

Features

- 22 dB Gain at 1950 MHz
- 29.5 dBm P1dB at 1950 MHz
- 47 dBm Output IP3 at 1950 MHz
- MTTF > 100 Years
- Two Power Supplies

Description

The ASL425, a power amplifier MMIC, has a high linearity, high gain, and high efficiency over a wide range of frequency, being suitable for use in both receiver and transmitter of telecommunication systems up to 4 GHz. The amplifier is available in a SOIC8 package and passes through the stringent DC, RF, and reliability tests.



Package Style: SOIC8

Typical Performance

(Supply Voltage = +5 V, $T_A = +25\text{ }^{\circ}\text{C}$, $Z_0 = 50\text{ }\Omega$)

Parameters	Units	Typical			
Frequency	MHz	900	1950	2300	2700
Gain	dB	34.0	22.0	20.0	17.5
S11	dB	-14	-13	-11	-9
S22	dB	-14	-15	-15	-17
Output IP3	dBm	45 ¹⁾	47 ²⁾	46 ²⁾	45 ²⁾
Noise Figure	dB	1.0	1.4	1.5	2.1
Output P1dB	dBm	29.0	29.5	29.5	28.5
Current	mA	350	350	350	350
Device Voltage	V	+5	+5	+5	+5

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

2) OIP3 measured with two tones at an output power of +13 dBm/tone separated by 1 MHz.

Product Specifications*

Parameters	Units	Min	Typ.	Max
Testing Frequency	MHz		1950	
Gain	dB		22.0	
S11	dB		-13	
S22	dB		-15	
Output IP3	dBm		47	
Noise Figure	dB		1.4	
Output P1dB	dBm		29.5	
Current	mA		350	
Device Voltage	V		+5	

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

Absolute Maximum Ratings

Parameters	Rating
Operating Case Temperature	-40 to +85 $^{\circ}\text{C}$
Storage Temperature	-40 to +150 $^{\circ}\text{C}$
Device Voltage	+6 V
Operating Junction Temperature	+150 $^{\circ}\text{C}$
Input RF Power (CW, 50 Ω matched)*	+23 dBm
Thermal Resistance	28 $^{\circ}\text{C/W}$

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

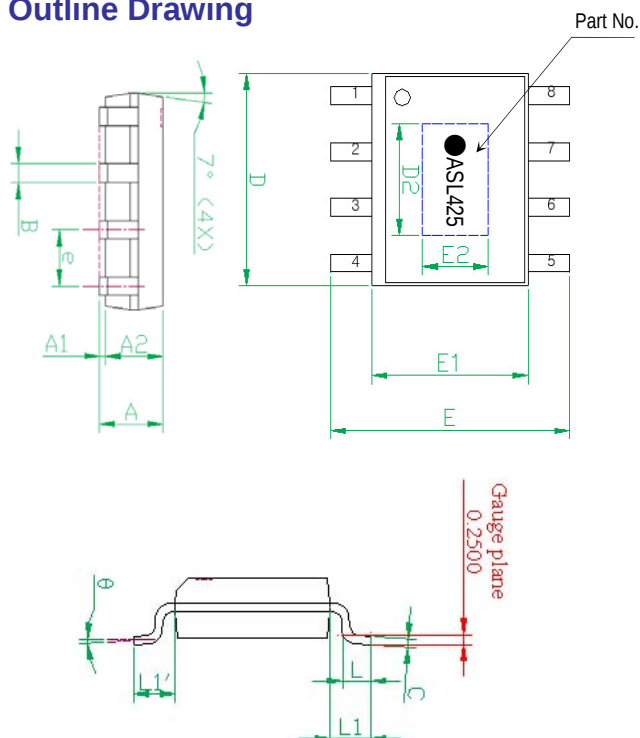
Application Circuit

- 206.5 MHz
- TETRA
- CDMA
- WCDMA
- 2300 ~ 2700 MHz

Pin Configuration

Pin No.	Function
1	2nd stage RF IN
2	1st stage RF OUT
3,5,8	GND
4	1st stage RF IN
6,7	2nd stage RF OUT

Outline Drawing

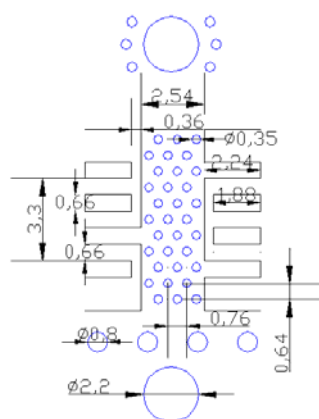


Symbols	Dimensions (In mm)		
	MIN	NOM	MAX
A	1.40	1.50	1.60
A1	0.00	---	0.10
A2	---	1.45	---
B	0.33	---	0.51
C	0.19	---	0.25
D	4.80	---	5.00
D2	3.20	3.30	3.40
E	5.80	6.00	6.20
E1	3.80	3.90	4.00
E2	2.30	2.40	2.50
e	---	1.27	---
L	0.40	---	1.27
y	---	---	0.10
θ	0°	---	8°
L1-L1'	---	---	0.12
L1	1.04REF		

Pin No.	Function	Pin No.	Function.
1	2nd stage RF IN	5	GND
2	1st stage RF OUT	6	2nd stage RF OUT
3	GND	7	2nd stage RF OUT
4	1st stage RF IN	8	GND

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

Mounting Recommendation (In mm)



- Note:**
1. Add as much copper as possible to inner and outer layers near the part to ensure optimal thermal performance.
 2. To ensure reliable operation, device ground paddle-to-ground pad soldering is critical.
 3. Add mounting screws near the part to fasten the board to a heat sink. Ensure that the ground / thermal via region contacts the heat sink.
 4. A proper heat dissipation path underneath the area of the PCB for the mounted device is strictly required for proper thermal operation. Damage to the device can result from inappropriate heat dissipation.

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

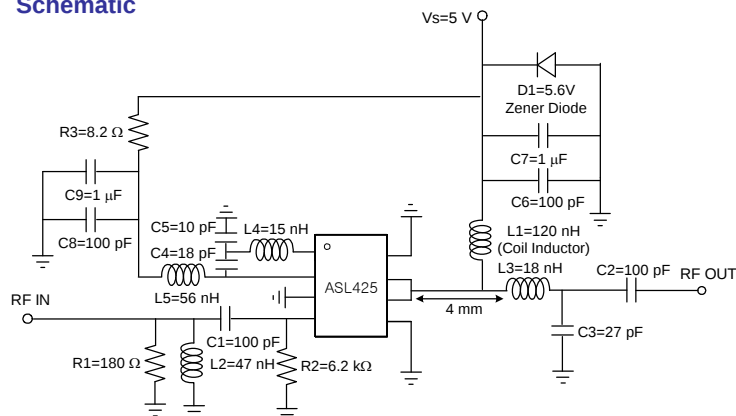
APPLICATION CIRCUIT

IF
206.5 MHz
+5 V

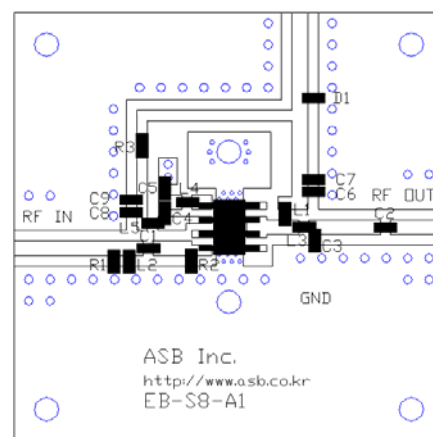
Frequency (MHz)	206.5
Magnitude S21 (dB)	37.5
Magnitude S11 (dB)	-17
Magnitude S22 (dB)	-10
Output P1dB (dBm)	29.5
Output IP3 ¹⁾ (dBm)	40
Noise Figure (dB)	2.4
Device Voltage (V)	+5
Current (mA)	350

