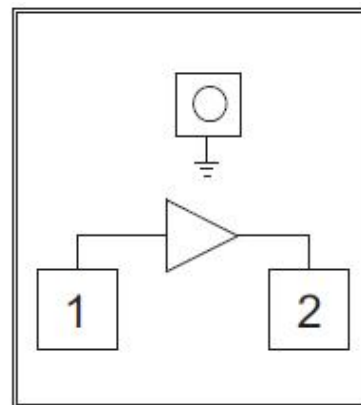


## High Linearity, Low Noise Gain Block Chip, 0.2-6GHz

### Performance characteristics

- Working frequency band : 200-6000MHz
- Noise figure: 0.4dB@1950MHz
- Small signal gain: 21dB@ 1900MHz
- P-1dB: 20dBm
- OIP3: 35 dBm
- Integrated shutdown function
- 50Ohm input and output
- Support +3V ~ +5V operation
- +5V /70mA
- DIE: 0.83 x 0.84 x0.1mm

### Functional Block Diagram



### Use restriction parameter <sup>1</sup>

Collector voltage	+6 V
Input power	+23dBm
Operating Current	110mA
Operating temperature	-55 ~ + 105 °C
Storage temperature	-65 ~ +150°C

【1】 Exceeding any of these maximum limits may cause permanent damage.

### Electrical performance parameters ( TA = +25°C, Vd = +5V, Ids = 70mA , 50Ω system)

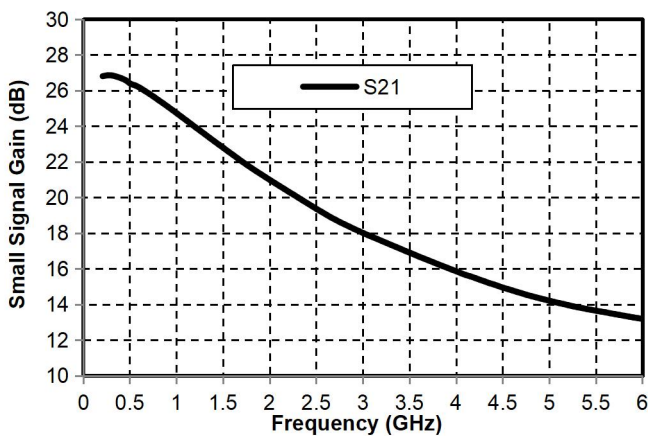
Index	Test Conditions	Minimum	Typical Value	Maximum	Unit
Frequency Range		200		6000	MHz
Small Signal Gain	@1900MHz		twenty one		dB
Input return loss			11		dB
Output return loss			11		dB
P-1			20		dBm
OIP3	Pout=+ 5dBm /tone, Δf =1MHz		35		dBm
Noise Figure	@1900MHz		0.4		dB
Switching speed	Rise Time (10%-90%)		120		ns
	Fall Time (90%-10%)		350		ns
Shutdown control	On state	0		0.4	V
	Off state (Power down)	+ 2.5	+ 3.3	VDD	V
Current	On state		70		mA
	Off state (Power down)		140		uA
Shutdown pin current	VPD ≥ 2.5 V		250		uA

## 200M-6000M electrical performance parameters

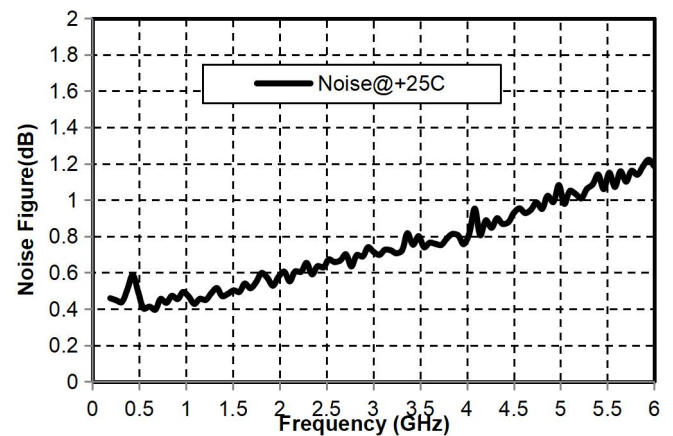
Electrical performance parameters ( TA = +25°C, Vd = +5V, Ids = 70mA, 50Ω system)							
Index	Test Conditions	Typical Value					Unit
Test frequency		200	900	1700	2300	5000	MHz
Small Signal Gain		26.5	25	twenty two	20	14	dB
Input return loss		5	10	12	13	11	dB
Output return loss		9.5	14	12	11	9.5	dB
P-1		19	20	20.5	20	20	dBm
OIP3	Pout=+ 5 dBm/tone, Δf =1 MHz	35	36	35	34.5	33.5	dBm
Noise Figure*		0.5	0.5	0.5	0.6	1.0	dB

\*The noise figure result does not deduct the input loss of the test DEMO board .

