

## WLAN/WiMAX Application

### 4. 2.3~2.7GHz BAND APPLICATION

#### 4-1 SUMMARY

The characteristics of 2.3~2.7GHz band has evaluated as follows. The evaluation circuit structure and measured data are reviewed.

#### 4-2-1 MEASURED DATA1 (DC)

General conditions:  $V_{DD}=V_{INV}=2.7V$ ,  $T_a=+25^{\circ}C$ ,  $Z_s=Z_l=50\Omega$

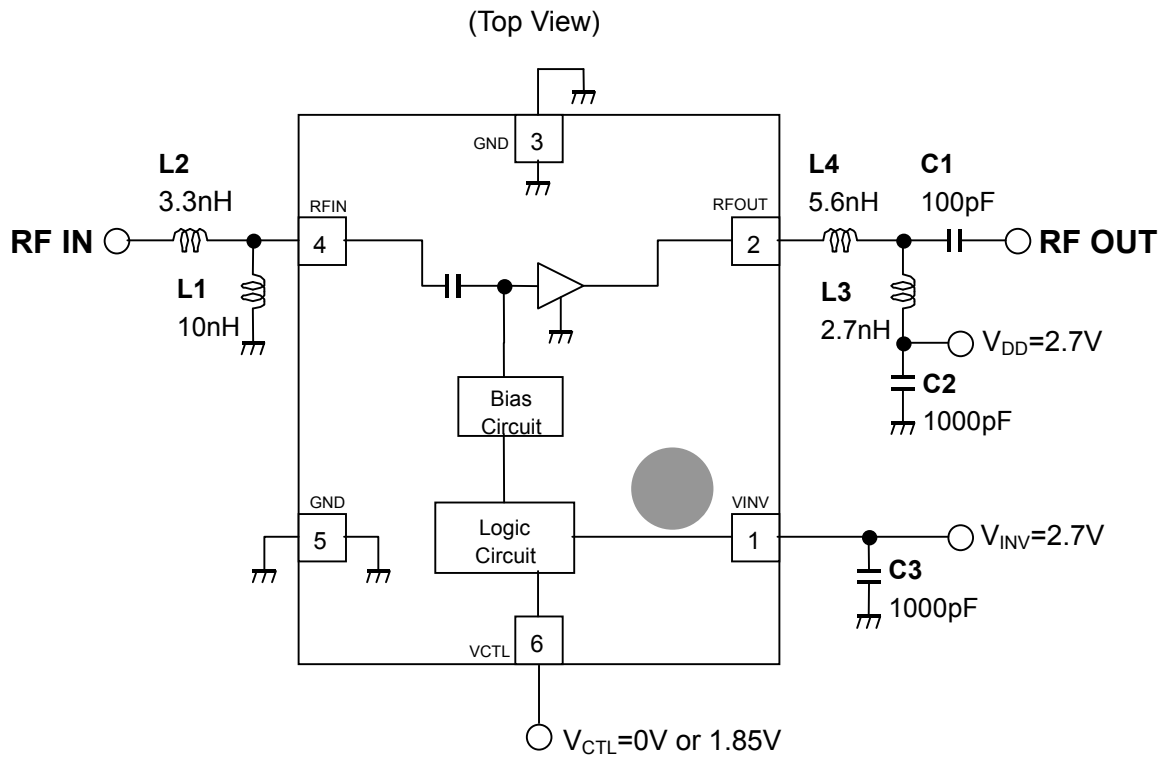
Parameter	Symbol	Conditions	Measurement data	Unit
Operating Voltage	$V_{DD}$		2.7	V
Inverter Voltage	$V_{INV}$		2.7	V
Control Voltage (High)	$V_{CTL(H)}$		1.85	V
Control Voltage (Low)	$V_{CTL(L)}$		0	V
Operating current	$I_{DD1}$	RF OFF, $V_{CTL}=1.85V$	2.01	mA
Operating current	$I_{DD2}$	RF OFF, $V_{CTL}=0V$	0	$\mu A$
Inverter current	$I_{INV1}$	RF OFF, $V_{CTL}=1.85V$	28.7	$\mu A$
Inverter current	$I_{INV2}$	RF OFF, $V_{CTL}=0V$	7.9	$\mu A$
Control current	$I_{CTL}$	RF OFF, $V_{CTL}=1.85V$	5.7	$\mu A$