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

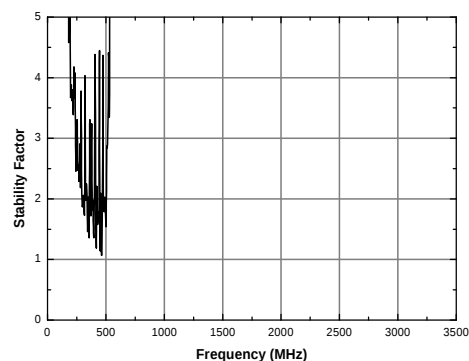
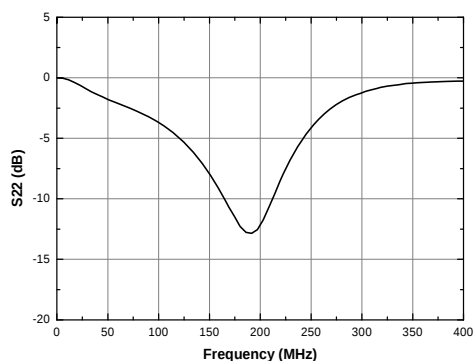
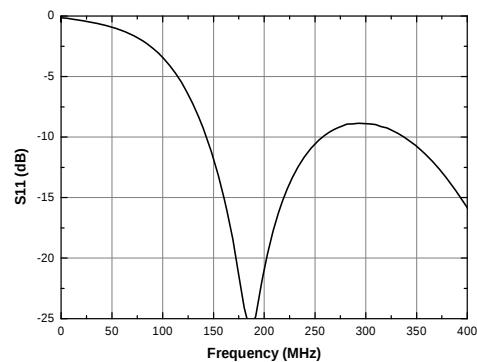
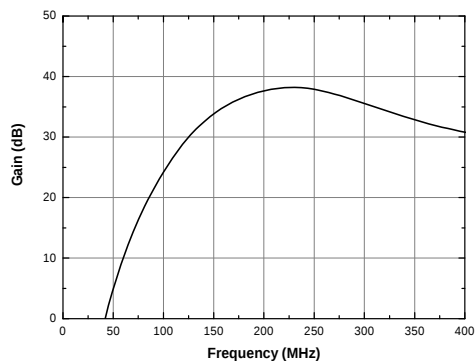
Schematic



Board Layout (FR4, 40x40 mm², 0.8T)



S-parameters & K-factor



APPLICATION CIRCUIT

TETRA

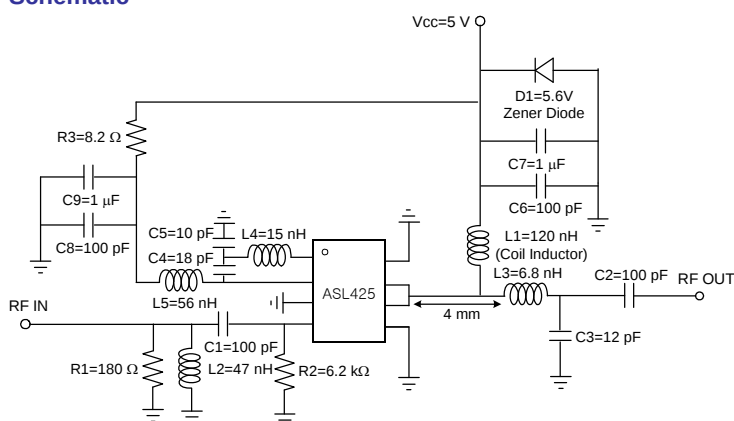
380 ~ 500 MHz

+5 V

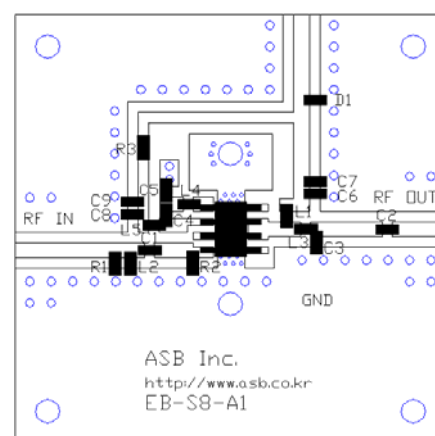
Frequency (MHz)	380	440	500
Magnitude S21 (dB)	40.0	40.5	39.0
Magnitude S11 (dB)	-11	-14	-15
Magnitude S22 (dB)	-6	-6	-6
Output P1dB (dBm)	30.0	29.5	29.0
Output IP3 ¹⁾ (dBm)	41	45	44
Noise Figure (dB)	2.1	2.0	2.0
Device Voltage (V)	+5	+5	+5
Current (mA)	350	350	350

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

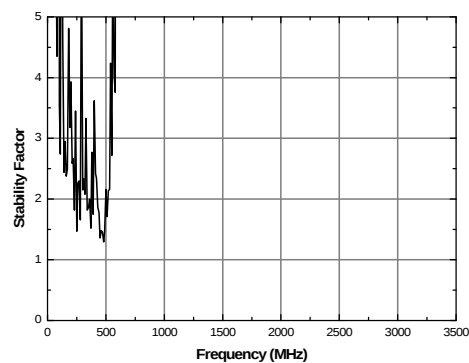
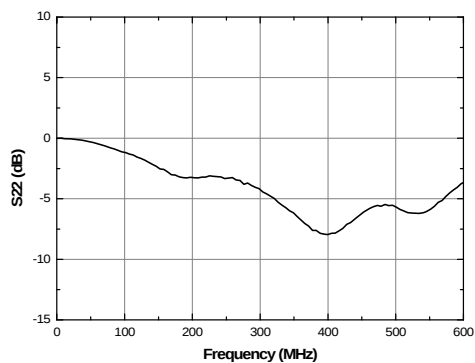
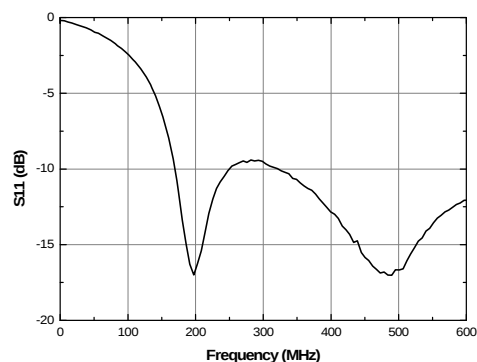
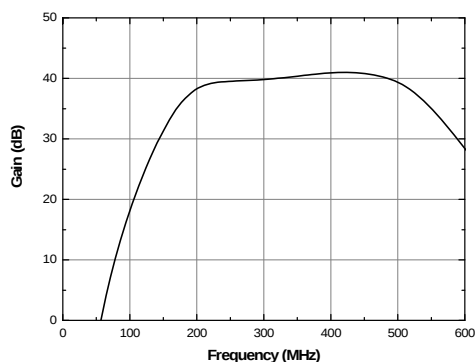
Schematic



