# ASW338

## 5 ~ 4000 MHz MMIC Amplifier

## Features

- 17.5 dB Gain at 900 MHz
- 26 dBm P1dB at 900 MHz
- 44 dBm Output IP3 at 900 MHz
- 2.0 dB NF at 900 MHz
- MTTF > 100 Years
- Single Supply

## Description

The ASW338, 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 SOT89 package and passes through the stringent DC, RF, and reliability tests.

RoHS-compliant GREEN Package


Package Style: SOT89

## Typical Performance

(Supply Voltage = +8 V, $T_A$ = +25 °C, $Z_0$ = 50 Ω)

| Parameters | Units | Typical | |
|---|---|---|---|
| Frequency | MHz | 900 | 1950 |
| Gain | dB | 17.5 | 16.5 |
| S11 | dB | -14 | -14 |
| S22 | dB | -18 | -14 |
| Output IP3 | dBm | 44[1)] | 43[2)] |
| Noise Figure | dB | 2.0 | 2.2 |
| Output P1dB | dBm | 26 | 25 |
| Current | mA | 120 | 120 |
| Device Voltage | V | +8 | +8 |

1) OIP3 is measured with two tones at an output power of +11 dBm/tone separated by 1 MHz.
2) OIP3 is measured with two tones at an output power of +7 dBm/tone separated by 1 MHz.

## Product Specifications

| Parameters | Units | Min | Typ | Max |
|---|---|---|---|---|
| Testing Frequency | MHz | | 900 | |
| Gain | dB | 17.0 | 17.5 | 18.0 |
| S11 | dB | | -14 | |
| S22 | dB | | -18 | |
| Output IP3 | dBm | | 44 | |
| Noise Figure | dB | | 2.0 | 2.2 |
| Output P1dB | dBm | 25 | 26 | |
| Current | mA | 110 | 120 | 130 |
| Device Voltage | V | | +8 | |

## Absolute Maximum Ratings, $T_A$ = +25 °C

| Parameters | Rating |
|---|---|
| Operating Case Temperature | -40 to +85 °C |
| Storage Temperature | -40 to +150 °C |
| Device Voltage | +9 V |
| Operating Junction Temperature | +150 °C |
| Input RF Power (CW, 50 Ω matched as in 1950 MHz application circuit)* | +26 dBm |
| Thermal Resistance | 43 °C/W |

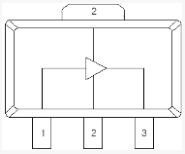
The operation of this device in excess of any of these limits may cause permanent damage.

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

## Application Circuit

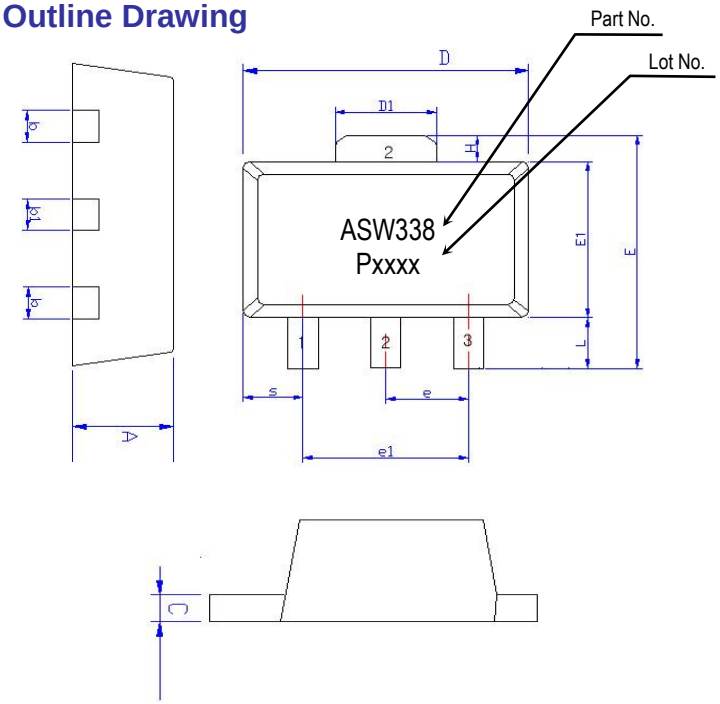
- IF (100 ~ 300 MHz)
- RFID (13.5 MHz)
- IF (10 ~ 100 MHz)
- IF (30 ~ 520 MHz)
- IF (140 +/- 25 MHz)
- LTE (698 ~ 787 MHz)
- CMMB
- CDMA & GSM (900 MHz)
- LTE (1745 ~ 1860 MHz)
- Wide Band (50 ~ 3240 MHz)
- Wide Band (1300 ~ 3000 MHz, 5 V / 8 V)
- Wide Band (1700 ~ 2700 MHz)
- WLAN (2450 MHz)
- Wide Band (50 ~ 1500 MHz)
- Wide Band (350 ~ 3000 MHz)
- CATV (50 ~ 1000 MHz, 75 Ω)

## Pin Configuration




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

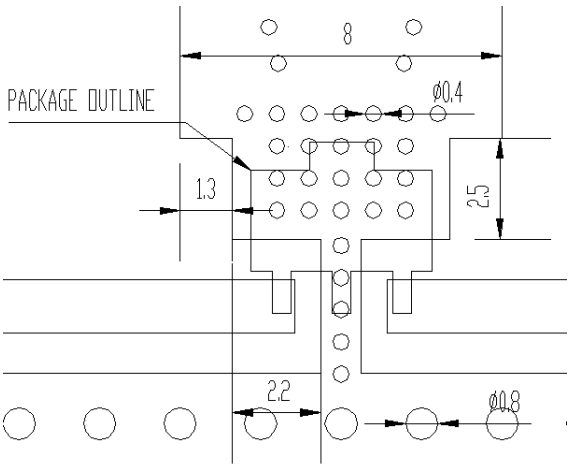
## Outline Drawing




| 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)




**Note**: 1. The number and size of ground via holes in a circuit board is critical for thermal and RF grounding considerations.
2. We recommend that the ground via holes be placed on the bottom of the lead pin 2 and exposed pad of the device for better RF and thermal performance, as shown in the drawing at the left side.

## ESD Classification & Moisture Sensitivity Level

### ESD Classification

| | |
|---|---|
| HBM | Class 1B |
| | Voltage Level: 550 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)

Level 3 at 260 °C reflow

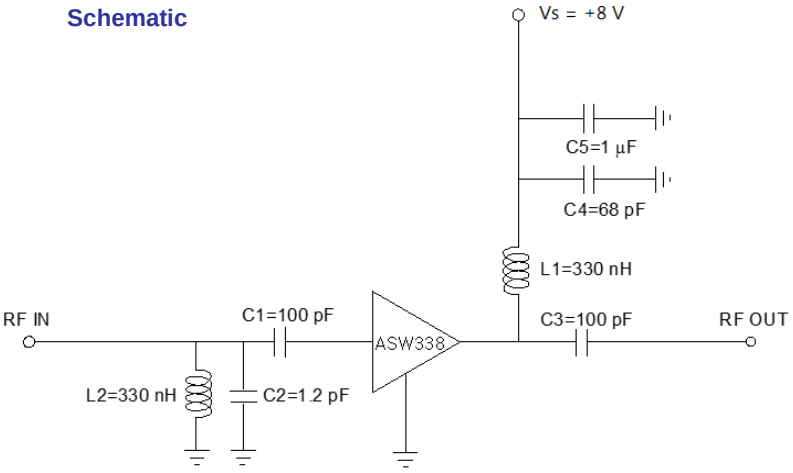
## APPLICATION CIRCUIT

| IF |
|---|
| 100 ~ 300 MHz |
| +8 V |

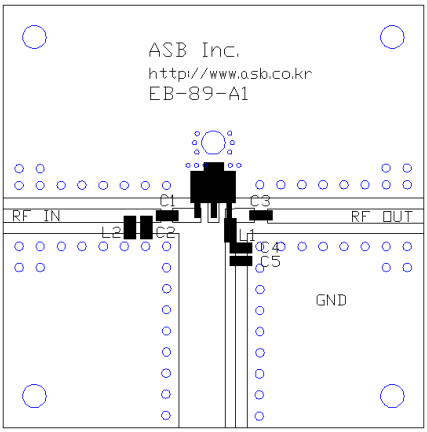
| Frequency (MHz) | 100 | 240 |
|---|---|---|
| Magnitude S21 (dB) | 19.0 | 18.5 |
| Magnitude S11 (dB) | -14 | -13 |
| Magnitude S22 (dB) | -15 | -14 |
| Output P1dB (dBm) | 26 | 26 |
| Output IP3[1)] (dBm) | 46 | 47 |
| Noise Figure (dB) | 1.7 | 1.9 |
| Device Voltage (V) | +8 | +8 |
| Current (mA) | 120 | 120 |

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

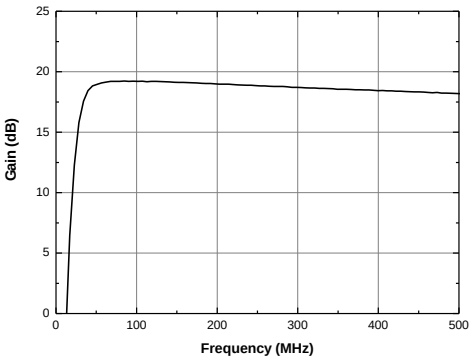
### Schematic

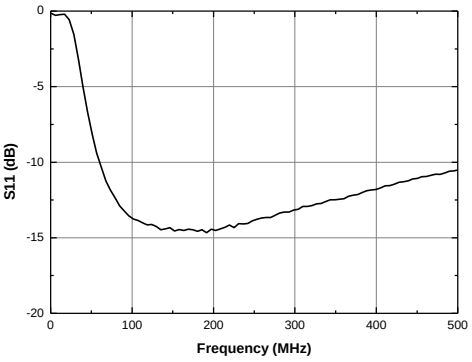


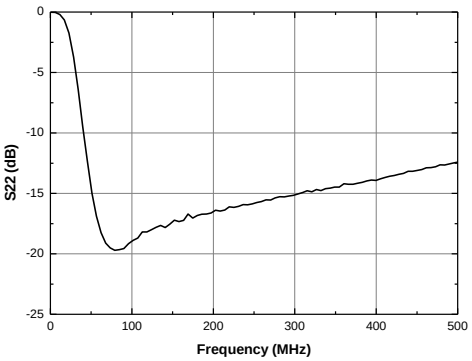

### Board Layout (FR4, 40x40 mm², 0.8T)

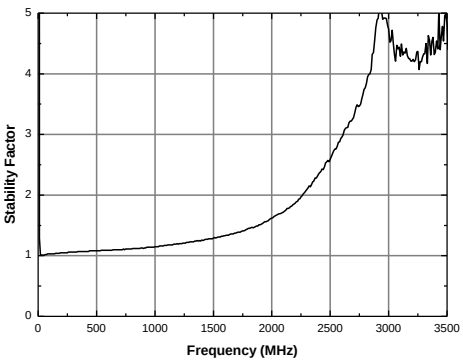



### S-parameters & K-factor



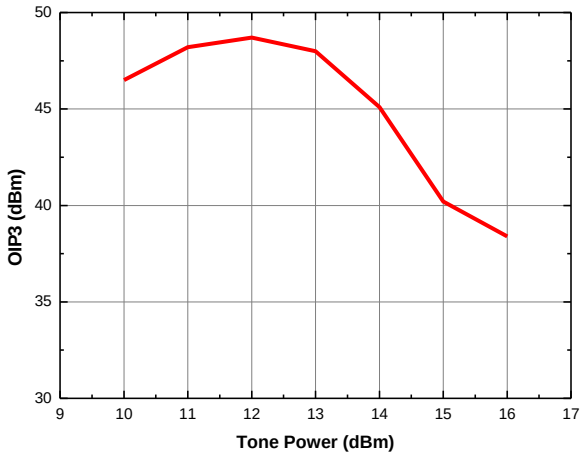



## Output IP3 vs. Tone Power (Frequency = 300 MHz)

| Tone power(dBm) | OIP3(dBm) |
|---|---|
| 10 | 46.5 |
| 11 | 48.2 |
| 12 | 48.7 |
| 13 | 48 |
| 14 | 45.1 |
| 15 | 40.2 |
| 16 | 38.4 |



