

**DESCRIPTION**

The LX5501B is a low cost, broadband RFIC amplifier that has been manufactured with an InGaP/GaAs Heterojunction Bipolar Transistor (HBT) process (MOCVD).

Designed as an easily cascadable 50-ohm internally matched gain block, the LX5501B can be used for IF and RF amplification in wireless / wired voice and data communication products and broadband test equipment operating up to 6 GHz.

The amplifier is available in a plastic 5-lead SOT-23 package.

**KEY FEATURES**

- Advanced InGaP HBT
- DC to 6 GHz Operation
- Single Supply
- Low Idle Current (10 - 35 mA)
- Small Signal Gain ~ 9 dB at 6 GHz
- P1dB ~ 8 dBm at 6 GHz
- SOT-23 Package

**APPLICATIONS**

- PA driver for WLAN and Cordless Phones
- VCO buffer
- Low Current, High Gain Cascaded Amplifiers

**PRODUCT HIGHLIGHT**

- Input and output matched to 50 ohms for ease of cascading.
- Cascaded gain blocks can be individually biased for the lowest supply current.

**PACKAGE ORDER INFO**

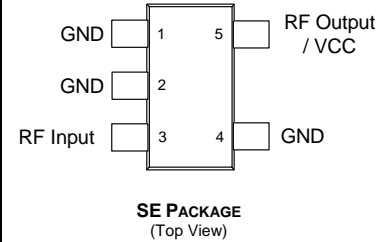
	<b>SE</b> Plastic SOT-23 5 pin
	RoHS Compliant / Pb-free Transition DC: 0503
-40 to +85°C	LX5501BSE

Note: Available in Tape & Reel. Append the letters "TR" to the part number.  
(i.e. LX5501BSE-TR)

**ABSOLUTE MAXIMUM RATINGS**

DC Supply Voltage .....	6V
Collector Current .....	100mA
RF Input Power .....	10dBm
Operating Temperature Range .....	-40 to +85°C
Storage Temperature Range .....	-65°C to 150°C
Peak Package Solder Reflow Temp. (40 seconds max. exposure) ..	260°C (+0, -5)

Note: Exceeding these ratings could cause damage to the device. All voltages are with respect to Ground. Currents are positive into, negative out of specified terminal.

**PACKAGE PIN OUT**


RoHS / Pb-free 100% Matte Tin Lead Finish

**THERMAL DATA**
**SE Plastic SOT-23 5-Pin**

THERMAL RESISTANCE-JUNCTION TO CASE, $\theta_{JC}$	138°C/W
THERMAL RESISTANCE-JUNCTION TO AMBIENT, $\theta_{JA}$	245°C/W

Junction Temperature Calculation:  $T_J = T_A + (P_D \times \theta_{JA})$ .

The  $\theta_{JA}$  numbers are guidelines for the thermal performance of the device/pc-board system. All of the above assume no ambient airflow.

**FUNCTIONAL PIN DESCRIPTION**

Pin No.	Description
1	Ground
2	Ground
3	RF Input
4	Ground
5	RF Output/VCC Supply

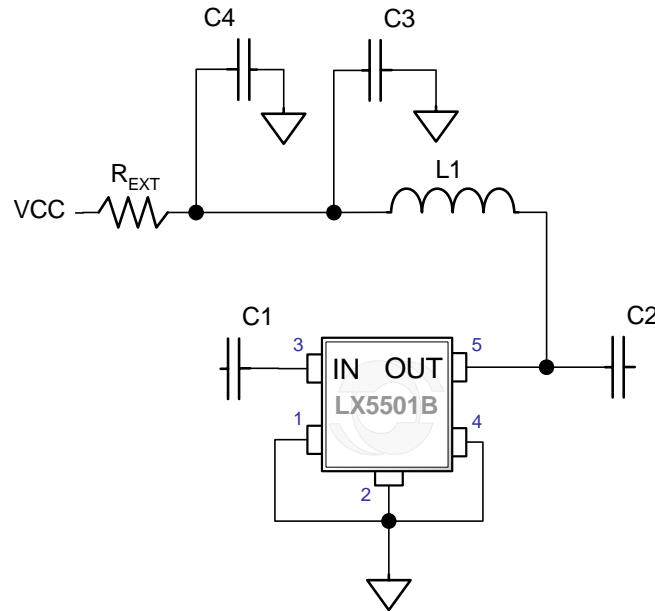
**RECOMMENDED OPERATING CONDITIONS**

Parameter	Symbol	LX5501B			Units
		Min	Typ	Max	
Supply Voltage (with appropriate external resistor)	VCC	2.7		6	V
Quiescent Current (No RF input)	Icq	10		40	mA

