Product Features

Frequency: 400MHz ~ 5GHz

Gain: 13.1dB@4.7GHz

OIP3: 41.1dBm@4.7GHz

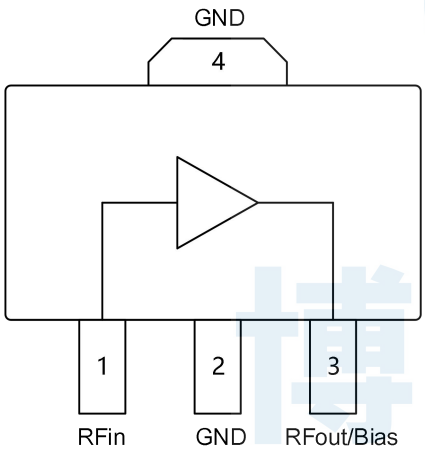
PdB Compression: 24.2 dBm@4.7GHz

Noise Figurer: 5.1dB@4.7GHz

Vdd=+5V, I_{DQ} 89mA

Package: SOT89 (4.5mm×4.1mm)

Functional Block Diagram



General Description

The BR9541TAJ is a 1/4W driven amplifier based on the GaAs process. The product is housed in SOT89 package, ,It provides 36dB gain at 2.6GHz. The 1dB compression point is greater than 30.2dBm and the OIP3 is greater than 49.4dBm.Thanks to the product matching flexible, the application frequency band can be adjusted by peripheral components, the drive amplifier for any frequency band matching, to achieve high linear output products. The product is suitable for wireless communication infrastructure, FDD/TDD base station, radar, high power amplifier driver stage and other applications.

Ordering Information

Part Number	Package	Description
BR9541TAJ	SOT89	400MHz to 5GHz 1/4W Drives Amplifier

Typical Performance (EVB test results+5V, 600MHz~5000MHz)

Parameters	Typ.									Units
Frequency	600	700	800	900	1000	1100	1200	1300	1400	MHz
Gain	17.4	17.4	17.5	17.5	17.5	17.5	17.4	17.3	17.3	dB
Input Return Loss	-4.4	-4.5	-4.8	-5.0	-5.2	-5.5	-5.9	-6.3	-6.8	dB
Output Return Loss	-6.0	-7.7	-9.8	-12.7	-17.1	-24.9	-28.7	-20.2	-15.9	dB
P1dB Compression	24.4	24.2	24.4	24.5	24.7	25.1	24.6	25.2	24.8	dBm
OIP3	38.4	38.9	38.8	40.4	38.4	39.7	38.2	38	38.3	dBm
Frequency	1500	1600	1700	1800	1900	2000	2100	2200		MHz
Gain	17.4	17.4	17.4	17.5	17.1	16.6	15.6	14.3		dB
Input Return Loss	-7.5	-8.3	-9.2	-9.6	-8.8	-6.9	-5.0	-3.5		dB
Output Return Loss	-14.0	-12.5	-12.5	-13.1	-15.4	-19.1	-21.6	-16.2		dB
P1dB Compression	24.3	24.5	26.0	25.7	25.9	25.9	24.0	23.8		dBm
OIP3	35.8	37.1	34.6	35.7	36.1	35.9	37.5	36.5		dBm
Test Conditions: Vdd=+5V, I=89mA; OIP3 spacing=1MHz,Pout=6dBm/tone; TA=+25℃										

Typical Performance (EVB test results+5V, 600MHz~5000MHz)

Parameters	Typ.							Units
Frequency	4400	4500	4600	4700	4800	4900	5000	MHz
Gain	12.14	12.61	12.99	13.08	13.15	12.99	12.73	dB
Input echo	-4.98	-6.32	-7.62	-9.42	-10.60	-11.43	-11.77	dB
Output echo	-19.47	-18.46	-16.44	-13.97	-11.46	-9.72	-8.16	dB
isolation	-25.82	-25.28	-24.93	-24.90	-24.97	-25.19	-25.60	dB
Noise figure	6.56	6.00	5.51	5.11	4.88	4.66	4.58	dB
P1dB compression	25.25	24.41	23.74	24.18	24.28	23.84	23.46	dBm
OIP3	37.40	38.20	39.10	41.10	44.10	43.10	40.80	dBm
Test conditions: Vdd=+5V, I=89mA; OIP3 spacing=1MHz,Pout=12dBm/tone; TA=+25℃								

