

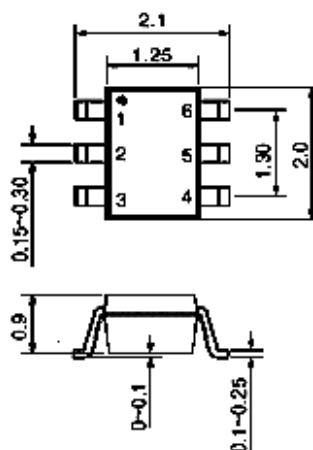
SiGe HBT MMIC Wideband Linear Amplifier

Descriptions

TARF 2202 is a high performance cascadeable 50-ohm amplifier. This RFIC uses the latest Silicon Germanium Hetero Junction Bipolar Transistor (TAHB09) process of Tachyonics Co., which has 30GHz f_T (Normal). TARF2202 uses a multi feedback cascade amplifier topology with resistive feedback for broad band performance as well as stability over its entire temperature range. TARF2202 also has internally matched 50 ohm impedance and wide bandwidth.

Features

- DC to 2500 MHz Operation
- Single Voltage Supply
- Internally Matched to 50 Ohm Input & Output
- High Power Gain : 20dB at 1900MHz
- Medium Output Power : $P_{1dB} = 9\text{dBm}$ at 900MHz

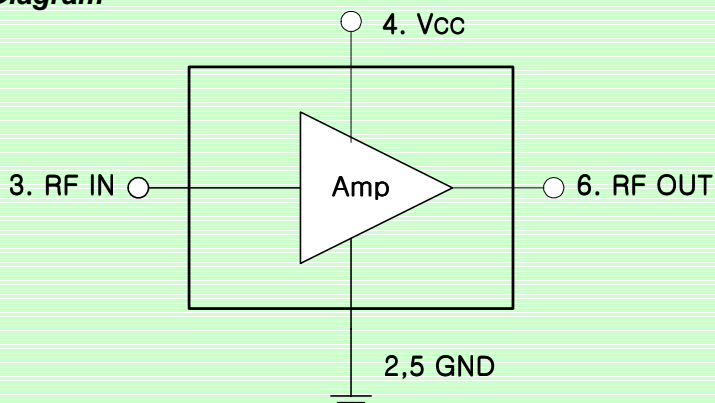


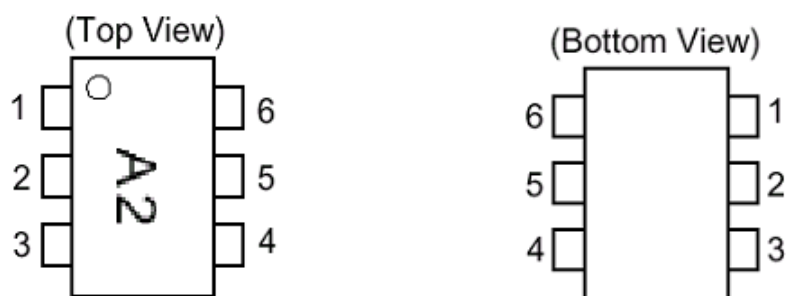
SOT363

Applications

- Oscillator Amplifier
- Transmission Stage Buffer (Mobile Communication)
- IF/RF Buffer Amplifier

Function Block Diagram



Pin Configuration**Pin Description**

Pin No.	Name	Description
1	N.C.	NO CONNECTION
2	GND	GROUND
3	RF IN	RF SIGNAL INPUT
4	VCC	POWER SUPPLY
5	GND	GROUND
6	RF OUT	RF SIGNAL OUTPUT

Absolute Maximum Ratings

Parameter	Rating	Unit
Supply Voltage	7	V
Supply Current	70	mA
RF Input Power	+10	dBm
Operation Temperature Range	-40 to +85	°C
Maximum Junction Temperature	+150	°C
Storage Temperature Range	-55 to +150	°C