## APPLICATION CIRCUIT

**RFID**

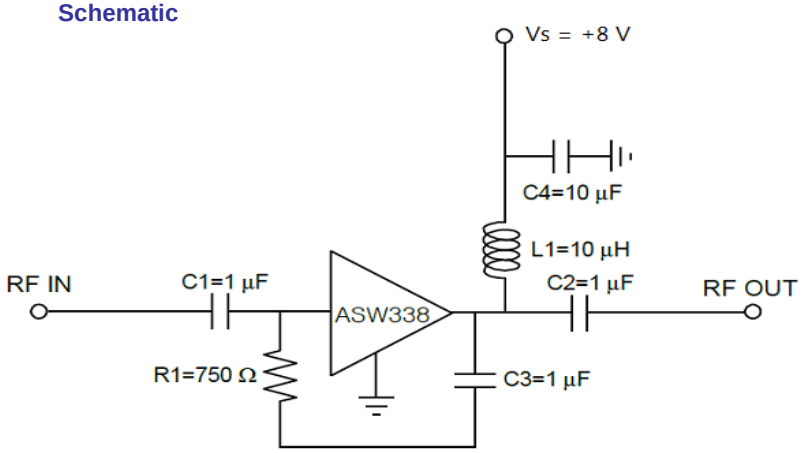
**13.5 MHz**

**+8 V**

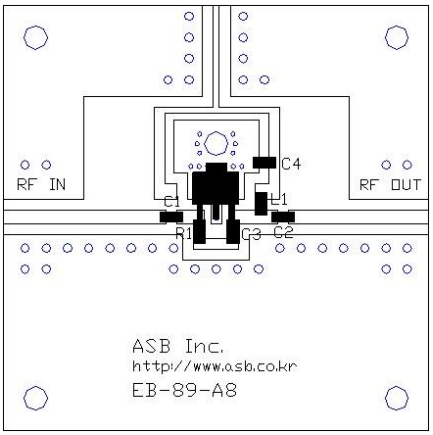
| Frequency (MHz) | 13.5 |
|---|---|
| Magnitude S21 (dB) | 17.5 |
| Magnitude S11 (dB) | -10 |
| Magnitude S22 (dB) | -20 |
| Output P1dB (dBm) | 25 |
| Output IP3[1)] (dBm) | 41 |
| Noise Figure (dB) | 2.2 |
| Device Voltage (V) | +8 |
| Current (mA) | 120 |

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

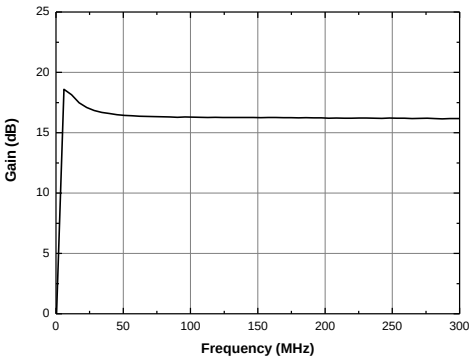
### Schematic

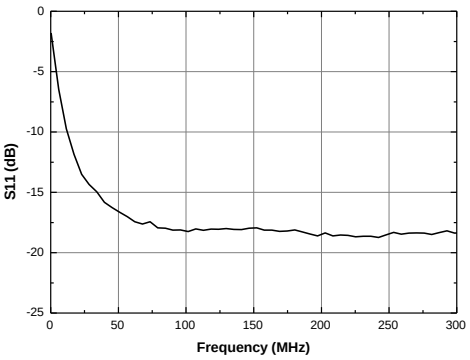


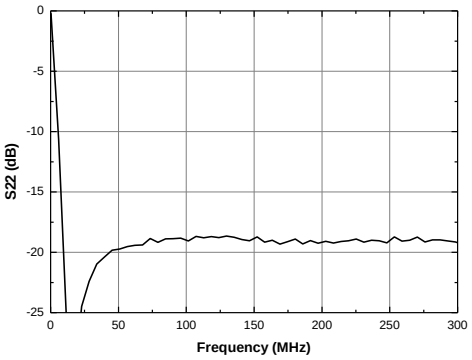

### Board Layout (FR4, 40x40 mm², 0.8T)

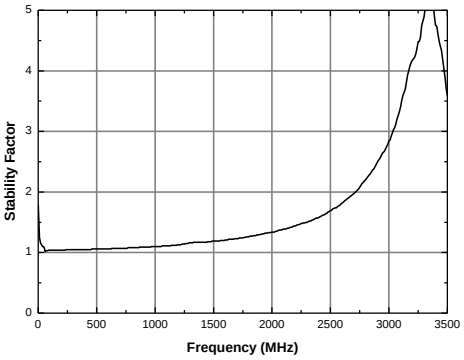



### S-parameters & K-factor



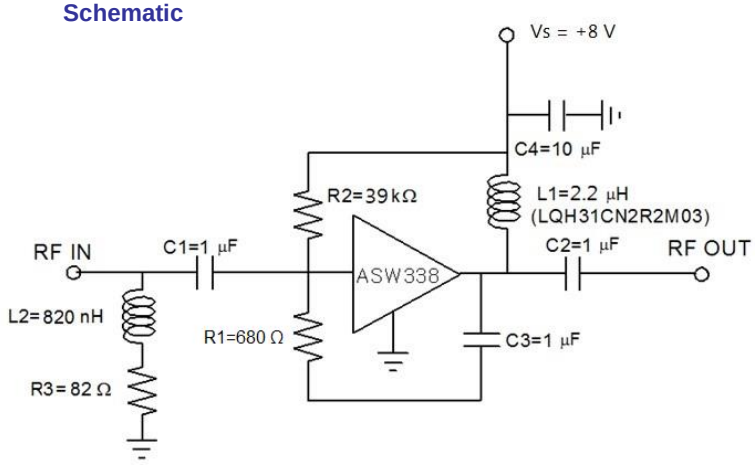
## APPLICATION CIRCUIT

| IF |
|---|
| 10 ~ 100 MHz |
| +8 V |

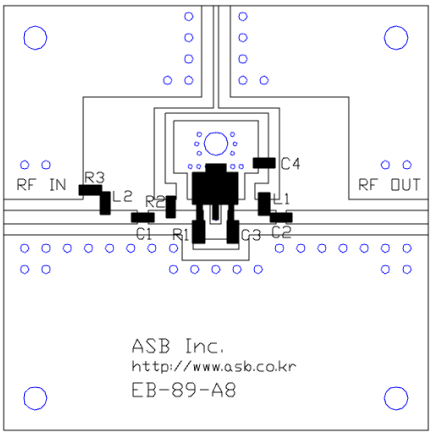
| Frequency (MHz) | 10 | 100 |
|---|---|---|
| Magnitude S21 (dB) | 16.0 | 15.5 |
| Magnitude S11 (dB) | -14 | -14 |
| Magnitude S22 (dB) | -14 | -14 |
| Output P1dB (dBm) | 25 | 26 |
| Output IP3[1)] (dBm) | 41.0 | 48.0 |
| Noise Figure (dB) | 4.6 | 2.0 |
| Device Voltage (V) | +8 | +8 |
| Current (mA) | 170 | 170 |