#### 4-2-2 MEASURED DATA2 (RF)

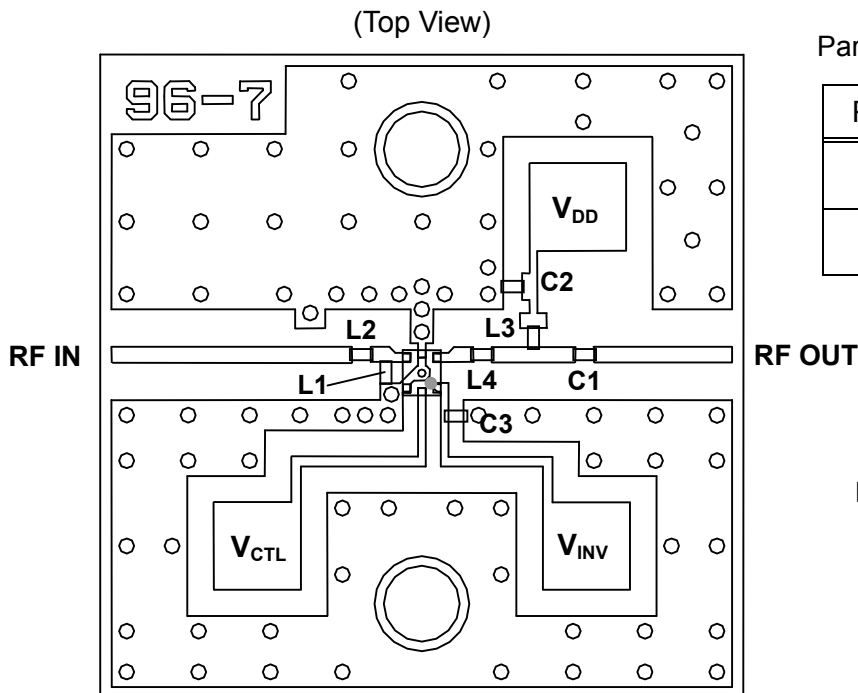
General conditions:  $V_{DD}=V_{INV}=2.7V$ ,  $V_{CTL}=1.85V$ ,  $f_{RF}=2500MHz$ ,  $T_a=+25^{\circ}C$ ,  $Z_s=Z_l=50\Omega$

Parameter	Symbol	Conditions	Measurement data	Unit
Small signal gain	Gain		15.5	dB
Gain flatness	Gflat	$f_{RF}=2300\sim 2700MHz$	1.2	dB
Noise figure	NF	Exclude PCB, Connector Losses (0.10dB)	1.51	dB
Pin at 1dB compression point	P-1dB(IN)		-11.4	dBm
Output 3rd order intercept point	OIP3	$f1=f_{RF}$ , $f2=f_{RF}+100kHz$ , Pin=-30dBm	+17.8	dBm
Input 3rd order intercept point	IIP3	$f1=f_{RF}$ , $f2=f_{RF}+100kHz$ , Pin=-30dBm	+2.1	dBm
RF Input port VSWR	VSWRi		1.72	
RF Output port VSWR	VSWRo		1.81	

## 4-3 APPLICATION CIRCUIT



## 4-4 PCB DESIGN



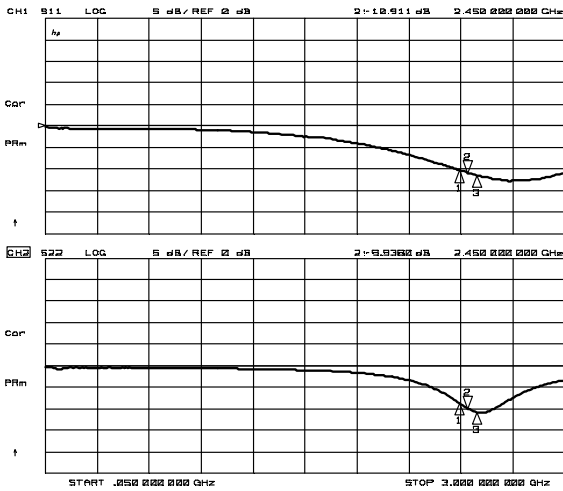
### Parts List

Parts ID	Comment
L1~L4	MURATA (LQP03T Series)
C1~C3	MURATA (GRM03 Series)

