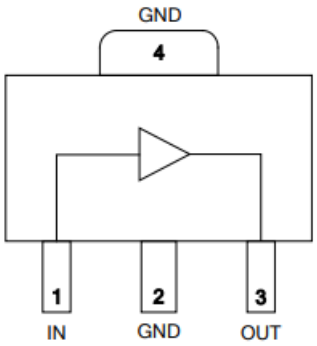
Features



Functional Block Diagram

- 100MHz to 7GHz operational
- Typical 17.5dB Small Signal Gain up to 7GHz
- ±1dB Wideband flat Gain up to 7GHz
- 17dB Gain at 3.5GHz
- +35dBm OIP3 at 3.5GHz
- OIP3 ≥+33.5dBm between 0.4GHz and 4.5GHz
- 3-5V single typical supply, 10mA~89mA operational
- Linearity and thermal compensation with Integrated Active Bias Circuit
- Industry Standard SOT-89 Package
- ESD protection all ports above 1000V HBM

Applications

- 5G mobile application/m-MIMO
- WLAN / WiMAX / WiBro
- WCDMA / LTE
- GPS / COMPASS
- TDD/FDD System
- GSM / CDMA / PCS
- CATV
- ISM

Product Description

The YG602020W, a cascade broadband InGaP/GaAs MMIC amplifier is a high performance solution for general purpose RF and microwave amplification needs, including Gain Stage or Driver Amplifier. This gain block is based on a reliable HBT proprietary MMIC design covering 100MHz-7GHz operation frequency and providing a flat gain. At 3.5GHz, the YG602020W typically provides 17dB of gain, 20.9dBm P1dB and 35dBm OIP3 while drawing 97mA current from a 5V single supply. The YG602020W is internally matched to 50Ω and assembled in an industry standard SOT-89 package. It is internally integrated with ESD protection unit.

Pin Description

Pin No.	Symbol	Description
1	IN	RF input
3	OUT	RF output and bias
2, 4	GND	Ground connected

Absolute Maximum Ratings

Parameter	Rating	Unit
Input RF Power	+20	dBm
Supply Voltage	6	V
Device Current	150	mA
Operating Ambient Temperature	-40 to +85	°C
Storage Temperature	-40 to +150	°C

Caution!

Exceeding any one or a combination of the Absolute Maximum Rating conditions may cause permanent damage to the device. Extended application of Absolute Maximum Rating conditions to the device may reduce device reliability.

Electrical Specifications

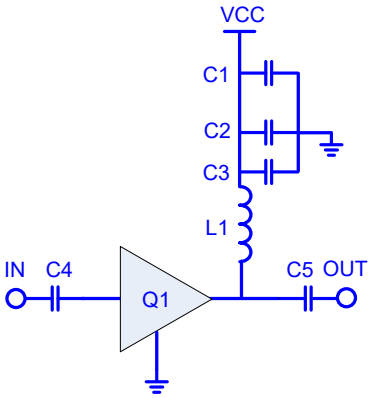
Parameter	Condition(1)	Specification			Unit
		Min.	Typ.	Max.	
Operational Frequency Range		0.1		7000	MHz
Test Frequency			4000		MHz
Small Signal Gain			16.8		dB
Gain Flatness	500M~7000M		±1		dB
P1dB Output Power			20.5		dBm
Input Return Loss			30.4		dB
Output Return Loss			10.9		dB
Reverse Isolation			25.3		dB
OIP3	Pout=1dBm/ tone,$\Delta f = 1MHz$		35.3		dBm
Supply Voltage		3	5	6	V
Device Current	VCC=5V		89		mA
	VCC=3V		10		mA

Notes: Test condition unless otherwise noted: VCC=+5V, Temp=+25℃, 50Ω system.

Device Current vs. VCC

VCC (V)	3	3.2	3.4	3.6	3.8	4	4.2	4.4	4.6	4.8	5
Current (mA)	10	17	24	32	40	48	57	65	73	81	89

100MHz~7000MHz Application



Bill of material

Reference Des.	Value	Description	Manuf.	Part Number
Q1		YG602020W, SOT-89	Innotion	YG602020W
C1	10uF	CAP, SMD, 10uF, 0402	various	
C2	1000pF	CAP, SMD, 1000pF, 0402	various	
C3	10pF	CAP, SMD,10pF, 0402	various	
C4，C5	100pF	CAP, SMD, 100pF, 0402	various	
L1	180nH	Coli IND, SMD, 180nH, 0603	TDK	