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

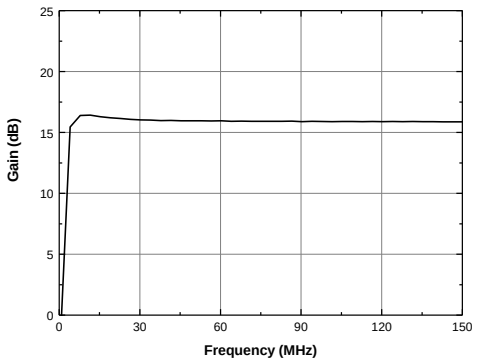
### Schematic

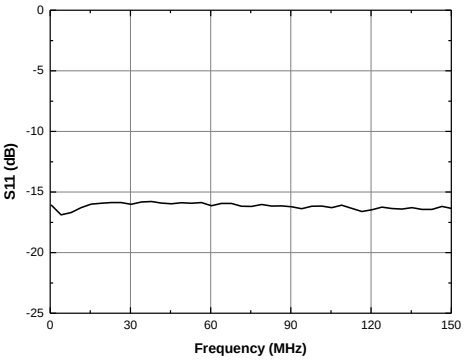


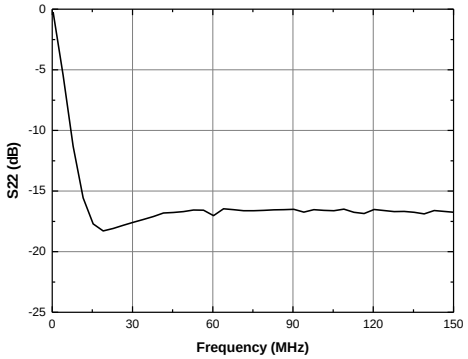

### Board Layout (FR4, 40x40 mm², 0.8T)



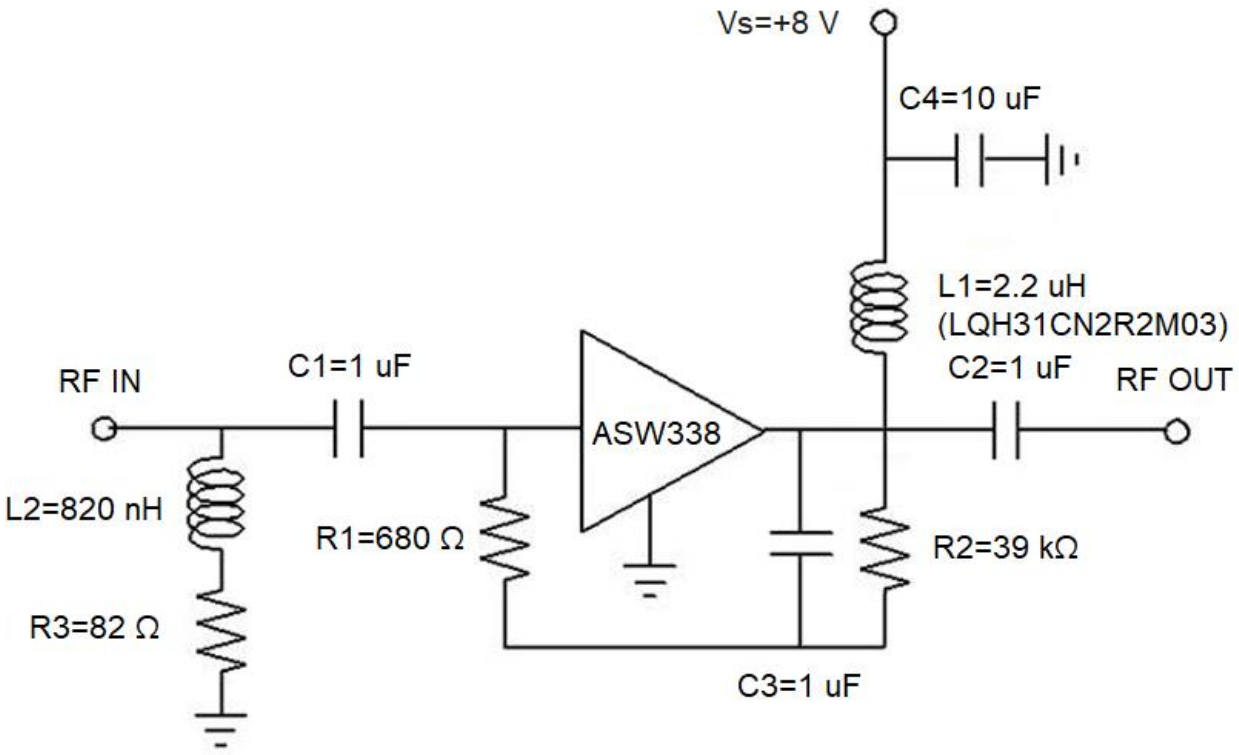

### S-parameters & K-factor



## ALTERNATIVE APPLICATION CIRCUIT



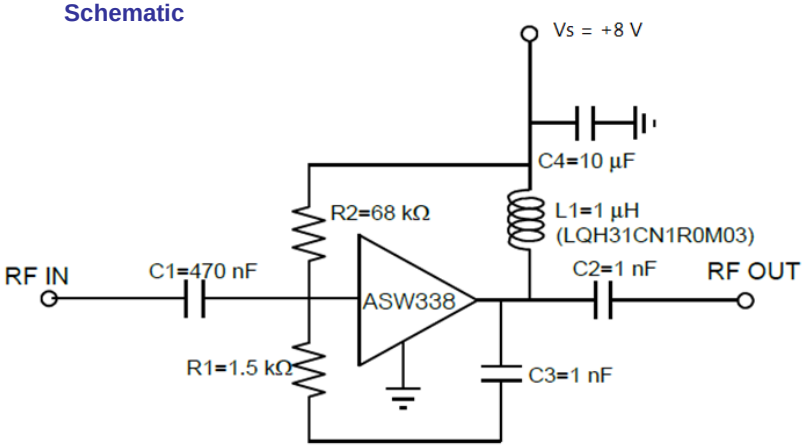
## APPLICATION CIRCUIT

| IF |
|---|
| 30 ~ 520 MHz |
| +8 V |

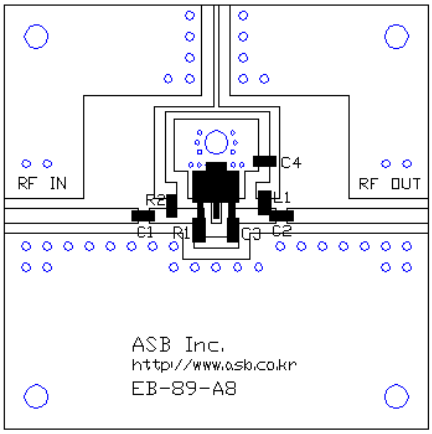
| Frequency (MHz) | 30 | 250 | 520 |
|---|---|---|---|
| Magnitude S21 (dB) | 17.0 | 17.0 | 16.5 |
| Magnitude S11 (dB) | -8 | -18 | -18 |
| Magnitude S22 (dB) | -18 | -18 | -18 |
| Output P1dB (dBm) | 26 | 26 | 26 |
| Output IP3[1)] (dBm) | 44.0 /39.5 | 48.0 /41.0 | 44.0 /36.5 |
| Noise Figure (dB) | 1.8 | 1.7 | 1.8 |
| Device Voltage (V) | +8 | +8 | +8 |
| Current (mA) | 150 | 150 | 150 |

1) OIP3 is measured with two tones at an output power of +13/+17 dBm/tone separated by 1 MHz.

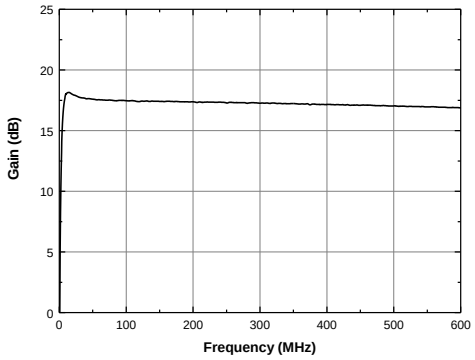
### Schematic

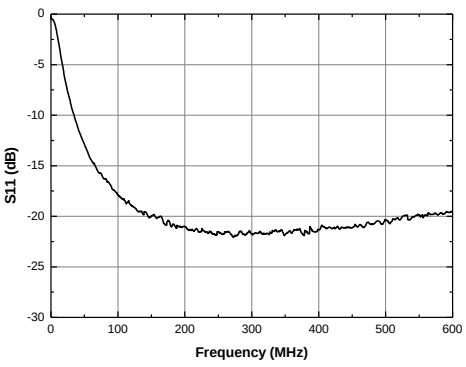


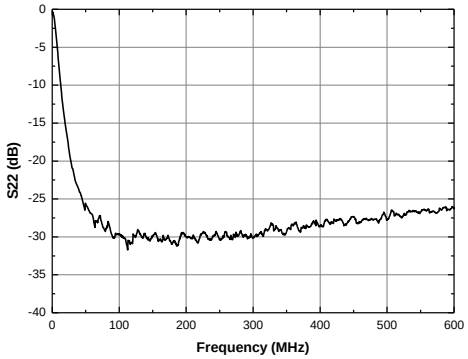

### Board Layout (FR4, 40x40 mm², 0.8T)

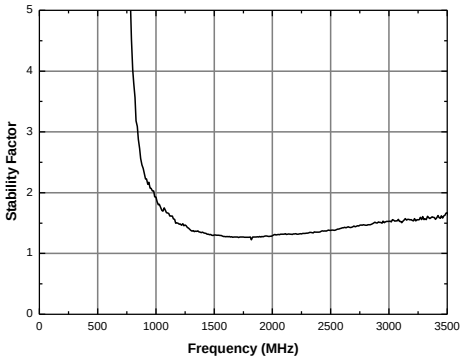



### S-parameters & K-factor



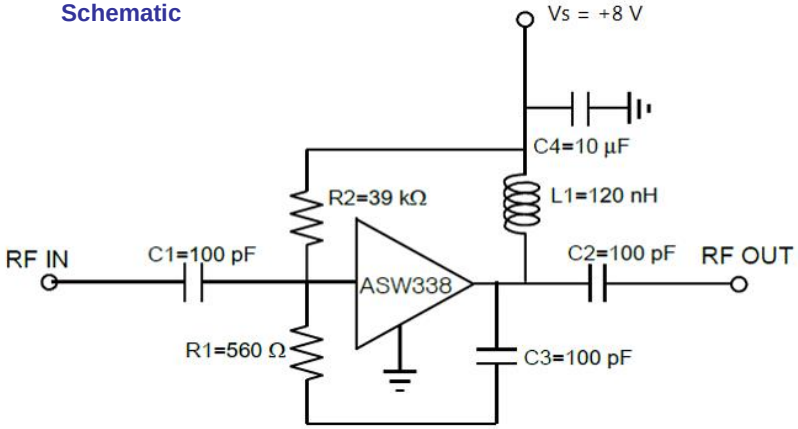
## APPLICATION CIRCUIT

| IF |
|---|
| 140 +/- 25 MHz |
| +8 V |

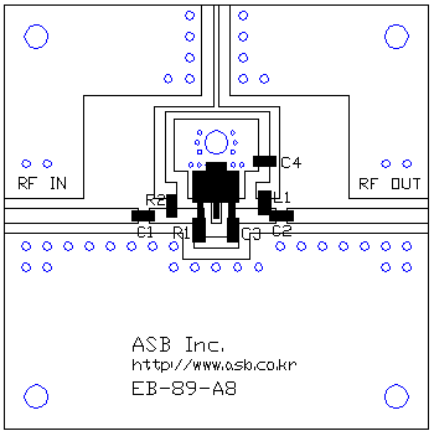
| Frequency (MHz) | 115 | 140 | 165 |
|---|---|---|---|
| Magnitude S21 (dB) | 14.4 | 14.6 | 14.7 |
| Magnitude S11 (dB) | -9 | -10 | -11 |
| Magnitude S22 (dB) | -10 | -11 | -11 |
| Output P1dB (dBm) | 25 | 25 | 25 |
| Output IP3[1)] (dBm) | 47 | 48 | 48 |
| Noise Figure (dB) | 2.2 | 2.2 | 2.2 |
| Device Voltage (V) | +8 | +8 | +8 |
| Current (mA) | 170 | 170 | 170 |

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

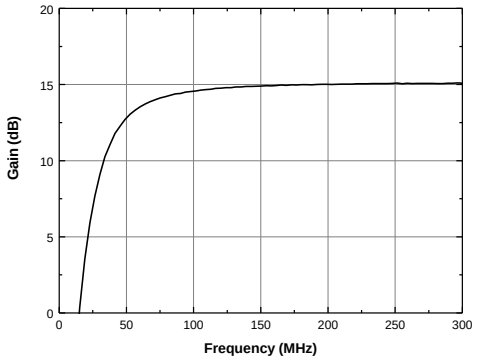
### Schematic

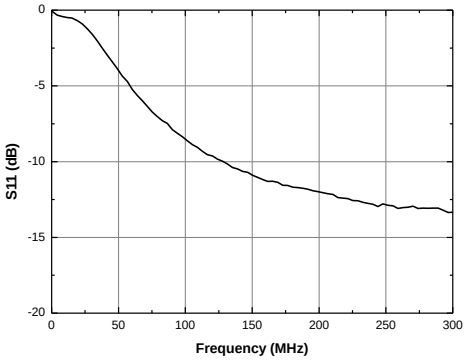


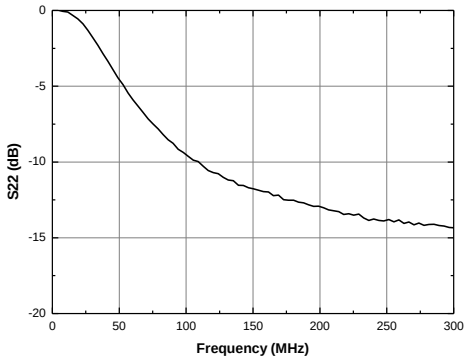

### Board Layout (FR4, 40x40 mm², 0.8T)

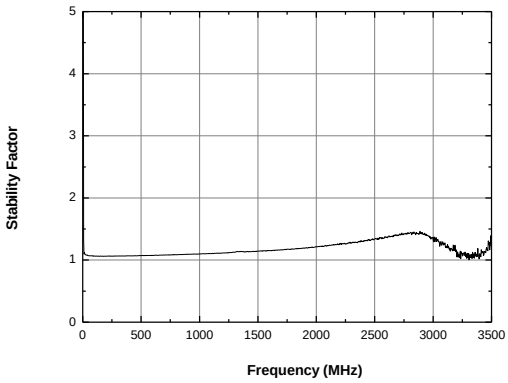



### S-parameters & K-factor



## APPLICATION CIRCUIT

**LTE**

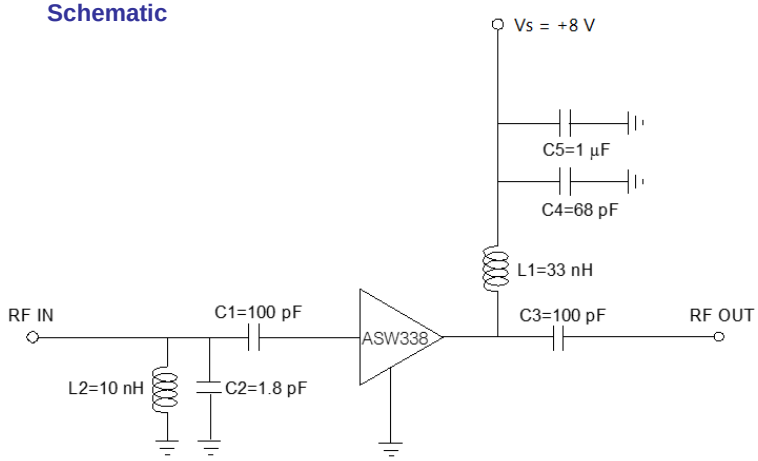
**698 ~ 787 MHz**

**+8 V**

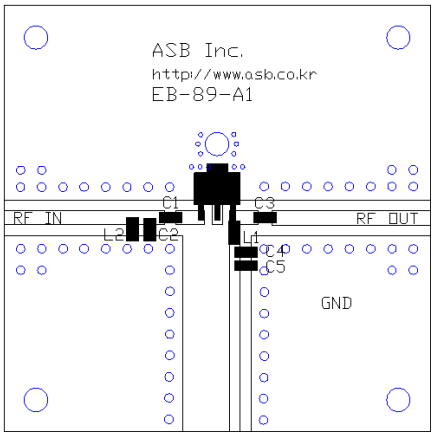
| Frequency (MHz) | 698 ~ 787 |
|---|---|
| Magnitude S21 (dB) | 17.5 |
| Magnitude S11 (dB) | -17 |
| Magnitude S22 (dB) | -18 |
| Output P1dB (dBm) | 26 |
| Output IP3[1)] (dBm) | 44 |
| Noise Figure (dB) | 1.7 |
| Device Voltage (V) | +8 |
| Current (mA) | 120 |

