

Product Features

Frequency: 30MHz ~ 4GHz

Gain: 16.6dB@900MHz@5V

Output Power for 1dB Compression:

22.3dBm@900MHz@5V

Noise Figure: 0.7dB@900MHz@5V

Output Third-Order Interception:

31.1dBm@900MHz

Supply Current:

43mA @Vdd=5V

25mA @Vdd=3V

Package: SOT343

Application

Communication Base Stations

Test and Measurement Equipment

Point-to-point Communication

Radio

Navigation Equipment

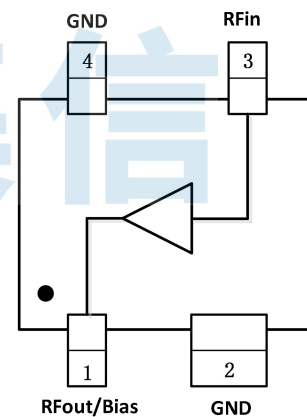
Ordering Information

Part Number	Package	Description
BR9118TC	SOT343	30MHz ~ 4GHz Low Noise Amplifier

General Description

BR9118TC is a high-performance MMIC low noise amplifier using GaAs process design, which can cover a frequency range of 30MHz ~ 4GHz. It has been internally matched to 50 ohms, and only requires an external RF choke and blocking/bypass capacitors. The on-chip active bias network ensures that the quiescent current is not affected by temperature. With single power supply voltage of +3V to +5V, the product has the characteristics of high stability, high linearity, low noise factor, high output P1dB and output IP3, which can be applied in high dynamic range system.

Functional Block Diagram



Electrical Specifications

Parameter	Min.	Typ.	Max.	Units	Test Condition
Gain	-	22.7	-	dB	30MHz
	-	18.1	-	dB	750MHz
	-	11.7	-	dB	2000MHz
Output Power for 1dB	-	20.1	-	dBm	30MHz
Compression	-	22.3	-	dBm	750MHz
Output Third-Order	-	26.2	-	dBm	30MHz
Interception	-	30.8	-	dBm	750MHz
Noise Figure	-	1.49	-	dB	30MHz
	-	0.61	-	dB	750MHz
Input Return Loss	-	-16.0	-	dB	750MHz
Output Return Loss	-	-15.5	-	dB	750MHz
Reverse Isolation	-	-23.0	-	dB	750MHz
Supply Voltage	-	+5	-	V	750MHz
Supply Current	-	43	-	mA	-
Test Conditions: Vdd=+5V, I=43mA, OIP3 spacing=1MHz, Pout=+0dBm/tone, Temp=+25°C					

Absolute Maximum Ratings

Maximum Operating Voltage: +5.5V;

Maximum RF input Power: +18dBm

Recommended Operating Conditions

Supply Voltage: +3V ~ +5V

Storage Temperature: -65°C ~ +150°C

Operating Temperature: -55°C ~ +125°C

Note: Operation of the device outside the parameter ranges given absolute-maximum-ratings conditions may cause permanent damage, and. exposure to absolute-maximum-ratings conditions for extended periods will affect the reliability.

ESD WARNING

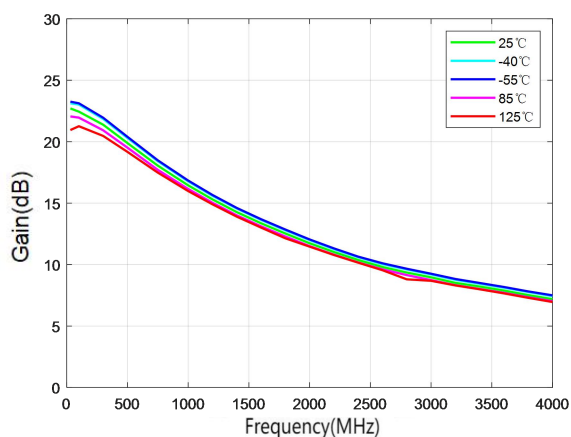

ELECTROSTATIC SENSITIVE DEVICE

OBSERVE HANDLING PRECAUTIONS

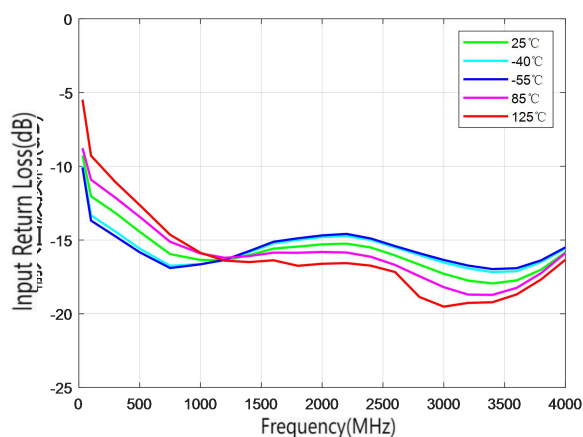
Typical Performance (EVB test results at +5V supply voltage)

