

## WiMAX Application

### 2. WiMAX (2.6GHz BAND) APPLICATION

#### 2-1 SUMMARY

The characteristics of WiMAX application (2.496~2.69GHz) have evaluated as follows. The evaluation circuit structure and measured data are reviewed.

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

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

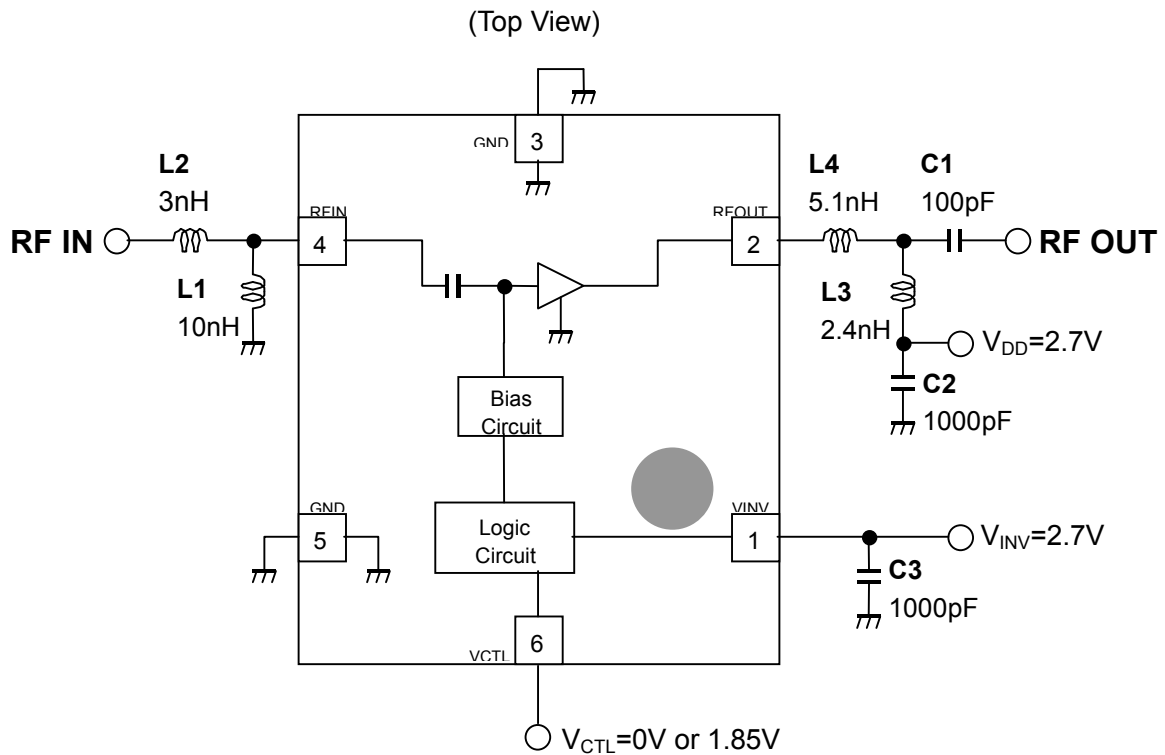
Parameter	Symbol	Conditions	Measurement data	Unit
Operating Voltage	$V_{DD}$		2.7	V
Inverter Voltage	$V_{INV}$		2.7	V
Control Voltage (High)	$V_{CTL(H)}$		1.85	V
Control Voltage (Low)	$V_{CTL(L)}$		0	V
Operating current	$I_{DD1}$	RF OFF, $V_{CTL}=1.85V$	2.04	mA
Operating current	$I_{DD2}$	RF OFF, $V_{CTL}=0V$	0	$\mu A$
Inverter current	$I_{INV1}$	RF OFF, $V_{CTL}=1.85V$	28.8	$\mu A$
Inverter current	$I_{INV2}$	RF OFF, $V_{CTL}=0V$	8.0	$\mu A$
Control current	$I_{CTL}$	RF OFF, $V_{CTL}=1.85V$	5.6	$\mu A$

