

Features

- 18.5 dB Gain at 900 MHz
- 20 dBm P1dB at 900 MHz
- 36 dBm Output IP3 at 900 MHz
- 0.8 dB NF at 900 MHz
- MTTF > 100 Years
- Single Supply

Description

The ASL210, a wideband linear low noise amplifier MMIC, has a low noise and high linearity at low bias current, being suitable for use in both receiver and transmitter of telecommunication systems up to 3 GHz. The amplifier is available in a SOT89 package and passes through the stringent DC, RF, and reliability tests.



Package Style: SOT89

Typical Performance

(Supply Voltage = Device Voltage, $T_A = +25\text{ }^{\circ}\text{C}$, $Z_0 = 50\text{ }\Omega$)

Parameters	Units	Typical					
Frequency	MHz	50	450	900	2000	2700	
Gain	dB	24.5	22.5	18.5	12.0	10.0	
S11	dB	-12	-15	-20	-18	-14	
S22	dB	-18	-15	-18	-12	-10	
Output IP3	dBm	35 ¹⁾	35 ²⁾	36 ³⁾	37 ⁴⁾	38 ⁴⁾	
Noise Figure	dB	2.5	0.8	0.8	0.9	1.2	
Output P1dB	dBm	18.5	20.0	20.0	20.5	20.5	
Current	mA	80	67	67	67	67	
Device Voltage	V	+3.0	+3.3	+3.3	+3.3	+3.3	

1) OIP3 is measured with two tones at an output power of +7 dBm/tone separated by 1 MHz.

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

3) OIP3 is measured with two tones at an output power of +12 dBm/tone separated by 1 MHz.

4) OIP3 is measured with two tones at an output power of +11 dBm/tone separated by 1 MHz.

Product Specifications

Parameters	Units	Min	Typ	Max
Testing Frequency	MHz		2000	
Gain	dB	11.5	12.0	14.0
S11	dB	-15	-18	
S22	dB	-10	-12	
Output IP3	dBm	34	37	
Noise Figure	dB		0.9	1.1
Output P1dB	dBm	19.0	20.5	
Current	mA	55	67	85
Device Voltage	V		+3.3	

Absolute Maximum Ratings

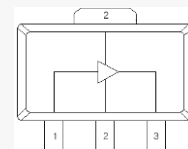
Parameters	Rating
Operating Case Temperature	-40 to +85 $^{\circ}\text{C}$
Storage Temperature	-40 to +150 $^{\circ}\text{C}$
Device Voltage	+5 V
Operating Junction Temperature	+150 $^{\circ}\text{C}$
Input RF Power (CW, 50 Ω matched)*	22 dBm
Thermal Resistance	184 $^{\circ}\text{C/W}$

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

Application Circuit

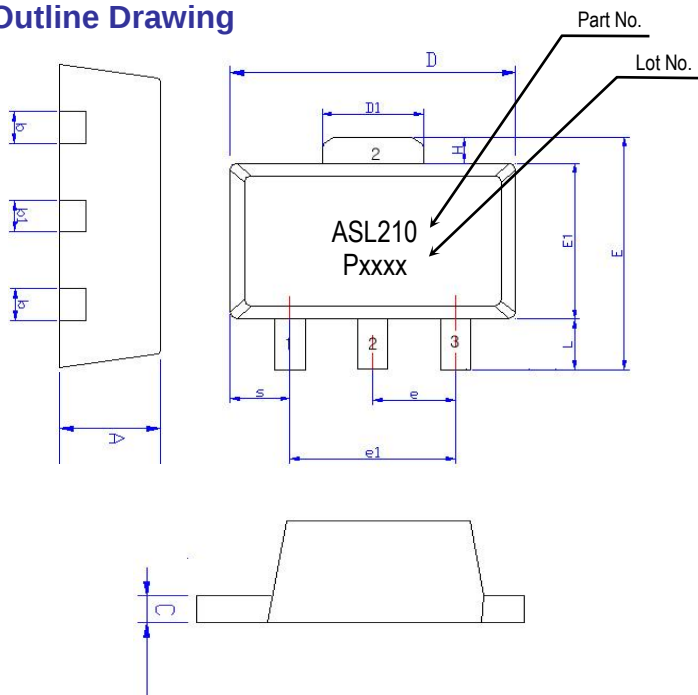
- IF (50 ~ 200 MHz)
- IF (470 ~ 510 MHz)
- CDMA
- GSM
- PCS & DCS
- WCDMA
- 2300 ~ 2700 MHz

