

## *ASSP Mobile Communication Systems*

# Piezoelectric SAW BPF (1000 to 2500 MHz)

## F6 Series (L2 type)

### ■ DESCRIPTION

The F6 series of SAW band pass filters apply to the frequency range 1000 to 2500 MHz.

The SAW filters are fabricated on a lithium tantalate ( $\text{LiTaO}_3$ ) substrate, producing filters with a wide frequency bandwidth, low insertion loss in passband and superior stability due to the high electromechanical coupling coefficient of the material.

Fujitsu's leading techniques for making filter pattern designs realized this high frequency filter.

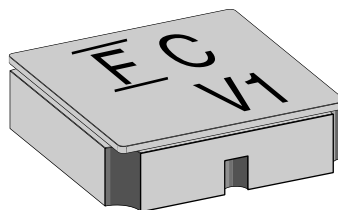
The F6 series filters are housed in a small surface mount package. Moreover, the impedance in the passband is  $50\ \Omega$ , and so applications require no external matching circuits.

The F6 series SAW filters are suitable for interstage RF filter in mobile communications systems in the sub microwave frequency band. Standard devices are available for PCS, DCS1800, and 2.4 GHz wireless LAN systems.

### ■ FEATURES

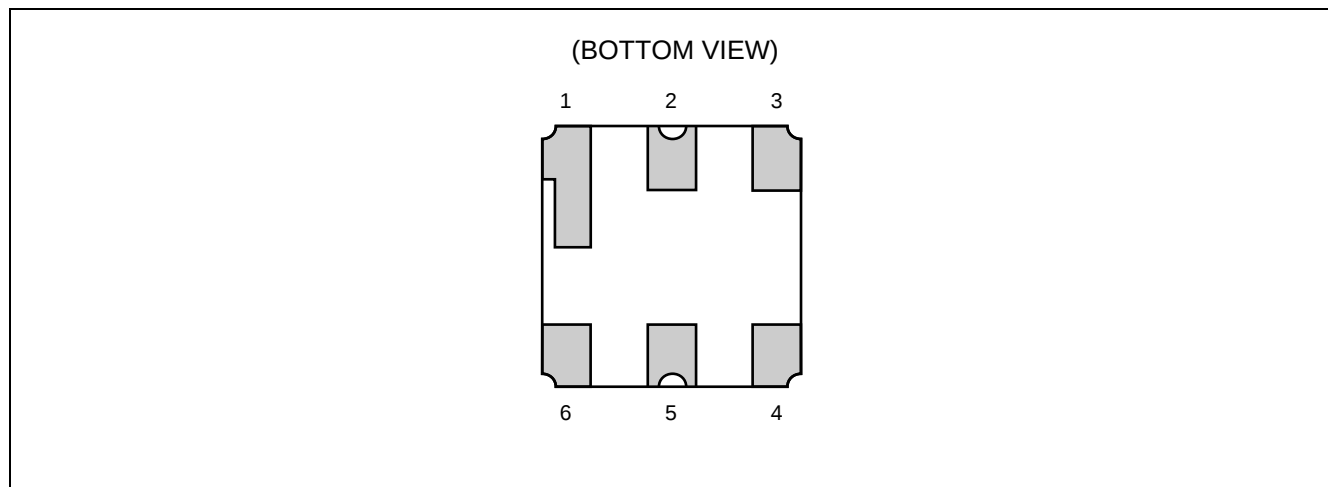
- High frequency filters
- Low insertion loss
- Ultra compact and light package (3.0 mm × 3.0 mm)
- External matching circuits are not required.
- Surface mount package (SMT)
- Wide variety of standard devices for worldwide mobile communication systems

### ■ PACKAGE



# F6 Series (L2 type)

## ■ PIN ASSIGNMENT



## ■ PIN DESCRIPTION

| Pin No. | Pin name | Description |
|---------|----------|-------------|
| 1       | GND      | Ground      |
| 2       | IN       | Input       |
| 3       | GND      | Ground      |
| 4       | GND      | Ground      |
| 5       | OUT      | Output      |
| 6       | GND      | Ground      |

## ■ ABSOLUTE MAXIMUM RATINGS

| Parameter             | Symbol          | Value                               |      | Unit |
|-----------------------|-----------------|-------------------------------------|------|------|
|                       |                 | Min.                                | Max. |      |
| Operating temperature | Ta              | −30                                 | +85  | °C   |
| Storage temperature   | Tstg            | −40                                 | +100 | °C   |
| Maximum input level   | P <sub>IN</sub> | Refer to electrical characteristics |      | dBm  |
| Input DC voltage      | —               | −5                                  | +5   | V    |

WARNING: Piezoelectric devices can be permanently damaged by application of stress (voltage, current, temperature, etc.) in excess of absolute maximum ratings. Do not exceed these ratings.

# F6 Series (L2 type)

## ■ RECOMMENDED OPERATING CONDITIONS (See WARNING)

| Parameter               | Symbol | Value |      | Unit |
|-------------------------|--------|-------|------|------|
|                         |        | Min.  | Max. |      |
| Operating temperature * | Ta     | -30   | +85  | °C   |

\* : Standard Rating for Wireless LAN Systems is 0 to +60 °C.

**WARNING:** The recommended operating conditions are required in order to ensure the normal operation of the piezoelectric device. All of the device's electrical characteristics are warranted when the device is operated within these ranges.

Always use piezoelectric devices within their recommended operating condition ranges. Operation outside these ranges may adversely affect reliability and could result in device failure.

No warranty is made with respect to uses, operating conditions, or combinations not represented on the data sheet. Users considering application outside the listed conditions are advised to contact their FUJITSU representatives beforehand.

## ■ STANDARD FREQUENCIES

| System       |    | Center freq. (MHz) | Band width | Part symbol | Part number          | Remarks                 |
|--------------|----|--------------------|------------|-------------|----------------------|-------------------------|
| GPS          |    | 1575.42            | 2          | 6           | FAR-F6CE-1G5754-L2UA |                         |
| PCN          | Tx | 1747.5             | 75         | A           | FAR-F6CE-1G7475-L2YA |                         |
|              | Rx | 1842.5             | 75         | B           | FAR-F6CE-1G8425-L2YB |                         |
|              |    | 1842.5             | 75         | YE          | FAR-F6CE-1G8425-L2YE | Low insertion loss type |
| US-PCS       | Tx | 1880.0             | 60         | C           | FAR-F6CE-1G8800-L2XA |                         |
|              |    | 1880.0             | 60         | c           | FAR-F6CE-1G8800-L2XZ | High Att. type          |
|              |    | 1880.0             | 60         | g           | FAR-F6CE-1G8800-L2XJ | High Att. at Rx band    |
|              | Rx | 1960.0             | 60         | D           | FAR-F6CE-1G9600-L2XB |                         |
|              |    | 1960.0             | 60         | d           | FAR-F6CE-1G9600-L2XY | High Att. type          |
|              |    | 1960.0             | 60         | v           | FAR-F6CE-1G9600-L2XK | High Att. at Rx band    |
| K-PCS        | Tx | 1765.0             | 30         | S           | FAR-F6CE-1G7650-L2TA |                         |
|              | Rx | 1855.0             | 30         | T           | FAR-F6CE-1G8550-L2TB |                         |
| Wireless LAN |    | 2448.5             | 97         | E           | FAR-F6CE-2G4500-L2WA |                         |
|              |    | 2484.0             | 26         | P           | FAR-F6CE-2G4840-L2WC | For Japan               |
|              |    | 2441.8             | 83         | L           | FAR-F6CE-2G4418-L2WD | For Europe, USA         |
| W-CDMA       | Tx | 1950.0             | 60         | j           | FAR-F6CE-1G9500-L2ZP |                         |
|              | Rx | 2140.0             | 60         | k           | FAR-F6CE-2G1400-L2ZQ |                         |
| Bluetooth    |    | 2441.8             | 83.5       | RB          | FAR-F6CE-2G4418-L2RB |                         |

# F6 Series (L2 type)

## ■ ELECTRICAL CHARACTERISTICS (STANDARD VERSION)

### 1. GPS

Part number : FAR-F6CE-1G5754-L2UA

(Ta = -30 °C to +85 °C)

| Parameter                     | Conditions             | Value      |               |          | Unit      | Remarks |
|-------------------------------|------------------------|------------|---------------|----------|-----------|---------|
|                               |                        | Min.       | Typ.          | Max.     |           |         |
| Insertion loss                | 1574.42 to 1576.42 MHz | —          | 2.7           | 3.5      | dB        |         |
| In-band deviation             | 1574.42 to 1576.42 MHz | —          | 0.2           | 1.0      | dB        |         |
| Absolute stopband attenuation | 1475.42 MHz            | 35         | 37            | —        | dB        |         |
|                               | 1525.42 MHz            | 35         | 50            | —        | dB        |         |
|                               | 1625.42 MHz            | 30         | 38            | —        | dB        |         |
|                               | 1675.42 MHz            | 30         | 35            | —        | dB        |         |
| In-band VSWR (Return loss)    | 1574.42 to 1576.42 MHz | —<br>(9.5) | 1.4<br>(15.6) | 2.0<br>— | —<br>(dB) |         |
| Max. input power              | 1574.42 to 1576.42 MHz | —          | —             | 10       | dBm       |         |

### 2. PCN (Tx)

Part number : FAR-F6CE-1G7475-L2YA

(Ta = -30 °C to +85 °C)

| Parameter                     | Conditions       | Value      |              |          | Unit      | Remarks |
|-------------------------------|------------------|------------|--------------|----------|-----------|---------|
|                               |                  | Min.       | Typ.         | Max.     |           |         |
| Insertion loss                | 1710 to 1785 MHz | —          | 3.0          | 4.2      | dB        |         |
| In-band deviation             | 1710 to 1785 MHz | —          | 1.8          | 2.7      | dB        |         |
| Absolute stopband attenuation | DC to 1500 MHz   | 17         | 19           | —        | dB        |         |
|                               | 1500 to 1670 MHz | 20         | 22           | —        | dB        |         |
|                               | 1805 to 1880 MHz | 7          | 12           | —        | dB        |         |
|                               | 1880 to 2200 MHz | 20         | 23           | —        | dB        |         |
|                               | 3420 to 3570 MHz | 25         | 31           | —        | dB        |         |
|                               | 5130 to 5355 MHz | 15         | 25           | —        | dB        |         |
| In-band VSWR (Return loss)    | 1710 to 1785 MHz | —<br>(6.0) | 2.5<br>(7.4) | 3.0<br>— | —<br>(dB) |         |
| Max. input power              | 1710 to 1785 MHz | —          | —            | 13       | dBm       |         |

