

ASL5563 Data Sheet

High Gain, Low Noise Amplifier

1. Product Overview

1.1 General Description

ASL5563 is a low noise amplifier with high linearity over a wide range of frequency up to 1.5 ~ 2.7 GHz with S11 & S22 < -10 dB. It is also suitable for use in the mobile wireless systems such as PCS, WCDMA, LTE, WiBro, WiMAX, WLAN and so on. It has an active bias circuit for stable current over temperature and process variation. The amplifier is available in SOT363 package and passes the stringent DC, RF and reliability tests.

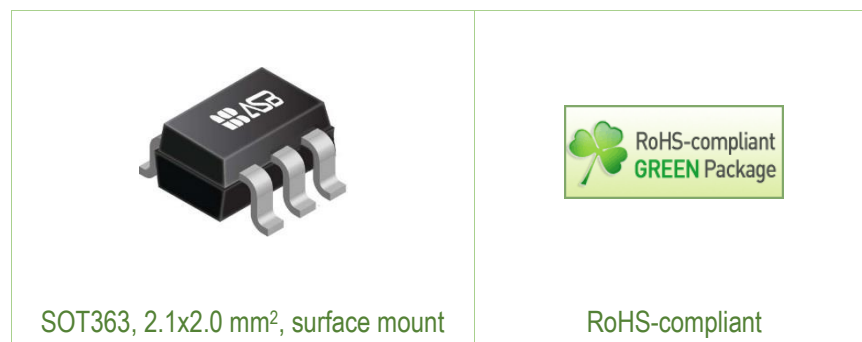
1.2 Features

- 17.3 dB Gain at 2000 MHz
- 17.0 dBm P1dB at 2000 MHz
- 37.0 dBm Output IP3 at 2000 MHz
- 0.85 dB NF at 2000 MHz
- MTTF > 100 Years
- Single Supply: +3.3 V

1.3 Applications

- Low Noise Amplifier for PCS, WCDMA, WLAN, and WiMAX
- Other Low Noise Application

1.4 Package Profile & RoHS Compliance



2. Summary on Product Performances

2.1 Typical Performance

Supply voltage = +3.3 V, T_A = +25 °C, Z_O = 50 Ω.

Parameter	Typical				Unit
Frequency	1700	1800	2000	2500	MHz
Gain	18.6	18.2	17.3	15.2	dB
S11	-14.0	-15.0	-15.0	-11.0	dB
S22	-10.0	-10.0	-12.0	-13.0	dB
Noise Figure	0.85	0.85	0.85	0.95	dB
Output IP3 ¹⁾	32.0	34.0	37.0	34.0	dBm
Output P1dB	17.0	17.0	17.0	17.0	dBm
Current	54				mA
Device Voltage	+3.3				V

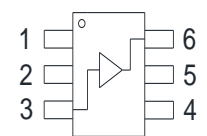
1) OIP3 is measured with two tones at the output power of +4 dBm/tone separated by 1 MHz.

2.2 Product Specification

Supply voltage = +3.3 V, T_A = +25 °C, Z_O = 50 Ω.

Parameter	Min	Typ	Max	Unit
Frequency		2000		MHz
Gain		17.3		dB
S11		-15.0		dB
S22		-12.0		dB
Noise Figure		0.85		dB
Output IP3		37.0		dBm
Output P1dB		17.0		dBm
Current		54		mA
Device Voltage		+3.3		V

2.3 Pin Configuration

Pin	Description	Simplified Outline
1, 2, 4, 5	Ground	
3	RF_IN	
6	RF_OUT & Bias	

2.4 Absolute Maximum Ratings

Parameters	Max. Ratings
Operation Case Temperature	-40 to +85 °C
Storage Temperature	-40 to +150 °C
Device Voltage	+6 V
Operation Junction Temperature	+150 °C
Input RF Power (CW, 50 Ω matched)	+25 dBm

The operation of this device in excess of any of these limits may cause permanent damage.

* Refer to the max. input RF power data at http://www.asb.co.kr/pdf/Maximum_Input_Power_Analysis.pdf. The max. input RF power, in principle, depends upon application frequency, matching circuit, and device voltage.

