ICG2130

DC – 3000 MHz GENERAL PURPOSE AMPLIFIER

FEATURES

- Characterized for 100-3000MHz Operation
- +26 dBm Output IP3
- +17 dB Gain at 850 MHz
- +12 dB Gain at 2000 MHz
- Internally 50Ω matched input and output
- +3V Single Voltage Supply
- Low Current Consumption: 30mA

APPLICATIONS

- IF or RF Buffer Amplifier
- Driver/Pre-Driver for CATV/SAT TV Amplifier
- VCO Buffer Driving Up/Down Converter
- General Rx/Tx Amplification
- LNB IF Path
- ISM Band Transceivers - WLAN - IEEE 802.11, Bluetooth
- ISO/EPC Compliant UHF RFID Readers

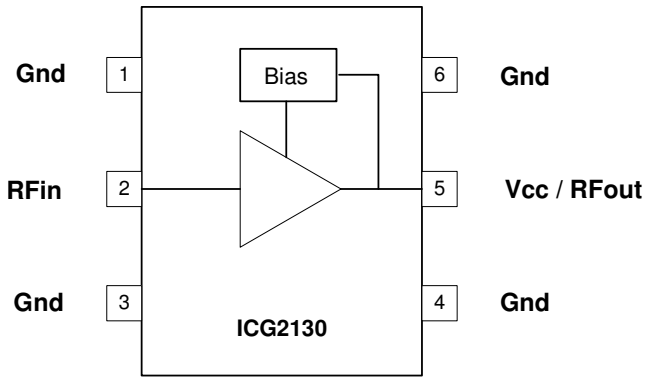
OVERVIEW

The ICG series of Gain Blocks are general purpose gain stages consisting of Broadband MMIC amplifiers in a Darlington configuration. The amplifiers housed in a low-cost surface mountable package provide a high output intercept point, high gain and low noise figure and do not require an external bias resistor.

The ICG2130 can be used for amplification in IF and RF applications from 100 MHz to 3000 MHz. The amplifier provides a gain of 17dB typically at 850 MHz and has single ended input and output, internally matched to 50 Ohms. The device can be operated with a single +3V supply.

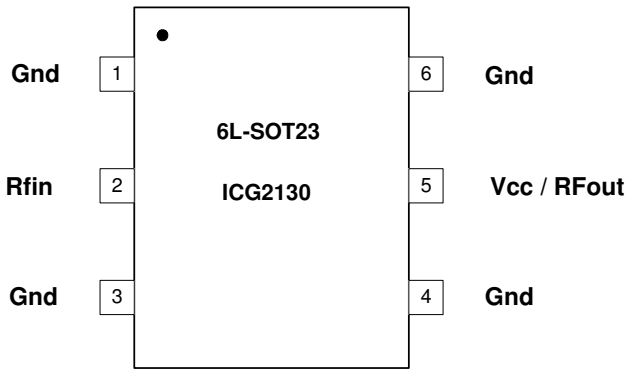
The IC is available in industry standard 6L-SOT23 package.

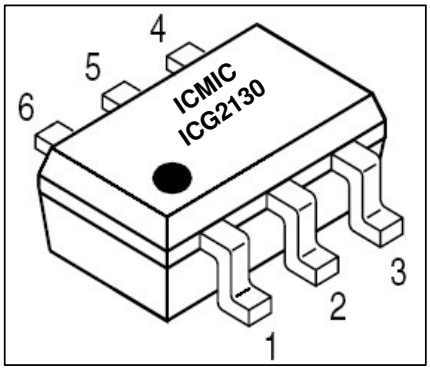
FUNCTIONAL BLOCK DIAGRAM



PACKAGE

6L-SOT23





PIN OUT DESCRIPTION

Pin #	Symbol	Description
1	Gnd	Ground connection. Keep traces physically short and immediately connect to ground plane.
2	RFin	RF input pin. This pin is not externally DC blocked and thus requires an external blocking capacitor suitable for the frequency of operation. The input impedance of this pin is internally matched to 50Ω using resistive feedback.
3	Gnd	Same as Pin 1
4	Gnd	Same as Pin 1
5	Vcc/RFout	RF out and bias pin. The input impedance of this pin is internally matched to 50Ω using resistive feedback. Bias should be supplied to this pin externally. Please note that an RF choke inductor is required but no external bias resistor is needed. A DC blocking capacitor should be used for most applications since DC bias is present on this pin. The supply should be well-bypassed.
6	Gnd	Same as Pin 1

ABSOLUTE MAXIMUM RATING

Symbol	Parameter	Value	Unit
V_{CC}	Positive Power Supply	+4.0	V_{DC}
T_{OP}	Operating Temperature	-40 to +85	°C
T_{STG}	Storage Temperature	-65 to +150	°C
T_{SOL}	Soldering Temperature	300	°C

Note: Stress greater than those listed above may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions above those indicated in the operational sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect reliability.

