HA21006MP — Preliminary

BS Tuner Use GaAs IC

Application

GaAs monolithic IC
BS tuner

Features

- BS tuner IC include mixer, RF AGC, IF AGC
- Operational in all BS frequency
  (0.95 to 1.75 GHz)
- Surface mount package

Absolute Maximum Ratings (Ta = 25°C)

Item	Symbol	Ratings	Unit
Supply voltage	V_{CC}*	11	V
Maximum current	I_t	50	mA
Maximum input voltage	V_{in}**	±5	V
Power dissipation	P_d***	500	mW
Channel temperature	Tch	125	°C
Storage temperature	Tstg	–55 to +125	°C
Operation temperature	Topr	–10 to +70	°C

* Operation voltage is 8.5 to 9.5V.
** Applied to 3, 4, 9, 11 and 16 pin.
*** When mounted on glass epoxy PCB (40 mm × 40 mm × 1.5 mm^t) covered with copper more than 30%. (Ta = 70 °C)

Caution

This product uses GaAs. Since dust and fumes from GaAs are highly poisonous to the human body, do not treat the product mechanically or chemically in a manner which might release hazardous substances into the air. It should never be thrown out with general industrial or domestic wastes.

Electrical Characteristics (Ta = 25°C)

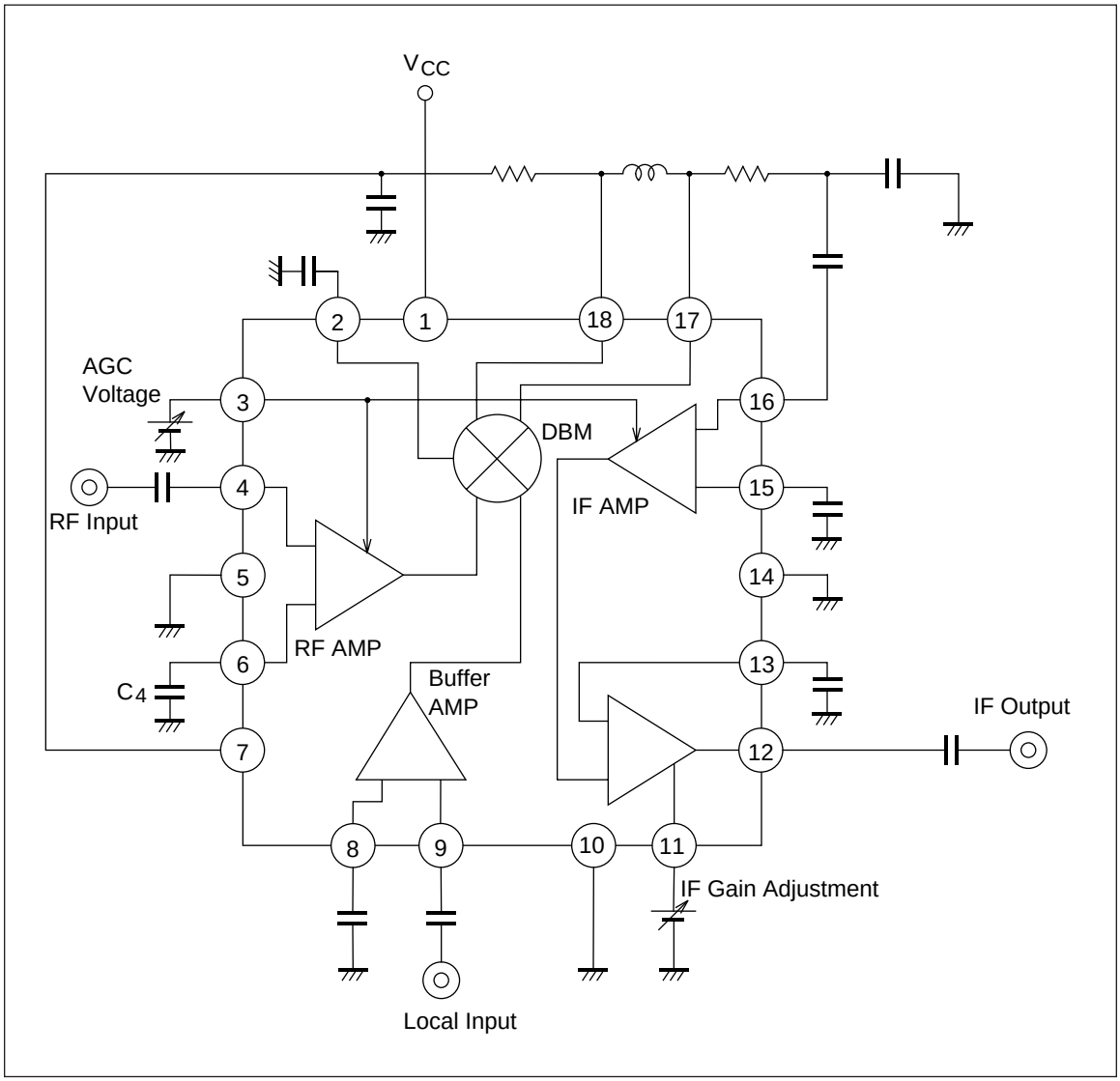
Item	Symbol	Min	Typ	Max	Unit	Test Conditions
Quiescent current	I_Q	25	—	50	mA	No signal
Conversion gain	CG	—	30	—	dB	V_{agc} = 4.5 V
Gain Reduction	GR	38	50	62	dB	V_{agc} = 4.5 V to 1 V