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

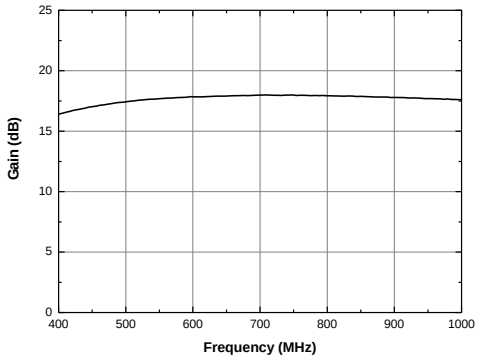
### Schematic

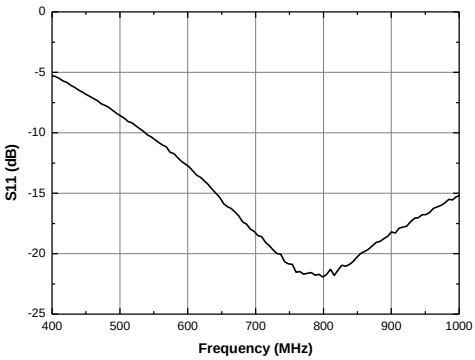


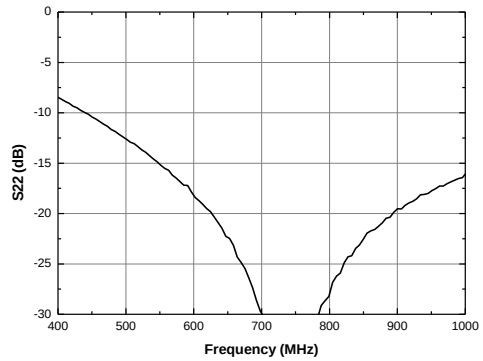

### Board Layout (FR4, 40x40 mm², 0.8T)

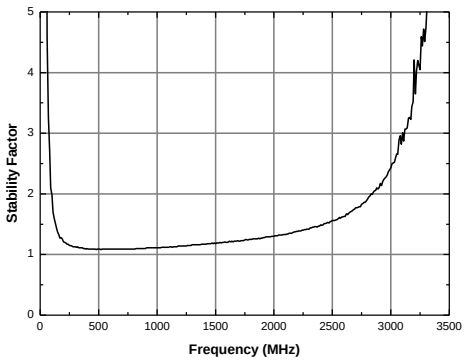



### S-parameters & K-factor



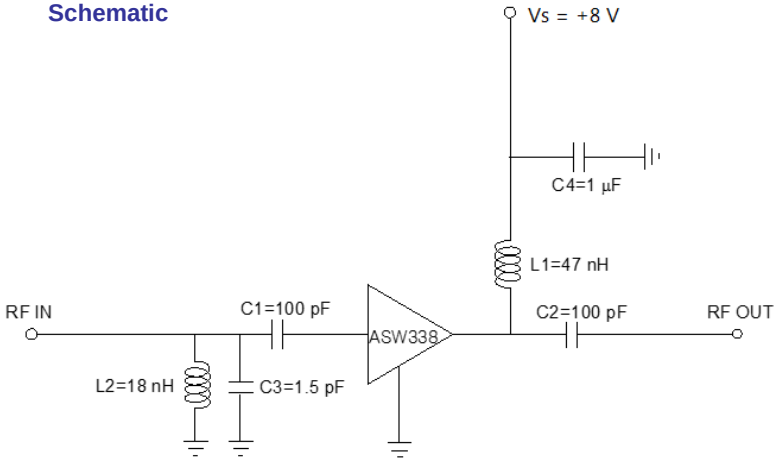
## APPLICATION CIRCUIT

| CMMB |
|---|
| 470 ~ 860 MHz |
| +8 V |

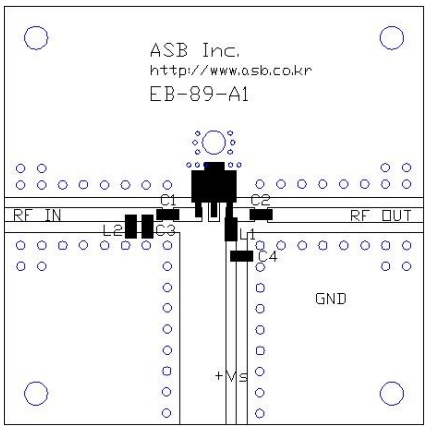
| Frequency (MHz) | 470 | 860 |
|---|---|---|
| Magnitude S21 (dB) | 17.5 | 17.5 |
| Magnitude S11 (dB) | -15 | -16 |
| Magnitude S22 (dB) | -15 | -16 |
| Output P1dB (dBm) | 26 | 26 |
| Output IP3[1] (dBm) | 46.0 | 41.5 |
| Noise Figure (dB) | 2.0 | 1.7 |
| Device Voltage (V) | +8 | +8 |
| Current (mA) | 120 | 120 |

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

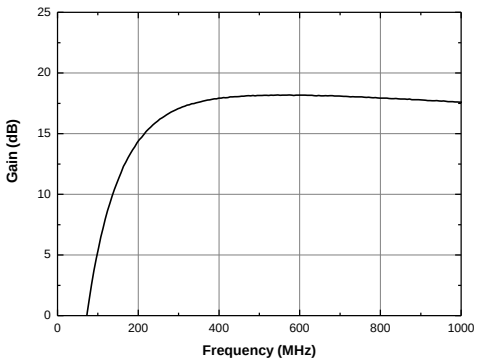
### Schematic

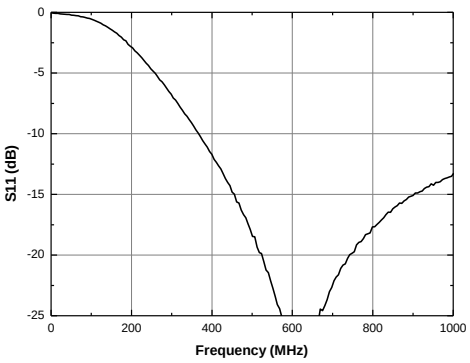


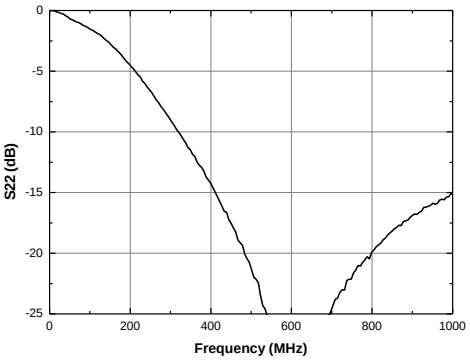

### Board Layout (FR4, 40x40 mm², 0.8T)

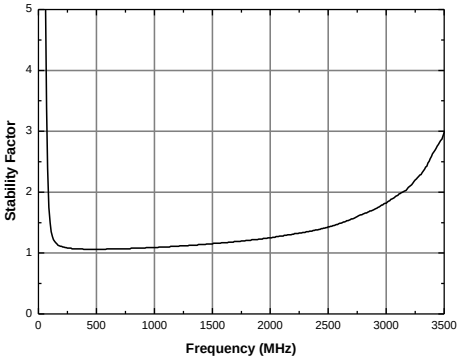



### S-parameters & K-factor



## APPLICATION CIRCUIT

**CDMA & GSM**

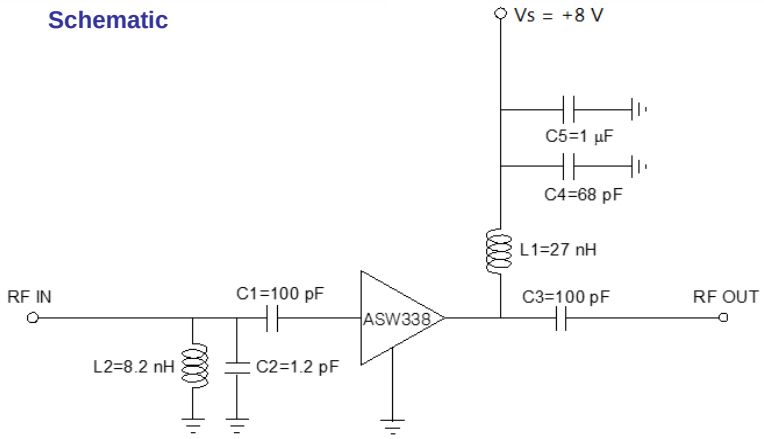
**900 MHz**

**+8 V**

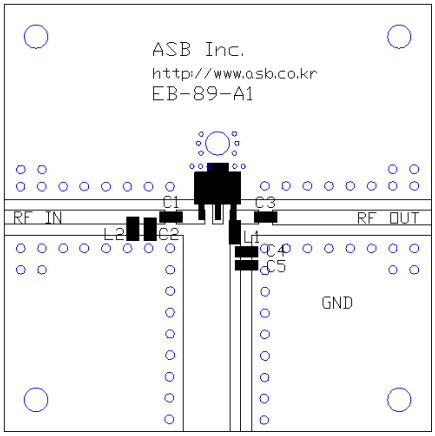
| Frequency (MHz) | 900 |
|---|---|
| Magnitude S21 (dB) | 17.5 |
| Magnitude S11 (dB) | -14 |
| Magnitude S22 (dB) | -18 |
| Output P1dB (dBm) | 26 |
| Output IP3[1)] (dBm) | 44 |
| Noise Figure (dB) | 2.0 |
| Device Voltage (V) | +8 |
| Current (mA) | 120 |

