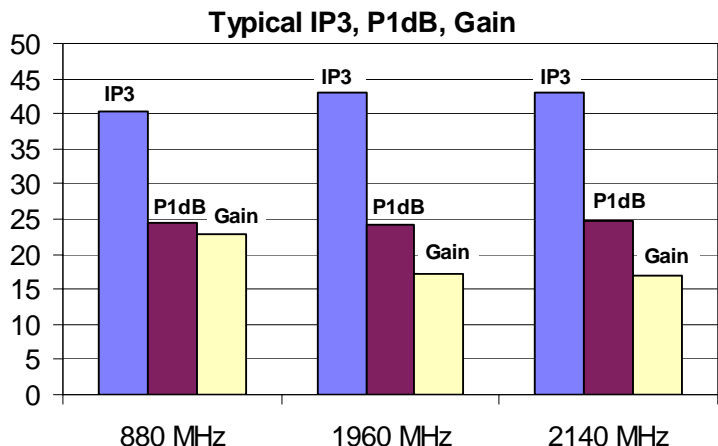




Product Description

Sirenza Microdevices' SXB-2089Z amplifier is a high linearity InGaP/GaAs Heterojunction Bipolar Transistor (HBT) MMIC housed in a low-cost, surface-mountable plastic package.

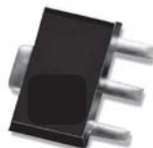
These amplifiers are specially designed for use as driver devices for infrastructure equipment in the 5-2500 MHz Cellular, ISM, WLL, PCS & W-CDMA applications. It's high linearity makes it an ideal choice for multi-carrier as well as digital applications.



Preliminary

SXB-2089Z

5-2500 MHz Medium Power InGaP/GaAs HBT Amplifier



Product Features

- High OIP3: +43dBm at 1960 MHz
- P1dB: 24dBm
- High Linearity/ACP Performance
- Robust 2000V ESD, Class 2
- SOT-89 package
- MSL 1 moisture rating

Applications

- PA Driver Amplifier
- IF Amplifier
- Cellular, PCS, ISM, WLL, W-CDMA

Symbol	Parameters	Units	Min.	Typ.	Max.
P_{1dB}	Output Power at 1 dB Compression	dBm	450 MHz		24.1
			880 MHz		24.5
			1960 MHz		24.2
			2140 MHz		24.7
S_{21}	Small Signal Gain	dBm	450 MHz		25
			880 MHz		23
			1960 MHz		17
			2140 MHz		17
S_{11}	Input VSWR		450 MHz		1.1:1
			880 MHz		1.3:1
			1960 MHz		1.4:1
			2140 MHz		1.3:1
NF	Noise Figure	dB	450 MHz		4.9
			880 MHz		4.3
			1960 MHz		4.3
			2140 MHz		4.2
OIP ₃	Third Order Intercept Point (Pout/tone = +11dBm, Tone spacing = 1MHz)	dBm	450 MHz		40
			880 MHz		41
			1960 MHz		43
			2140 MHz		43
ACP	Channel Power IS-95 at 450/880/1960MHz, -55dBc ACP WCDMA at 2140MHz, -50dBc ACP	dBm	450 MHz		16
			880 MHz		16.3
			1960 MHz		15.5
			2140 MHz		15.6
I_D	Device Current	mA	Vs = 8V Rbias = 20 Ohms Vdevice = 5.2V	120	135
$R_{TH}, j-l$	Thermal Resistance @ 85C (junction - lead)	°C/W		51.3	

Test Conditions: $T_a = 25^\circ\text{C}$ $Z_0 = 50$ Ohms

The information provided herein is believed to be reliable at press time. Sirenza Microdevices assumes no responsibility for inaccuracies or omissions. Sirenza Microdevices assumes no responsibility for the use of this information, and all such information shall be entirely at the user's own risk. Prices and specifications are subject to change without notice. No patent rights or licenses to any of the circuits described herein are implied or granted to any third party. Sirenza Microdevices does not authorize or warrant any Sirenza Microdevices product for use in life-support devices and/or systems. Copyright 2005 Sirenza Microdevices, Inc.. All worldwide rights reserved.

303 S. Technology Ct.
Broomfield, CO 80021

Phone: (800) SMI-MMIC

<http://www.sirenza.com>

Absolute Maximum Ratings

Parameter	Absolute Limit
Max Device Current (I_{DQ})	190mA
Max Device Voltage (V_D)	6 V
Max. RF Input Power	+20 dBm
Max. Operating Dissipated Power (quiescent)	1.0 W
Max. Junction Temp. (T_J)	+150°C
Operating Temp. Range (T_L)	-40°C to +85°C
Max. Storage Temp.	+150°C

Operation of this device beyond any one of these limits may cause permanent damage. For reliable continuous operation, the device voltage and current must not exceed the maximum operating values specified in the table on page one.