Pin Configuration



Pin No.	Function
1	RF IN
2	GND
3	RF OUT & Bias

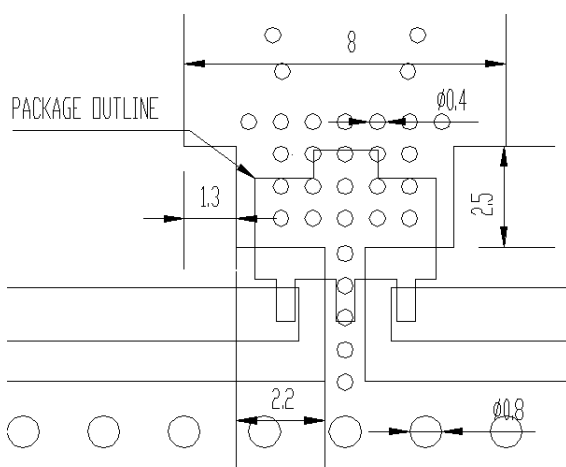
Outline Drawing



Symbols	Dimensions (In mm)		
	MIN	NOM	MAX
A	1.40	1.50	1.60
L	0.89	1.04	1.20
b	0.36	0.42	0.48
b1	0.41	0.47	0.53
C	0.38	0.40	0.43
D	4.40	4.50	4.60
D1	1.40	1.60	1.75
E	3.64	---	4.25
E1	2.40	2.50	2.60
e1	2.90	3.00	3.10
H	0.35	0.40	0.45
S	0.65	0.75	0.85
e	1.40	1.50	1.60

Pin No.	Function
1	RF IN
2	GND
3	RF OUT & Bias

Mounting Recommendation (In mm)



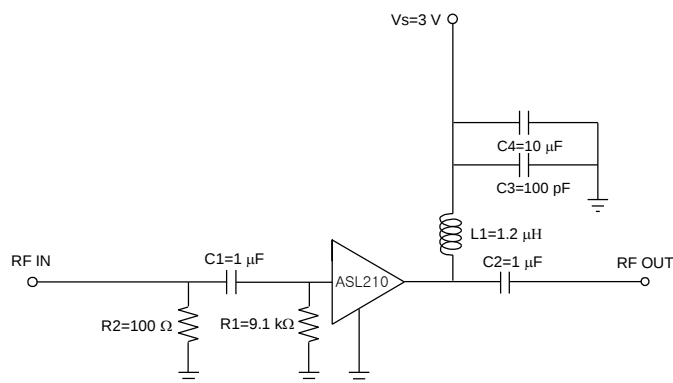
APPLICATION CIRCUIT

IF
50 ~ 200 MHz
+3 V

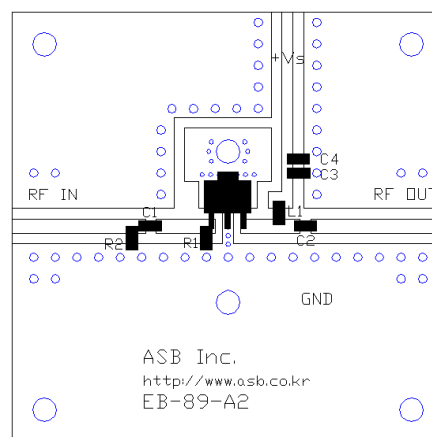
Frequency (MHz)	50	100	200
Magnitude S21 (dB)	24.5	24.0	23.0
Magnitude S11 (dB)	-12	-12	-11
Magnitude S22 (dB)	-18	-20	-20
Output P1dB (dBm)	18.5	18.5	18.5
Output IP3 ¹⁾ (dBm)	35	35	35
Noise Figure (dB)	2.5	2.4	2.4
Device Voltage (V)	+3	+3	+3
Current (mA)	80	80	80

1) OIP3 is measured with two tones at an output power of +7 dBm/tone separated by 1 MHz.

