

Features

- 18 dB Gain at 2000 MHz
- 32.5 dBm P1dB at 2000 MHz
- 49 dBm Output IP3 at 2000 MHz
- MTTF > 100 Years
- Two Power Supplies

Description

The ASX621, 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 3 GHz. The amplifier is available in an SOIC-8 package and passes through the stringent DC, RF, and reliability tests.



Package Style: SOIC-8

Typical Performance*

| Parameters | Units | Typical | | | | | | | |
|--------------------------|-------|---------|------|------|------|------|------|------|--|
| | | 900 | 2000 | 2450 | 900 | 2000 | 2450 | 2700 | |
| Frequency | MHz | 900 | 2000 | 2450 | 900 | 2000 | 2450 | 2700 | |
| Gain | dB | 30 | 18 | 13 | 30 | 18 | 13 | 16 | |
| S11 | dB | -17 | -14 | -9 | -17 | -14 | -9 | -12 | |
| S22 | dB | -7.5 | -14 | -10 | -7.5 | -14 | -10 | -15 | |
| Output IP3 ¹⁾ | dBm | 45 | 47 | 46 | 48 | 49 | 48 | 48 | |
| Noise Figure | dB | 11 | 5.5 | 6.8 | 11.5 | 5.6 | 7 | 5.9 | |
| Output P1dB | dBm | 32 | 31.5 | 32 | 33 | 32.5 | 33 | 33 | |
| Current | mA | 930 | | | | 1150 | | | |
| Device Voltage | V | 4.6 | | | | 5 | | | |

* Performance tested at 50 Ω system and a room temperature.

1) OIP3 measured with two tones at an output power of +14 dBm/tone separated by 1 MHz.

Application Circuit

- CDMA
- GSM
- WCDMA
- WLAN
- WiMAX
- 1200 ~ 1400 MHz

Product Specifications*

| Parameters | Units | Min | Typ | Max |
|-------------------|-------|------|------|------|
| Testing Frequency | MHz | | 2000 | |
| Gain | dB | 17 | 18 | |
| S11 | dB | | -14 | |
| S22 | dB | | -14 | |
| Output IP3 | dBm | 47 | 49 | |
| Noise Figure | dB | | 5.6 | 6 |
| Output P1dB | dBm | 31.5 | 32.5 | |
| Current | mA | 1050 | 1150 | 1250 |
| Device Voltage | V | | 5 | |

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

Absolute Maximum Ratings

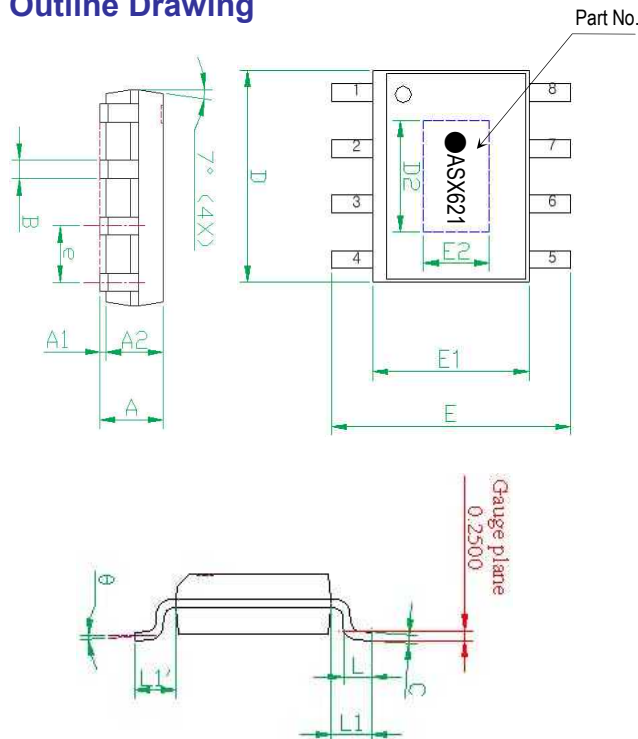
| Parameters | Rating |
|-------------------------------------|---------------|
| Operating Case Temperature | -40 to +85°C |
| Storage Temperature | -40 to +150°C |
| Device Voltage | +6 V |
| Operating Junction Temperature | +150°C |
| Input RF Power (CW, 50ohm matched)* | 25 dBm |

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

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

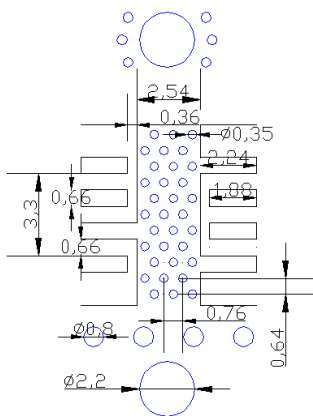


| Symbols | Dimensions (In mm) | | |
|----------|--------------------|------|------|
| | MIN | NOM | MAX |
| A | 1.40 | 1.50 | 1.60 |
| A1 | 0.00 | --- | 0.10 |
| A2 | --- | 1.45 | --- |
| B | 0.33 | --- | 0.51 |
| C | 0.19 | --- | 0.25 |
| D | 4.80 | --- | 5.00 |
| D2 | 3.20 | 3.30 | 3.40 |
| E | 5.80 | 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 1B Voltage Level: 500 V~1000 V |
| MM | Class A Voltage Level: <200 V |

CAUTION: ESD-sensitive device!