# F6 Series (L2 type)

## 3. PCN (Rx)

Part number : FAR-F6CE-1G8425-L2YB

(Ta = -30 °C to +85 °C)

| Parameter                     | Conditions       | Value      |              |          | Unit      | Remarks |
|-------------------------------|------------------|------------|--------------|----------|-----------|---------|
|                               |                  | Min.       | Typ.         | Max.     |           |         |
| Insertion loss                | 1805 to 1880 MHz | —          | 3.3          | 4.5      | dB        |         |
| In-band deviation             | 1805 to 1880 MHz | —          | 1.5          | 2.5      | dB        |         |
| Absolute stopband attenuation | DC to 1500 MHz   | 20         | 22           | —        | dB        |         |
|                               | 1600 to 1710 MHz | 22         | 24           | —        | dB        |         |
|                               | 1710 to 1785 MHz | 10         | 29           | —        | dB        |         |
|                               | 1920 to 2400 MHz | 25         | 27           | —        | dB        |         |
|                               | 3610 to 3760 MHz | 25         | 35           | —        | dB        |         |
|                               | 5415 to 5640 MHz | 15         | 21           | —        | dB        |         |
| In-band VSWR (Return loss)    | 1805 to 1880 MHz | —<br>(6.0) | 2.5<br>(7.4) | 3.0<br>— | —<br>(dB) |         |
| Max. input power              | 1805 to 1880 MHz | —          | —            | 13       | dBm       |         |

## 4. PCN (Rx) Low insertion loss type

Part number : FAR-F6CE-1G8425-L2YE

(Ta = -30 °C to +85 °C)

| Parameter                     | Conditions       | Value      |              |          | Unit      | Remarks |
|-------------------------------|------------------|------------|--------------|----------|-----------|---------|
|                               |                  | Min.       | Typ.         | Max.     |           |         |
| Insertion loss                | 1805 to 1880 MHz | —          | 2.6          | 3.7      | dB        |         |
| In-band deviation             | 1805 to 1880 MHz | —          | 1.0          | 2.1      | dB        |         |
| Absolute stopband attenuation | DC to 1720 MHz   | 15         | 17           | —        | dB        |         |
|                               | 1720 to 1765 MHz | 25         | 28           | —        | dB        |         |
|                               | 1765 to 1785 MHz | 8          | 20           | —        | dB        |         |
|                               | 1920 to 1980 MHz | 15         | 23           | —        | dB        |         |
|                               | 1980 to 2400 MHz | 17         | 21           | —        | dB        |         |
|                               | 2400 to 3500 MHz | 20         | 23           | —        | dB        |         |
|                               | 3500 to 4000 MHz | 15         | 24           | —        | dB        |         |
|                               | 4000 to 6000 MHz | 5          | 8            | —        | dB        |         |
| In-band VSWR (Return loss)    | 1805 to 1880 MHz | —<br>(6.0) | 2.6<br>(7.0) | 3.0<br>— | —<br>(dB) |         |
| Max. input power              | 1805 to 1880 MHz | —          | —            | 13       | dBm       |         |

# F6 Series (L2 type)

## 5. US-PCS (Tx)

Part number : FAR-F6CE-1G8800-L2XA

(Ta = -30 °C to +85 °C)

| Parameter                     | Conditions       | Value      |              |          | Unit      | Remarks |
|-------------------------------|------------------|------------|--------------|----------|-----------|---------|
|                               |                  | Min.       | Typ.         | Max.     |           |         |
| Insertion loss                | 1850 to 1910 MHz | —          | 3.2          | 4.2      | dB        |         |
| In-band deviation             | 1850 to 1910 MHz | —          | 2.0          | 2.5      | dB        |         |
| Absolute stopband attenuation | DC to 1500 MHz   | 20         | 22           | —        | dB        |         |
|                               | 1500 to 1800 MHz | 23         | 25           | —        | dB        |         |
|                               | 1930 to 1990 MHz | 7          | 18           | —        | dB        |         |
|                               | 3700 to 3820 MHz | 25         | 32           | —        | dB        |         |
|                               | 5550 to 5730 MHz | 15         | 21           | —        | dB        |         |
| In-band VSWR (Return loss)    | 1850 to 1910 MHz | —<br>(7.4) | 2.0<br>(9.5) | 2.5<br>— | —<br>(dB) |         |
| Max. input power              | 1850 to 1910 MHz | —          | —            | 13       | dBm       |         |

## 6. US-PCS (Tx) High Attenuation type

Part number : FAR-F6CE-1G8800-L2XZ

(Ta = -30 °C to +85 °C)

| Parameter                     | Conditions       | Value      |              |          | Unit      | Remarks |
|-------------------------------|------------------|------------|--------------|----------|-----------|---------|
|                               |                  | Min.       | Typ.         | Max.     |           |         |
| Insertion loss                | 1850 to 1910 MHz | —          | 3.7          | 5.0      | dB        |         |
| In-band deviation             | 1850 to 1910 MHz | —          | 1.7          | 3.0      | dB        |         |
| Absolute stopband attenuation | DC to 120 MHz    | 40         | 47           | —        | dB        |         |
|                               | 120 to 200 MHz   | 38         | 42           | —        | dB        |         |
|                               | 200 to 1500 MHz  | 32         | 34           | —        | dB        |         |
|                               | 1500 to 1800 MHz | 35         | 38           | —        | dB        |         |
|                               | 1930 to 1990 MHz | 7          | 17           | —        | dB        |         |
|                               | 1990 to 2200 MHz | 35         | 41           | —        | dB        |         |
|                               | 2200 to 2350 MHz | 40         | 43           | —        | dB        |         |
|                               | 2350 to 4000 MHz | 20         | 32           | —        | dB        |         |
|                               | 4000 to 5000 MHz | 5          | 9            | —        | dB        |         |
| In-band VSWR (Return loss)    | 1850 to 1910 MHz | —<br>(6.5) | 2.3<br>(8.1) | 2.8<br>— | —<br>(dB) |         |
| Max. input power              | 1850 to 1910 MHz | —          | —            | 13       | dBm       |         |

# F6 Series (L2 type)

## 7. US-PCS (Tx) High Attenuation at Rx band type

Part number : FAR-F6CE-1G8800-L2XJ

(Ta = -30 °C to +85 °C)

| Parameter                     | Conditions       | Value      |              |          | Unit      | Remarks |
|-------------------------------|------------------|------------|--------------|----------|-----------|---------|
|                               |                  | Min.       | Typ.         | Max.     |           |         |
| Insertion loss                | 1850 to 1910 MHz | —          | 2.7          | 4.2      | dB        |         |
| In-band deviation             | 1850 to 1910 MHz | —          | 1.2          | 2.6      | dB        |         |
| Absolute stopband attenuation | DC to 1500 MHz   | 15         | 20           | —        | dB        |         |
|                               | 1500 to 1750 MHz | 20         | 22           | —        | dB        |         |
|                               | 1930 to 1990 MHz | 9          | 15           | —        | dB        |         |
|                               | 1990 to 2300 MHz | 20         | 25           | —        | dB        |         |
|                               | 2300 to 2500 MHz | 15         | 20           | —        | dB        |         |
| In-band VSWR (Return loss)    | 1850 to 1910 MHz | —<br>(7.4) | 2.2<br>(8.5) | 2.5<br>— | —<br>(dB) |         |
| Max. input power              | 1850 to 1910 MHz | —          | —            | 13       | dBm       |         |

## 8. US-PCS (Rx)

Part number : FAR-F6CE-1G9600-L2XB

(Ta = -30 °C to +85 °C)

| Parameter                     | Conditions       | Value      |               |          | Unit      | Remarks |
|-------------------------------|------------------|------------|---------------|----------|-----------|---------|
|                               |                  | Min.       | Typ.          | Max.     |           |         |
| Insertion loss                | 1930 to 1990 MHz | —          | 3.3           | 4.5      | dB        |         |
| In-band deviation             | 1930 to 1990 MHz | —          | 2.0           | 2.8      | dB        |         |
| Absolute stopband attenuation | DC to 1500 MHz   | 21         | 23            | —        | dB        |         |
|                               | 1500 to 1850 MHz | 23         | 25            | —        | dB        |         |
|                               | 1850 to 1910 MHz | 10         | 30            | —        | dB        |         |
|                               | 3860 to 3980 MHz | 25         | 32            | —        | dB        |         |
|                               | 5790 to 5970 MHz | 15         | 23            | —        | dB        |         |
| In-band VSWR (Return loss)    | 1930 to 1990 MHz | —<br>(7.4) | 1.8<br>(10.9) | 2.5<br>— | —<br>(dB) |         |
| Max. input power              | 1930 to 1990 MHz | —          | —             | 13       | dBm       |         |

# F6 Series (L2 type)

## 9. US-PCS (Rx) High Attenuation type Part number : FAR-F6CE-1G9600-L2XY

(Ta = -30 °C to +85 °C)

| Parameter                     | Conditions       | Value      |              |          | Unit      | Remarks |
|-------------------------------|------------------|------------|--------------|----------|-----------|---------|
|                               |                  | Min.       | Typ.         | Max.     |           |         |
| Insertion loss                | 1930 to 1990 MHz | —          | 3.5          | 5.0      | dB        |         |
| In-band deviation             | 1930 to 1990 MHz | —          | 1.0          | 2.5      | dB        |         |
| Absolute stopband attenuation | DC to 100 MHz    | 40         | 42           | —        | dB        |         |
|                               | 100 to 200 MHz   | 35         | 36           | —        | dB        |         |
|                               | 200 to 1100 MHz  | 25         | 30           | —        | dB        |         |
|                               | 1100 to 1190 MHz | 29         | 31           | —        | dB        |         |
|                               | 1190 to 1700 MHz | 30         | 32           | —        | dB        |         |
|                               | 1700 to 1850 MHz | 35         | 41           | —        | dB        |         |
|                               | 1850 to 1880 MHz | 25         | 47           | —        | dB        |         |
|                               | 1880 to 1910 MHz | 8          | 12           | —        | dB        |         |
|                               | 2010 to 2040 MHz | 8          | 15           | —        | dB        |         |
|                               | 2040 to 2070 MHz | 25         | 48           | —        | dB        |         |
|                               | 2070 to 2300 MHz | 40         | 41           | —        | dB        |         |
|                               | 2300 to 3100 MHz | 35         | 37           | —        | dB        |         |
|                               | 3100 to 3700 MHz | 33         | 36           | —        | dB        |         |
|                               | 3700 to 4800 MHz | 25         | 35           | —        | dB        |         |
|                               | 4800 to 6000 MHz | 10         | 14           | —        | dB        |         |
| In-band VSWR<br>(Return loss) | 1930 to 1990 MHz | —<br>(7.0) | 2.3<br>(8.1) | 2.6<br>— | —<br>(dB) |         |
| Max. input power              | 1930 to 1990 MHz | —          | —            | 13       | dBm       |         |