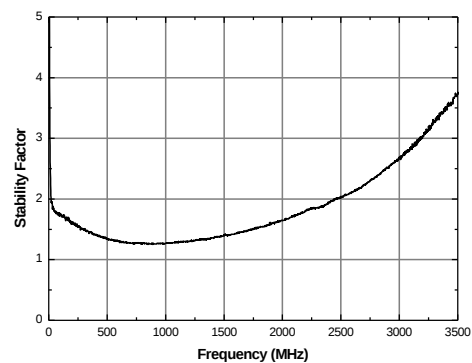
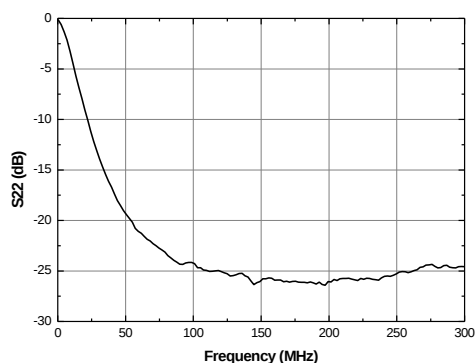
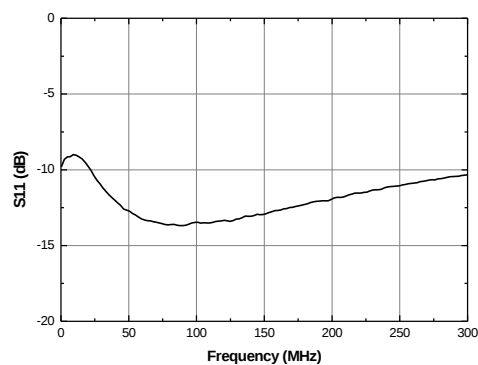
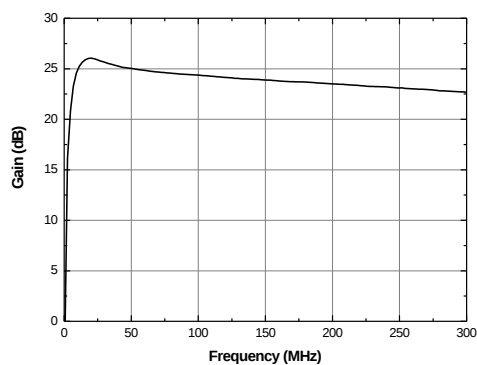
Schematic



Board Layout (FR4, 40x40 mm², 0.8T)



S-parameters & K-factor



APPLICATION CIRCUIT

IF

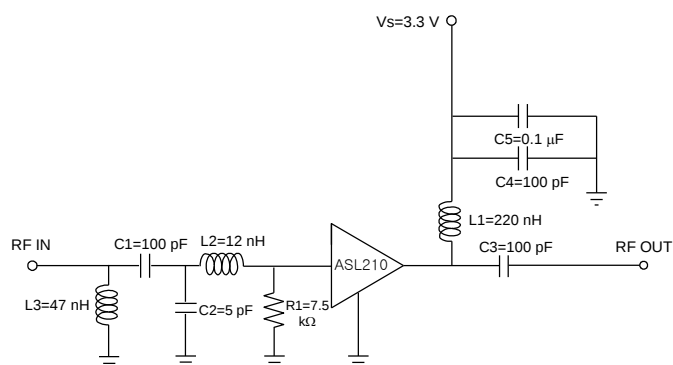
470 ~ 510 MHz

+3.3 V

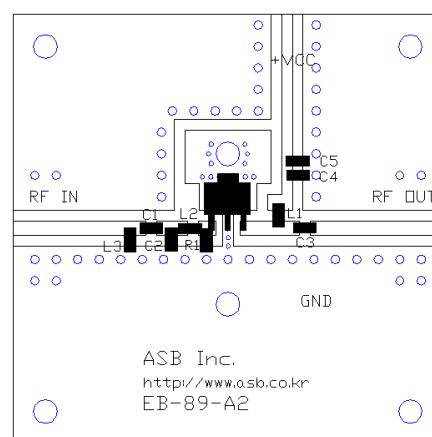
Frequency (MHz)	470	510
Magnitude S21 (dB)	22.5	22.0
Magnitude S11 (dB)	-15	-17
Magnitude S22 (dB)	-15	-15
Output P1dB (dBm)	20	20
Output IP3 ¹⁾ (dBm)	35	35
Noise Figure (dB)	0.8	0.9
Device Voltage (V)	+3.3	+3.3
Current (mA)	67	67