Board Layout (FR4, 40x40 mm², 0.8T)



S-parameters & K-factor



APPLICATION CIRCUIT

TETRA

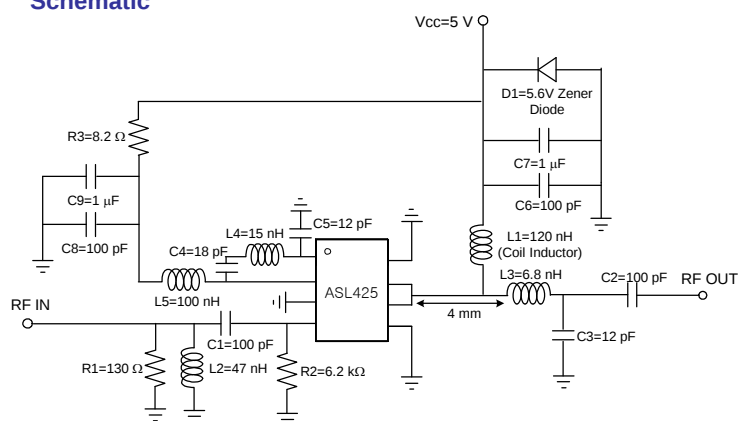
380 ~ 420 MHz

+5 V

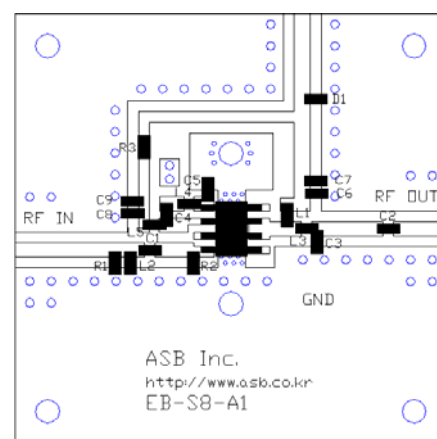
Frequency (MHz)	380	400	420
Magnitude S21 (dB)	35.5	35.0	34.5
Magnitude S11 (dB)	-10	-10	-9
Magnitude S22 (dB)	-5	-6	-6
Output P1dB (dBm)	29	29	29
Output IP3 ¹⁾ (dBm)	45.0	45.5	46.0
Noise Figure (dB)	2.8	2.8	2.8
Device Voltage (V)	+5	+5	+5
Current (mA)	350	350	350

1) OIP3 is measured with two tones at an output power of +8 dBm/tone separated by 1 MHz.

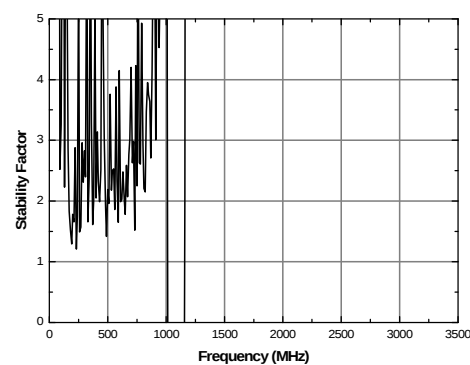
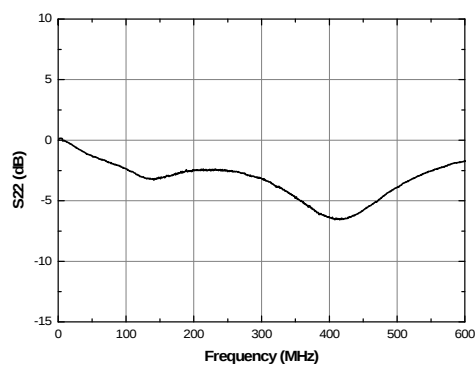
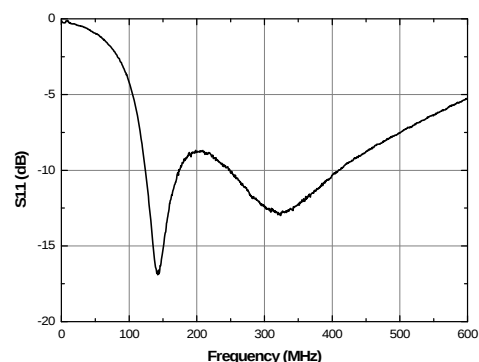
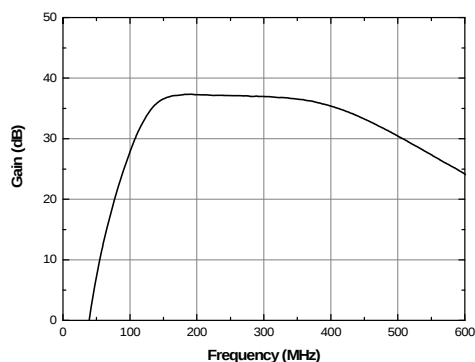
Schematic



Board Layout (FR4, 40x40 mm², 0.8T)