# F6 Series (L2 type)

## 10. US-PCS (Rx) Low insertion loss type Part number : FAR-F6CE-1G9600-L2XK

(Ta = -30 °C to +85 °C)

| Parameter                     | Conditions       | Value      |               |          | Unit      | Remarks               |
|-------------------------------|------------------|------------|---------------|----------|-----------|-----------------------|
|                               |                  | Min.       | Typ.          | Max.     |           |                       |
| Insertion loss                | 1930 to 1990 MHz | —          | 3.2           | 4.5      | dB        | Ta = -30 °C to -15 °C |
|                               |                  |            |               | 4.2      | dB        | Ta = -15 °C to +85 °C |
| In-band deviation             | 1930 to 1990 MHz | —          | 1.7           | 3.0      | dB        |                       |
| Absolute stopband attenuation | DC to 1500 MHz   | 18         | 21            | —        | dB        |                       |
|                               | 1500 to 1850 MHz | 20         | 25            | —        | dB        |                       |
|                               | 1850 to 1910 MHz | 15         | 21            | —        | dB        | Ta = -30 °C to +65 °C |
|                               |                  | 13         |               |          | dB        | Ta = +65 °C to +85 °C |
|                               | 2010 to 2020 MHz | 4          | 9             | —        | dB        |                       |
|                               | 2020 to 2040 MHz | 10         | 21            | —        | dB        |                       |
|                               | 2040 to 2295 MHz | 20         | 29            | —        | dB        |                       |
|                               | 2295 to 2500 MHz | 30         | 31            | —        | dB        |                       |
|                               | 2500 to 4000 MHz | 10         | 16            | —        | dB        |                       |
|                               | 4000 to 6000 MHz | 4          | 6             | —        | dB        |                       |
| In-band VSWR (Return loss)    | 1930 to 1990 MHz | —<br>(8.1) | 1.7<br>(11.7) | 2.3<br>— | —<br>(dB) |                       |
| Max. input power              | 1930 to 1990 MHz | —          | —             | 13       | dBm       |                       |

## 11. Korea-PCS (Tx) Upper 30 MHz Band Width Part number : FAR-F6CE-1G7650-L2TA

(Ta = -30 °C to +85 °C)

| Parameter                     | Conditions       | Value      |               |          | Unit      | Remarks               |
|-------------------------------|------------------|------------|---------------|----------|-----------|-----------------------|
|                               |                  | Min.       | Typ.          | Max.     |           |                       |
| Insertion loss                | 1750 to 1780 MHz | —          | 2.2           | 2.5      | dB        | Ta = +25 °C           |
|                               |                  |            |               | 3.0      | dB        | Ta = -30 °C to +85 °C |
| In-band deviation             | 1750 to 1780 MHz | —          | 1.2           | 1.5      | dB        |                       |
| Absolute stopband attenuation | 1350 to 1380 MHz | 25         | 27            | —        | dB        |                       |
|                               | 1660 to 1690 MHz | 30         | 40            | —        | dB        |                       |
|                               | 1840 to 1870 MHz | 30         | 35            | —        | dB        |                       |
|                               | 2150 to 2180 MHz | 30         | 33            | —        | dB        |                       |
| In-band VSWR (Return loss)    | 1750 to 1780 MHz | —<br>(9.5) | 1.8<br>(10.9) | 2.0<br>— | —<br>(dB) |                       |
| Max. input power              | 1750 to 1780 MHz | —          | —             | 13       | dBm       |                       |

# F6 Series (L2 type)

## 12. Korea-PCS (Rx) Upper 30 MHz Band Width Part number : FAR-F6CE-1G8550-L2TB

(Ta = -30 °C to +85 °C)

| Parameter                     | Conditions       | Value      |               |          | Unit      | Remarks               |
|-------------------------------|------------------|------------|---------------|----------|-----------|-----------------------|
|                               |                  | Min.       | Typ.          | Max.     |           |                       |
| Insertion loss                | 1840 to 1870 MHz | —          | 2.2           | 2.5      | dB        | Ta = +25 °C           |
|                               |                  |            |               | 3.0      | dB        | Ta = -30 °C to +85 °C |
| In-band deviation             | 1840 to 1870 MHz | —          | 1.1           | 1.5      | dB        |                       |
| Absolute stopband attenuation | 1440 to 1470 MHz | 25         | 28            | —        | dB        |                       |
|                               | 1750 to 1780 MHz | 30         | 40            | —        | dB        |                       |
|                               | 1930 to 1960 MHz | 30         | 40            | —        | dB        |                       |
|                               | 2240 to 2270 MHz | 30         | 34            | —        | dB        |                       |
| In-band VSWR (Return loss)    | 1840 to 1870 MHz | —<br>(9.5) | 1.7<br>(11.7) | 2.0<br>— | —<br>(dB) |                       |
| Max. input power              | 1840 to 1870 MHz | —          | —             | 13       | dBm       |                       |

## 13. Wireless-LAN 97 MHz Band Width Part number : FAR-F6CE-2G4500-L2WA

(Ta = 0 to +60 °C)

| Parameter                     | Conditions       | Value      |              |          | Unit      | Remarks |
|-------------------------------|------------------|------------|--------------|----------|-----------|---------|
|                               |                  | Min.       | Typ.         | Max.     |           |         |
| Insertion loss                | 2400 to 2497 MHz | —          | 4.0          | 5.0      | dB        |         |
| In-band deviation             | 2400 to 2497 MHz | —          | 2.0          | 3.0      | dB        |         |
| Absolute stopband attenuation | DC to 1700 MHz   | 20         | 22           | —        | dB        |         |
|                               | 1800 to 2200 MHz | 25         | 27           | —        | dB        |         |
|                               | 2700 to 3100 MHz | 30         | 33           | —        | dB        |         |
|                               | 4800 to 5000 MHz | 10         | 16           | —        | dB        |         |
| In-band VSWR (Return loss)    | 2400 to 2497 MHz | —<br>(7.0) | 2.2<br>(8.5) | 2.6<br>— | —<br>(dB) |         |
| Max. input power              | 2400 to 2497 MHz | —          | —            | 10       | dBm       |         |

# F6 Series (L2 type)

## 14. Wireless-LAN 26 MHz Band Width (For Japan)

Part number : FAR-F6CE-2G4840-L2WC

(Ta = 0 to +60 °C)

| Parameter                     | Conditions       | Value      |               |          | Unit      | Remarks |
|-------------------------------|------------------|------------|---------------|----------|-----------|---------|
|                               |                  | Min.       | Typ.          | Max.     |           |         |
| Insertion loss                | 2471 to 2497 MHz | —          | 2.5           | 3.5      | dB        |         |
| In-band deviation             | 2471 to 2497 MHz | —          | 1.0           | 1.5      | dB        |         |
| Absolute stopband attenuation | DC to 1700 MHz   | 20         | 23            | —        | dB        |         |
|                               | 1800 to 2200 MHz | 25         | 27            | —        | dB        |         |
|                               | 2700 to 3100 MHz | 30         | 33            | —        | dB        |         |
|                               | 4800 to 5000 MHz | 10         | 16            | —        | dB        |         |
| In-band VSWR (Return loss)    | 2471 to 2497 MHz | —<br>(9.5) | 1.5<br>(14.0) | 2.0<br>— | —<br>(dB) |         |
| Max. input power              | 2471 to 2497 MHz | —          | —             | 10       | dBm       |         |

## 15. Wireless-LAN 83.5 MHz Band Width (For Europe, USA)

Part number : FAR-F6CE-2G4418-L2WD

(Ta = 0 to +60 °C)

| Parameter                     | Conditions         | Value      |              |          | Unit      | Remarks |
|-------------------------------|--------------------|------------|--------------|----------|-----------|---------|
|                               |                    | Min.       | Typ.         | Max.     |           |         |
| Insertion loss                | 2400 to 2483.5 MHz | —          | 3.2          | 4.5      | dB        |         |
| In-band deviation             | 2400 to 2483.5 MHz | —          | 1.3          | 2.5      | dB        |         |
| Absolute stopband attenuation | DC to 1700 MHz     | 20         | 22           | —        | dB        |         |
|                               | 1800 to 2200 MHz   | 25         | 27           | —        | dB        |         |
|                               | 2700 to 3100 MHz   | 30         | 33           | —        | dB        |         |
|                               | 4800 to 5000 MHz   | 10         | 16           | —        | dB        |         |
| In-band VSWR (Return loss)    | 2400 to 2483.5 MHz | —<br>(7.0) | 2.2<br>(8.5) | 2.6<br>— | —<br>(dB) |         |
| Max. input power              | 2400 to 2483.5 MHz | —          | —            | 10       | dBm       |         |

# F6 Series (L2 type)

## 16. W-CDMA (Tx)

Part number : FAR-F6CE-1G9500-L2ZP

(Ta = -30 °C to +85 °C)

| Parameter                     | Conditions       | Value      |              |          | Unit      | Remarks |
|-------------------------------|------------------|------------|--------------|----------|-----------|---------|
|                               |                  | Min.       | Typ.         | Max.     |           |         |
| Insertion loss                | 1920 to 1980 MHz | —          | 3.2          | 4.0      | dB        |         |
| In-band deviation             | 1920 to 1980 MHz | —          | 1.2          | 2.0      | dB        |         |
| Absolute stopband attenuation | DC to 1600 MHz   | 20         | 21           | —        | dB        |         |
|                               | 1600 to 1800 MHz | 23         | 25           | —        | dB        |         |
|                               | 1800 to 1875 MHz | 25         | 31           | —        | dB        |         |
|                               | 2025 to 2050 MHz | 30         | 31           | —        | dB        |         |
|                               | 2050 to 3500 MHz | 25         | 26           | —        | dB        |         |
|                               | 3500 to 4000 MHz | 20         | 30           | —        | dB        |         |
|                               | 4000 to 6000 MHz | 10         | 14           | —        | dB        |         |
| In-band VSWR (Return loss)    | 1920 to 1980 MHz | —<br>(8.5) | 2.0<br>(9.5) | 2.2<br>— | —<br>(dB) |         |
| Max. input power              | 1920 to 1980 MHz | —          | —            | 13       | dBm       |         |

