Advanced Data Sheet

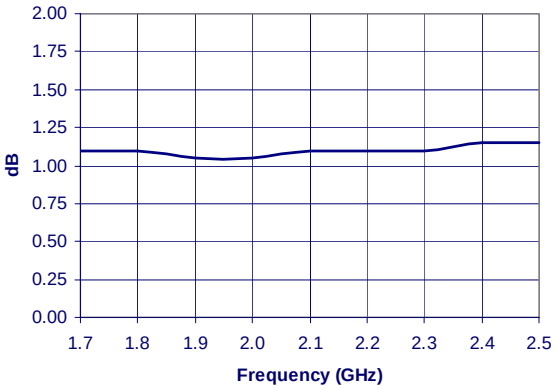
SLX-2043

1700-2500 MHz High Linearity Low Noise Amplifier Module

Product Description

The Stanford Microdevices' SLX-2043 is a low noise amplifier module operating in the 1700 - 2500 MHz frequency band. This device has been optimized to serve high linearity basestation applications where a high intercept point is required with low noise figure. The SLX-2043 uses PHEMT device technology, internal bias circuitry, and proven ceramic module technology to yield a high performance product with proven reliability. Internal RF matching is also included on both the input and output to provide an easy to implement, unconditionally stable, 50 ohm circuit block.

Noise Figure



Product Features

- **NF = 1.1dB**
- **IIP_3 = +19dBm**
- **Gain = 15dB**
- **50Ω input/output match**
- **Single supply operation**

Applications

- **PCS, TDMA, CDMA, WCDMA receivers**

Key Specifications

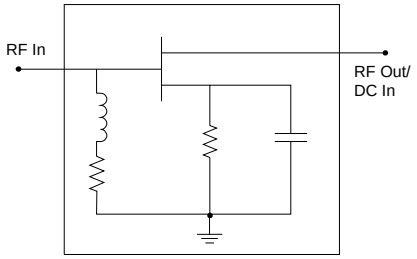
Symbol	Parameters	Test Conditions (Z_O=50Ω, T=25°C, V_D=4V)	Unit	Min.	Typ.	Max.
	Frequency Range		MHz	1700		2500
IIP_3	Input Third Order Intercept Point	Power out per tone = 6dBm	dBm		+19	
OIP_3	Third Order Intercept Point	Power out per tone = 6dBm	dBm		+34	
NF	Noise Figure		dB		1.1	1.2
S_{21}	Small Signal Gain		dB		15	
P_{1dB}	Output Power	@ 1dB Compression	dBm		20	
S_{11}	Input VSWR		—		1.8:1	
S_{22}	Output VSWR		—		1.8:1	
V_D	Device Voltage		V	+3.5	+4.0	+4.5
I_D	Device Current		mA	90	105	120
R_{th}j-c	Thermal Resistance	(junction-case)	°C/W		60	

Absolute Maximum Ratings

Parameters	Value	Unit
Supply Current	150	mA
Device Voltage	5.0	V
Operating Temperature	-40 to +85	ºC
Maximum Input Power	+17	dBm
Storage Temperature Range	-65 to +150	ºC
Operating Junction Temperature	+150	ºC

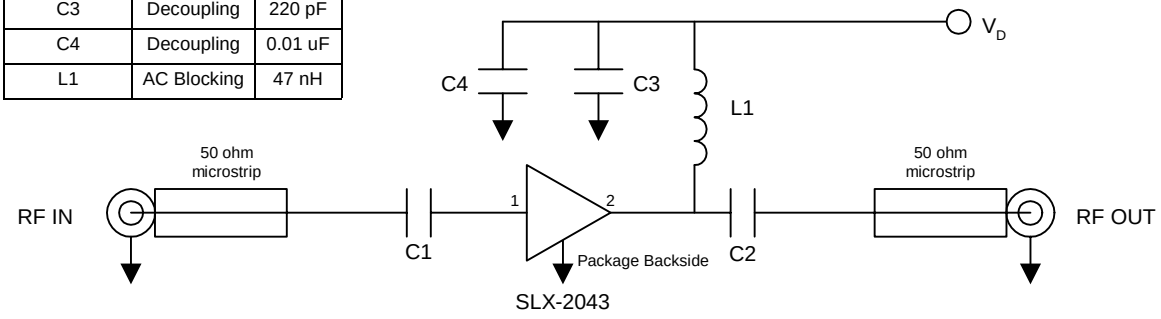
Operation of this device above any one of these parameters may cause permanent damage.

