

AHL3326T8 Data Sheet

Ultra-Low Noise High Gain Amplifier

1. Product Overview

1.1 General Description

AHL3326T8 has high gain, high linearity and ultra-low noise to be suitable for use in the RF front-end of CBRS. The active bias circuit stabilizing the current over process variation is adopted. The amplifier is available in a TDFN8 package and passes through the stringent 100% DC & RF test via an automated test handler.

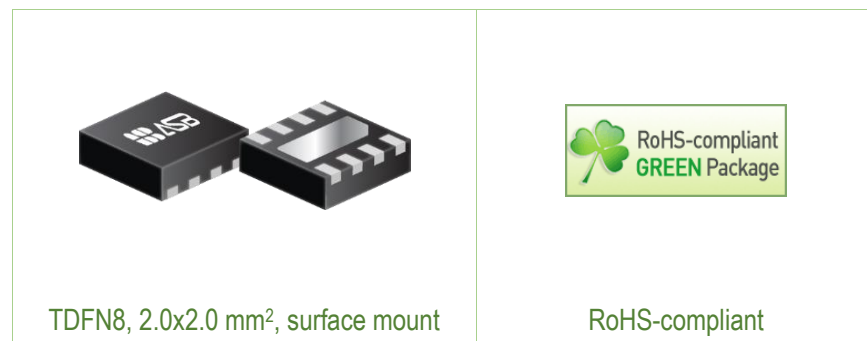
1.2 Features

- 27.5 dB Gain at 3600 MHz
- 0.95 dB NF at 3600 MHz
- 5 dBm P1dB at 3600 MHz
- 13 dBm OIP3 at 3600 MHz
- MTTF > 100 Years
- Single Supply: +3 V, 15mA

1.3 Applications

- CBRS receiver and active antenna

1.4 Package Profile & RoHS Compliance



2. Summary on Product Performances

2.1 Typical Performance

Supply voltage = +3 V, T_A = +25 °C, Z₀ = 50 Ω.

Parameter	Test Conditions	Typical			Unit
Frequency		3300	3600	3900	MHz
Gain	Pin = -30 dBm	28.5	27.5	26.0	dB
S11	Pin = -30 dBm	-14	-18	-13	dB
S22	Pin = -30 dBm	-13	-11	-8	dB
Noise Figure		1.00	0.95	0.93	dB
Output IP3 ¹⁾		13	13	13	dBm
Output P1dB		5	5	11	dBm
Current	Without Pin	15			mA
Device Voltage	Without Pin	+3			V

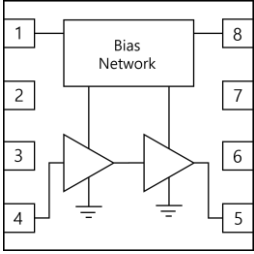
1) OIP3 is measured with two tones at an output power of -10 dBm/tone separated by 1 MHz.

2.2 Product Specification

Supply voltage = +3 V, T_A = +25 °C, Z₀ = 50 Ω.

Parameter	Min	Typ	Max	Unit
Frequency		3600		MHz
Gain		27.5		dB
S11		-18		dB
S22		-11		dB
Noise Figure		0.95		dB
OIP3		13		dBm
P1dB		5		dBm
Current		15		mA
Device Voltage		3		V

2.3 Pin Configuration

Pin	Description	Simplified Outline
1	Current Adjustable	
2, 3, 6, 7	NC or GND	
4	RF_IN	
5	RF_OUT	
8	VDD	
Backside Paddle	DC/RF Ground	

2.4 Absolute Maximum Ratings, $T_A = +25\text{ }^\circ\text{C}$

Parameters	Max. Ratings
Operation Case Temperature	-40 to +85 $^\circ\text{C}$
Storage Temperature	-40 to +150 $^\circ\text{C}$
Device Voltage	+5 V
Operation Junction Temperature	+150 $^\circ\text{C}$
Input RF Power (At 3600 MHz CW, 50 Ω matched)*	TBD

2.5 Thermal Resistance

Symbol	Description	Typ	Unit
R_{th}	Thermal resistance from junction to lead	TBD	$^\circ\text{C/W}$

2.6 ESD Classification & Moisture Sensitivity Level

ESD Classification

HBM	Class H0	Voltage Level: 200 V
-----	----------	----------------------

CAUTION: Gallium Arsenide Integrated Circuits are sensitive to electrostatic discharge (ESD) and can be damaged by static electricity. Proper ESD control techniques should be used when handling these devices.