2.5 Thermal Resistance

Symbol	Description	Typ	Unit
R _{th}	Thermal resistance from junction to lead	110	°C/W

2.6 ESD Classification & Moisture Sensitivity Level

ESD Classification

HBM	Class 1A	Voltage Level: 400 V
MM	Class A	Voltage Level: 50 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.

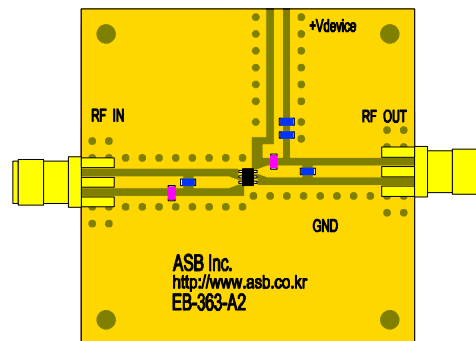
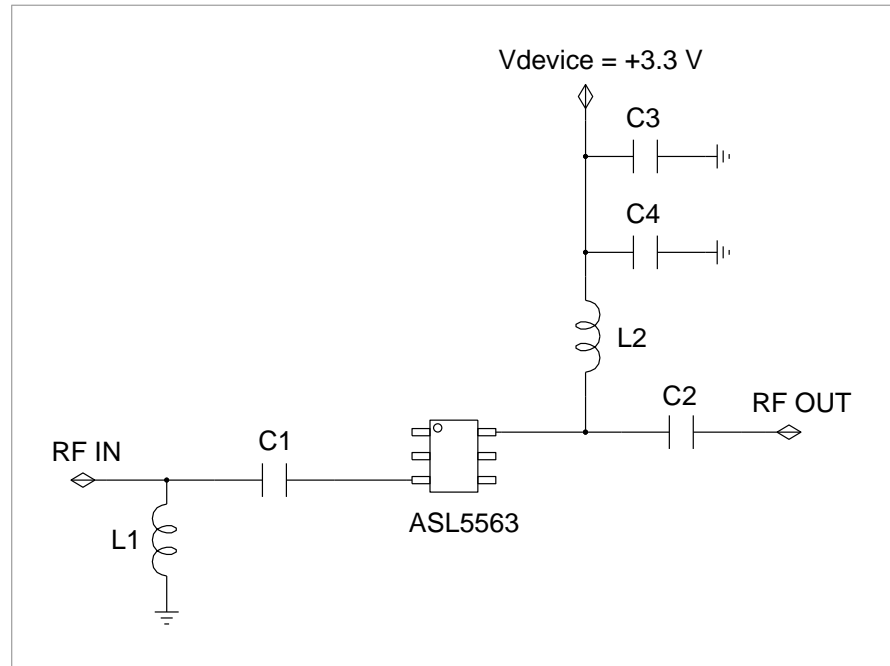
Moisture Sensitivity Level

MSL 3 at 260 °C reflow

(Intentionally Blanked)

3. Application: 1700 ~ 2500 MHz ($V_{\text{supply}} = +3.3 \text{ V}$)

3.1 Application Circuit & Evaluation Board



PCB Information	
Material	FR4
Thickness (mm)	0.8
Size (mm)	40x40
EB No.	EB-363-A2

Bill of Material

Symbol	Value	Size	Description	Manufacturer
ASL5563	-	-	MMIC Amplifier	ASB
C1	2.7 pF	0603	DC block and matching capacitor	Murata
C2	100 pF	0603	DC blocking capacitor	Murata
C3	1 μ F	0603	Decoupling capacitor	Murata
C4	100 pF	0603	Decoupling capacitor	Murata
L1	5.6 nH	0603	Matching inductor	Murata
L2	18 nH	0603	RF choke inductor	Murata