Parameter	Typ.							Units
Frequency	30	50	100	300	500	750	1000	MHz
Gain	22.7	22.2	22.4	21.4	19.9	18.1	16.4	dB
Input Return Loss	-9.3	-11.2	-12.0	-13.2	-14.4	-16.0	-16.4	dB
Output Return Loss	-17.6	-19.0	-18.4	-17.6	-16.7	-15.5	-14.5	dB
Output Power for 1dB Compression	20.1	22.3	22.7	22.3	22.4	22.3	22.3	dBm
Output Third-Order Interception	26.2	35.7	28.6	29.6	30.6	30.8	31.2	dBm
Noise Figure	1.49	1.32	0.89	0.65	0.60	0.62	0.72	dB
Test Conditions: Vdd=+5V, I=43mA, OIP3 spacing=1MHz, Pout=+0dBm/tone, Temp=+25°C								

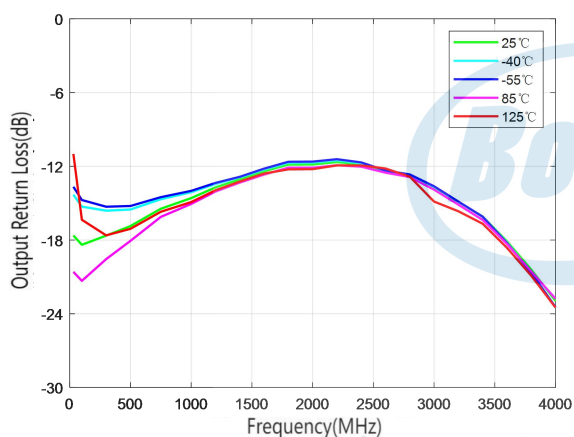
Parameter	Typ.							Units
Frequency	1200	1600	2000	2600	3000	3600	4000	MHz
Gain	15.3	13.4	11.7	9.6	9.0	7.9	7.2	dB
Input Return Loss	-16.4	-15.6	-15.3	-16.7	-17.3	-17.7	-15.8	dB
Output Return Loss	-13.7	-12.4	-11.9	-12.5	-13.7	-18.1	-23.0	dB
Output Power for 1dB Compression	22.4	22.5	22.6	22.7	22.7	22.6	22.4	dBm
Output Third-Order Interception	31.9	33.1	33.4	35.7	35.9	36.0	25.2	dBm
Noise Figure	0.76	0.80	1.04	1.22	1.18	1.30	1.59	dB
Test Condition: Vdd=+5V, I=43mA, OIP3 spacing=1MHz, Pout=+0dBm/tone, Temp=+25°C								



