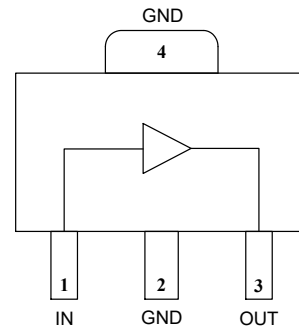


Features

- 1MHz to 2.7GHz operational
- Typical +30dBm P1dB
- 13.8dB Gain at 2000MHz
- Typical +45 dBm OIP3
- 5V typical supply, 160mA Current at VCB=3.75V
- ESD protection all ports above 1000V HBM
- Industry Standard SOT89 Package
- Linearity and thermal compensation with Integrated Active Bias Circuit



Functional Block Diagram

Applications

- | | |
|-----------------------------------|----------------------------|
| ■ Repeaters | ■ TDD / FDD System |
| ■ BTS High Power Amplifiers | ■ GSM / CDMA / PCS |
| ■ WCDMA / LTE | ■ ISM |
| ■ GPS / COMPASS / BDS / WALK TALK | ■ General Purpose Wireless |

Product Description

The YG401530VB is an InGaP/GaAs MMIC linear amplifier targeted for use as a driver amplifier in wireless infrastructure where high linearity, medium power, and high efficiency are required. The YG401530VB delivers high performance across a broad range of frequencies. At 2000MHz, the YG401530VB typically provides 13.8dB of gain, 30.9dBm P1dB and 45dBm OIP3 while drawing 150mA quiescent current from a 5V supply. The YG401530VB is assembled in an industry standard SOT89 package with internally integrated ESD protection unit.



Pin Description

Pin No.	Symbol	Description
1	RFIN	RF input & VB Bias
3	RFOUT/ VCC	RF output and Supply voltage
2,4	GND	Ground

Absolute Maximum Ratings

Parameter	Rating	Unit
Input RF Power@2GHz	+22	dBm
Input RF Power@400MHz	+15	dBm
Supply Voltage	+6.5	V
Device Current	1000	mA
Operating Ambient Temperature	-40 to +85	°C
Storage Temperature	-40 to +150	°C

**Caution!**

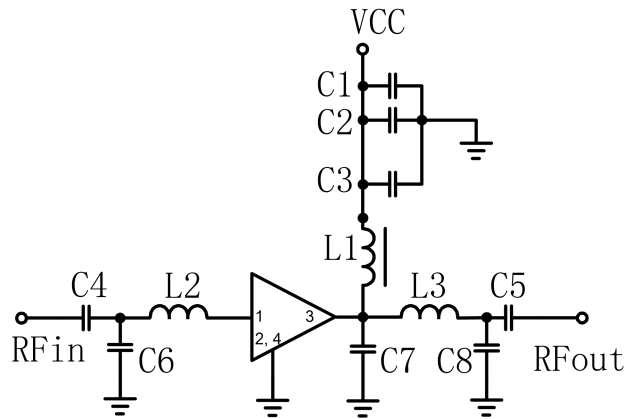
Exceeding any one or a combination of the Absolute Maximum Rating conditions may cause permanent damage to the device. Extended application of Absolute Maximum Rating conditions to the device may reduce device reliability.

Electrical Specifications

Parameter	Condition	Specification			Unit
		Min.	Typ.	Max.	
Operational Frequency Range		1		4000	MHz
Test Frequency			2000		MHz
Small Signal Gain			13.8		dB
P1dB Output Power			30.9		dBm
S11			-17.9		dB
S22			-17		dB
OIP3	Pout=15dBm/ tone, $\Delta f = 1\text{MHz}$		45		dBm
WCDA Channel power (at -50dBc ACLR)	3GPP WCDMA, TM1+64 DPCH, +5 MHz offset		20.9		dBm
Supply Voltage		3	5	6	V
Quiescent Current, Icq	VCC=5V	35	150	220	mA

