Product Features

Frequency: 400MHz ~ 5GHz

Gain: 11.5dB@4.7GHz

OIP3: 40dBm@4.7GHz

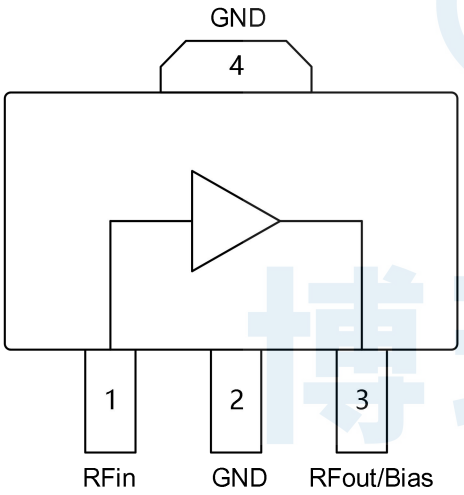
P1dB Compression: 28.3dBm@4.7GHz

Noise Figure: 4.1dB@4.7GHz

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

Package: SOT89 (4.5mm×4.1mm)

Functional Block Diagram



General Description

The BR9542TAJ is a 0.5W driven amplifier constructed with GaAs process. The product is housed in a SOT89 package, small signal gain 11.5dB at 4.7GHz, achieves a peak power of 28.3dBm P1dB and 40dBm OIP3. Product matching is flexible, in the application frequency band can be adjusted by peripheral components, the drive amplifier for any frequency band matching, to achieve high linear output of 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
BR9542TAJ	SOT89	400MHz to 5GHz 1/2W Drive Amplifier

Typical Performance (EVB test results +5V,600MHz ~ 1300MHz)

Parameters	Typ.								Units
Frequency	600	700	800	900	1000	1100	1200	1300	MHz
Gain	19.2	18.6	18.2	18.1	18.4	18.7	18.5	17.2	dB
Input Return Loss	-5.8	-5.7	-5.7	-6.1	-7.1	-9.7	-14.2	-13.9	dB
Output Return Loss	-9.8	-8.0	-7.2	-7.4	-8.5	-10.4	-9.6	-6.0	dB
P1dB	26.6	27.3	27.7	28.6	28.1	27.8	27.0	26.2	dBm
OIP3	38.0	39.4	37.7	37.5	38.2	39.8	37.5	39.7	dBm
Test Condition: Vdd=+5V, I=89mA; OIP3 tested with spacing=1MHz,Pout=15dBm per tone; TA=+25℃									

Typical Performance (EVB test results +5V,4400MHz ~ 5000MHz)

Parameters	Typ.							Units
Frequency	4400	4500	4600	4700	4800	4900	5000	MHz
Gain	10.7	10.9	11.2	11.5	11.7	11.9	12.1	dB
Input Return Loss	-4.0	-4.6	-5.1	-5.7	-6.2	-6.7	-7.5	dB
Output Return Loss	-10.0	-10.4	-11.0	-12.0	-13.1	-14.4	-15.2	dB
Reverse Isolation	-26.3	-25.8	-25.5	-25.2	-25.1	-24.9	-24.9	dB
Noise Figure	4.7	4.5	4.3	4.1	4.0	3.7	3.6	dB
Output Power for 1dB Compression	27.3	28.7	28.4	28.3	28.7	28.3	27.8	dBm
Output Third-Order Interception	35.7	36.4	37.1	40.0	41.7	38.9	38.6	dBm
Test Conditions: Vdd=+5V, I=89mA; OIP3 tested with spacing=1MHz,Pout=19dBm per tone; TA=+25℃								

Absolute Maximum Ratings

Maximum Operating Voltage (Vdd) : +6.5V

Maximum RF input Power: +31dBm

ESD Rating: Class 2 (< 4000V)