Bias Conditions should also satisfy the following expression:

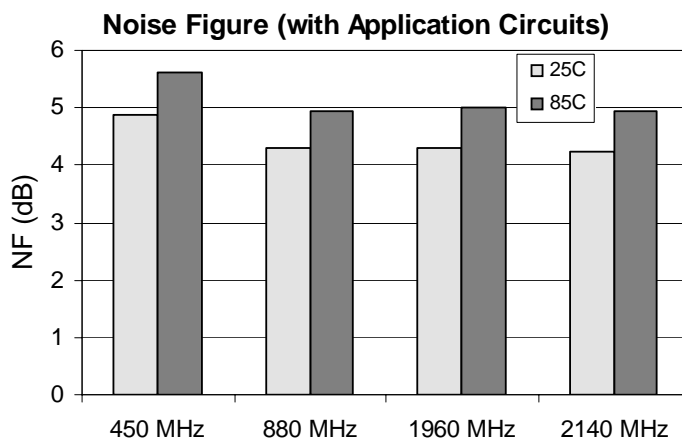
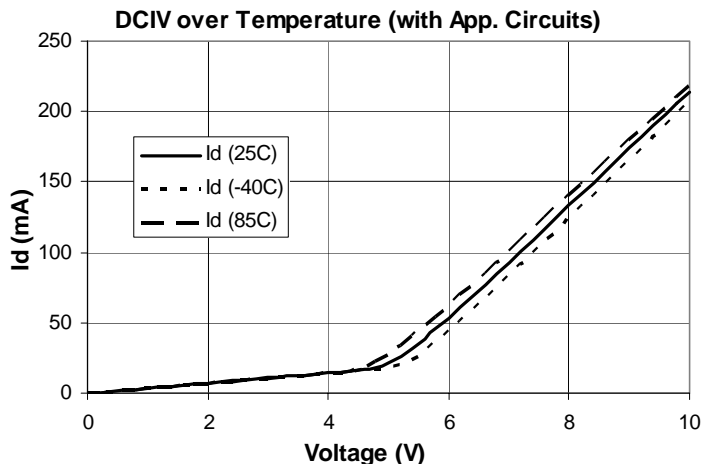
$$I_D V_D < (T_J - T_L) / R_{TH}, \text{ j-l } T_L = T_{LEAD}$$



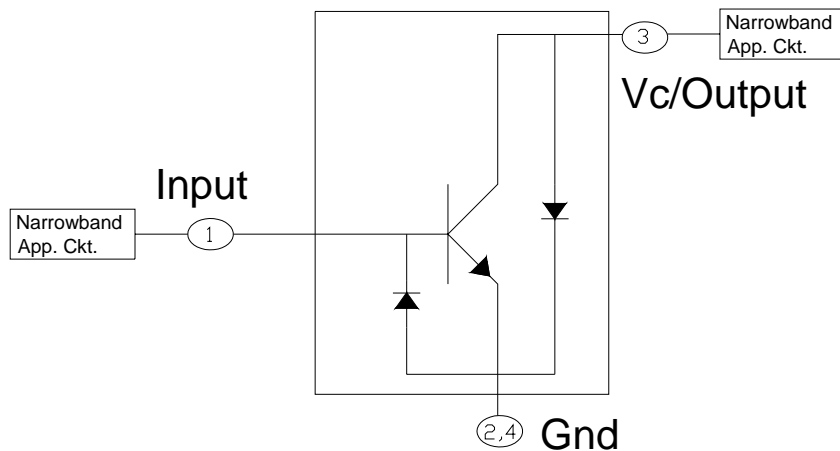
ESD Class 2, 2000V HBM

Appropriate precautions in handling, packaging and testing devices must be observed.