Typical Performance (Ta = 25°C, V_{CC} = 9 V)

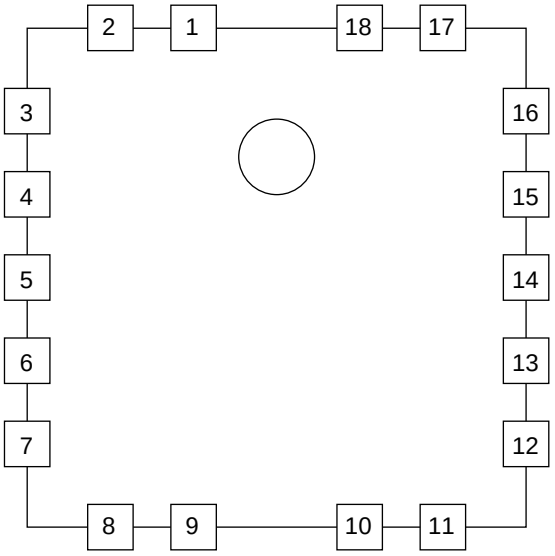
Item	Symbol	Typ	Unit	Test Conditions
Noise figure	NF	8	dB	
2nd order intermodulation distortion	IM2	50	dB	GR = 50 dB, –25 dBm, 2 RF signal input
3rd order intermodulation distortion	IM3	56	dB	GR = 50 dB, –25 dBm, 2 RF signal input
Local leak level	LL_{RF}	–40	dBm	Leak to RF input
Local leak level	LL_{IF}	–24	dBm	Leak to IF output

Note 1 Test condition is as follows unless otherwise specified.
RF = 990 MHz, IF = 480 MHz, P_{LOCAL} = 4 dBm, P_{RF} = –50 dBm

Block Diagram



Pin Arrangement



Top View

Pin No	Pin Name	Pin No	Pin Name
1	$V_{CC}1$	10	GND
2	Mixer AC GND	11	IF Gain Adjustment
3	AGC	12	IF Output
4	RF Input	13	AC GND 3
5	GND	14	GND
6	AC GND 2	15	AC GND 1
7	$V_{CC}2$	16	IF Input
8	AC GND 4	17	Mixer Out 2
9	Local Input	18	Mixer Out 1

Test Fixture

Notes: 1. C* Capacitor: 2200 pF
2. L1: ϕ0.35 mm Enameled Copper wire, Internal diameter = ϕ2.5 mm, T = 4 Turn.

Evaluation Circuit

Notes: 1. C* Capacitor: 2200 pF
2. L1: ϕ0.35 mm Enameled copper wire, Internal diameter = ϕ2.5 mm, T = 4 Turn.

