

Features

- 21 dB Gain at 900 MHz
- 2.0 dB NF at 900 MHz
- 34 dBm OIP3 at 900 MHz
- 22 dBm P1dB at 900 MHz
- One-stage LNA

Description

AST30S is a one-stage LNA, which has a low noise, high gain, and high linearity over a wide range of frequency up to 6 GHz. It is also suitable for use in the low noise amplifier block of the mobile wireless systems of T-DMB, CDMA, GSM, PCS, WCDMA, WiBro, WiMAX, and WLAN so on. The amplifier is available in a DFN6 package and passes the stringent DC, RF and reliability tests.

Typical Performance

(Supply Voltage = +5 V, $T_A = +25\text{ }^\circ\text{C}$, $Z_o = 50\ \Omega$)

Parameters	Units	Typical	
Testing Frequency	MHz	900	1950
Gain	dB	21.0	15.5
S11	dB	-18	-15
S22	dB	-15	-15
Output IP3 ¹⁾	dBm	34	37
Noise Figure	dB	2.0	1.9
Output P1dB	dBm	22	22
Current	mA	135	
Device Voltage	V	+4.4	

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

Product Specifications

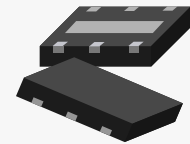
Parameters	Units	Min	Typ	Max
Frequency	MHz		900	
Gain	dB		21	
S11	dB		-18	
S22	dB		-15	
Output IP3	dBm		34	
Noise Figure	dB		2.0	
Output P1dB	dBm		22	
Current	mA		135	
Device Voltage	V		+4.4	

*100% in-house DC & RF testing is done on packaged products before taping.

Absolute Maximum Ratings

Parameters	Rating
Operating Case Temperature	-40 to +85 °C
Storage Temperature	-40 to +150 °C
Device Voltage	+6 V
Operating Junction Temperature	+150 °C
Input RF Power (CW, 50 Ω matched)*	+23 dBm
Thermal Resistance	98 °C/W

* Please find the max. input power data from http://www.asb.co.kr/pdf/Maximum_Input_Power_Analysis.pdf



Package Style: DFN6

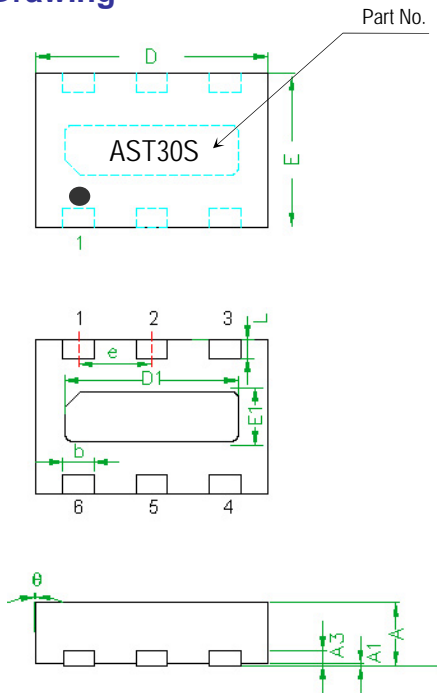
Application Circuit

- 900 MHz
- 1950 MHz

Pin Configuration

Pin No.	Function
1	RF IN
2	GND
3	GND
4	RF OUT & Bias
5	NC
6	GND

Outline Drawing



Part No.

Symbols	Dimensions (In mm)		
	MIN	NOM	MAX
A	0.80	0.85	0.90
A1	0	0.010	0.030
A3	---	0.20REF	---
b	0.35	0.40	0.45
D	2.95	3.00	3.03
D1	---	2.25BSC	---
E	1.95	2.00	2.03
E1	---	0.65BSC	---
e	---	0.95BSC	---
L	0.275	0.325	0.375
θ	-12.	---	0

Pin No.	Function	Pin No.	Function.
1	RF IN	4	RF OUT & Bias
2	GND	5	NC
3	GND	6	GND

Note: 1. Backside metal paddle is RF and DC ground.

ESD Classification & Moisture Sensitivity Level

ESD Classification

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

CAUTION: ESD-sensitive device!

