

WLAN / WiMAX Application

1. 2.4GHz BAND APPLICATION

1-1 SUMMARY

The characteristics of 2.4GHz band have evaluated as follows. The evaluation circuit structure and measured data are reviewed.

1-2-1 MEASURED DATA1 (DC)

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

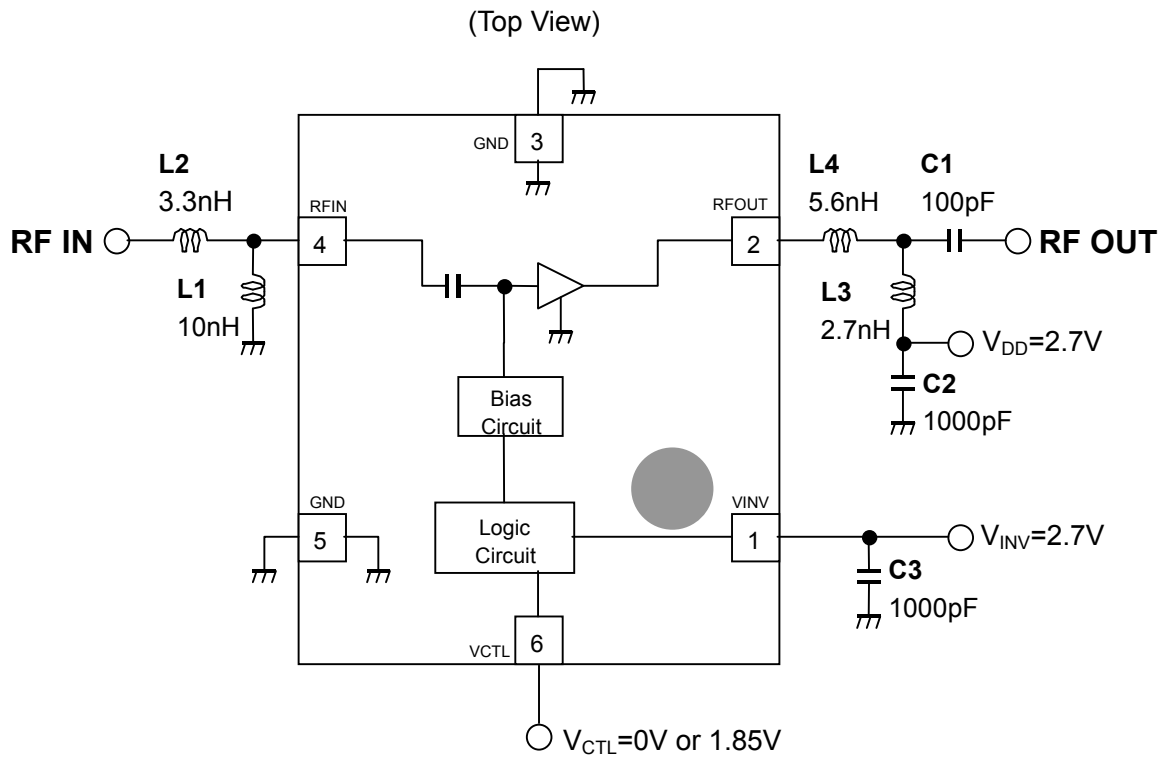
Parameter	Symbol	Conditions	Measurement data	Unit
Operating Voltage	V_{DD}		2.7	V
Inverter Voltage	V_{INV}		2.7	V
Control Voltage (High)	$V_{CTL(H)}$		1.85	V
Control Voltage (Low)	$V_{CTL(L)}$		0	V
Operating current	I_{DD1}	RF OFF, $V_{CTL}=1.85V$	2.01	mA
Operating current	I_{DD2}	RF OFF, $V_{CTL}=0V$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

1-2-2 MEASURED DATA2 (RF)

