

Product Features

Operating Frequency: 30MHz ~ 2.5GHz

Gain: 19.3dB@1GHz

High Gain Flatness: ± 1 dB

Output Power for 1dB Compression:

20.7dBm@1GHz

Noise Figure: 1.1dB@1GHz

Output Third-Order Interception:

27.8dBm@1GHz

Supply Current 22mA@ Vdd=5V

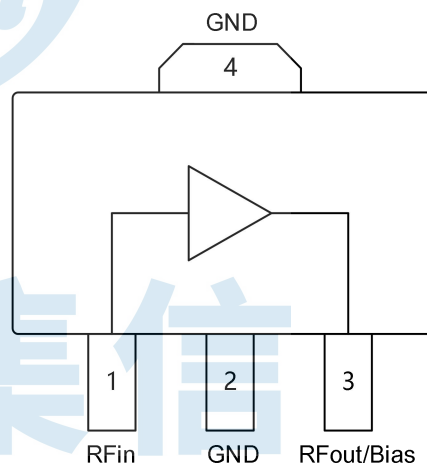
Supply Current 13mA@ Vdd=3.3V

Package: SOT89

General Description

The BR9518TA is a wideband MMIC low noise amplifier designed in a SOT89 package. At 1GHz, the amplifier typically provides a gain of 19.3dB, a noise figure of 1.1dB, an output P1dB of 20.7dBm, an output IP3 of 27.8dBm. The device exhibits superior input/output return loss across a wide frequency band, making it suitable for applications with high gain flatness and low power consumption.

Functional Block Diagram



Application

Communication Base Stations

Test and Measurement Equipment

Point-to-Point Communication

VHF/UHF Stations

Ordering Information

Part Number	Package	Description
BR9518TA	SOT89	30MHz ~ 2.5GHz Low Noise Amplifier

Electrical Specifications

Parameters	Test Condition	Min.	Typ.	Max.	Units
Gain	30MHz	-	19.5	-	dB
	1GHz	-	19.3	-	dB
	2GHz	-	18.2	-	dB
Output Power for 1dB Compression	30MHz	-	21.2	-	dBm
	1GHz	-	20.7	-	dBm
	2GHz	-	17.4	-	dBm
Output Third-Order Interception	30MHz	-	27.0	-	dBm
	1GHz	-	27.8	-	dBm
	2GHz	-	28.2	-	dBm
Noise Figure	30MHz	-	1.2	-	dB
	1GHz	-	1.2	-	dB
	2GHz	-	1.4	-	dB
Input Return Loss	30MHz	-	-10.8	-	dB
	1GHz	-	-13.8	-	dB
	2GHz	-	-23.1	-	dB
Output Return Loss	30MHz	-	-12.7	-	dB
	1GHz	-	-14.2	-	dB
	2GHz	-	-16.5	-	dB
Supply Voltage	-	-	5	-	V
Supply Current	-	-	22	-	mA
Test Condition: Vdd=+5V, I=22mA, OIP3 spacing=1MHz, Pout=0dBm/tone, TA=+25°C					

Absolute Maximum Ratings

Maximum Operating Voltage (Vdd): +6V;

Maximum RF input Power: +20dBm;

Recommended Operating Conditions

Supply Voltage: +5V;

Supply Current: 22mA;