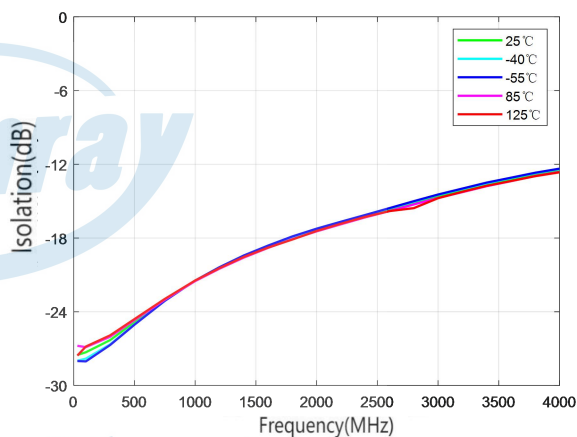
Gain



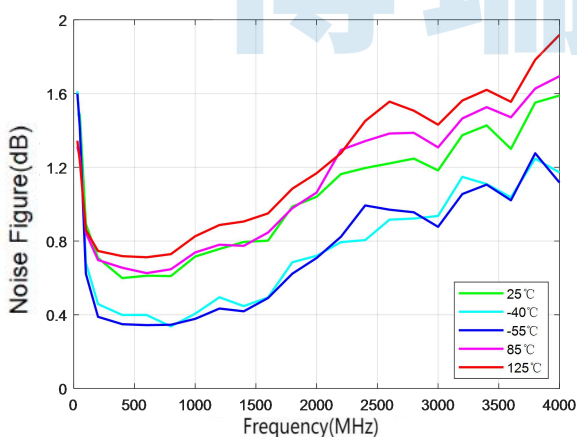
Input Return Loss



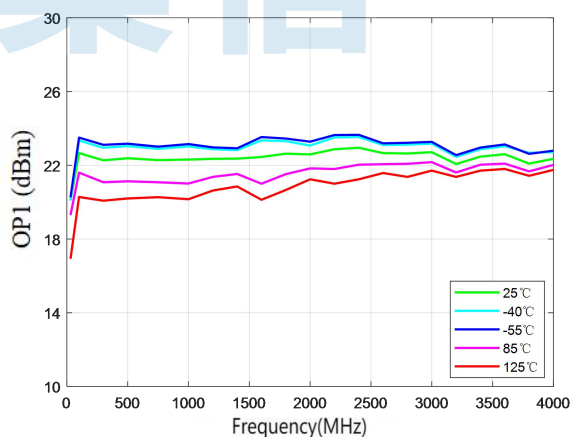
Output Return Loss



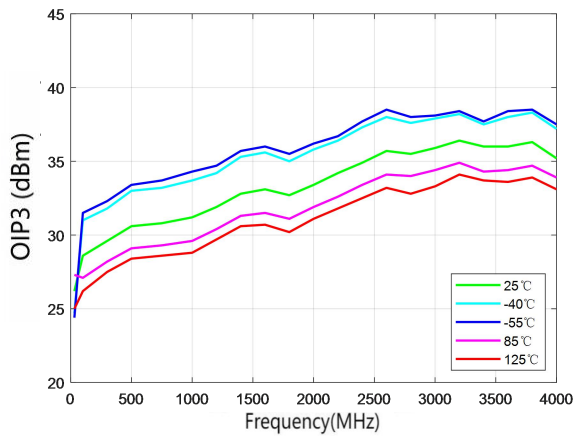
Reverse Isolation



Noise Figure



Output Power for 1dB Compression



Output Third-Order Interception

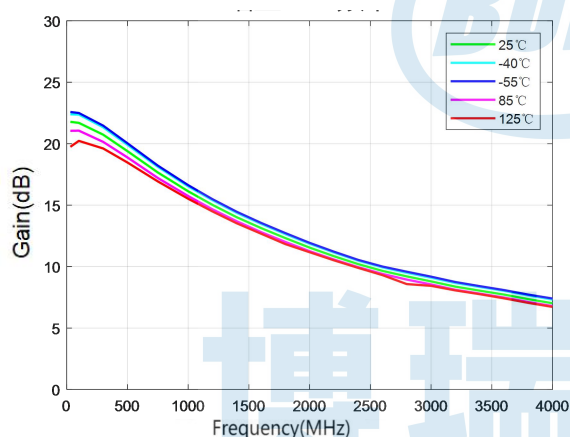
Typical Performance (EVB test results at +3V supply voltage)

Parameter	Typ.							Units
Frequency	30	50	100	300	500	750	1000	MHz
Gain	21.8	21.5	21.7	20.7	19.4	17.7	16.1	dB
Input Return Loss	-8.0	-9.6	-10.2	-11.3	-12.6	-14.5	-15.5	dB
Output Return Loss	-21.5	-24.9	-21.9	-20.4	-18.9	-16.9	-15.8	dB
Output Power for 1dB Compression	3.8	18.8	19.3	19.0	19.1	19.1	19.3	dBm
Output Third-Order Interception	25.5	25.9	24.5	25.0	25.6	26.1	26.0	dBm
Noise Figure	1.48	1.37	0.79	0.52	0.48	0.49	0.56	dB

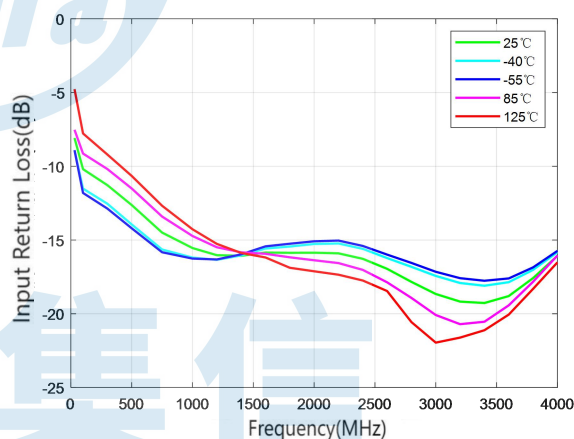
Test Conditions: Vdd=+3V, I=25mA, OIP3 spacing=1MHz, Pout=+0dBm/tone, Temp=+25°C