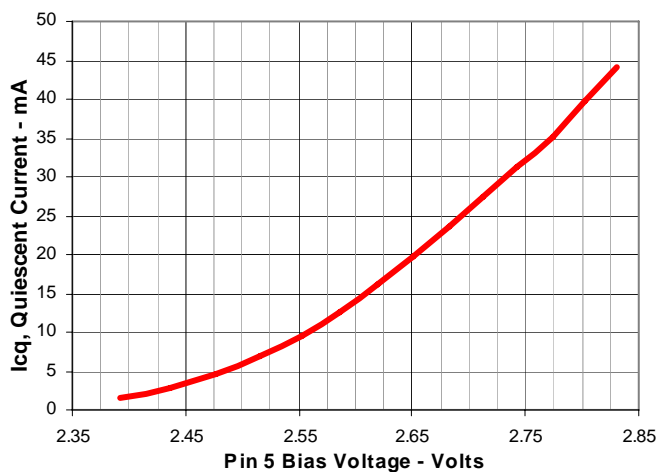
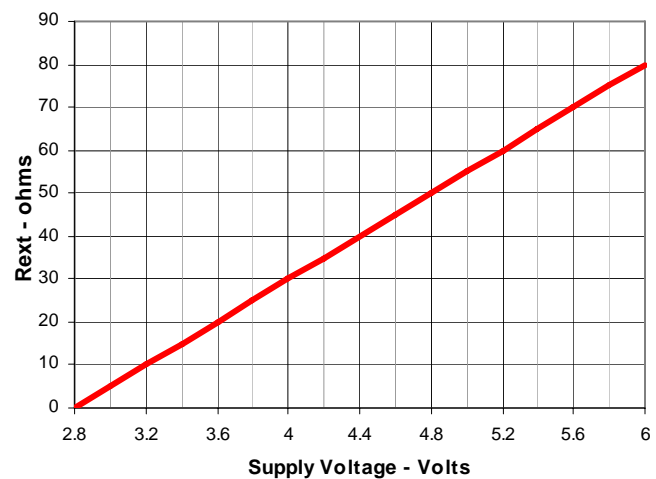
**ELECTRICAL CHARACTERISTICS**

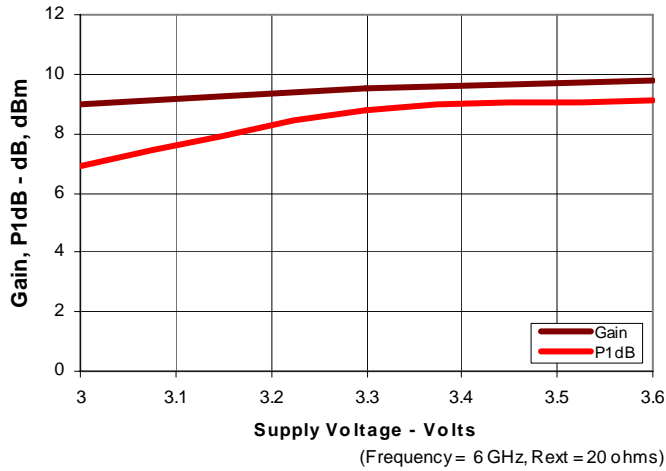
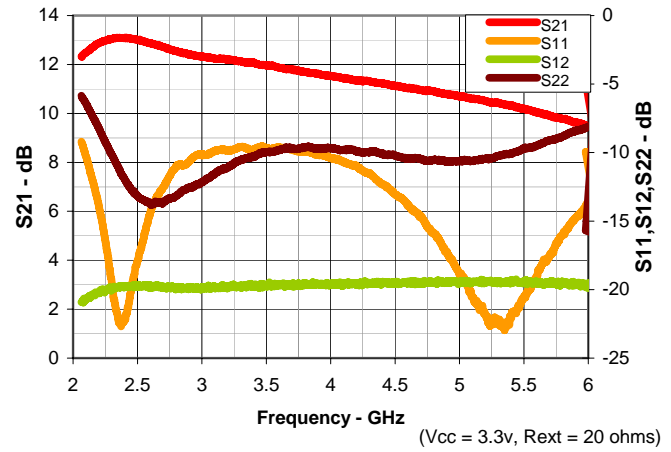
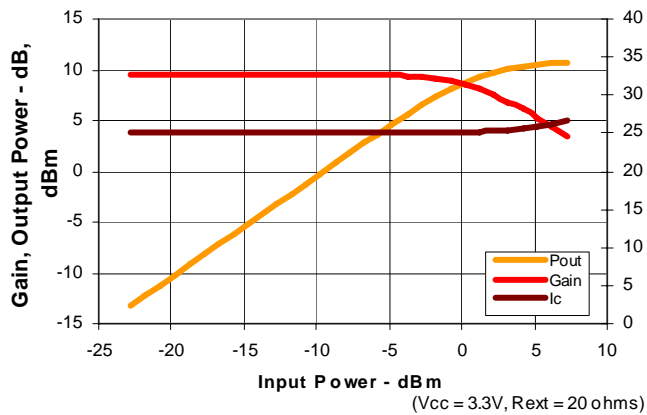
Conditions: +25°C