ORDERING INFORMATION

Part	Description
ICG2130	6L-SOT23, 3V Amplifier
ICG2130-EVAL	Fully Assembled Evaluation Board

TEST CONDITIONS

Parameter	Value	Unit
V_{CC}	+3.0	V_{DC}
T_{OP}	+25	°C

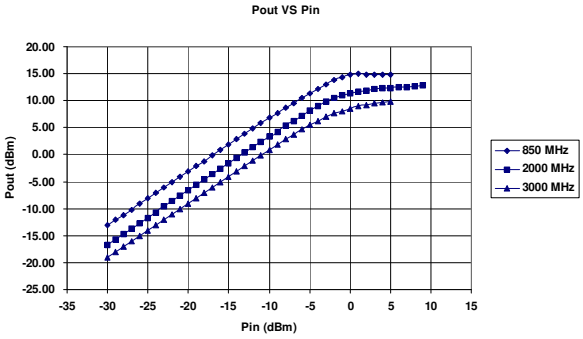
Unless otherwise stated, measurements were done on the evaluation board

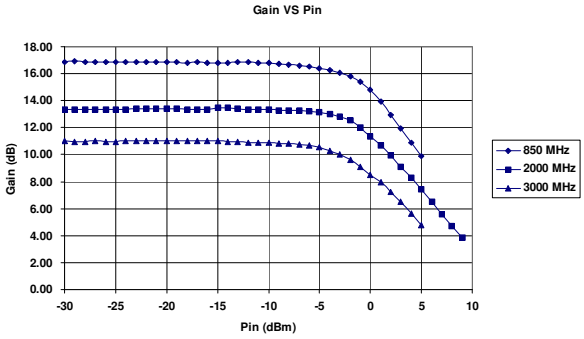
Caution! ESD Sensitive Device
Appropriate precaution in handling, packaging and testing must be observed

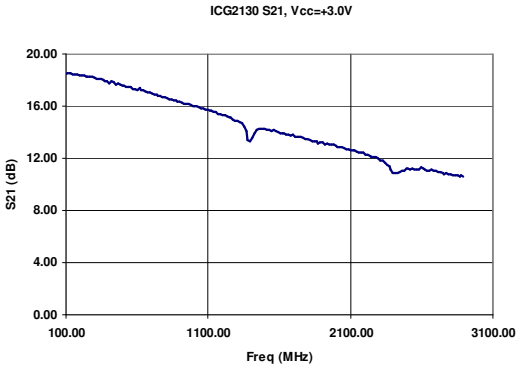
PRODUCT SPECIFICATIONS

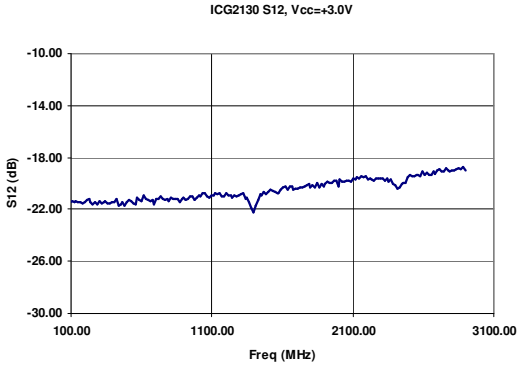
Parameter	Test Conditions	Min	Typ	Max	Unit
Supply Voltage			+3.0		V
Supply Current		27	30	33	mA

