Product Features

Frequency: 0.4GHz ~ 4GHz

Gain : 17.4dB@1.6GHz

P1dB Compression: 30.1dBm@1.6GHz

OIP3: 44.6dBm@1.6GHz

Vdd=+5V, I_{CQ} 245mA

Package: SOT89

Application

Wireless Infrastructure

FDD/TDD Base Stations

Test and Measurement Equipment

Commercial and Military Radars

High Power Amplifiers

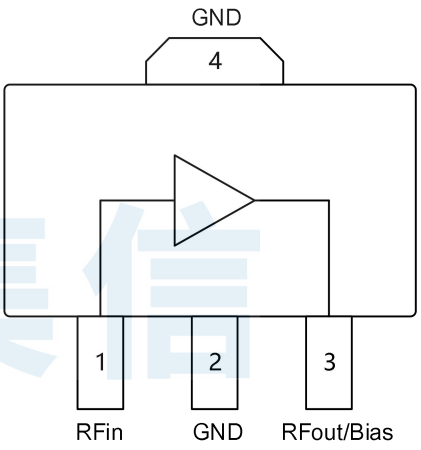
Ordering Information

Part Number	Package	Description
BR9543TA	SOT89	0.4GHz to 4GHz 1W Drive Amplifier

General Description

The BR9543TA is a high linearity single-chip drive amplifier constructed with GaAs process. The product is housed in a SOT89 package, and with a Power Gain of 17.4dB in 1.6GHz small signal, achieves a power of 28.3dBm P1dB, and 44.6dBm OIP3. The product is suitable for wireless communication infrastructure, FDD/TDD base station, radar, high power amplifier driver stage or final stage applications.

Functional Block Diagram



Electrical Specifications

Parameters	Test Condition	Min.	Typ.	Max.	Units
Gain	500MHz	-	23.0	-	dB
	1600MHz	-	17.4	-	dB
Input Return Loss	500MHz	-	-11.6	-	dB
	1600MHz	-	-12.8	-	dB
Output Return Loss	500MHz	-	-11.8	-	dB
	1600MHz	-	-13.4	-	dB
Reverse Isolation	500MHz	-	-29.1	-	dB
	1600MHz	-	-27.6	-	dB
Output Power for 1dB Compression	500MHz	-	28.3	-	dBm
	1600MHz	-	30.1	-	dBm
Output Third-Order Interception	500MHz	-	43.2	-	dBm
	1600MHz	-	44.6	-	dBm
Operating Voltage	-	-	5	-	V
Static Current	-	-	245	-	mA
Test Conditions: Vdd=+5V, OIP3 spacing=1MHz, Pout=15dBm/tone (1500MHz~1700MHz, Pout=16dBm/tone), TA=+25°C					

Absolute Maximum Ratings

Maximum Operating Voltage (Vdd) : +8V

Maximum RF input Power: +30dBm

ESD Rating: 3kV (Class 2)

Recommended Operating Conditions

Power Supply Voltage: +5V

Storage Temperature: -65℃ ~ +150℃

Operating Temperature: -55℃ ~ +125℃

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

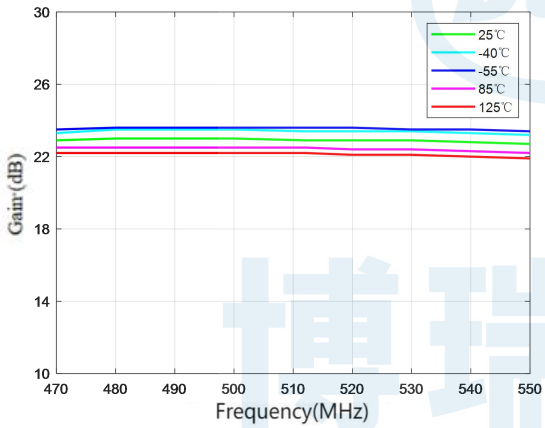
ELECTROSTATIC SENSITIVE DEVICE

OBSERVE HANDLING PRECAUTIONS

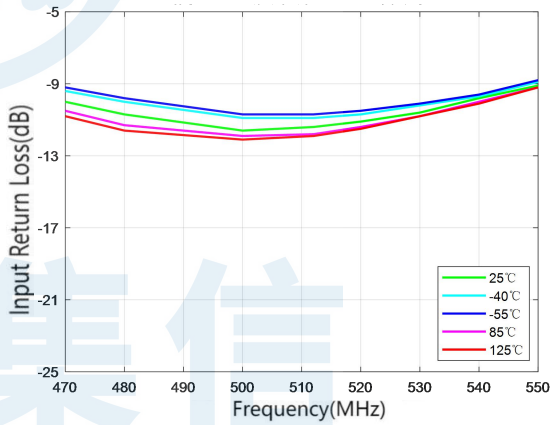
ESD Rating: Class 2

Typical Performance (EVB test results+5V,70MHz~550MHz)