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

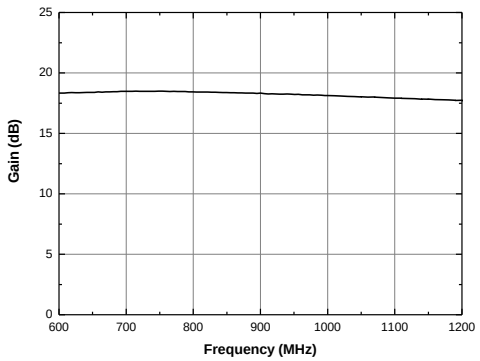
### Schematic

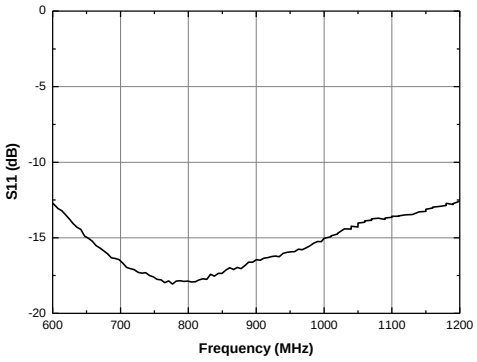


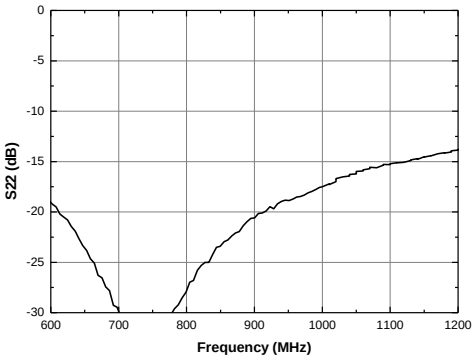

### Board Layout (FR4, 40x40 mm², 0.8T)

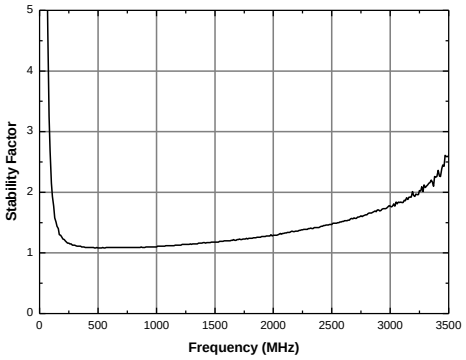



### S-parameters & K-factor



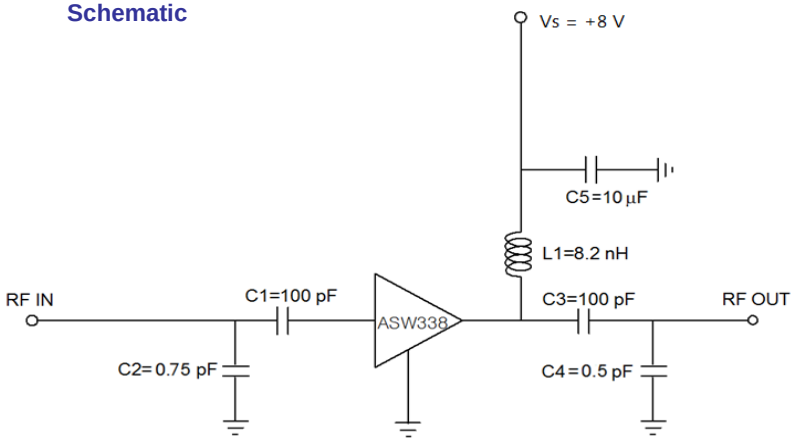
## APPLICATION CIRCUIT

| LTE |
|---|
| 1745 ~ 1860 MHz |
| +8 V |

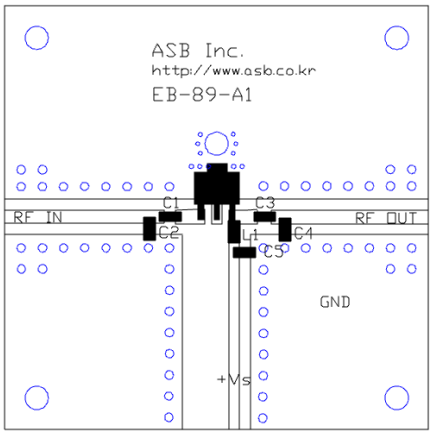
| Frequency (MHz) | 1745 | 1860 |
|---|---|---|
| Magnitude S21 (dB) | 16.0 | 16.0 |
| Magnitude S11 (dB) | -12 | -12 |
| Magnitude S22 (dB) | -11 | -11 |
| Output P1dB (dBm) | 25 | 24 |
| Output IP3[1)] (dBm) | 42.0 | 41.5 |
| Noise Figure (dB) | 2.1 | 2.1 |
| Device Voltage (V) | +8 | +8 |
| Current (mA) | 120 | 120 |

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

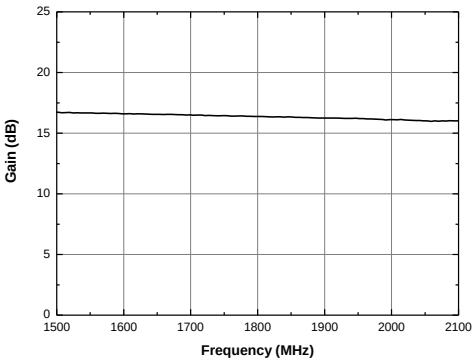
### Schematic

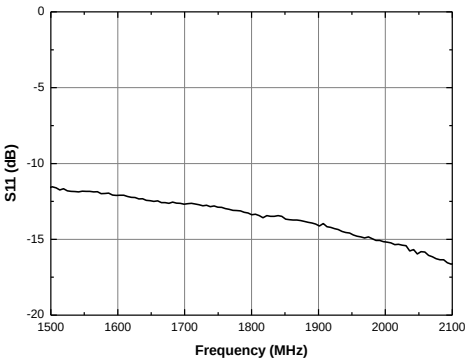


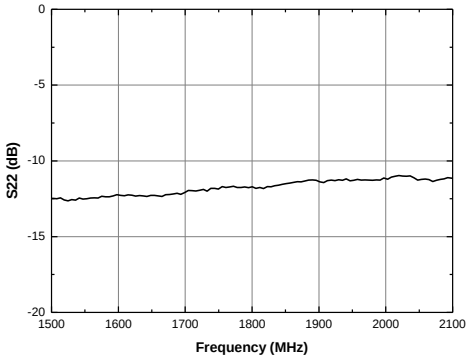

### Board Layout (FR4, 40x40 mm², 0.8T)



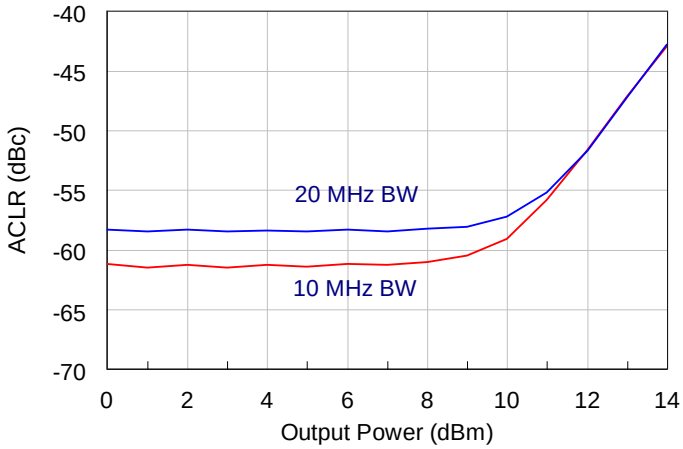

### S-parameters & K-factor



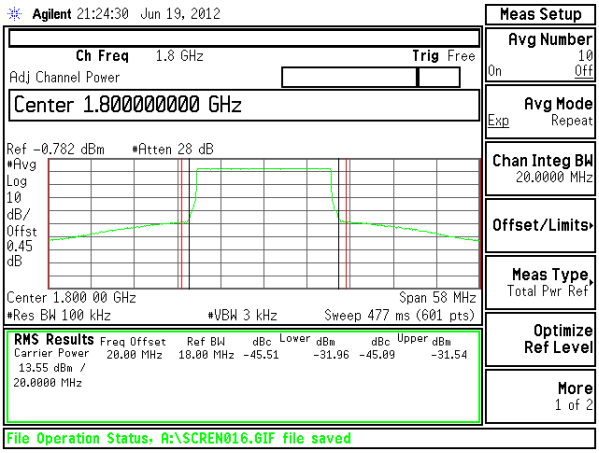



### LTE ACLR – 10 MHz & 20 MHz




1) Test Source : LTE_FDD_test model 3.1, BW: 10 MHz & 20 MHz, Test Frequency: 1.8 GHz

### LTE ACLR – 20 MHz




2) Test Source : LTE_FDD_test model 3.1, BW: 20 MHz, Test Frequency: 1.8 GHz

## APPLICATION CIRCUIT

**Wide Band**

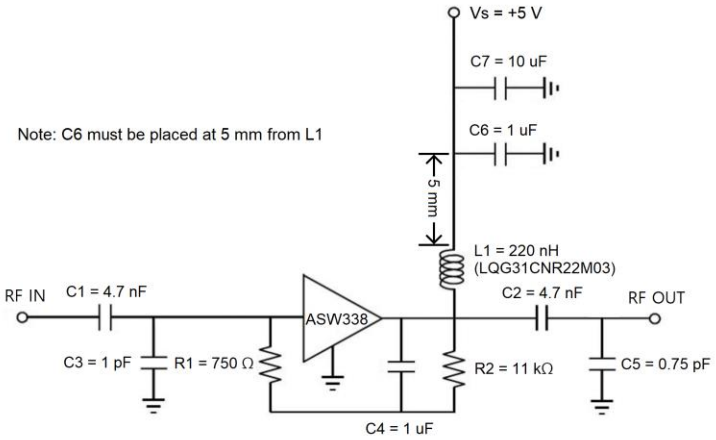
**50 ~ 3240 MHz**

**+5 V**

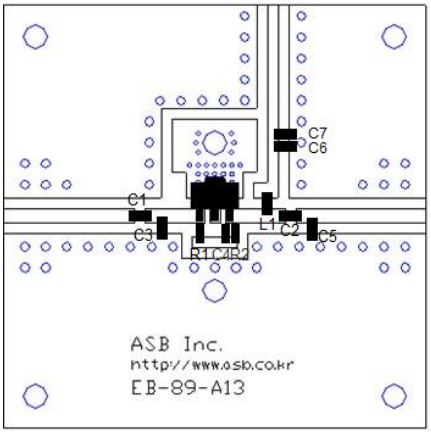
| Frequency (MHz) | 50 | 1000 | 2000 | 3000 | 3240 |
|---|---|---|---|---|---|
| Magnitude S21 (dB) | 15.3 | 15.1 | 14.5 | 16.5 | 16.7 |
| Magnitude S11 (dB) | -9 | -12 | -8 | -21 | -11 |
| Magnitude S22 (dB) | -10 | -13 | -7 | -8 | -7 |
| Output P1dB (dBm) | 22.0 | 22.0 | 23.0 | 22.0 | 21.0 |
| Output IP3[1)] (dBm) | 44.0 | 41.0 | 40.0 | 40.0 | 36.0 |
| Noise Figure (dB) | 2.8 | 2.0 | 2.3 | 3.0 | 3.5 |
| Device Voltage (V) | +5 | +5 | +5 | +5 | +5 |
| Current (mA) | 130 | 130 | 130 | 130 | 130 |

1) OIP3 is measured with two tones at an output power of +6 dBm/tone separated by 1 MHz.