S-parameters & K-factor



APPLICATION CIRCUIT

TETRA

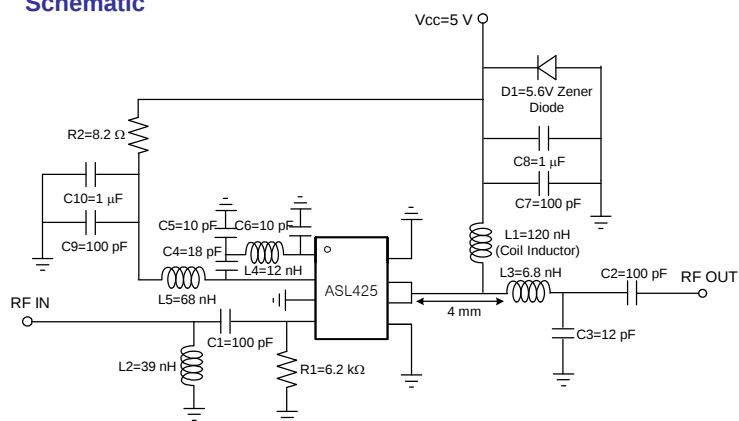
420 ~ 460 MHz

+5 V

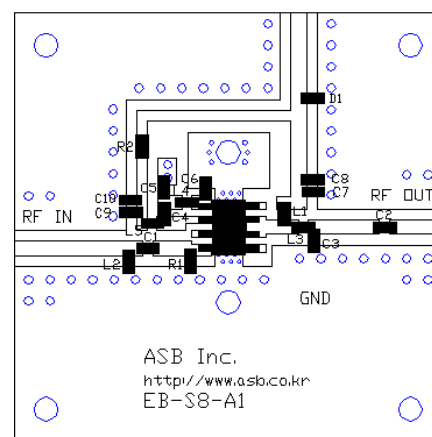
Frequency (MHz)	420	440	460
Magnitude S21 (dB)	43.0	42.0	41.0
Magnitude S11 (dB)	-9.0	-9.0	-8.5
Magnitude S22 (dB)	-5	-5	-5
Output P1dB (dBm)	29.5	30.0	29.5
Output IP3 ¹⁾ (dBm)	44.0	45.0	44.5
Noise Figure (dB)	0.9	0.8	0.8
Device Voltage (V)	+5	+5	+5
Current (mA)	350	350	350

1) OIP3 is measured with two tones at an output power of +8 dBm/tone separated by 1 MHz.

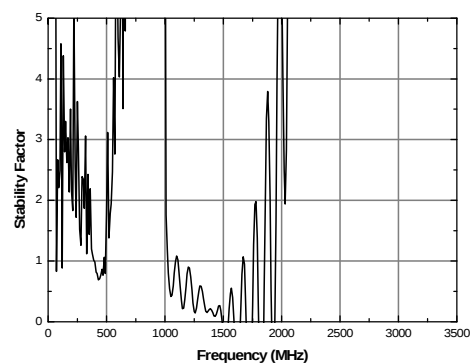
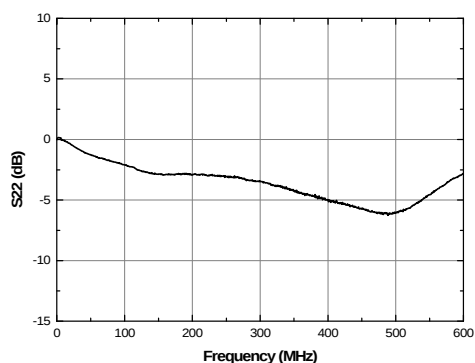
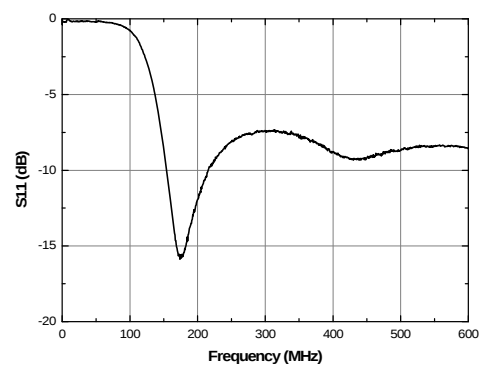
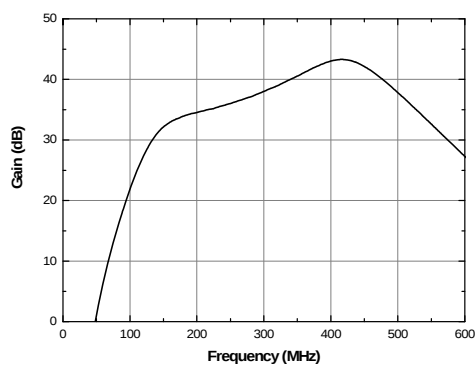
Schematic



Board Layout (FR4, 40x40 mm², 0.8T)



S-parameters & K-factor



APPLICATION CIRCUIT

TETRA

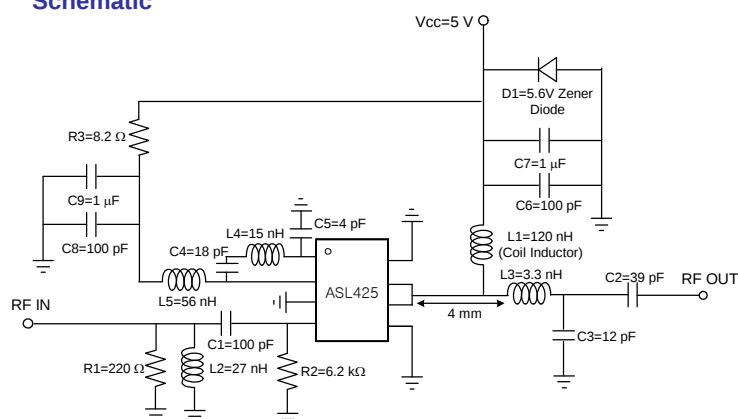
460 ~ 500 MHz

+5 V

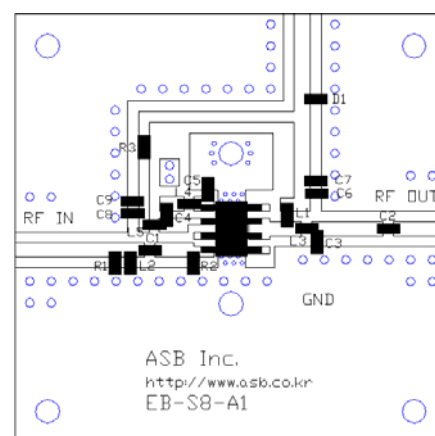
Frequency (MHz)	460	480	500
Magnitude S21 (dB)	40.0	39.0	38.5
Magnitude S11 (dB)	-11	-10	-10
Magnitude S22 (dB)	-7	-8	-8
Output P1dB (dBm)	30.0	30.0	29.5
Output IP3 ¹⁾ (dBm)	44.5	45.0	44.5
Noise Figure (dB)	1.80	1.90	1.95
Device Voltage (V)	+5	+5	+5
Current (mA)	350	350	350

1) OIP3 is measured with two tones at an output power of +9 dBm/tone separated by 1 MHz.

