

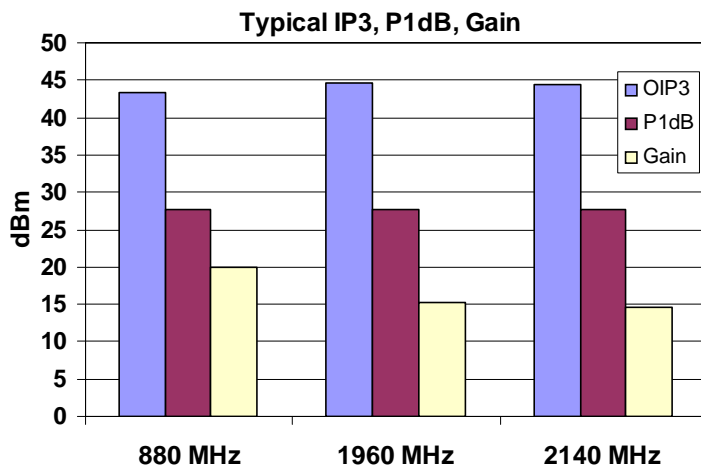


Product Description

Sirenza Microdevices' SXB-4089 amplifier is a high efficiency InGaP/ GaAs Heterojunction Bipolar Transistor (HBT) MMIC housed in low-cost, surface-mountable plastic package.

These amplifiers are specially designed for use as driver devices for infrastructure equipment in the 400-2500 MHz cellular, ISM, WLL, PCS, W-CDMA applications.

Its high linearity makes it an ideal choice for multi-carrier as well as digital applications.



Symbol	Parameters	Units	Frequency	Min.	Typ.	Max.
P_{1dB}	Output Power at 1 dB Compression	dBm	880 MHz		27.5	
			1960 MHz		27.5	
			2140 MHz		27.5	
S_{21}	Small Signal Gain	dBm	880 MHz		20	
			1960 MHz		15	
			2140 MHz	13	14.5	16
S_{11}	Input VSWR		880 MHz		1.3:1	
			1960 MHz		1.3:1	
			2140 MHz		1.3:1	
OIP3	Output Third Order Intercept Point (Pout/Tone = +11 dBm, Tone spacing = 1 MHz)	dBm	880 MHz		43.5	
			1960 MHz		44.5	
			2140 MHz		44.5	
NF	Noise Figure	dB	880 MHz		4.9	
			1960 MHz		3.3	
			2140 MHz		3.3	
V_{CC}	Device Operating Voltage	V		4.75	5	5.25
I_D	Device Operating Current	mA		235	260	285
$R_{TH, j-l}$	Thermal Resistance (junction - lead)	°C/W			25.3	