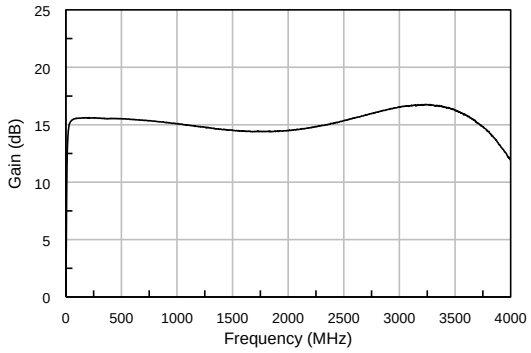
### Schematic

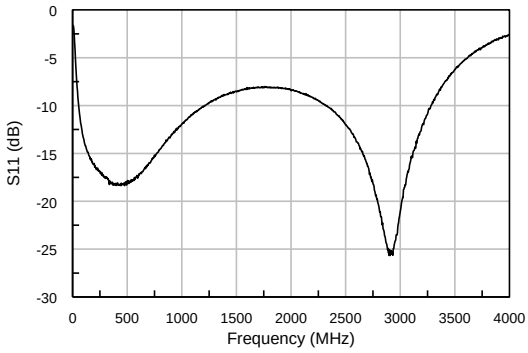


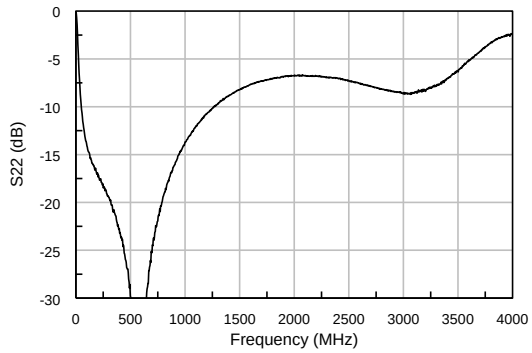

### Board Layout (FR4, 40x40 mm2, 0.8T)

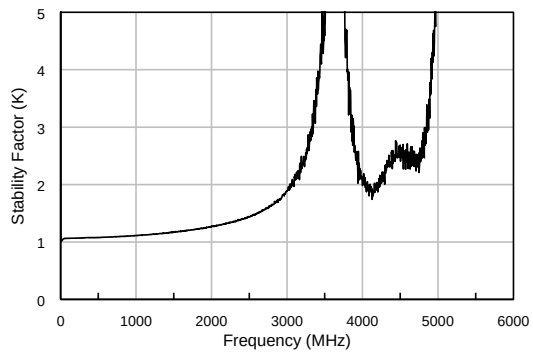



### S-parameters & K-factor



## APPLICATION CIRCUIT

**Wide Band**

**Positive Gain Slope**

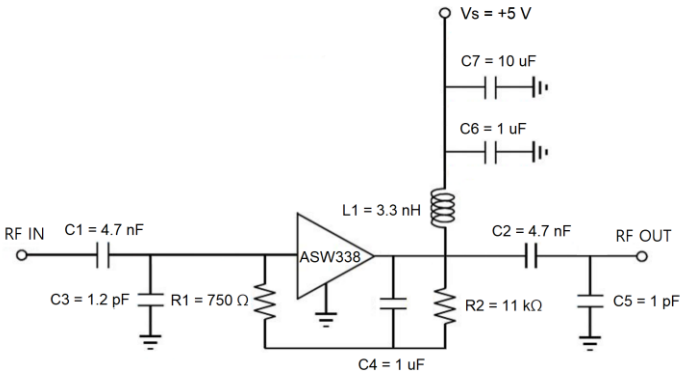
**1300 ~ 3000 MHz**

**+5 V**

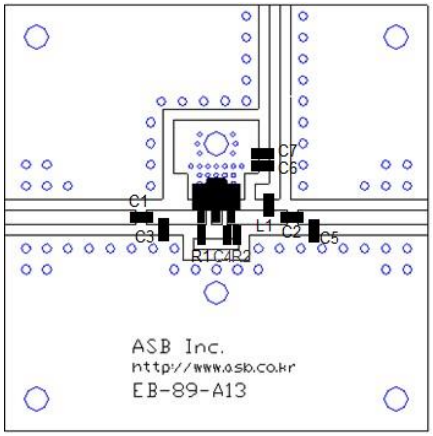
| Frequency (MHz) | 1300 | 1900 | 2300 | 2700 | 3000 |
|---|---|---|---|---|---|
| Magnitude S21 (dB) | 14.8 | 15.6 | 16.0 | 16.5 | 16.7 |
| Magnitude S11 (dB) | -8.1 | -13.2 | -17.3 | -14.8 | -7.6 |
| Magnitude S22 (dB) | -8.7 | -13.5 | -11.8 | -14.7 | -16.4 |
| Output P1dB (dBm) | 21.2 | 23.6 | 23.5 | 22.8 | 21.5 |
| Output IP3[1)] (dBm) | 42.5 | 40.1 | 40.2 | 38.5 | 40.7 |
| Noise Figure (dB) | 2.0 | 2.2 | 2.3 | 2.7 | 3.4 |
| Device Voltage (V) | +5 | +5 | +5 | +5 | +5 |
| Current (mA) | 134 | 134 | 134 | 134 | 134 |

1) OIP3 is measured with two tones at an output power of +6 dBm/tone separated by 1 MHz.

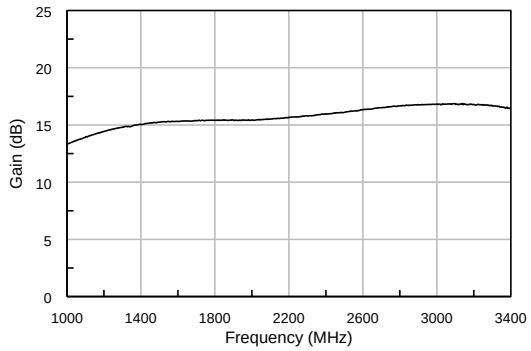
### Schematic

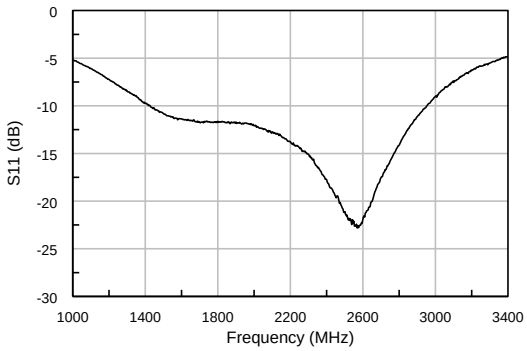


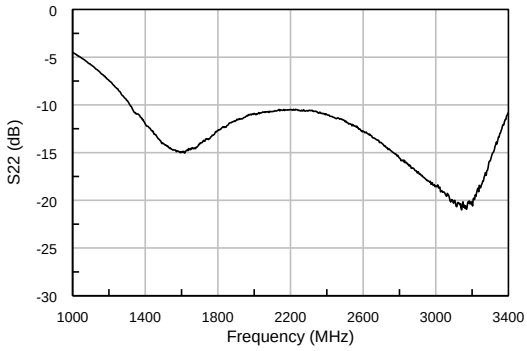

### Board Layout (FR4, 40x40 mm$^2$, 0.8T)

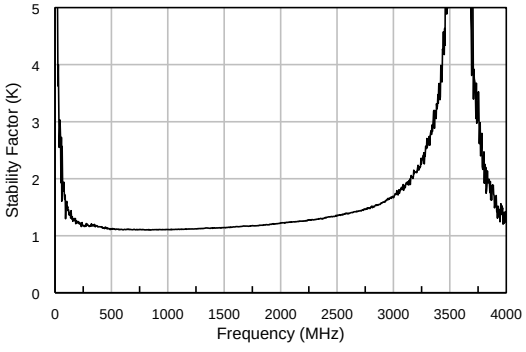



### S-parameters & K-factor



## APPLICATION CIRCUIT

**Wide Band**

**Positive Gain Slope**

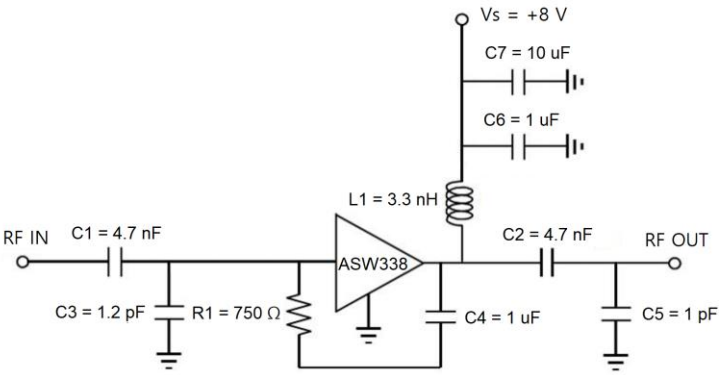
**1300 ~ 3000 MHz**

**+8 V**

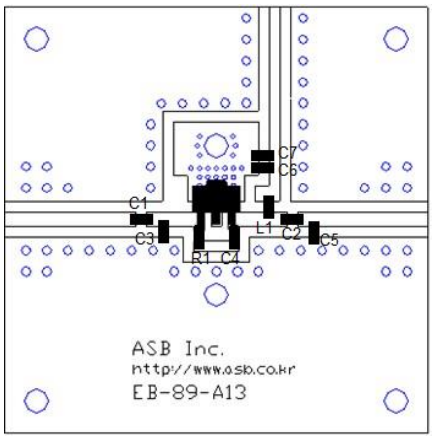
| Frequency (MHz) | 1300 | 1900 | 2300 | 2700 | 3000 |
|---|---|---|---|---|---|
| Magnitude S21 (dB) | 14.6 | 15.4 | 15.8 | 16.3 | 16.4 |
| Magnitude S11 (dB) | -8.1 | -13.3 | -18.2 | -14.6 | -7.4 |
| Magnitude S22 (dB) | -8.6 | -13.0 | -11.1 | -14.1 | -16.7 |
| Output P1dB (dBm) | 25.0 | 26.0 | 26.0 | 24.3 | 21.7 |
| Output IP3[1)] (dBm) | 42.7 | 42.8 | 42.3 | 38.2 | 35.4 |
| Noise Figure (dB) | 2.1 | 2.2 | 2.4 | 2.8 | 3.4 |
| Device Voltage (V) | +8 | +8 | +8 | +8 | +8 |
| Current (mA) | 120 | 120 | 120 | 120 | 120 |

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

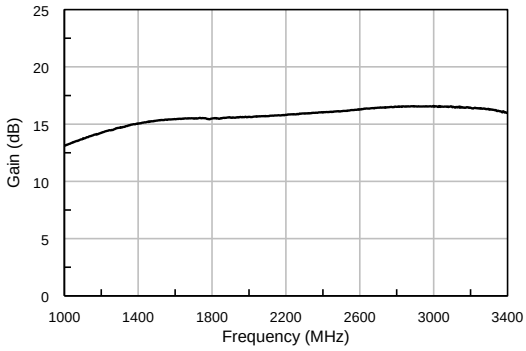
### Schematic

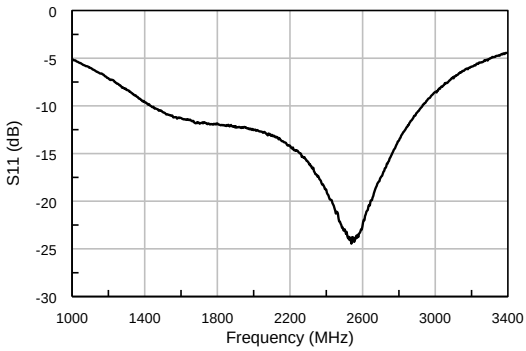


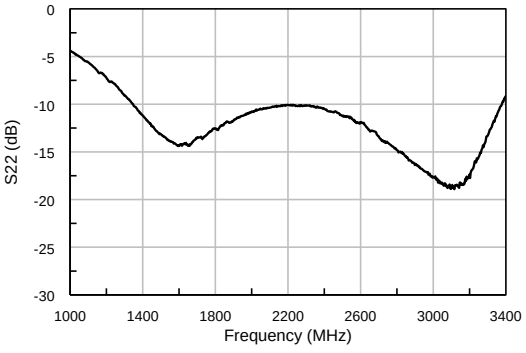

### Board Layout (FR4, 40x40 mm², 0.8T)

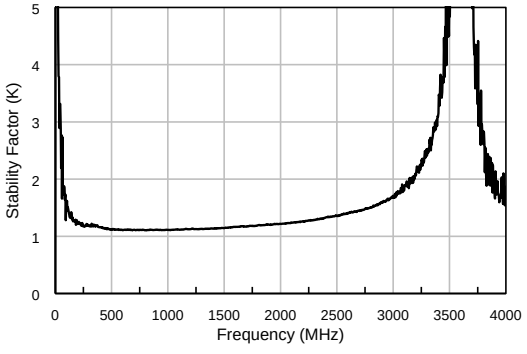



### S-parameters & K-factor



## APPLICATION CIRCUIT

**Wide Band**

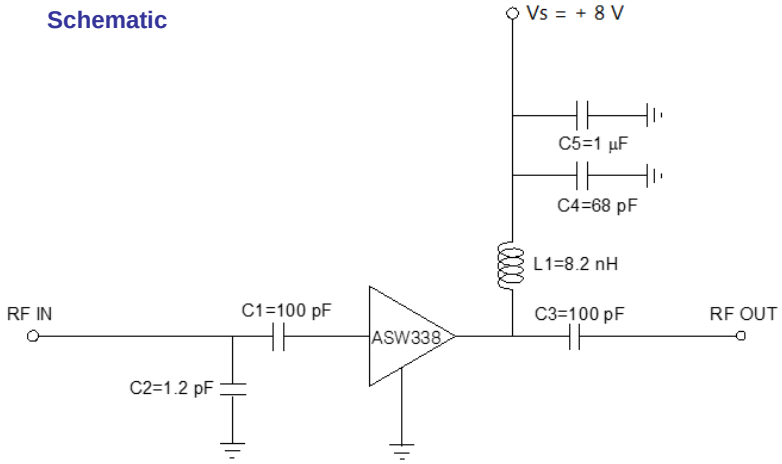
**1700 ~ 2700 MHz**

**+8 V**

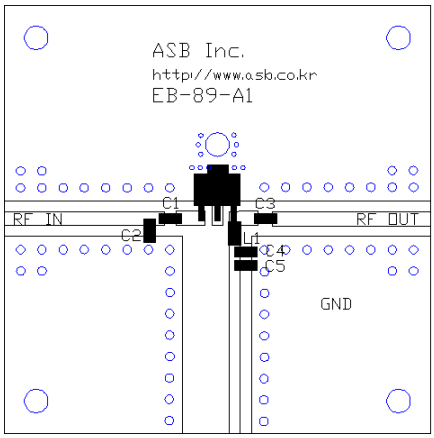
| Frequency (MHz) | 1950 | 2450 |
|---|---|---|
| Magnitude S21 (dB) | 16.5 | 16.0 |
| Magnitude S11 (dB) | -14 | -14 |
| Magnitude S22 (dB) | -14 | -14 |
| Output P1dB (dBm) | 25 | 22 |
| Output IP3[1)] (dBm) | 43.0 | 41.5 |
| Noise Figure (dB) | 2.2 | 2.8 |
| Device Voltage (V) | +8 | +8 |
| Current (mA) | 120 | 120 |