Absolute Maximum Ratings

Maximum Operating Voltage (Vdd) : +6V

Maximum RF input Power: +28dBm

ESD Rating: Class 2 (< 2500V)

Recommended Operating Conditions

Power Supply : +5V

Static Operating Current: 89mA

Storage Temperature: -65℃ ~ +150℃

Operating Temperature: -55℃ ~ +125℃

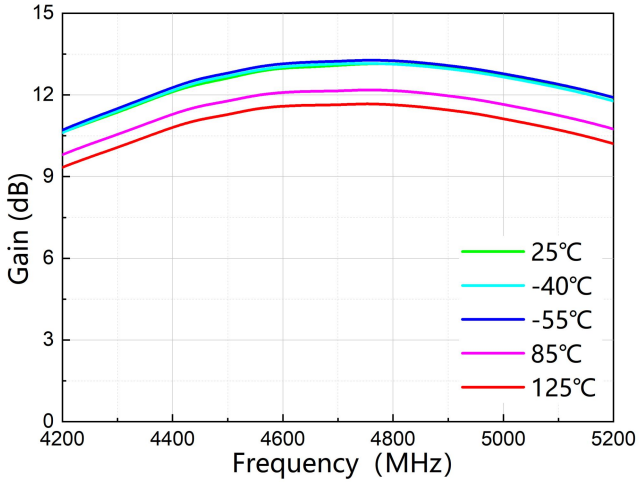
Note: Operation of the device outside the parameter ranges given absolute-maximum-ratings conditions may cause permanent damage, and. exposure to absolute-maximum-ratings conditions for extended periods will affect the reliability.