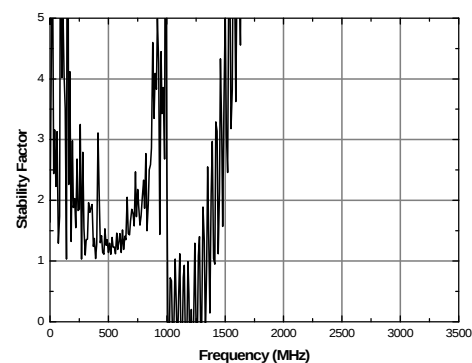
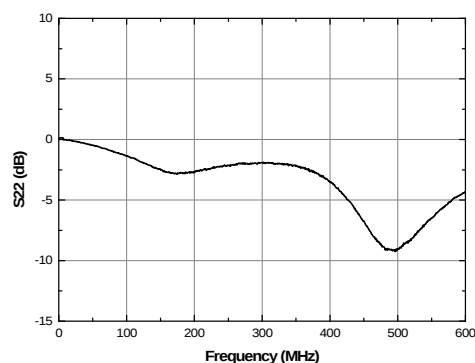
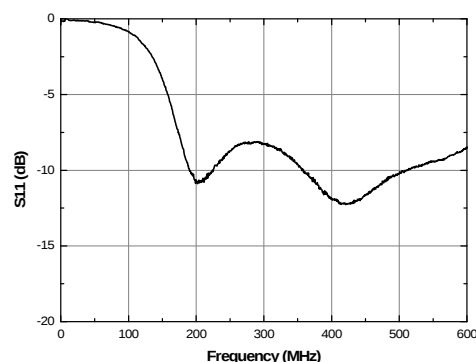
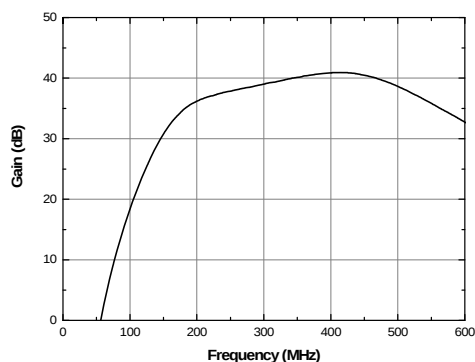
Schematic



Board Layout (FR4, 40x40 mm², 0.8T)



S-parameters & K-factor



APPLICATION CIRCUIT

CDMA

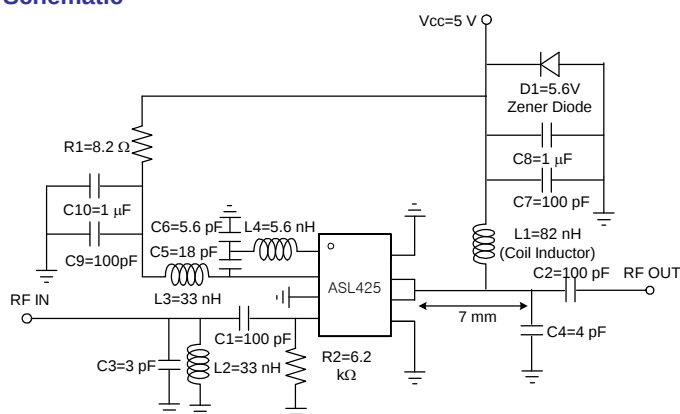
824 ~ 894 MHz

+5 V

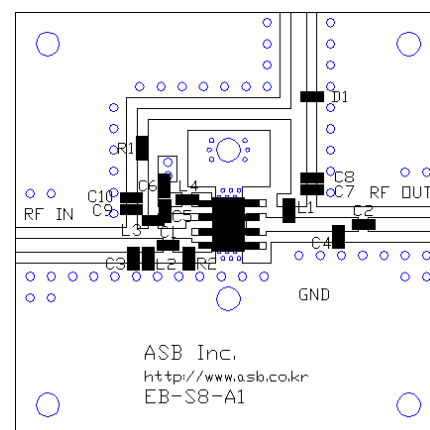
Frequency (MHz)	824 ~ 849	869 ~ 894
Magnitude S21 (dB)	34.5	34
Magnitude S11 (dB)	-8	-14
Magnitude S22 (dB)	-13	-14
Output P1dB (dBm)	28	29
Output IP3 ¹⁾ (dBm)	43	45
Noise Figure (dB)	1.0	1.0
Device Voltage (V)	+5	
Current (mA)	350	

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

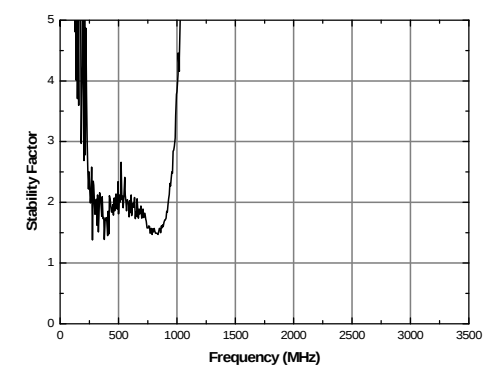
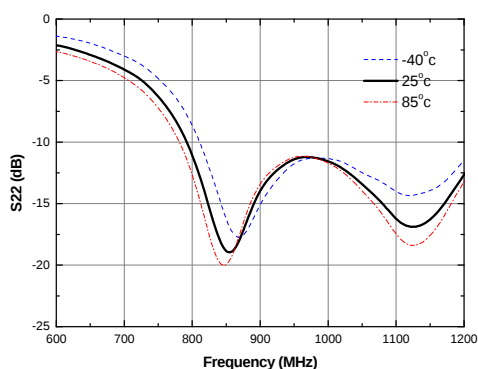
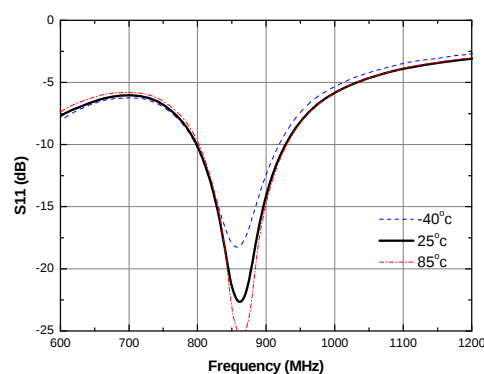
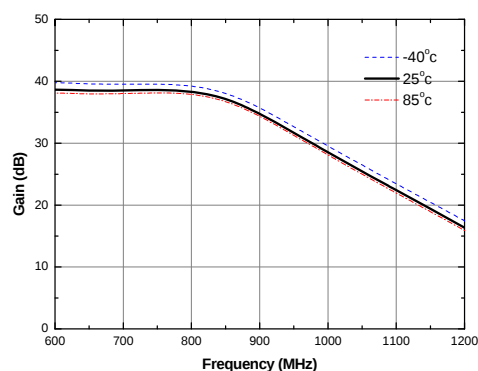
Schematic



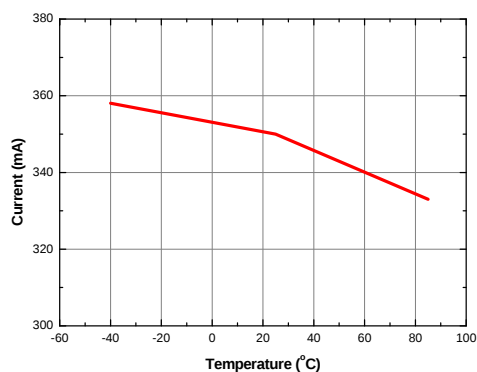
Board Layout (FR4, 40x40 mm², 0.8T)