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

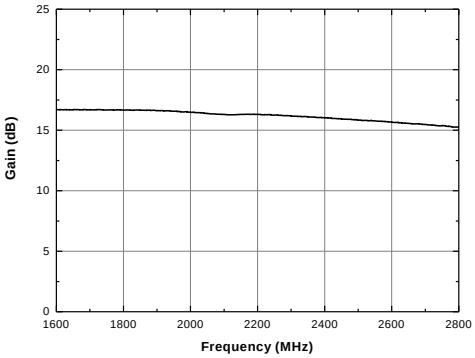
### Schematic

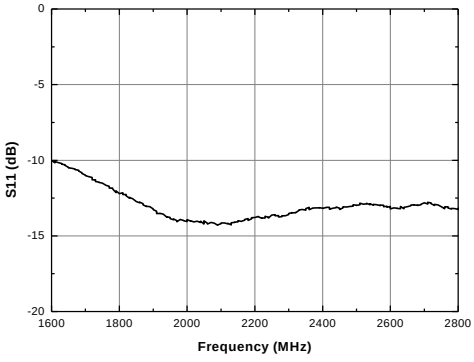


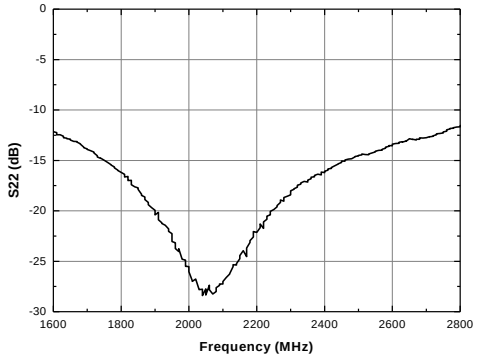

### Board Layout (FR4, 40x40 mm², 0.8T)

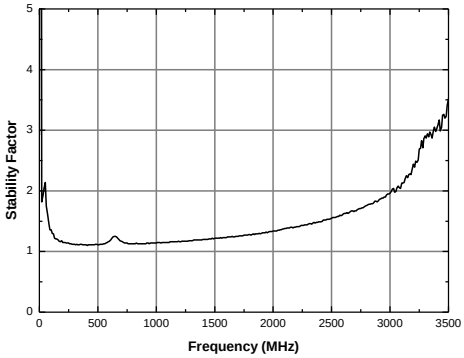



### S-parameters & K-factor



## APPLICATION CIRCUIT

**WLAN**

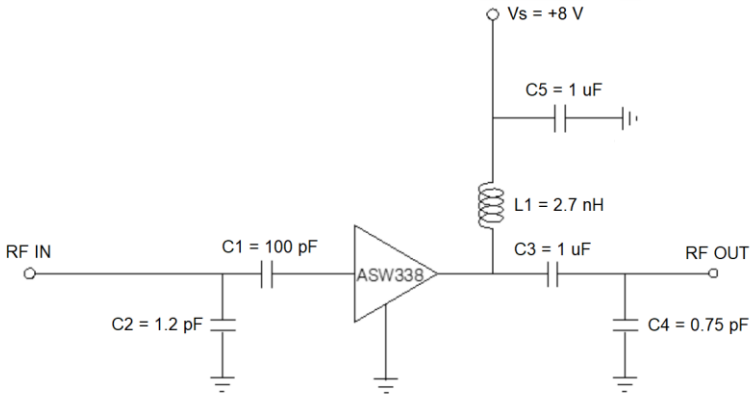
**2450 MHz**

**+8 V**

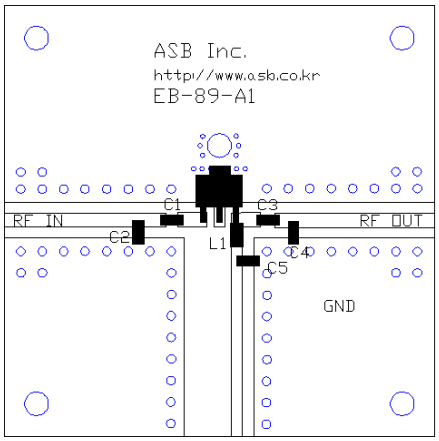
| Frequency (MHz) | 2450 |
|---|---|
| Magnitude S21 (dB) | 16.0 |
| Magnitude S11 (dB) | -17 |
| Magnitude S22 (dB) | -14 |
| Output P1dB (dBm) | 26 |
| Output IP3[1)] (dBm) | 43 |
| Noise Figure (dB) | 2.6 |
| Device Voltage (V) | +8 |
| Current (mA) | 125 |

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

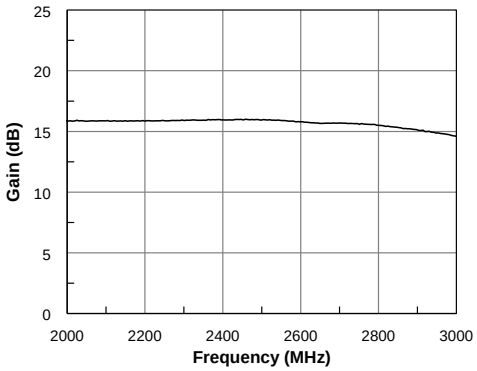
### Schematic

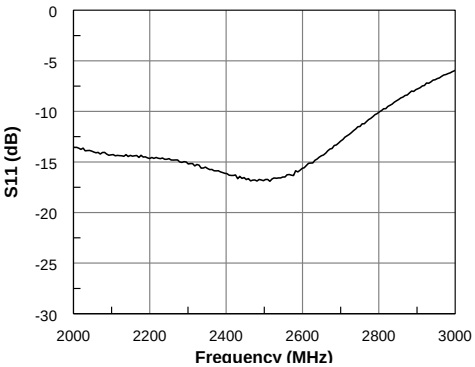


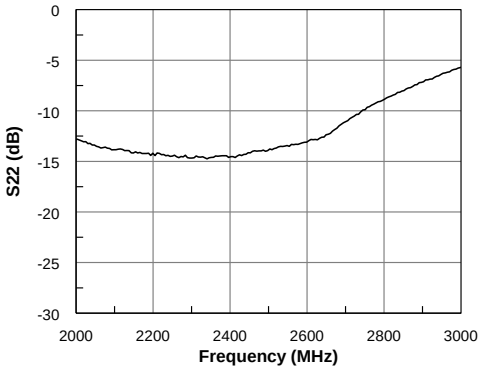

### Board Layout (FR4, 40x40 mm², 0.8T)

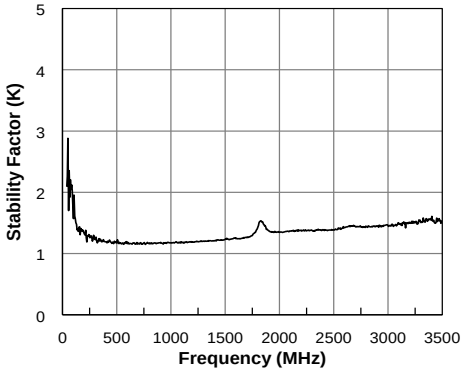



### S-parameters & K-factor



## APPLICATION CIRCUIT

**Wide Band**

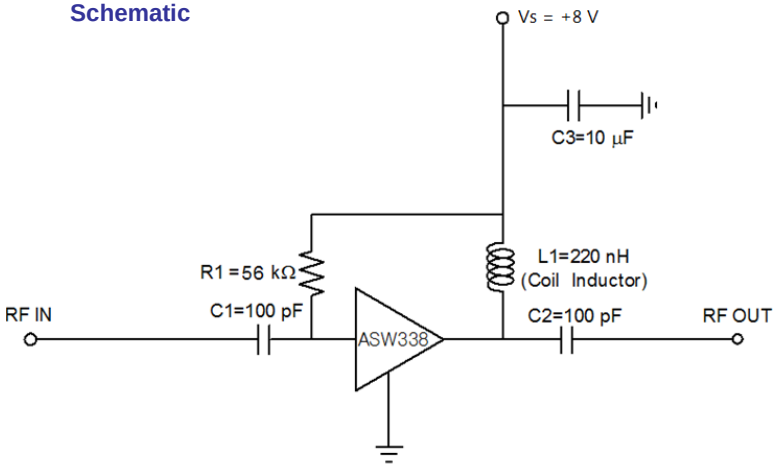
**50 ~ 1500 MHz**

**+8 V**

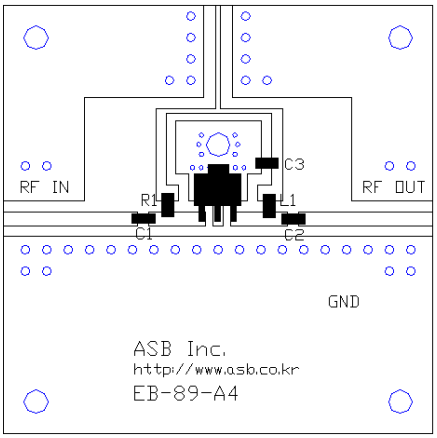
| Frequency (MHz) | 50 | 1000 | 1500 |
|---|---|---|---|
| Magnitude S21 (dB) | 17.9 | 17.6 | 16.7 |
| Magnitude S11 (dB) | -5 | -13 | -11 |
| Magnitude S22 (dB) | -10 | -14 | -11 |
| Output P1dB (dBm) | 25 | 26 | 26 |
| Output IP3[1)] (dBm) | 46 | 45 | 44 |
| Noise Figure (dB) | 1.8 | 1.8 | 2.0 |
| Device Voltage (V) | +8 | +8 | +8 |
| Current (mA) | 150 | 150 | 150 |