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

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Preliminary

SXB-4089

SXB-4089Z



**400-2500 MHz ½ W Medium Power
InGaP/GaAs HBT Amplifier with
Active Bias**

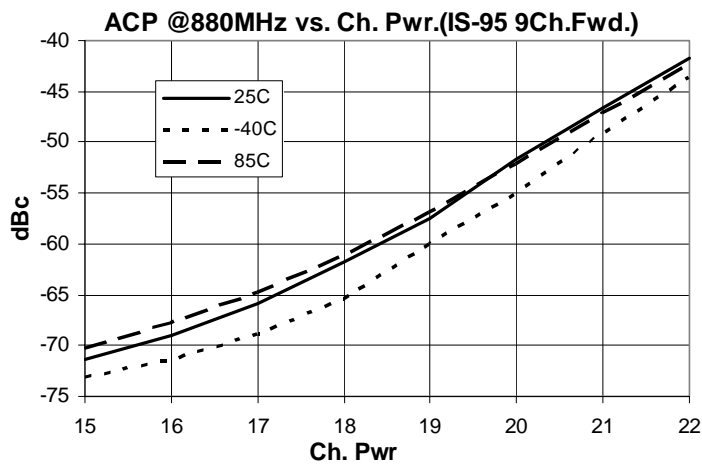
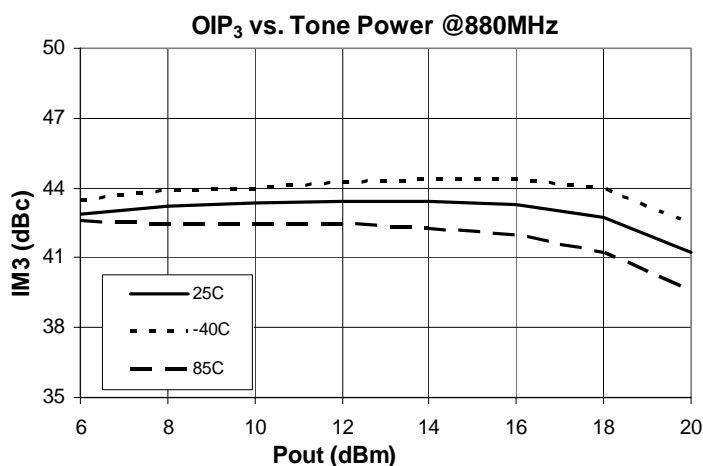
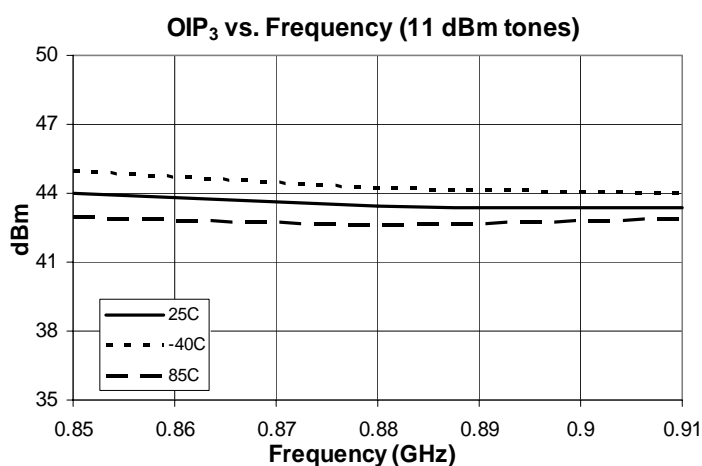
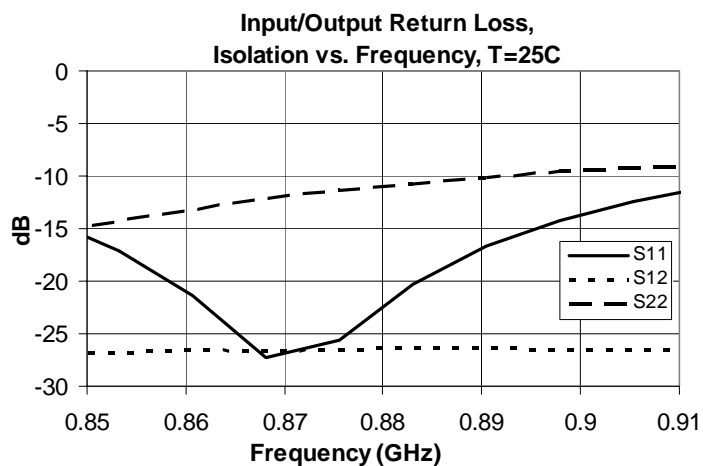
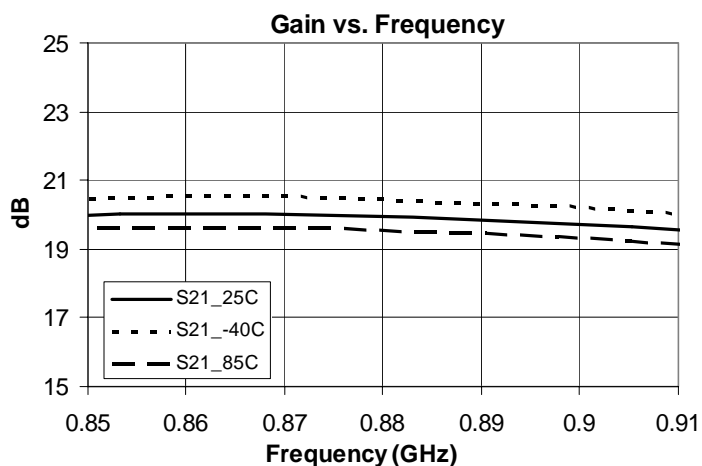
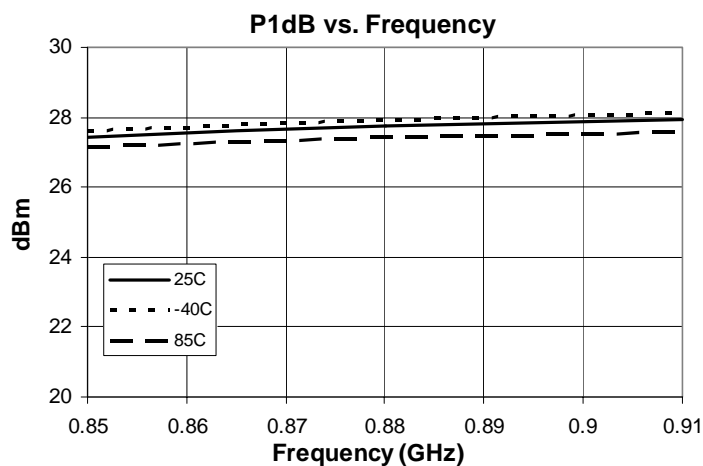