Reference Evaluation Board

869MHz~894MHz Application



Bill of material

Reference Des.	Value	Description	Manuf.	Part Number
PCB		Printed circuit Board,3CMX3CM		
U1		YG401530VB, DFN2x2_6L	Innotion	YG401530VB
C1	22uF	CAP, SMD, 0603	various	
C2	1000pF	CAP, SMD, 0402	various	
C3	10pF	CAP, SMD, 0402	various	
C4	3.9pF	CAP, SMD, 0603	Dalicap	
C5	22pF	CAP, SMD, 0402	various	
C6	7.5pF	CAP, SMD, 0402	various	
C7	2.7pF	CAP, SMD, 0402	various	
C8	6.3pF	CAP, SMD, 0402	various	
L1	9.5nH	Coli IND, SMD, 0603	TDK	
L2	1.2nH	IND, SMD, 0402	various	
L3	3.3nH	IND, SMD, 0402	various	

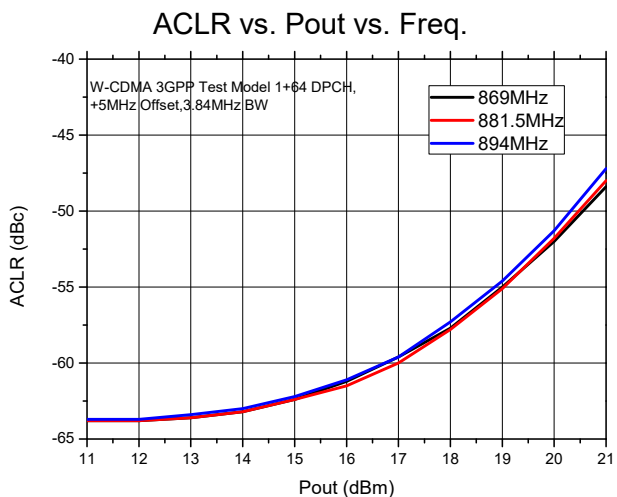
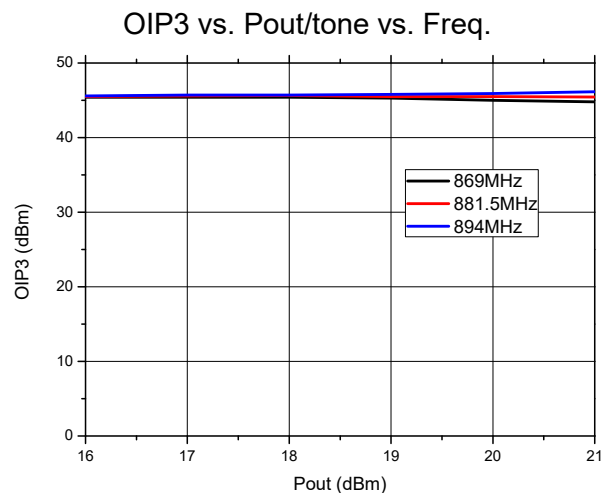
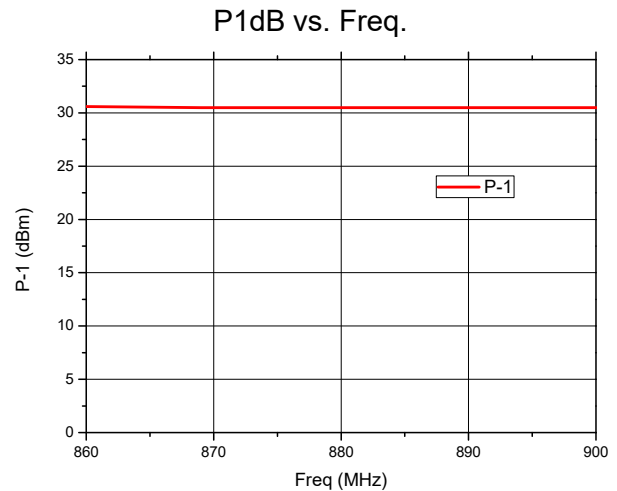
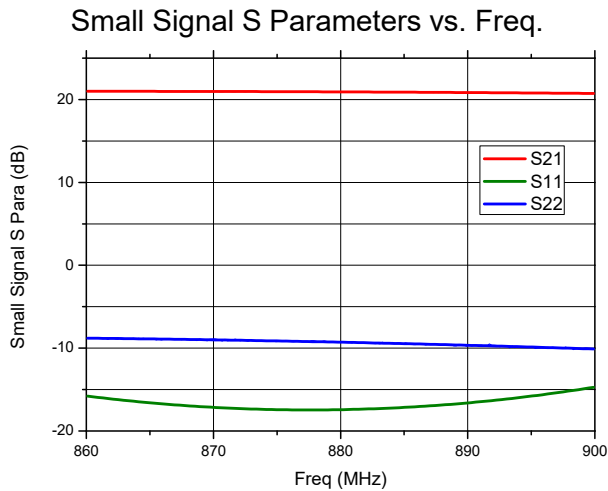
Critical component placement locations