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

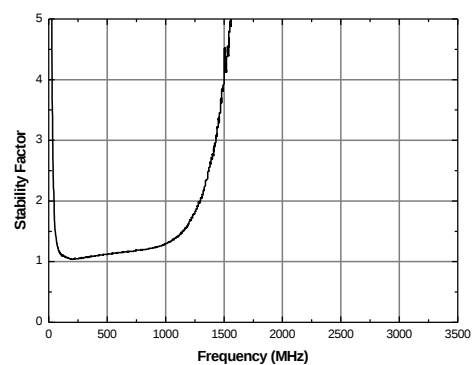
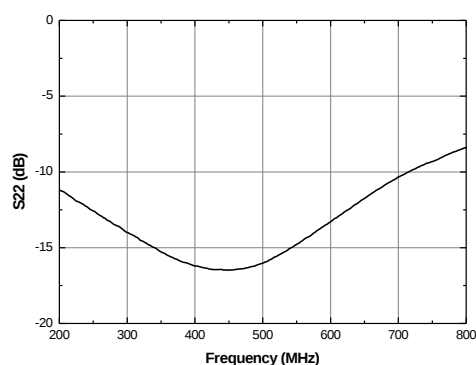
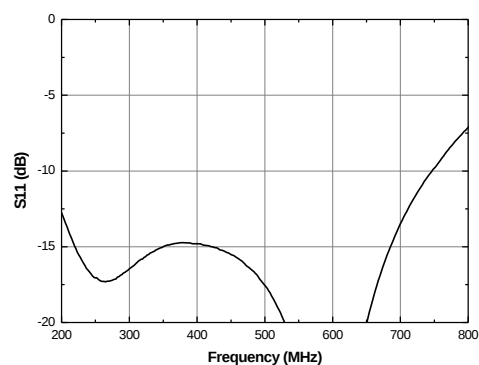
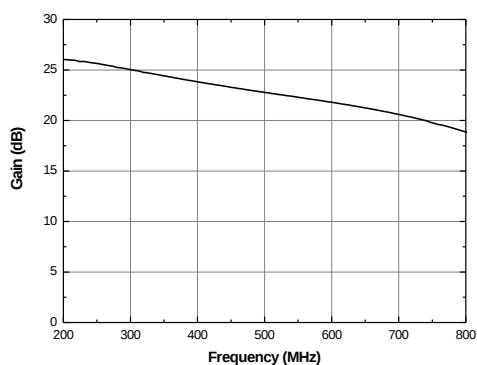
Schematic



Board Layout (FR4, 40x40 mm², 0.8T)



S-parameters & K-factor



APPLICATION CIRCUIT

CDMA & GSM

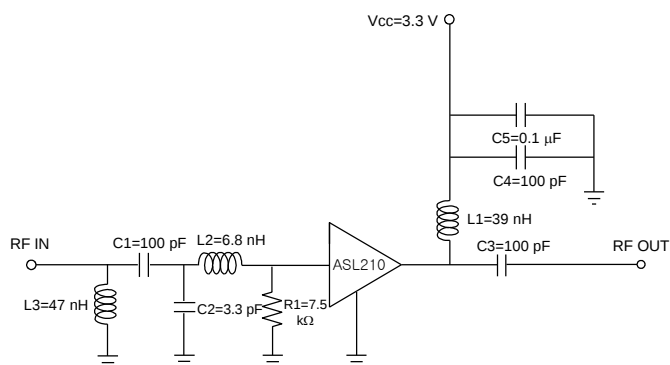
824 ~ 960 MHz

+3.3 V

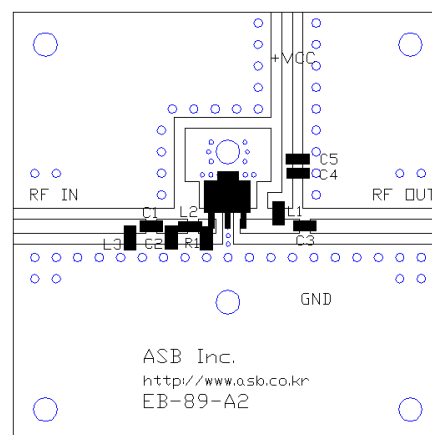
Frequency (MHz)	824	894	960
Magnitude S21 (dB)	19.5	18.5	18.0
Magnitude S11 (dB)	-15	-20	-15
Magnitude S22 (dB)	-20	-18	-15
Output P1dB (dBm)	20.0	20.0	19.5
Output IP3 ¹⁾ (dBm)	35.0	35.0	35.5
Noise Figure (dB)	0.7	0.8	0.8
Device Voltage (V)	+3.3	+3.3	+3.3
Current (mA)	67	67	67

1) OIP3 is measured with two tones at an output power of +12 dBm/tone separated by 1 MHz.

