

WiMAX Application

5. WiMAX 1.8GHZ BAND APPLICATION

5-1 SUMMARY

The characteristics of WiMAX 1.8GHz band application have evaluated as follows. The evaluation circuit structure and measured data are reviewed.

5-2-1 MEASURED DATA1 (DC)

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

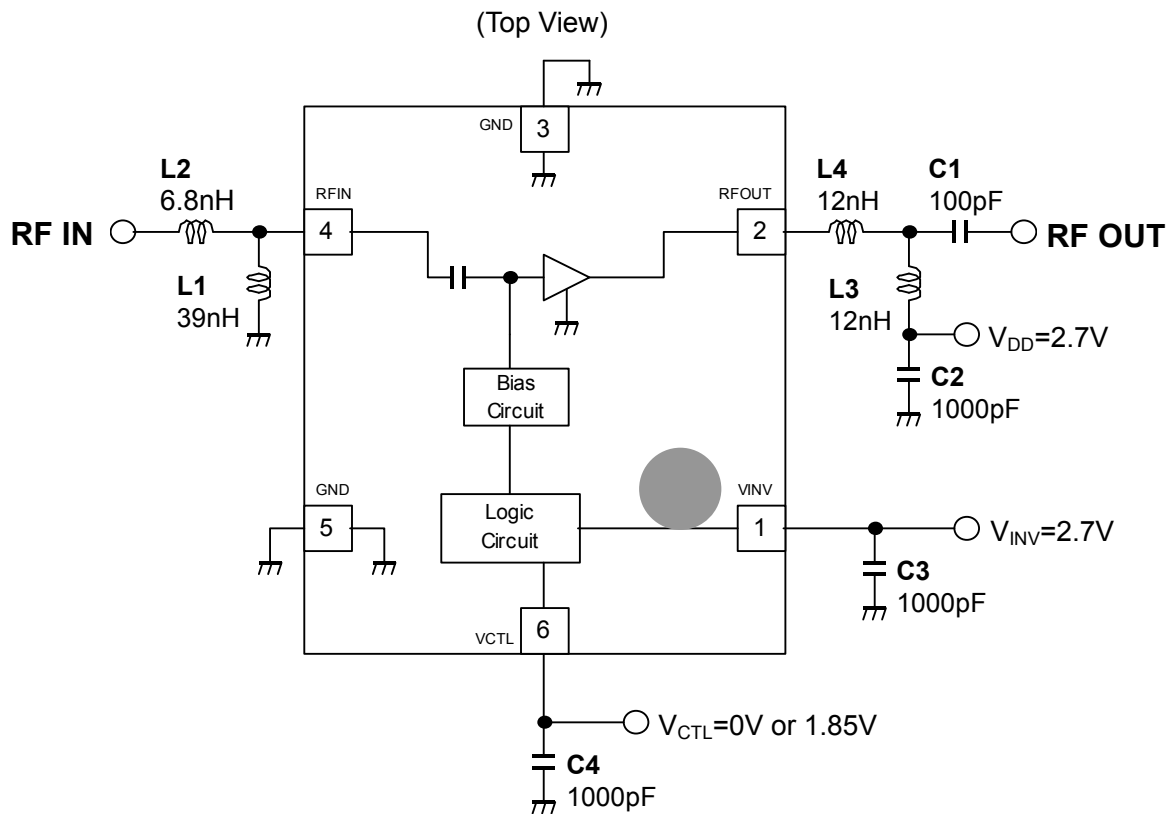
Parameter	Symbol	Conditions	Measurement data	Unit
Operating Voltage	V_{DD}		2.7	V
Inverter Voltage	V_{INV}		2.7	V
Control Voltage (High)	$V_{CTL(H)}$		1.85	V
Control Voltage (Low)	$V_{CTL(L)}$		0	V
Operating current	I_{DD1}	RF OFF, $V_{CTL}=1.85V$	2.20	mA
Operating current	I_{DD2}	RF OFF, $V_{CTL}=0V$	0	μA
Inverter current	I_{INV1}	RF OFF, $V_{CTL}=1.85V$	30.2	μA
Inverter current	I_{INV2}	RF OFF, $V_{CTL}=0V$	8.0	μA
Control current	I_{CTL}	RF OFF, $V_{CTL}=1.85V$	5.9	μA

5-2-2 MEASURED DATA2 (RF)