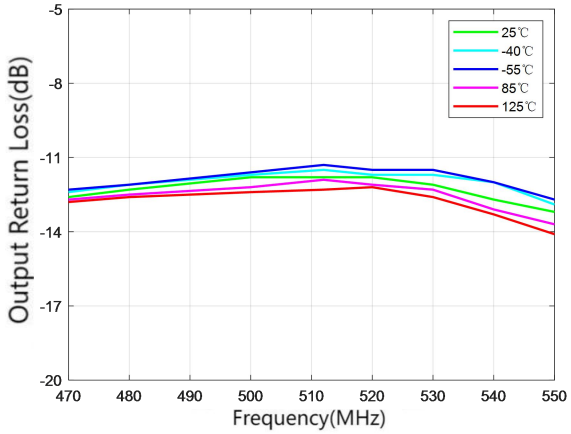
Parameters	Typ.								Units
Frequency	470	480	500	512	520	530	540	550	MHz
Gain	22.9	23.0	23.0	22.9	22.9	22.9	22.8	22.7	dB
Input Return Loss	-10.0	-10.7	-11.6	-11.4	-11.1	-10.6	-9.8	-9.1	dB
Output Return Loss	-12.6	-12.3	-11.8	-11.8	-11.8	-12.1	-12.7	-13.2	dB
Reverse Isolation	-29.5	-29.3	-29.1	-29.1	-29.1	-29.1	-29.1	-29.2	dB
Output Power for 1dB Compression	29.1	29.2	28.3	28.5	29.4	30.3	30.7	30.7	dBm
Output Third-Order Interception	46.5	46	43.2	41.8	41.4	41.3	40.7	40.4	dBm
Psat	31.6	31.9	32.5	32.7	32.9	33.0	33.1	33.1	dBm
Test Conditions: Vdd=+5V, I=249mA, OIP3 spacing=1MHz, Pout=+15dBm/tone, Temp=+25℃									