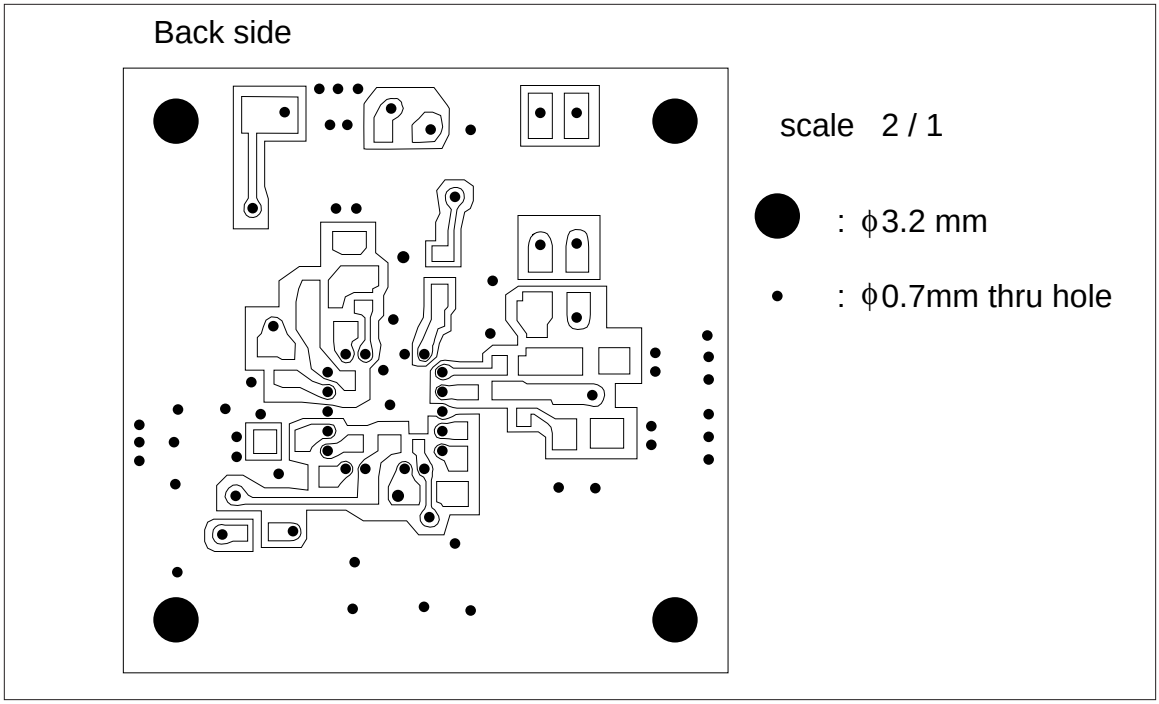


Figure 1 Back Side view of PCB Pattern

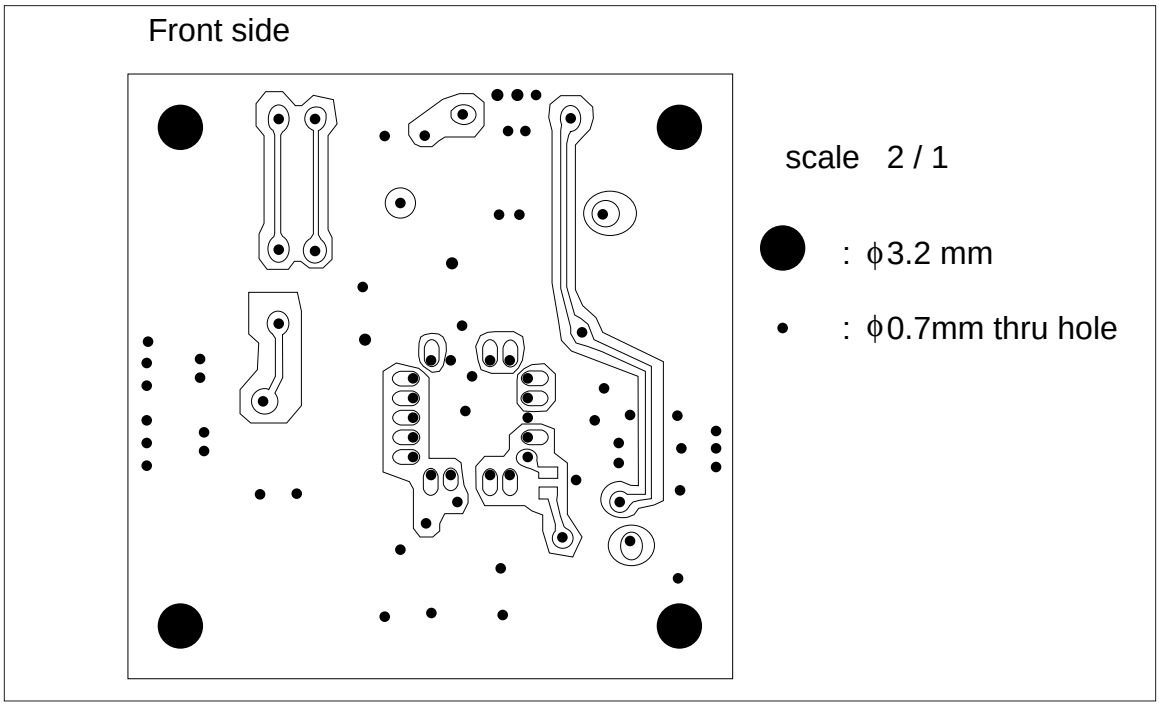


Figure 2 Front Side view of PCB Pattern

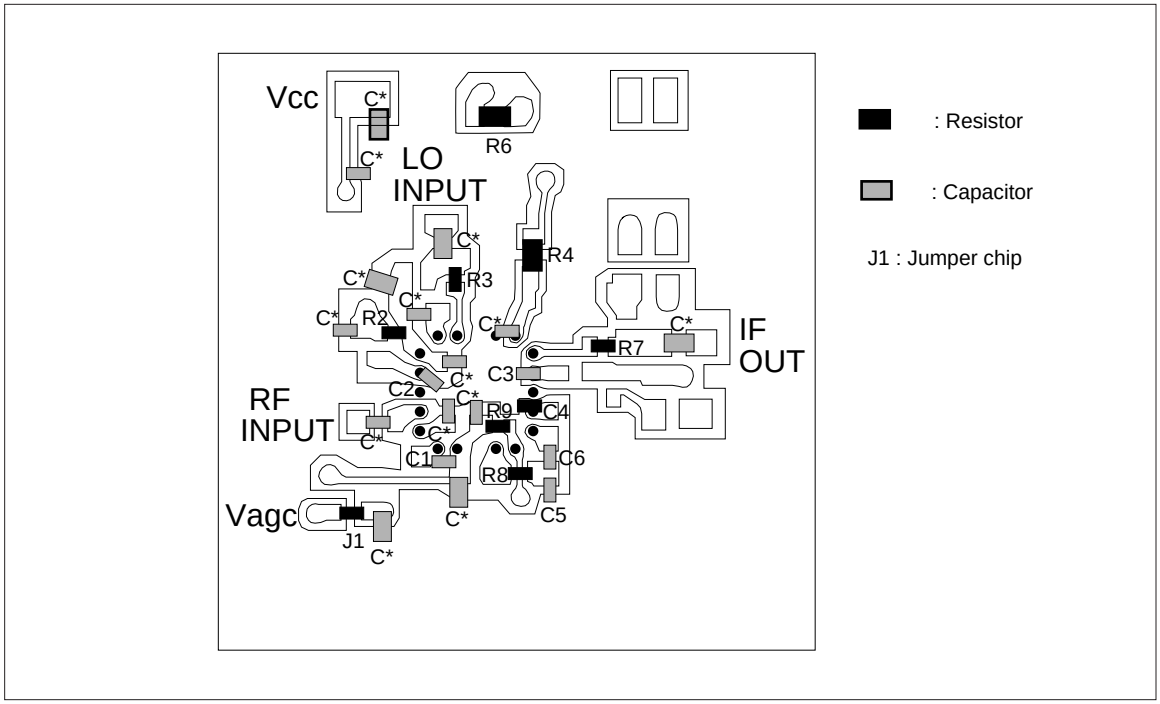