Electrical Characteristics(T_A = 25°C, V_{CC} = 3V, Z_S = Z_L = 50Ω)

Symbol	Parameter	Condition	Specification			Unit
			Min.	Typ.	Max.	
f _{3dB}	RF Input Freq. Range		2000	2500		MHz
S ₂₁	Small Signal Gain	f = 900MHz	17	18.5	22	dB
		f = 1900MHz	18	19.5	22	dB
P _{1dB}	Output 1dB Compression Point	f = 900MHz	8	9	–	dBm
		f = 1900MHz	6	7	–	dBm
RL _{IN}	Input Return Loss	f = 900MHz	9	14	–	dB
		f = 1900MHz	7	9	–	dB
RL _{OUT}	Output Return Loss	f = 900MHz	7	8.5	–	dB
		f = 1900MHz	10	18	–	dB
OIP ₃	Output 3 rd Order Intercept Point	f ₁ = 899MHz, f ₂ = 901MHz	20	25	–	dBm
		f ₁ = 1899MHz, f ₂ = 1901MHz	11	15	–	dBm
NF	Noise Figure	f = 900MHz	–	4.0	6.0	dB
		f = 1900MHz	–	4.0	6.0	dB
ISL	Isolation	f = 900MHz	28	30	–	dB
		f = 1900MHz	28	30	–	dB
I _{CC}	Bias Current	V _{CC} = 3V	–	25	30	mA