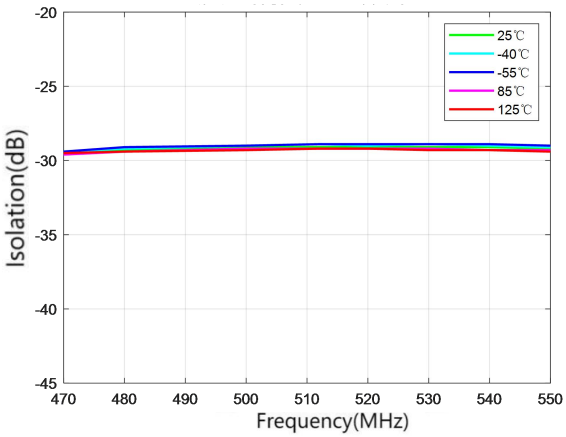
Gain



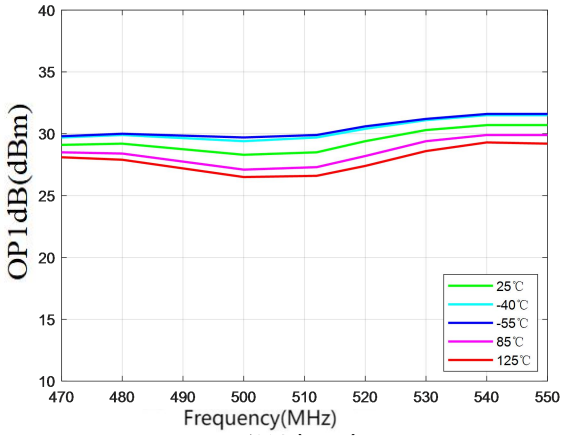
Input Return Loss



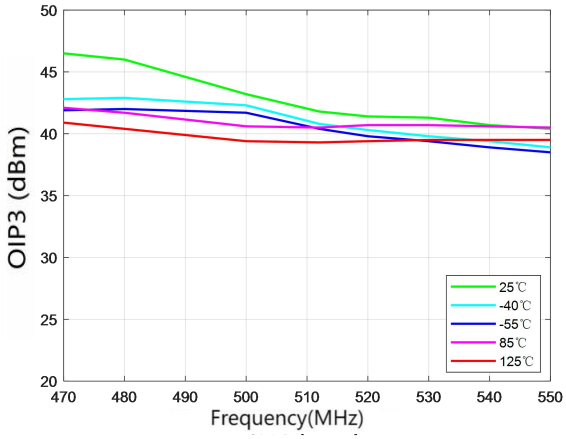
Output Return Loss



Reverse Isolation



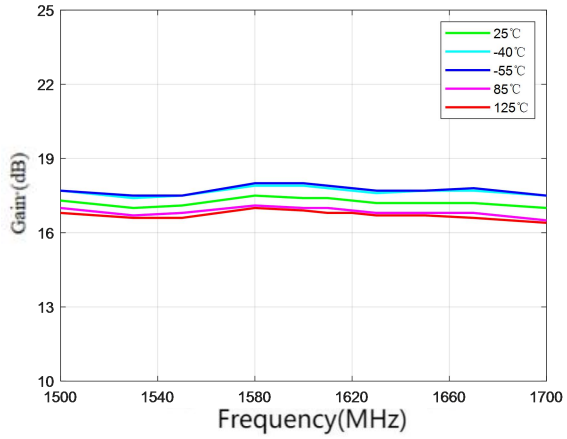
Output Power for 1dB Compression



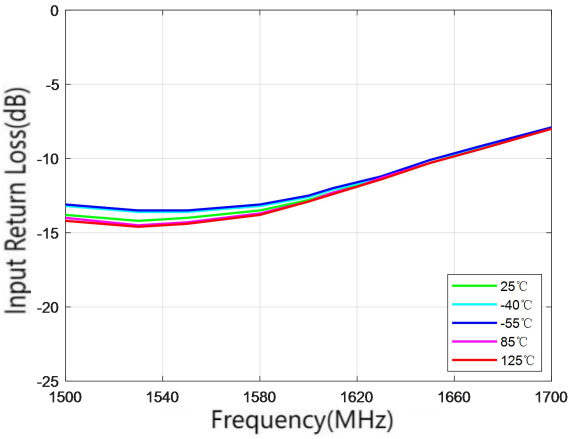
Output Third-Order Interception

Typical Performance (EVB test results+5V,1500MHz~1700MHz)

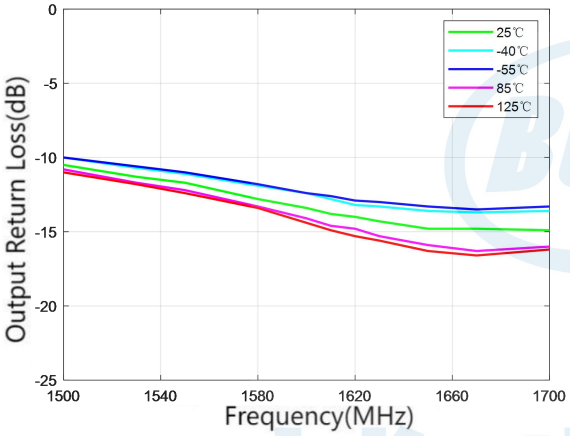
Parameters	Typ.											Units
Frequency	1500	1530	1550	1580	1600	1610	1620	1630	1650	1670	1700	MHz
Gain	17.3	17.0	17.1	17.5	17.4	17.4	17.3	17.2	17.2	17.2	17.0	dB
Input Return Loss	-13.8	-14.2	-14.0	-13.5	-12.8	-12.3	-11.8	-11.4	-10.3	-9.4	-8.0	dB
Output Return Loss	-10.5	-11.3	-11.7	-12.8	-13.4	-13.8	-14.0	-14.3	-14.8	-14.8	-14.9	dB
Reverse Isolation	-28.3	-28.2	-27.8	-27.5	-27.6	-27.6	-27.5	-27.4	-27.2	-27.1	-27.4	dB
Output Power for 1dB Compression	29.4	29.1	29.4	30.1	30.1	29.8	29.6	29.5	30.1	30.6	29.6	dBm
Output Third-Order Interception	48.3	48.4	47.9	44.1	44.6	45	45	44.8	44.6	43.7	42.3	dBm
Psat	31.7	31.7	32.1	32.5	32.5	32.4	32.4	32.3	32.4	32.6	32.5	dBm
Test Conditions: Vdd=+5V, I=239mA, OIP3 spacing=1MHz, Pout=+16dBm/tone, Temp=+25℃												