ESD WARNING

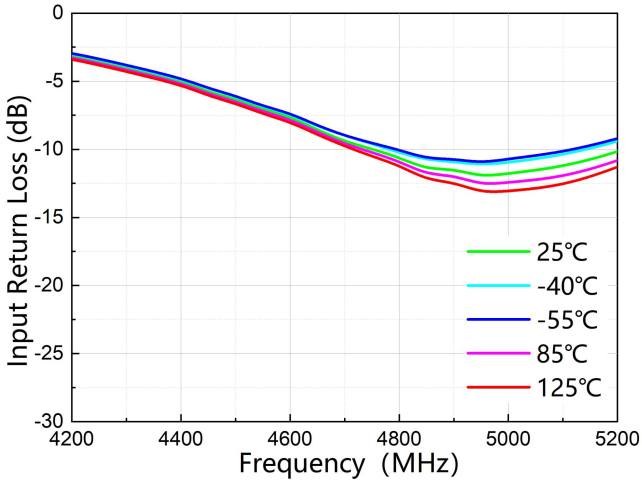
ELECTROSTATIC SENSITIVE DEVICE

OBSERVE HANDLING PRECAUTIONS

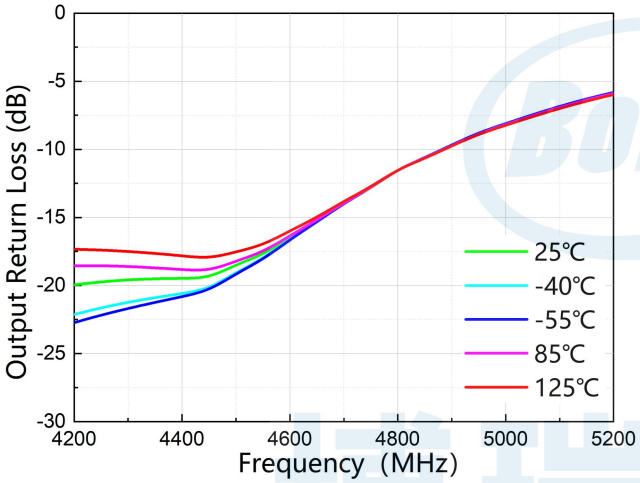
ESD Rating: Class 2



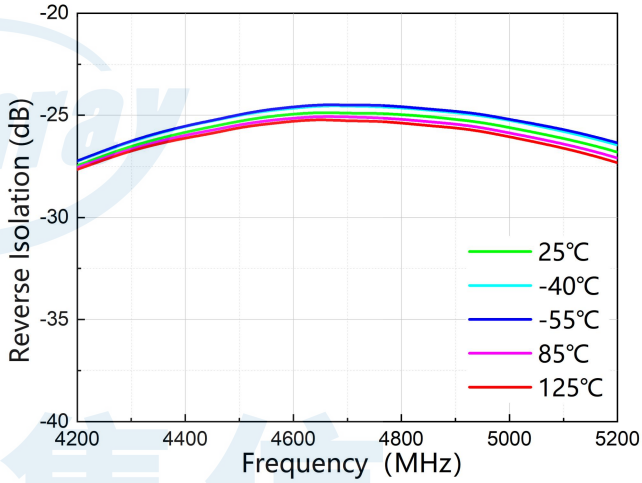
Gain vs. Freq



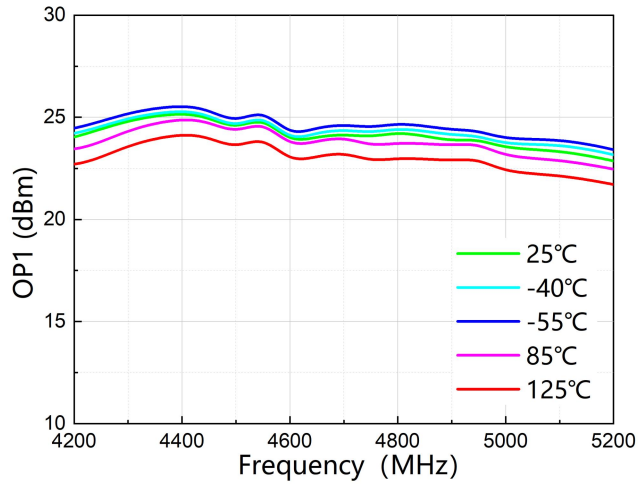
Input Return Loss vs. Freq



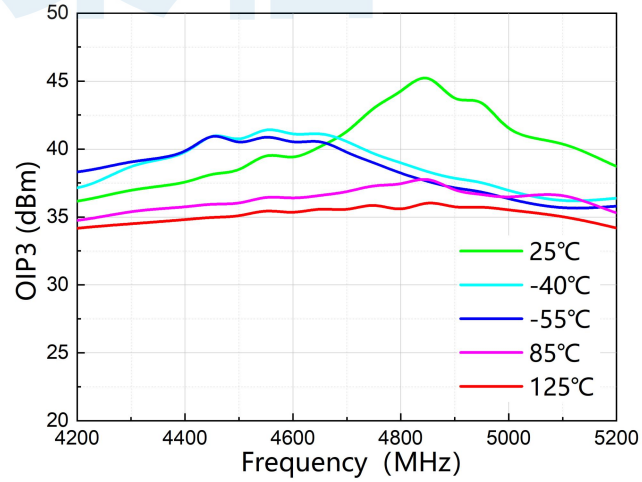
Output Return Loss vs. Freq



Reverse Isolation vs. Freq

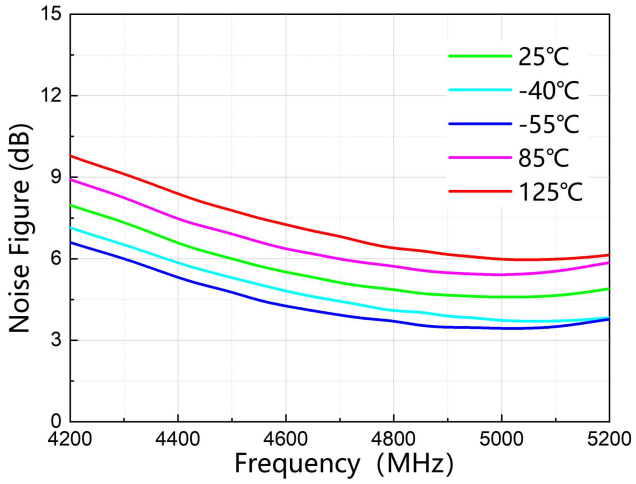


Output Power for 1dB Compression vs. Freq

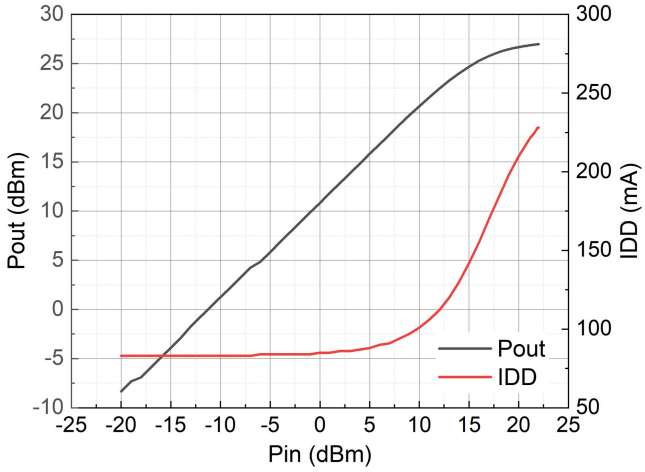


Output Third-Order Interception vs. Freq

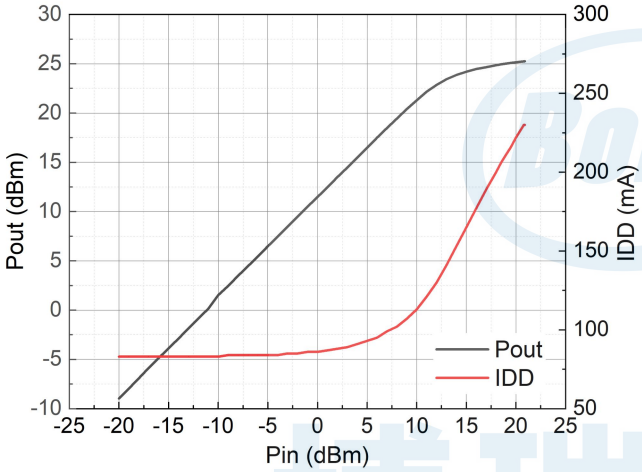