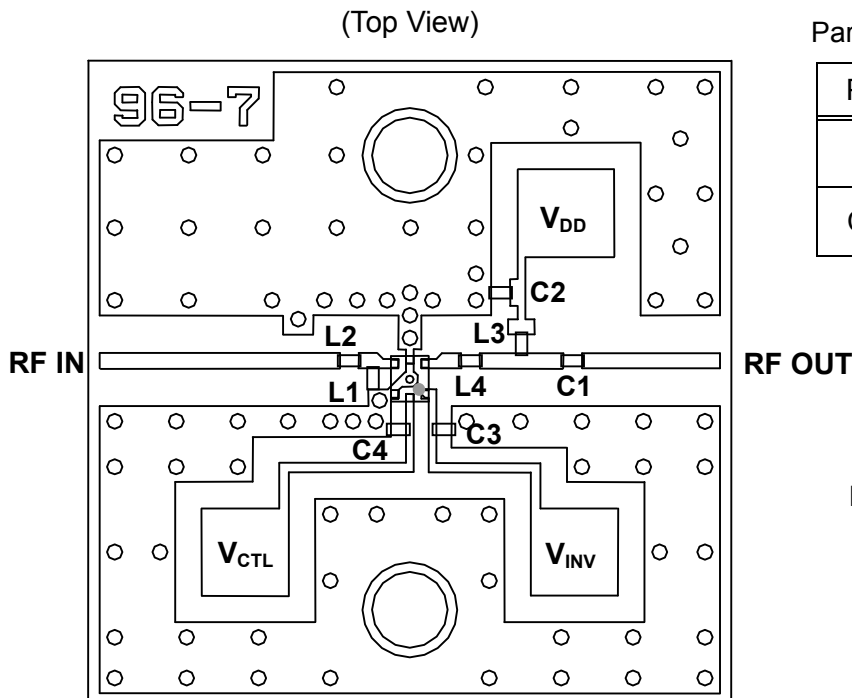
General conditions: $V_{DD}=V_{INV}=2.7V$, $V_{CTL}=1.85V$, $f_{RF}=1770\sim 1805MHz$,
 $T_a=+25^{\circ}C$, $Z_s=Z_l=50\Omega$

Parameter	Symbol	Conditions	Measurement data	Unit
Small signal gain	Gain		17.8 ~ 17.9	dB
Noise figure	NF	Exclude PCB, Connector Losses (0.05dB)	0.91 ~ 0.97	dB
Pin at 1dB compression point	P-1dB(IN)		-13.7 ~ -13.3	dBm
Input 3rd order intercept point	IIP3	$f1=f_{RF}$, $f2=f_{RF}+100kHz$, Pin=-34dBm	+1.6 ~ +1.8	dBm
RF Input port VSWR	VSWRi		2.09 ~ 2.11	
RF Output port VSWR	VSWRo		1.78 ~ 1.90	

5-3 APPLICATION CIRCUIT



5-4 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 ($Z_0=50\Omega$)

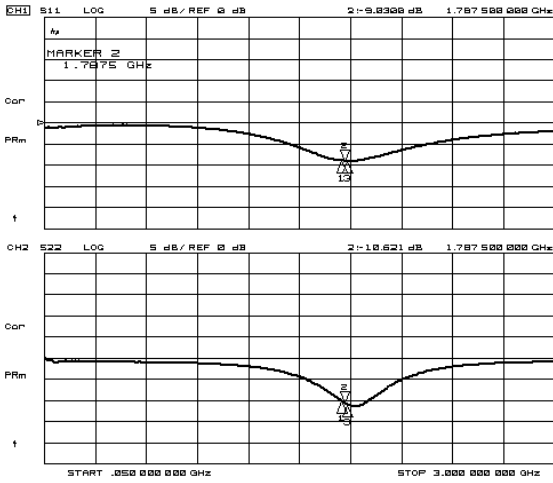
PCB SIZE=17.0mm x 17.0mm

CAUTION

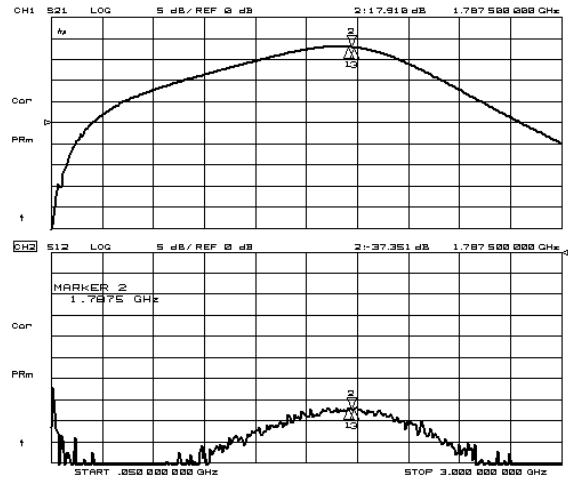
In order not to couple with terminal RFIN and RFOUT, please layout ground pattern under the IC.