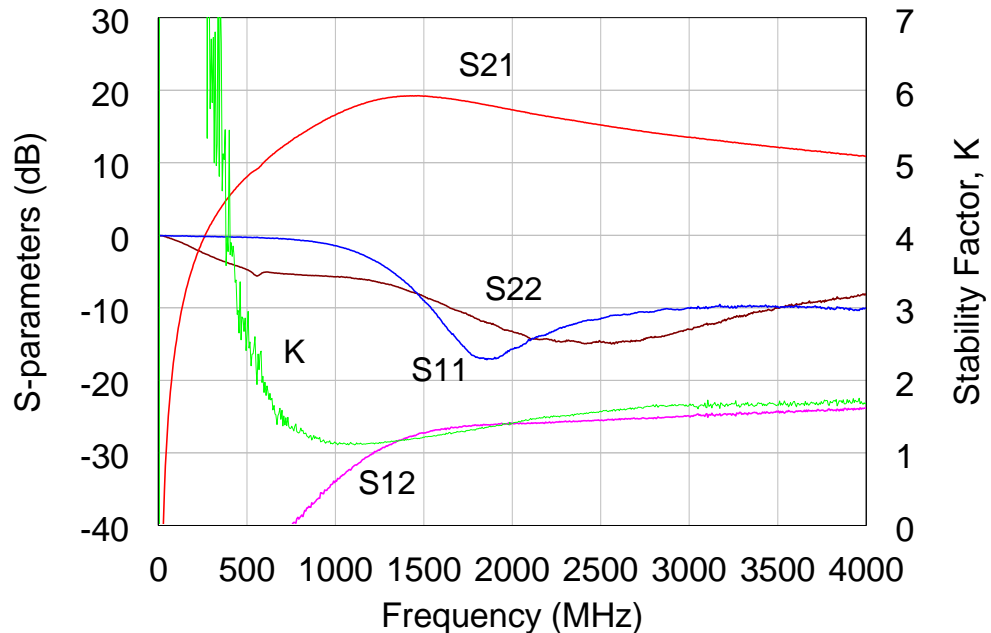
3.2 Performance Table

Supply voltage = +3.3 V, $T_A = +25\text{ }^\circ\text{C}$, $Z_O = 50\ \Omega$.

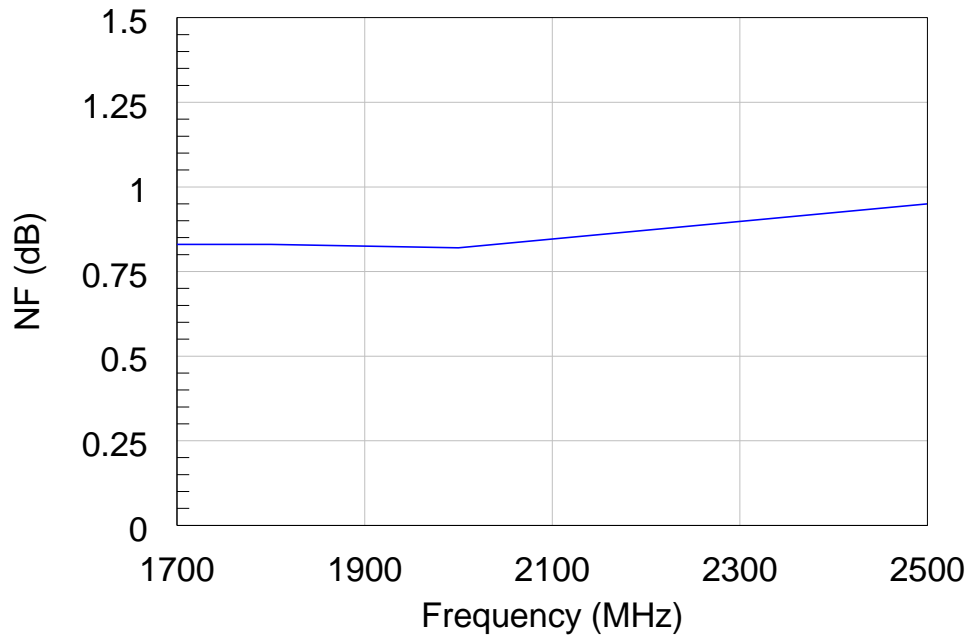
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Device Voltage	+3.3				V