Moisture Sensitivity Level (MSL)

Level 3 at 260 °C reflow

APPLICATION CIRCUIT

GSM, CDMA

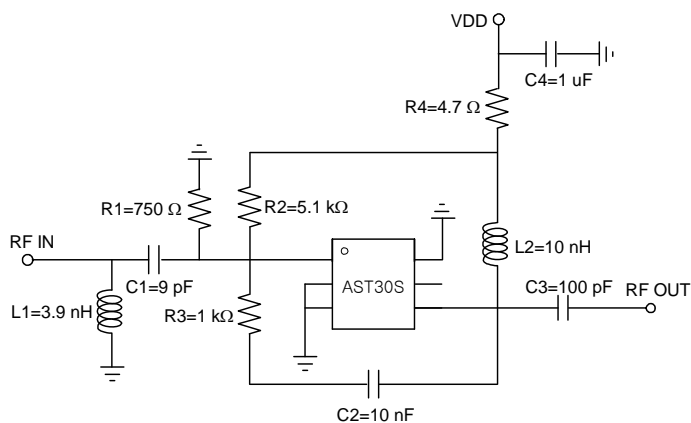
900 MHz

+5 V

Parameter	Symbol	Test Conditions	MIN.	TYP.	MAX.	Unit
Power Gain	G_p	F = 900 MHz		21		dB
Noise Figure	NF	F = 900 MHz		2.0		dB
Input Return Loss	RL_{in}	F = 900 MHz		-18		dB
Output Return Loss	RL_{out}	F = 900 MHz		-15		dB
1 dB Gain Compression Output Power	$P_{o(1dB)}$	F = 900 MHz		22		dBm
3 rd Intercept Point Output Power ¹⁾	OIP3	F = 900 MHz		34		dBm
Circuit Current	I_d	F = 900 MHz Non-RF		135		mA

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

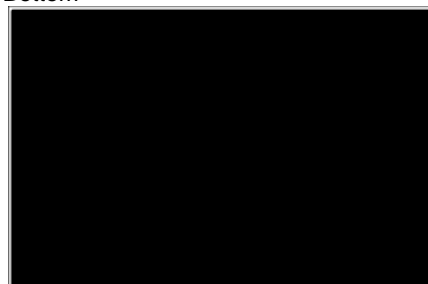
Schematic



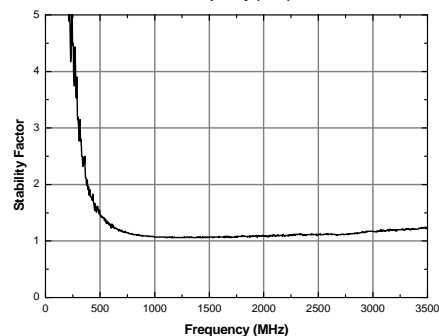
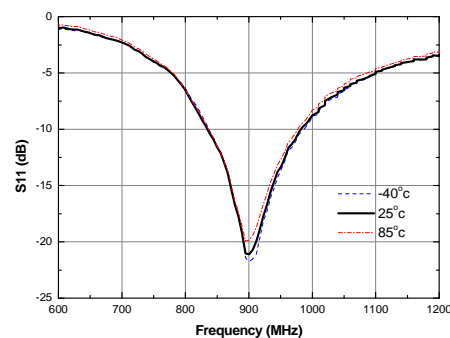
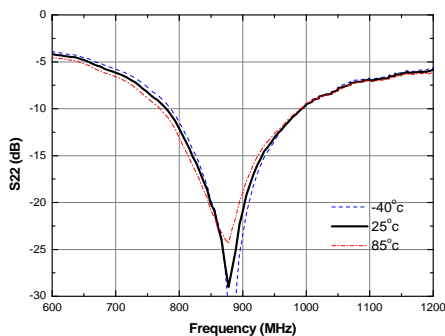
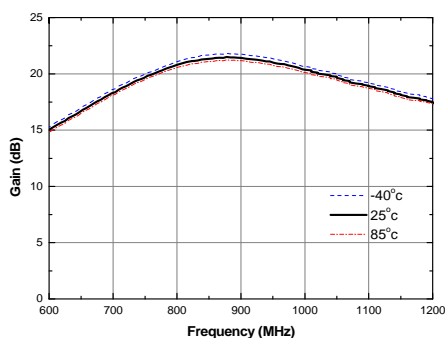
Board Layout (FR4, 24x16 mm², 0.8T)