Moisture Sensitivity Level (MSL)

Level 3 at 260°C reflow

APPLICATION CIRCUIT

CDMA Rx

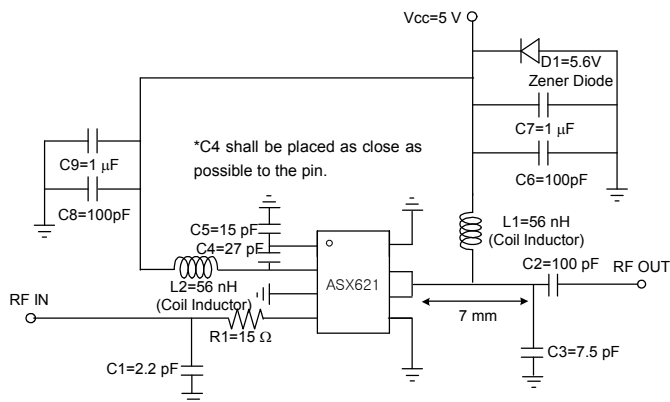
824 ~ 849 MHz

+5 V

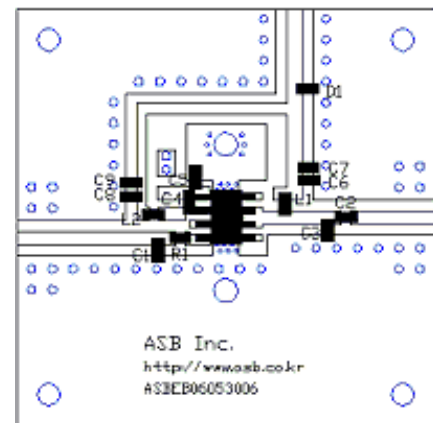
| Frequency (MHz) | 824~849 |
|--------------------------------|---------|
| Magnitude S21 (dB) | 28 |
| Magnitude S11 (dB) | -14 |
| Magnitude S22 (dB) | -8 |
| Output P1dB (dBm) | 32.5 |
| Output IP3 ¹⁾ (dBm) | 47 |
| Noise Figure (dB) | 11 |
| Device Voltage (V) | 5 |
| Current (mA) | 1150 |

1) OIP3 is measured with two tones at an output power of +15 dBm/tone separated by 1 MHz.

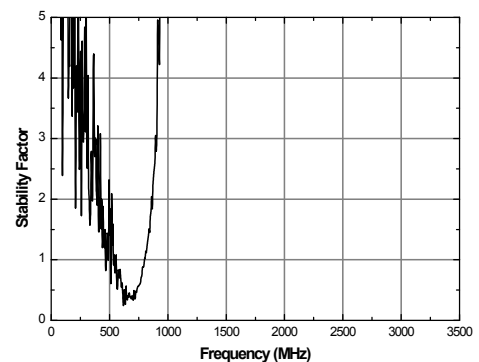
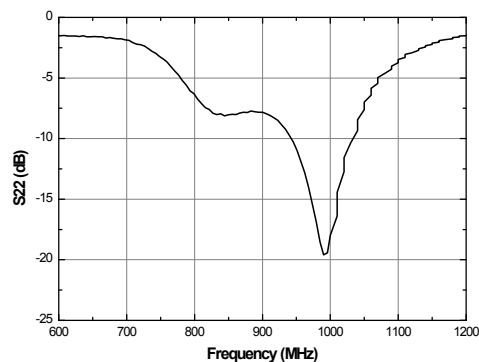
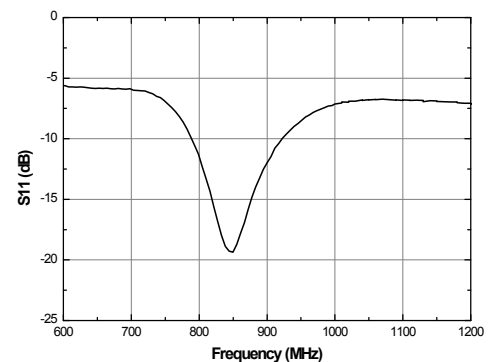
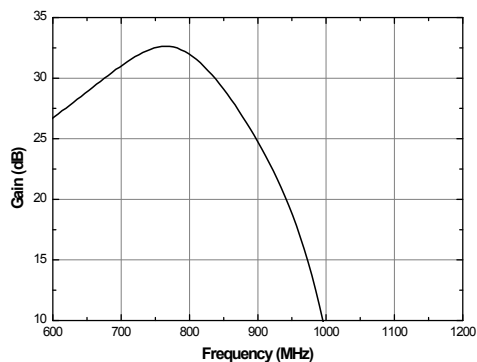
Schematic