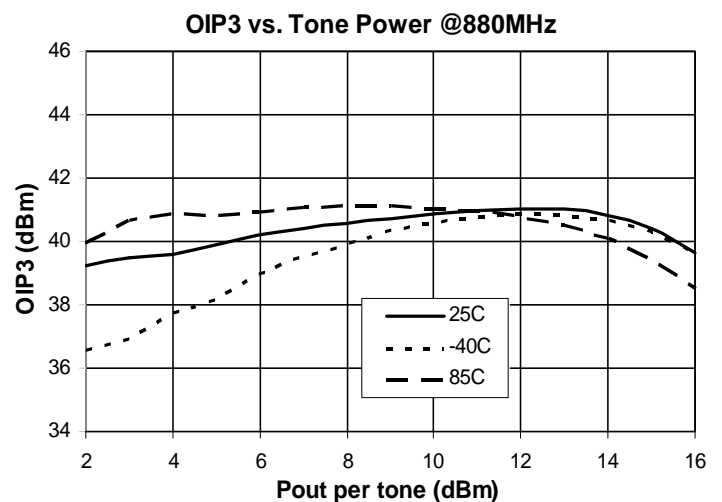
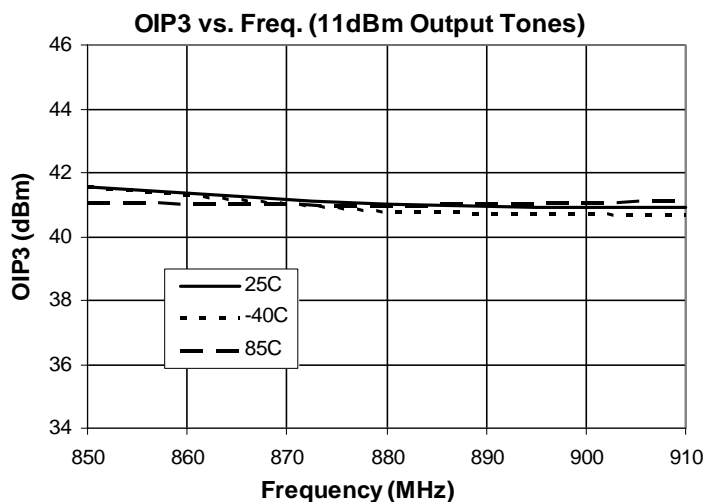
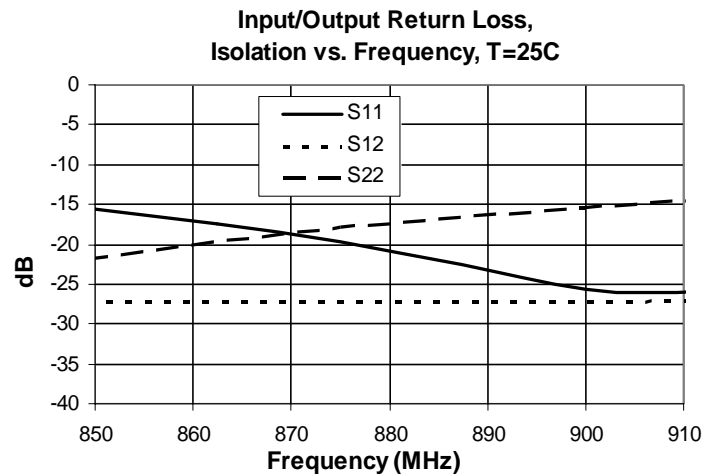
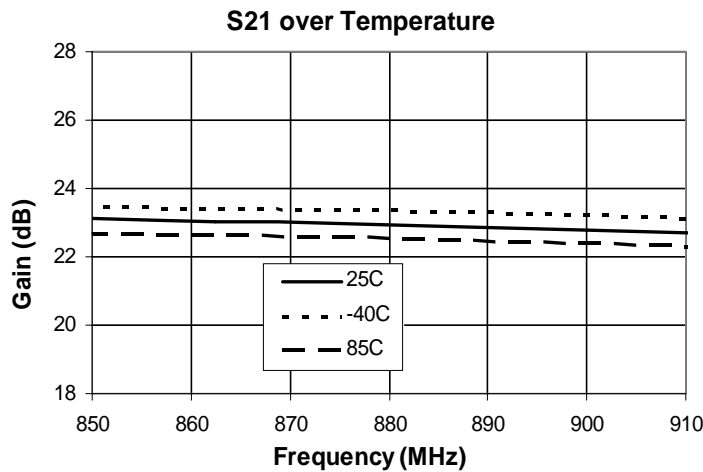