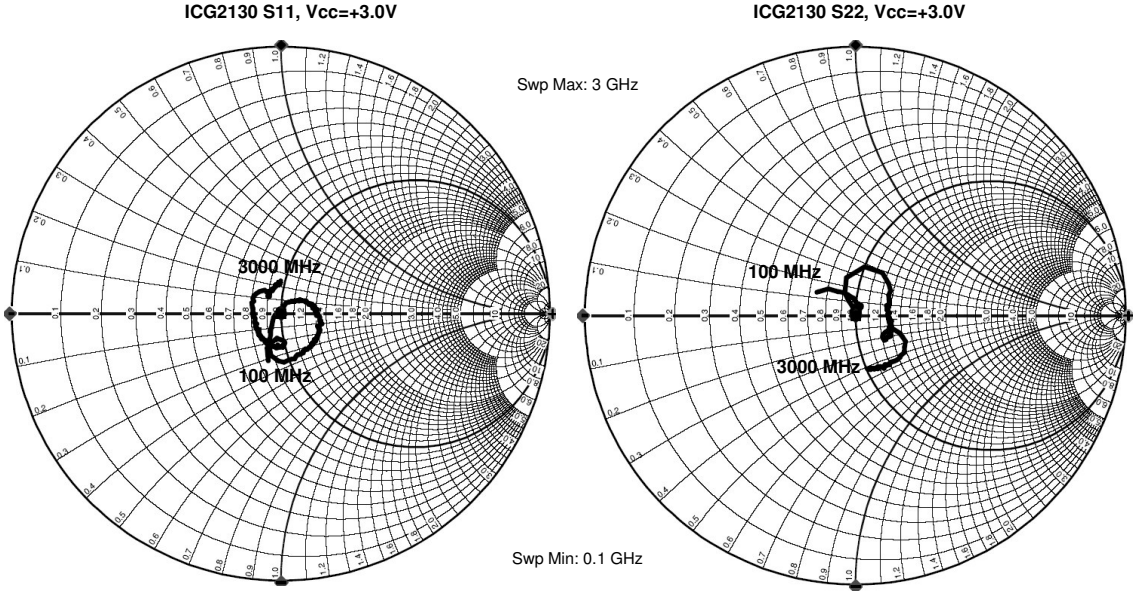
Parameter	Test Conditions	Min	Typ	Max	Unit
Overall Frequency Range		DC	850	3000	MHz
100 MHz Performance Gain Noise Figure Output IP3 Output P1dB Input Return Loss Output Return Loss Isolation	V_{CC}=+3.0V, T_{OP} = +25 °C		 18.8 3.5 25 14.3 16.2 16.7 21.5		 dB dB dBm dBm dB dB dB
850 MHz Performance Gain Noise Figure Output IP3 Output P1dB Input Return Loss Output Return Loss Isolation	V_{CC}=+3.0V, T_{OP} = +25 °C		 18.8 3.4 26 14.8 15.4 27.6 21.3		 dB dB dBm dBm dB dB dB
2000 MHz Performance Gain Noise Figure Output IP3 Output P1dB Input Return Loss Output Return Loss Isolation	V_{CC}=+3.0V, T_{OP} = +25 °C		 13.3 3.6 21 11.5 17.2 20.8 20		 dB dB dBm dBm dB dB dB
3000 MHz Performance Gain Noise Figure Output IP3 Output P1dB Input Return Loss Output Return Loss Isolation	V_{CC}=+3.0V, T_{OP} = +25 °C		 10.8 3.9 18 8.5 13.4 11.3 19.2		 dB dB dBm dBm dB dB dB

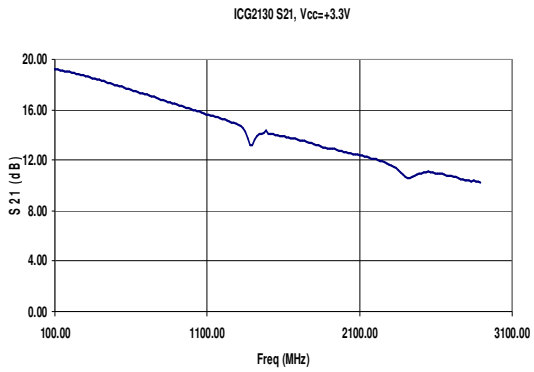

Pout VS Pin
Pout (dBm)
Pin (dBm)
850 MHz
2000 MHz
3000 MHz

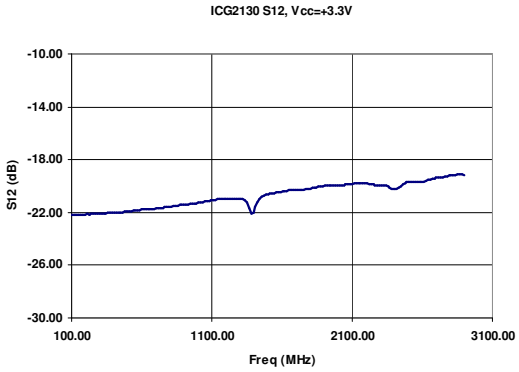

Gain VS Pin
Gain (dB)
Pin (dBm)
850 MHz
2000 MHz
3000 MHz


ICG2130 S21, Vcc=+3.0V
S21 (dB)
Freq (MHz)