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 Warnings



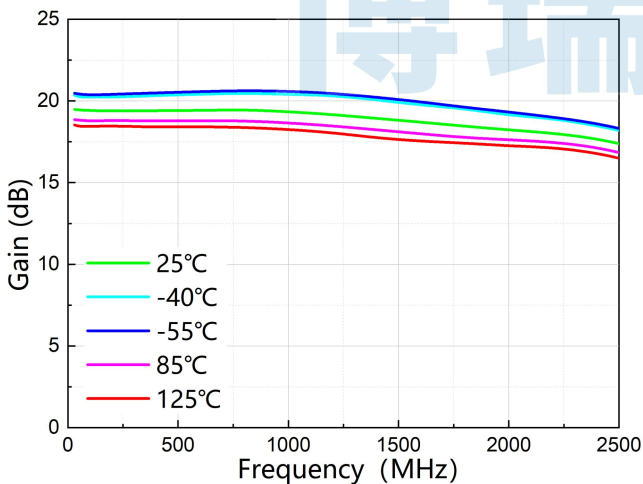
ELECTROSTATIC SENSITIVE DEVICE

OBSERVE HANDLING PRECAUTIONS

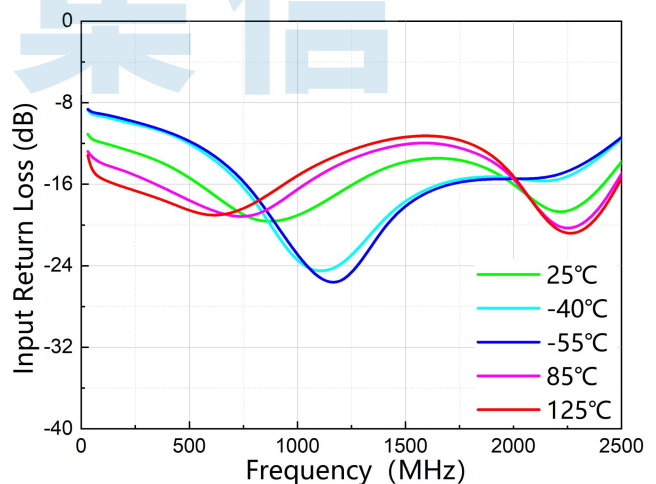
Typical Performance (EVB test results at +5V supply voltage)

Parameters	Typ.													Units
Frequency	30	50	100	200	400	600	800	1000	1400	1800	2000	2400	2600	MHz
Gain	19.5	19.4	19.4	19.4	19.4	19.4	19.5	19.3	18.9	18.5	18.2	17.7	17.1	dB
Input Return Loss	-11.1	-11.7	-11.9	-12.5	-13.9	-16.8	-20.1	-19.4	-14.2	-13.6	-15.7	-16.9	-10.7	dB
Output Return Loss	-13.2	-12.6	-12.4	-12.6	-14.1	-15.1	-16.0	-14.3	-12.0	-10.8	-10.8	-10.9	-10.0	dB
Reverse Isolation	-22.2	-22.1	-22.2	-22.2	-22.2	-22.3	-22.2	-22.4	-23.4	-24.5	-25.2	-27.4	-29.1	dB
Output Power for 1dB Compression	21.2	21.9	21.1	21.3	21.3	21.0	21.0	20.7	19.7	18.3	17.4	16.9	17.3	dBm
Output Third-Order Intercept	27.0	29.4	28.4	28.3	27.9	29.2	28.5	27.8	25.7	26.8	28.2	28.6	27.8	dBm
Noise Figure	1.2	1.1	1.1	1.1	1.1	1.0	1.2	1.1	1.1	1.1	1.3	1.8	2.1	dB

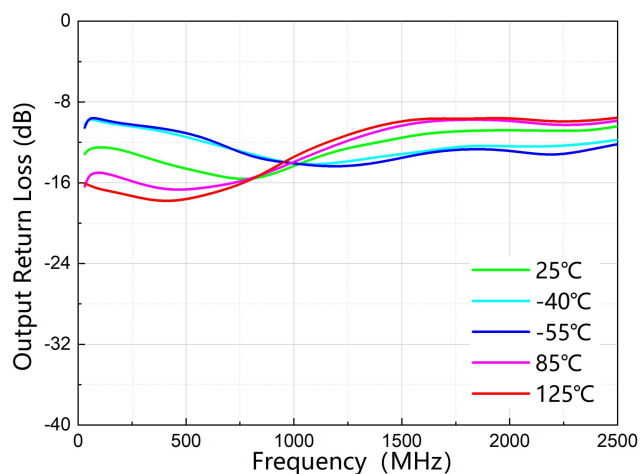
Test Conditions: Vdd=+5V, I=22mA, OIP3 spacing=1MHz, Pout=0dBm/tone, TA=+25°C