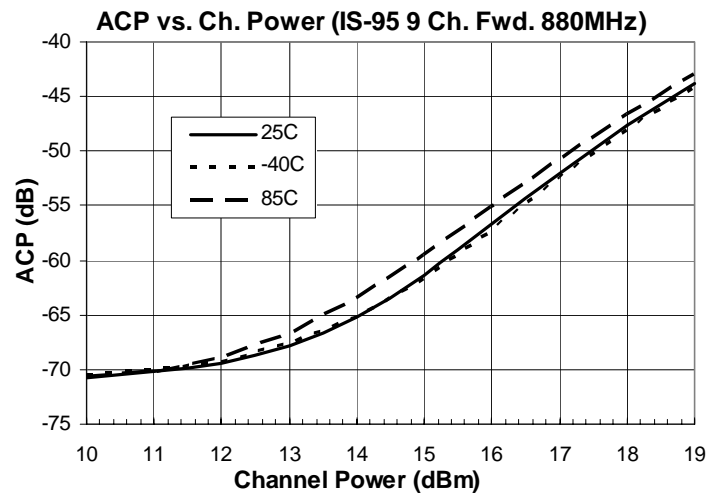
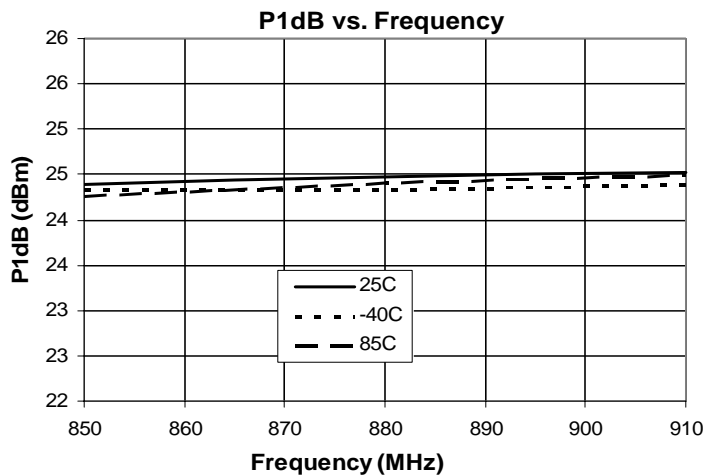
MSL (Moisture Sensitivity Level) Rating: Level 1