## 17. W-CDMA (Rx)

Part number : FAR-F6CE-2G1400-L2ZQ

(Ta = -30 °C to +85 °C)

| Parameter                     | Conditions       | Value      |              |          | Unit      | Remarks |
|-------------------------------|------------------|------------|--------------|----------|-----------|---------|
|                               |                  | Min.       | Typ.         | Max.     |           |         |
| Insertion loss                | 2110 to 2170 MHz | —          | 3.2          | 4.0      | dB        |         |
| In-band deviation             | 2110 to 2170 MHz | —          | 1.2          | 2.0      | dB        |         |
| Absolute stopband attenuation | DC to 500 MHz    | 21         | 23           | —        | dB        |         |
|                               | 500 to 1900 MHz  | 20         | 21           | —        | dB        |         |
|                               | 1900 to 2050 MHz | 25         | 28           | —        | dB        |         |
|                               | 2215 to 2300 MHz | 20         | 30           | —        | dB        |         |
|                               | 2300 to 4500 MHz | 25         | 27           | —        | dB        |         |
| In-band VSWR (Return loss)    | 2110 to 2170 MHz | —<br>(8.5) | 2.0<br>(9.5) | 2.2<br>— | —<br>(dB) |         |
| Max. input power              | 2110 to 2170 MHz | —          | —            | 13       | dBm       |         |

# F6 Series (L2 type)

## 18. Bluetooth

Part number : FAR-F6CE-2G4418-L2RB

(Ta = 0 to +60 °C)

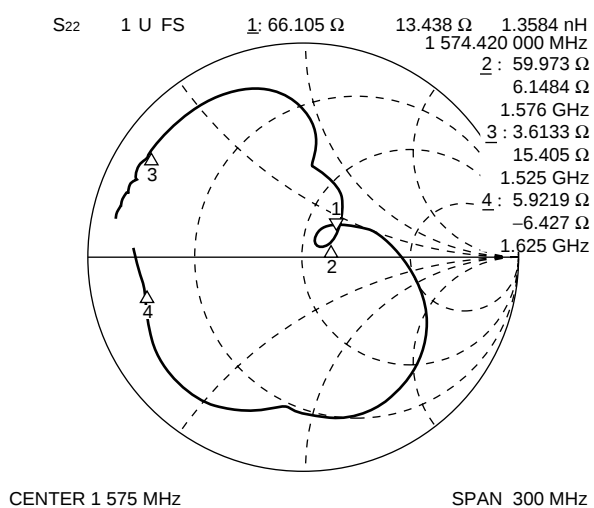
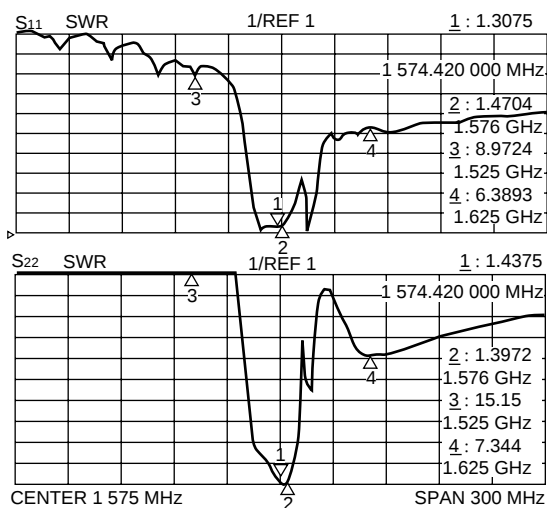
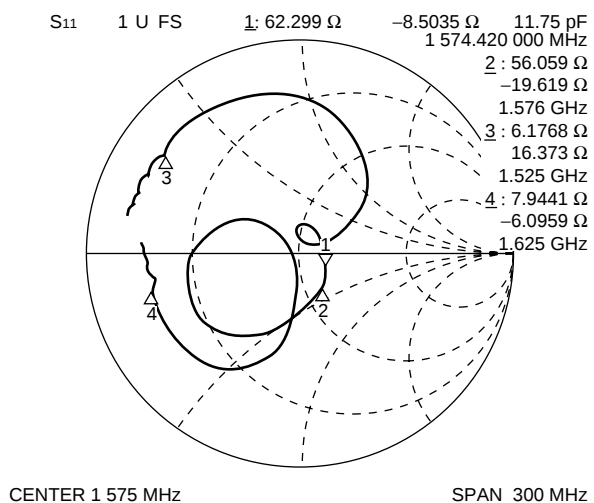
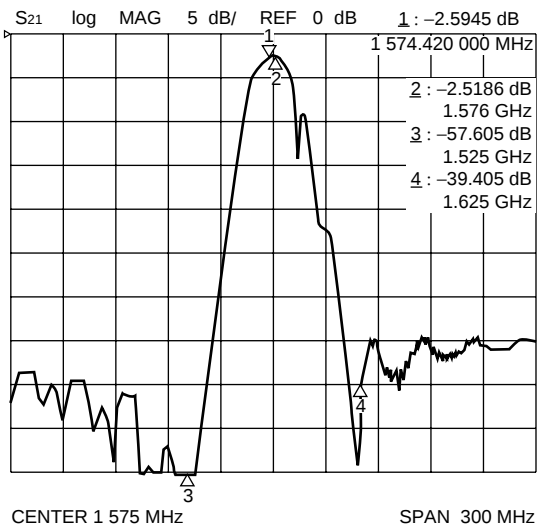
| Parameter                     | Conditions         | Value      |              |          | Unit      | Remarks |
|-------------------------------|--------------------|------------|--------------|----------|-----------|---------|
|                               |                    | Min.       | Typ.         | Max.     |           |         |
| Insertion loss                | 2400 to 2483.5 MHz | —          | 3.2          | 5.0      | dB        |         |
| In-band deviation             | 2400 to 2483.5 MHz | —          | 1.2          | 3.0      | dB        |         |
| Absolute stopband attenuation | DC to 1700 MHz     | 20         | 22           | —        | dB        |         |
|                               | 1700 to 2200 MHz   | 25         | 27           | —        | dB        |         |
|                               | 2700 to 3100 MHz   | 30         | 33           | —        | dB        |         |
|                               | 3100 to 4000 MHz   | 20         | 27           | —        | dB        |         |
|                               | 4000 to 5000 MHz   | 10         | 16           | —        | dB        |         |
| In-band VSWR<br>(Return loss) | 2400 to 2483.5 MHz | —<br>(7.0) | 2.2<br>(8.5) | 2.6<br>— | —<br>(dB) |         |
| Max. input power              | 2400 to 2483.5 MHz | —          | —            | 10       | dBm       |         |

# F6 Series (L2 type)

## ■ TYPICAL CHARACTERISTICS (STANDARD VERSION)

### 1. GPS

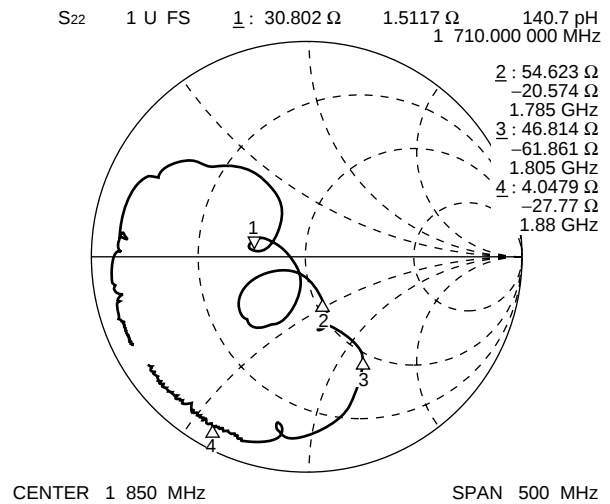
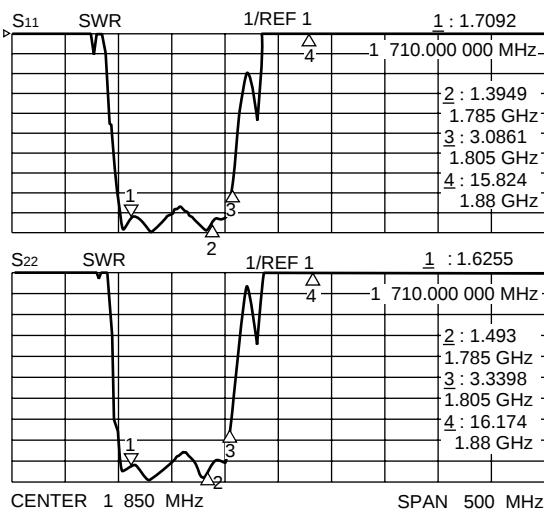
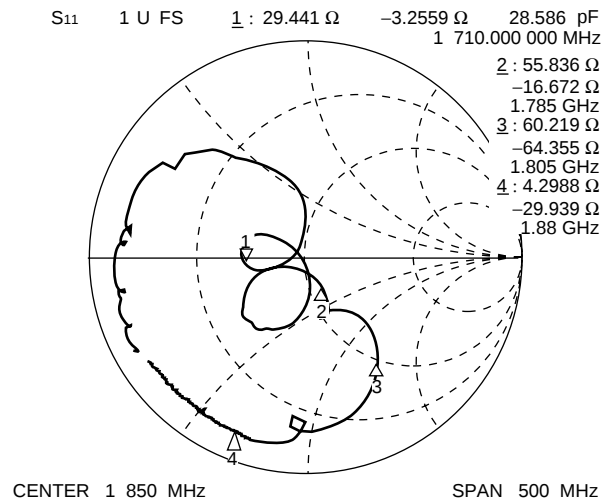
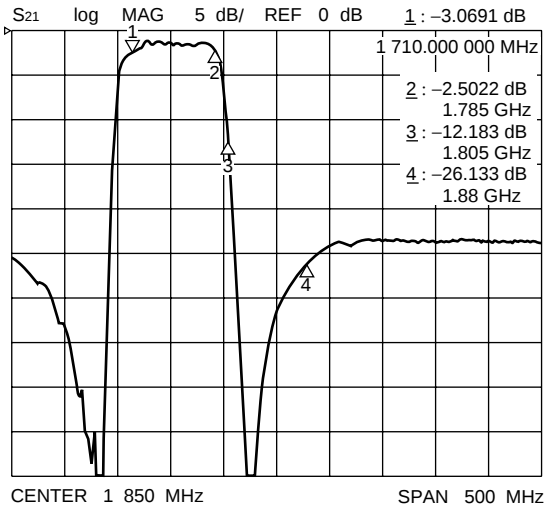
Part number : FAR-F6CE-1G5754-L2UA



