Product Features

Frequency: 30MHz~8GHz

Gain: 17.5dB@2GHz

Output Power for 1dB Compression: 14.0dBm@2GHz

Noise Figure: 4.2dB@2GHz

Output Third-Order Interception: 26.1dBm@2GHz

Supply Current: 45mA @ Vdd=+5V

Package: DFN6

Applications

PTP

PMP

LMDS

Cellular

WLAN

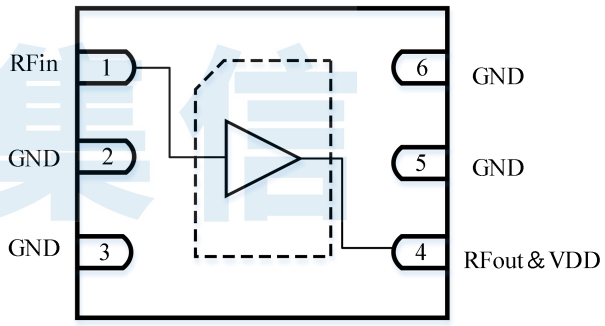
Ordering Information

Part Number	Package	Description
BR9034DC	DFN6	30MHz ~ 8GHz Gain Block Amplifier

General Description

BR9034DC is a broadband MMIC gain block amplifier manufactured using GaAs HBT process. Covering a frequency range of 30MHz to 8GHz, the amplifier is internally matched to 50 ohms, and only requires an external RF choke and blocking/bypass capacitors. Designed with an external bias resistor, the amplifier provides flexibility and stability. The product has the advantage of low-power consumption and high performance in the broadband range, which can meet the general-purpose RF and microwave amplifier requirements.

Functional Block Diagram



Electrical Specifications

Parameter	Conditions	Min.	Typ.	Max.	Units
Gain	1GHz	-	18.0	-	dB
	4GHz	-	16.8	-	dB
	8GHz	-	15.0	-	dB
Output Power for 1dB Compression	1GHz	-	13.8	-	dBm
	4GHz	-	14.0	-	dBm
	8GHz	-	13.0	-	dBm
Output Third-Order Interception	1GHz	-	26.4	-	dBm
	4GHz	-	26.1	-	dBm
	8GHz	-	20.2	-	dBm
Noise Figure	1GHz	-	4.0	-	dB
	4GHz	-	4.6	-	dB
	8GHz	-	5.2	-	dB
Input Return Loss	1GHz	-	-12.9	-	dB
	4GHz	-	-14.0	-	dB
Output Return Loss	1GHz	-	-10.6	-	dB
	4GHz	-	-12.2	-	dB
Temperature Gain Stability	2GHz	-	-0.0034	-	dB/℃
Supply Voltage	-	-	5	-	V
Supply Current	-	-	45	-	mA
Test Condition: VDD=+5V, I=45mA; OIP3 spacing=1MHz, Pout=0dBm/tone; TA=+25℃					

Absolute Maximum Ratings

Maximum Supply Voltage (Vdd): +5.5V

Maximum RF input Power: 17dBm

Recommended Operating Conditions

Supply Voltage: +5V

Supply Current: 45mA

Operating Temperature: -55℃ ~ +125℃

Storage Temperature: -65℃ ~ +150℃

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.