Board Layout (FR4, 40x40 mm², 0.8T)



S-parameters



APPLICATION CIRCUIT

CDMA Tx, GSM

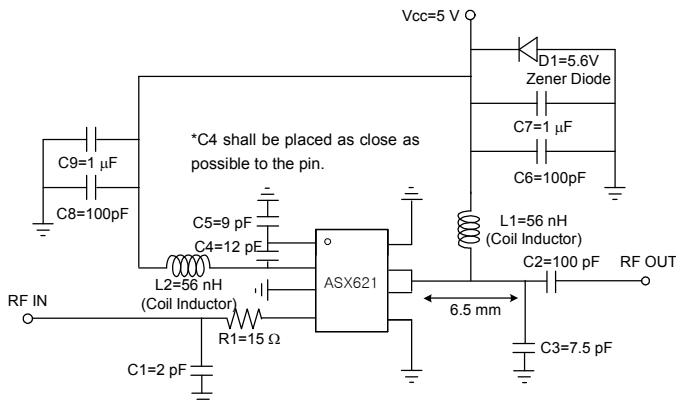
869 ~ 960 MHz

+5 V

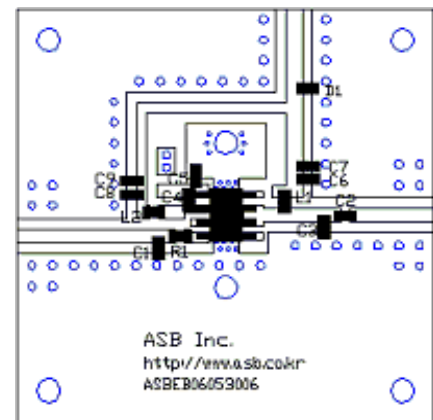
| Frequency (MHz) | 869 | 960 |
|--------------------------------|------|------|
| Magnitude S21 (dB) | 31 | 26 |
| Magnitude S11 (dB) | -13 | -18 |
| Magnitude S22 (dB) | -8 | -7.5 |
| Output P1dB (dBm) | 32.5 | 32.5 |
| Output IP3 ¹⁾ (dBm) | 47 | 48 |
| Noise Figure (dB) | 11 | 11 |
| Device Voltage (V) | 5 | 5 |
| Current (mA) | 1150 | 1150 |

1) OIP3 is measured with two tones at an output power of +15 dBm/tone separated by 1 MHz.

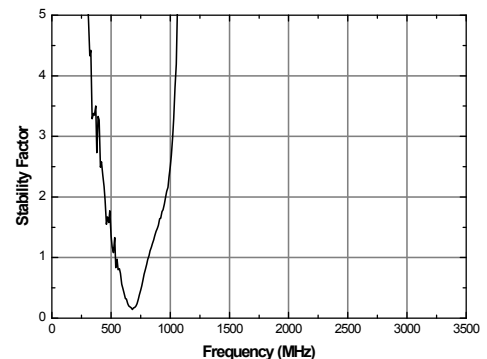
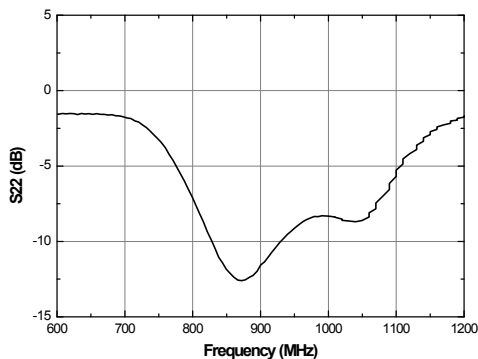
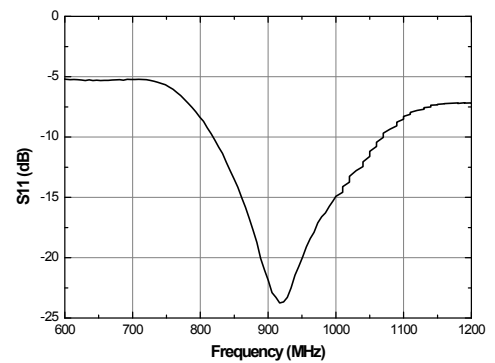
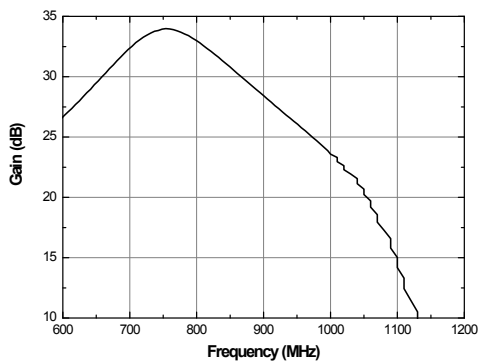
Schematic



