

WiMAX Application

3. WiMAX 2.7~2.9GHZ BAND APPLICATION

3-1 SUMMARY

The characteristics of WiMAX 2.7~2.9GHz band application have evaluated as follows. The evaluation circuit structure and measured data are reviewed.

3-2-1 MEASURED DATA1 (DC)

General conditions: $V_{DD}=V_{INV}=2.85V$, $T_a=+25^{\circ}C$, $Z_s=Z_l=50\Omega$

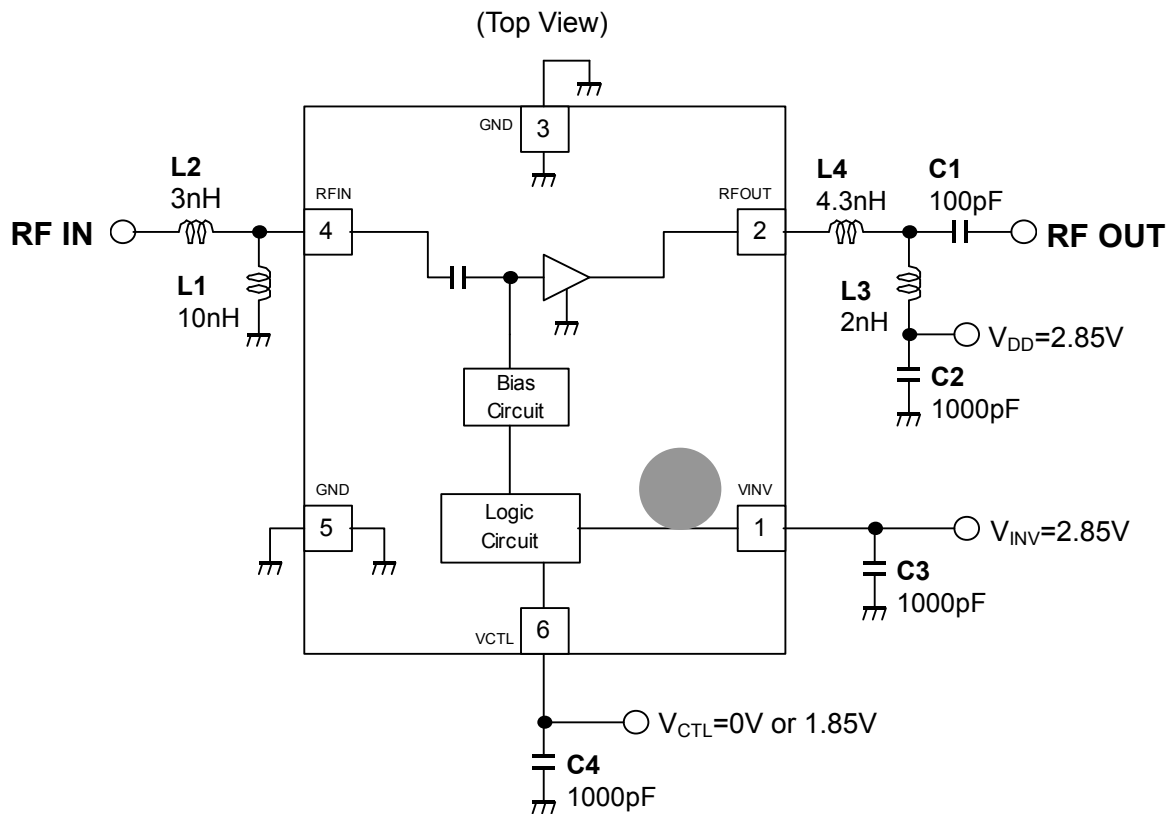
Parameter	Symbol	Conditions	Measurement data	Unit
Operating Voltage	V_{DD}		2.85	V
Inverter Voltage	V_{INV}		2.85	V
Control Voltage (High)	$V_{CTL(H)}$		1.85	V
Control Voltage (Low)	$V_{CTL(L)}$		0	V
Operating current	I_{DD1}	RF OFF, $V_{CTL}=1.85V$	2.27	mA
Operating current	I_{DD2}	RF OFF, $V_{CTL}=0V$	0	μA
Inverter current	I_{INV1}	RF OFF, $V_{CTL}=1.85V$	31.0	μA
Inverter current	I_{INV2}	RF OFF, $V_{CTL}=0V$	8.7	μA
Control current	I_{CTL}	RF OFF, $V_{CTL}=1.85V$	5.2	μA

3-2-2 MEASURED DATA2 (RF)