Recommended Operating Conditions

Power Supply Voltage: +5V

Static Operating Current: 89mA

Storage Temperature: -65℃ ~ +150℃

Operating Temperature: -55℃ ~ +125℃

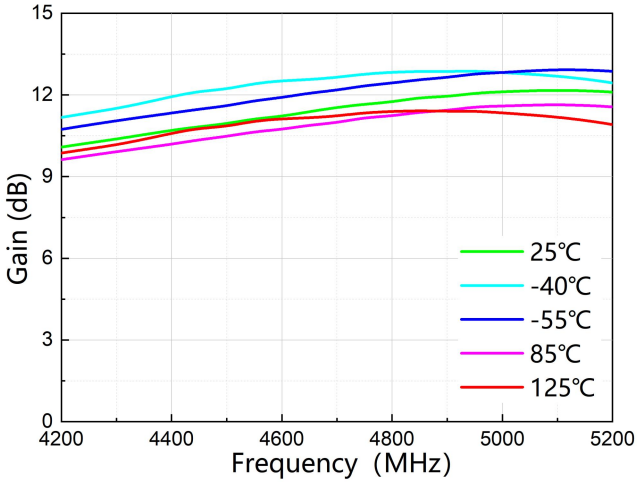
Note: Operation of the device outside the parameter ranges given absolute-maximum-ratings conditions may cause permanent damage, and. exposure to absolute-maximum-ratings conditions for extended periods will affect the reliability.