Distance from U1 Pin2 Pad (left edge) to L2 (right edge): 70mil
Distance from L2 (left edge) to C6 (right edge): 91mil
Distance from C6 (left edge) to C4 (right edge): 0mil
Distance from U1 Pin5 Pad (right edge) to C7 (left edge): 30mil
Distance from C7 (right edge) to L3 (left edge): 16mil
Distance from L3 (right edge) to C8 (left edge): 16mil
Distance from C8 (right edge) to C5 (left edge): 64mil

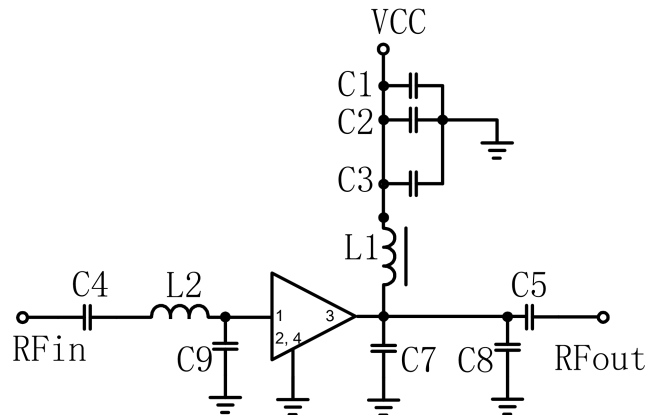
Typical performance on EVB

Typical Performance at +25 °C	(MHz)	869	881.5	894
Small Signal Gain	dB	21	20.9	20.8
Input Return Loss	dB	-16.8	-17.8	-16
Output Return Loss	dB	-9	-9.4	-9.8
P1dB	dBm	30.5	30.5	30.5
OIP3 (+19dBm/tone, $\Delta f=1$ MHz)	dBm	45.3	45.5	45.8
WCDMA Channel power (at -50dBc ACLR)	dBm	20.5	20.4	20.3
Efficiency at Pout=30dBm	%	51.28	52.22	53.33
Supply Voltage, Vcc	V	5		
Quiescent Collector Current, Icq	mA	145~150		

Performance plots



2300MHz~2400MHz Application



Bill of material

Reference Des.	Value	Description	Manuf.	Part Number
PCB		Printed circuit Board,3CMX3CM		
U1		YG401530VB, DFN2x2_6L	Innotion	YG401530VB
C1	22uF	CAP, SMD, 0603	various	
C2	1000pF	CAP, SMD, 0402	various	
C3	10pF	CAP, SMD, 0402	various	
C4	0.7pF	CAP, SMD, 0603	Dalicap	
C5	22pF	CAP, SMD, 0402	various	
C7	1.8pF	CAP, SMD, 0402	various	
C8	2pF	CAP, SMD, 0402	various	
C9	2pF	CAP, SMD, 0402	various	
L1	4.3nH	Coli IND, SMD, 0603	TDK	
L2	0.8nH	IND, SMD, 0402	various	