# F6 Series (L2 type)

## 2. PCN (Tx)

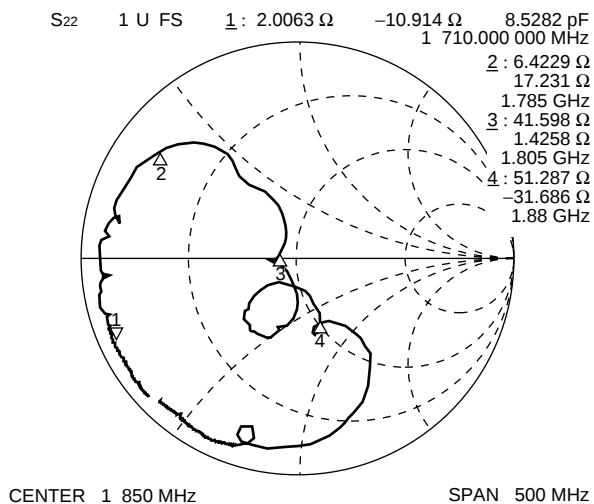
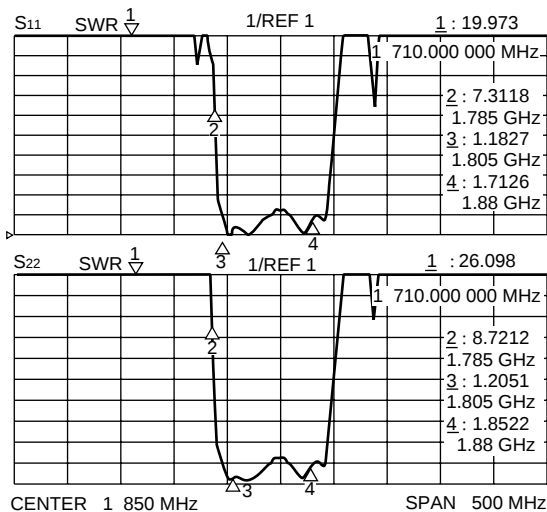
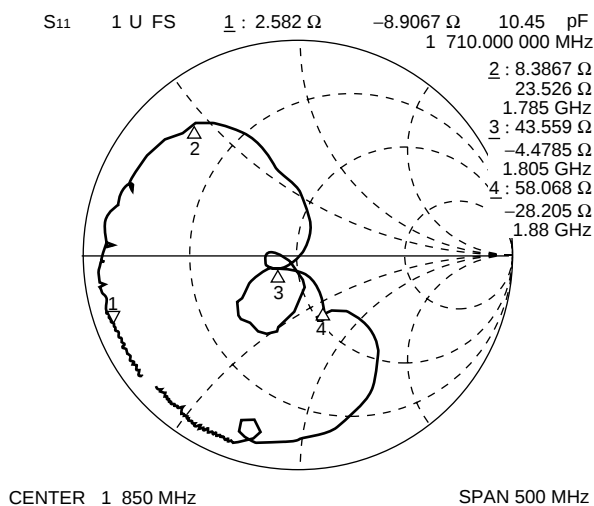
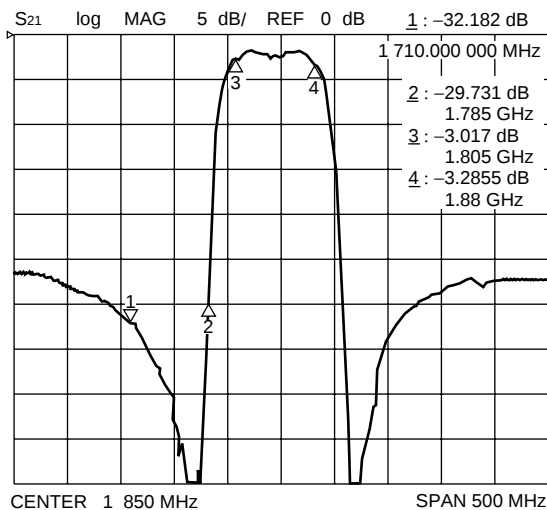
Part number : FAR-F6CE-1G7475-L2YA



# F6 Series (L2 type)

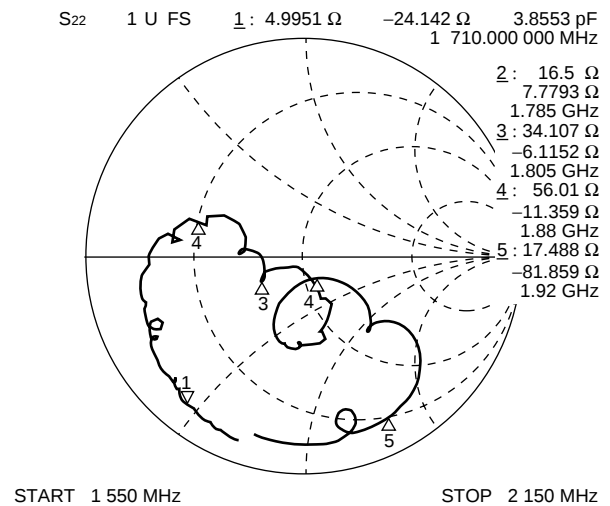
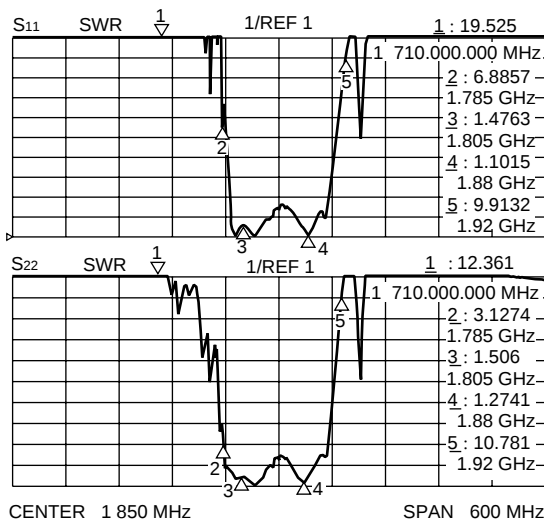
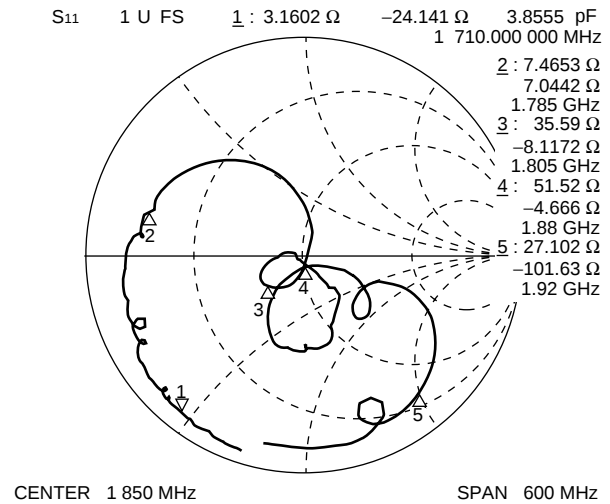
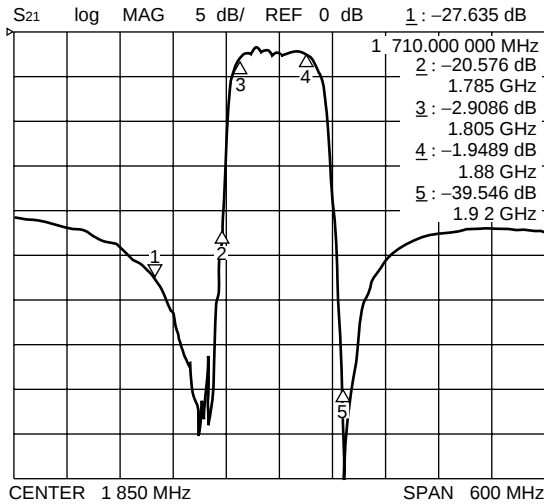
## 3. PCN (Rx)

Part number : FAR-F6CE-1G8425-L2YB



# F6 Series (L2 type)

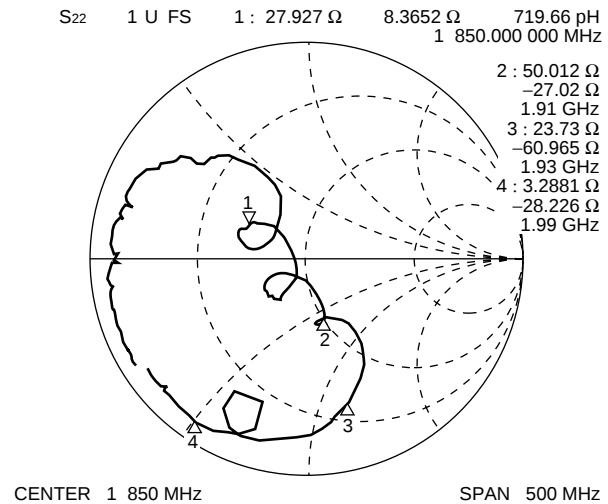
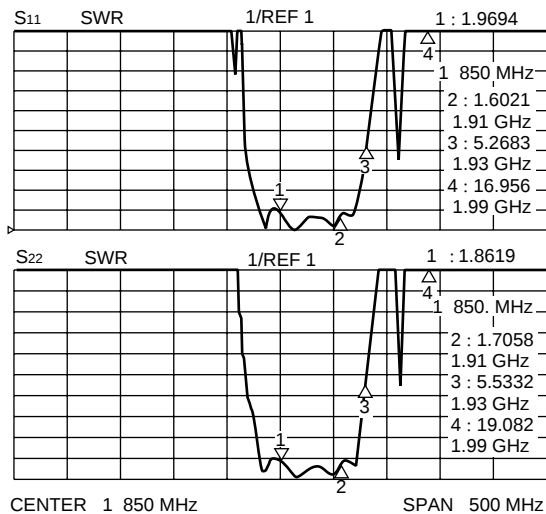
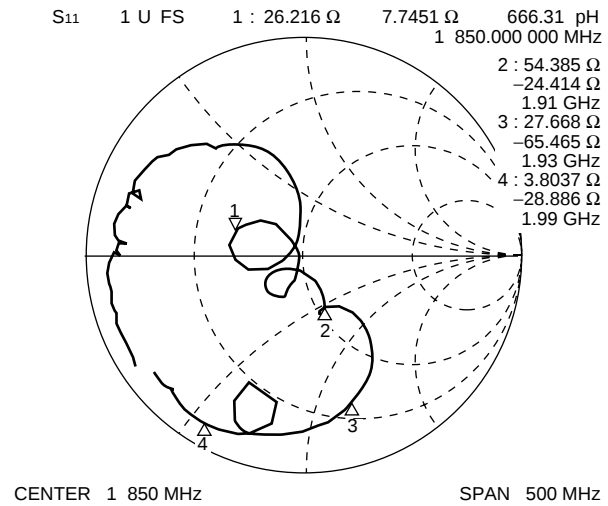
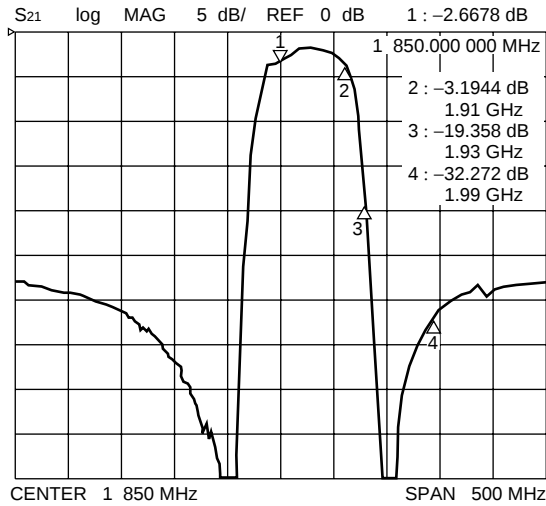
## 4. PCN (Rx) Low insertion loss type Part number : FAR-F6CE-1G8425-L2YE