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

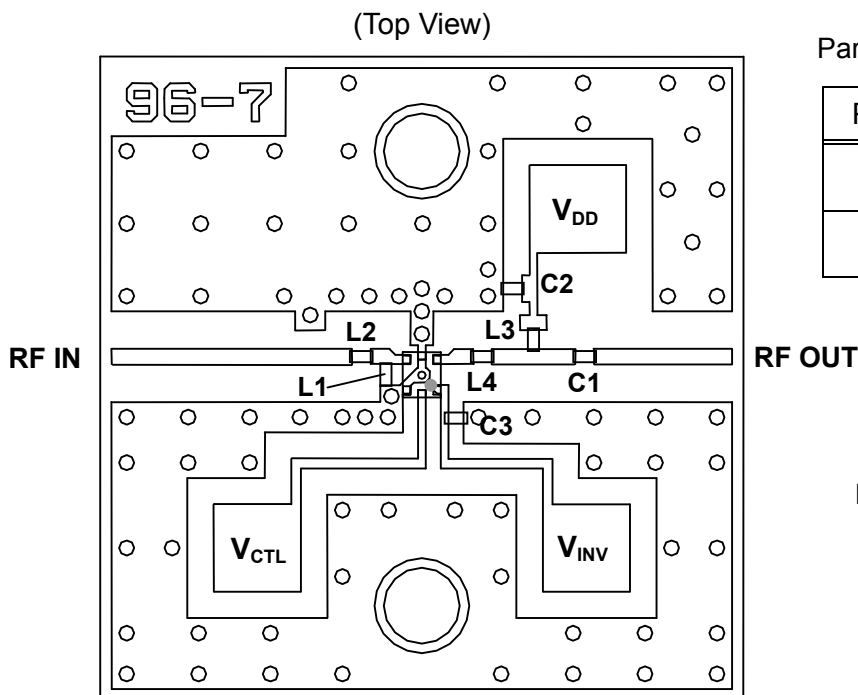
General conditions:  $V_{DD}=V_{INV}=2.7V$ ,  $V_{CTL}=1.85V$ ,  $f_{RF}=2600MHz$ ,  $T_a=+25^{\circ}C$ ,  $Z_s=Z_l=50\Omega$

Parameter	Symbol	Conditions	Measurement data	Unit
Small signal gain	Gain		14.9	dB
Gain flatness	Gflat	$f_{RF}=2496\sim 2690MHz$	0.4	dB
Noise figure	NF	Exclude PCB, Connector Losses (0.11dB)	1.56	dB
Pin at 1dB compression point	P-1dB(IN)		-10.7	dBm
Output 3rd order intercept point	OIP3	$f1=f_{RF}$ , $f2=f_{RF}+100kHz$ , Pin=-30dBm	+18.3	dBm
Input 3rd order intercept point	IIP3	$f1=f_{RF}$ , $f2=f_{RF}+100kHz$ , Pin=-30dBm	+3.4	dBm
RF Input port VSWR	VSWRi		1.86	
RF Output port VSWR	VSWRo		1.84	

## 2-3 APPLICATION CIRCUIT



## 2-4 PCB DESIGN



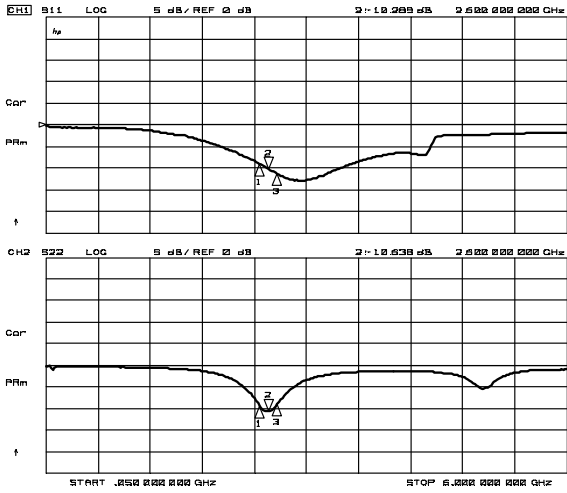
### Parts List

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

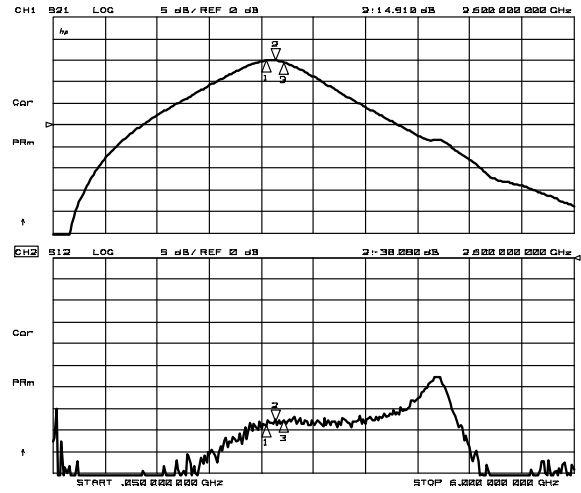
PCB (FR-4):  
 t=0.2mm  
 MICROSTRIP LINE WIDTH  
 =0.4mm ( $Z_0=50\Omega$ )  
 PCB SIZE=17.0mm x 17.0mm