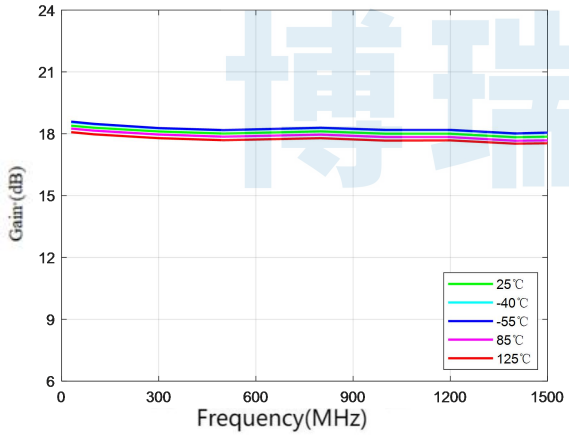
ESD WARNING

ELECTROSTATIC SENSITIVE DEVICE

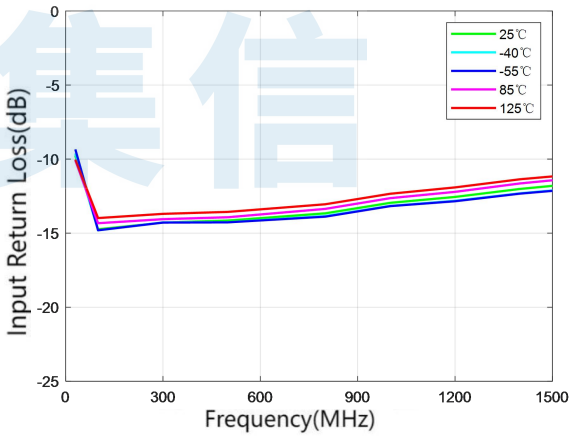
OBSERVE HANDLING PRECAUTIONS

Typical Performance (EVB test results at +5V supply voltage for 30MHz~1400MHz)

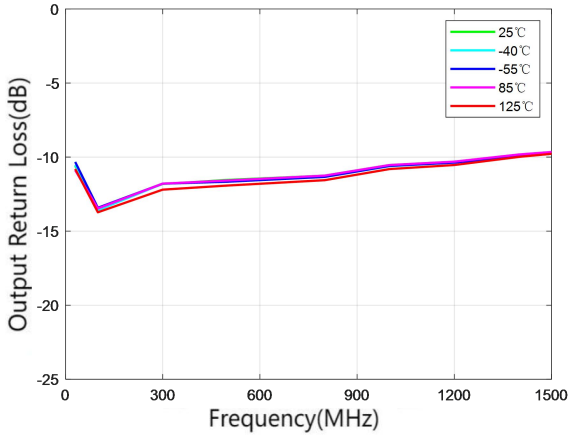
Parameter	Typ.								Units
Frequency	30	100	300	500	800	1000	1200	1400	MHz
Gain	18.3	18.2	18.0	17.9	18.0	17.9	17.8	17.6	dB
Input Return Loss	-9.8	-14.7	-14.3	-14.1	-13.7	-13.0	-12.6	-12.0	dB
Output Return Loss	-10.6	-13.5	-11.8	-11.5	-11.3	-10.5	-10.3	-9.9	dB
Reverse Isolation	-21.1	-21.4	-21.6	-21.3	-21.3	-21.3	-21.7	-21.7	dB
Output Power for 1dB Compression	14.2	14.3	14.2	14.3	14.1	13.8	13.7	13.7	dBm
Noise Figure	5.7	4.2	4.1	4.1	4.2	4.0	4.3	4.3	dB
Output Third-Order Interception	28.7	27.1	26.3	26.9	26.6	26.4	26.9	26.4	dBm
Test Condition: VDD=+5V, I=45mA, OIP3 spacing=1MHz, Pout=0dBm/tone, TA=+25°C									