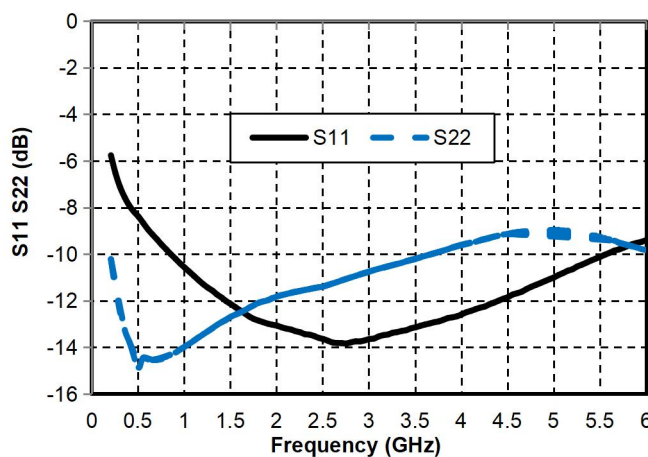
## Main index test curve ( TA = +25°C , Vcc = + 5V)



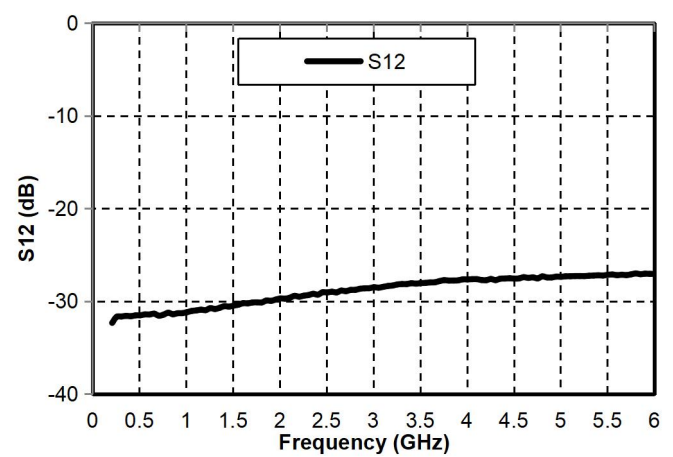
Small Signal Gain vs. Frequency



Noise Figure vs. Frequency

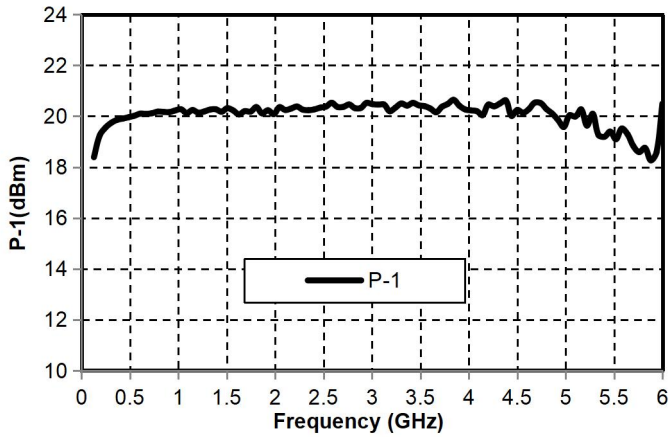


Input /Output Return Loss vs. Frequency

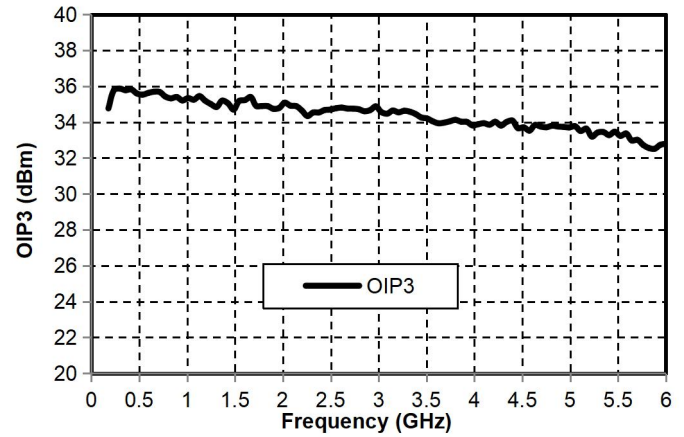


Reverse Isolation vs. Frequency

## High Linearity, Low Noise Gain Block Chip, 0.2-6GHz



P-1dB vs. Frequency



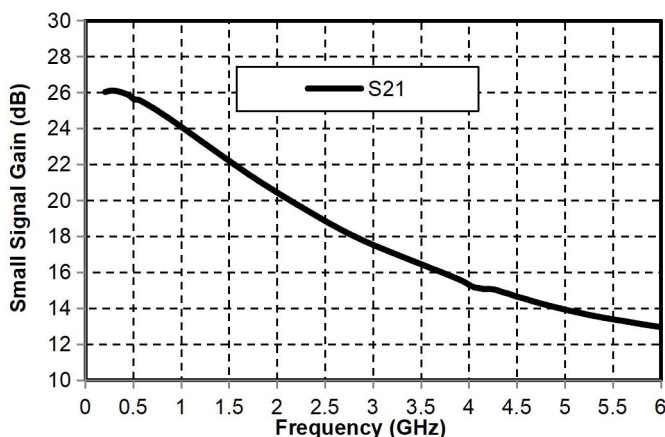
OIP3 vs. Frequency

### 200M-6000M electrical performance parameters

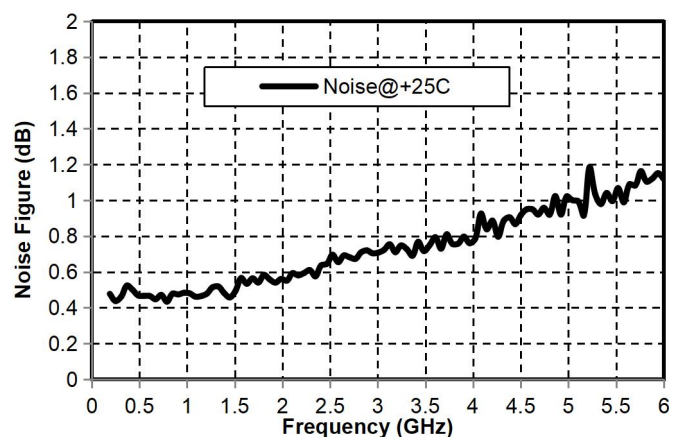