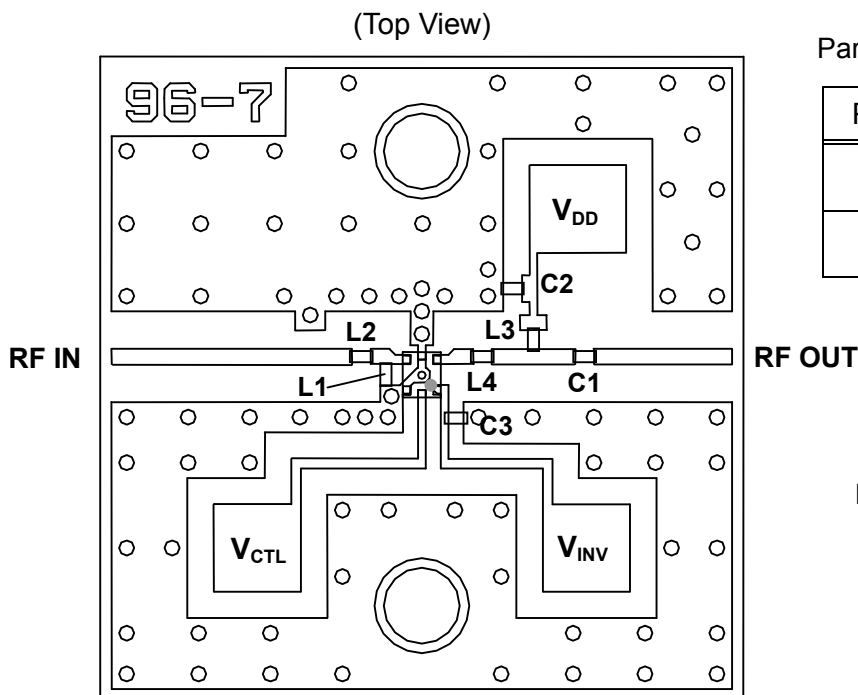
General conditions: $V_{DD}=V_{INV}=2.7V$, $V_{CTL}=1.85V$, $f_{RF}=2450MHz$, $T_a=+25^{\circ}C$, $Z_s=Z_l=50\Omega$

Parameter	Symbol	Conditions	Measurement data	Unit
Small signal gain	Gain		15.2	dB
Gain flatness	Gflat	$f_{RF}=2400\sim 2500MHz$	0.1	dB
Noise figure	NF	Exclude PCB, Connector Losses (0.10dB)	1.47	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	+17.5	dBm
Input 3rd order intercept point	IIP3	$f1=f_{RF}$, $f2=f_{RF}+100kHz$, Pin=-30dBm	+2.3	dBm
RF Input port VSWR	VSWRi		1.94	
RF Output port VSWR	VSWRo		1.77	

1-3 APPLICATION CIRCUIT



1-4 PCB DESIGN



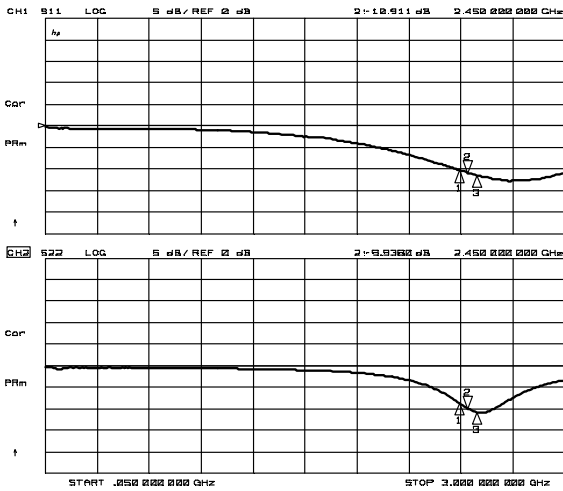
Parts List

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

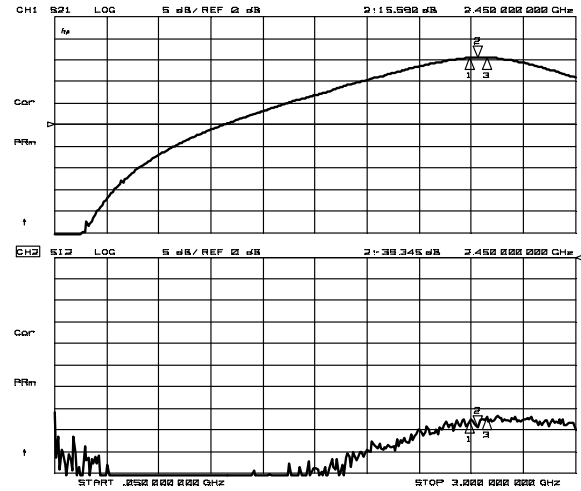
PCB (FR-4):
 $t=0.2\text{mm}$
 MICROSTRIP LINE WIDTH
 $=0.4\text{mm}$ ($Z_0=50\Omega$)
 PCB SIZE= $17.0\text{mm} \times 17.0\text{mm}$