Figure 3 Back Side view of Part Layout

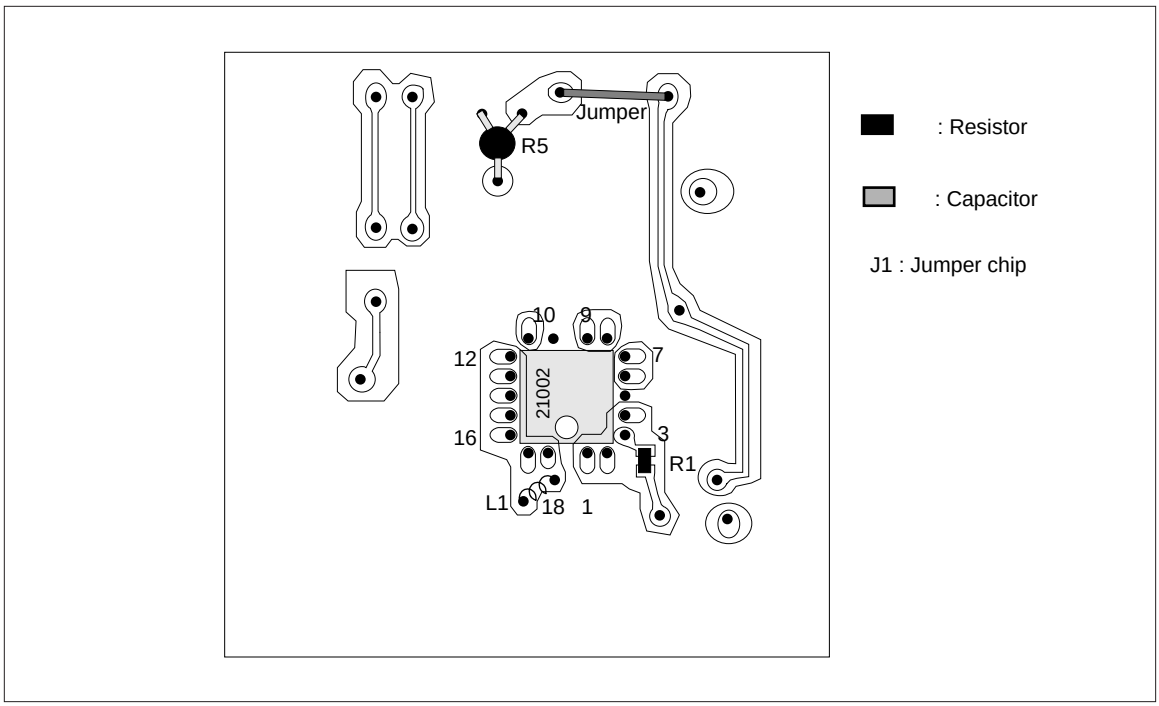


Figure 4 Front Side view pf Part Layout

Home Print

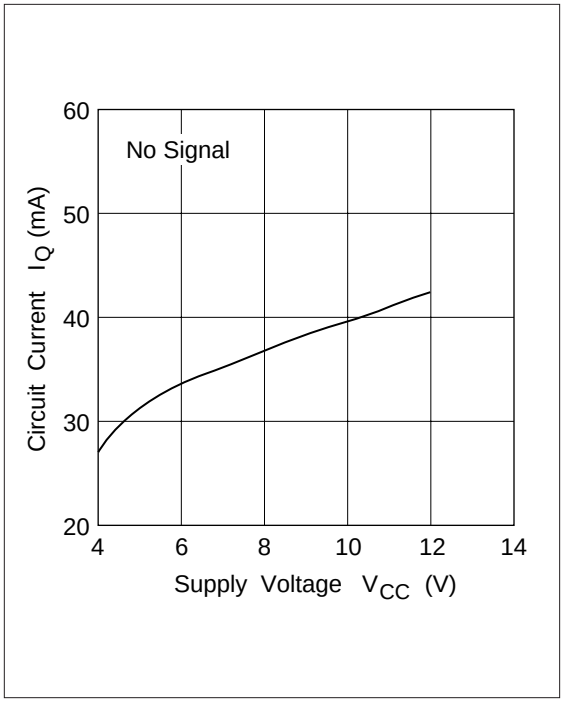