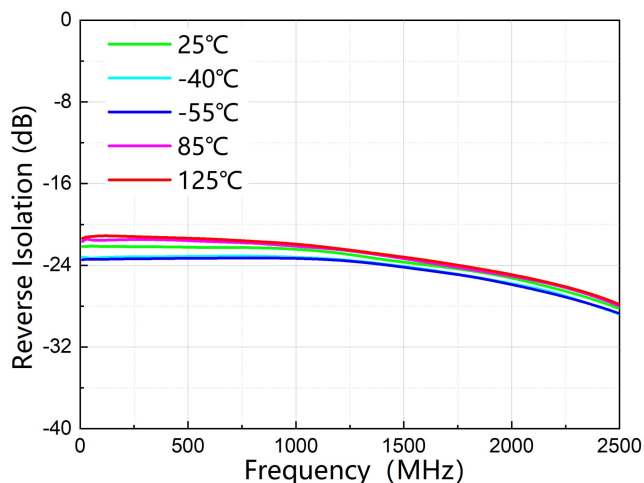
Gain vs. Freq



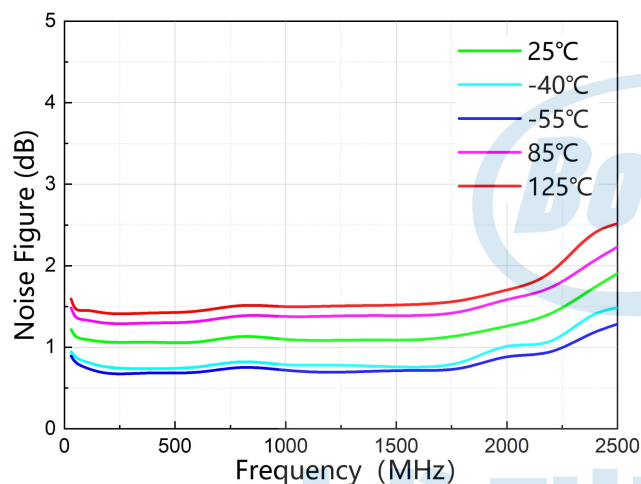
Input Return Loss vs. Freq



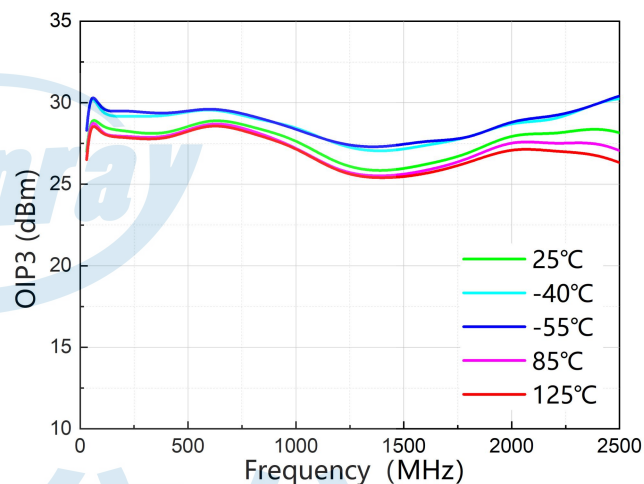
Output Return Loss vs. Freq



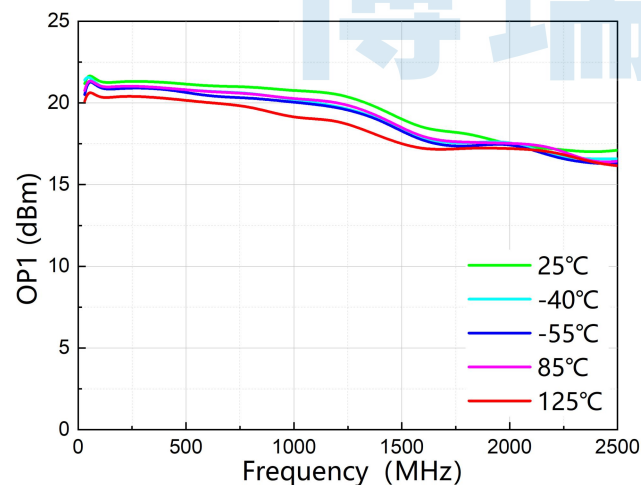
Reverse Isolation vs. Freq



Noise Figure vs. Freq



Output Third-Order Interception vs. Freq

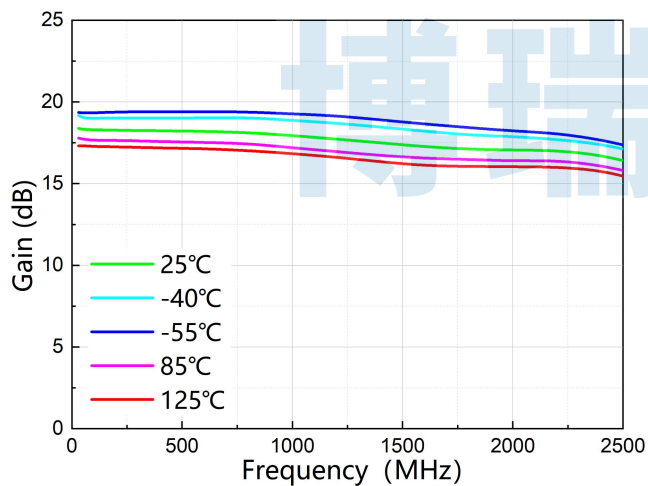


Output Power for 1dB Compression vs. Freq

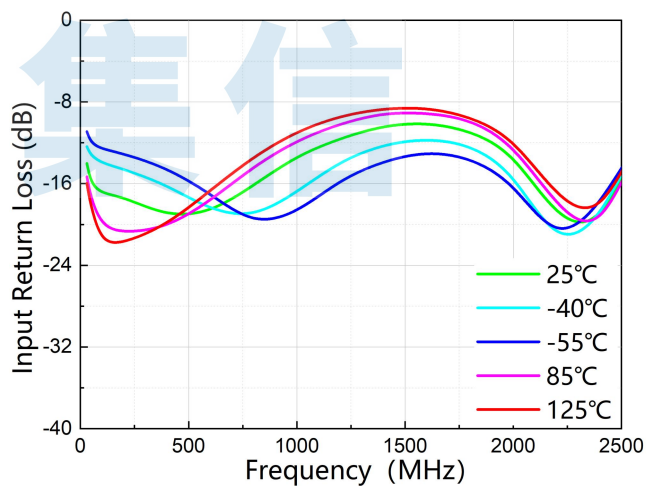
Typical Performance (EVB test results at +3.3V supply voltage)

Parameters	Typ.													Units
Frequency	30	50	100	200	400	600	800	1000	1400	1800	2000	2400	2600	MHz
Gain	18.4	18.3	18.3	18.3	18.2	18.2	18.1	17.9	17.5	17.1	17.1	16.8	16.1	dB
Input Return Loss	-14.0	-16.0	-17.0	-17.3	-19.2	-18.9	-16.2	-13.3	-10.3	-10.8	-12.9	-20.7	-10.6	dB
Output Return Loss	-21.7	-18.6	-19.4	-20.0	-19.5	-17.7	-15.0	-12.5	-9.5	-8.4	-8.7	-8.8	-8.3	dB
Reverse Isolation	-20.8	-20.9	-20.9	-20.9	-21.0	-21.1	-21.4	-21.7	-22.6	-24.1	-25.0	-26.9	-29.0	dB
Output Power for 1dB Compression	19.0	19.1	18.7	18.9	18.7	18.3	17.9	17.4	16.5	15.4	14.6	13.8	13.0	dBm
Output Third-Order Intercept	25.7	28.8	26.9	26.7	25.9	29.4	27.6	26.8	24.5	26.3	25.4	22.9	21.3	dBm
Noise Figure	1.3	1.1	1.2	1.2	1.2	1.2	1.3	1.2	1.3	1.3	1.4	1.9	1.9	dB