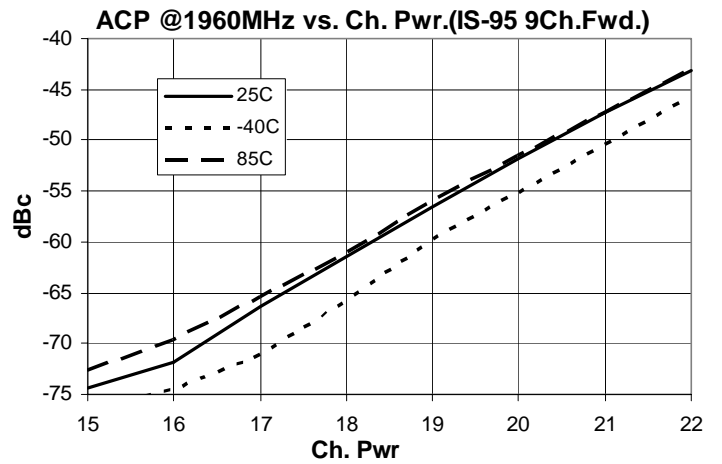
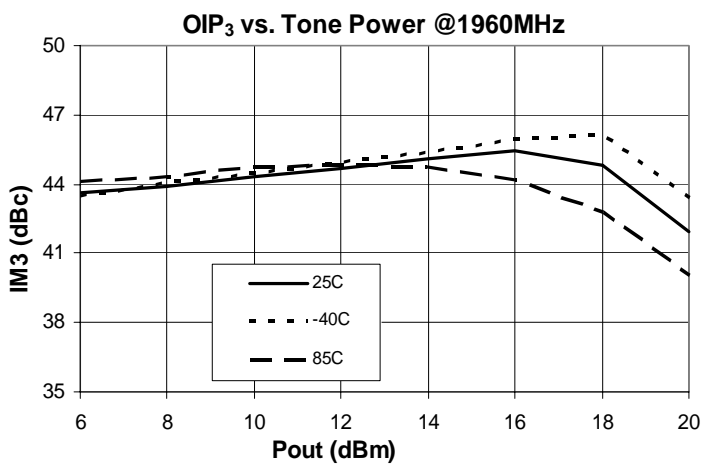
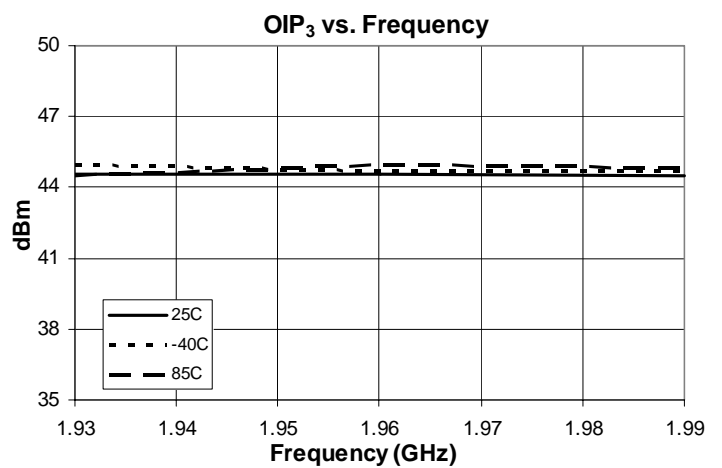
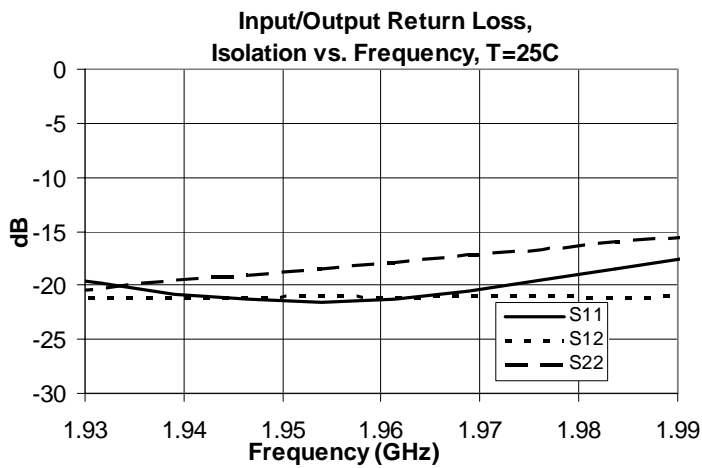
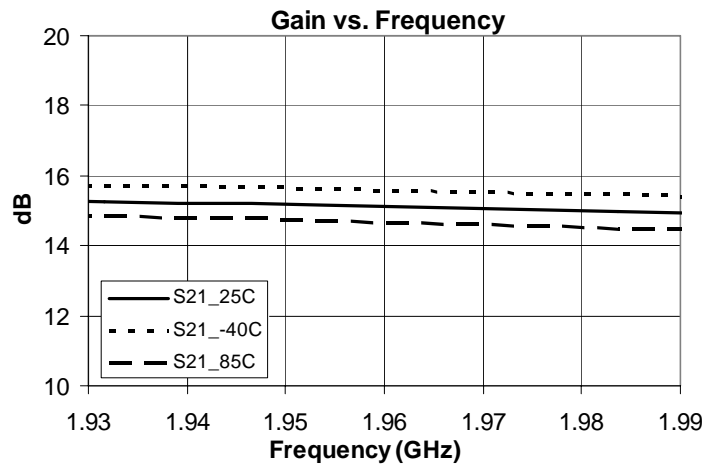
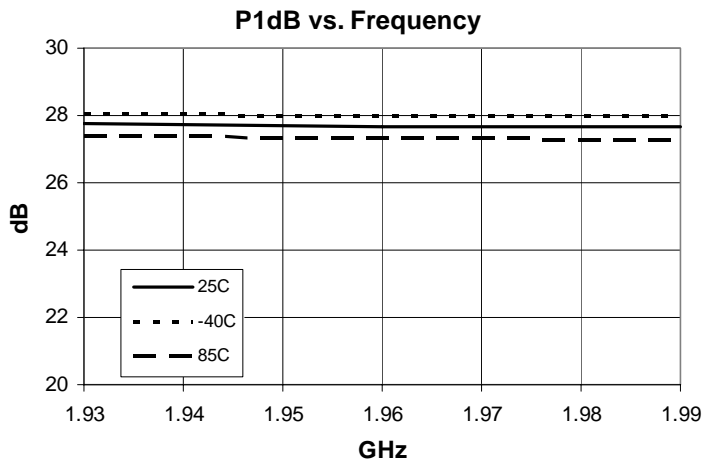
Product Features