Figure 5 Circuit Current vs. Supply Voltage

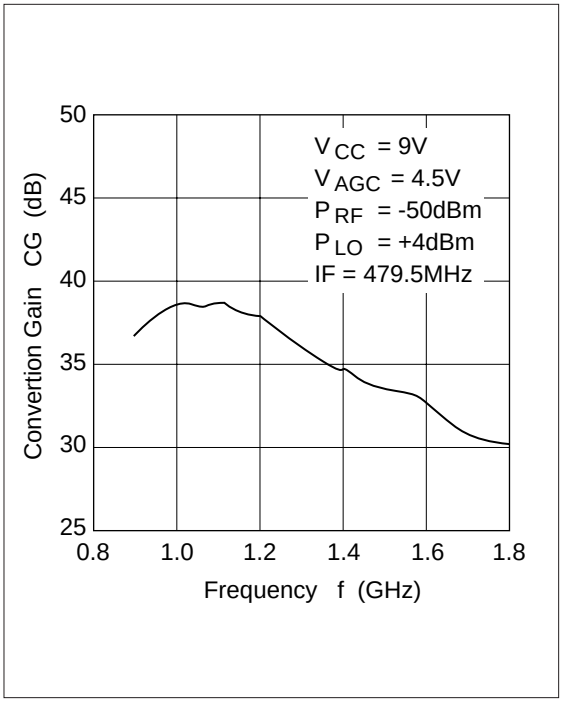


Figure 6 Conversion Gain vs. Frequency

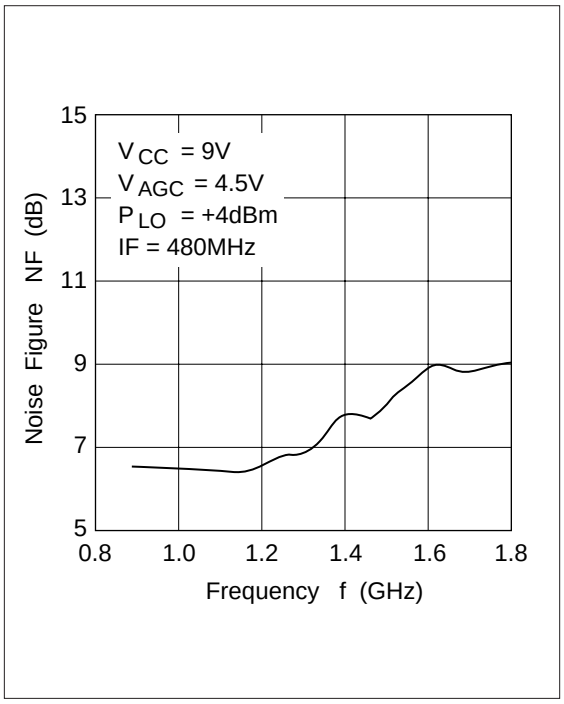


Figure 7 Noise Figure vs. Frequency