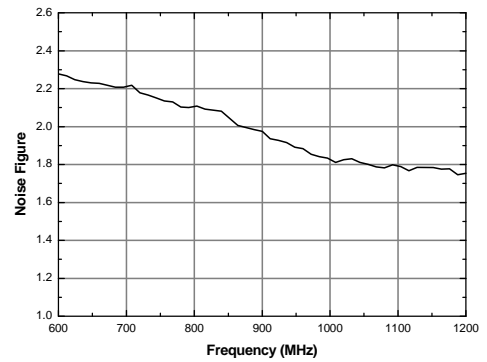
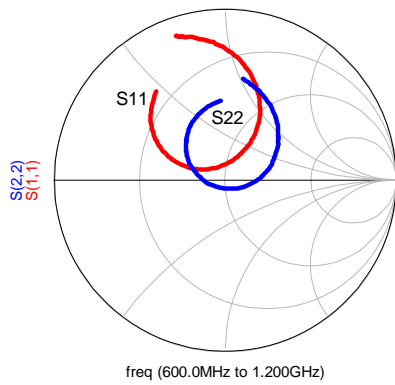


Bottom

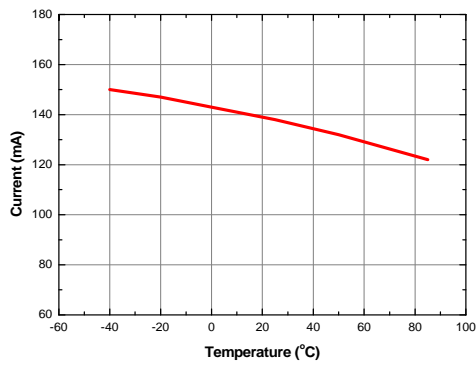


S-parameters & Noise Figure

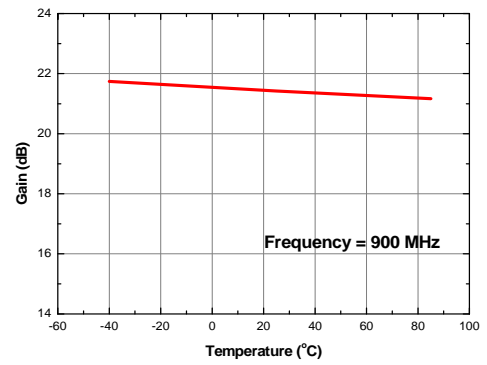




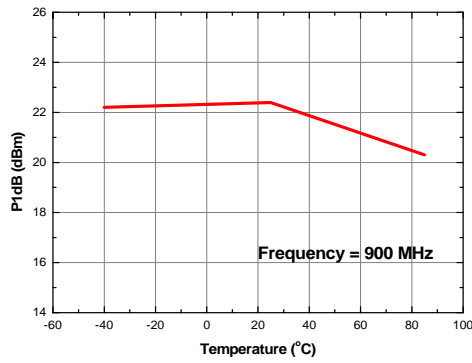
Current vs. Temperature



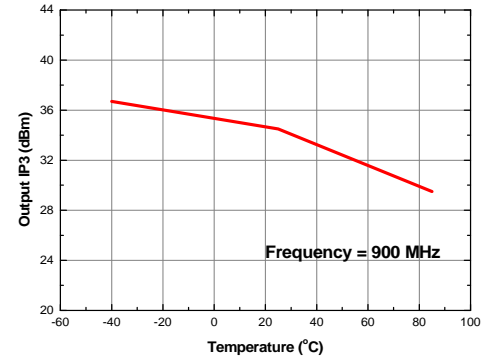
Gain vs. Temperature



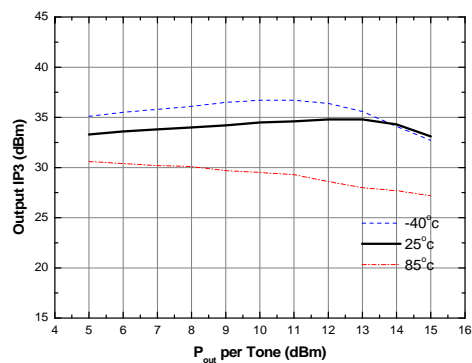
P1dB vs. Temperature



Output IP3 vs. Temperature



Output IP3 vs. Tone Power (Frequency = 900 MHz)