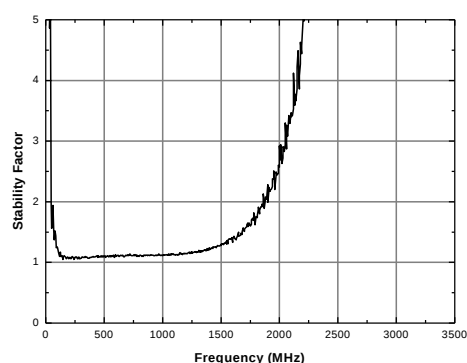
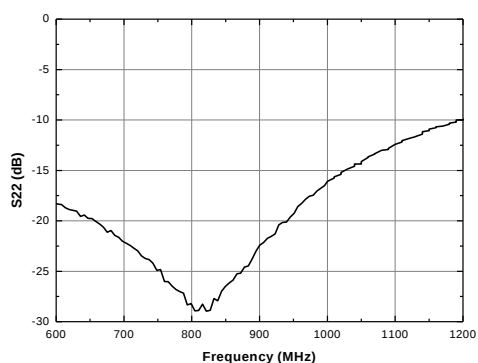
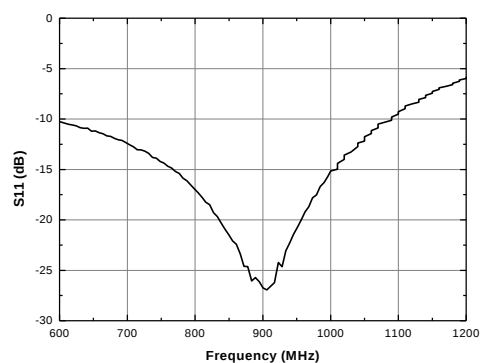
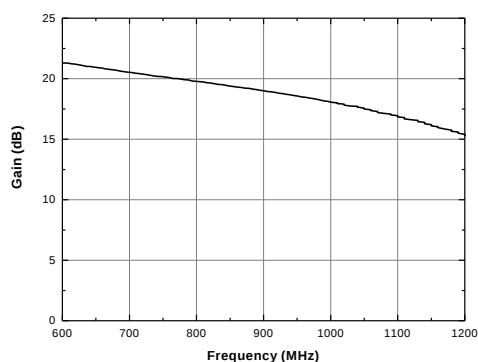
Schematic



Board Layout (FR4, 40x40 mm², 0.8T)



S-parameters & K-factor



APPLICATION CIRCUIT

PCS & DCS

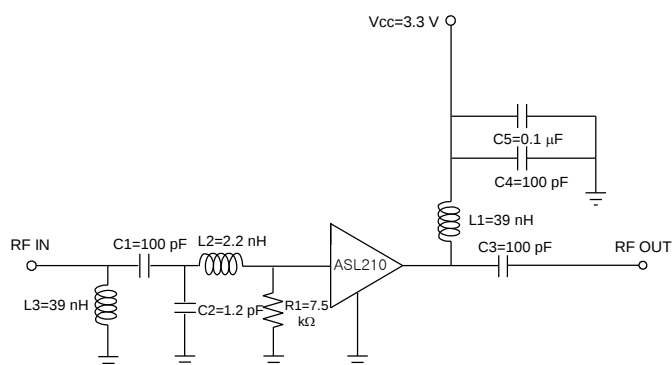
1710 ~ 1990 MHz

+3.3 V

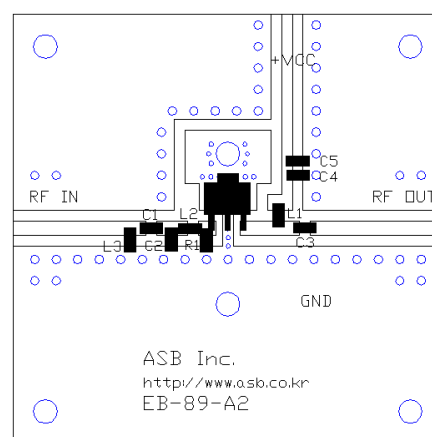
Frequency (MHz)	1710	1990
Magnitude S21 (dB)	14	13
Magnitude S11 (dB)	-18	-16
Magnitude S22 (dB)	-16	-14
Output P1dB (dBm)	19.5	19.5
Output IP3 ¹⁾ (dBm)	37.0	37.5
Noise Figure (dB)	0.7	0.8
Device Voltage (V)	+3.3	+3.3
Current (mA)	67	67

1) OIP3 is measured with two tones at an output power of +11 dBm/tone separated by 1 MHz.

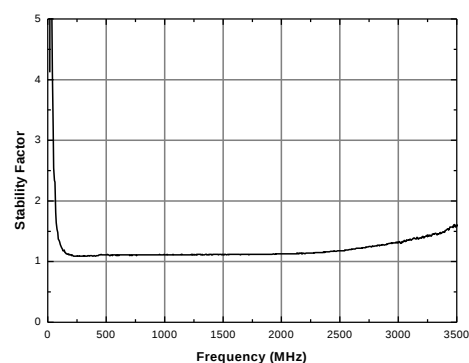
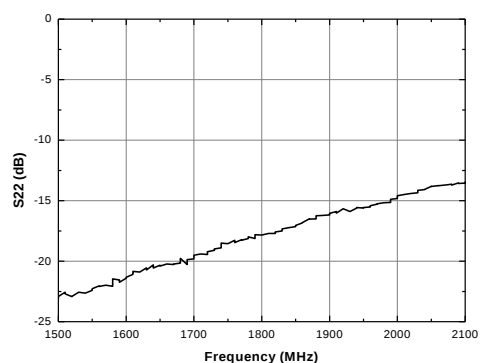
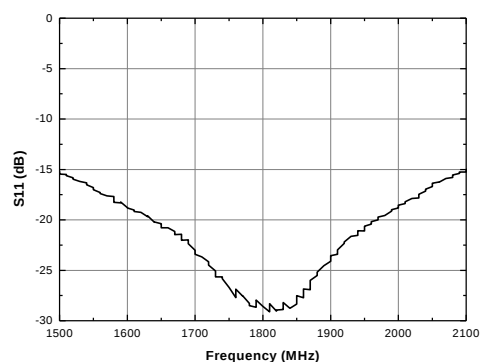
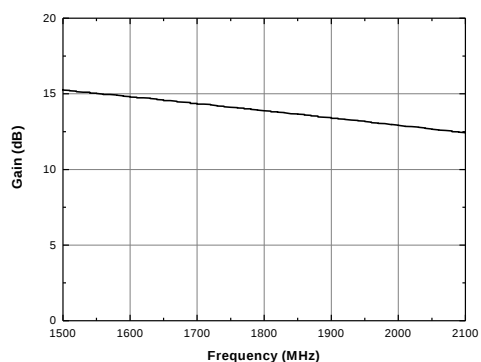
Schematic