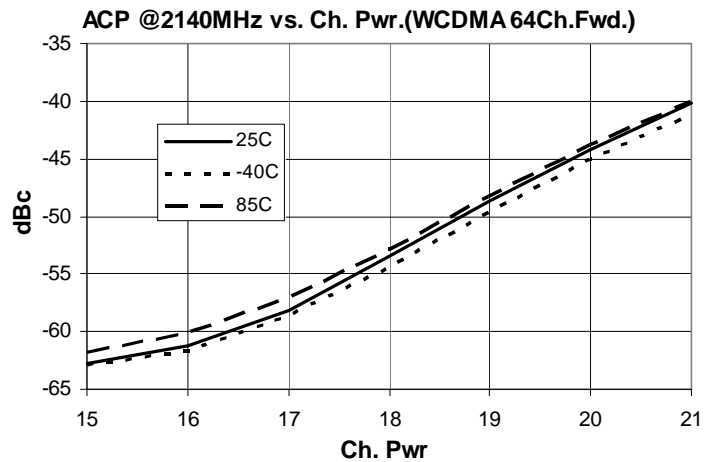
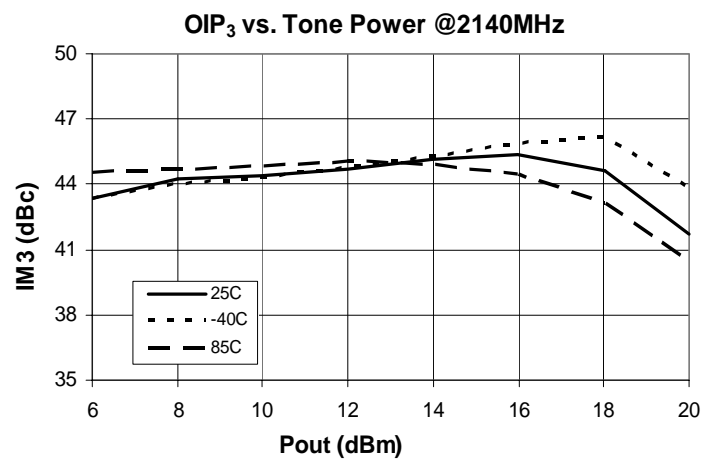
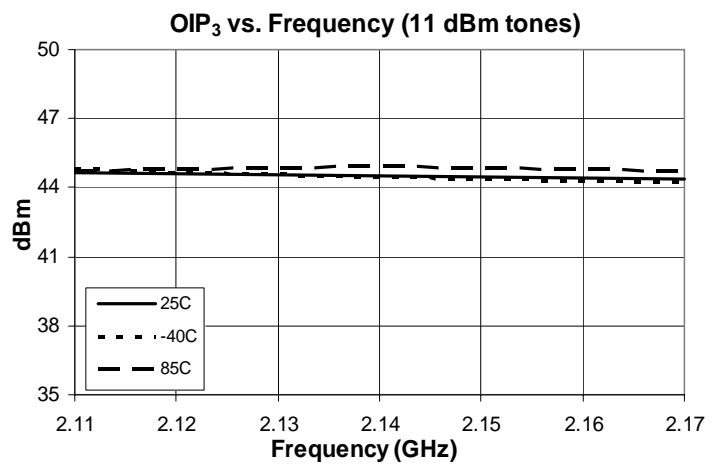
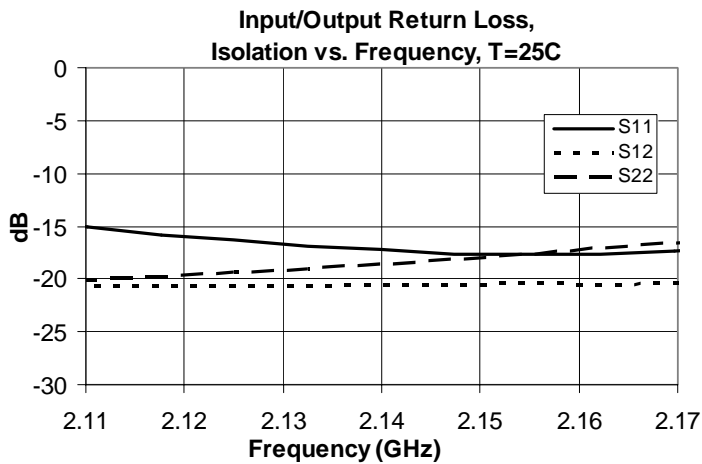
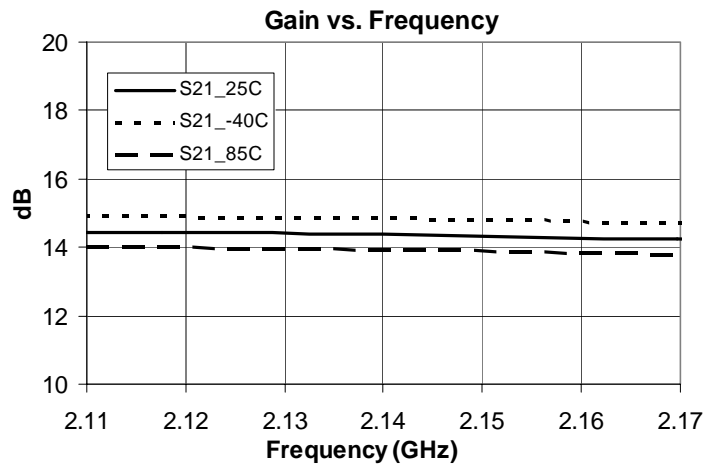
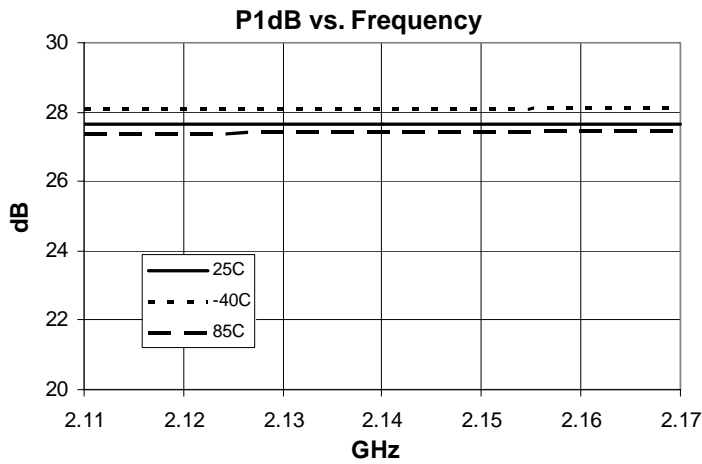
- On-chip Active Bias Control, Single 5V Supply
- High Output 3rd Order Intercept:
+45 dBm typ.
- High P1dB : +28 dBm typ.
- High Gain: +20 dB at 880 MHz
- Low Rth: 25°C/W typ.
- Robust 2000V ESD, Class 2