Board Layout (FR4, 40x40 mm², 0.8T)



S-parameters



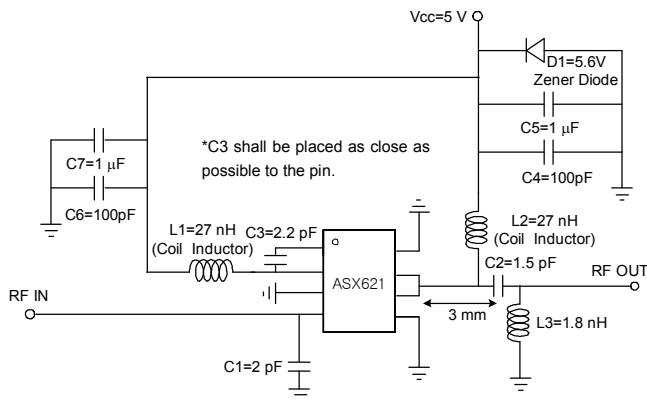
APPLICATION CIRCUIT

WCDMA Rx
1920 ~ 1980 MHz
+5 V

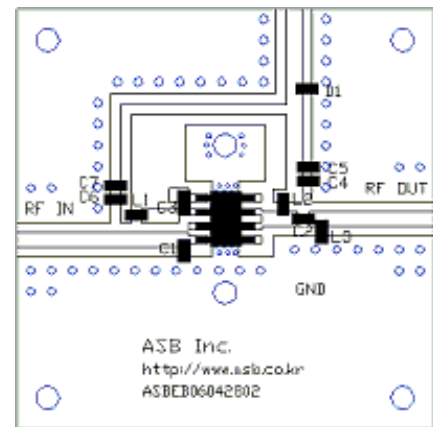
| Frequency (MHz) | 1920~1980 |
|--------------------------------|-----------|
| Magnitude S21 (dB) | 18 |
| Magnitude S11 (dB) | -14 |
| Magnitude S22 (dB) | -14 |
| Output P1dB (dBm) | 32.5 |
| Output IP3 ¹⁾ (dBm) | 50 |
| Noise Figure (dB) | 5.6 |
| Device Voltage (V) | 5 |
| Current (mA) | 1150 |

1) OIP3 is measured with two tones at an output power of +14 dBm/tone separated by 1 MHz.

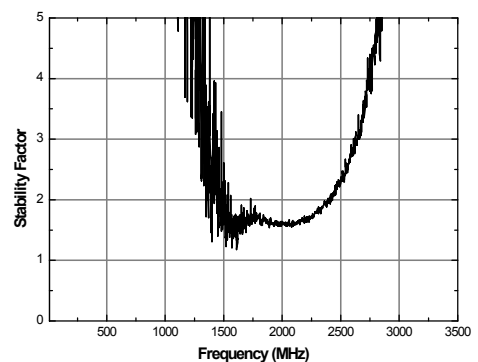
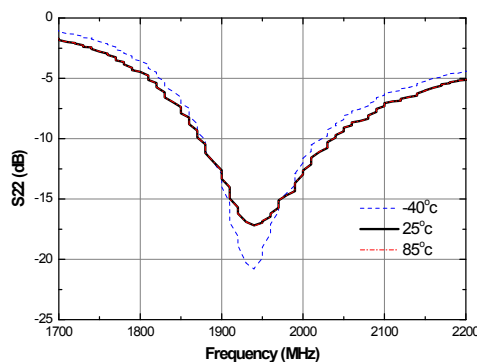
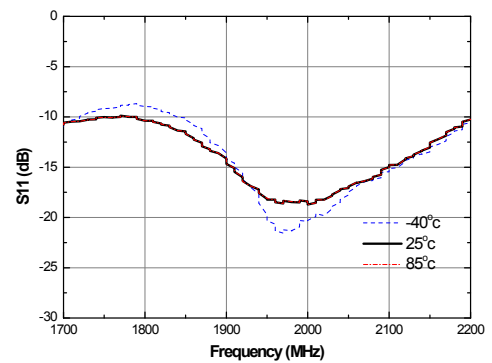
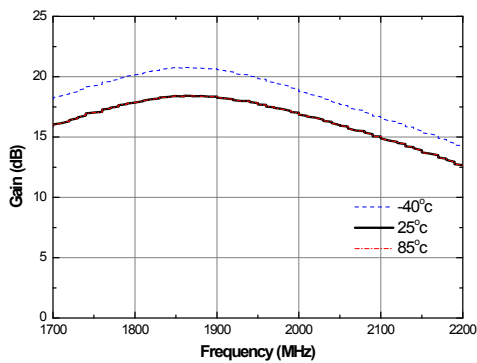
Schematic