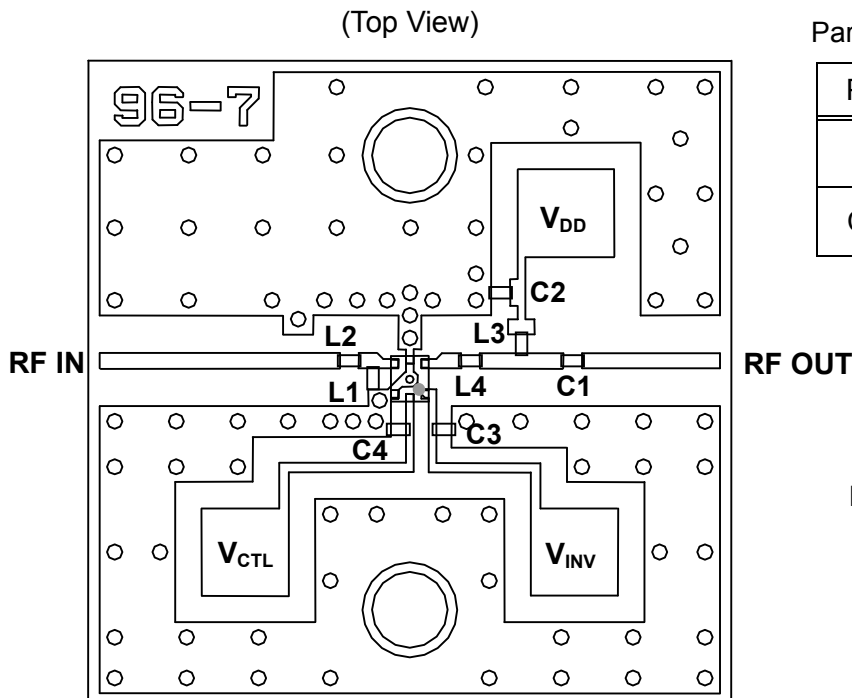
General conditions: $V_{DD}=V_{INV}=2.85V$, $V_{CTL}=1.85V$, $f_{RF}=2.7\sim 2.9GHz$, $T_a=+25^{\circ}C$, $Z_s=Z_l=50\Omega$, with application circuit

Parameter	Symbol	Conditions	Measurement data	Unit
Small signal gain	Gain	Exclude PCB, Connector Losses (Input and Output: 0.23dB)	14.6 ~ 14.9	dB
Gain flatness	Gflat		0.3	dB
Isolation	ISO		-38.5 ~ -36.7	dB
Noise figure	NF	Exclude PCB, Connector Losses (Input: 0.14dB)	1.46 ~ 1.50	dB
Pin at 1dB compression point	P-1dB(IN)		-11.8 ~ -9.7	dBm
Input 3rd order intercept point	IIP3	$f1=f_{RF}$, $f2=f_{RF}+100kHz$, $Pin=-30dBm$	+4.1 ~ +6.6	dBm
RF Input port VSWR	VSWRi		1.66 ~ 1.68	
RF Output port VSWR	VSWRo		1.66 ~ 2.15	

3-3 APPLICATION CIRCUIT



3-4 PCB DESIGN



Parts List

Parts ID	Comment
L1 ~ L4	MURATA (LQP03T Series)
C1 ~ C4	MURATA (GRM03 Series)

PCB (FR-4):

t=0.2mm

MICROSTRIP LINE WIDTH

=0.4mm ($Z_0=50\Omega$)

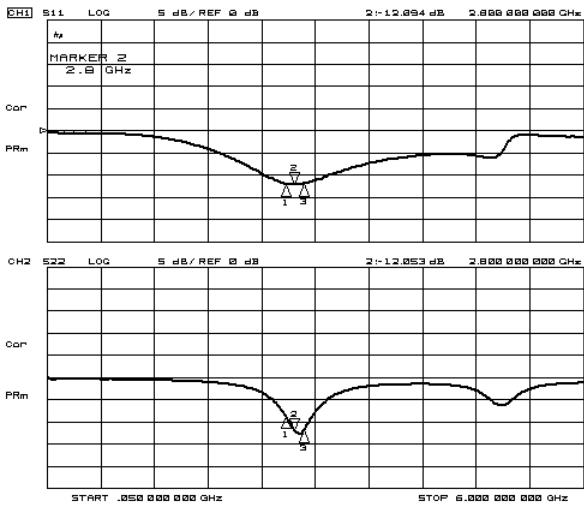
PCB SIZE=17.0mm x 17.0mm

CAUTION

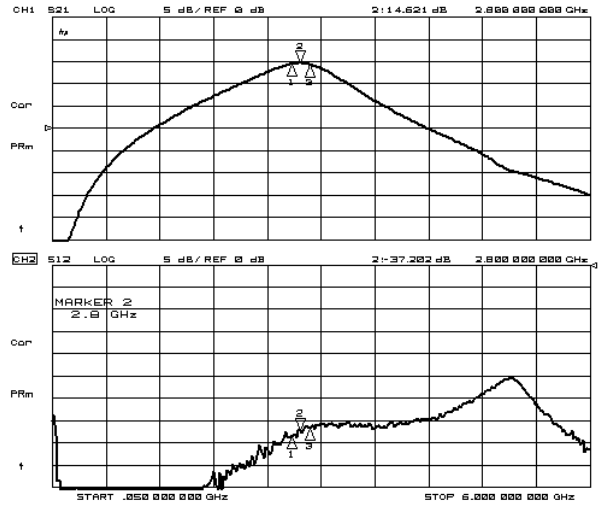
In order not to couple with terminal RFIN and RFOUT, please layout ground pattern under the IC.