Applications

- W-CDMA, PCS, Cellular Systems
- Multi-Carrier Applications



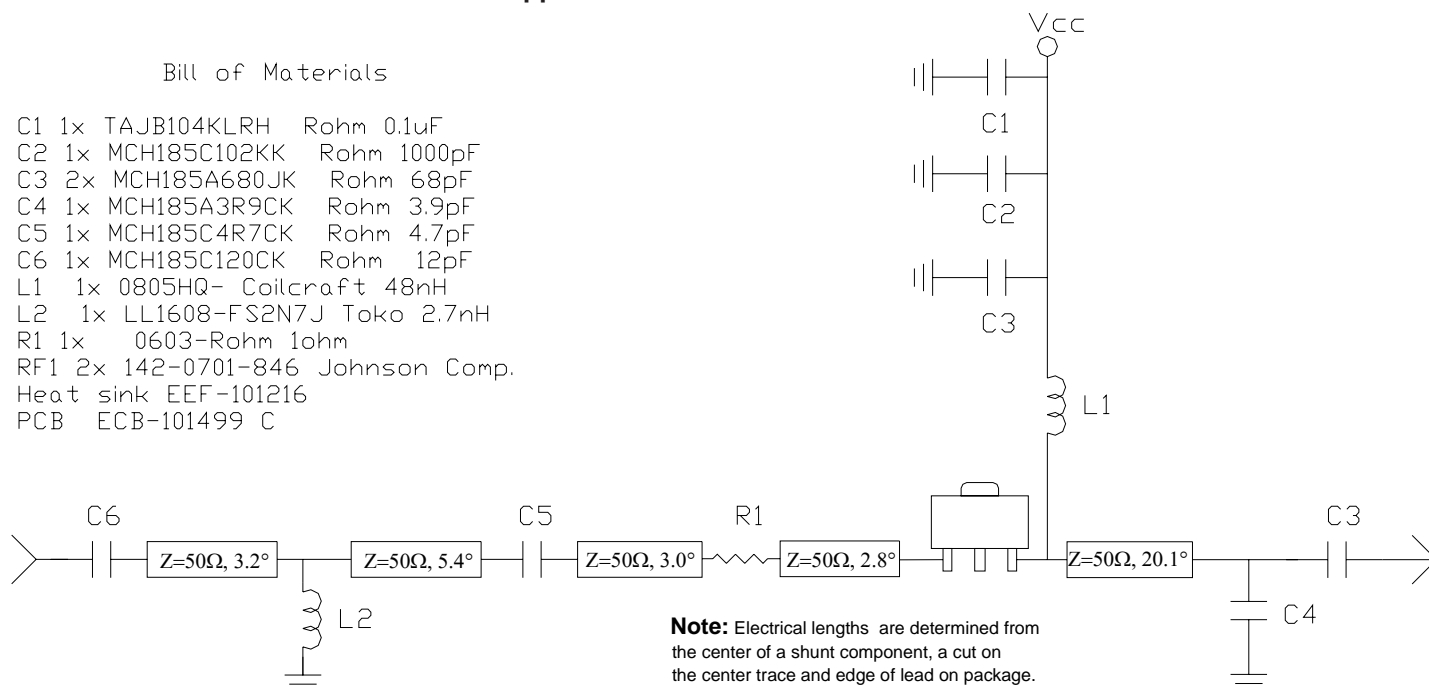




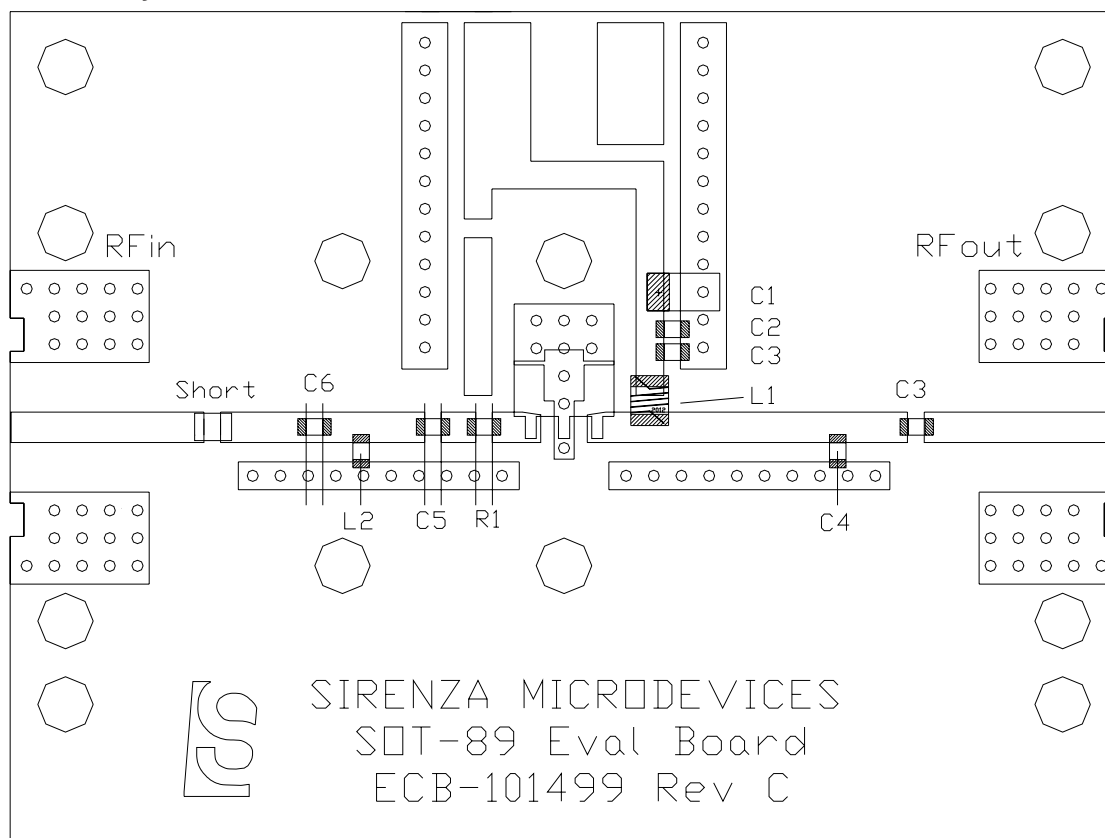
Application Schematic for 880 MHz

Bill of Materials

C1 1x TAJB104KLRH Rohm 0.1uF
 C2 1x MCH185C102KK Rohm 1000pF
 C3 2x MCH185A680JK Rohm 68pF
 C4 1x MCH185A3R9CK Rohm 3.9pF
 C5 1x MCH185C4R7CK Rohm 4.7pF
 C6 1x MCH185C120CK Rohm 12pF
 L1 1x 0805HQ- Coilcraft 48nH
 L2 1x LL1608-FS2N7J Toko 2.7nH
 R1 1x 0603-Rohm 1ohm
 RF1 2x 142-0701-846 Johnson Comp.
 Heat sink EEF-101216
 PCB ECB-101499 C