Typical Characteristics

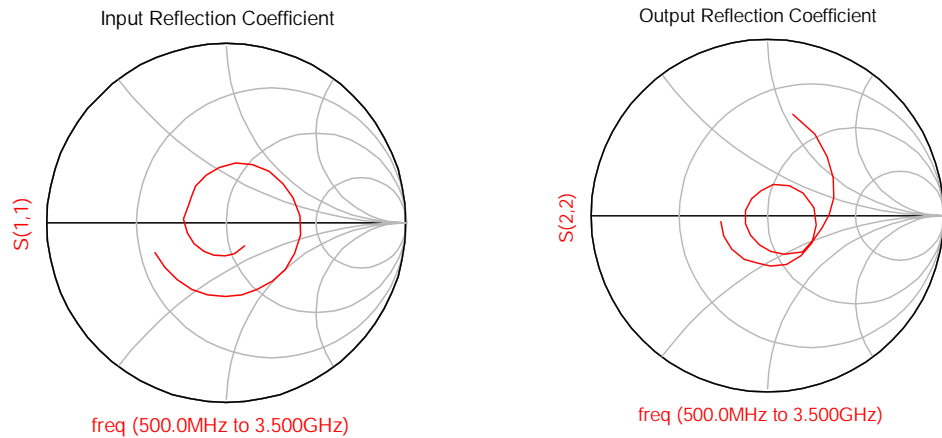


Fig1. Input/Output Impedance

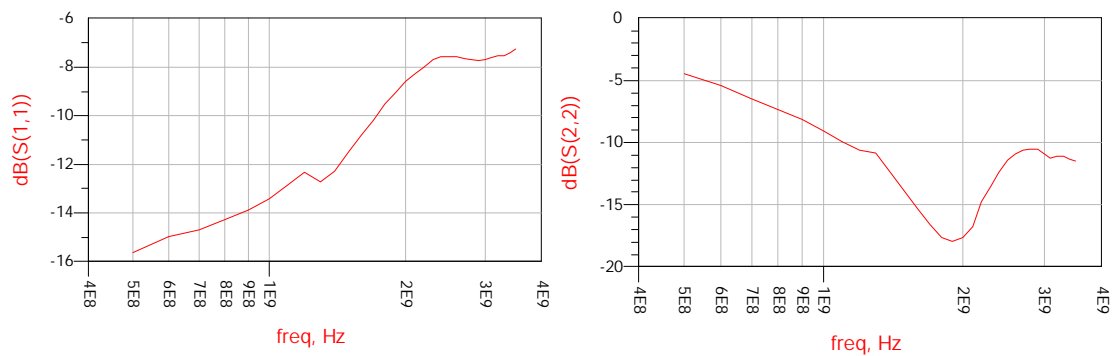


Fig2. Input/Output Return Loss

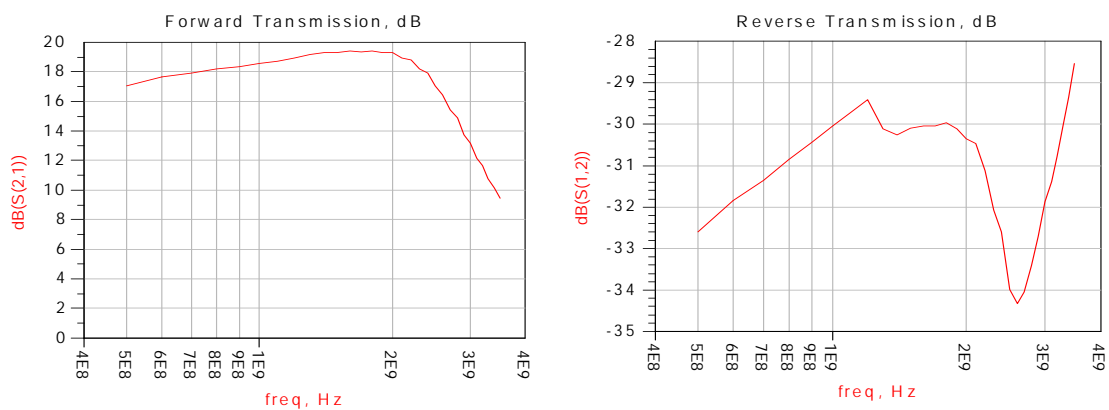


Fig3. Small Signal Gain

Fig4. Isolation

Typical Characteristics

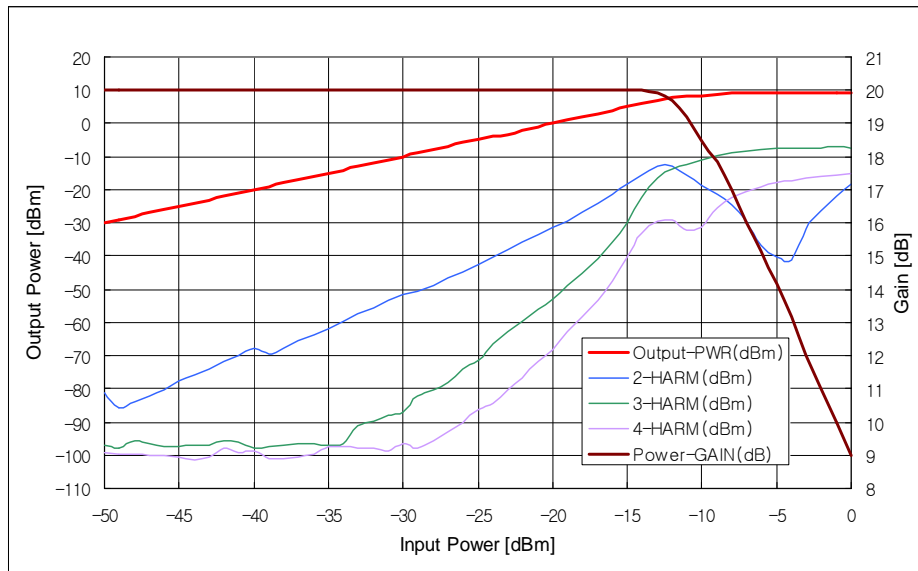


Fig5. 900MHz One Tone Power Sweep