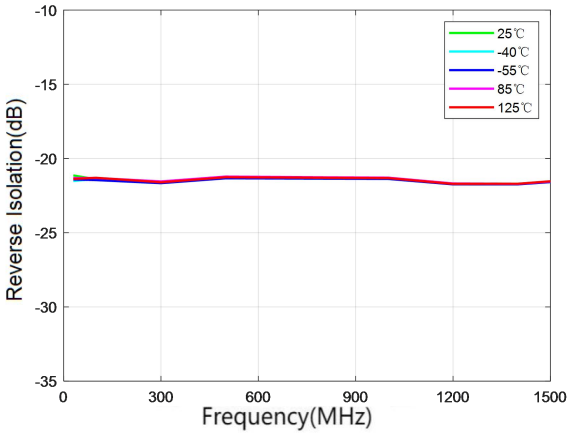
Gain



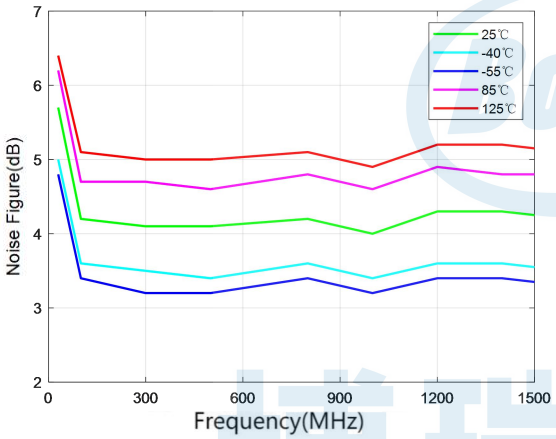
Input Return Loss



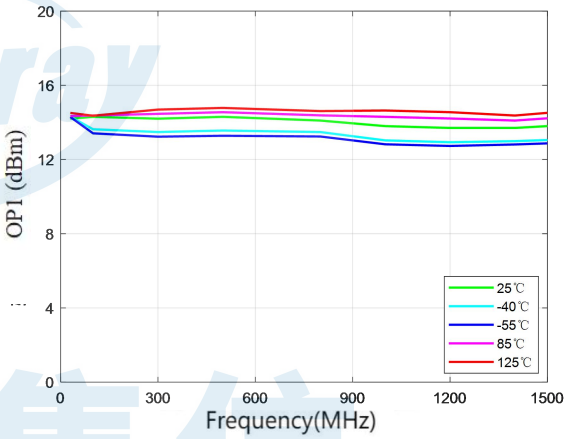
Output Return Loss



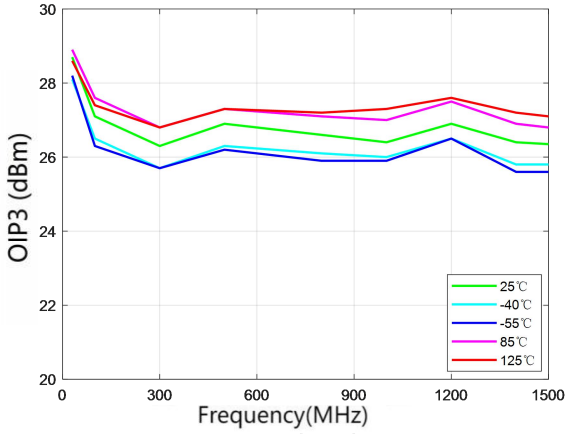
Reverse Isolation



Noise Figure



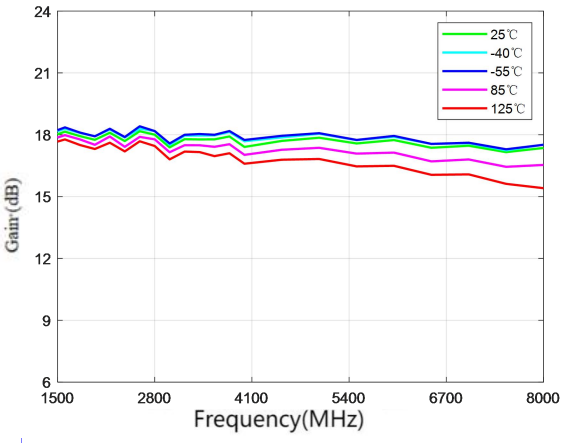
Output Power for 1dB Compression



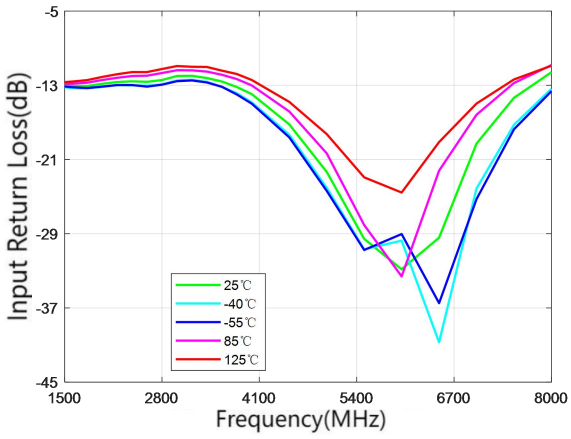
Output Third-Order Interception

Typical Performance (EVB test results at +5V supply voltage for 1500MHz~8000MHz)