Board Layout (FR4, 40x40 mm², 0.8T)



S-parameters & K-factor



APPLICATION CIRCUIT

WCDMA

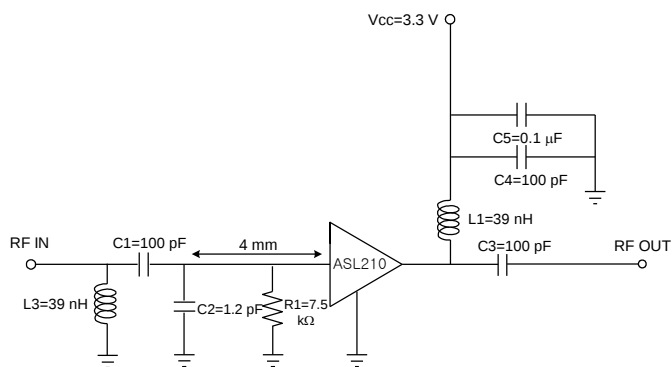
1920 ~ 2170 MHz

+3.3 V

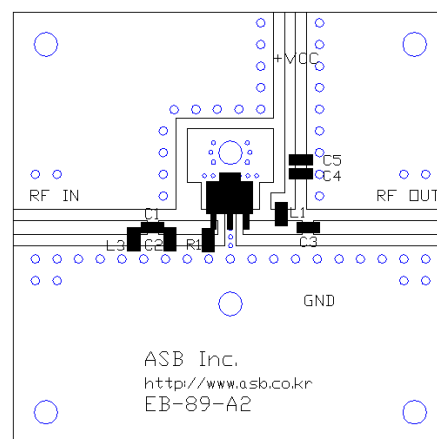
Frequency (MHz)	1920	2170
Magnitude S21 (dB)	13	12
Magnitude S11 (dB)	-15	-18
Magnitude S22 (dB)	-14	-12
Output P1dB (dBm)	20.0	20.5
Output IP3 ¹⁾ (dBm)	37	37
Noise Figure (dB)	0.8	0.9
Device Voltage (V)	+3.3	+3.3
Current (mA)	67	67

1) OIP3 is measured with two tones at an output power of +11 dBm/tone separated by 1 MHz.

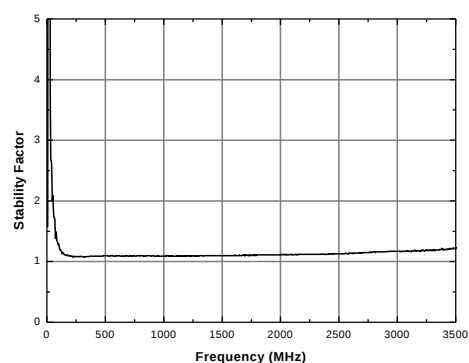
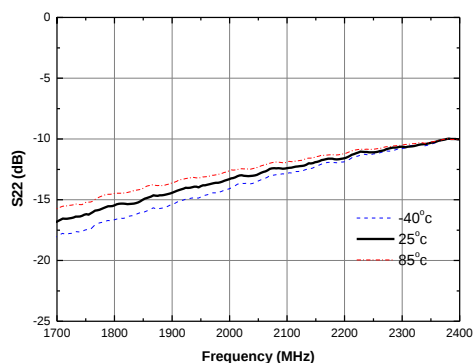
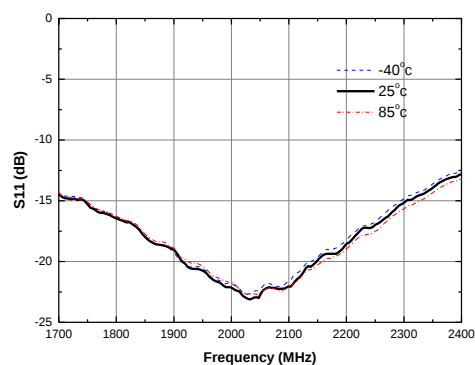
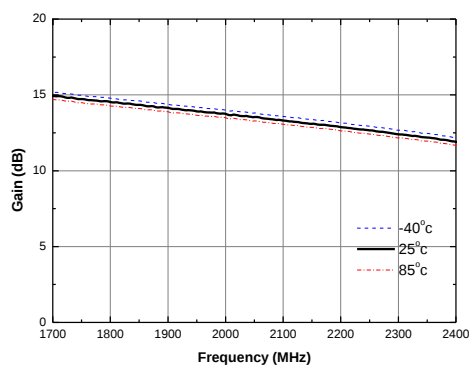
Schematic