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

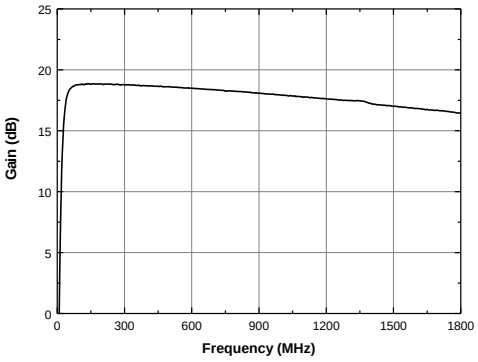
### Schematic

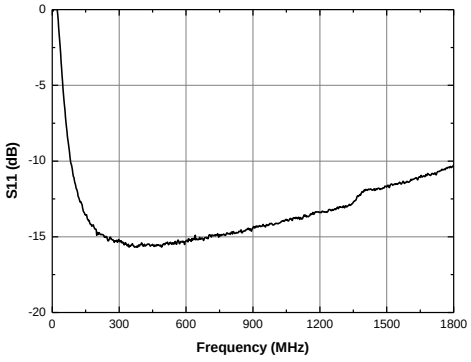


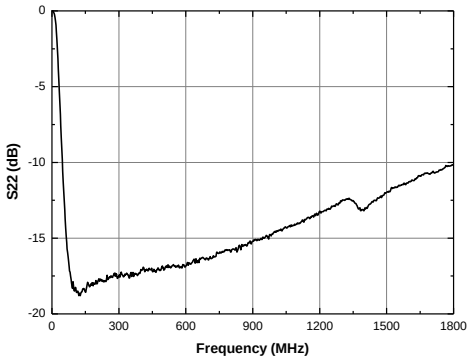

### Board Layout (FR4, 40x40 mm², 0.8T)

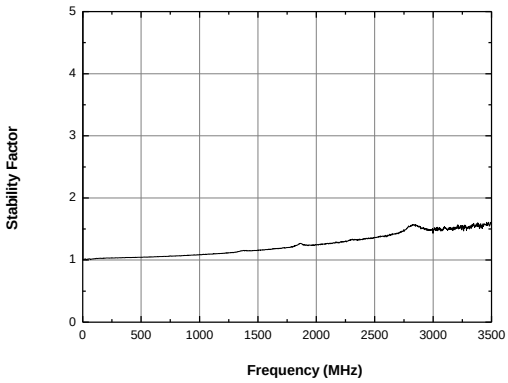



### S-parameters & K-factor



## APPLICATION CIRCUIT

**Wide Band**

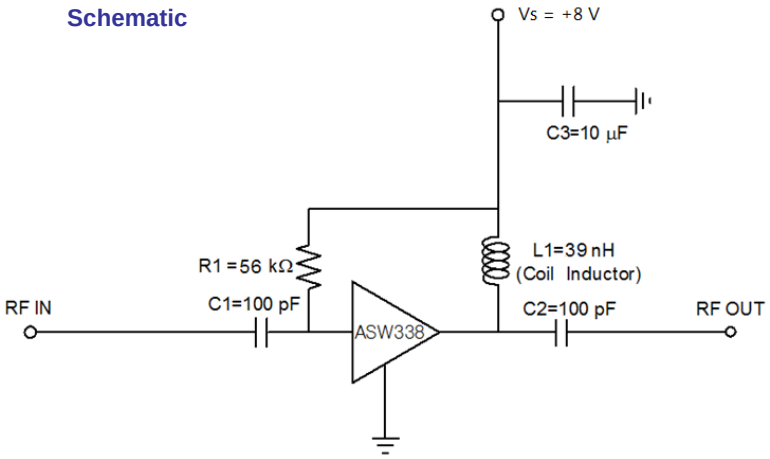
**350 ~ 3000 MHz**

**+8 V**

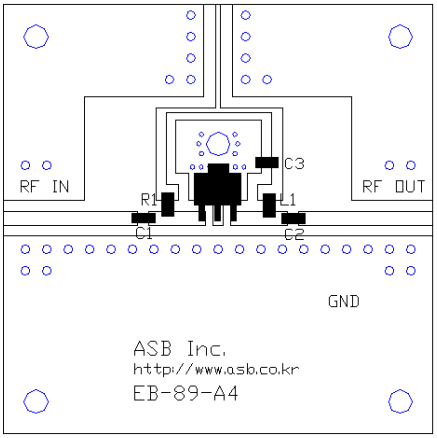
| Frequency (MHz) | 350 | 1500 | 2000 | 2400 | 3000 |
|---|---|---|---|---|---|
| Magnitude S21 (dB) | 18.0 | 17.0 | 16.0 | 15.5 | 14.6 |
| Magnitude S11 (dB) | -9 | -12 | -10 | -8 | -6 |
| Magnitude S22 (dB) | -10 | -12 | -10 | -8 | -5 |
| Output P1dB (dBm) | 25.5 | 25.5 | 25.0 | 20.5 | 20.0 |
| Output IP3[1)] (dBm) | 45.0 | 44.0 | 43.0 | 40.5 | 40.5 |
| Noise Figure (dB) | 2.0 | 2.0 | 2.4 | 2.8 | - |
| Device Voltage (V) | +8 | +8 | +8 | +8 | +8 |
| Current (mA) | 150 | 150 | 150 | 150 | 150 |

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

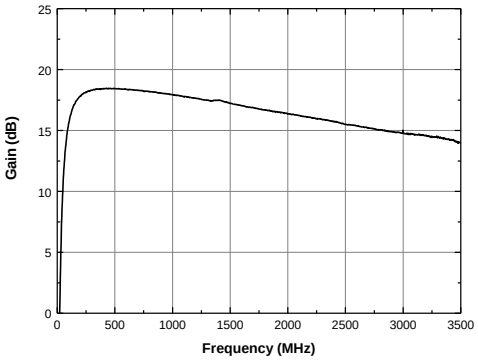
### Schematic

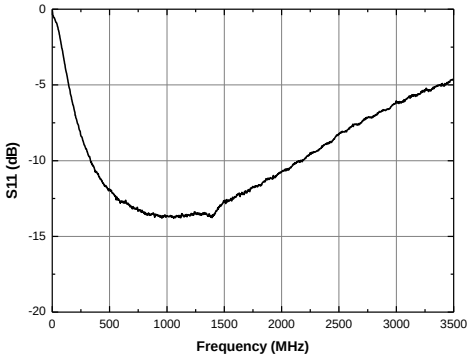


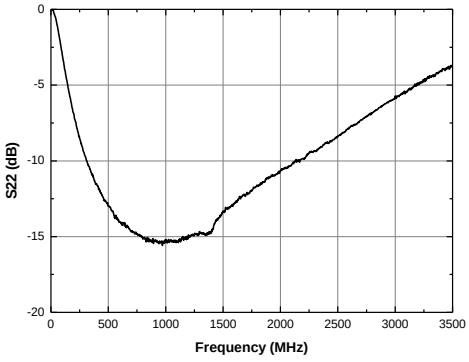

### Board Layout (FR4, 40x40 mm², 0.8T)

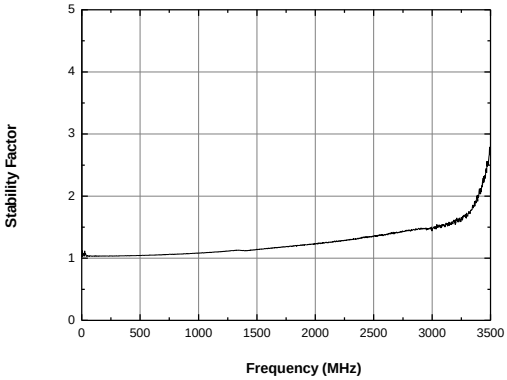



### S-parameters & K-factor



## APPLICATION CIRCUIT

**CATV Push-Pull (75 Ω)**

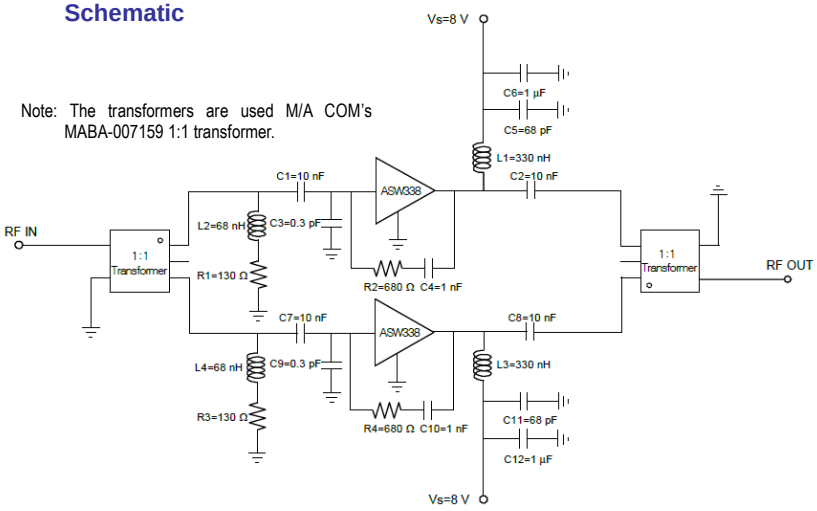
**50 ~ 1000 MHz**

**+8 V**

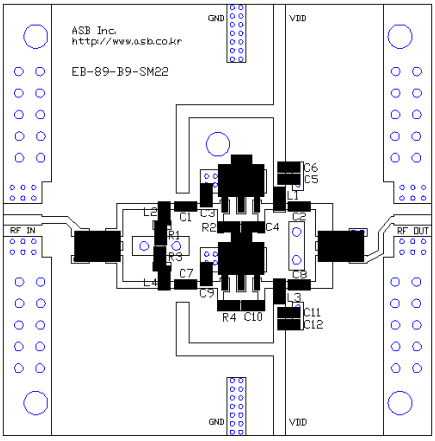
| Frequency (MHz) | 50 | 500 | 860 |
|---|---|---|---|
| Magnitude S21 (dB) | 14.1 | 14.3 | 14.2 |
| Magnitude S11 (dB) | -15 | -11 | -14 |
| Magnitude S22 (dB) | -11 | -10 | -12 |
| Output P1dB (dBm) | 26 | 28 | 28 |
| Output IP3[1)] (dBm) | 41.0 | 45.0 | 42.5 |
| Output IP2[1),2)] (dBm) | 73 | 65 | 54 |
| Noise Figure (dB) | 3.5 | 2.8 | 3.2 |
| Device Voltage (V) | +8 | +8 | +8 |
| Current (mA) | 240 | 240 | 240 |

1) OIP3 and OIP2 are measured with two tones at an output power of +8 dBm/tone separated by 6 MHz.
2) OIP2 is measured at F1+F2 Frequency.

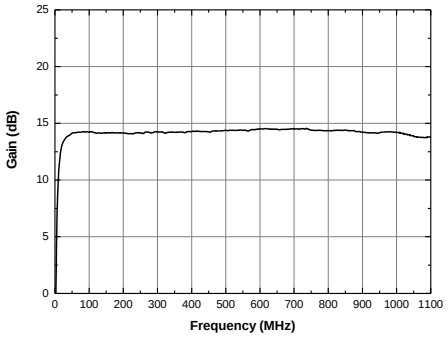
### Schematic

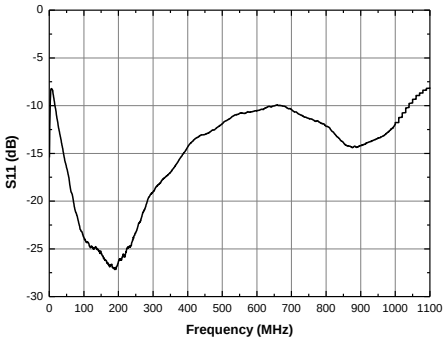


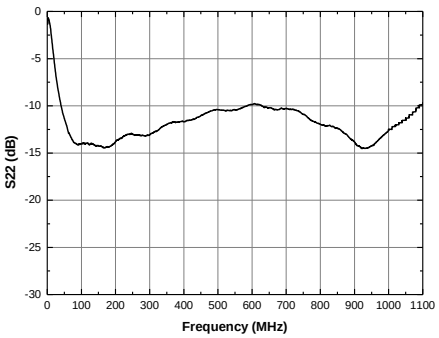

### Board Layout (FR4, 40x40 mm², 0.8T)




### S-parameters



## Recommended Soldering Reflow Profile