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

Performance tests for ICmic products were performed internally by ICmic and measured using specific systems and/or components. Any difference in circuit implementation, test software, or test equipment may affect actual performance. The information provided herein is believed to be reliable at the time of this printing. ICmic assumes no responsibility for the use of this information and/or the described product(s). Prices and specifications are subject to change without notice. Copyright 2004 IC MICROSYSTEMS SDN. BHD. All worldwide rights reserved

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

Swp Max: 3 GHz

Swp Min: 0.1 GHz

Swp Max: 3 GHz

Swp Min: 0.1 GHz

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