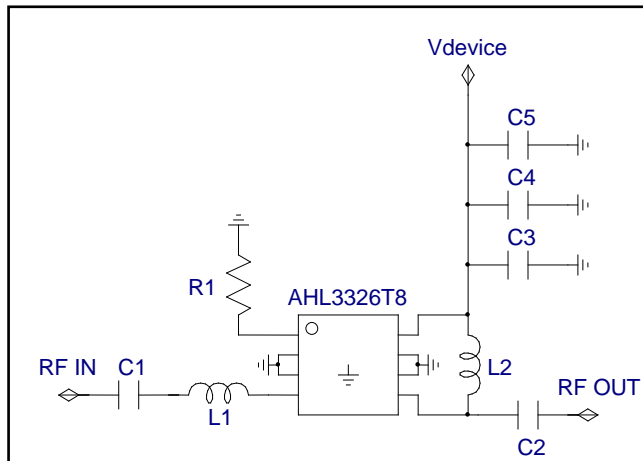
Moisture Sensitivity Level

MSL 3 at 260 $^\circ\text{C}$ reflow

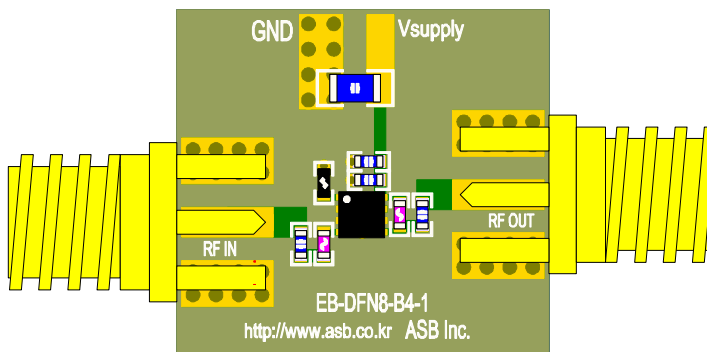
(Intentionally Blanked)

3. Application: CBRS 3300 ~ 3900 MHz, $V_{device} = +3 V$

3.1 Application Circuit & Evaluation Board



- Note: 1. C3 and C4 must be placed as close to the device as possible. All traces on the evaluation board affect the characteristics at the time of adjustment.
 2. Refer to 'Surface Mount Recommendation' section.



PCB Information	
Material	FR4
Thickness (mm)	0.8
Size (mm)	16 x 15
EB No.	EB-DFN8-B4-1

Bill of Material

Symbol	Value	Size(Inch)	Description	Manufacturer
AHL3326T8	-	-	MMIC Amplifier	ASB
C1	10 pF	0402	Matching Capacitor	Murata
C2	1 pF	0402	Matching Capacitor	Murata
C3	56 pF	0402	Decoupling Capacitor	Murata
C4	1 μ F	0402	Decoupling Capacitor	Murata
C5	10 μ F	0805	Decoupling Capacitor	Murata
R1	0 Ω	0402	Current Adjust Resistor	Murata
L1	1.5 nH	0402	Matching Inductor	Murata
L2	2.4 nH	0402	Matching Inductor	Murata

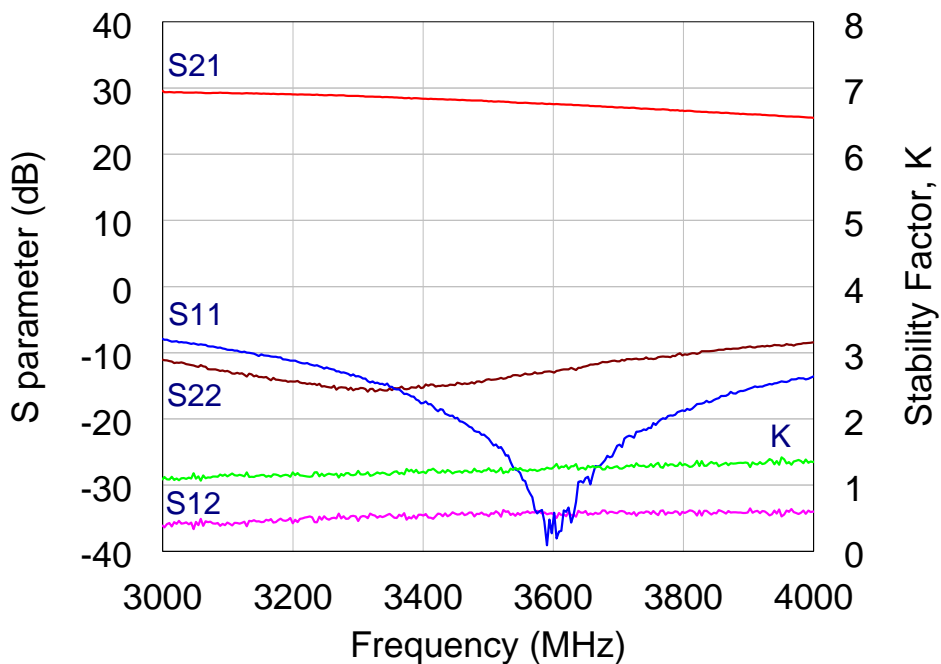
3.2 Performance Table

Supply voltage = +3 V, $T_A = +25\text{ }^\circ\text{C}$, $Z_0 = 50\ \Omega$.