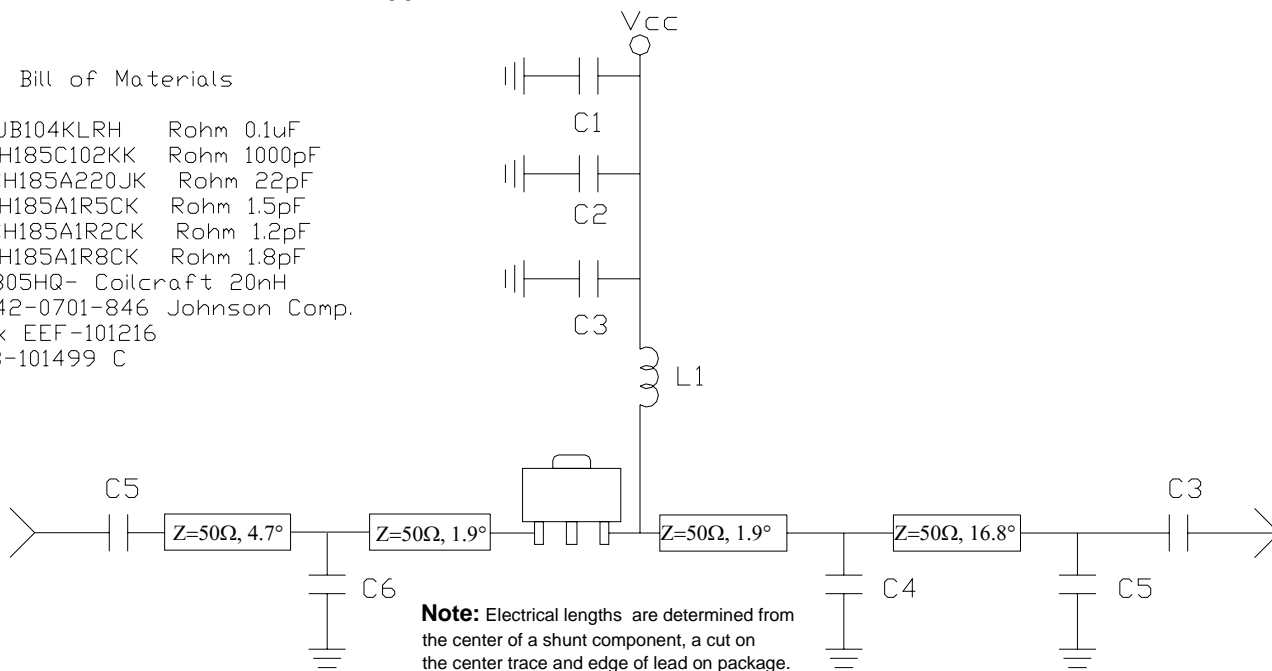
Evaluation Board Layout for 880 MHz



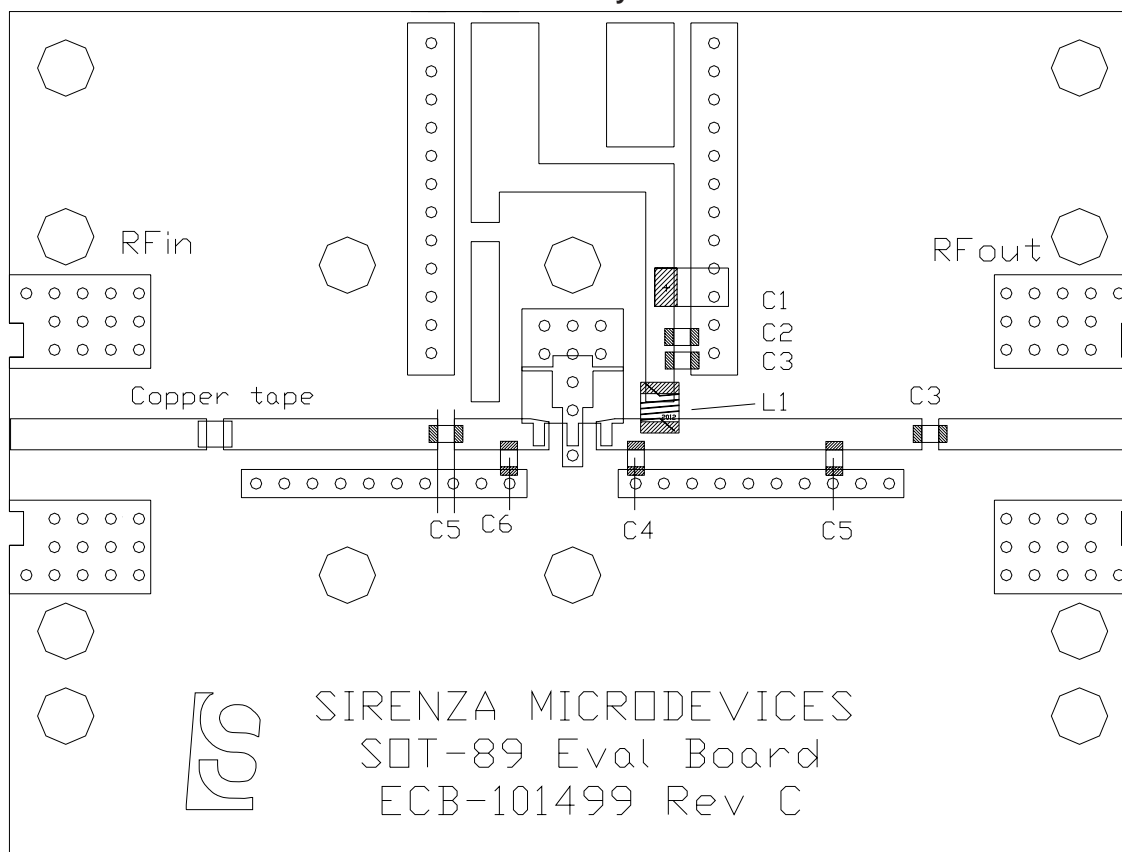
Application Schematic for 1960 MHz

Bill of Materials

C1	1x	TAJB104KLRH	Rohm	0.1uF
C2	1x	MCH185C102KK	Rohm	1000pF
C3	2x	MCH185A220JK	Rohm	22pF
C4	1x	MCH185A1R5CK	Rohm	1.5pF
C5	2x	MCH185A1R2CK	Rohm	1.2pF
C6	1x	MCH185A1R8CK	Rohm	1.8pF
L1	1x	0805HQ-	Coilcraft	20nH
RF1	2x	142-0701-846	Johnson Comp.	
Heat sink EEF-101216				
PCB ECB-101499 C				