Bias conditions should also satisfy the following expression: $I_D V_D$ (max) < $(T_J - T_{OP})/R_{th}$, j-l

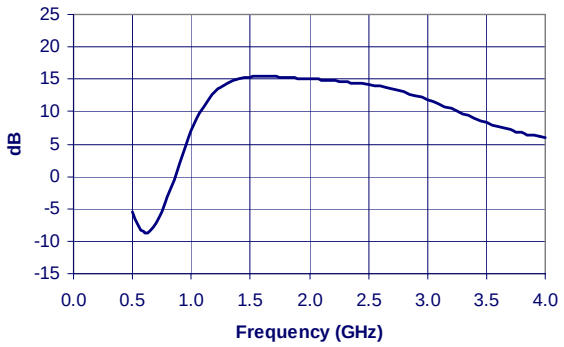
Pin #	Function	Description	Device Schematic
1	RF In	RF input pin. This pin requires the use of an external DC blocking capacitor chosen for the frequency of operation.	
2	RF Out/ Bias	RF output and bias pin. Bias should be supplied to this pin through an external RF choke inductor. Because DC biasing is present on this pin, a DC blocking capacitor should be used in most applications (see application schematic). The supply side of the bias network should be well bypassed.	
3 Package Backside	GND	Connection to ground. For best performance use via holes as shown in recommended PCB layout to reduce inductance and to provide adequate thermal path.	

Reference Designators	Function	Value
C1, C2	DC Blocking	10 pF
C3	Decoupling	220 pF
C4	Decoupling	0.01 uF
L1	AC Blocking	47 nH

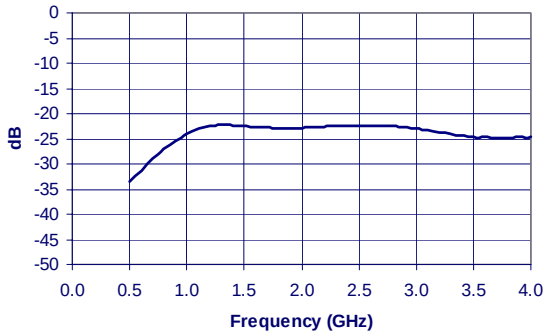
Application Schematic



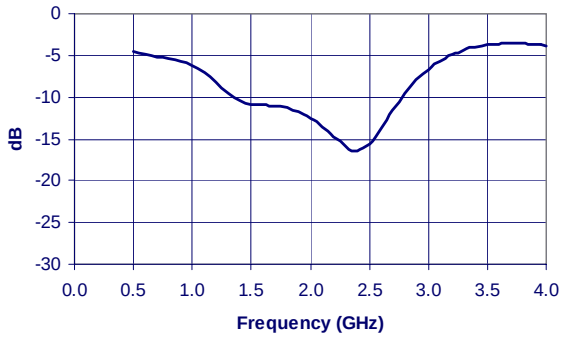
S21, T = 25ºC



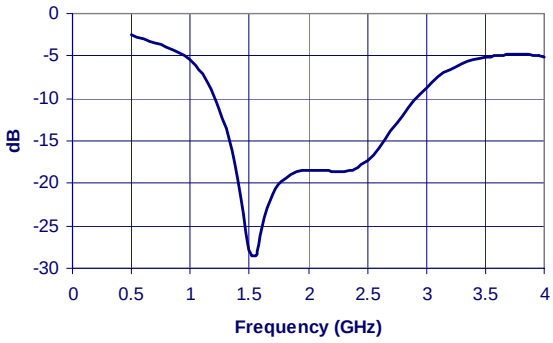
S12, T = 25ºC



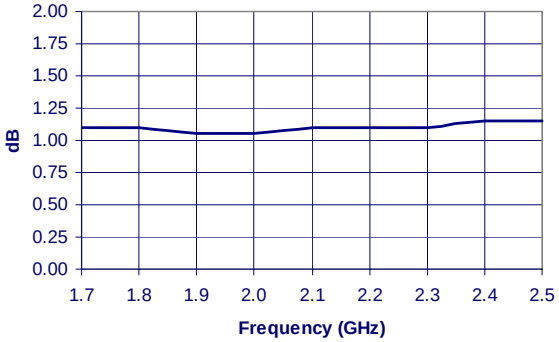
S11, T = 25ºC



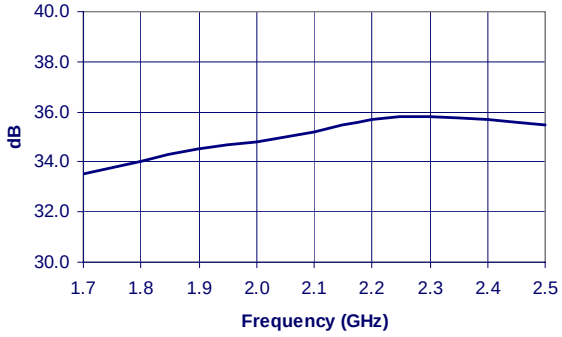
S22, T = 25ºC



Noise Figure



Output IP3



SLX-2043 1700-2500 MHz LNA Module

Caution: ESD Sensitive
Appropriate precaution in handling, packaging and testing devices must be observed.