ESD WARNING

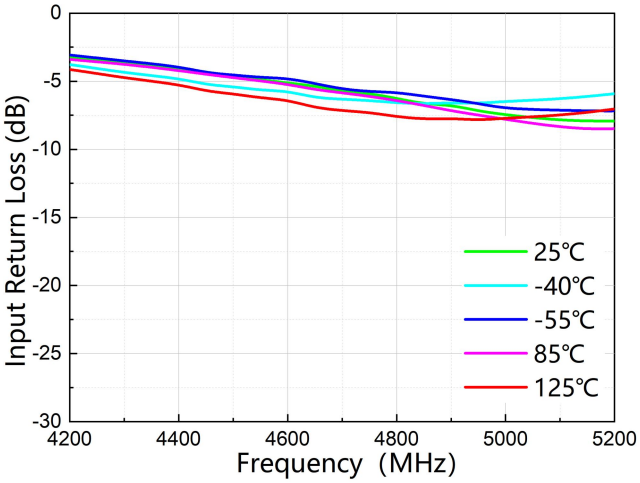
ELECTROSTATIC SENSITIVE DEVICE

OBSERVE HANDLING PRECAUTIONS

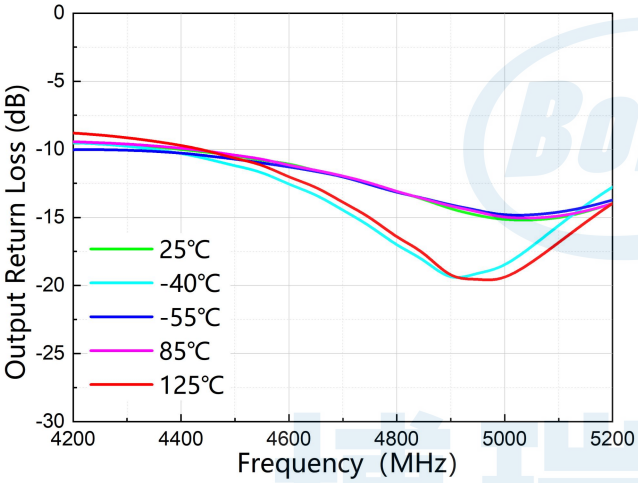
ESD Rating: Class 2



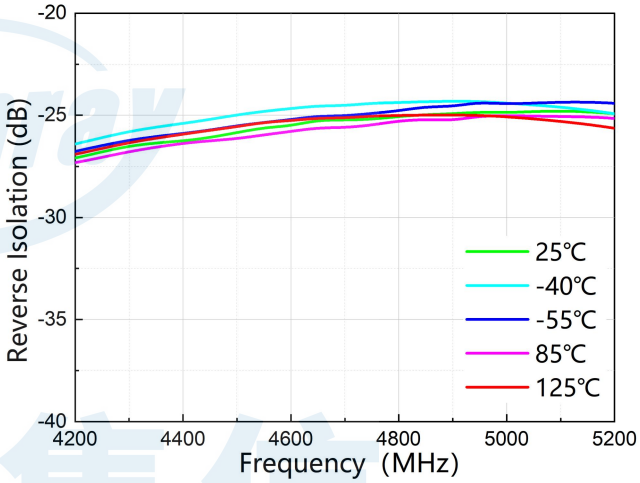
Gain vs. Freq



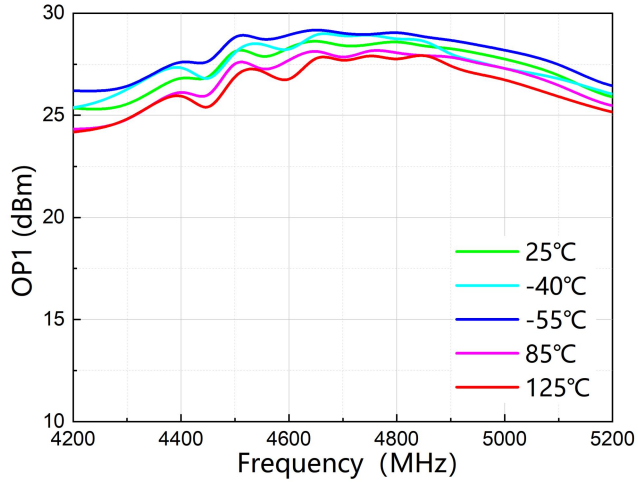
Input Return Loss vs. Freq



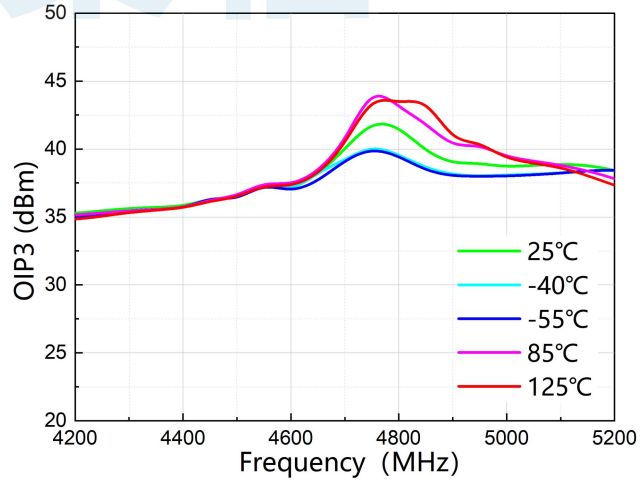
Output Return Loss vs. Freq



Reverse Isolation vs. Freq

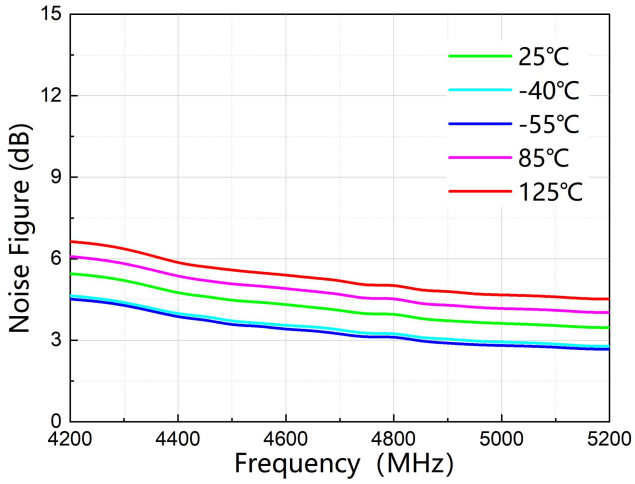


Output Power for 1dB Compression vs. Freq

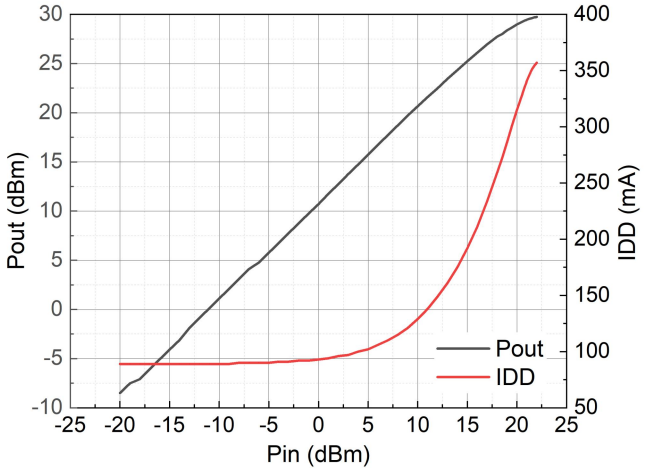


Output Third-Order Interception vs. Freq

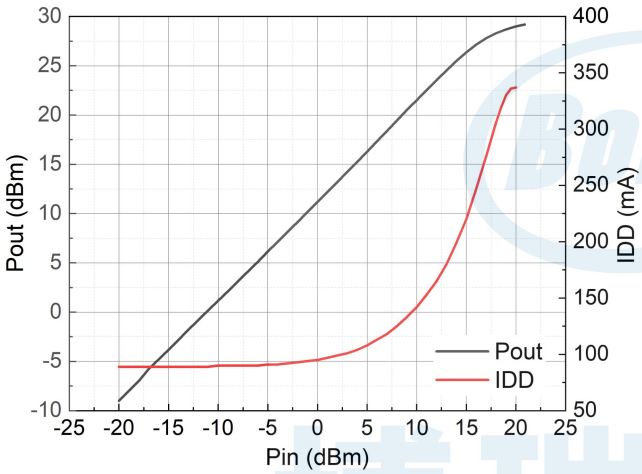
Pout=19dBm/tone, spacing=1MHZ