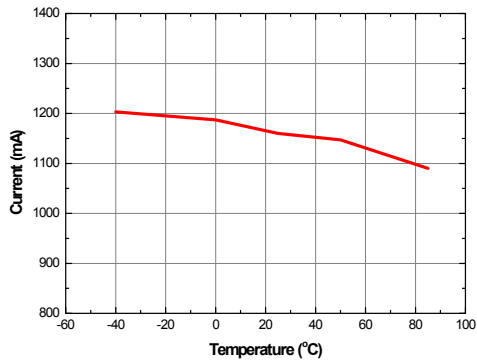
Board Layout (FR4, 40x40 mm², 0.8T)



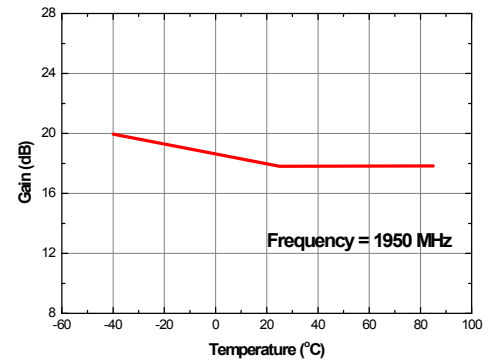
S-parameters



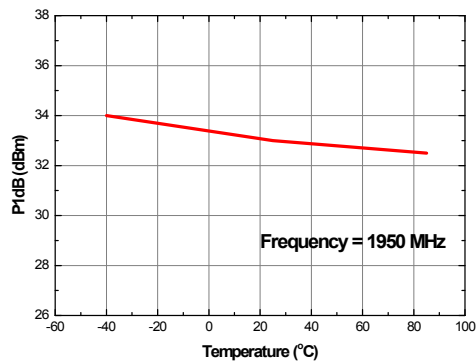
Current vs. Temperature



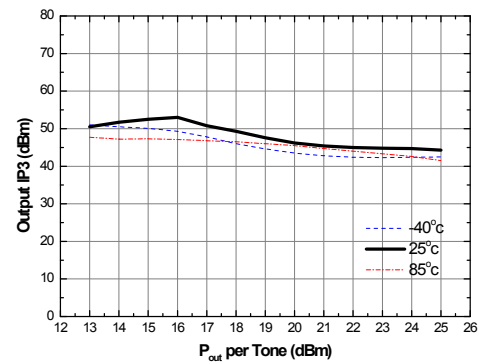
Gain vs. Temperature



P1dB vs. Temperature



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



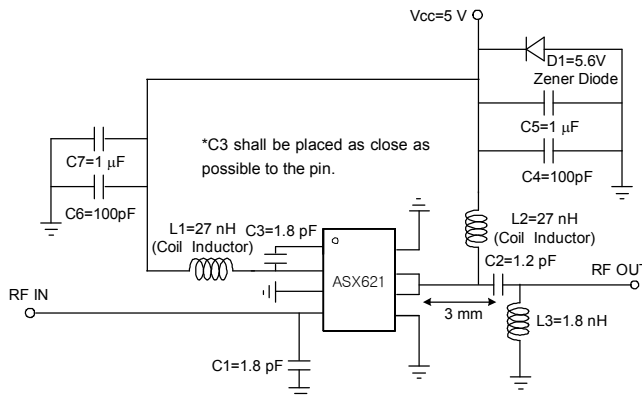
APPLICATION CIRCUIT

WCDMA Tx
2110 ~ 2170 MHz
+5 V

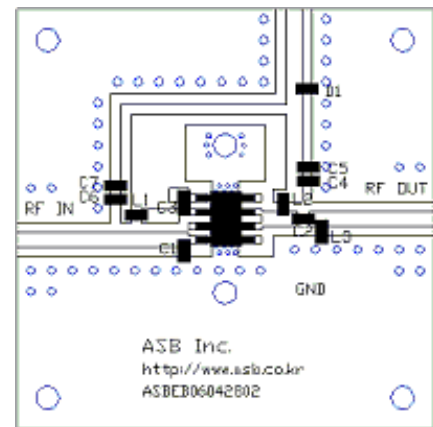
| Frequency (MHz) | 2110~2170 |
|--------------------------------|-----------|
| Magnitude S21 (dB) | 17 |
| Magnitude S11 (dB) | -15 |
| Magnitude S22 (dB) | -13 |
| Output P1dB (dBm) | 32.5 |
| Output IP3 ¹⁾ (dBm) | 50 |
| Noise Figure (dB) | 5.6 |
| Device Voltage (V) | 5 |
| Current (mA) | 1150 |

1) OIP3 is measured with two tones at an output power of +14 dBm/tone separated by 1 MHz.