## 2-5-1 Typical Characteristics

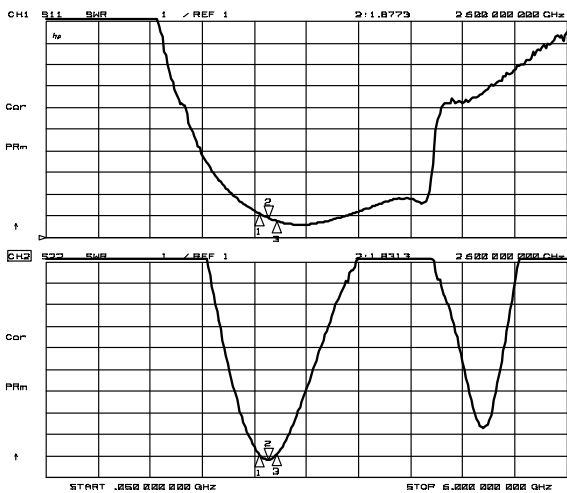
Condition:  $T_a=+25^{\circ}\text{C}$ ,  $V_{DD}=V_{INV}=2.7\text{V}$ ,  $V_{CTL}=1.85\text{V}$ ,  $Z_s=Z_l=50\Omega$



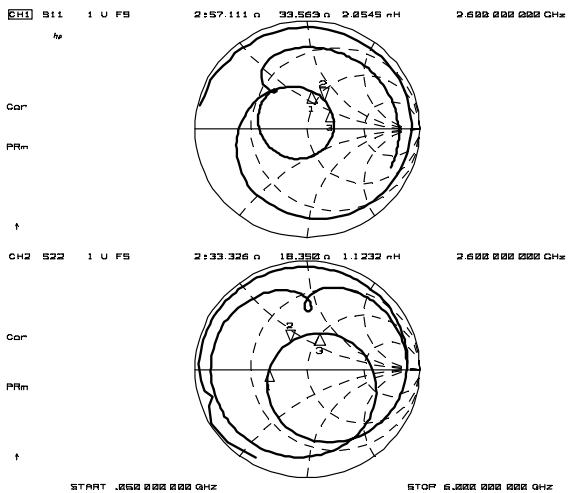
S11, S22



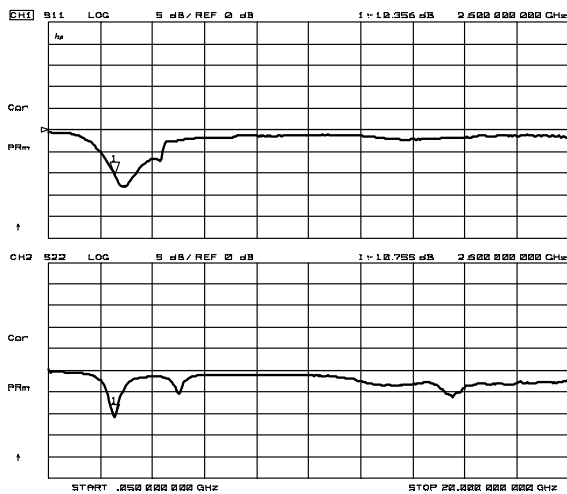
S21, S12



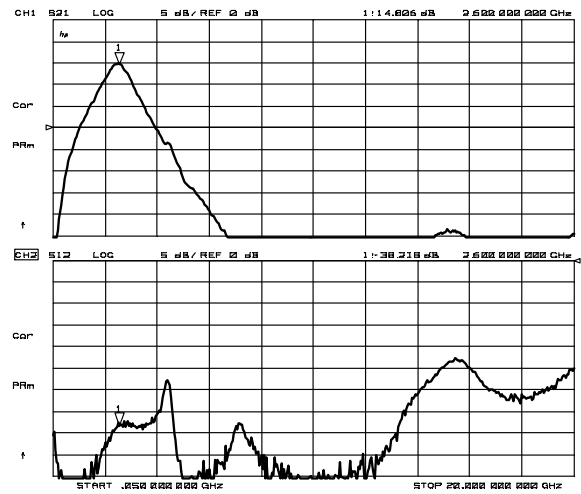
VSWR



Zin, Zout



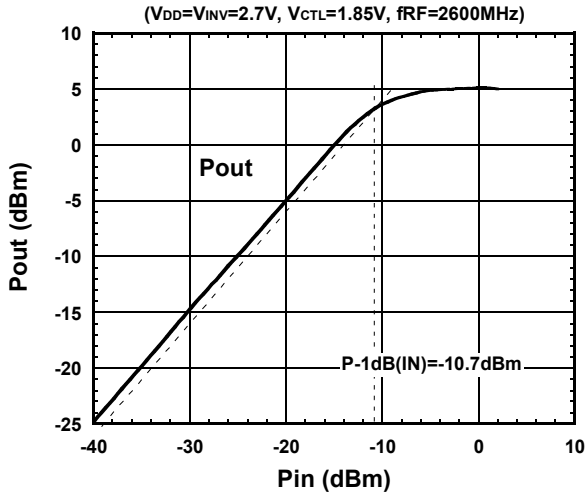
S11, S22 (f=50MHz~20GHz)