Parameter	Typ.							Units
Frequency	1200	1600	2000	2600	3000	3600	4000	MHz
Gain	15.0	13.1	11.5	9.7	8.8	7.7	7.0	dB
Input Return Loss	-16.0	-15.8	-15.9	-17.0	-18.7	-18.8	-16.1	dB
Output Return Loss	-14.7	-13.2	-12.6	-13.2	-14.7	-19.9	-25.2	dB
Output Power for 1dB Compression	19.1	20.0	19.5	19.6	19.6	19.6	19.3	dBm
Output-Third-Order Interception	27.4	27.7	28.5	31.3	30.8	31.2	30.9	dBm
Noise Figure	0.66	0.70	0.90	1.26	1.04	1.25	1.42	dB

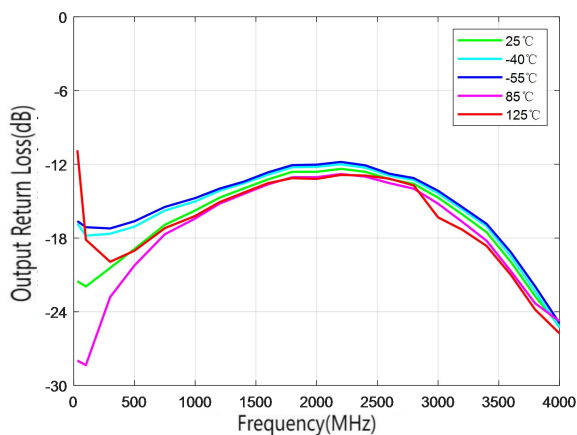
Test Conditions: Vdd=+3V, I=25mA, OIP3 spacing=1MHz, Pout=+0dBm/tone, Temp=+25°C