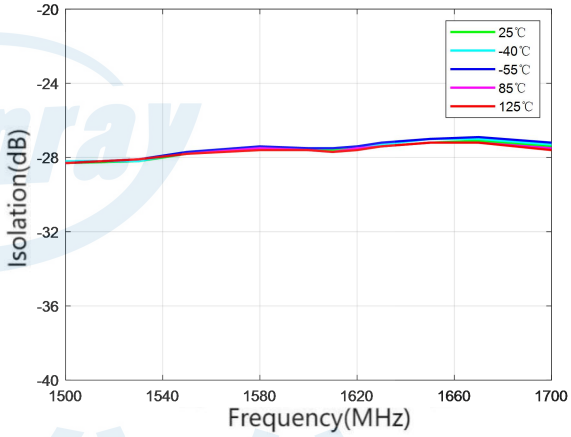
Gain



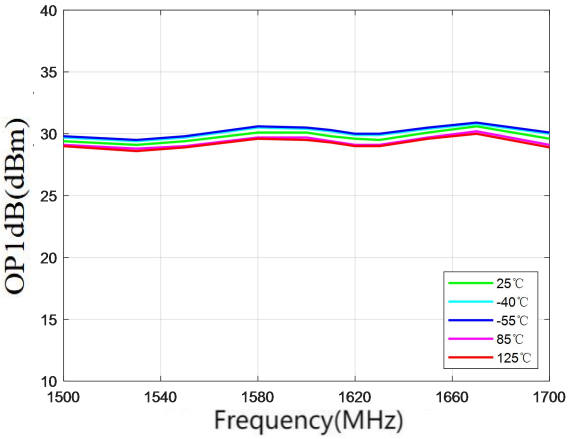
Input Return Loss



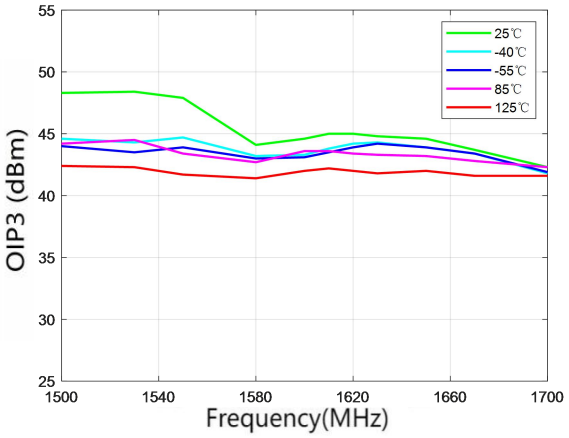
Output Return Loss



Reverse Isolation

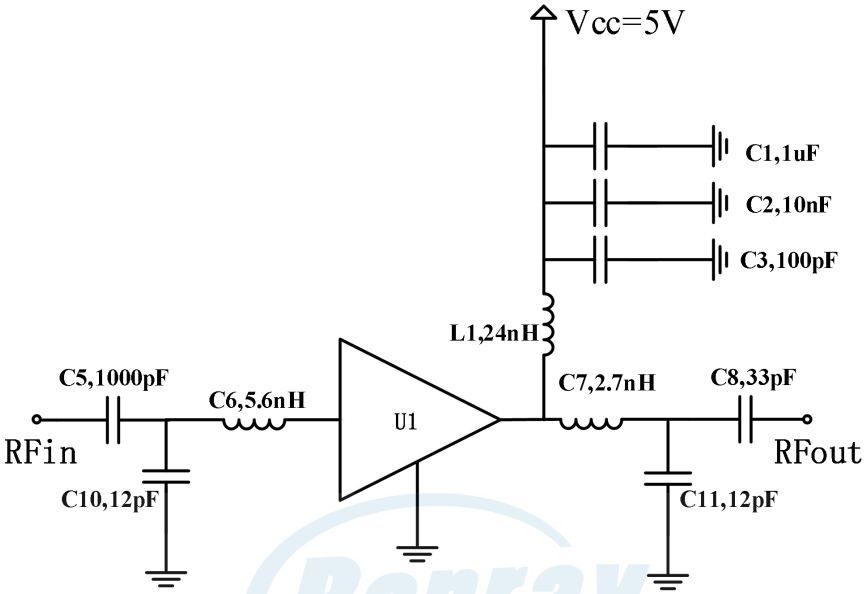


Output Power for 1dB Compression



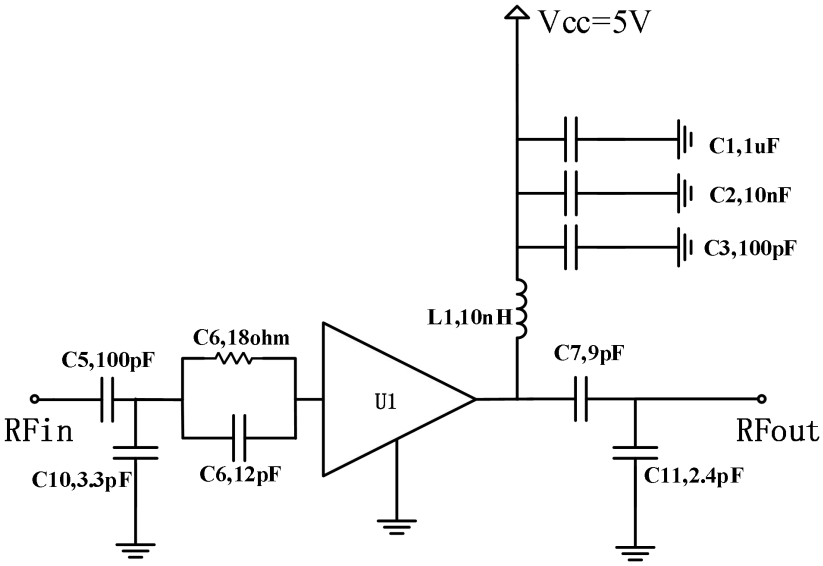
Output Third-Order Interception

Typical Application Schematic