3-5-1 Typical Characteristics

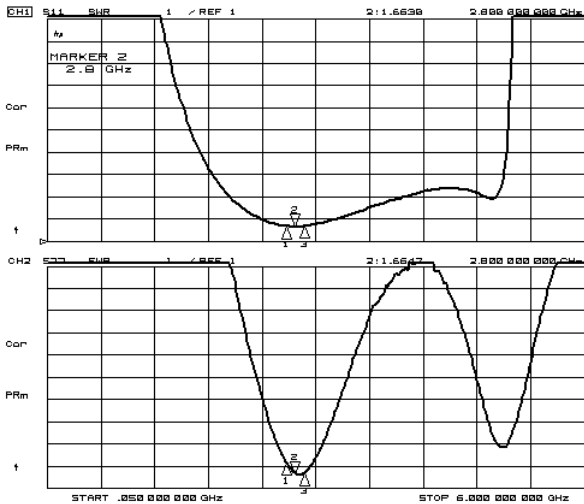
Condition: $T_a = +25^\circ\text{C}$, $V_{DD} = V_{INV} = 2.85\text{V}$, $V_{CTL} = 1.85\text{V}$, $Z_s = Z_l = 50\Omega$



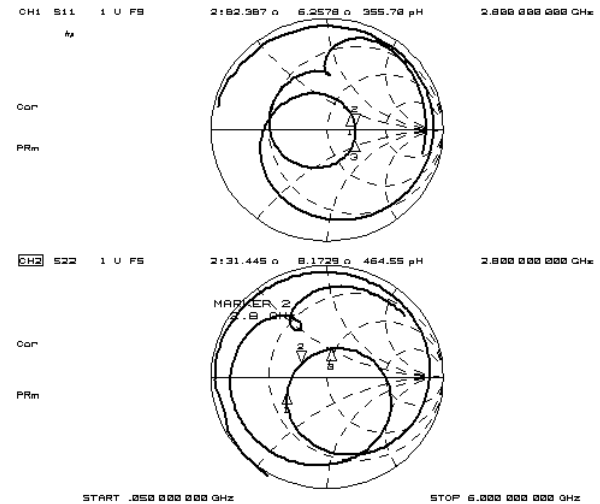
S11, S22



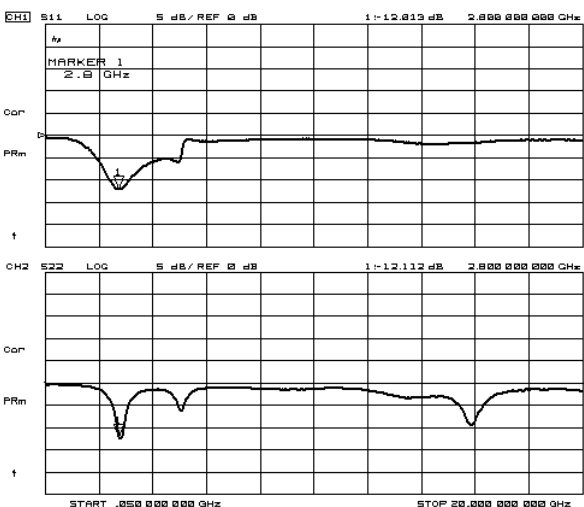
S21, S12



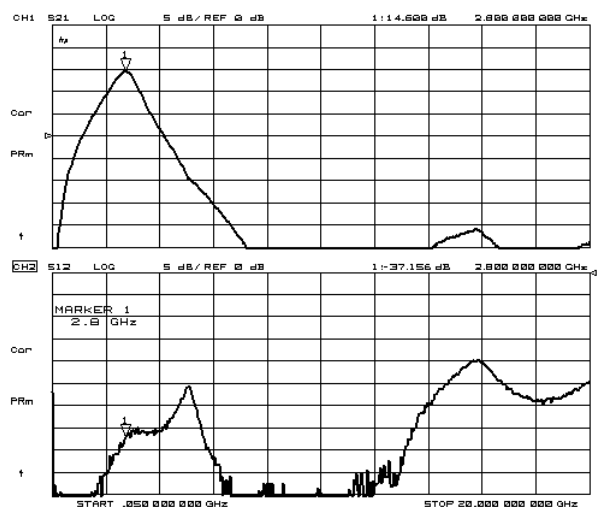
VSWR



Zin, Zout



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



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

3-5-2 Typical Characteristics