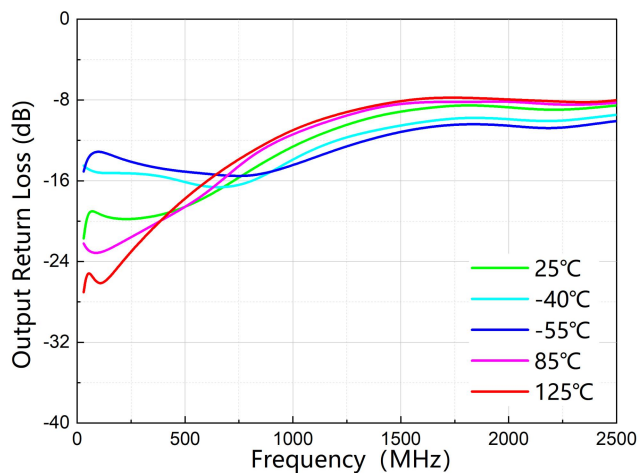
Test Conditions: Vdd=+3.3V, I=13mA, OIP3 spacing=1MHz, Pout=0dBm/tone, TA=+25°C



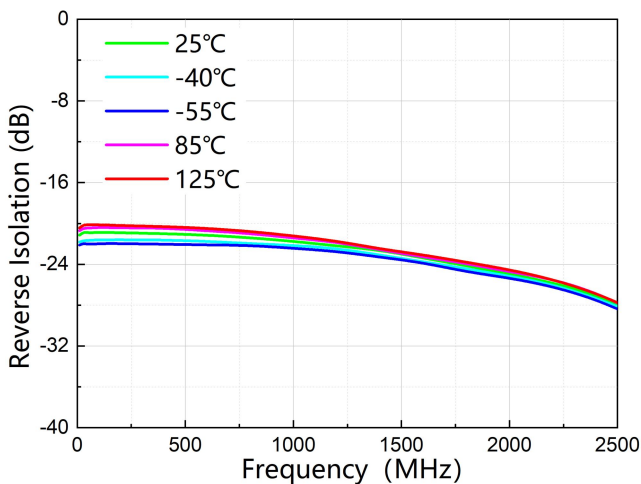
Gain vs. Freq



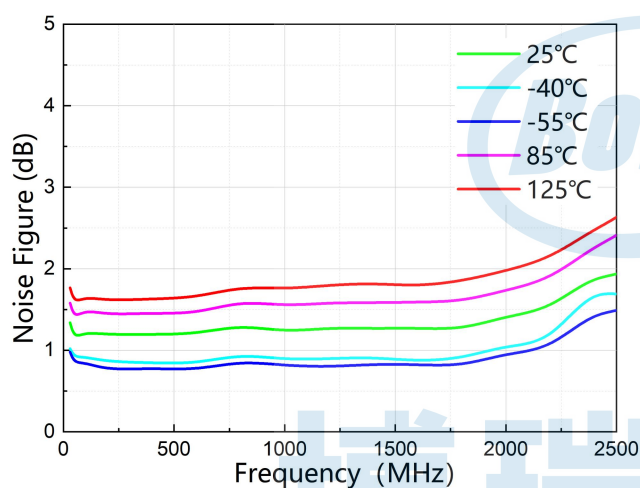
Input Return Loss vs. Freq



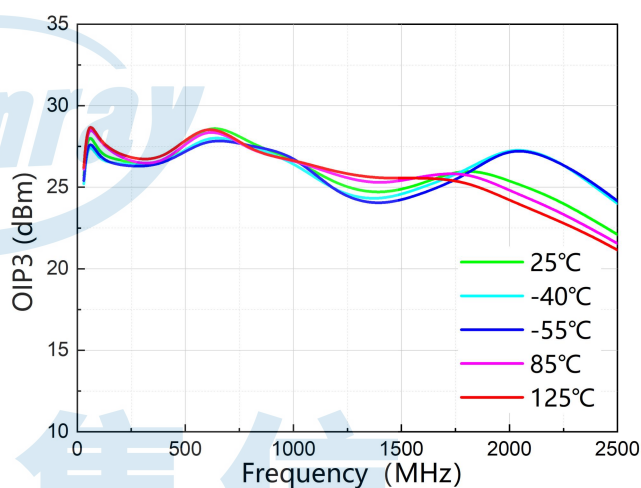
Output Return Loss vs. Freq



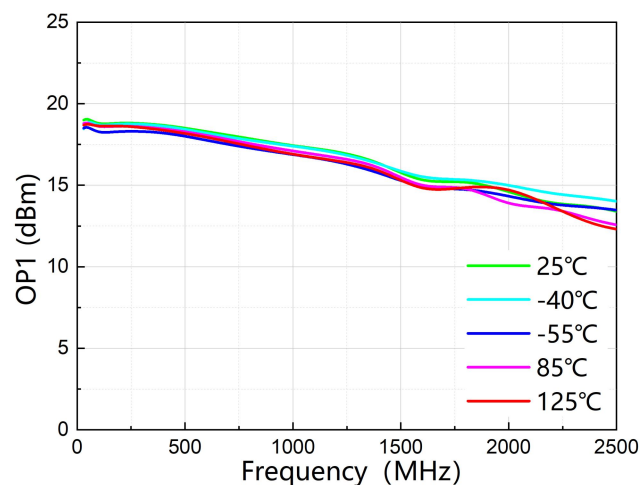
Reverse Isolation vs. Freq



Noise Figure vs. Freq

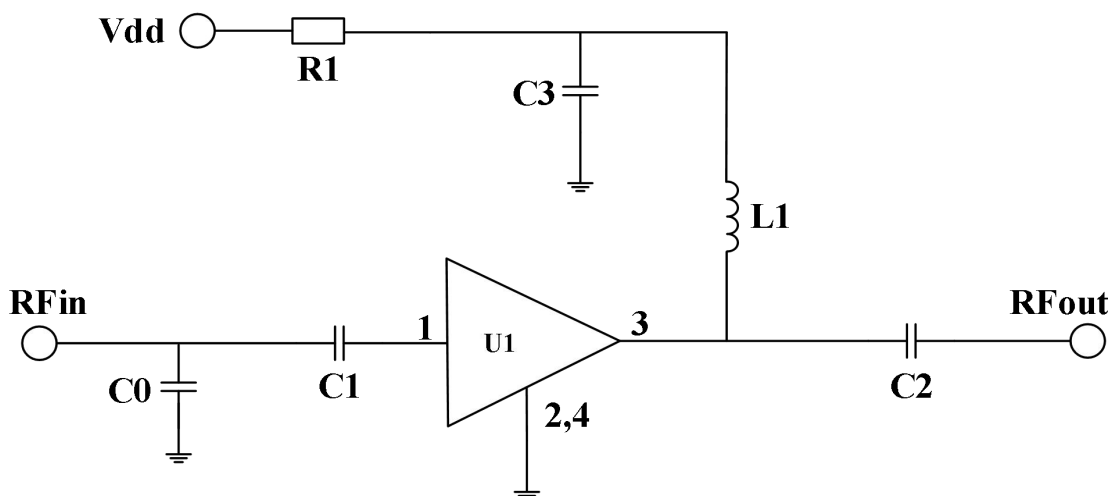


Output Third-Order Interception vs. Freq



Output Power for 1dB Compression vs. Freq

Typical Application Schematic



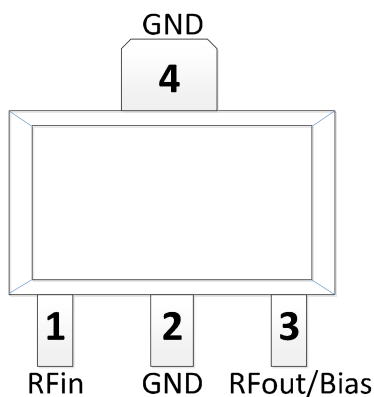