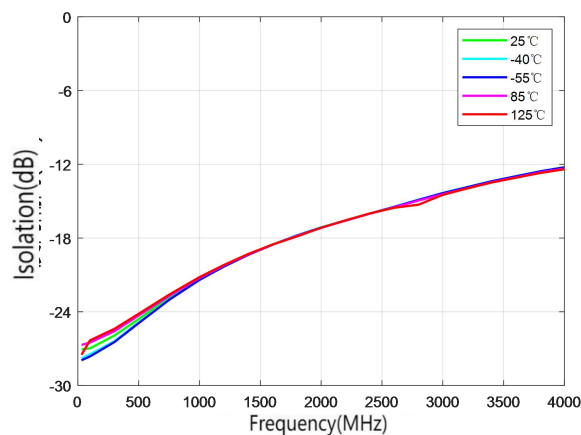
Gain



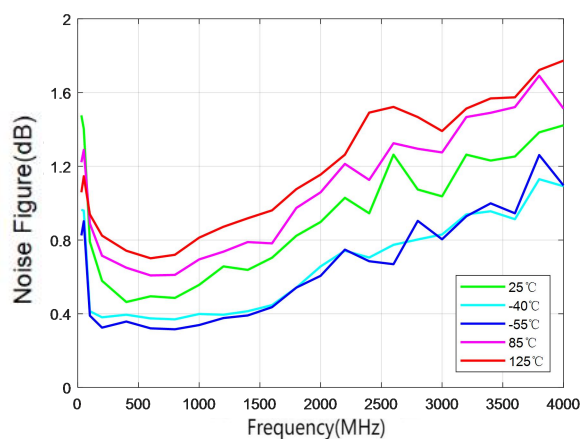
Input Return Loss



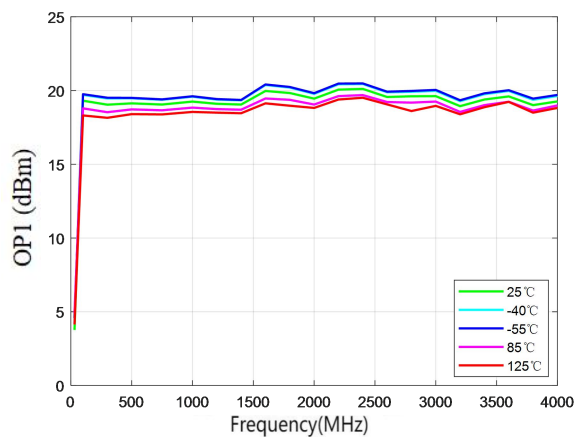
Output Return Loss



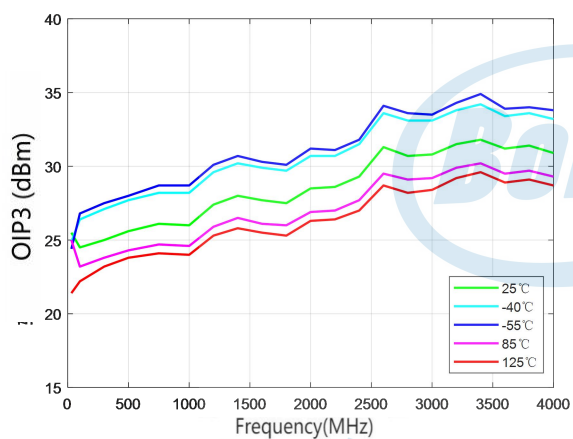
Reverse Isolation



Noise Figure

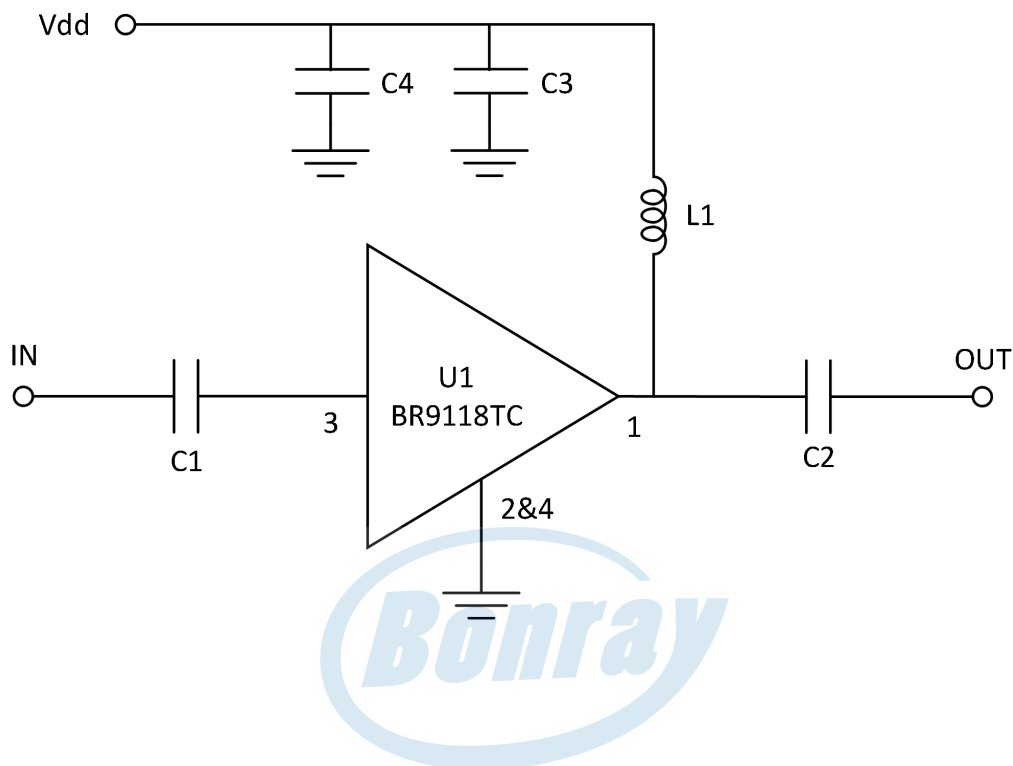


Output Power for 1dB Compression



Output Third-Order Interception

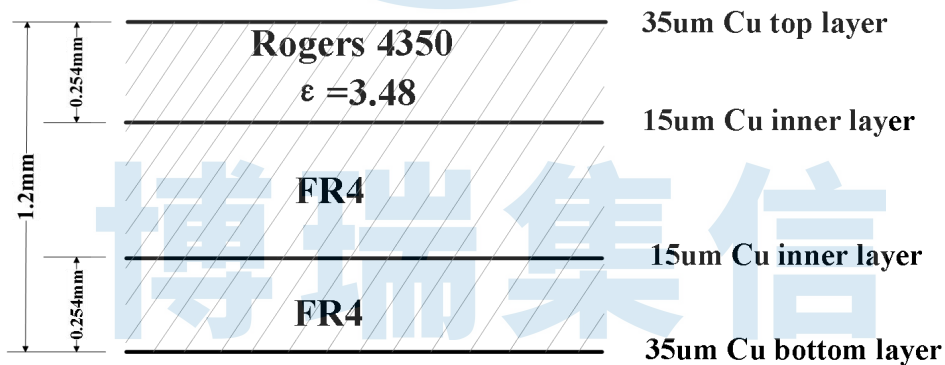
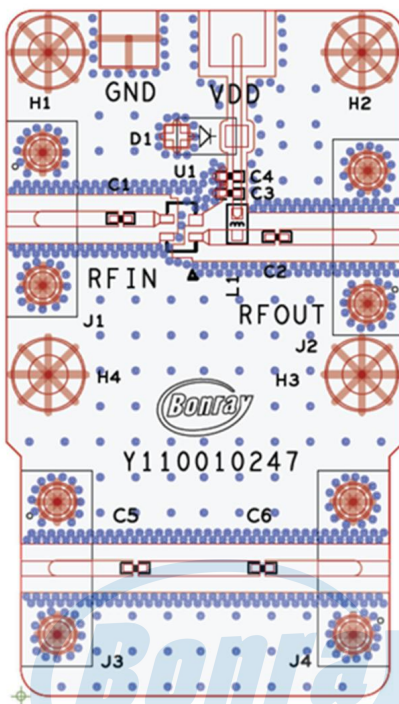
Typical Application Schematic



Bill of Material

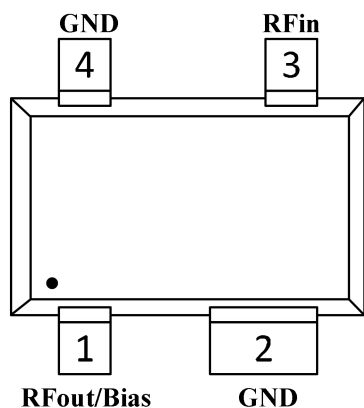
Reference Designator	Package	Value	P/N
C1, C2	0402	1000pF	GRM1555C1H102JA01D
C3	0402	100pF	GRM1555C1H101JA01D
C4	0402	10nF	GRM155R71E103KA01D
L1	1008	1.1uH	1008AF-112XJRB

PCB Evaluation Board



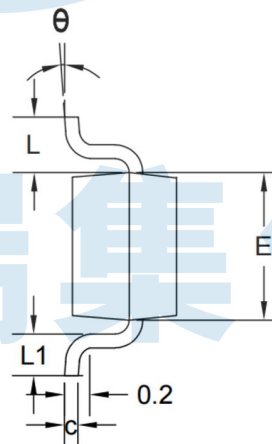