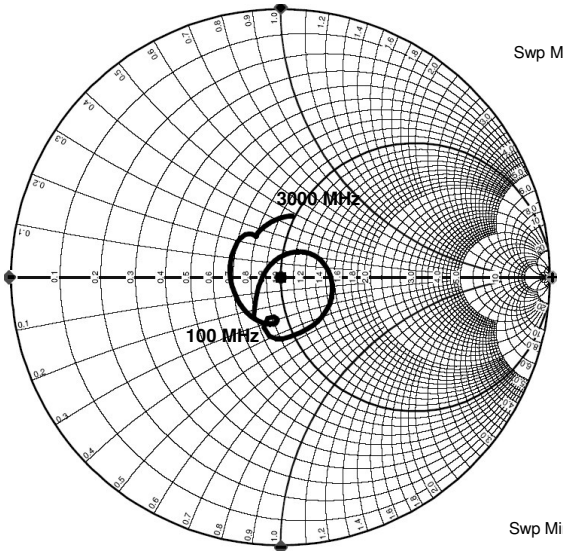

ICG2130 S12, Vcc=+3.0V
S12 (dB)
Freq (MHz)


ICG2130 S11, Vcc=+3.0V
ICG2130 S22, Vcc=+3.0V
Swp Max: 3 GHz
3000 MHz
100 MHz
100 MHz
3000 MHz
Swp Min: 0.1 GHz