Bill of Material

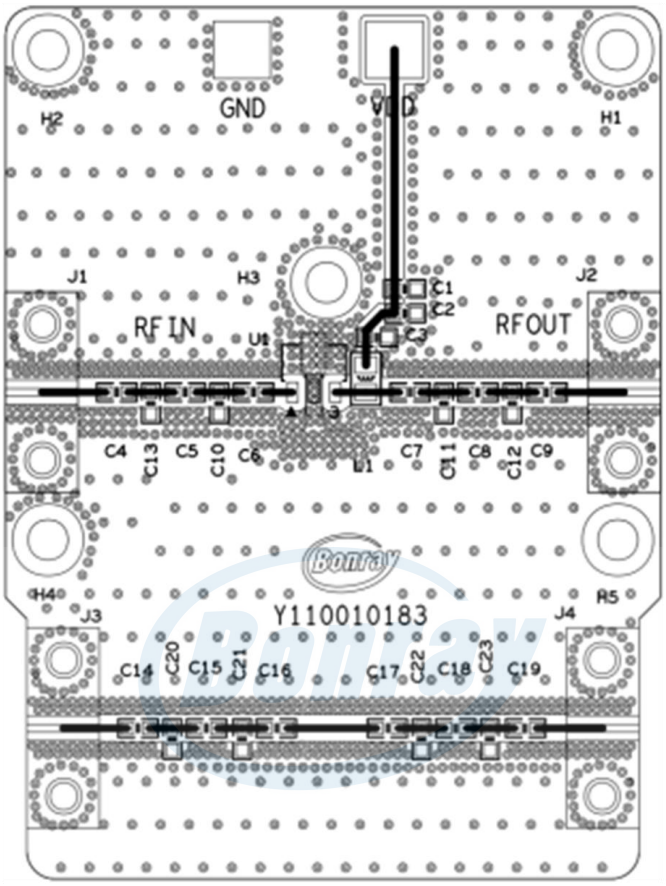
Designator	Package	Description	Part Number
L1	0603	24nH	0603HP-24NXGRU
C6	0402	5.6 nH	LQG15HS5N6S02D
C7	0402	2.7 nH	LQG15HS2N7S02D
C1	0603	1uF	GCM188R71C105KA64D
C2	0603	10nF	GRM188R71H103KA01J
C3	0603	100pF	GRM1885C1H101JA01D
C5	0402	1000pF	GRM155R71C102KA88
C8	0402	33pF	GRM1555C1H330JA01D
C10, C11	0402	12pF	GRM1555C1H120JA01D