# F6 Series (L2 type)

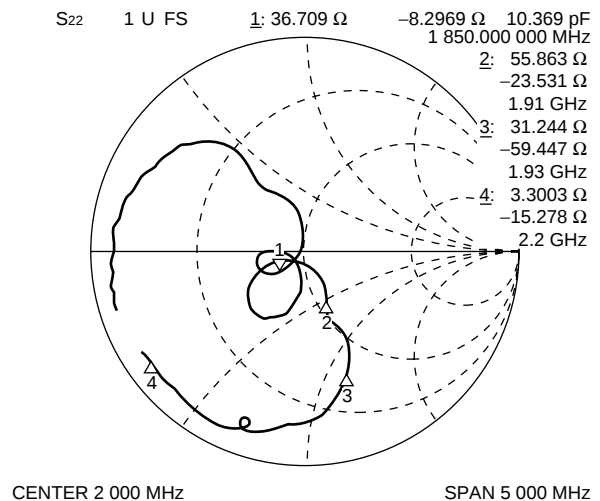
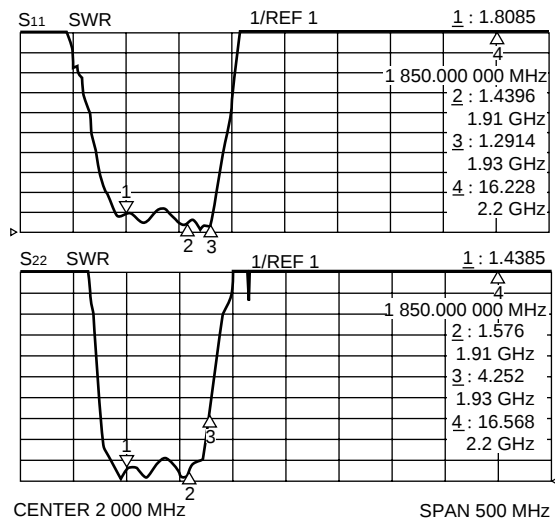
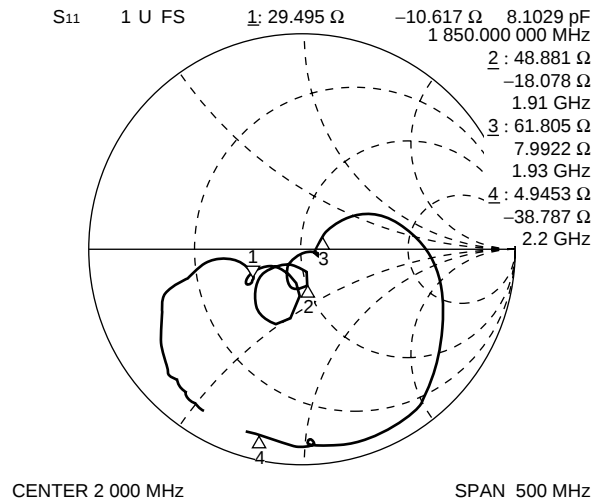
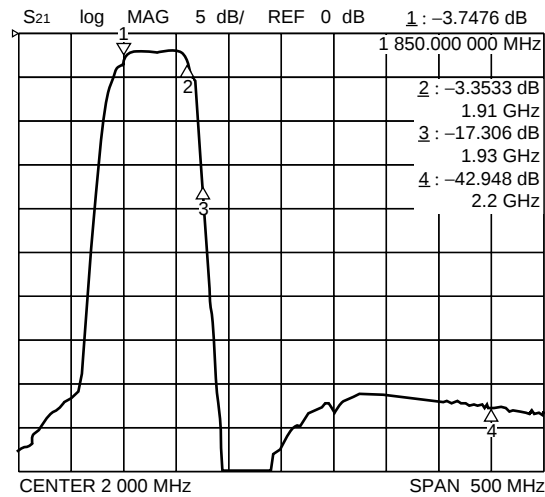
## 5. US-PCS (Tx)

Part number : FAR-F6CE-1G8800-L2XA



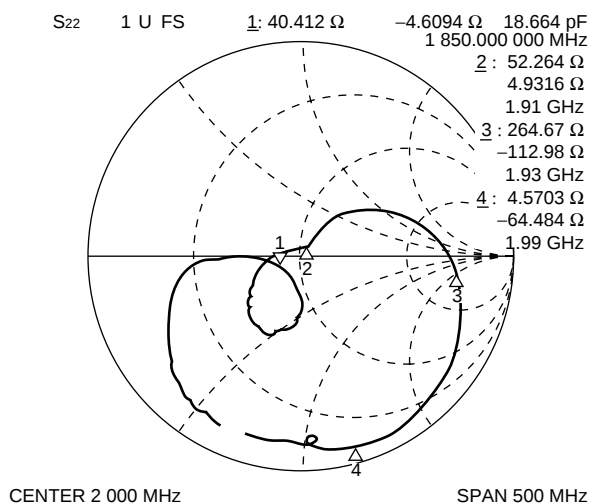
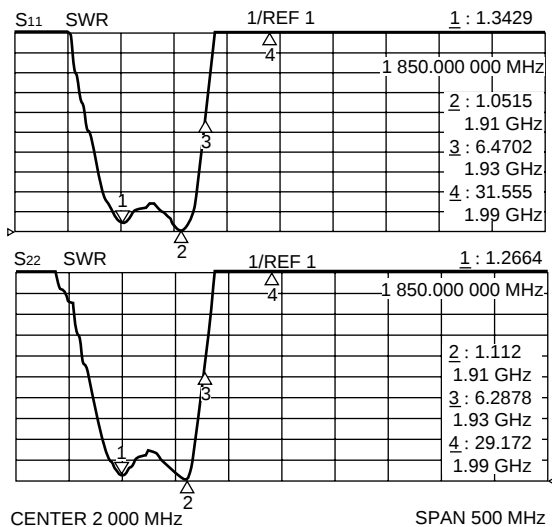
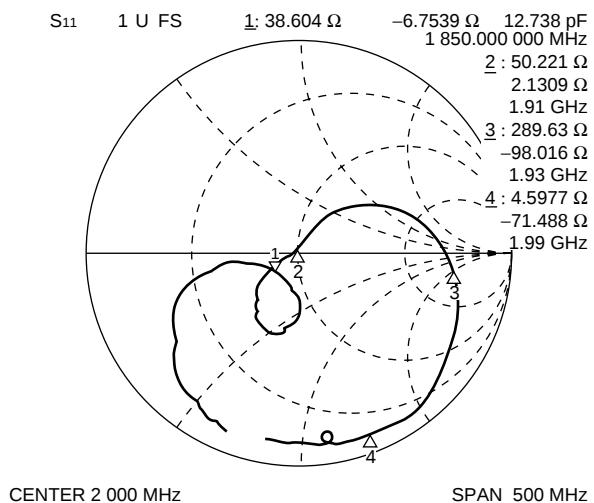
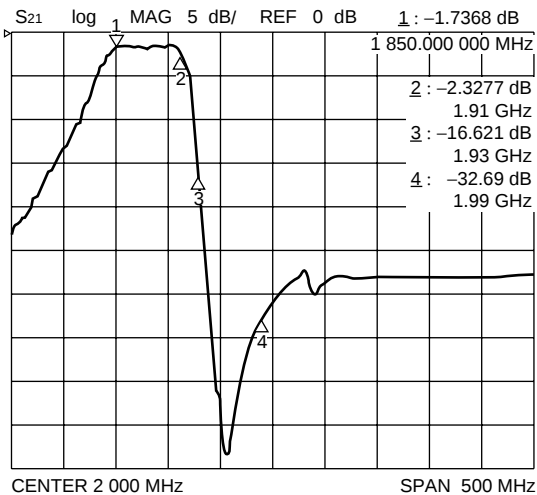
# F6 Series (L2 type)