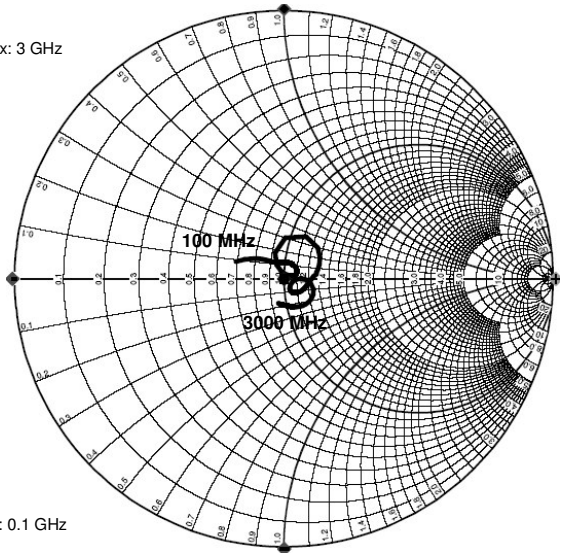
ICG2130 S11, Vcc=+3.3V



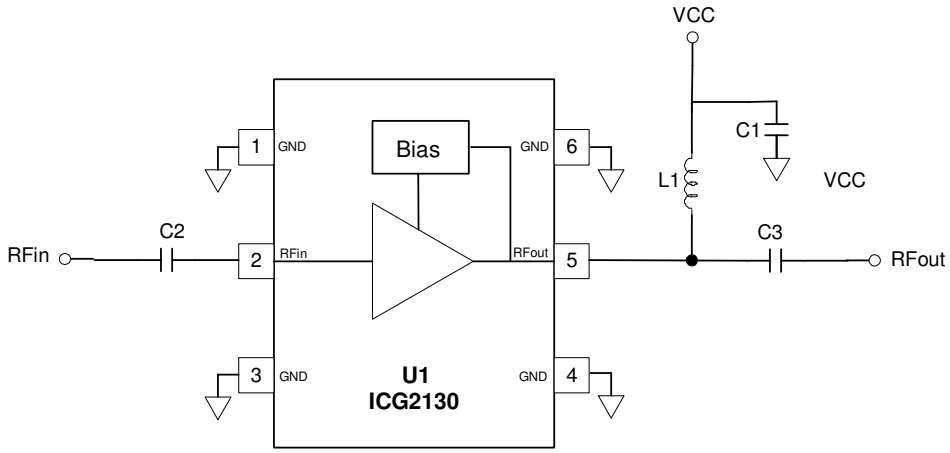
Swp Max: 3 GHz

Swp Min: 0.1 GHz

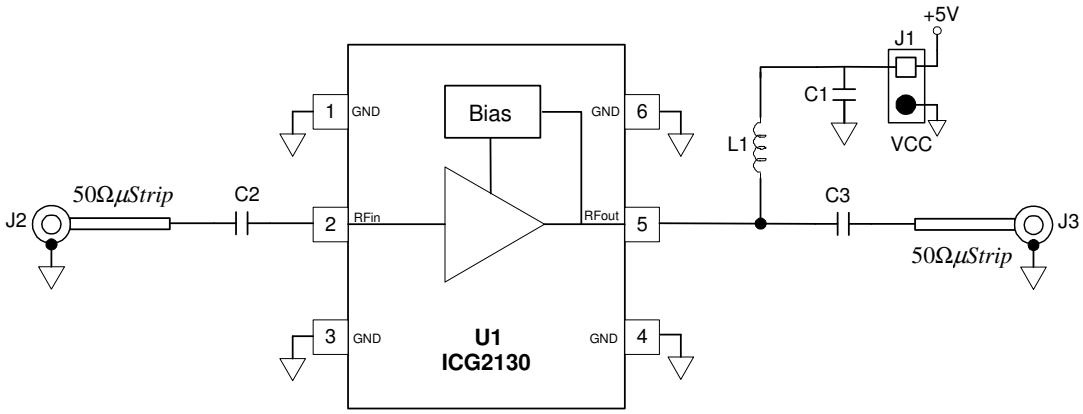
ICG2130 S22, Vcc=+3.3V



APPLICATION SCHEMATIC

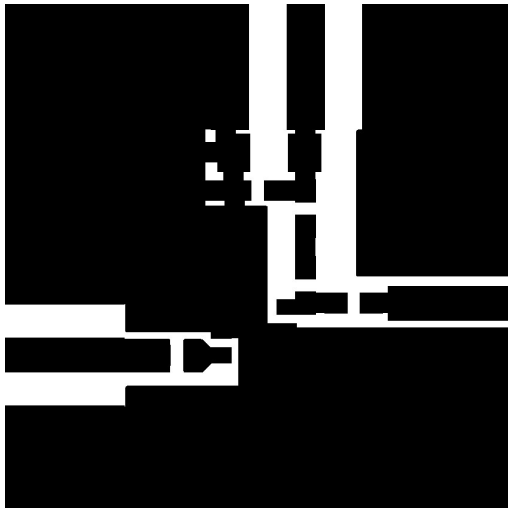


EVALUATION BOARD SCHEMATIC

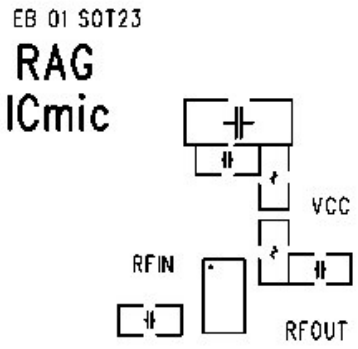


TEST PCB

PCB Top - Component Side

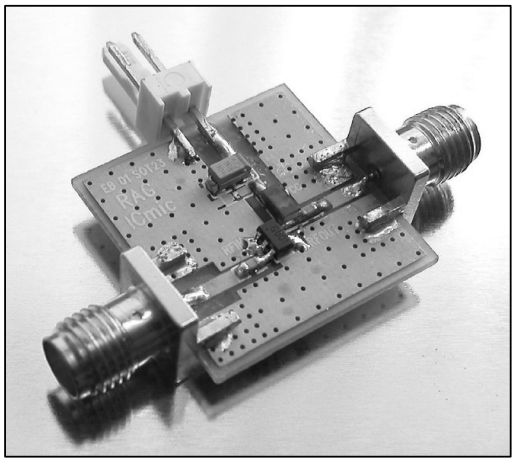


PCB SilkScreen



FULLY ASSEMBLED PCB

ICG2130-EVAL



PCB COMPONENTS

Component Designator	Value	Qty	Description
U1		1	ICG2130 Gain Block
J1		1	2 Pin Header - VCC
J2, J3		2	SMA End Launch Connectors
C1	4.7 µF	1	Bypass Capacitor
C2, C3	100 pF	2	Blocking Capacitors
L1	220 nH	1	Inductor

PACKAGE DIAGRAM

6L-SOT23