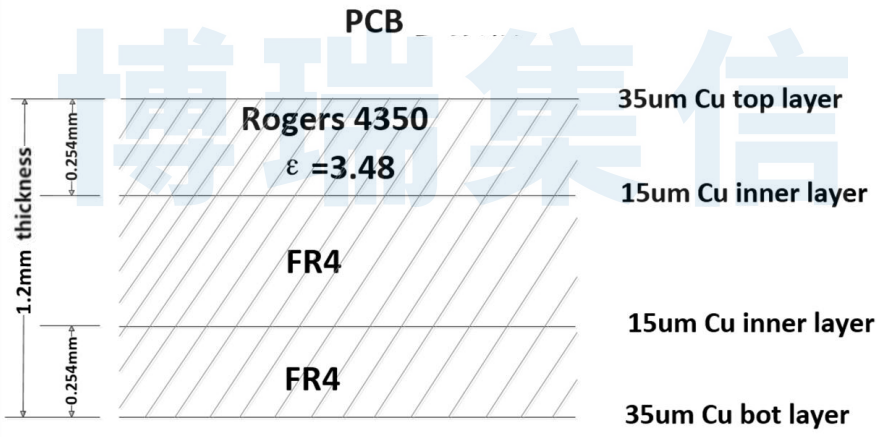


Bill of Material

Designator	Package	Description	Part Number
L1	0603	10nH	0603HP-10NX JEU
C6	0402	12pF	GRM1555C1H120JA01D
C6	0402	18 Ω	RC0402JR-0718RL
C7	0402	9pF	GRM1555C1H9R0CA01D
C1	0603	1uF	GRM188R61C105KA93D
C2	0603	10nF	GRM188R71H103KA01J
C3	0603	100pF	GRM1885C1H101JA01D
C5	0402	100pF	GRM1555C1H101JA01D
C11	0402	2.4 pF	GJM1555C1H2R4WB01
C10	0402	3.3 pF	GRM1555C1H3R3CA01D

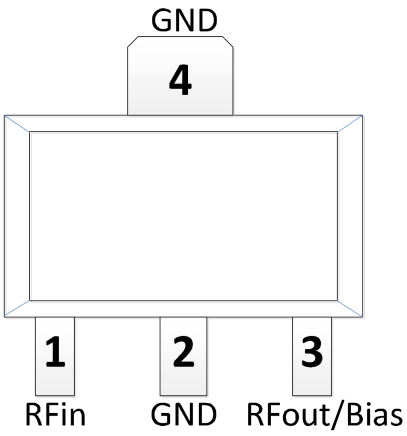
PCB Evaluation Board





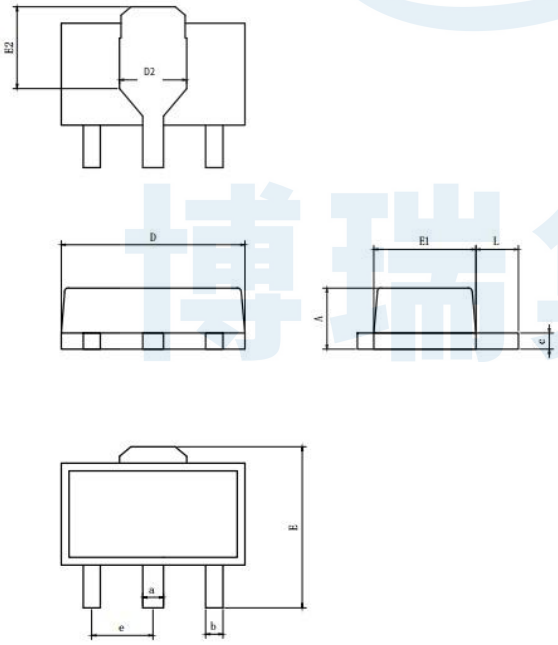
50 ohms Impedance Signal Lines： width=0.53mm,spacing=0.53mm

Pin Configuration and Description



Pin Number	Pin Name	Description
1	RFin	Rf input pins;
2, 4	GND	Ground pin; This pin and the package substrate must be connected to the RF/DC ground.
3	RFout/Bias	Rf output pin;

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