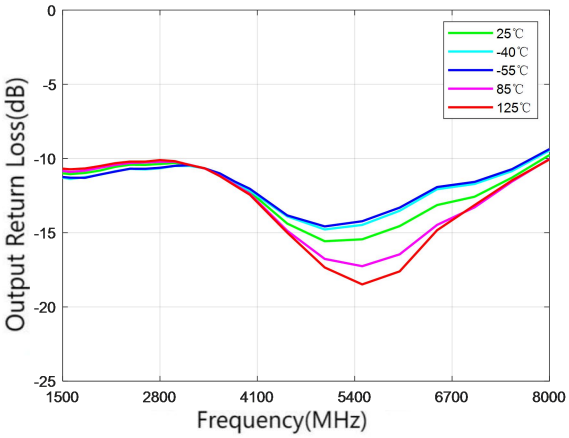
Parameter	Typ.										Units
Frequency	1600	1800	2000	2200	2400	2600	2800	3000	3200	3400	MHz
Gain	18.0	17.7	17.5	17.8	17.4	17.8	17.7	17.0	17.4	17.4	dB
Input Return Loss	-13.1	-13.1	-12.8	-12.7	-12.6	-12.6	-12.4	-12.0	-12.0	-12.2	dB
Output Return Loss	-11.1	-11.0	-10.8	-10.6	-10.4	-10.4	-10.4	-10.3	-10.5	-10.7	dB
Reverse Isolation	-21.3	-21.7	-21.4	-21.5	-21.6	-21.3	-21.9	-21.5	-21.6	-21.6	dB
Output Power for 1dB Compression	14.5	14.3	14.0	13.9	14.2	14.1	14.0	13.7	13.9	13.7	dBm
Noise Figure	4.3	4.2	4.2	4.3	4.4	5.0	4.4	4.5	4.5	4.5	dB
Output-Third-Order Interception	27.3	27.2	26.1	26.7	26.7	25.7	26.7	25.6	26.3	27.1	dBm
Frequency	3800	4000	4500	5000	5500	6000	6500	7000	7500	8000	MHz
Gain	17.4	16.8	17.1	17.1	16.8	16.7	16.3	16.0	15.3	15.0	dB
Input Return Loss	-13.2	-14.0	-17.2	-22.3	-29.6	-32.8	-29.4	-19.3	-14.4	-11.6	dB
Output Return Loss	-11.7	-12.2	-14.4	-15.6	-15.4	-14.6	-13.1	-12.6	-11.3	-9.8	dB
Reverse Isolation	-21.5	-21.2	-21.0	-20.8	-20.8	-20.7	-20.6	-20.6	-20.5	-20.3	dB
Output Power for 1dB Compression	13.9	14.0	14.0	14.1	14.3	14.7	14.2	14.2	13.8	13.0	dBm
Noise Figure	4.6	4.6	4.5	4.8	4.6	4.6	4.7	4.7	4.8	5.2	dB
Output-Third-Order Interception	26.0	26.1	25.0	24.3	23.4	22.7	22.3	21.6	20.7	20.2	dBm
Test Conditions: VDD=+5V, I=45mA, OIP3 spacing=1MHz, Pout=0dBm/tone, TA=+25°C											