Simplified Device Schematic with ESD diodes

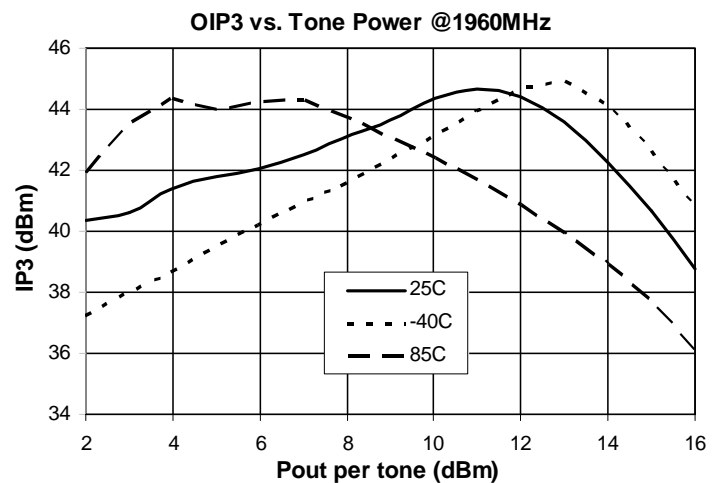
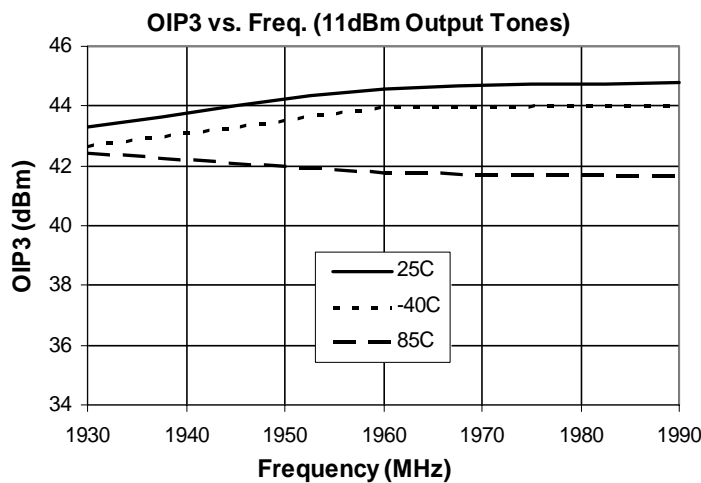
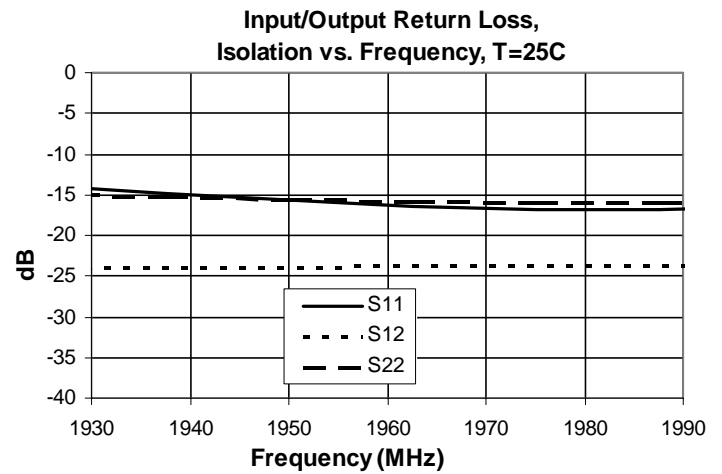
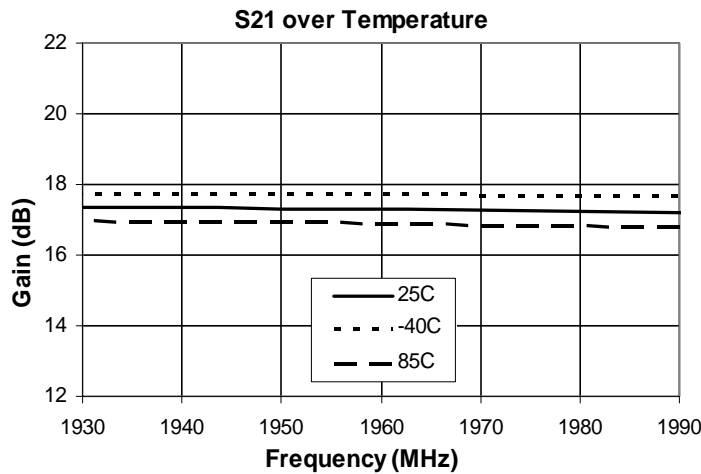
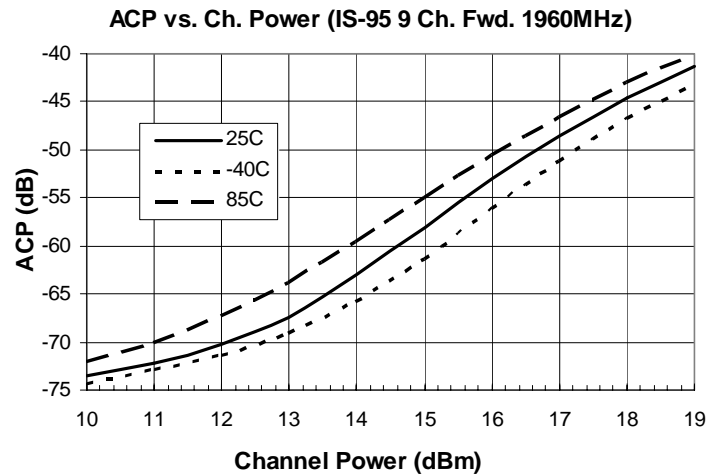
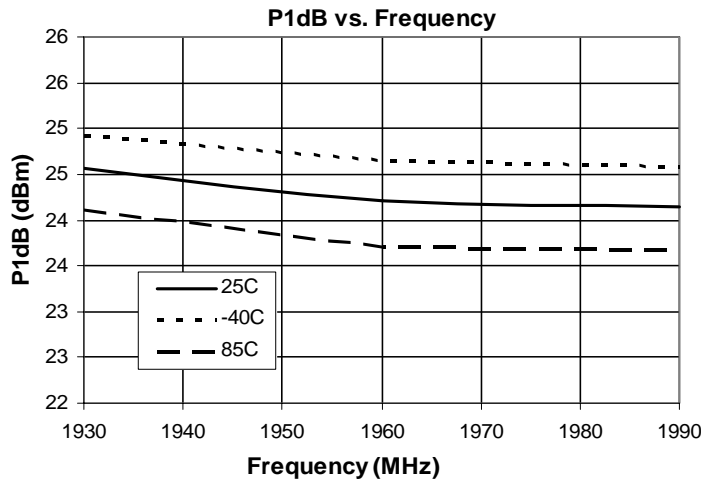