Pout=19dBm/tone, fspacing=1MHZ



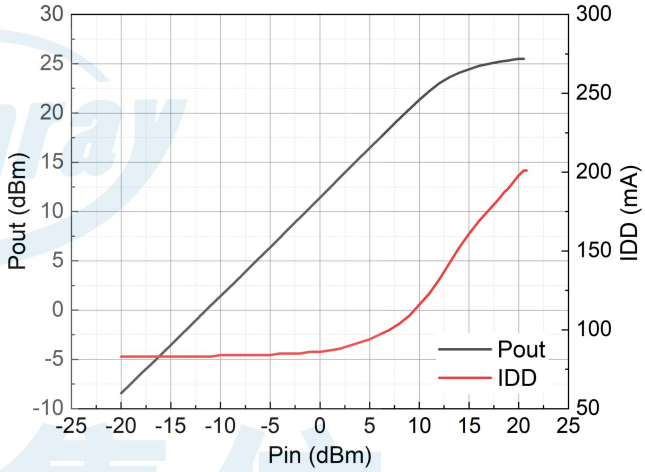
Noise Figure vs. Freq



P_{out}, IDD vs. P_{in} @4.4GHz

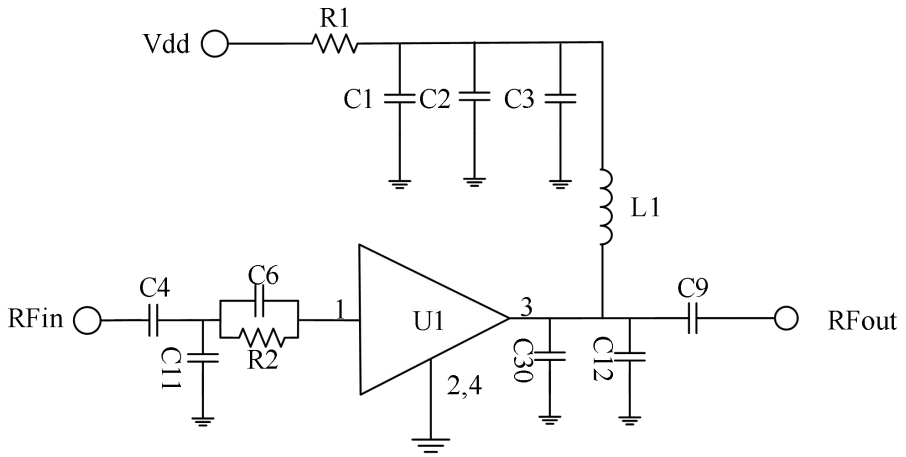


P_{out}, IDD vs. P_{in} @4.8GHz



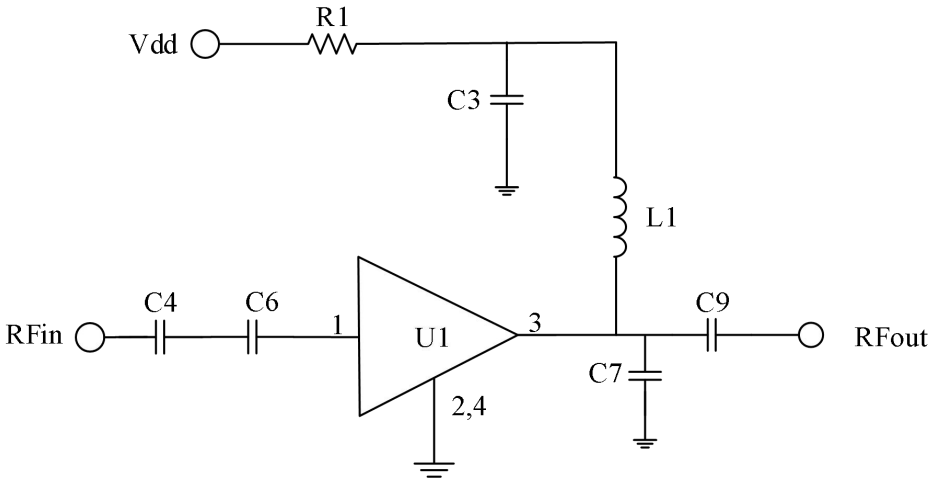
P_{out}, IDD vs. P_{in} @5GHz

Application infomation



Bill of Material (0.6GHz~2.2GHz)

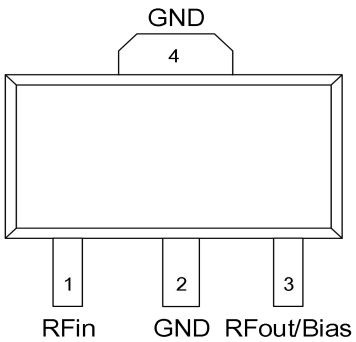
Designator	Package	Description	Part Number
U1	SOT89	Drive amplifier 400MHz~5GHz	BR9541TAJ
R1	0603	0 Ω	RC0603JR-070RL
C1	0603	1uF	CC0603KRX5R9BB105
C2	0603	10nF	GRM188R71H103KA01J
C3	0402	100pF	GRM1555C1H101JA01D
C4, C9	0603	100pF	GRM1885C1H101JA01D