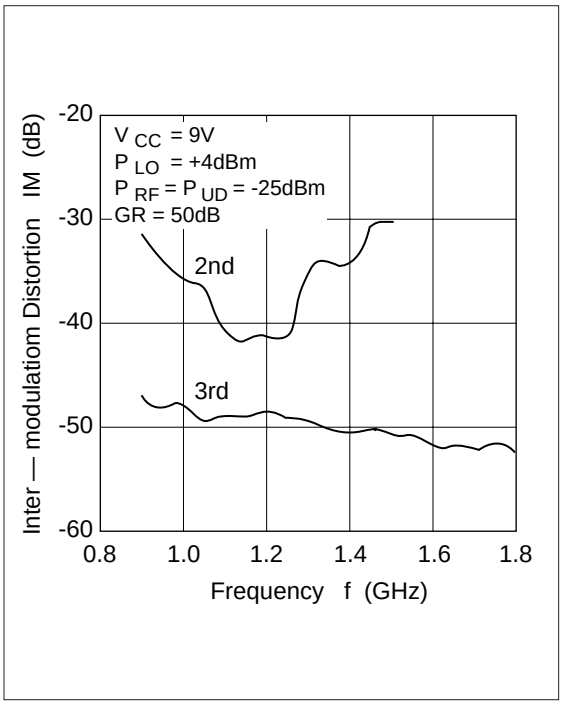


Figure 8 Inter–modulation Distortion vs. Frequency

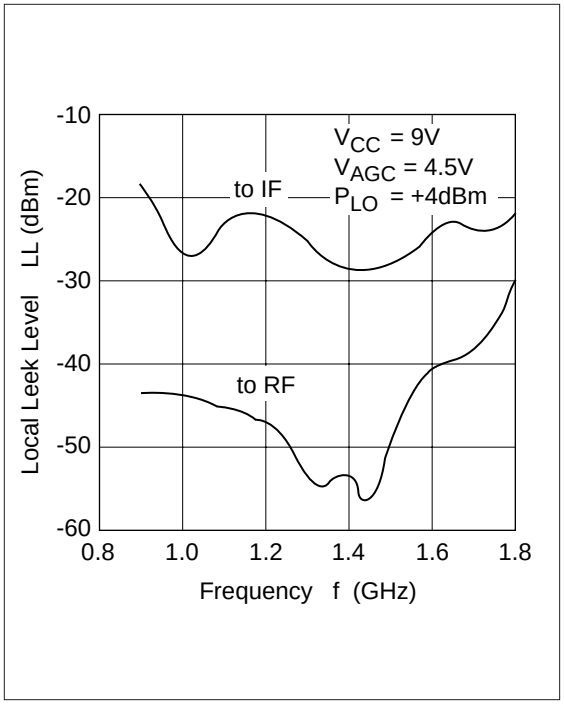


Figure 9 Local Leak Level vs. Frequency

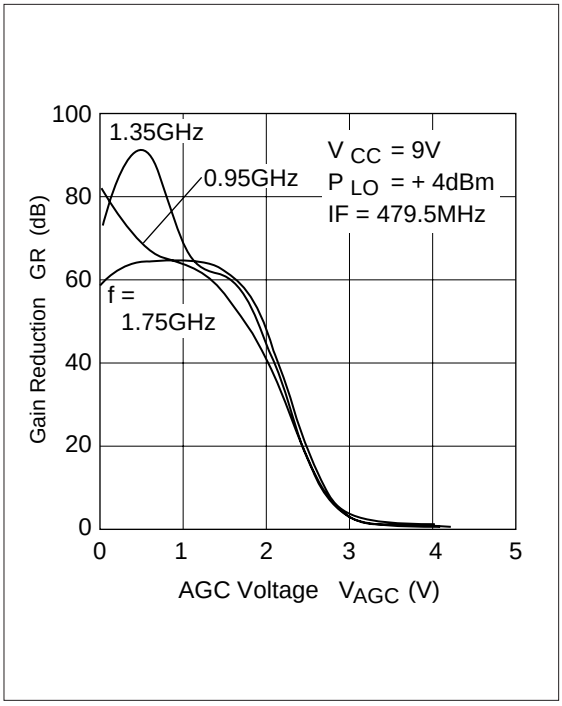