APPLICATION CIRCUIT

WCDMA

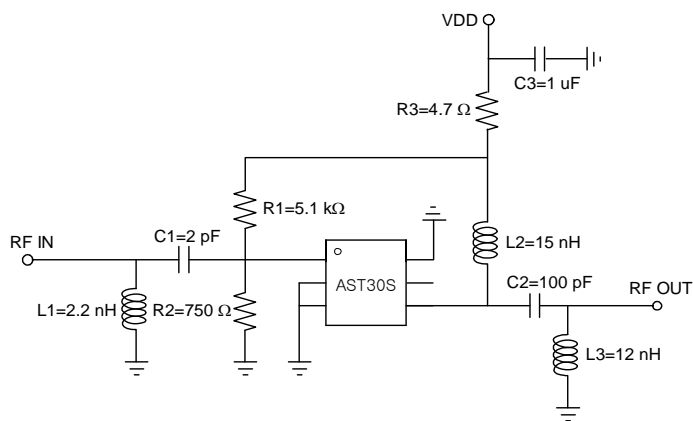
1950 MHz

+5 V

Parameter	Symbol	Test Conditions	MIN.	TYP.	MAX.	Unit
Power Gain	G_p	F = 1.95 GHz		15.5		dB
Noise Figure	NF	F = 1.95 GHz		1.9		dB
Input Return Loss	RL_{in}	F = 1.95 GHz		-15		dB
Output Return Loss	RL_{out}	F = 1.95 GHz		-15		dB
1 dB Gain Compression Output Power	$P_{o(1dB)}$	F = 1.95 GHz		22		dBm
3 rd Intercept Point Output Power ¹⁾	OIP3	F = 1.95 GHz		37		dBm
Circuit Current	I_d	F = 1.95 GHz Non-RF		135		mA

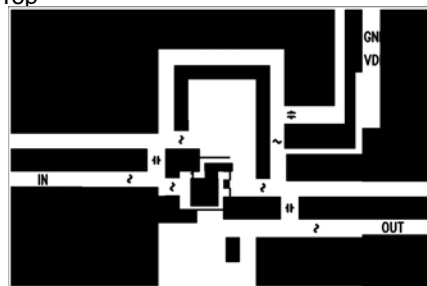
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Schematic

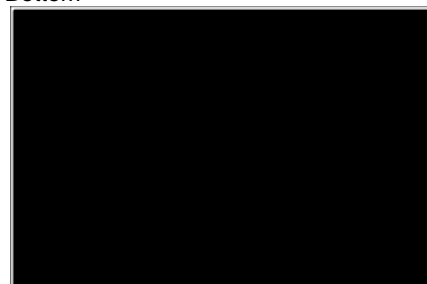


Board Layout (FR4, 24x16 mm², 0.8T)

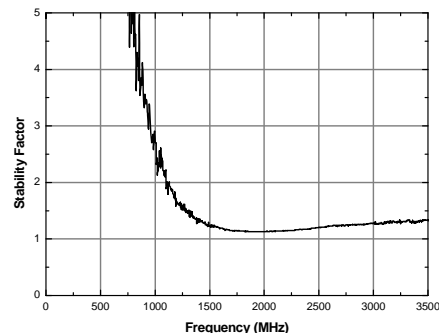
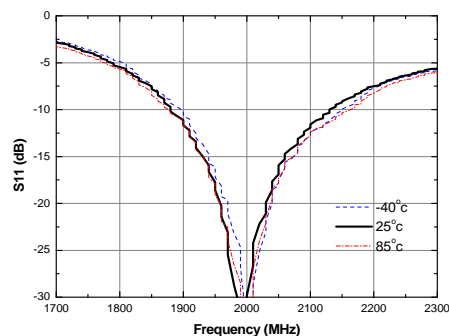
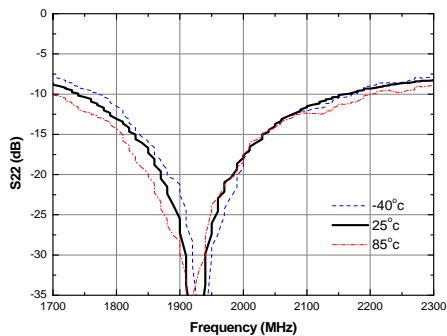
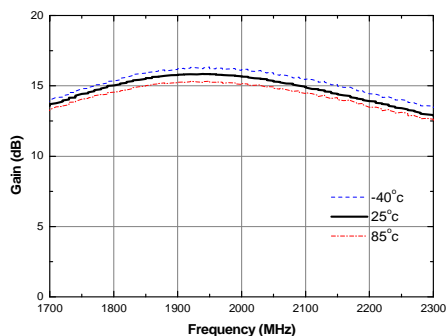
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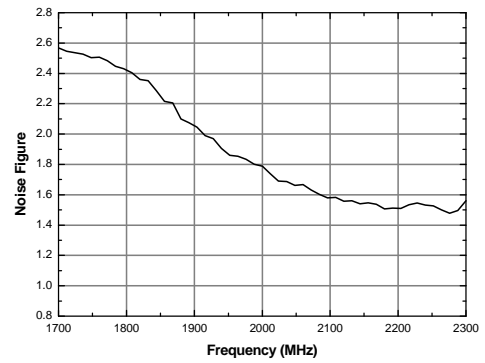
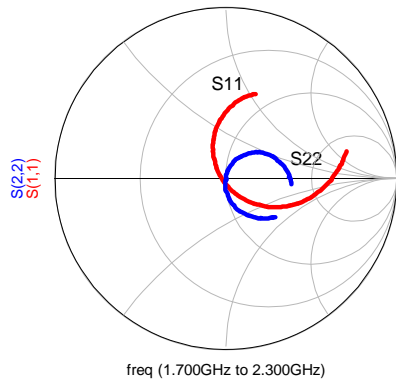