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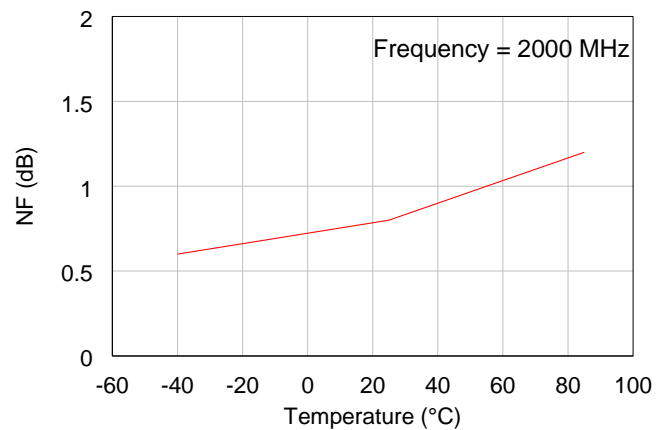
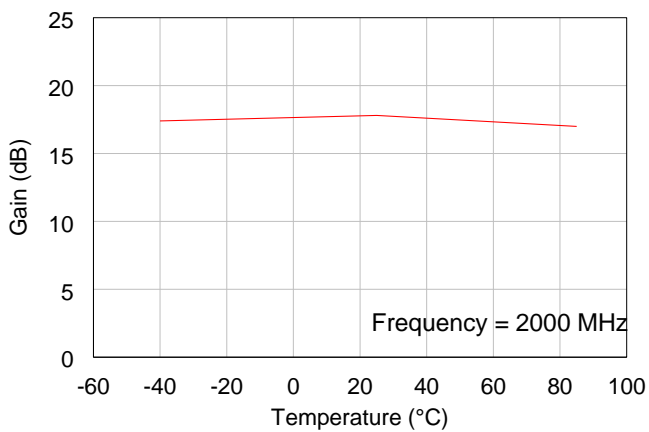
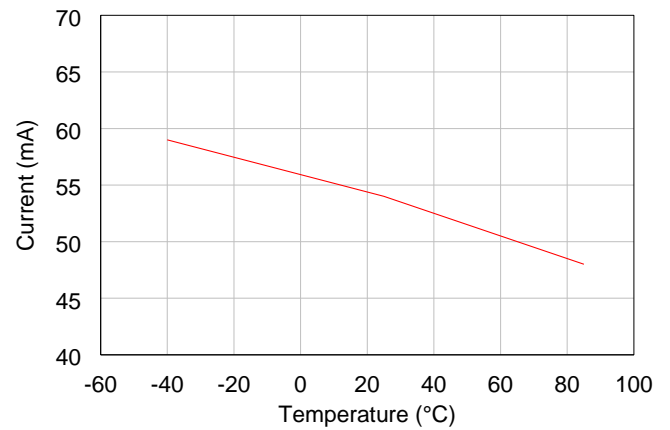
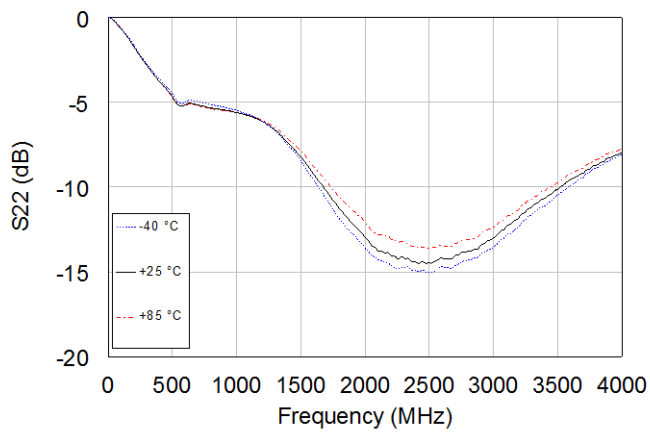
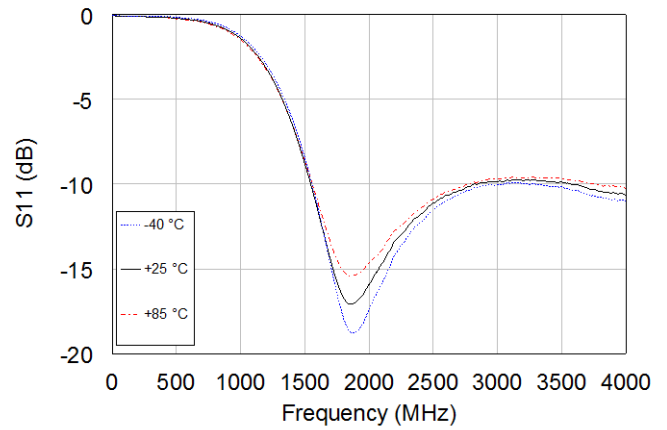
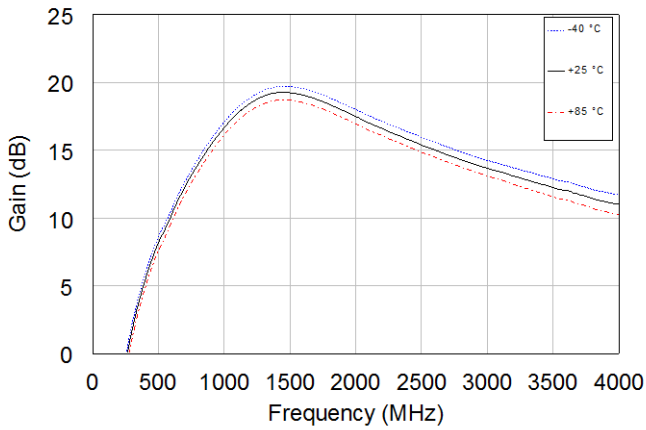
3.3 Plot of S-parameter & Stability Factor