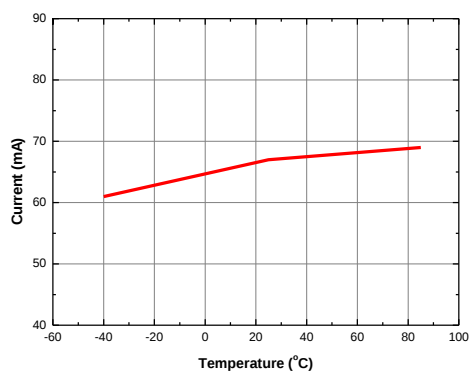
Board Layout (FR4, 40x40 mm², 0.8T)



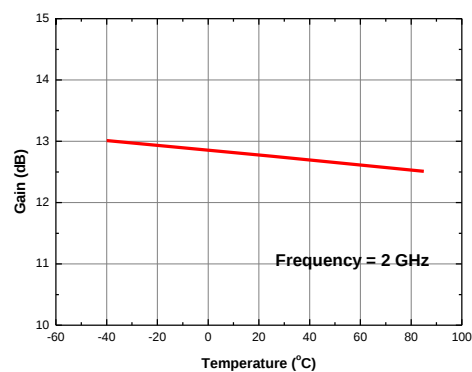
S-parameters & K-factor



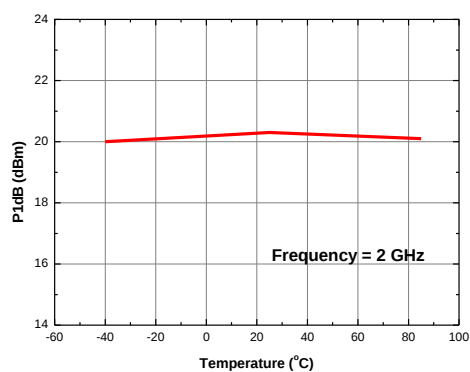
Current vs. Temperature



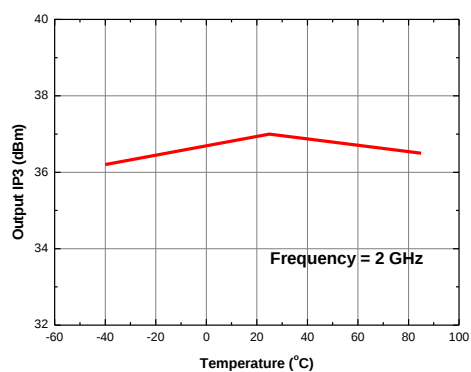
Gain vs. Temperature



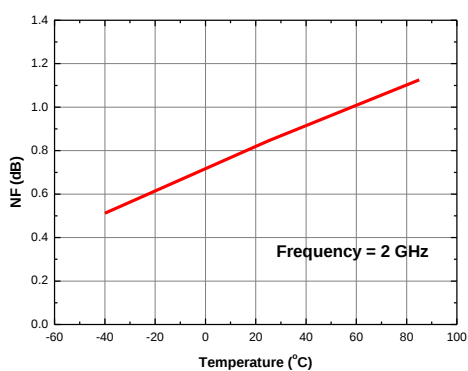
P1dB vs. Temperature



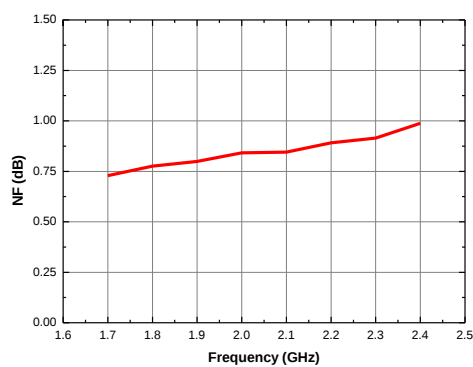
Output IP3 vs. Temperature



NF vs. Temperature



NF vs. Frequency



APPLICATION CIRCUIT

LTE

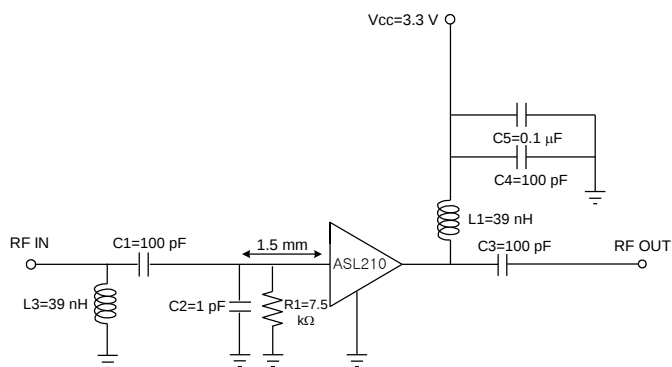
2300 ~ 2700 MHz

+3.3 V

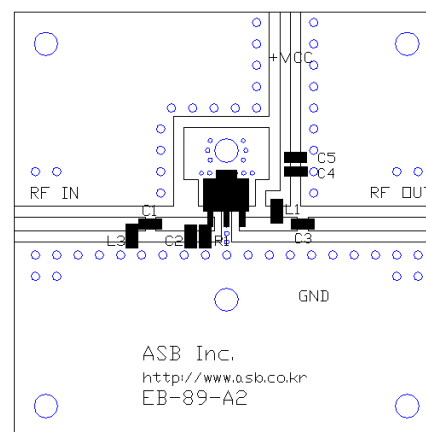
Frequency (MHz)	2300	2500	2700