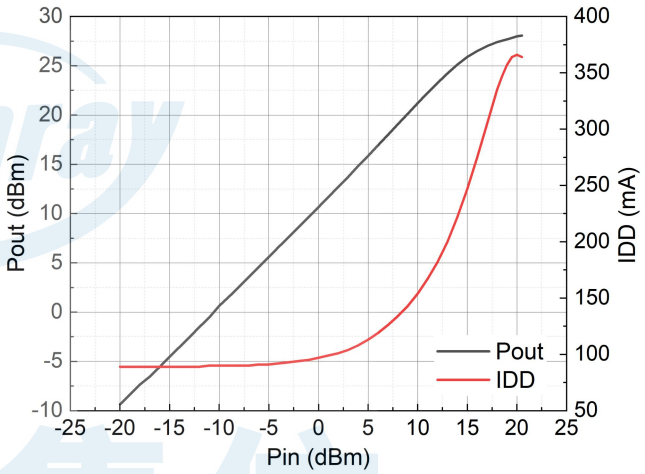
Noise Figure vs. Freq



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

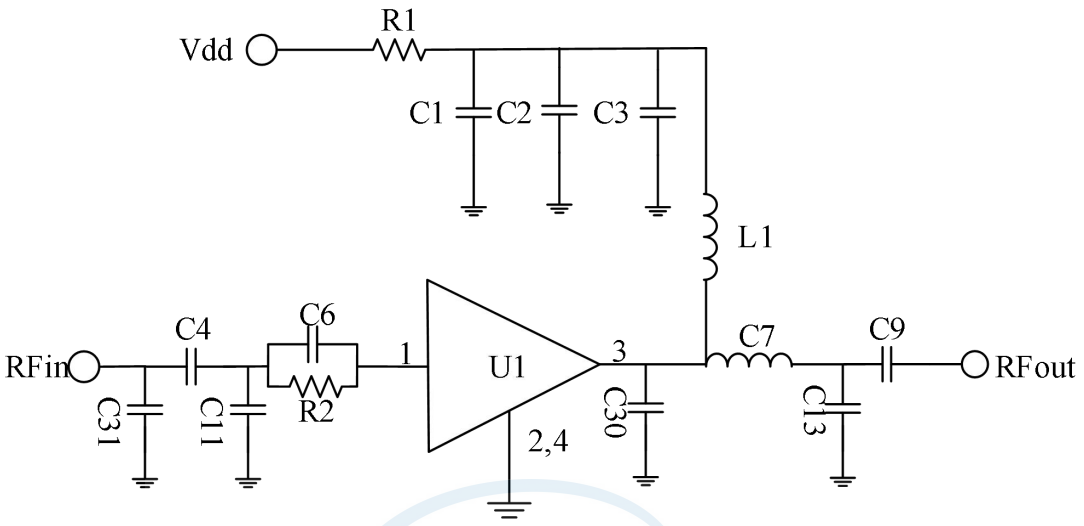


P_{out}, IDD vs. P_{in} @ 4.8GHz



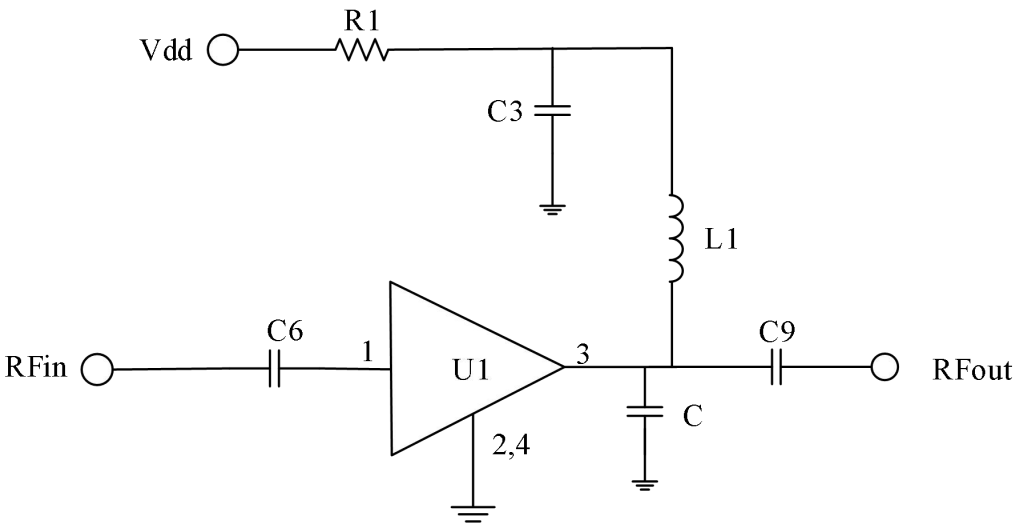
P_{out}, IDD vs. P_{in} @ 5GHz

Typical Application Schematic



Bill of Material (0.6GHz~1.3GHz)

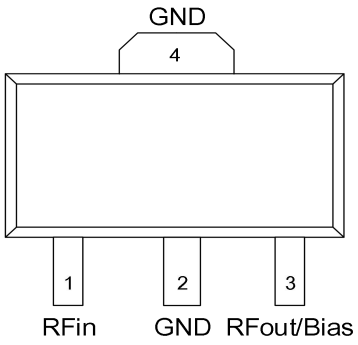
Designator	Package	Description	Part Number
U1	SOT89	Drive amplifier, 400MHz~5GHz	BR9542TAJ
R1	0603	0 Ω	RC0603JR-070RL
C1	0603	1uF	CC0603KRX5R9BB105
C2	0603	10nF	GRM188R71H103KA01J
C3	0402	100pF	GRM1555C1H101JA01D
L1	0603	43nH	0603HP-43NXGLW