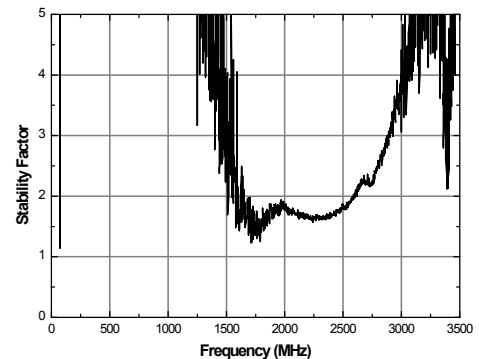
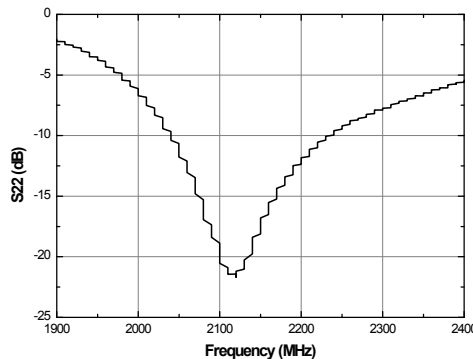
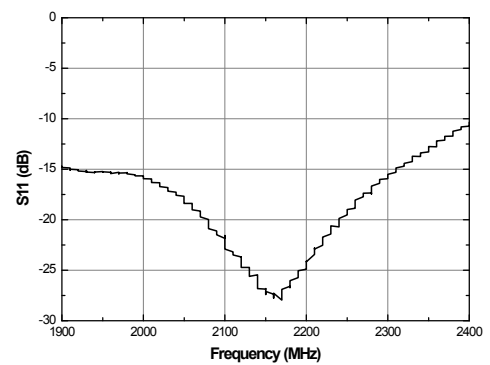
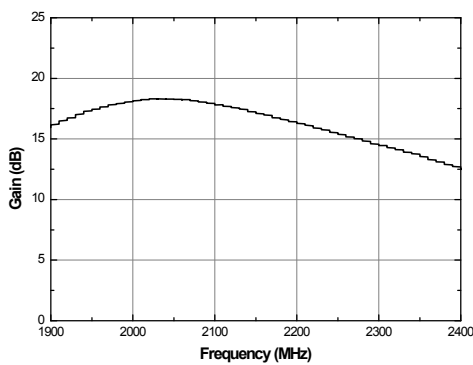
Schematic



Board Layout (FR4, 40x40 mm², 0.8T)



S-parameters



APPLICATION CIRCUIT

WLAN

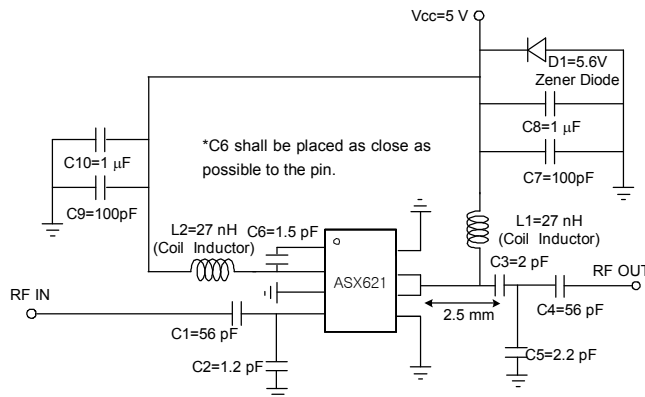
2400 ~ 2500 MHz

+5 V

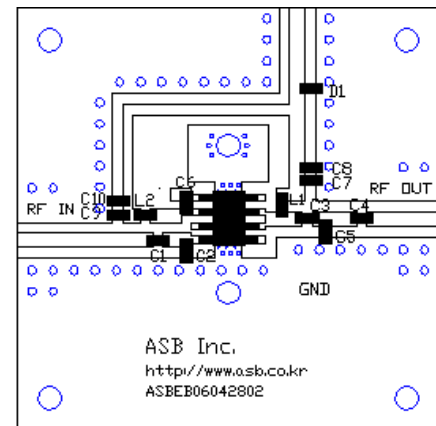
| Frequency (MHz) | 2400~2500 |
|--------------------------------|-----------|
| Magnitude S21 (dB) | 13 |
| Magnitude S11 (dB) | -9 |
| Magnitude S22 (dB) | -10 |
| Output P1dB (dBm) | 33 |
| Output IP3 ¹⁾ (dBm) | 48 |
| Noise Figure (dB) | 7 |
| Device Voltage (V) | 5 |
| Current (mA) | 1150 |

1) OIP3 is measured with two tones at an output power of +14 dBm/tone separated by 1 MHz.