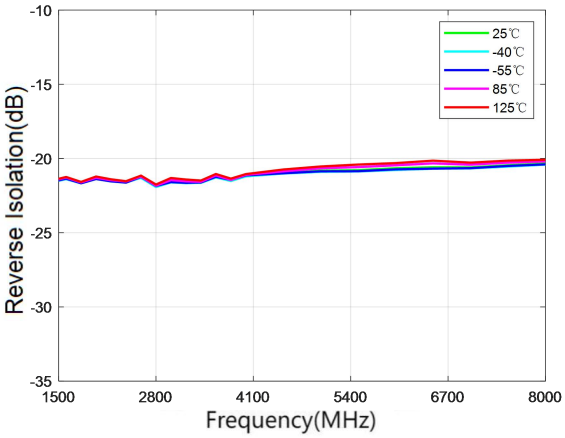
Gain



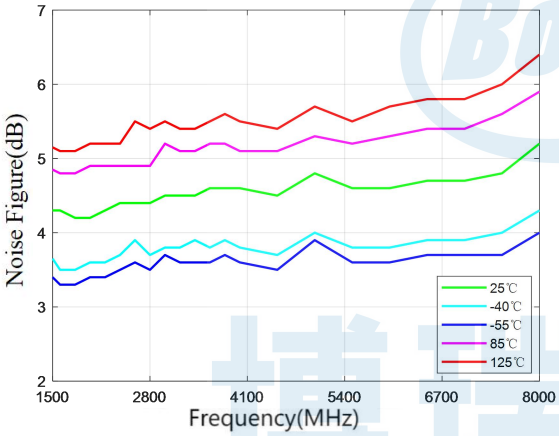
Input Return Loss



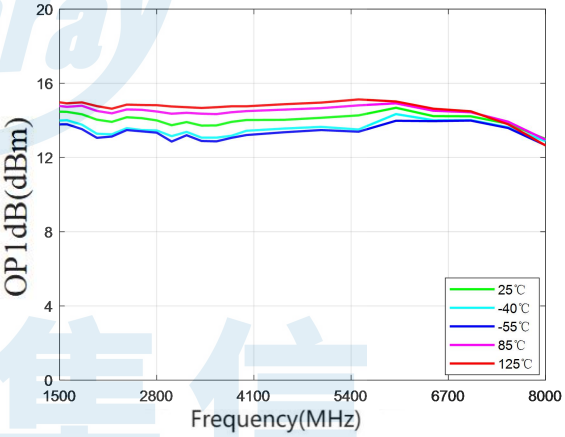
Output Return Loss



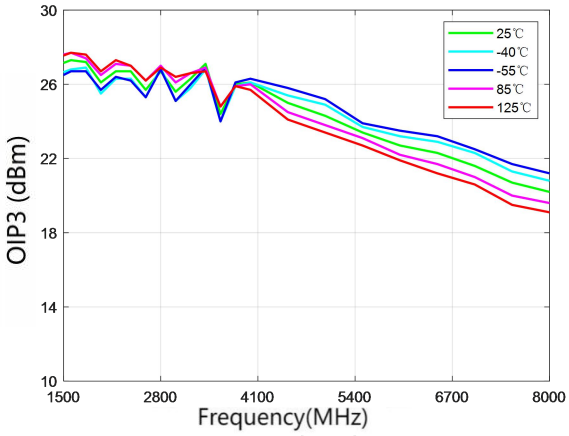
Reverse Isolation



Noise Figure

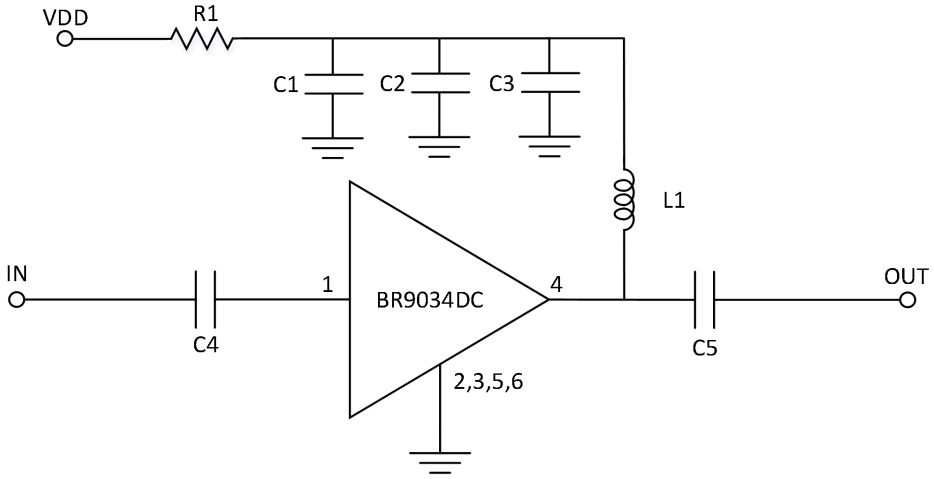


Output Power for 1dB Compression



Output Third-Order Interception

Typical Application Schematic



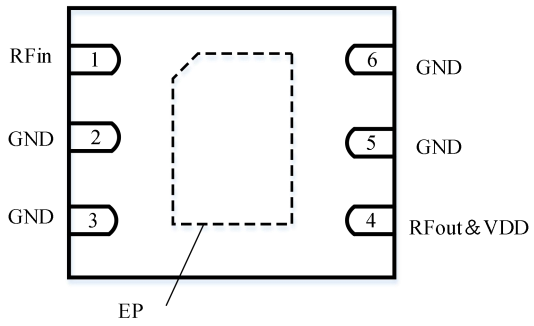
Bill of Material (0.03GHz~1.5GMHz)