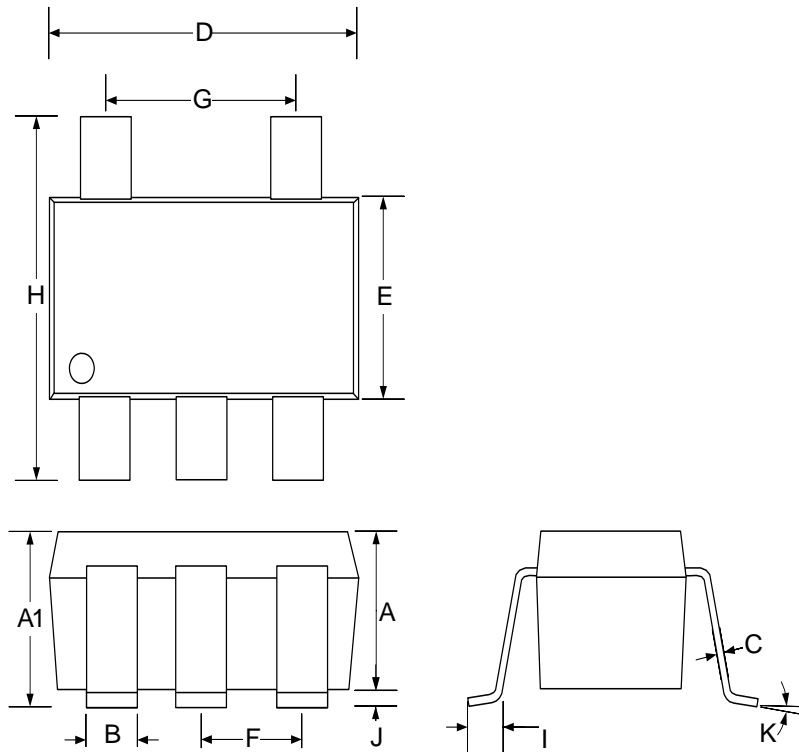
Parameter	Symbol	Test Conditions	LX5501B			Units
			Min	Typ	Max	
<b>GENERAL SPECIFICATIONS (FIG 1. TEST CIRCUIT)</b>						
Small Signal Gain	S21	Frequency = 6 GHz		9		dB
P1dB Compression	P1dB	Frequency = 6 GHz		8		dBm
Input Return Loss	S11	Frequency = 4.9-6 GHz		-10		dB
Output Return Loss	S22	Frequency = 4.9-6 GHz		-9		dB
Isolation	S12	Frequency = 4.9-6 GHz		-20		dB
Harmonics		Frequency = 6 GHz, Pout = P1dB		-30		dBC
Quiescent Current	Icq			23		mA

**FIGURE 1: TEST CIRCUIT FOR 4 TO 6 GHz**


Location	Value	Comment
C1,C2	2pF	DC block (0402)
C3	10pf	RF decoupling (0402)
C4	0.1μF	LF decoupling (0402)
L1	3.3nH	RF choke (0402)
R <sub>EXT</sub>	5 ohms	Bias setting resistor (0402)
V <sub>cc</sub>	2.85V	Supply Voltage

**QUIESCENT CURRENT VS BIAS VOLTAGE**

**R<sub>EXT</sub> VS SUPPLY VOLTAGE**

 Recommended R<sub>EXT</sub> Value versus Maximum Supply Voltage

**P1dB, GAIN VS VCC**

**S PARAMETER**

**5.8GHZ POWER SWEEP**


**PACKAGE DIMENSIONS**
**SE 5 Pin Plastic SOT-23**


Dim	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	0.90	1.30	0.035	0.051
A1	0.90	1.45	0.035	0.057
B	0.25	0.50	0.010	0.020
C	0.09	0.20	0.004	0.008
D	2.80	3.10	0.110	0.122
E	1.50	1.75	0.059	0.069
F	0.95 BSC		0.038 BSC	
G	1.90 BSC		0.075 BSC	
H	2.60	3.00	0.102	0.118
I	0.35	0.55	0.014	0.022
J	0.00	0.15	0.000	0.006
K	10° MAX		10° MAX	

**Note:**

1. Dimensions do not include mold flash or protrusions; these shall not exceed 0.155mm(.006") on any side. Lead dimension shall not include solder coverage.



LX5501B

InGAP HBT Gain Block

PRODUCTION DATA SHEET

NOTES

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