5-5-1 Typical Characteristics

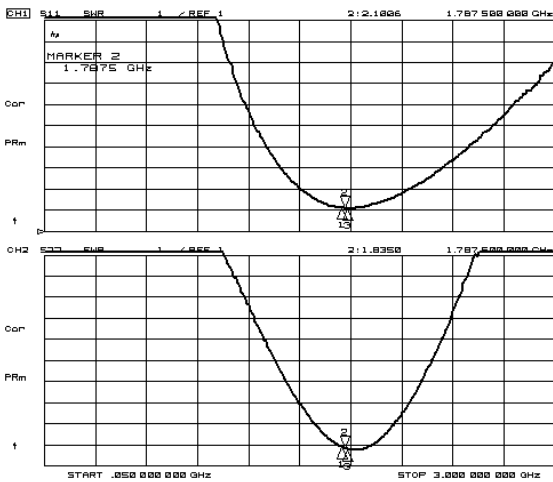
Condition: $T_a=+25^{\circ}\text{C}$, $V_{DD}=V_{INV}=2.7\text{V}$, $V_{CTL}=1.85\text{V}$, $Z_s=Z_l=50\Omega$



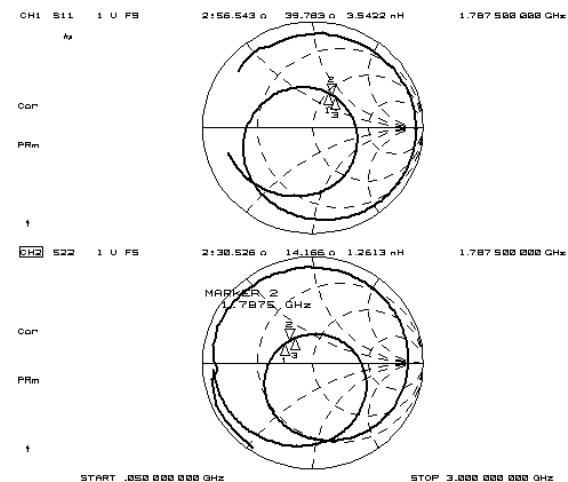
S11, S22



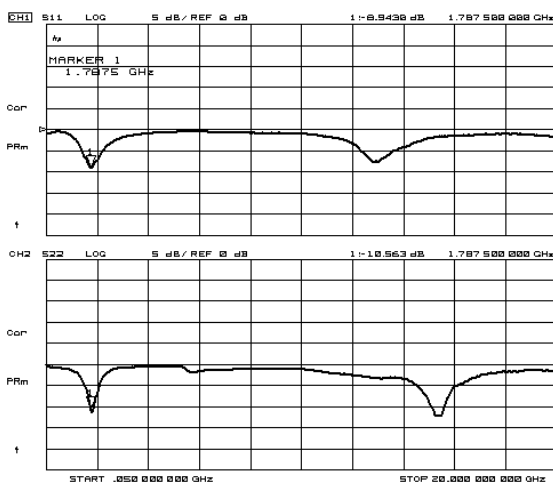
S21, S12



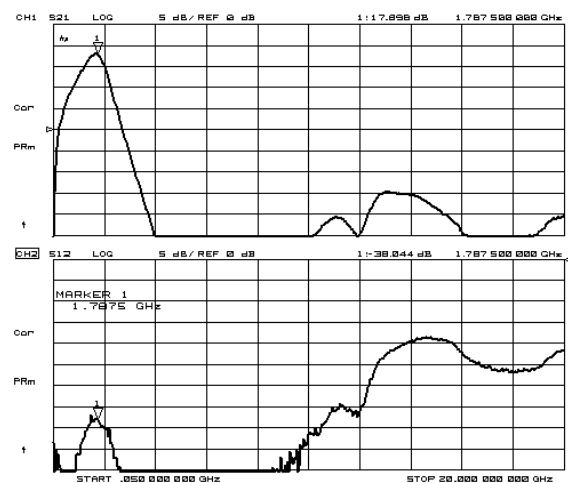
VSWR



Zin, Zout



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



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

5-5-2 Typical Characteristics