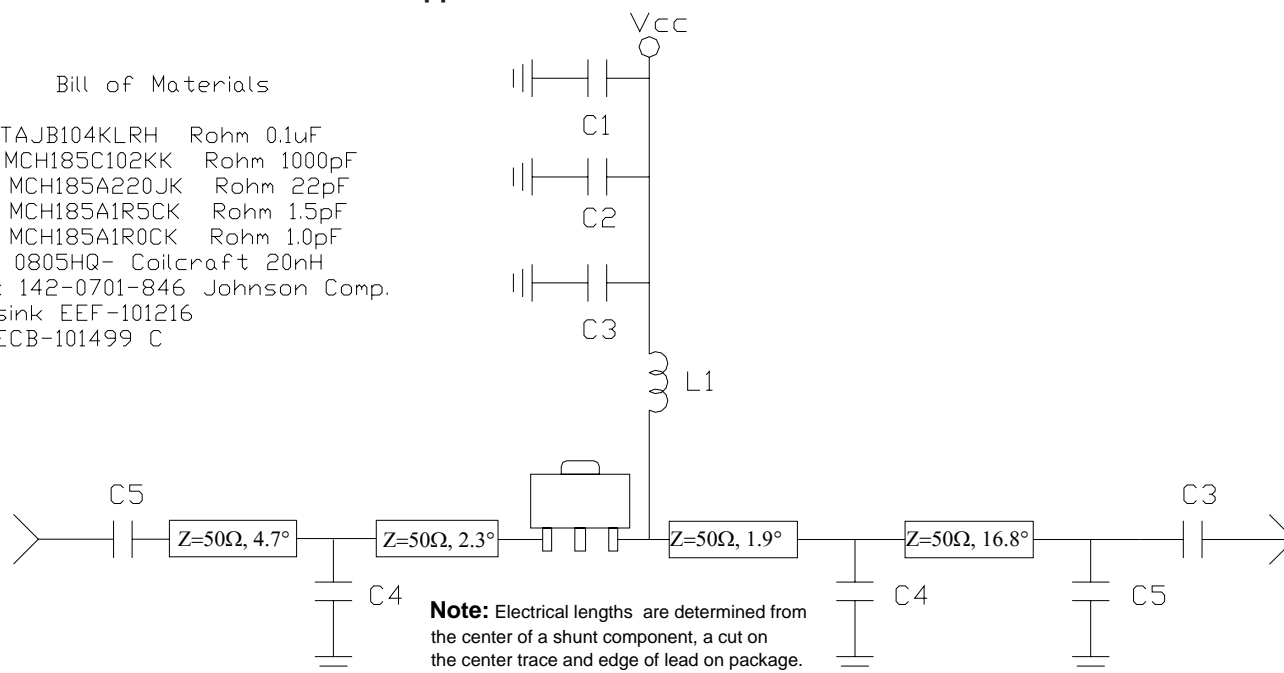
Evaluation Board Layout for 1960 MHz



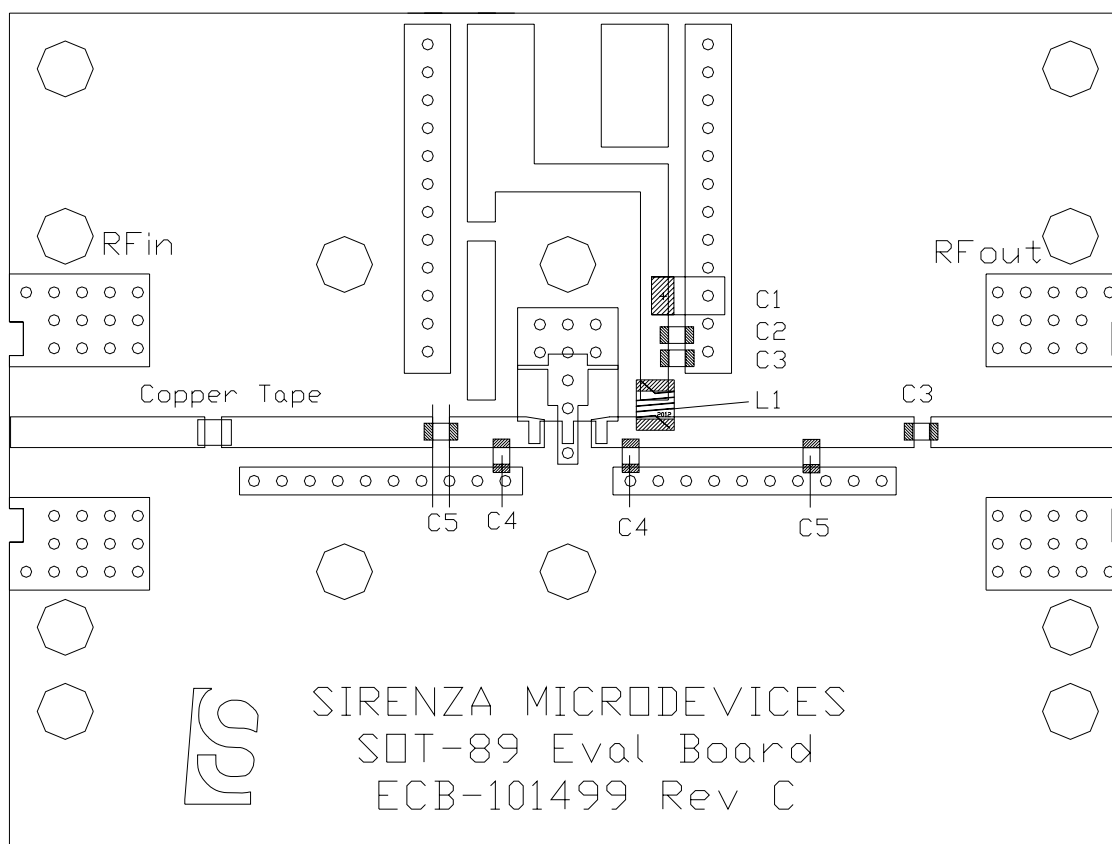
Application Schematic for 2140 MHz

Bill of Materials

C1 1x TAJB104KLRH Rohm 0.1uF
 C2 1x MCH185C102KK Rohm 1000pF
 C3 2x MCH185A220JK Rohm 22pF
 C4 2x MCH185A1R5CK Rohm 1.5pF
 C5 2x MCH185A1R0CK Rohm 1.0pF
 L1 1x 0805HQ- Coilcraft 20nH
 RF1 2x 142-0701-846 Johnson Comp.
 Heat sink EEF-101216
 PCB ECB-101499 C



Evaluation Board Layout for 2140 MHz

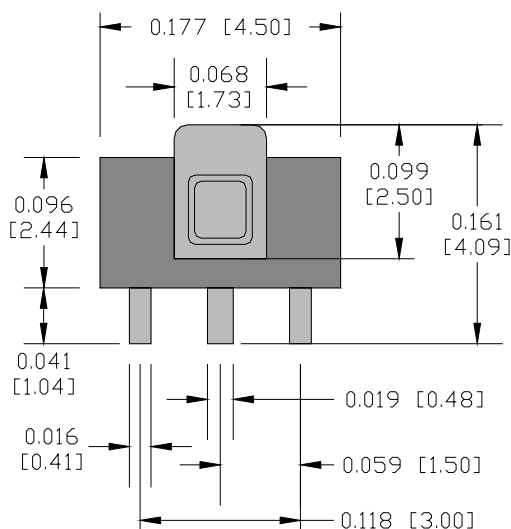


Nominal Package Dimensions

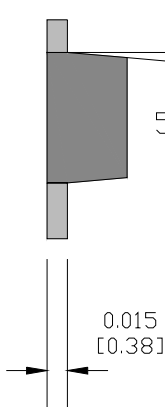
Dimensions in inches (millimeters)

Refer to package drawing posted at www.sirenza.com for tolerances

Bottom View

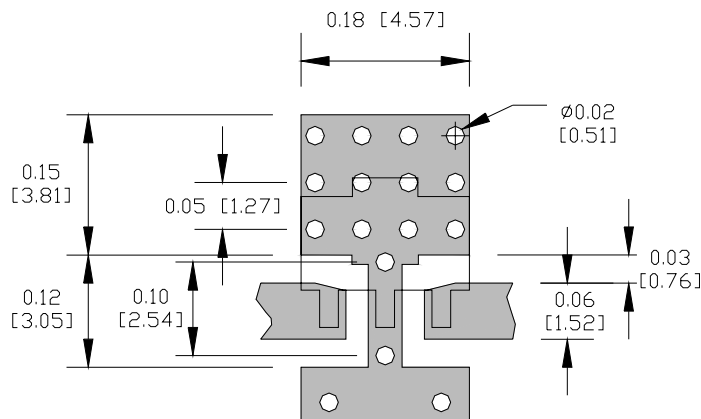


Side View



Suggested PCB Pad Layout

Dimensions in inches (millimeters)



Absolute Maximum Ratings

Parameter	Absolute Limit
Max Device Current (I_D)	500 mA
Max Device Voltage (V_D)	6 V
Max. RF Input Power	60mW
Max. Dissipated Power	2W
Max. Junction Temp. (T_J)	+165°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.

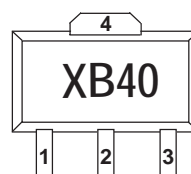
Bias Conditions should also satisfy the following expression:

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

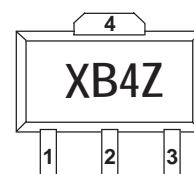
Part Number Ordering Information

Part Number	Reel Size	Devices / Reel
SXB-4089	7"	1000
SXB-4089Z	7"	1000

Package Marking



Tin-Lead



Lead Free



ESD: Class 2 (Passes 2000V ESD Pulse)

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

MSL (Moisture Sensitivity Level) Rating: Level 1

Pin #	Function	Description
1	RF IN	RF input pin. This pin requires the use of an external DC blocking capacitor 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 and bias pin. DC voltage is present on this pin, therefore a DC blocking capacitor is necessary for proper operation.