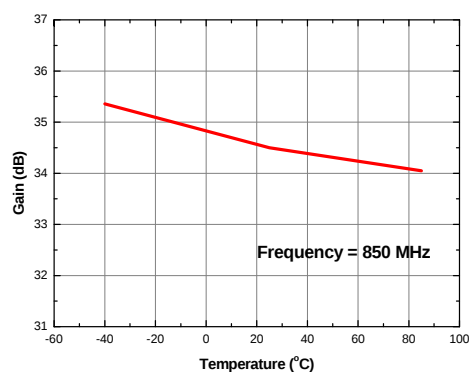
S-parameters & K-factor



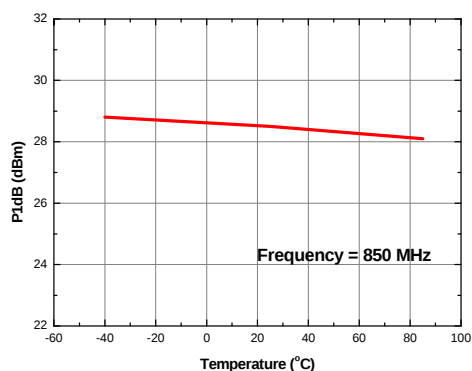
Current vs. Temperature



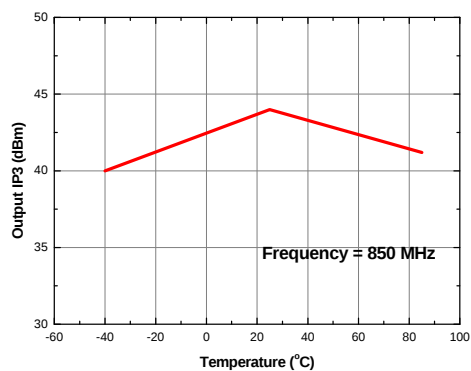
Gain vs. Temperature



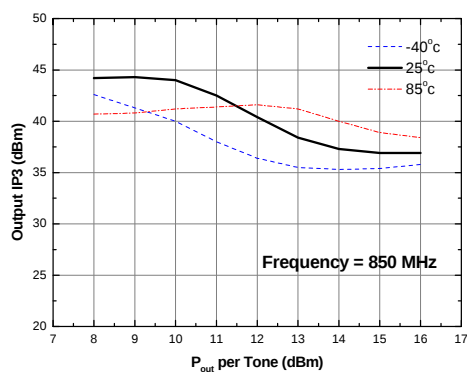
P1dB vs. Temperature



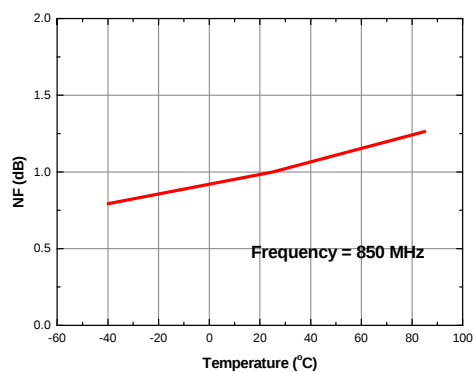
Output IP3 vs. Temperature



Output IP3 vs. Tone Power



NF vs. Temperature



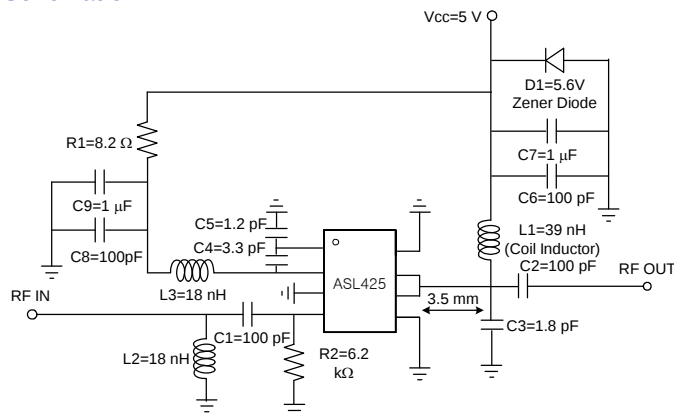
APPLICATION CIRCUIT

WCDMA Rx
1920 ~ 1980 MHz
+5 V

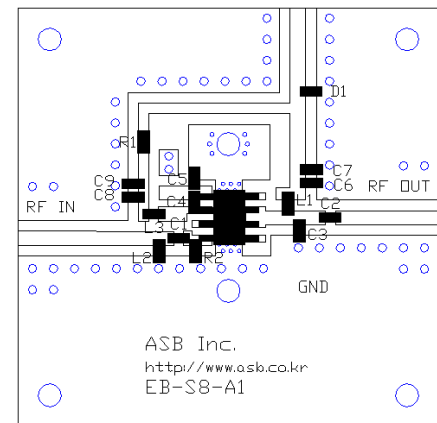
Frequency (MHz)	1920 ~ 1980
Magnitude S21 (dB)	22.0
Magnitude S11 (dB)	-13
Magnitude S22 (dB)	-15
Output P1dB (dBm)	29.5
Output IP3 ¹⁾ (dBm)	47
Noise Figure (dB)	1.4
Device Voltage (V)	+5
Current (mA)	350

1) OIP3 is measured with two tones at an output power of +13 dBm/tone separated by 1 MHz.

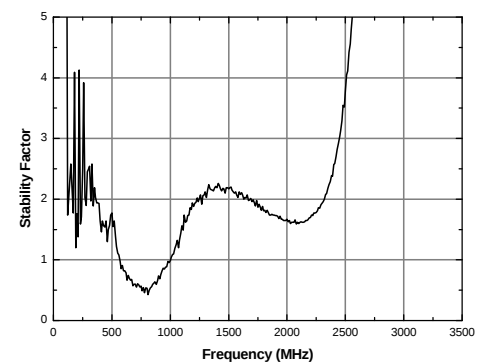
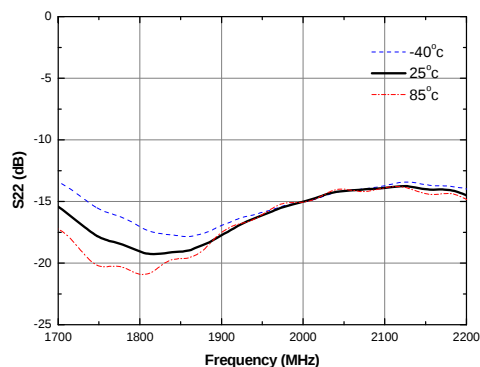
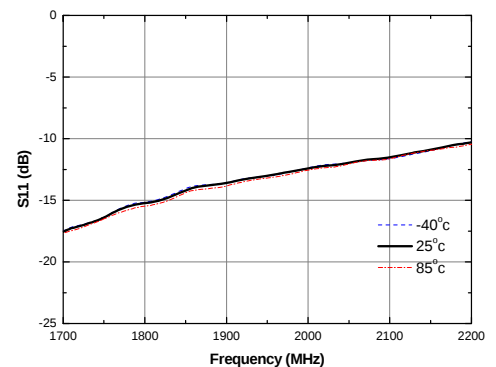
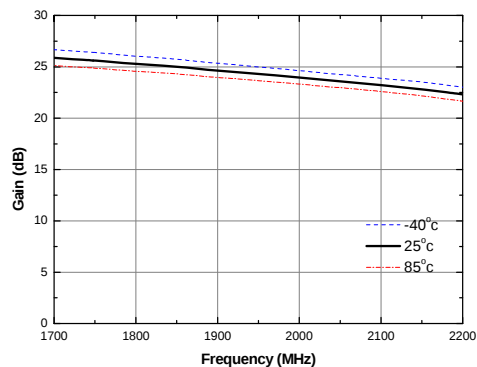
Schematic