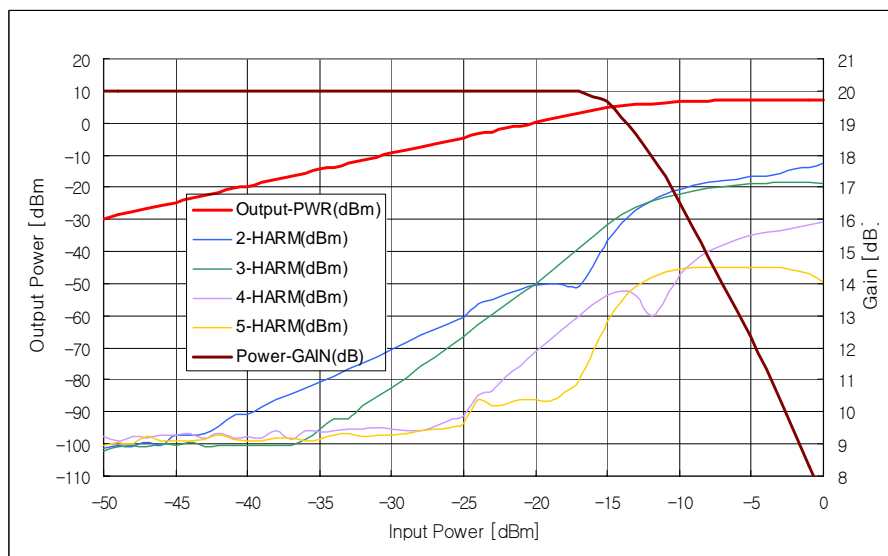


Fig6. 1900MHz One Tone Power Sweep

Typical Characteristics

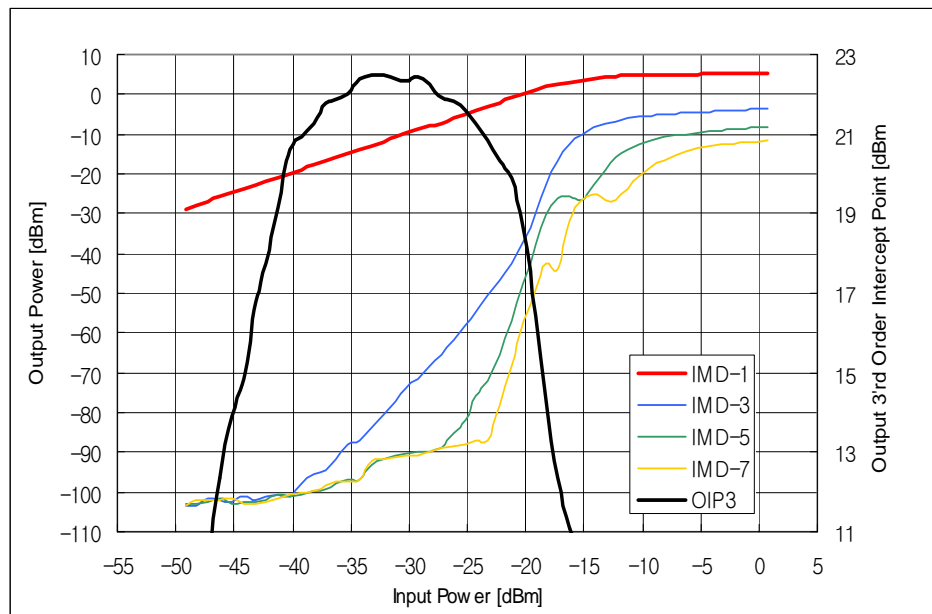


Fig7. 900MHz Two Tone Power Sweep

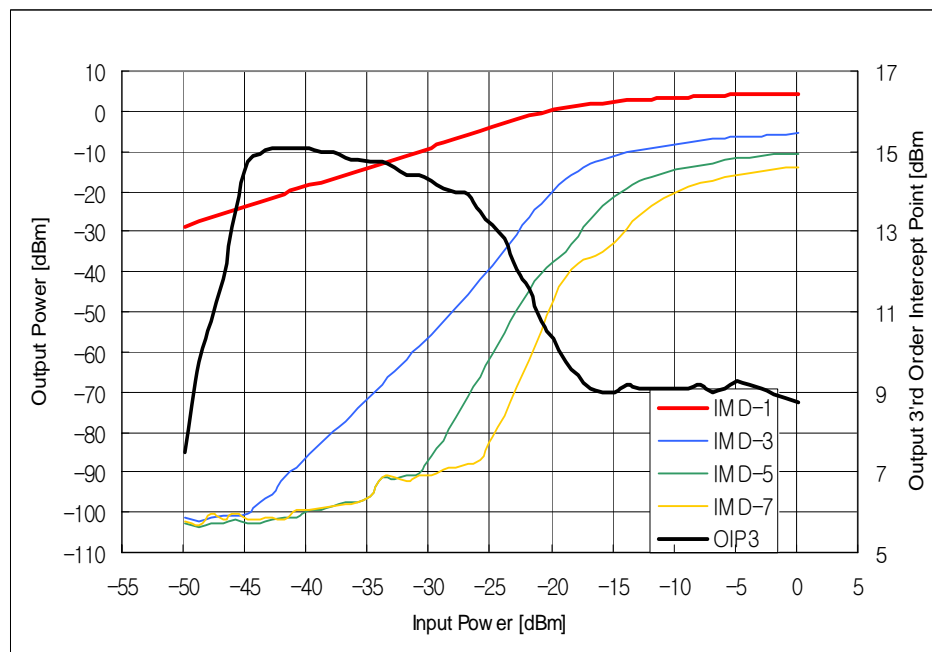
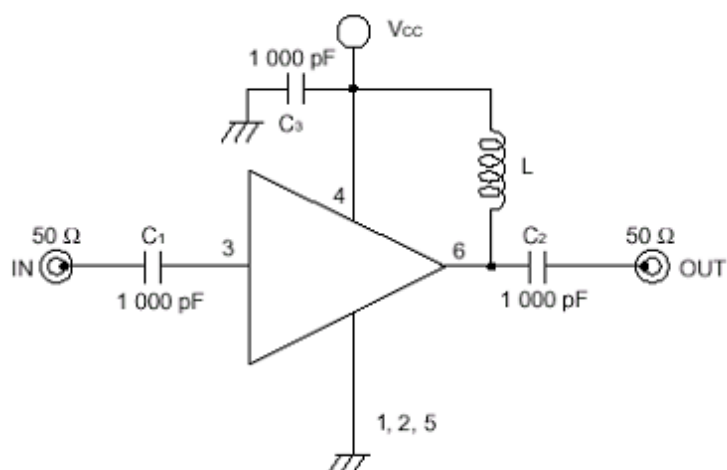
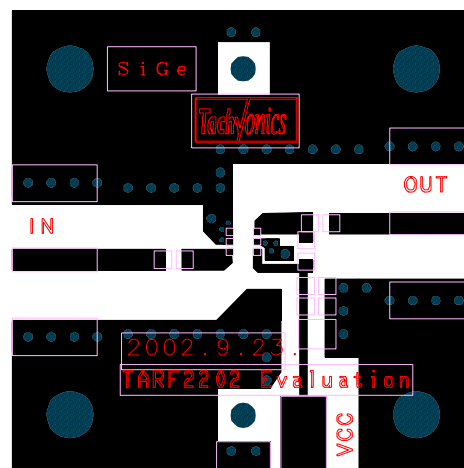


Fig8. 1900MHz Two Tone Power Sweep

Test Circuit



Evaluation Board

Board Size 30 x 30 mm²

NOTE

Board Thickness 0.8mm
 Board Material FR4
 Multi-Layer or Double Layer

Component List

Name	Value	Remark
C1	1000 pF	100MHz or higher frequency
C2	1000 pF	100MHz or higher frequency
C3	1000 pF	100MHz or higher frequency
L	50 nH	900MHz Band application
	10 nH	Over 2GHz Band application
	1000 nH (Bias Tee)	For measuring electrical characteristics