Designator	Package	Description	Part Number
C1	0603	1uF	GCM188R71C105KA64D
C3	0402	68pF	GRM1555C1H680JA01D
C2, C4, C5	0402	1000pF	GRM155R71C102KA88
L1	1008	1.1uH	1008AF-112XJRB
R1	0402	24 Ω	RC0402JR-0724RL

Bill of Material (1.5GHz~8GHz)

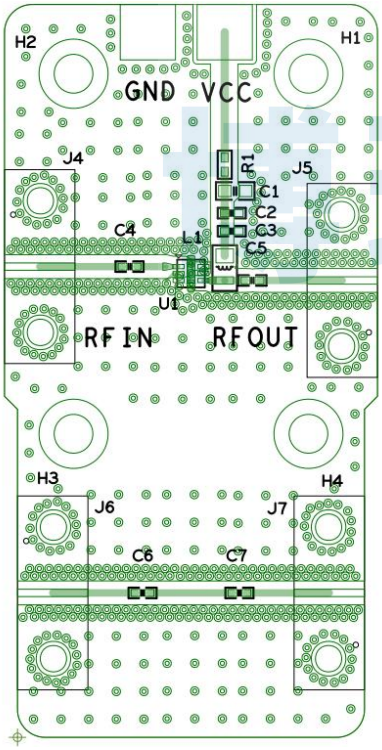
Designator	Package	Description	Part Number
C1	0603	1uF	GCM188R71C105KA64D
C3	0402	68pF	GRM1555C1H680JA01D
C2, C4, C5	0402	1000pF	GRM155R71C102KA88
L1	0805	18nH	0805HT-18NTJRB
R1	0402	24 Ω	RC0402JR-0724RL

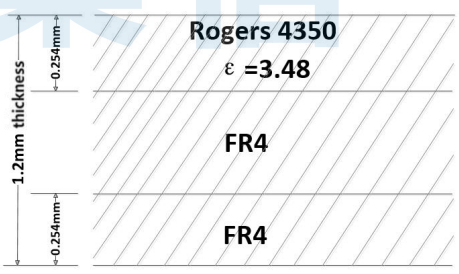
Pin Configuration and Description



Pin Number	Pin Name	Description
1	RFin	RF input pin. A DC Block is required.
2,3,5,6	GND	RF/DC Ground pin. Connect to RF/DC ground
4	RFout& VDD	RF Output pin. DC bias will also need to be injected through a RF bias choke/inductor for operation.
-	EP	RF/DC ground. Use recommended via pattern to minimize inductance and thermal resistant; see PCB Mounting Pattern for suggested footprint.

PCB Evaluation Board





35um Cu top layer

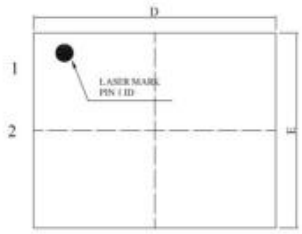
15um Cu inner layer

15um Cu inner layer

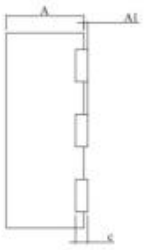
35um Cu bot layer

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

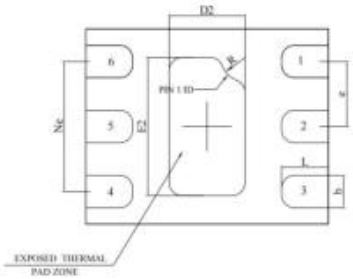
Package Dimensions (mm)



TOP VIEW



SIDE VIEW



BOTTOM VIEW

SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	0.70	0.75	0.80
A1	—	0.02	0.05
b	0.15	0.20	0.25
e	0.20BSC		
D	1.40	1.50	1.60
D2	0.37	0.47	0.57
e	0.40BSC		
Nd	0.80BSC		
E	1.10	1.20	1.30
E2	0.75	0.85	0.95
L	0.24	0.29	0.34
R	0.15REF.		

SIDE VIEW