Typical performance on EVB

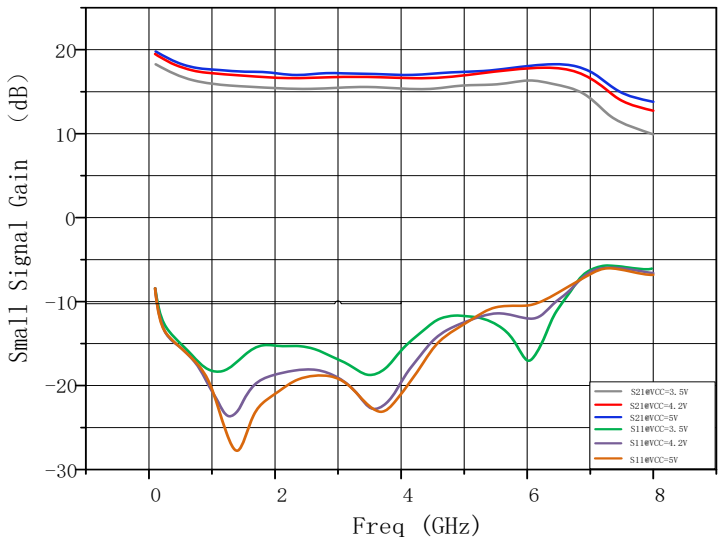
Parameter	Typical Value																Unit
Frequency	0.5	1	1.5	2	2.5	3	3.5	4	4.5	5	5.5	6	6.5	7	7.5	8	GHz
Small Signal Gain	18.3	17.6	17.2	17.1	16.7	17	17	16.8	16.9	17.5	17.9	18.6	18.1	17.3	14.8	13.7	dB
Input Return Loss	15	19.4	16.2	14.3	14.2	15.4	18.4	30.4	22.6	15.8	13.7	16.2	8	6.4	6.2	6.8	dB
Reverse Isolation	21.9	23.1	23.6	24.1	24.4	24.5	24.9	25.3	25.3	25	24	25	24	26.1	27.1	27.5	dB
P1dB	20	20.8	20.7	20.6	20.9	20.7	20.9	20.5	20.6	20.3	20.3	20.1	17.4	15.5	15.2	14.5	dBm
OIP3	34	34	34	33.5	35	34.3	35	35.3	34.6	31	23	21.5	—	—	—	—	dBm

Notes:

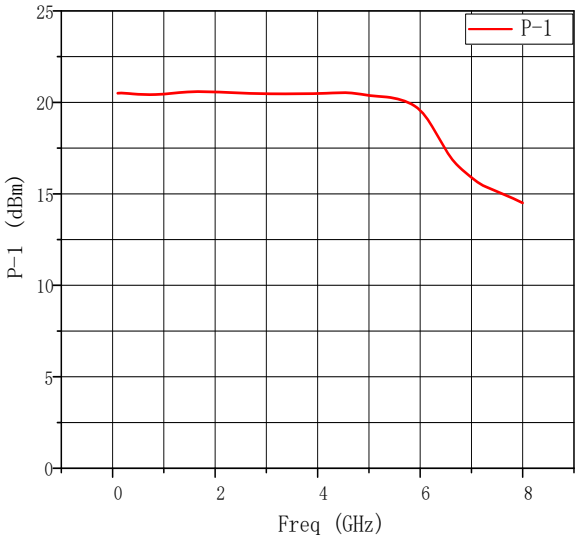
1. Test condition unless otherwise noted: VCC=+5V, Temp=+25℃, 50Ω system.
2. OIP3 measured with two tones at an output power of 1dBm/ tone separated by 1MHz.

Performance plots

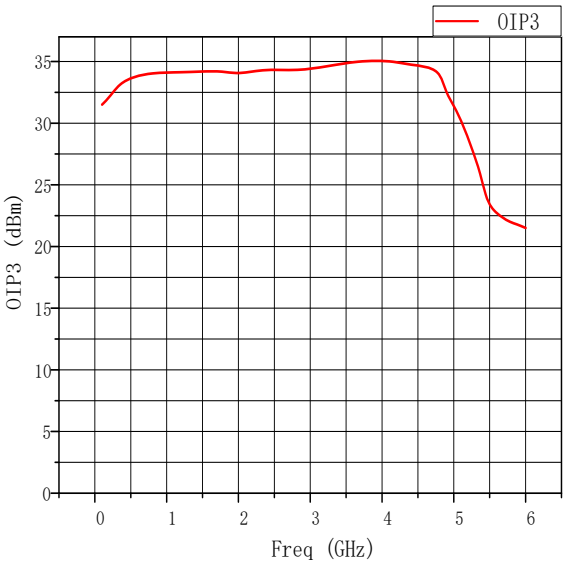
Small Signal Gain vs. Frequency



P1dB vs. Frequency



OIP3 vs. Frequency



Package Diagram

(Units: millimeters)