Part Number Ordering Information

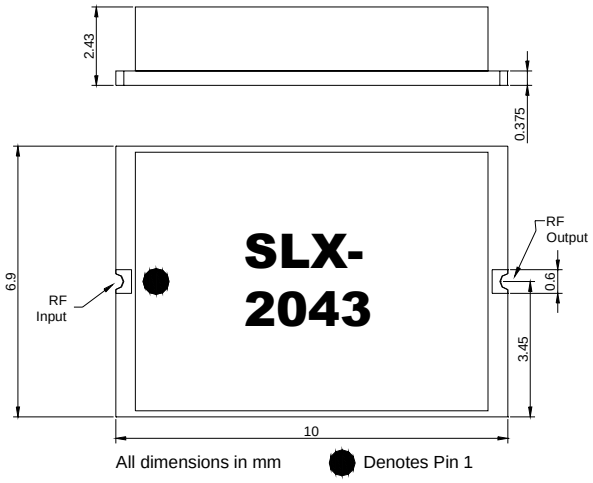
Part Number	Reel Size	Devices/Reel
SLX-2043	TBD	TBD

Part Symbolization

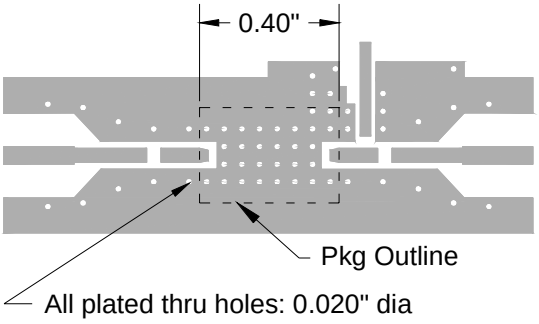
The part will be symbolized with a “TBD” marking designator on the top surface of the package.

Package Dimensions (“43” package)

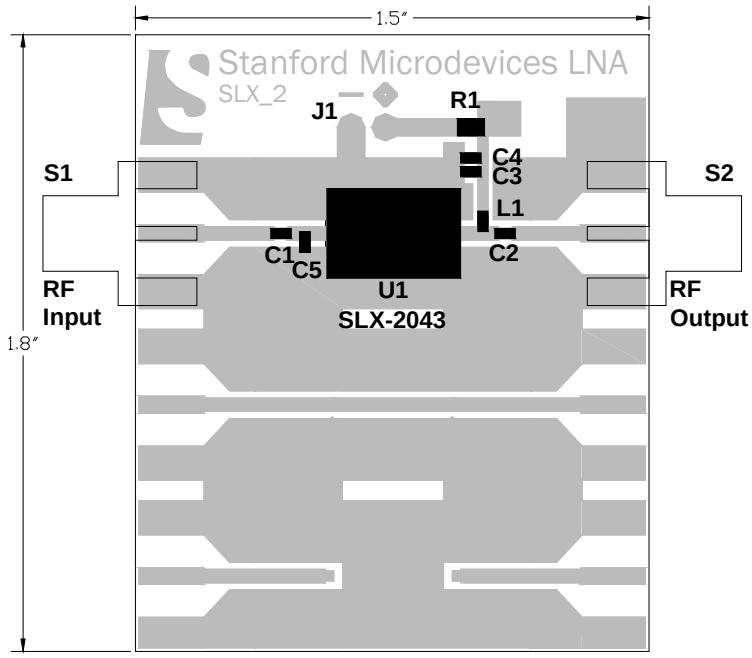
Pin #	Function
1	RF In
2	RF out/V



Test PCB Pad Layout



Demo Test Board
(Fully Assembled PCB)



Bill of Materials

Component Designator	Value	Qty	Vendor	Part Number	Description
U1		1	SMDI	SLX-2043	High linearity low noise amplifier
S1, S2		2	Johnson Components	142-0701-851	SMA side mount connector
C1, C2	10 pF	2	Kemet	C0603C100J5GAC	0603 capacitor (critical)
C3	220 pF	1	Kemet	C0603C221J5GAC	0603 capacitor
C4	0.01 uF	1	Kemet	C0603C103K5RAC	0603 capacitor
C5	0.5pF	1	Kemet	C0402C508C5GAC	0402 capacitor (will not be required on production modules) (critical)
R1	0Ω	1	Panasonic	POOGCTND	0603 jumper
J1		1	Sullins	S1312-2-ND	2 pin header
L1	47 nH	1	TOKO	LL1608-F47NK	0603 inductor (critical)