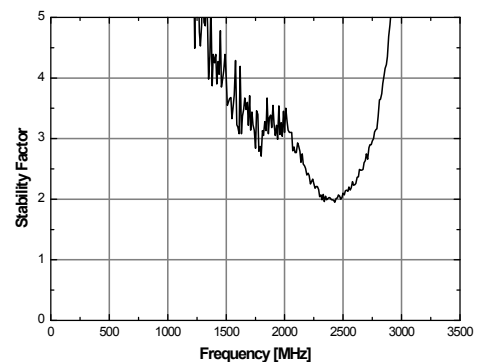
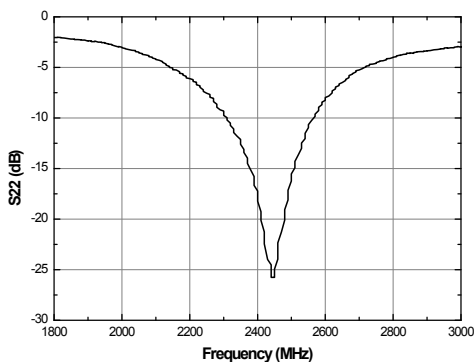
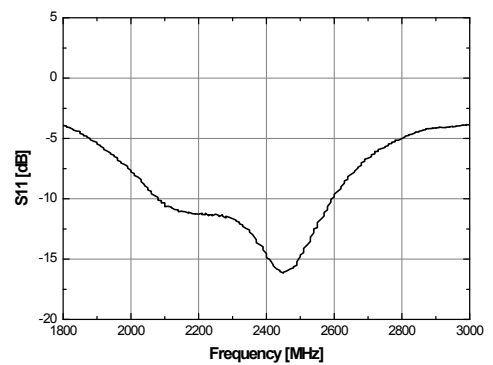
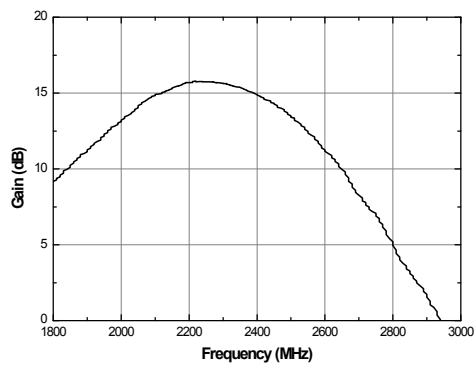
Schematic



Board Layout (FR4, 40x40 mm², 0.8T)



S-parameters



APPLICATION CIRCUIT

WiMAX

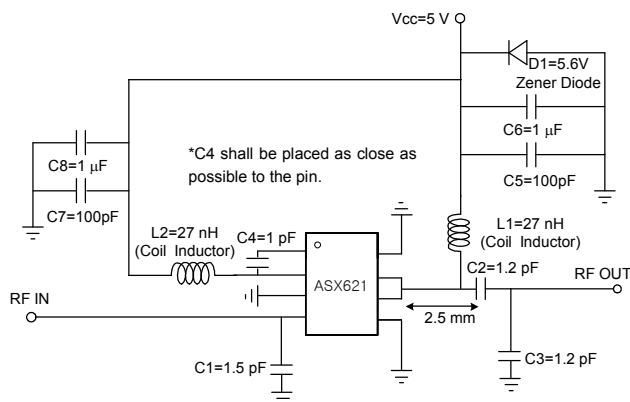
2700 ~ 2900 MHz

+5 V

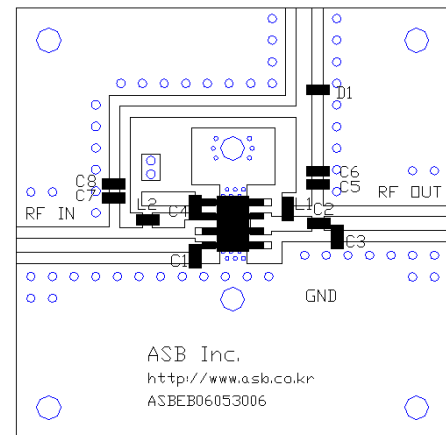
| Frequency (MHz) | 2700 | 2900 |
|--------------------------------|------|------|
| Magnitude S21 (dB) | 16 | 14 |
| Magnitude S11 (dB) | -12 | -12 |
| Magnitude S22 (dB) | -15 | -15 |
| Output P1dB (dBm) | 33 | |
| Output IP3 ¹⁾ (dBm) | 48 | |
| Noise Figure (dB) | 5.9 | |
| Device Voltage (V) | 5 | |
| Current (mA) | 1150 | |

1) OIP3 is measured with two tones at an output power of +15 dBm/tone separated by 1 MHz.