Electrical performance parameters ( TA = +25°C, Vd = +3.3V, Ids = 45mA, 50Ω system)							
Index	Test Conditions	Typical Value					Unit
Test frequency		200	900	1700	2300	5000	MHz
Small Signal Gain		26	twenty four	twenty one	19	14	dB
Input return loss		5	8	10	11	10	dB
Output return loss		10	14	12	11	9	dB
P-1		16	17	17.5	17.5	17	dBm
OIP3	Pout=+ 2 dBm/tone, Δf =1 MHz	30	31.5	32	32.5	33.5	dBm
Noise Figure*		0.5	0.5	0.5	0.6	1.0	dB

\*The noise figure result does not deduct the input loss of the test DEMO board .

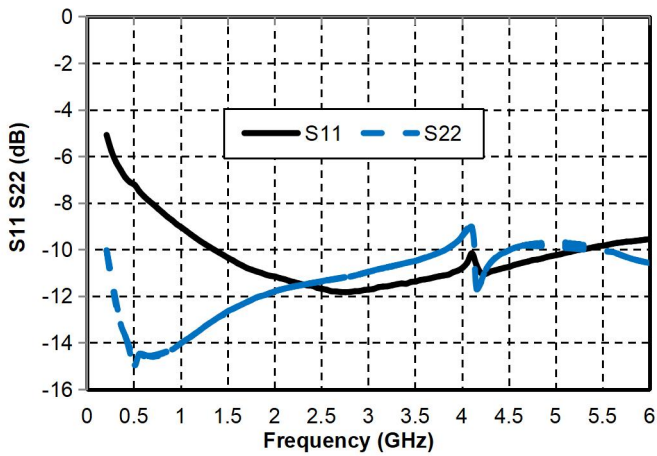
### Main performance test curve ( TA = +25°C , Vcc = + 3.3V)