Bottom

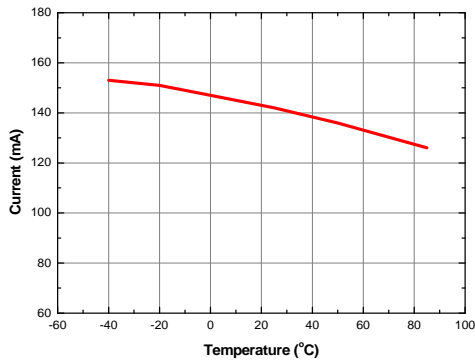


S-parameters & Noise Figure

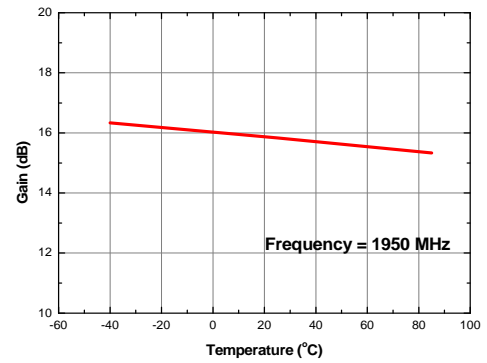




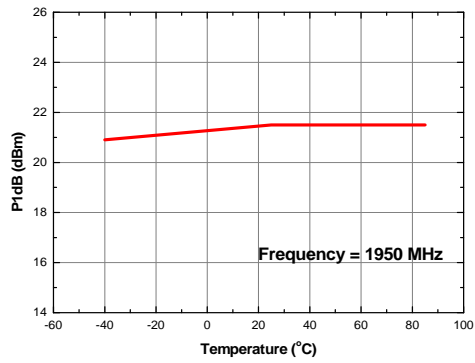
Current vs. Temperature



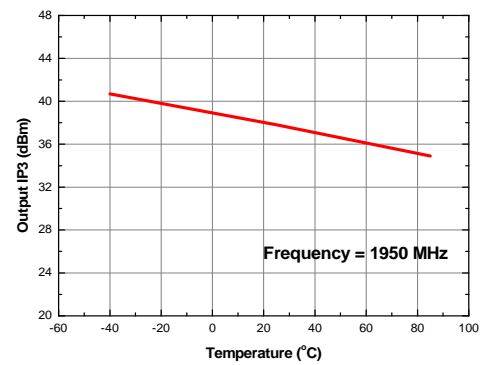
Gain vs. Temperature



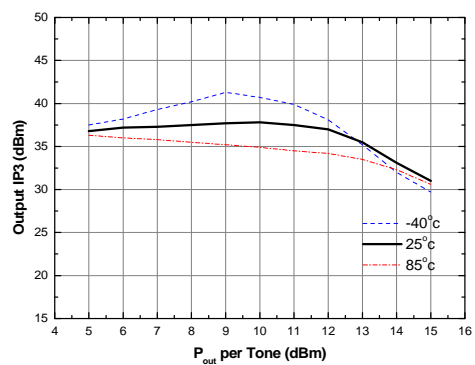
P1dB vs. Temperature



Output IP3 vs. Temperature



Output IP3 vs. Tone Power (Frequency = 1950 MHz)



Recommended Soldering Reflow Profile