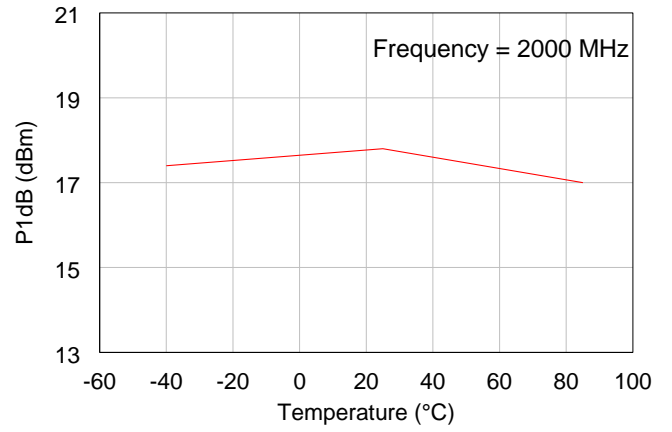
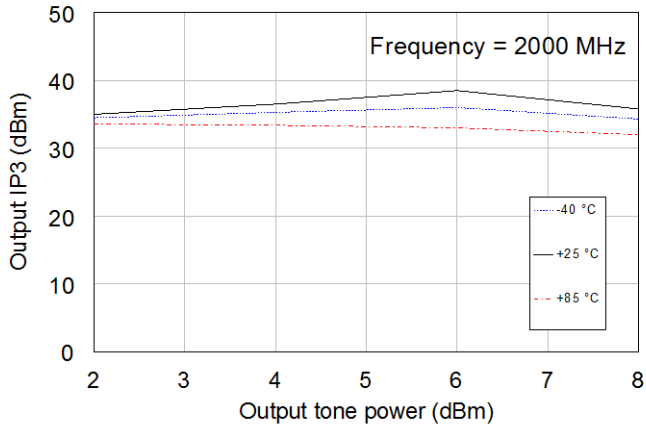