C31	0402	2.7 pF	GRM1555C1H2R7CA01D
C4, C9	0603	100pF	GRM1885C1H101JA01D
C11	0402	2.4 pF	GRM155C1H2R1CA01D
C6	0402	15pF	GRM1555C1H150JA01D
R2	0402	10 Ω	RC0402FR-0710RL
C30	0402	6pF	GRM1555C1H1R3BA01D
C7	0402	2.4 nH	LQW15AN2N4C00D
C13	0402	3.6 pF	GRM1555C1H3R6CA01D



Bill of Material (4.4GHz~5GHz)

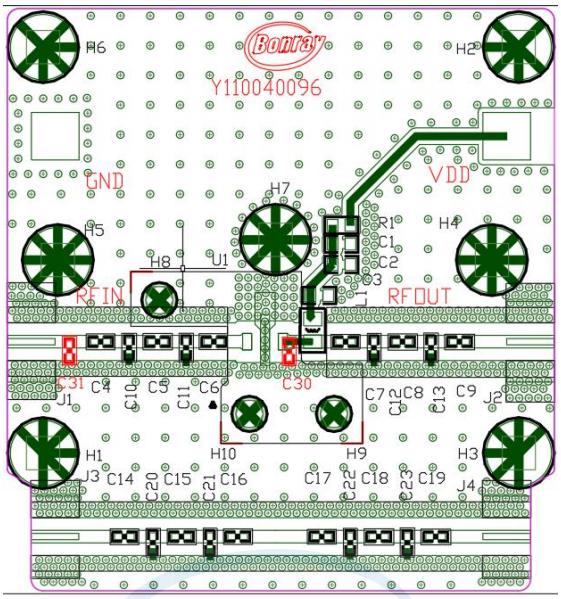
Designator	Package	Description	Part Number
U1	SOT89	Drive amplifier, 400MHz~5GHz	BR9542TAJ
C (chip 3 pin to ground)	0603	0.5 pF	GQM1875G2ER50BB12#
C6	0603	0.3 pF	GQM1875C2ER30BB12#
C9	0402	2.2 pF	GRM1555C1H2R2BA01J
C3	0603	0.22 uF	CT41G-0603-2X1-10V-224-K
L1	0603	10nH	LQW18AN10NG80
R1	0402	0 Ω	HP02WAJ0000TCE