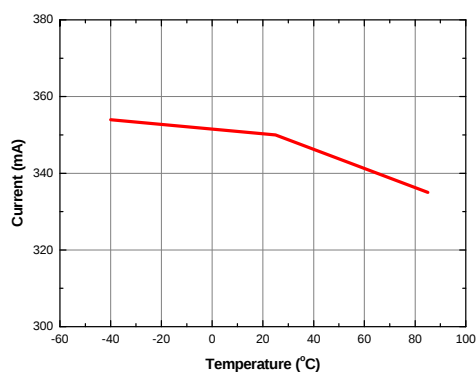
Board Layout (FR4, 40x40 mm², 0.8T)



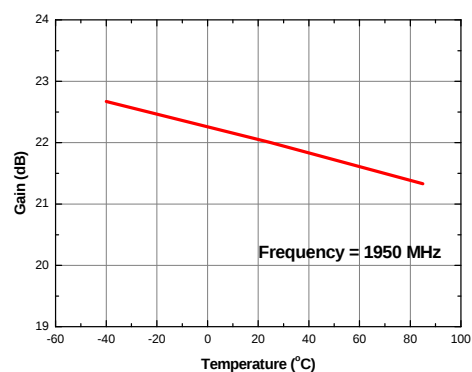
S-parameters & K-factor



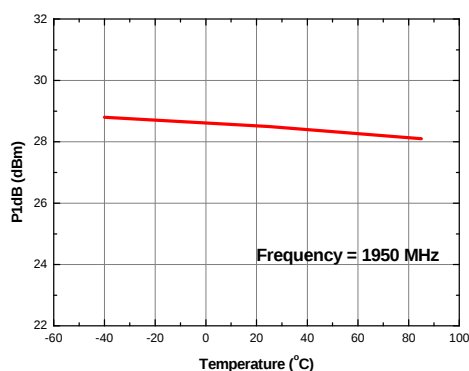
Current vs. Temperature



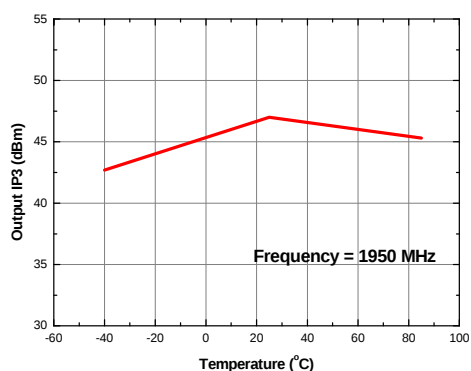
Gain vs. Temperature



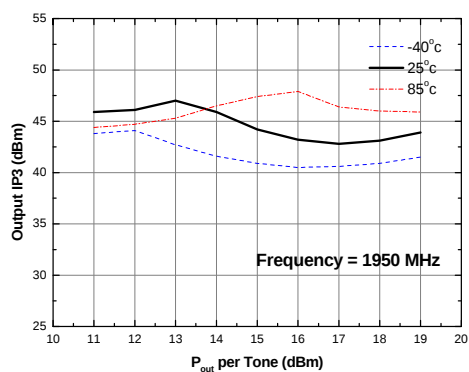
P1dB vs. Temperature



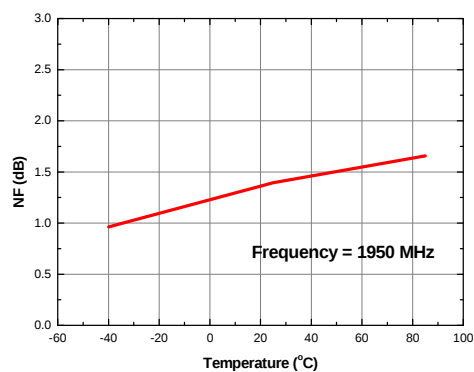
Output IP3 vs. Temperature



Output IP3 vs. Tone Power



NF vs. Temperature



APPLICATION CIRCUIT

WCDMA Tx

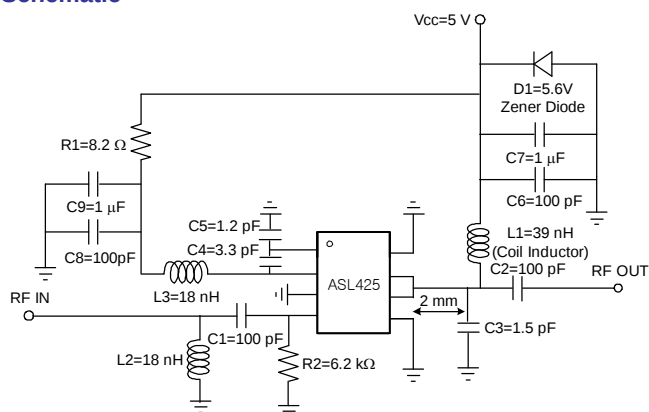
2110 ~ 2170 MHz

+5 V

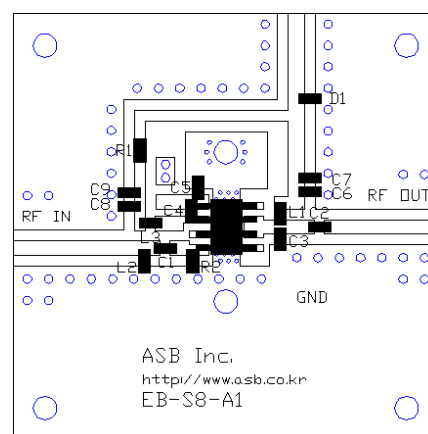
Frequency (MHz)	2110 ~ 2170
Magnitude S21 (dB)	22.5
Magnitude S11 (dB)	-10
Magnitude S22 (dB)	-18
Output P1dB (dBm)	29.5
Output IP3 ¹⁾ (dBm)	47
Noise Figure (dB)	1.5
Device Voltage (V)	+5
Current (mA)	350

1) OIP3 is measured with two tones at an output power of +13 dBm/tone separated by 1 MHz.