## 6. US-PCS (Tx) High Attenuation type Part number : FAR-F6CE-1G8800-L2XZ



# F6 Series (L2 type)

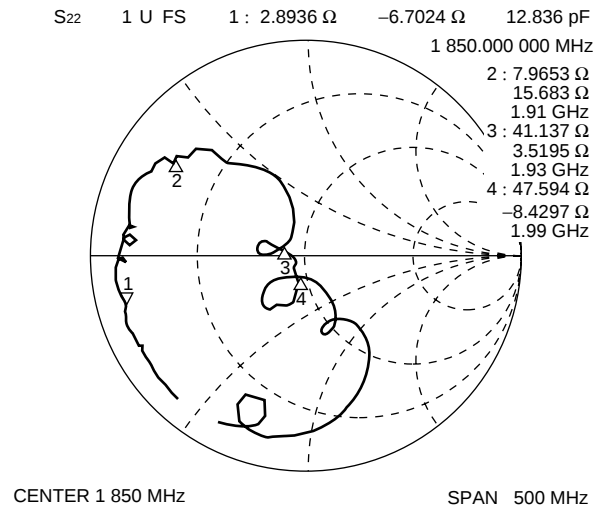
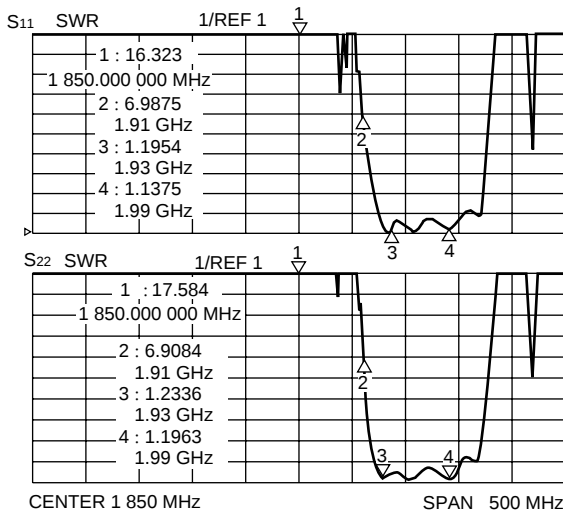
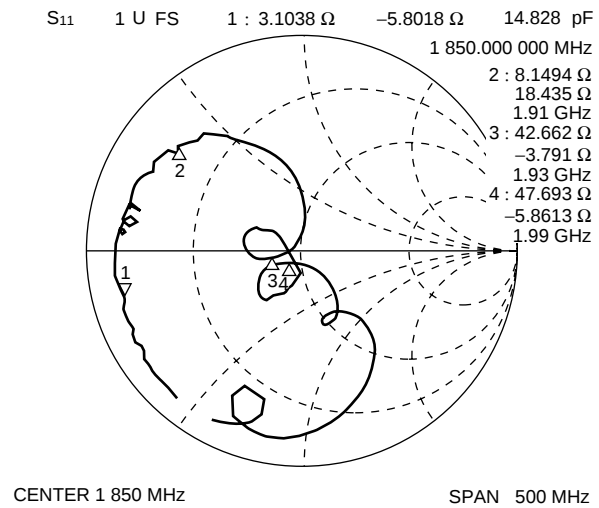
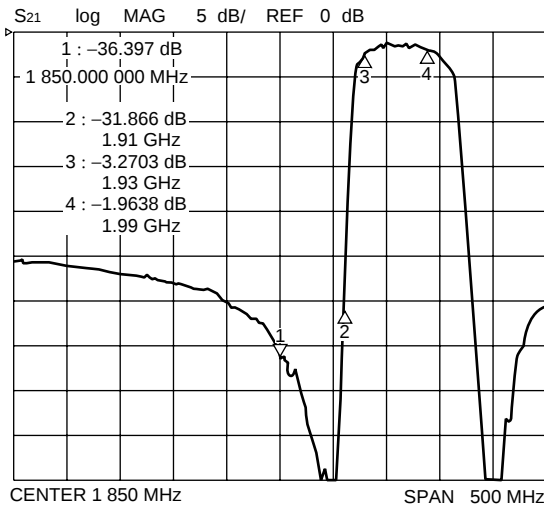
## 7. US-PCS (Tx) High Attenuation at Rx band type Part number : FAR-F6CE-1G8800-L2XJ



# F6 Series (L2 type)

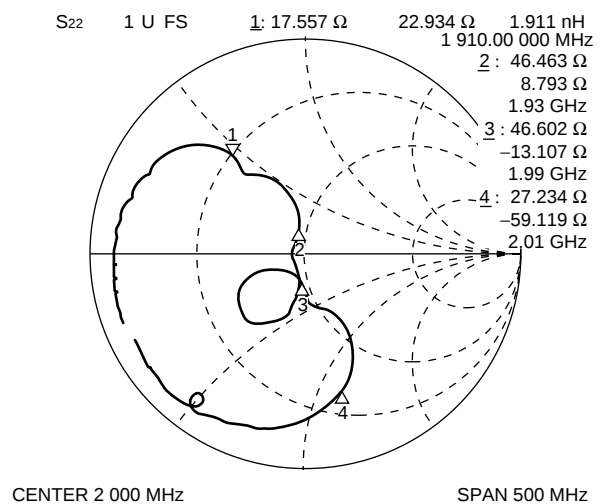
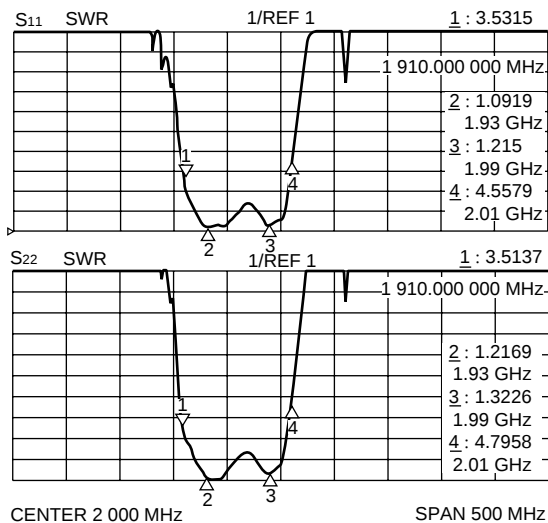
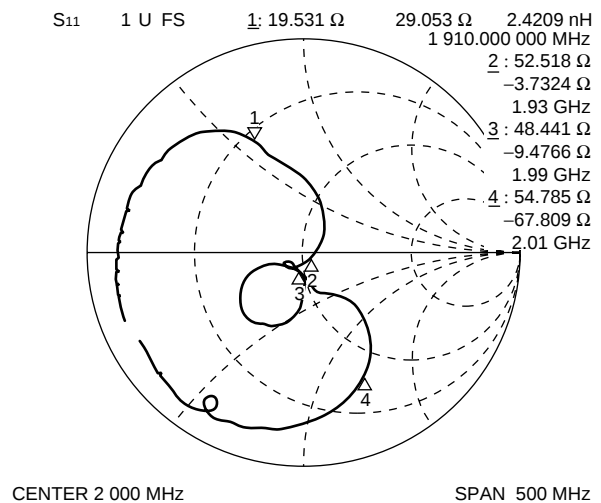
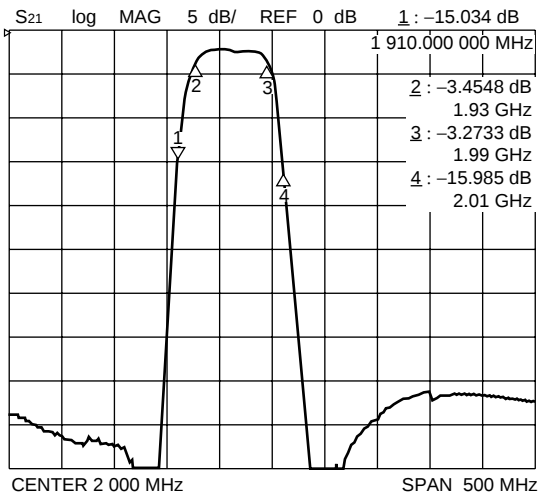
## 8. US-PCS (Rx)

Part number : FAR-F6CE-1G9600-L2XB



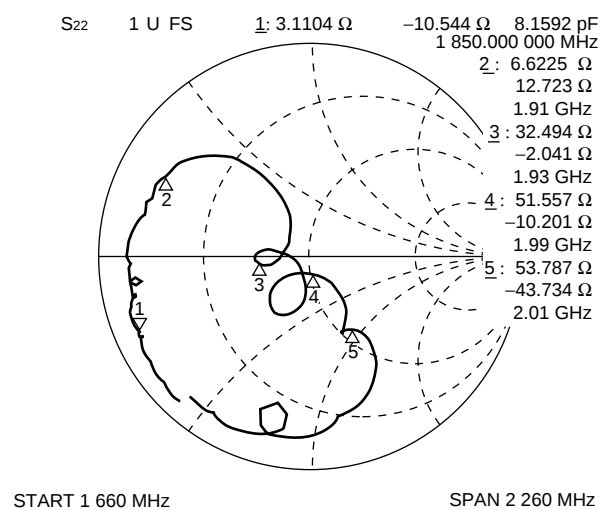
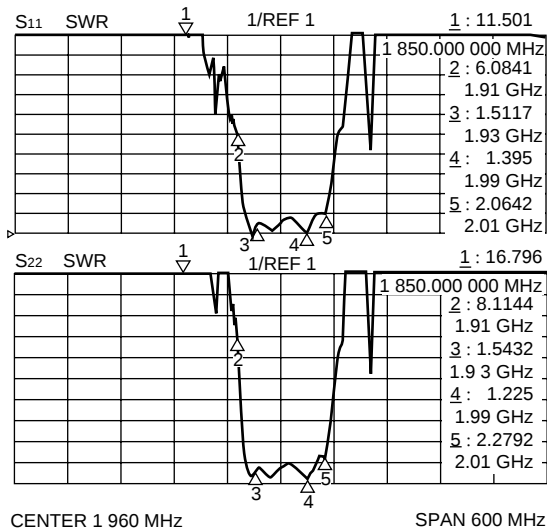
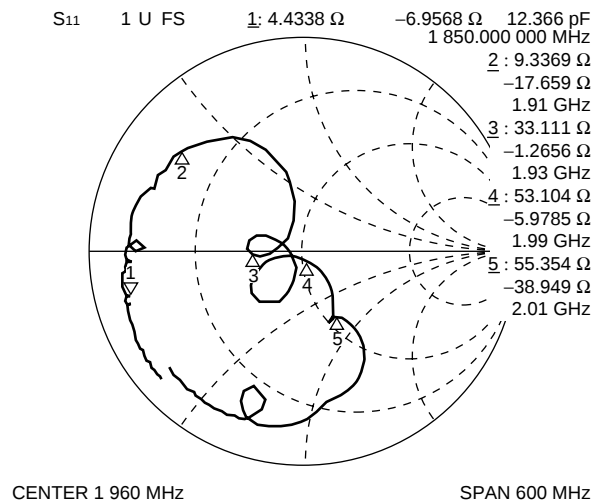
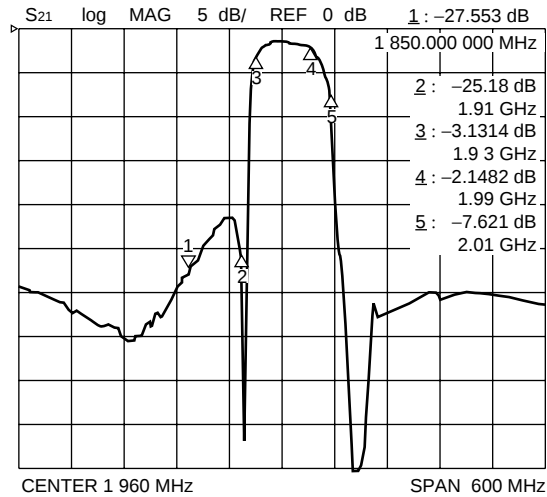
# F6 Series (L2 type)