C6	0402	15pF	GRM1555C1H150JA01D
R2	0402	10 Ω	RC0402FR-0710RL
C11	0402	2.1 pF	GRM155C1H2R1CA01D
C12	0402	1pF	GRM1555C1H1R0CA01D
C30	0402	1.3 pF	GRM1555C1H1R3BA01D
L1	0603	43nH	0603HP-43NXGLW



Bill of Material (4.4GHz~5GHz)

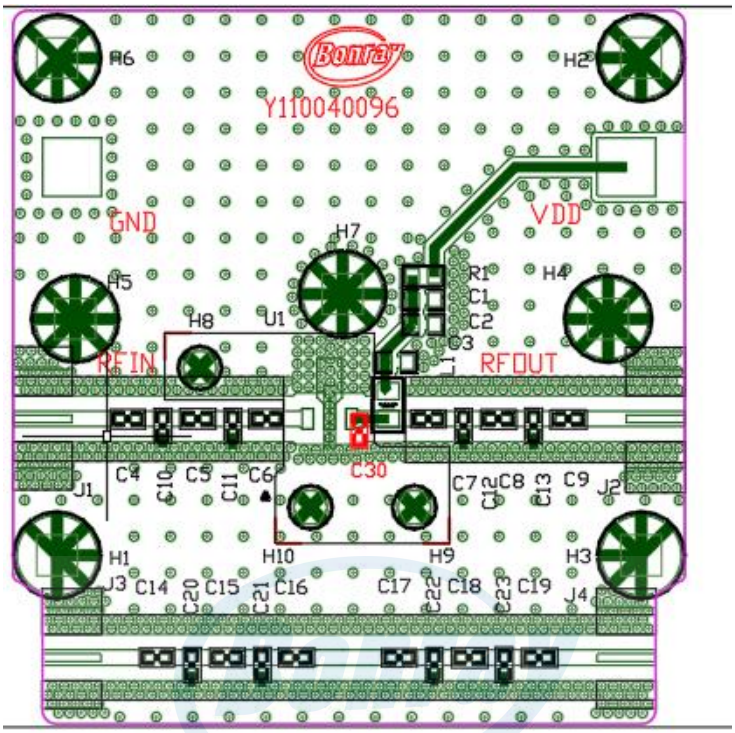
Designator	Package	Description	Part Number
U1	SOT89	Drive amplifier 400MHz~5GHz	BR9541TAJ
C7	0603	0.3pF (1-pin to ground of C7)	GQM1875C2ER30BB12#
C4	0603	2pF	GQM1875C2E2R0BB12#
C6	0402	0.2 pF	GRM1555C1HR20WA01
C9	0402	8.2 pF	GRM1555C1H8R2CA01D
C3	0603	0.22 uF	CT41G-0603-2X1-10V-224-K
L1	0603	10nH	LQW18AN10NG80
R1	0402	0 Ω	HP02WAJ0000TCE