Figure 10 Gain Reduction vs. AGC Voltage

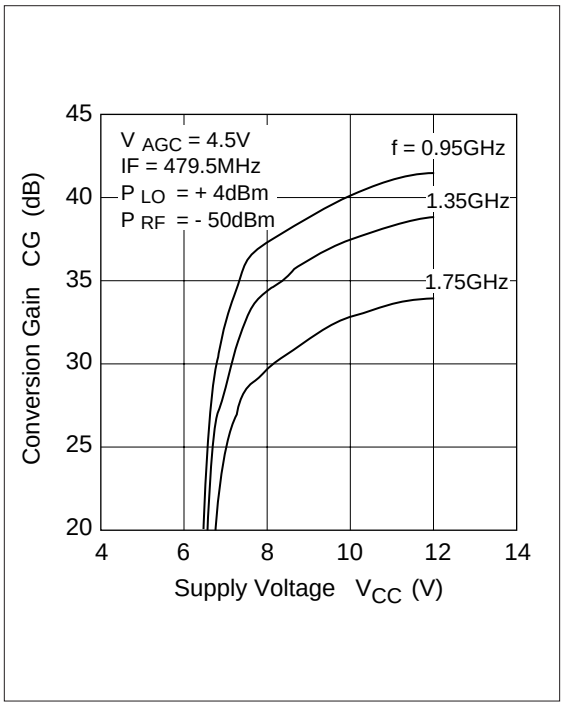


Figure 11 Conversion Gain vs. Supply Voltage

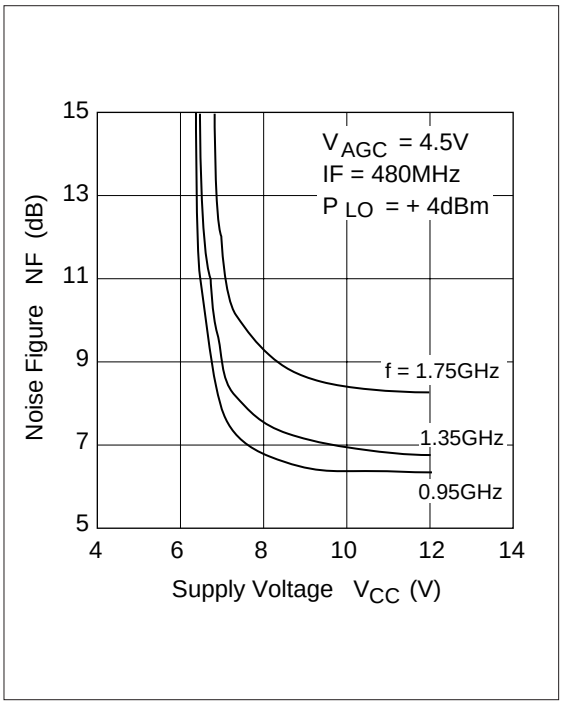


Figure 12 Noise Figure vs. Supply Voltage