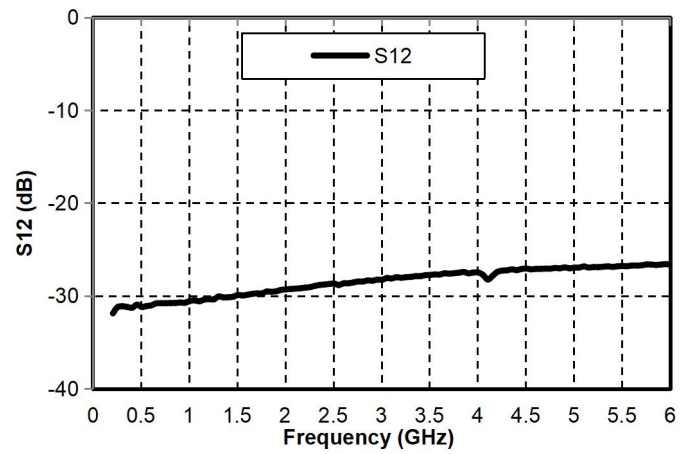
Small Signal Gain vs. Frequency



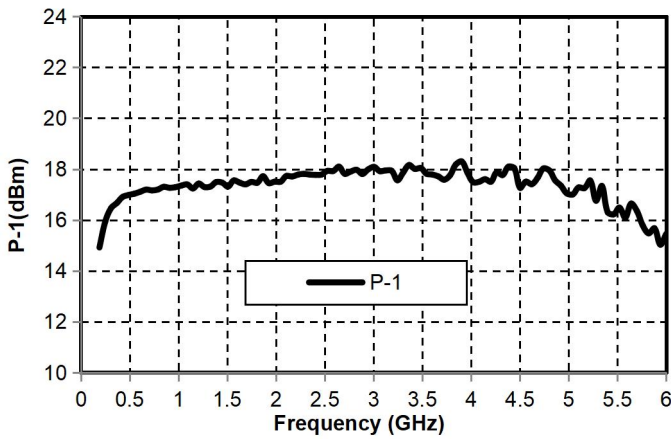
Noise Figure vs. Frequency



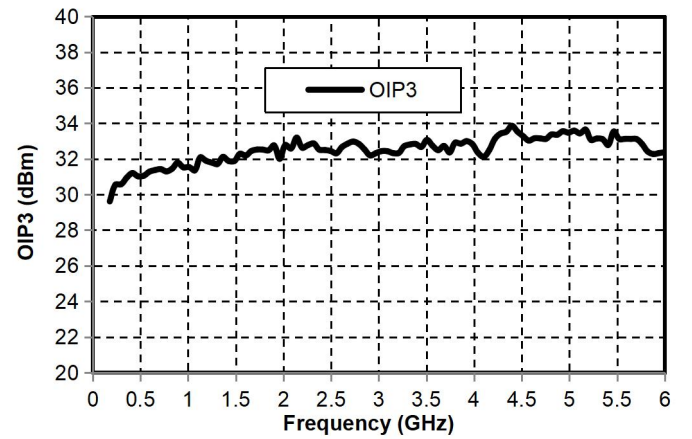
Input /Output Return Loss vs. Frequency



Reverse Isolation vs. Frequency

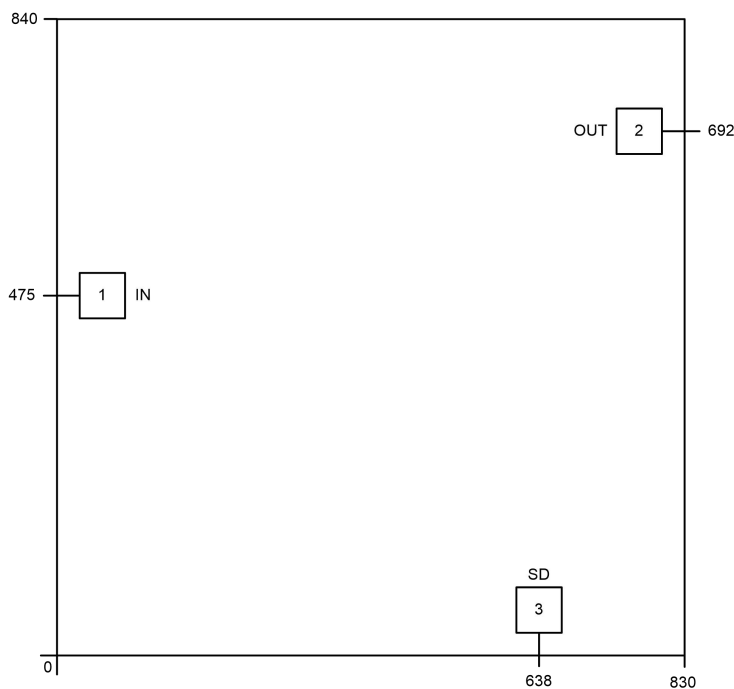


P-1dB vs. Frequency



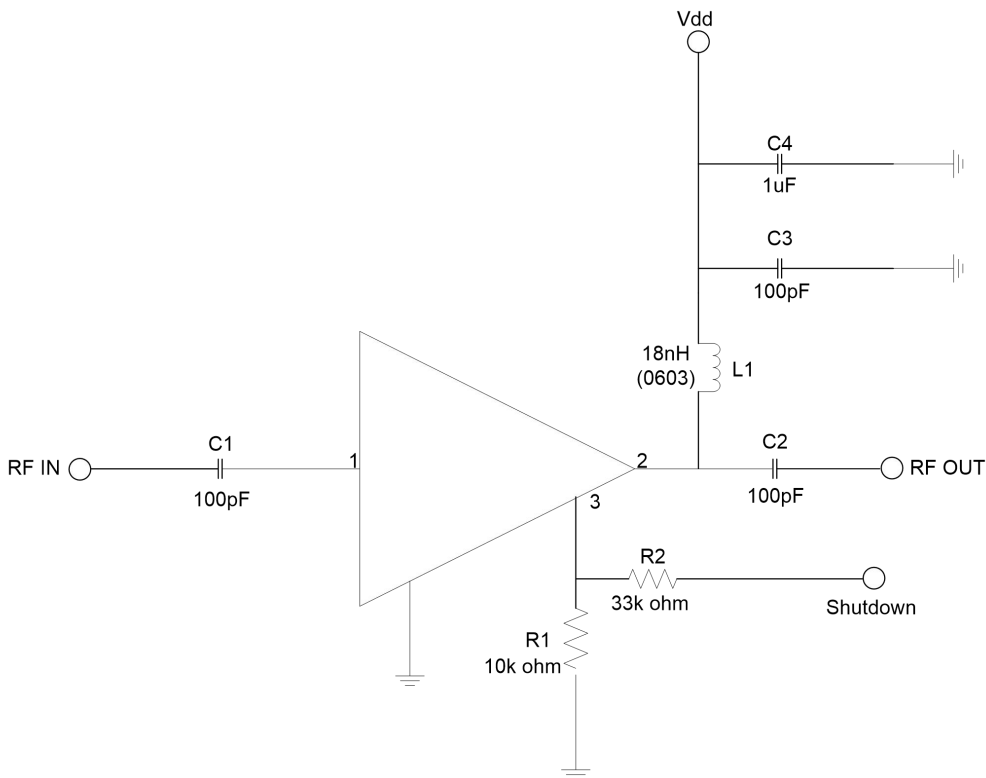
OIP3 vs. Frequency

## Appearance structure



Bonding point number	Function Symbol	Functional Description
1	RFIN	RF input, external DC blocking capacitor is required
2	RFOUT	RF output and chip DC bias, bias the circuit at the output end through external choke inductor and bias resistor, and require external DC blocking capacitor
3	Shutdown	Amplifier RF output shutdown port
Chip bottom	GND	The bottom of the chip needs to be well grounded to RF and DC

## Recommended circuit diagram



## Precautions

- 1、 The capacitance values of C1 , C2 and C3 need to be adjusted accordingly according to the actual application frequency.
- 2、 The inductance of L1 needs to be adjusted accordingly according to the actual application frequency.
- 3、 If not needed, R1 and R2 can be not installed; when R1 and R2 are not installed, the amplifier is always in working state.

## Ingredients list

Raw material	RC Inductance	Describe	Brand
R1	10K $\Omega$	Resistor, Chip, 5%, 1/16W	various
R2	33K $\Omega$	Resistor, Chip, 5%, 1/16W	various
L1	18nH	Inductor, 5%, Ceramic	various
C4	1.0uF	Cap., Chip, 10%, 10V, X5R	various
C1, C2, C3	100pF	Cap., Chip, 5%, 50V, NPO/COG	various