Critical component placement locations

Distance from U1 Pin2 Pad (left edge) to C9 (right edge): 30mil

Distance from C9 (left edge) to L2 (right edge): 15mil

Distance from L2 (left edge) to C4 (right edge): 103.5mil

Distance from U1 Pin5 Pad (right edge) to C7 (left edge): 30mil

Distance from C7 (right edge) to C8 (left edge): 93.5mil

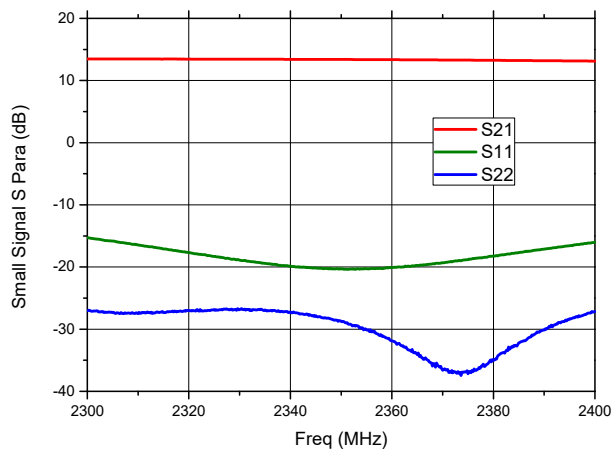
Distance from C8 (right edge) to C5 (left edge): 64mil

Typical performance on EVB

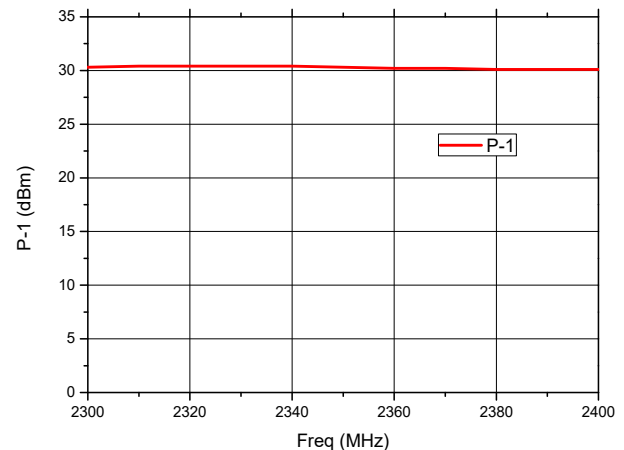
Typical Performance at +25 °C	(MHz)	2300	2350	2400
Small Signal Gain	dB	13.46	13.39	13.13
Input Return Loss	dB	-15.3	-20.31	-16
Output Return Loss	dB	-27.06	-28.76	-27.17
P1dB	dBm	30.3	30.3	30.1
OIP3 (+15dBm/tone, $\Delta f=1$ MHz)	dBm	46.4	45.8	46.4
WCDMA Channel power (at -50dBc ACLR)	dBm	20.8	20.7	20.3
Efficiency at Pout=30dBm	%	43.57	45.05	45.98
Supply Voltage, Vcc	V	5		
Quiescent Collector Current, Icq	mA	160		

Performance plots

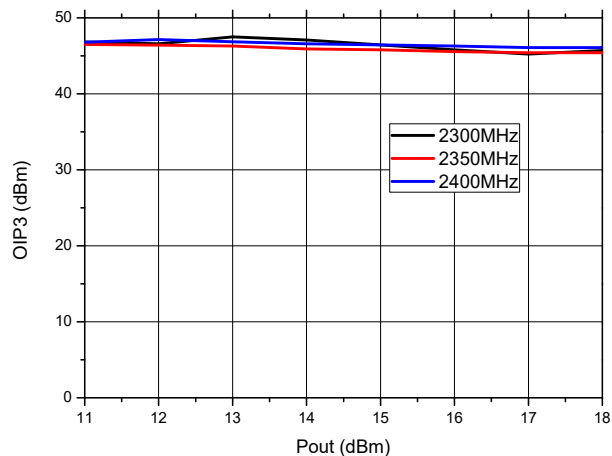
Small Signal S Para. vs. Freq.