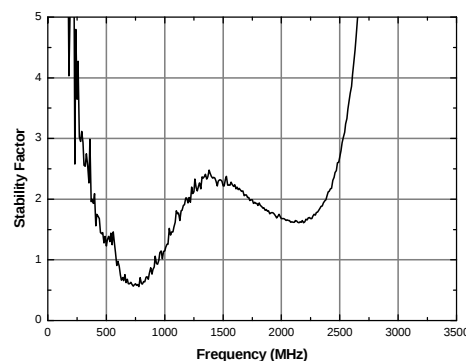
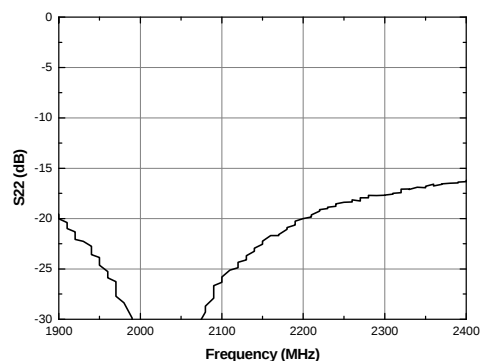
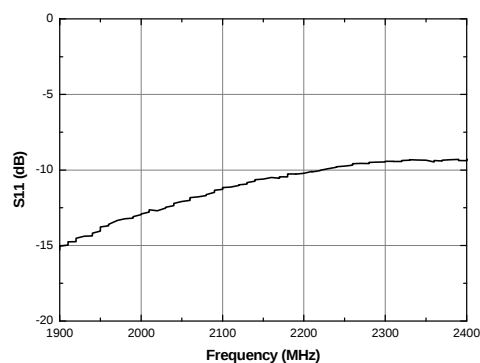
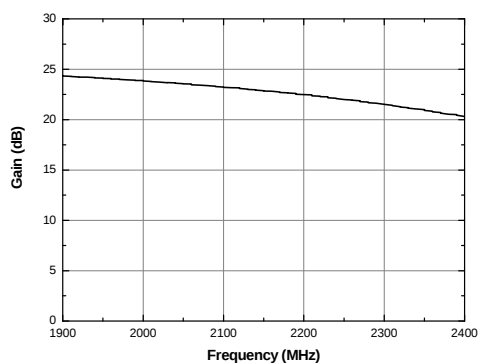
Schematic



Board Layout (FR4, 40x40 mm², 0.8T)



S-parameters & K-factor



APPLICATION CIRCUIT

LTE

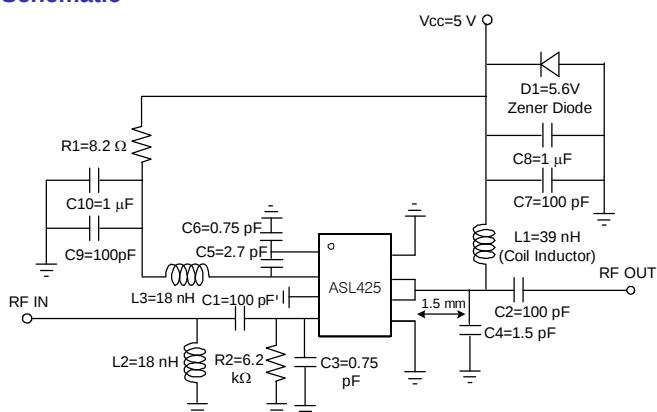
2300 ~ 2700 MHz

+5 V

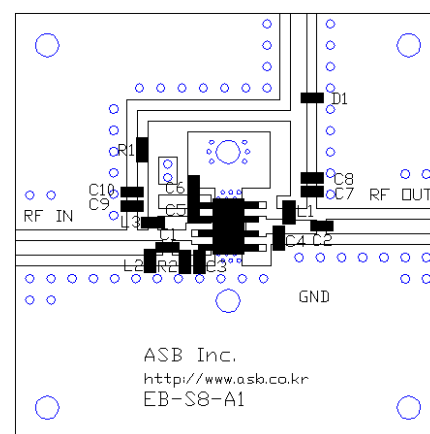
Frequency (MHz)	2300	2500	2700
Magnitude S21 (dB)	20.0	19.5	17.5
Magnitude S11 (dB)	-11	-20	-9
Magnitude S22 (dB)	-15	-15	-17
Output P1dB (dBm)	29.5	30.0	28.5
Output IP3 ¹⁾ (dBm)	46	45	45
Noise Figure (dB)	1.5	1.6	2.1
Device Voltage (V)	+5	+5	+5
Current (mA)	350	350	350

1) OIP3 is measured with two tones at an output power of +13 dBm/tone separated by 1 MHz.

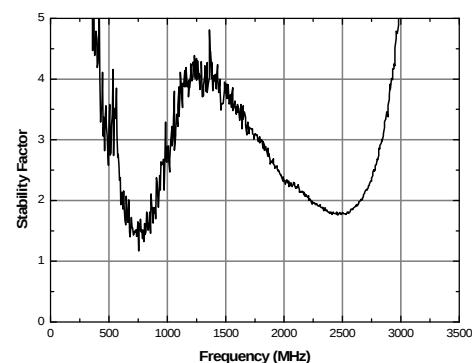
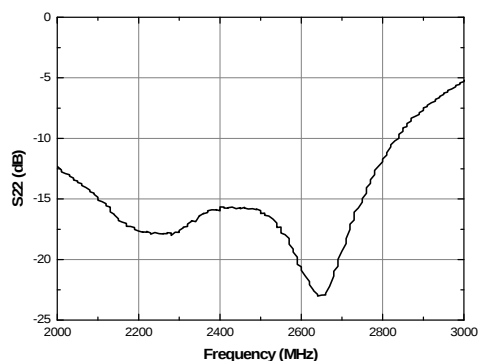
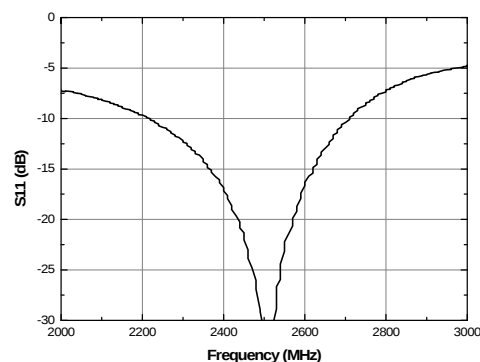
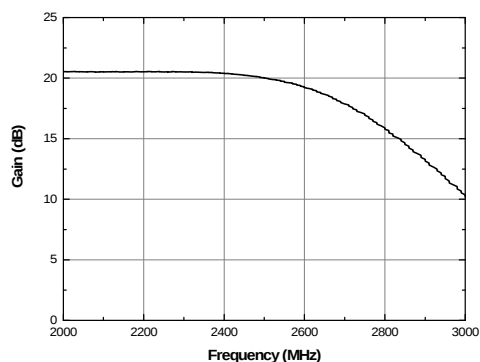
Schematic



Board Layout (FR4, 40x40 mm², 0.8T)



S-parameters & K-factor



Recommended Soldering Reflow Profile