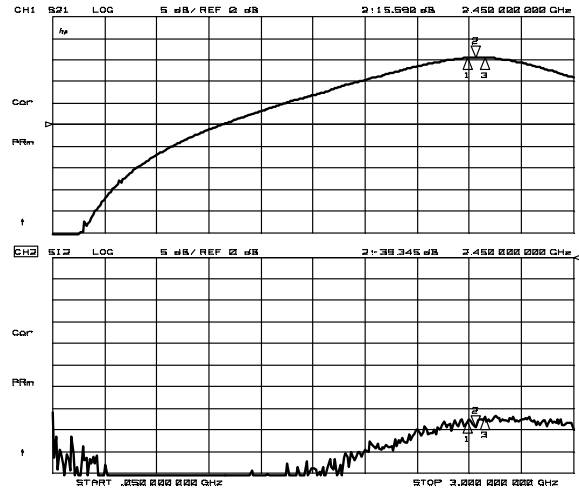
PCB (FR-4):  
 t=0.2mm  
 MICROSTRIP LINE WIDTH  
 =0.4mm ( $Z_0=50\Omega$ )  
 PCB SIZE=17.0mm x 17.0mm

## 4-5-1 Typical Characteristics

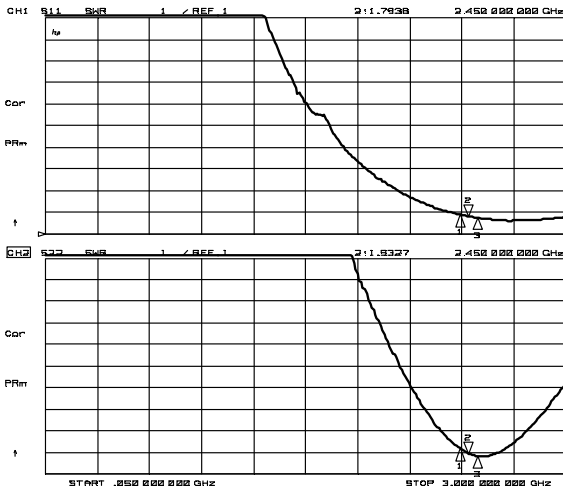
Condition:  $T_a=+25^{\circ}\text{C}$ ,  $V_{DD}=V_{INV}=2.7\text{V}$ ,  $V_{CTL}=1.85\text{V}$ ,  $Z_s=Z_l=50\Omega$