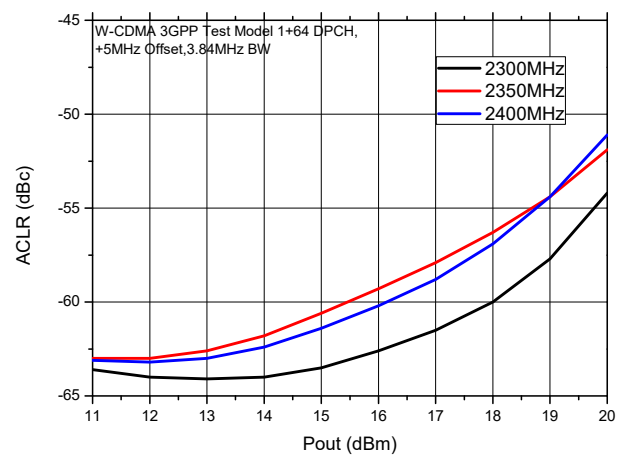
P1dB vs. Freq.



OIP3 vs. Pout/tone vs. Freq.

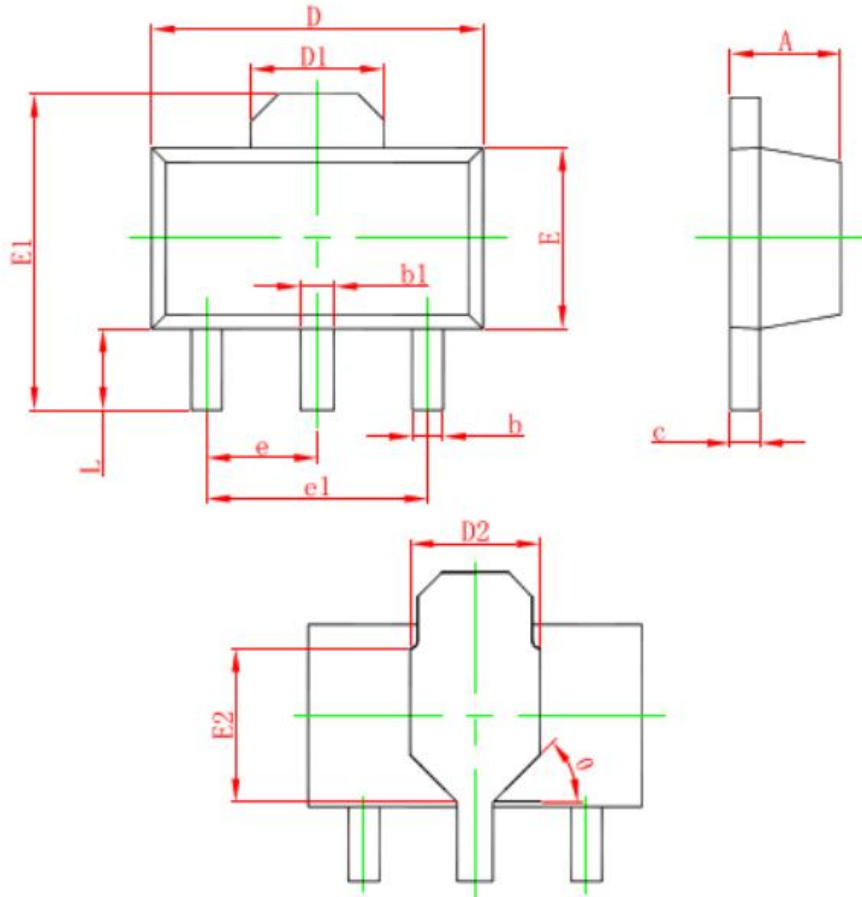


ACLR vs. Pout vs. Freq.



Package Diagram

(Units: millimeters)



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	1.400	1.600	0.055	0.063
b	0.320	0.520	0.013	0.020
b1	0.400	0.580	0.016	0.023
c	0.350	0.440	0.014	0.017
D	4.400	4.600	0.173	0.181
D1	1.550 REF.		0.061 REF.	
D2	1.750 REF.		0.069 REF.	
E	2.300	2.600	0.091	0.102
E1	3.940	4.250	0.155	0.167
E2	1.900 REF.		0.075 REF.	
e	1.500 TYP.		0.060 TYP.	
e1	3.000 TYP.		0.118 TYP.	
L	0.900	1.200	0.035	0.047
θ	45°		45°	

PCB Land Pattern