Magnitude S21 (dB)	11.5	10.5	10.0
Magnitude S11 (dB)	-14	-15	-14
Magnitude S22 (dB)	-14	-12	-10
Output P1dB (dBm)	20.5	21.0	20.5
Output IP3 ¹⁾ (dBm)	38	38	38
Noise Figure (dB)	1.0	1.1	1.2
Device Voltage (V)	+3.3	+3.3	+3.3
Current (mA)	67	67	67

1) OIP3 is measured with two tones at an output power of +11 dBm/tone separated by 1 MHz.

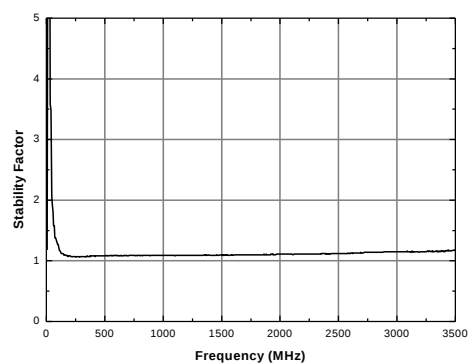
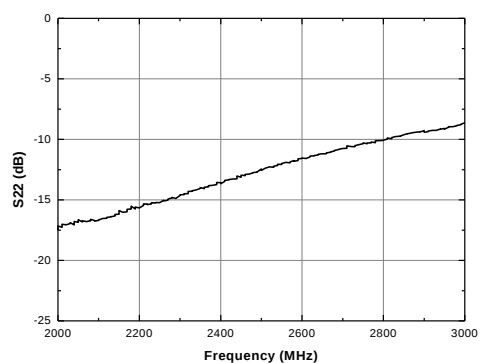
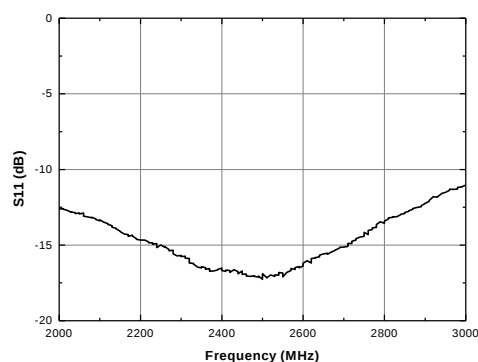
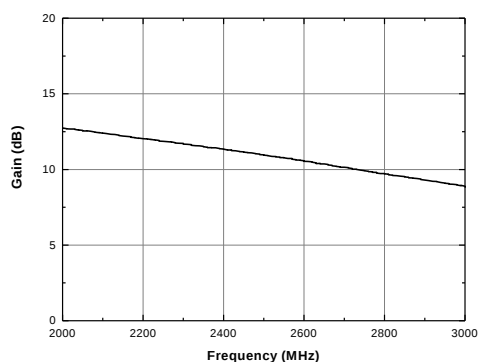
Schematic



Board Layout (FR4, 40x40 mm², 0.8T)



S-parameters & K-factor



Recommended Soldering Reflow Profile