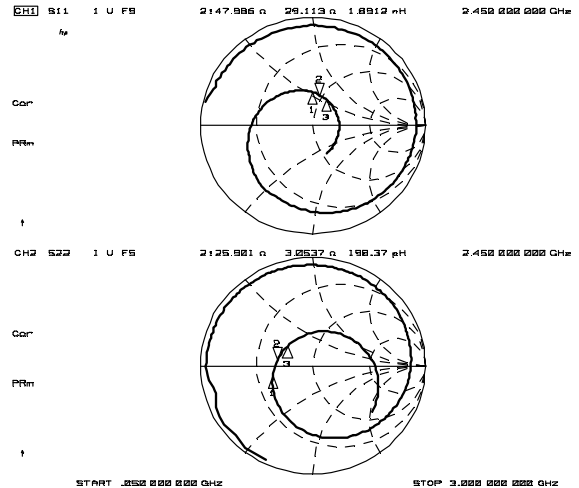
S11, S22



S21, S12

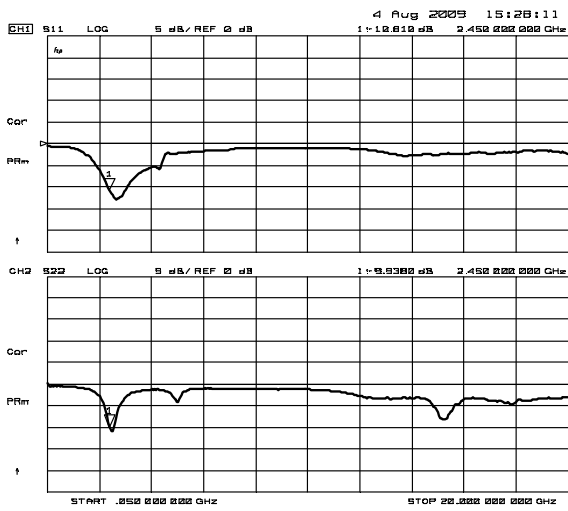


VSWR

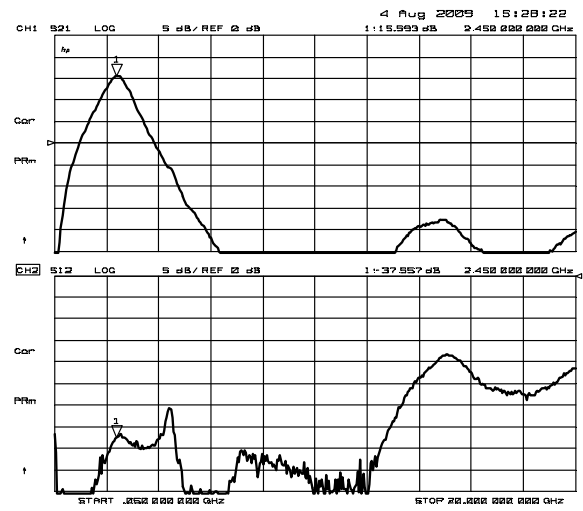


Zin, Zout

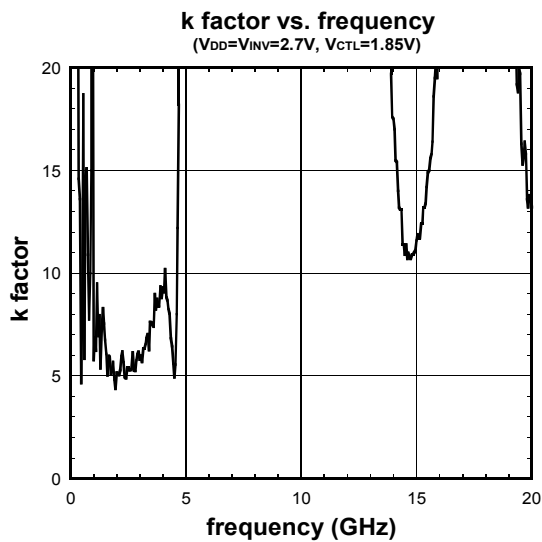
## 4-5-2 Typical Characteristics



S11, S22 (f=50MHz~20GHz)

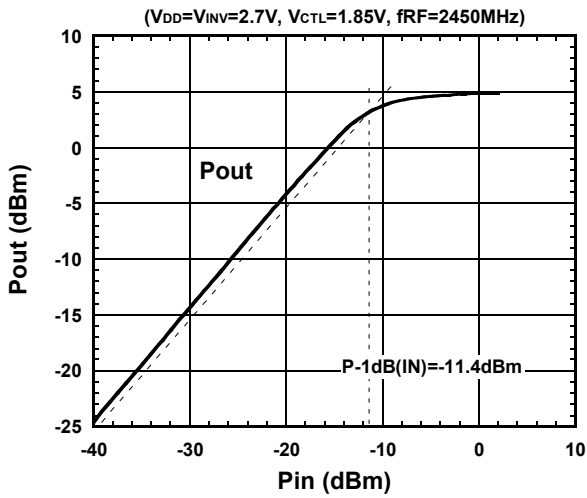


S21, S22 (f=50MHz~20GHz)