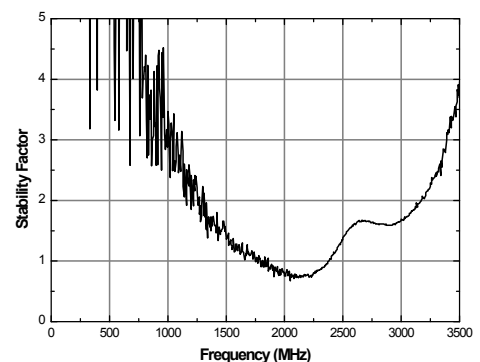
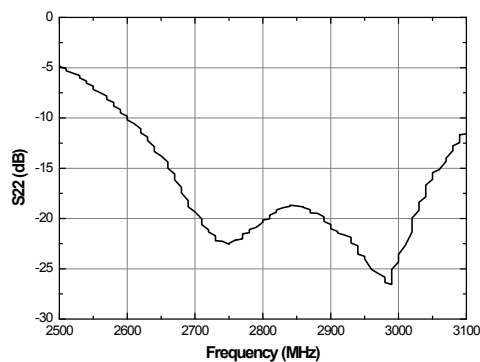
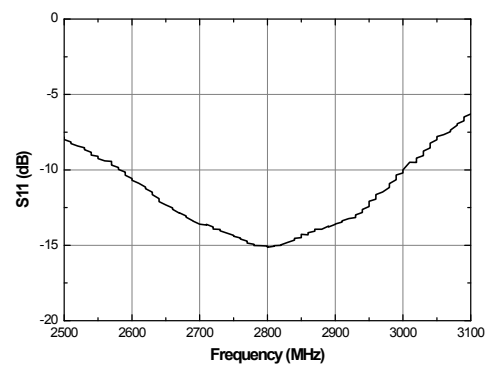
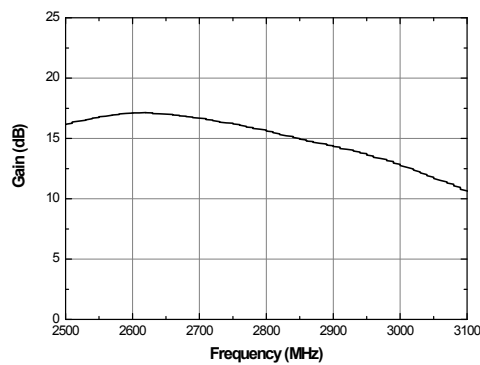
Schematic



Board Layout (FR4, 40x40 mm², 0.8T)



S-parameters



APPLICATION CIRCUIT

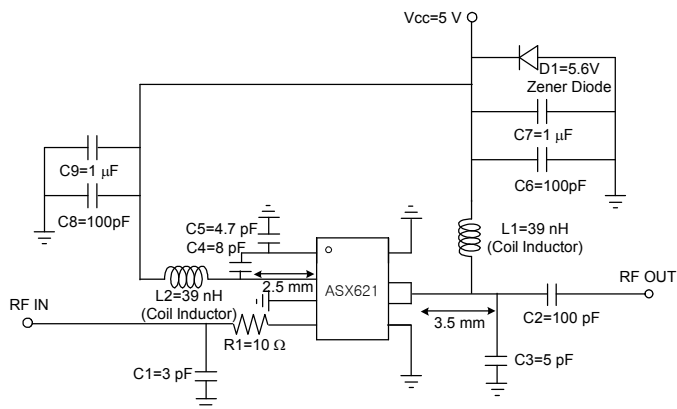
1200 ~ 1400 MHz

+5 V

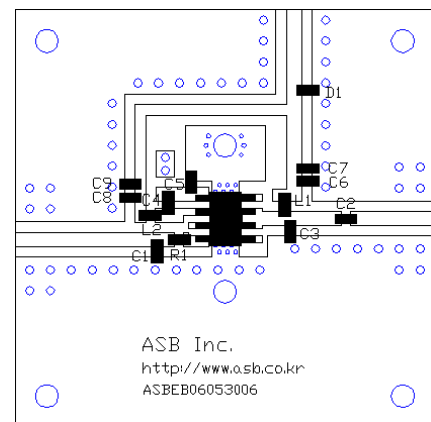
| Frequency (MHz) | 1200 | 1300 | 1400 |
|--------------------------------|------|------|------|
| Magnitude S21 (dB) | 25.5 | 23 | 20 |
| Magnitude S11 (dB) | -14 | -12 | -7 |
| Magnitude S22 (dB) | -10 | -9 | -7 |
| Output P1dB (dBm) | 31 | 32.5 | 31 |
| Output IP3 ¹⁾ (dBm) | 48 | 48 | 47 |
| Noise Figure (dB) | 9.5 | 9.5 | 9.5 |
| Device Voltage (V) | 5 | 5 | 5 |
| Current (mA) | 1150 | 1150 | 1150 |

1) OIP3 is measured with two tones at an output power of +14 dBm/tone separated by 1 MHz.

Schematic



Board Layout (FR4, 40x40 mm², 0.8T)



S-parameters