1-5-1 Typical Characteristics

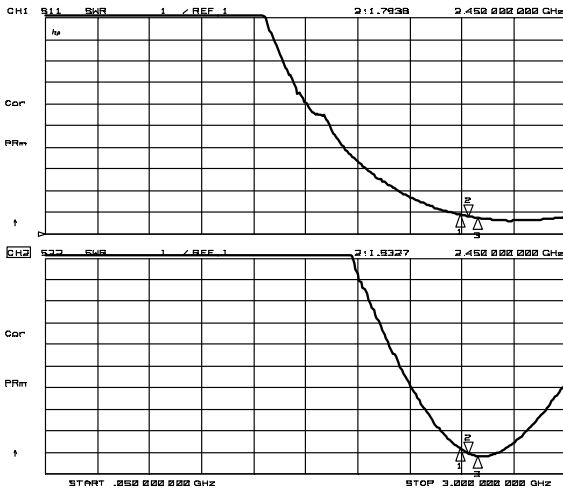
Condition: $T_a=+25^{\circ}\text{C}$, $V_{DD}=V_{INV}=2.7\text{V}$, $V_{CTL}=1.85\text{V}$, $Z_s=Z_l=50\Omega$



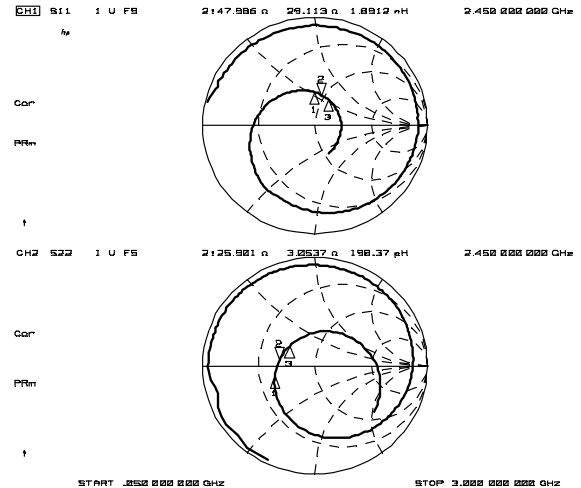
S11, S22



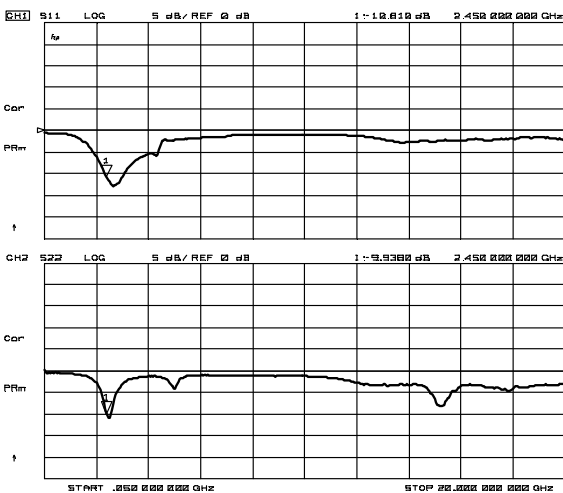
S21, S12



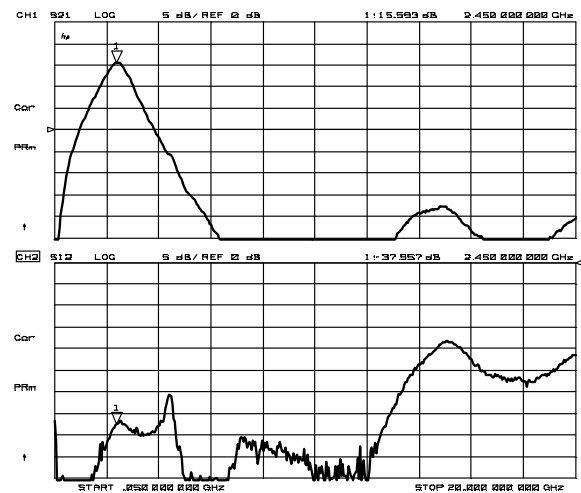
VSWR



Zin, Zout



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



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

1-5-2 Typical Characteristics