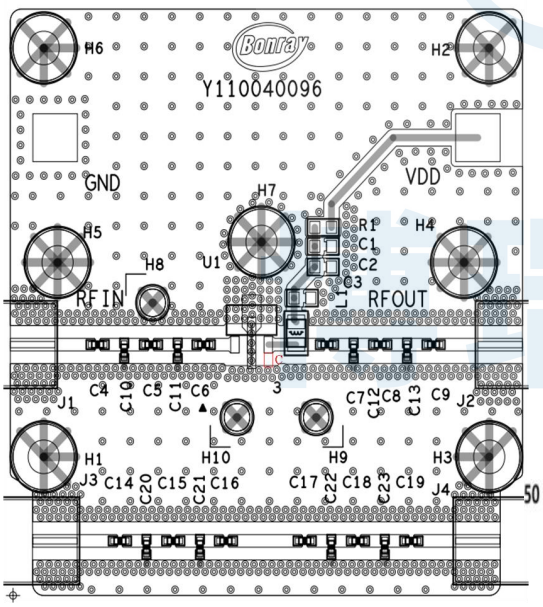
Pin Configuration and Description

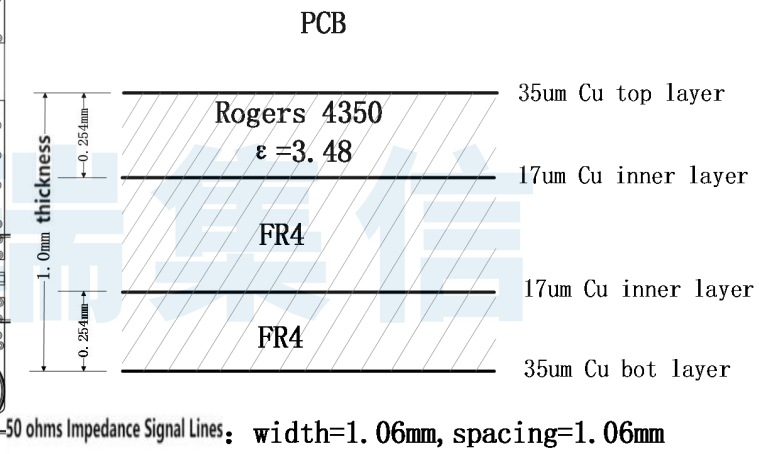


Pin Number	Pin Name	Description
1	RFin	Rf input pins; **External DC block required**
2, 4	GND	Ground pins; This pin and the package substrate must be connected to the RF/DC ground.
3	RFout/Bias	Rf output and DC bias voltage supply pins.

PCB Evaluation Board

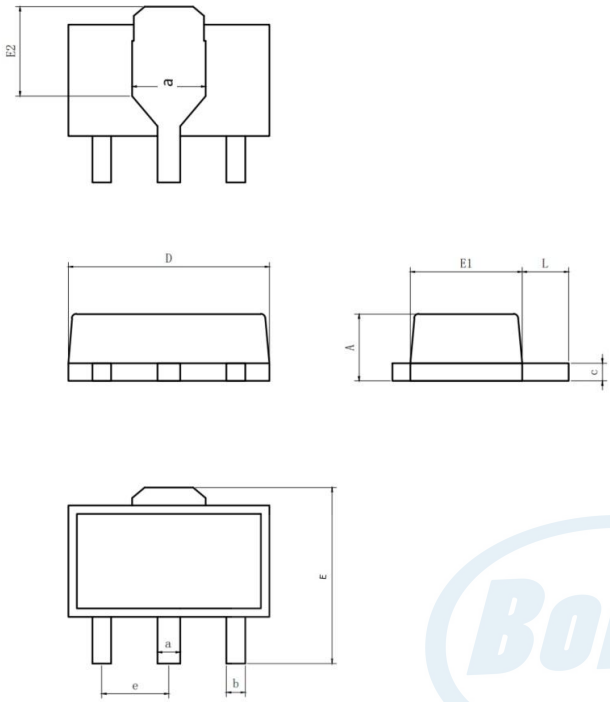






Note: The C4, C5, C8, and C9 digit numbers actually use 0 ohm lines for short-circuit processing.

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