22****S23****S32****S11****S13****S31**

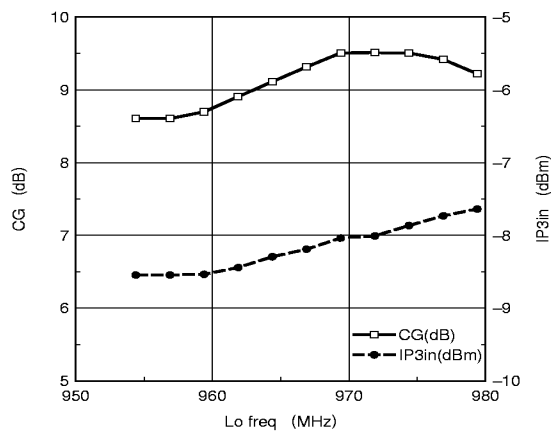
START 100MHz
STOP 2.6GHz

**S33**

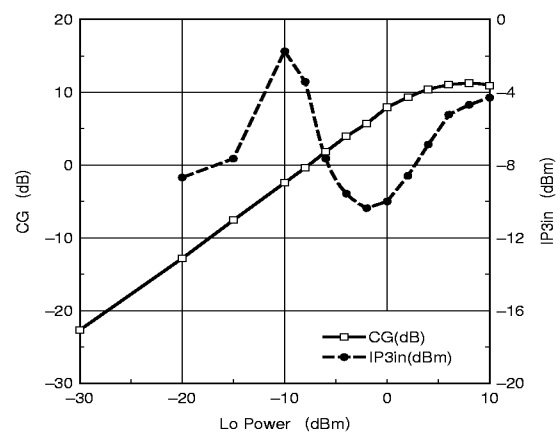
START 100MHz

STOP 2.6GHz

Lo freq. – CG, IP3



Lo power – CG, IP3

 V_D – CG, OIP3