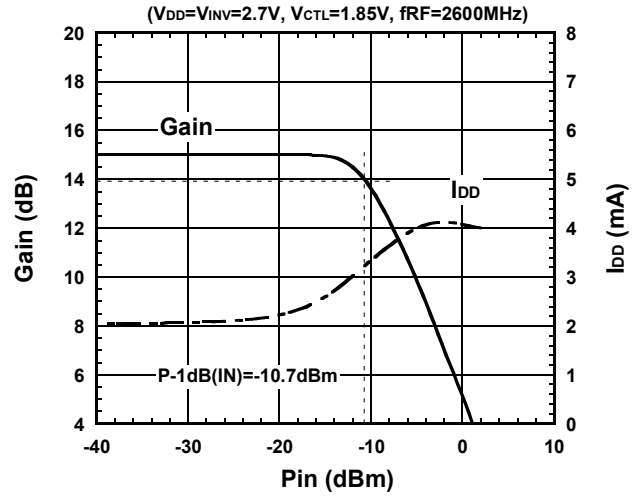
S21, S12 (f=50MHz~20GHz)

## 2-5-2 Typical Characteristics

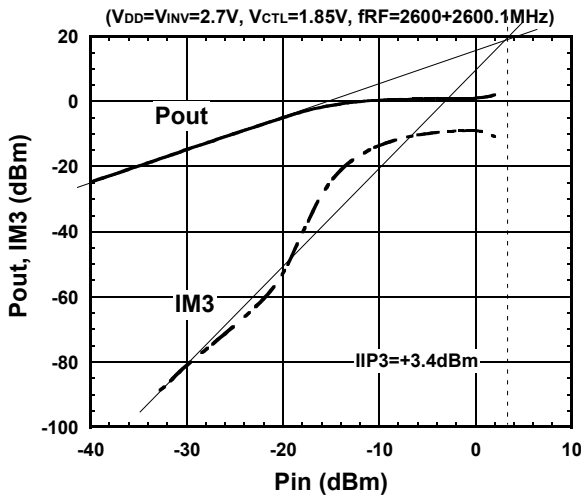
### Pout vs. Pin



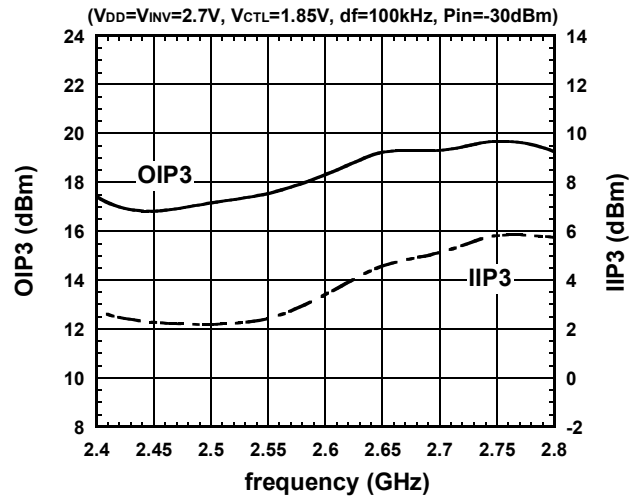
### Gain, I<sub>DD</sub> vs. Pin



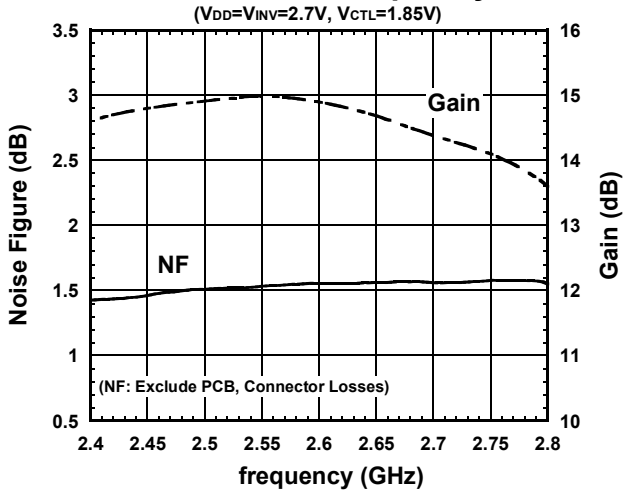
### Pout, IM3 vs. Pin



### OIP3, IIP3 vs. frequency



### NF, Gain vs. frequency



### k factor vs. frequency