3.4 Plot of Noise Figure

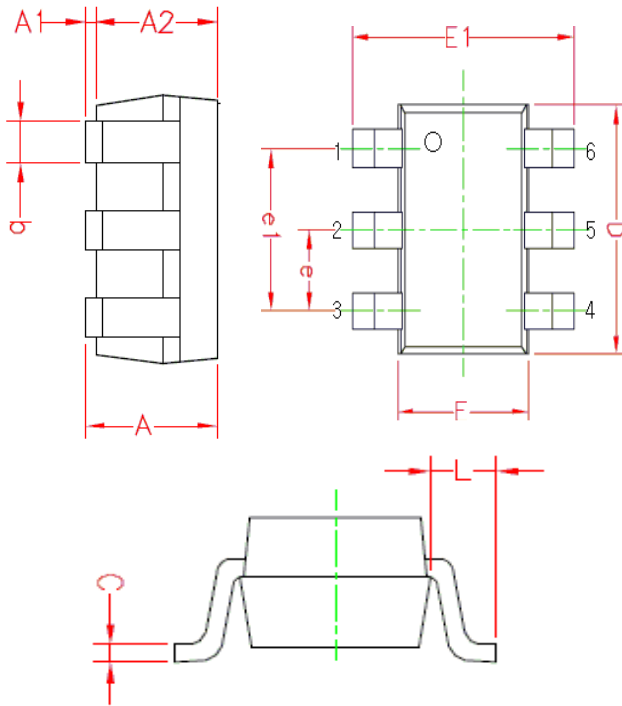


3.5 Plots of Noise Figure and Performances with Temperature



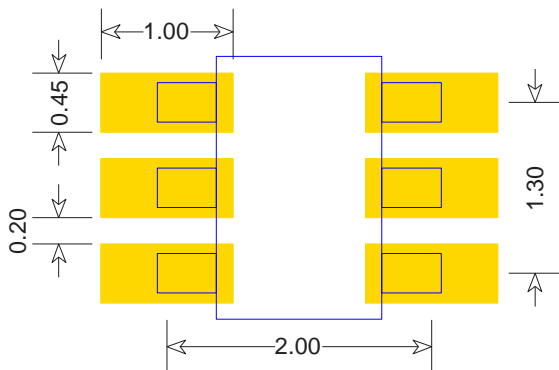


4. Package Outline (SOT363, 2.1x2.0x1.0 mm)

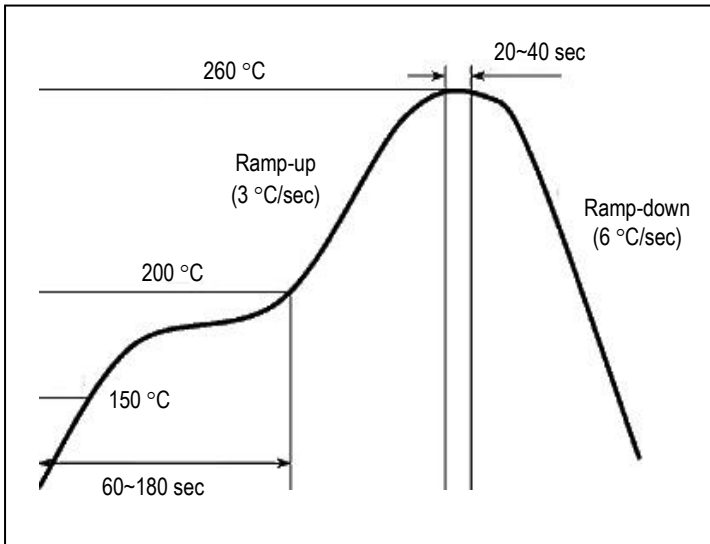


Symbols	Dimensions (In mm)		
	MIN	NOM	MAX
A	0.900	1.000	1.10
A1	0.025	0.062	0.10
A2	0.875	0.937	1.00
b	0.200	0.300	0.40
C	0.100	0.125	0.15
D	1.900	2.000	2.10
F	1.150	1.250	1.35
E1	2.000	2.100	2.20
e	0.65BSC		
e1	1.30BSC		
L	0.425REF		

5. Surface Mount Recommendation (In mm)



6. Recommended Soldering Reflow Profile



(End of Datasheet)

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