Bill of Material

Reference Designator	Package	Value	P/N
L1	1008	1.1uH	1008AF-112XJRB
C1, C2	0402	470nF	GRM155R71A474KE01J
C3	0402	3.3nF	GRM155R71H332JA01D
R1	0402	0Ω	RC0402JR-070RL
C0	0402	1pF	GRM1555C1H1R0CA01D

C0 component placement location:

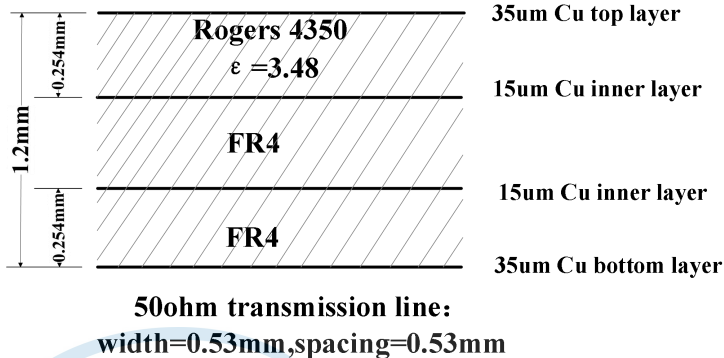
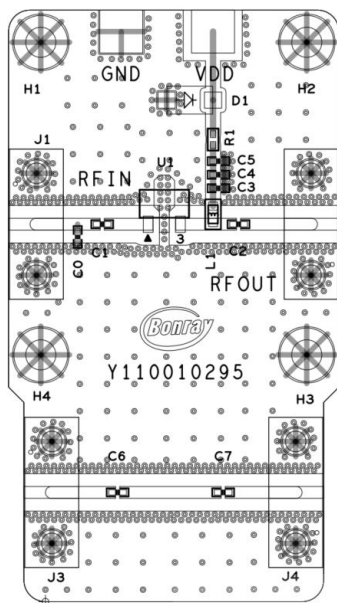
Distance from input pin of U1 package to C0: 7mm, when operating frequency exceeds 1GHz. Otherwise, do not use.

Pin Configuration and Description



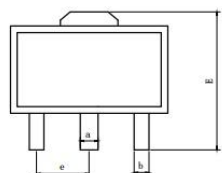
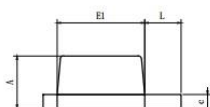
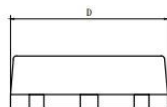
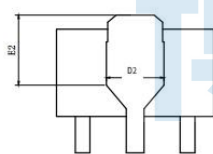
Pin Number	Pin Name	Description
1	RFin	RF input pin. A DC Block is required.
2,4	GND	Ground pins; These pins a must be connected to the RF/DC ground.
3	RFout/ Bias	RF output and DC bias pin. DC bias will also need to be injected through a RF bias choke/inductor for operation.

PCB Evaluation Board



Note: C4 and C5 component placement locations are reserved.

Package Dimensions (mm)



SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	1.40	1.50	1.60
b	0.37	0.42	0.45
c	0.38	—	0.42
a	0.45	0.48	0.51
D	4.40	4.50	4.60
E	4.00	4.10	4.20
E1	2.40	2.50	2.60
e	1.50BSC		
L	0.89	1.045	1.20
D2	1.50	1.60	1.70
E2	2.218	2.318	2.418