880 MHz Application Circuit Data, $I_D=135mA$, $T=+25C$, $R_{Bias}=20\ \Omega$, $V_S=8V$



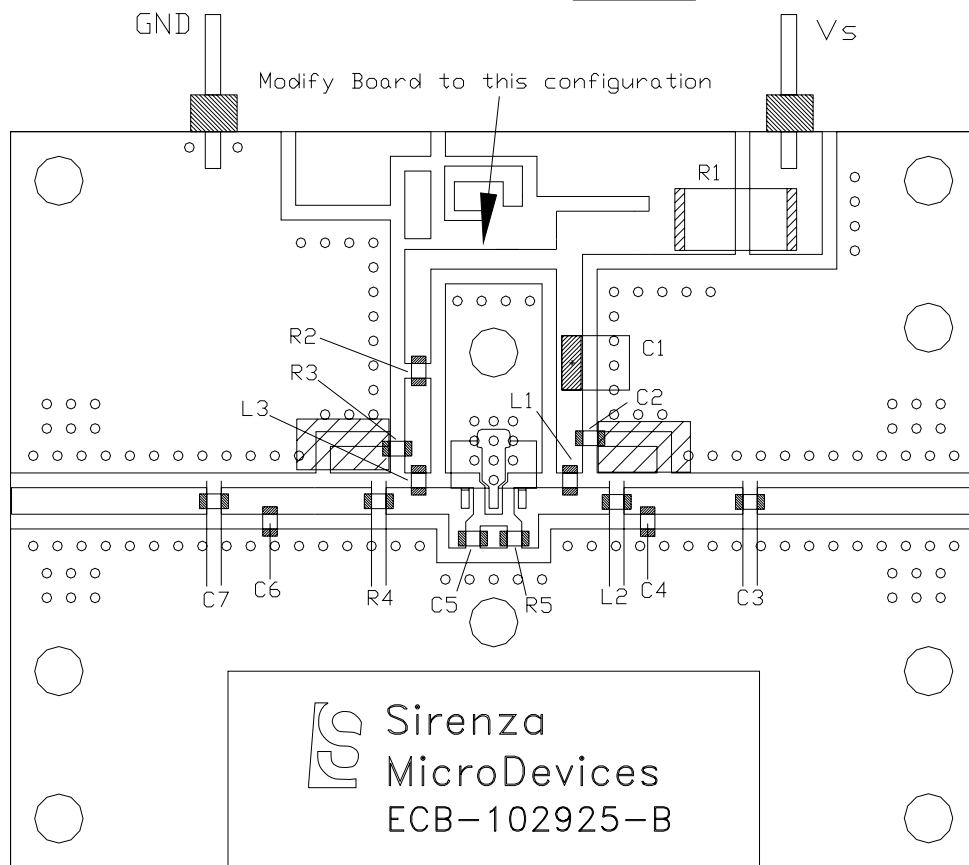
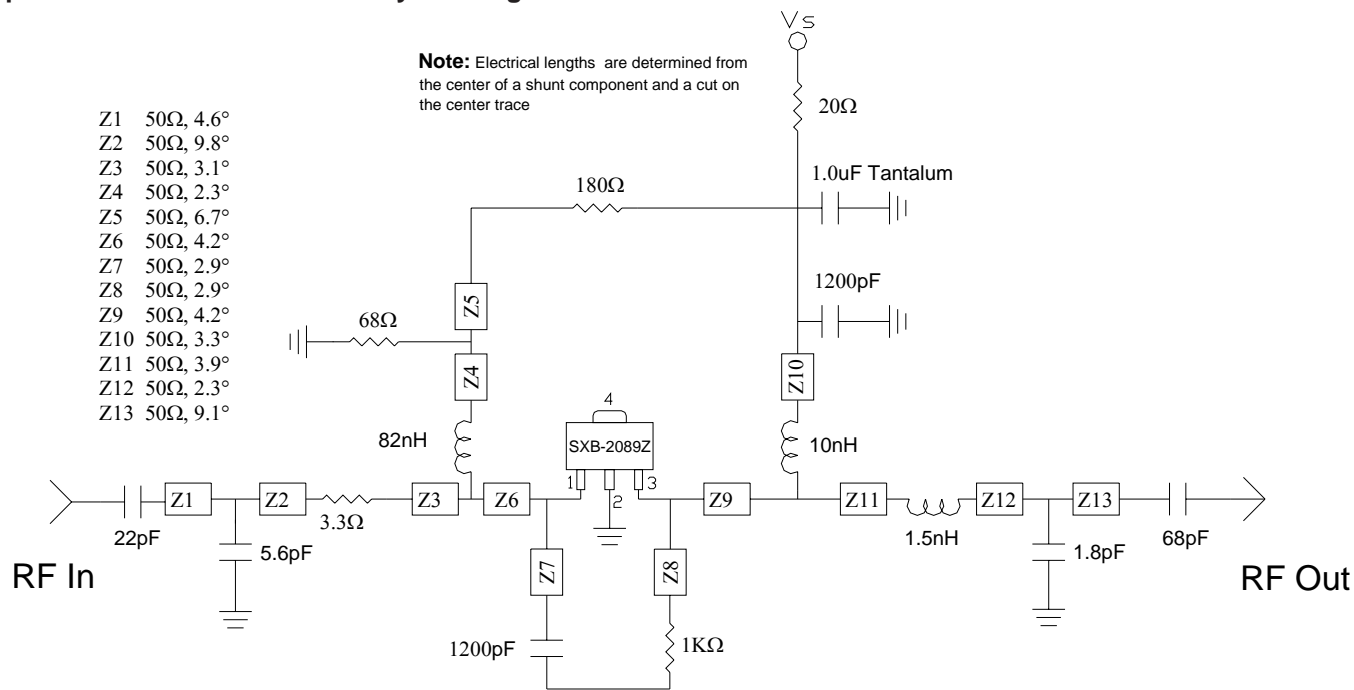
450 MHz & 2140MHz Application Circuits available in Application Note AN-078 at www.sirenza.com

1960 MHz Application Circuit Data, $I_D=135\text{mA}$, $T=+25^\circ\text{C}$, $R_{\text{Bias}}=20\ \Omega$, $V_S=8\text{V}$