Parameter	Typical			Unit
Frequency	3300	3600	3900	MHz
Gain	28.5	27.5	26.0	dB
S11	-14	-18	-13	dB
S22	-13	-11	-8	dB
Noise Figure	1.00	0.95	0.93	dB
Output IP3 ¹⁾	13.	13	13	dBm
Output P1dB	5	5	11	dBm
Current	15			mA
Device Voltage	+3			V

1) OIP3 is measured with two tones at an output power of -10 dBm/tone separated by 1 MHz.

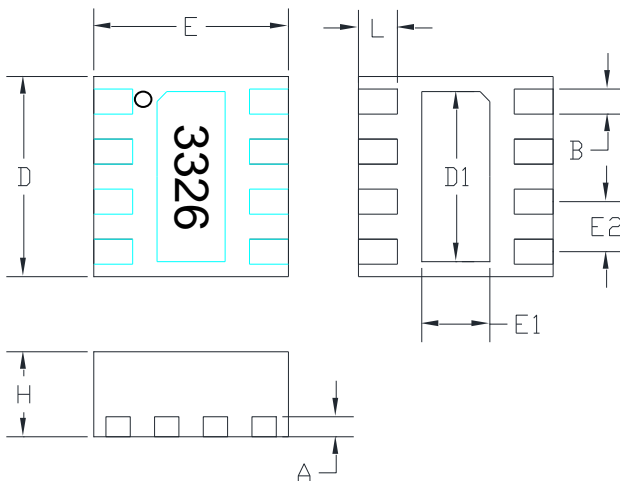
3.3 Plot of S-parameter & Stability Factor



► Customized Application Circuit Support

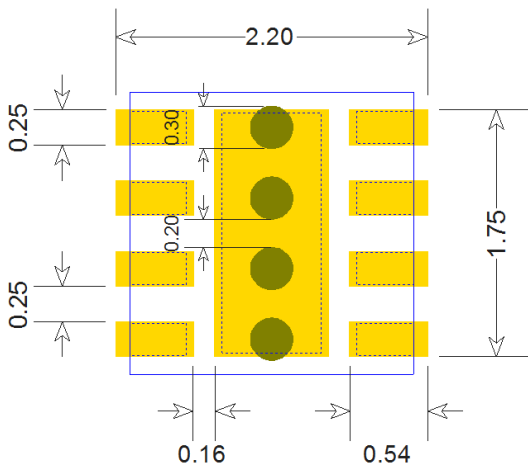
Customized application circuit (reference design) with respect to application frequency, impedance, gain, linearity, and bias condition can be supported upon customer's request. Please feel free to contact us at sales@asb.co.kr.

4. Package Outline (TDFN8)



Symbols	Dimensions (In mm)		
	MIN	NOM	MAX
A	-	0.20REF	-
B	0.18	0.23	0.28
D	1.95	2.00	2.03
D1	-	1.7BSC	-
E	1.95	2.00	2.03
E1	-	0.7BSC	-
E2	-	0.5BSC	-
L	0.35	0.40	0.45
H	0.80	0.85	0.90

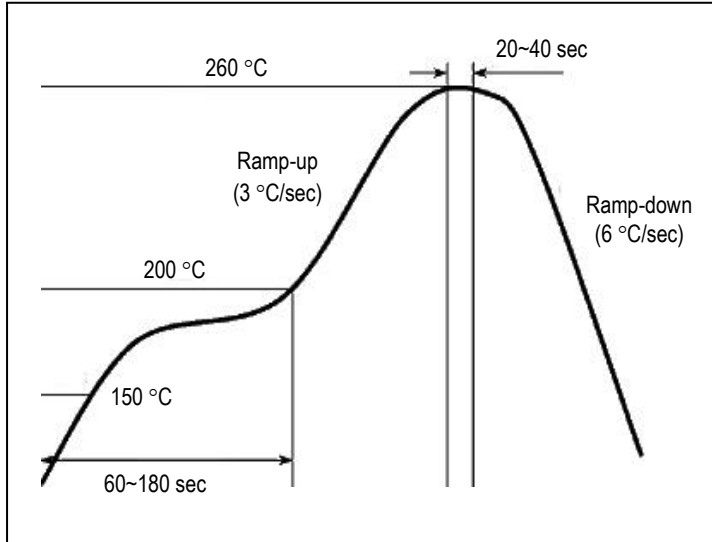
5. Surface Mount Recommendation (In mm)



NOTE

1. It is recommended that the ground via holes be placed on the bottom of exposed pad of the device for better RF and thermal performance, as shown in the drawing at the left side.

6. Recommended Soldering Reflow Profile



(End of Datasheet)

Copyright ©2018 ASB Inc. All rights reserved. Datasheet subject to change without notice. ASB assumes no responsibility for any errors which may appear in this datasheet. No part of the datasheet may be copied or reproduced in any form or by any means without the prior written consent of ASB.