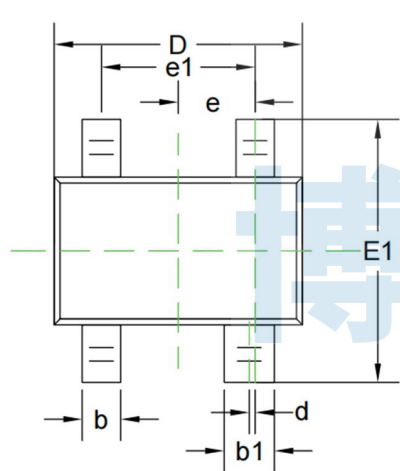
50ohm transmission line:
width=0.53mm,spacing=0.53mm

Pin Configuration and Description



Pin Number	Pin Name	Description
1	RFout/Bias	RF Output and DC bias pin. DC bias will also need to be injected through a RF bias choke/inductor for operation.
2,4	GND	Ground pins. These pins must be connected to RF/DC ground
3	RFin	RF input pin. A DC Block is required.

Package Dimensions (mm)



Num	Size (mm)		
	Min	TYP	Max
A	0.850	0.950	1.050
A1	0.000	0.050	0.100
A2	0.850	0.900	0.950
b	0.250	0.325	0.400
b1	0.350	0.425	0.500
c	0.080	0.115	0.150
d	0.05TYP		
D	2.000	2.100	2.200
E	1.150	1.250	1.350
E1	2.000	2.250	2.450
e	0.650TYP		
e1	1.200	1.300	1.400
L	0.525TYP		
L1	0.260	0.360	0.460
theta	0°	4°	8°