450 MHz & 2140MHz Application Circuits available in Application Note AN-078 at www.sirenza.com

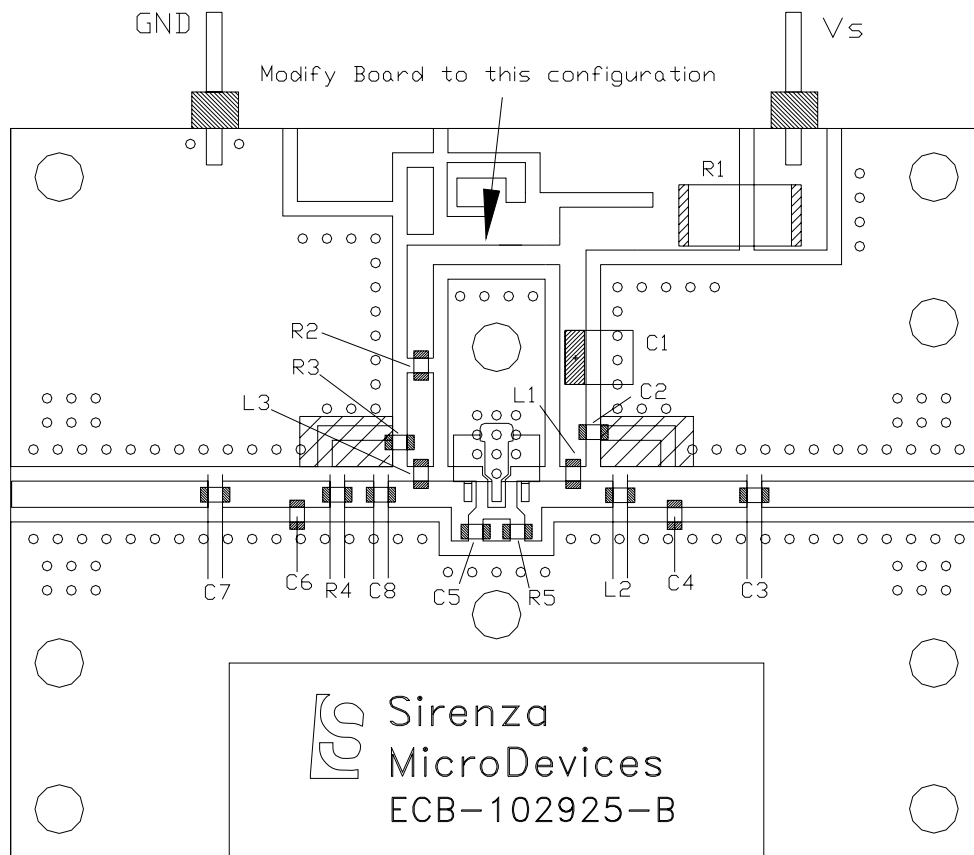
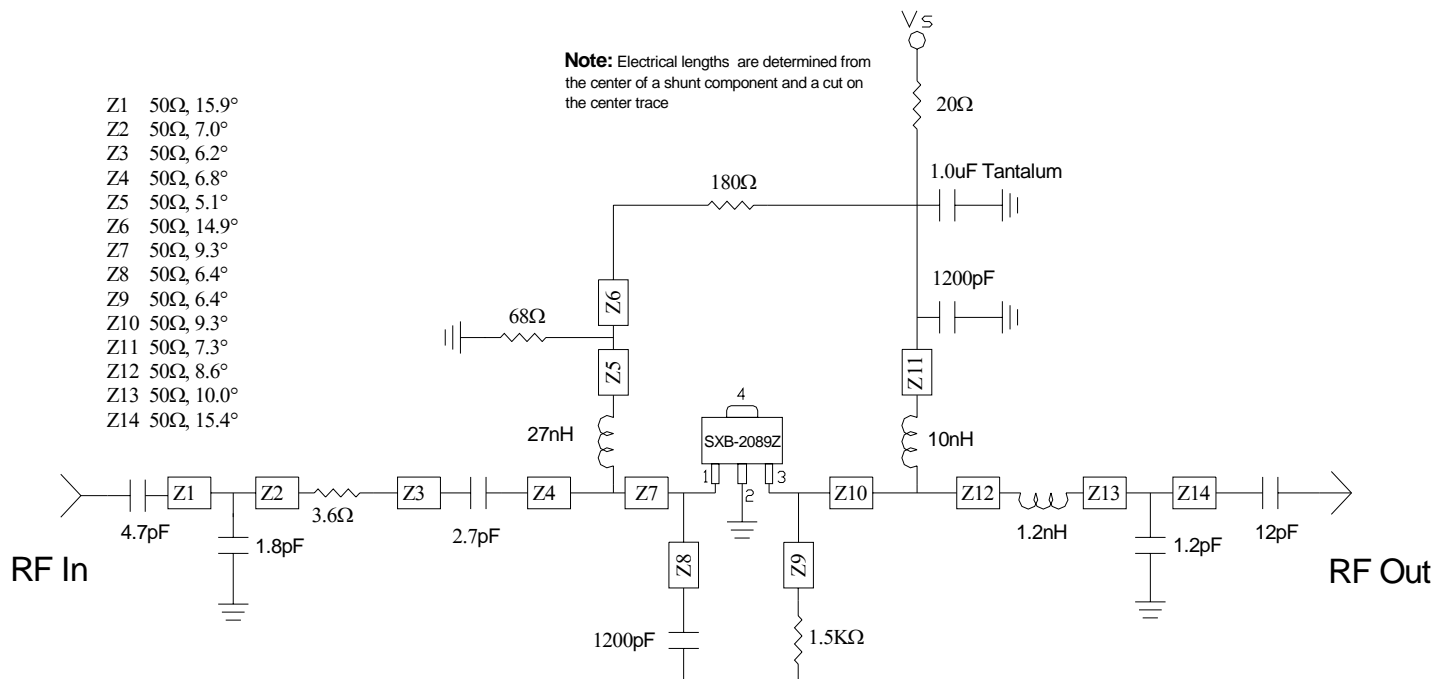
Application Schematic & Assembly Drawing 880MHz Circuit