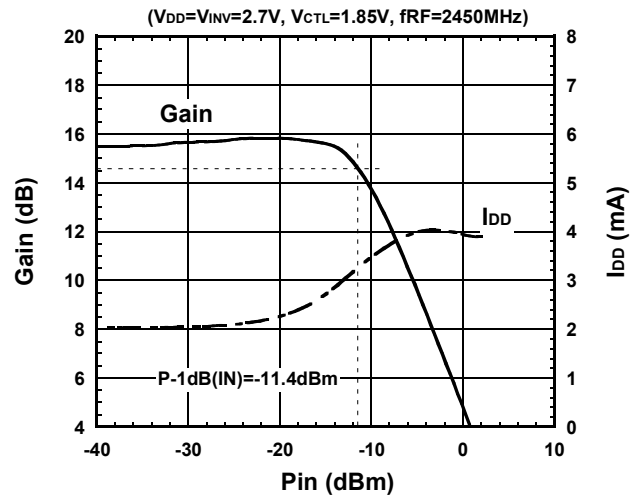


## 4-5-3 Typical Characteristics

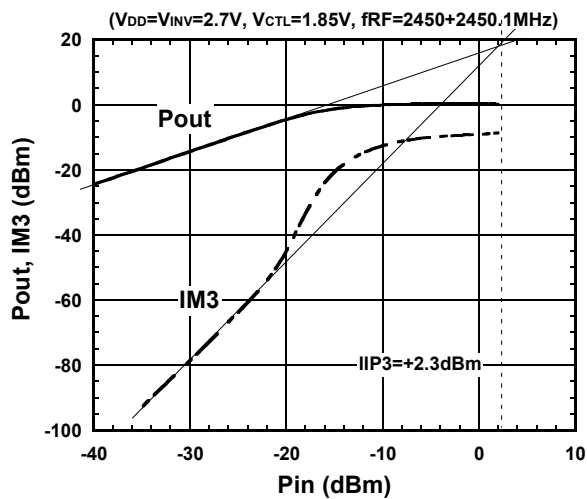
### Pout vs. Pin



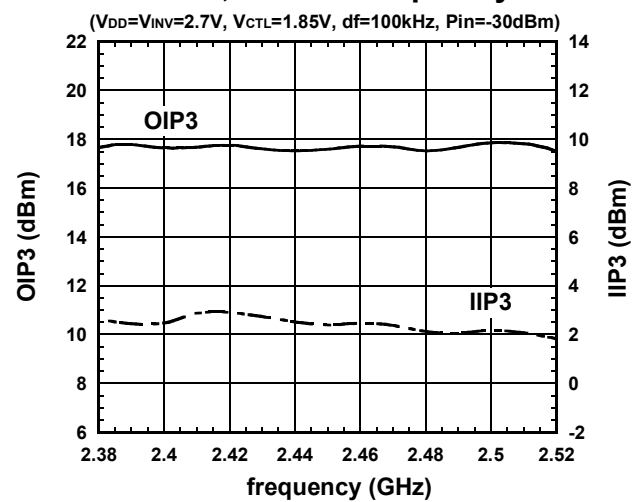
### Gain, IDD vs. Pin



### Pout, IM3 vs. Pin



### OIP3, IIP3 vs. frequency

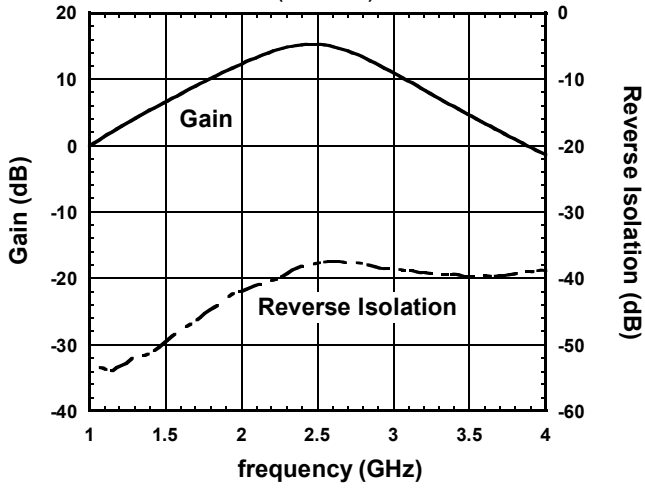


## 4-5-4 Typical Characteristics

**NJG1108HA8**

**Gain, Isolation vs. frequency**

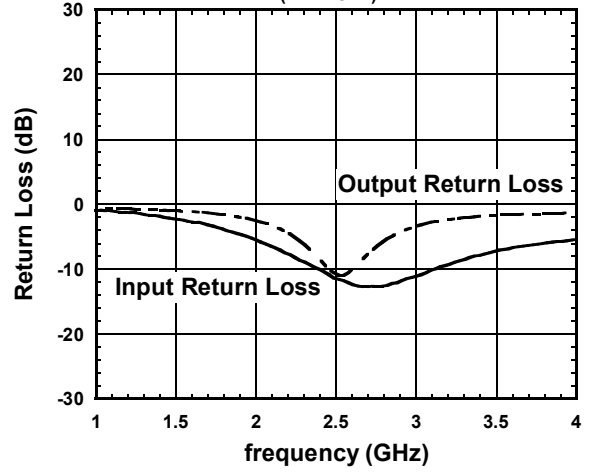
(f=1~4GHz)



**NJG1108HA8**

**Return Loss vs. frequency**

(f=1~4GHz)



**NJG1108HA8**

**Gain, NF vs. frequency**

(f=2.5~2.7GHz)