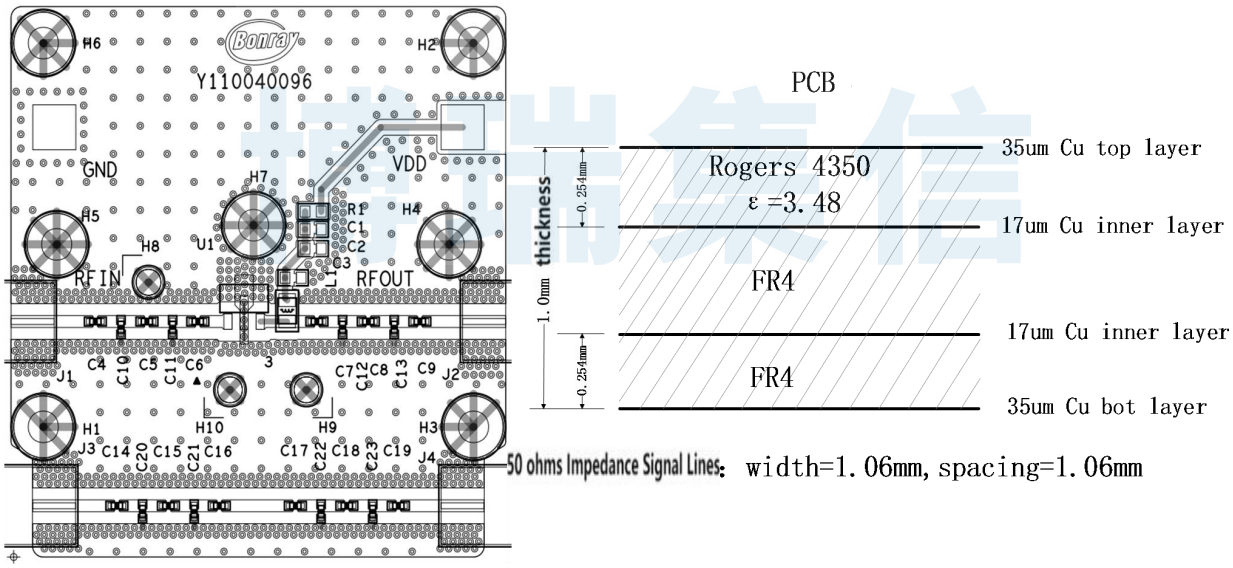
Pin layout and Description



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

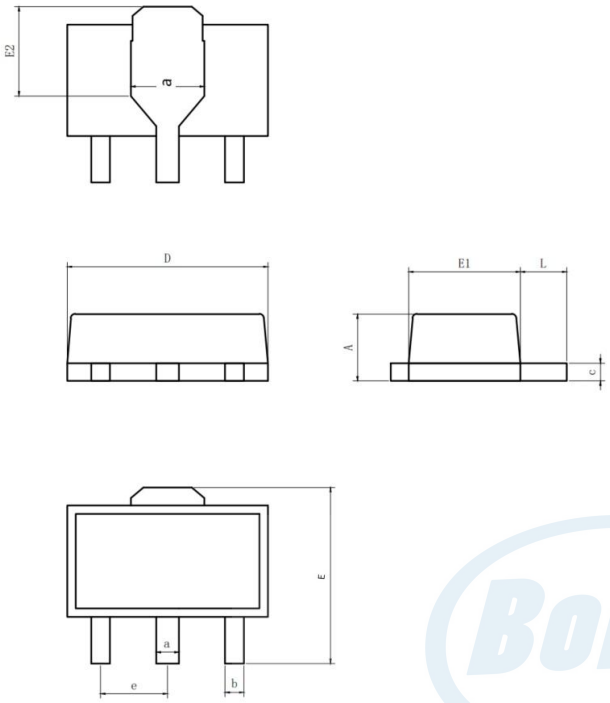
Evaluation Board





Note: The C5 and C8 actually use 0 ohm for short-circuit

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