Home Print

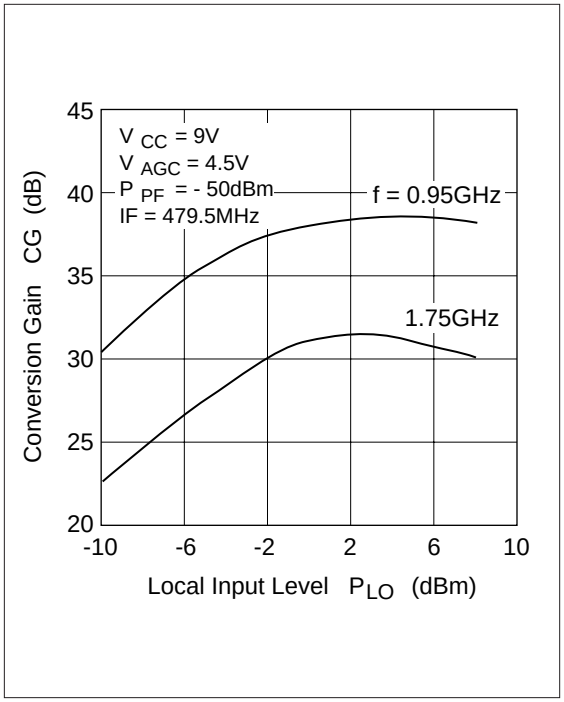


Figure 13 Conversion Gain vs. Local Input Level

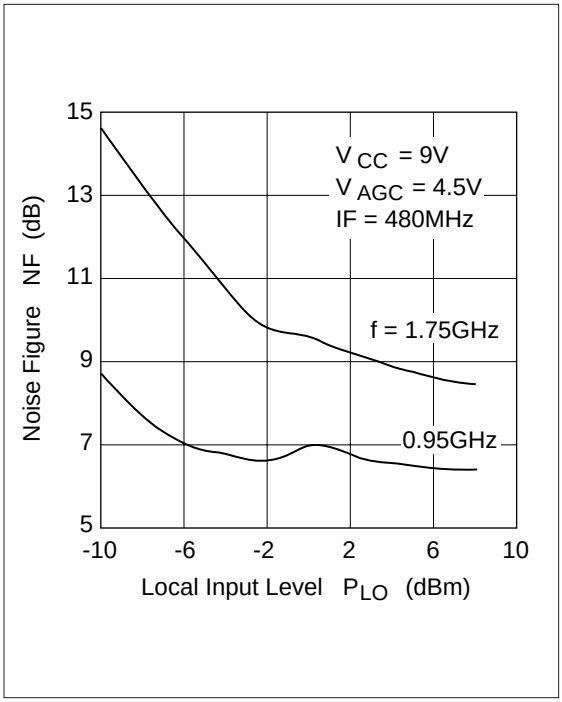


Figure 14 Noise Figure vs. Local Input Level