Bill of Materials

C1	TAJB105KLRH Rohm 1.0uF
C2,C5	MCH185C122KK Rohm 1200pF
C3	MCH185A680JK Rohm 68pF
C4	MCH185A1R8CK Rohm 1.8pF
C6	MCH185A5R6DK Rohm 5.6pF
C7	MCH185A220JK Rohm 22pF
L1	LL1608-FS10NJ Toko 10nH
L2	LL1608-FS1N5S Toko 1.5nH
L3	LL1608-FSR82NJ Toko 82nH
R1	20Ω 2515 res (1%)
R2	180Ω 0603 res (5%)
R3	68Ω 0603 res (5%)
R4	3.3Ω 0603 res (5%)
R5	1KΩ 0603 res (5%)
Connectors	2x PSF-S01-1mm GigaLane Co.
Heat sink	EEF-101407
PCB	ECB-102925-B

Application Schematic & Assembly Drawing 1960MHz Circuit

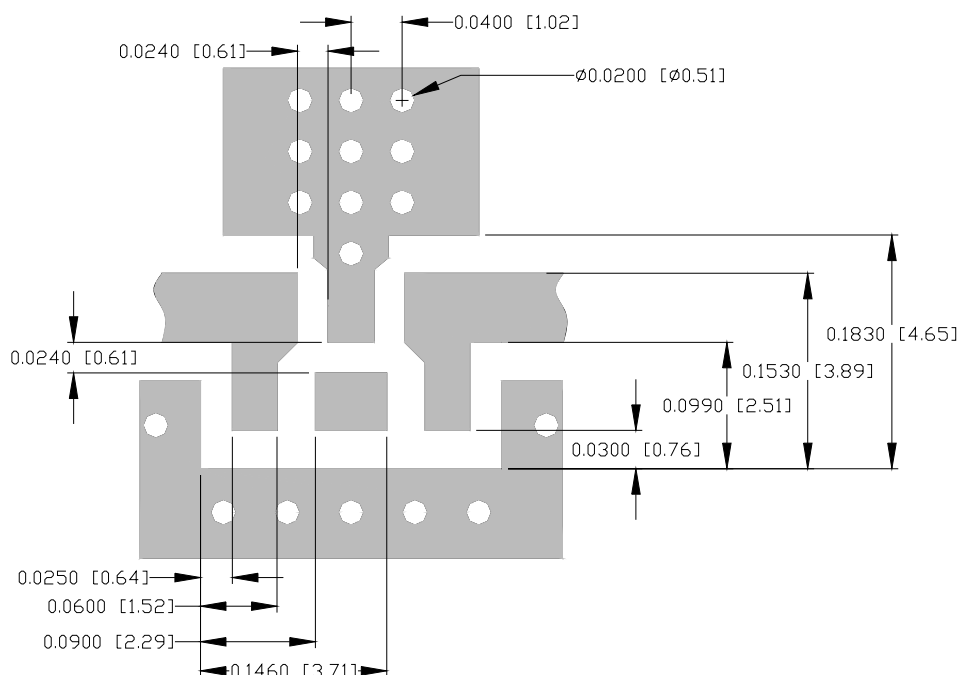


Bill of Materials

C1	TAJB105KLRH	Rohm	1.0uF
C2,C5	MCH185C122KK	Rohm	1200pF
C3	MCH185A120JK	Rohm	12pF
C4	MCH185A1R2CK	Rohm	1.2pF
C6	MCH185A1R8CK	Rohm	1.8pF
C7	MCH185A4R7CK	Rohm	4.7pF
C8	MCH185A2R7CK	Rohm	2.7pF
L1	LL1608-FS10NJ	Toko	10nH
L2	LL1608-FS1N2S	Toko	1.2nH
L3	LL1608-FS270JK	Toko	27nH
R1	20Ω 2512 res		(1%)
R2	180Ω 0603 res		(5%)
R3	68Ω 0603 res		(5%)
R4	3.6Ω 0603 res		(5%)
R5	1.5KΩ 0603 res		(5%)
Connectors	2x PSF-S01-1mm GigaLane Co.		
Heat sink	EEF-101407		
PCB	ECB-102925-B		

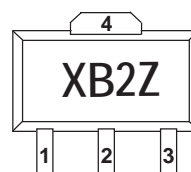
Suggested PCB Pad Layout

Dimensions in inches [millimeters]



Pin #	Function	Description
1	RF IN	RF input pin. This pin requires the use of an external DC blocking capacitor and matching components chosen for the frequency of operation.
2,4	GND	Connection to ground. Use via holes for best performance to reduce lead inductance as close to ground leads as possible.
3	RF OUT/ BIAS	RF output pin. This pin requires the use of an external DC blocking capacitor, choke and matching components as shown in the Application Schematic.

Package Marking



Part Number Ordering Information

Part Number	Reel Size	Devices / Reel
SXB-2089Z	7"	1000

Package Dimensions

(Refer to Application Note AN075 at www.sirenza.com)