## 9. US-PCS (Rx) High Attenuation type Part number : FAR-F6CE-1G9600-L2XY



# F6 Series (L2 type)

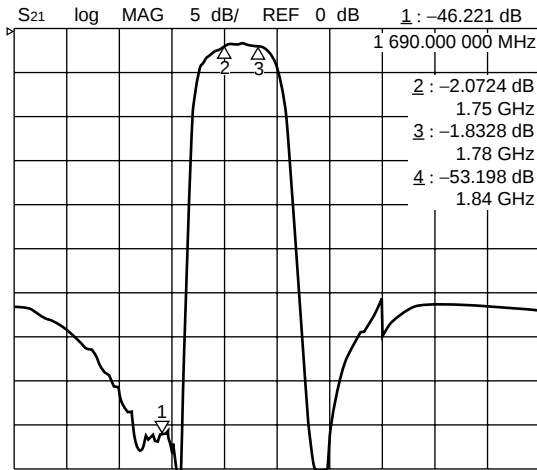
## 10. US-PCS (Rx) Low insertion loss type Part number : FAR-F6CE-1G9600-L2XK



# F6 Series (L2 type)

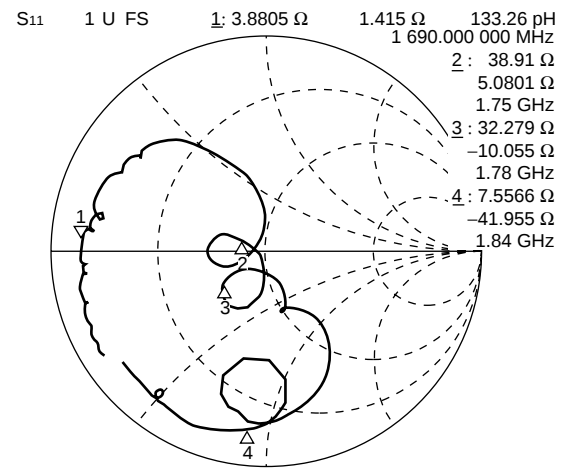
## 11. Korea-PCS (Tx) type

Part number : FAR-F6CE-1G7650-L2TA



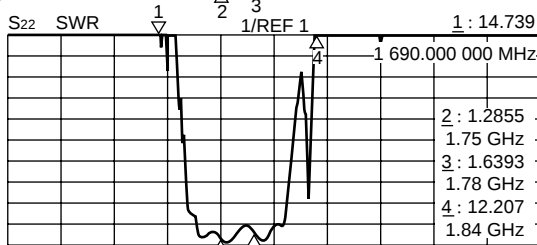
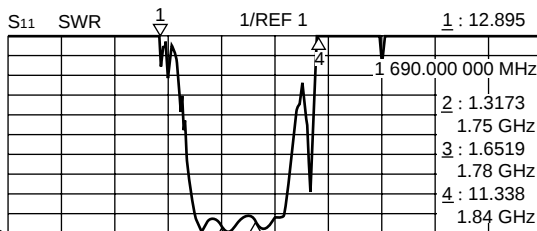
CENTER 1 800 MHz

SPAN 500 MHz



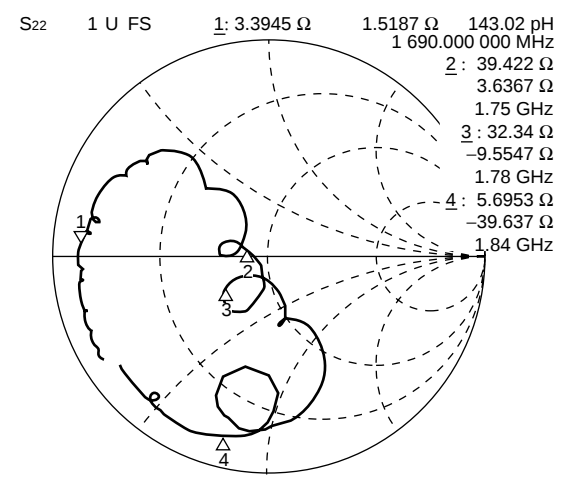
CENTER 1 800 MHz

SPAN 500 MHz



CENTER 1 800 MHz

SPAN 500 MHz



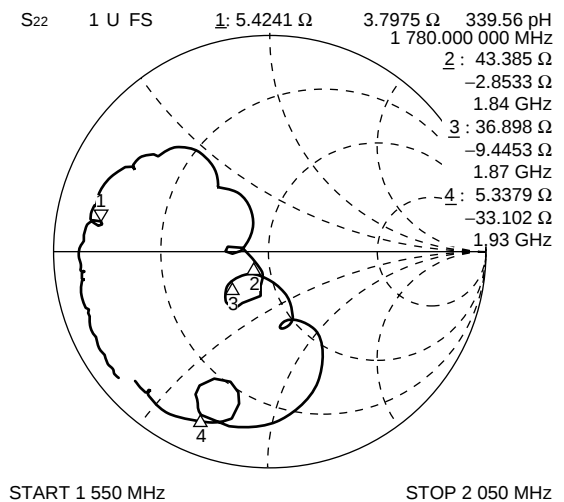
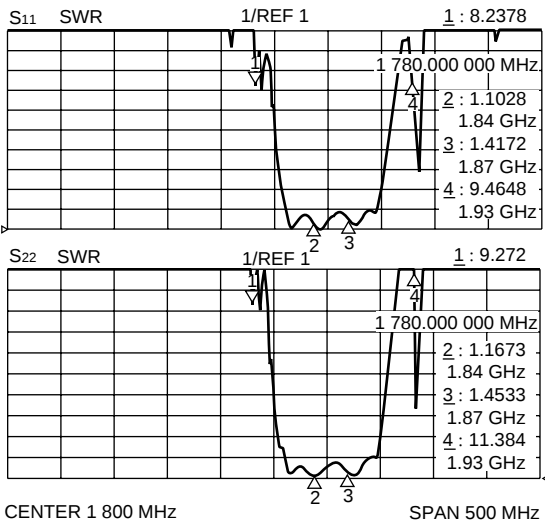
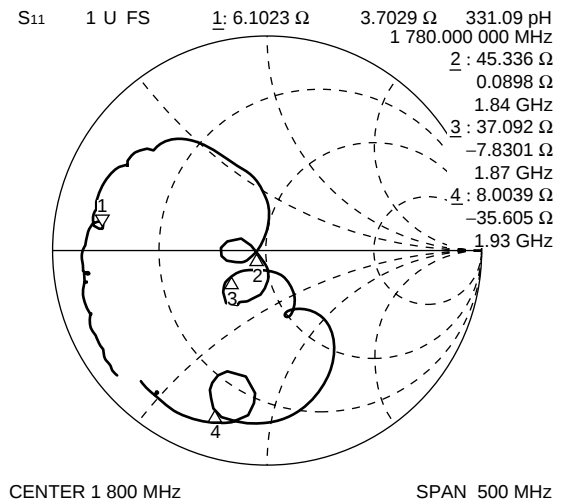
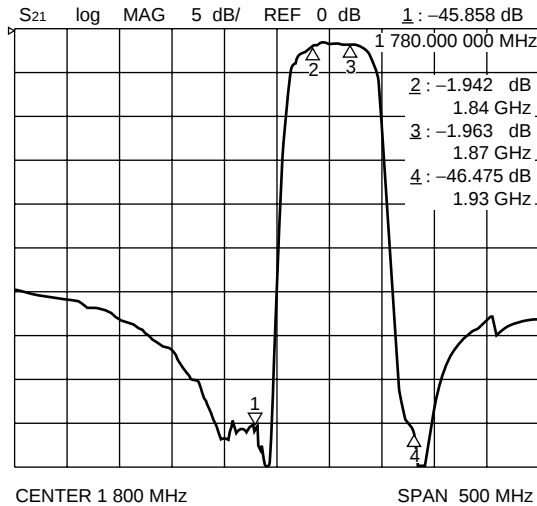
CENTER 1 800 MHz

SPAN 500 MHz

# F6 Series (L2 type)

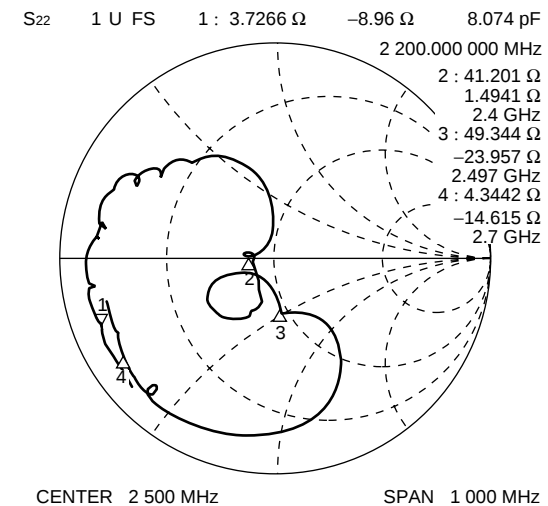
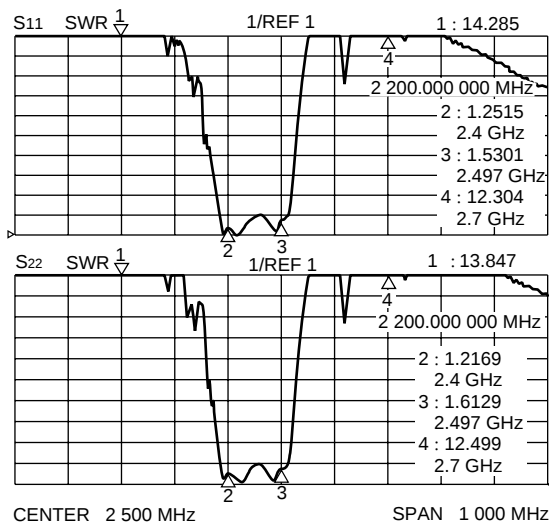
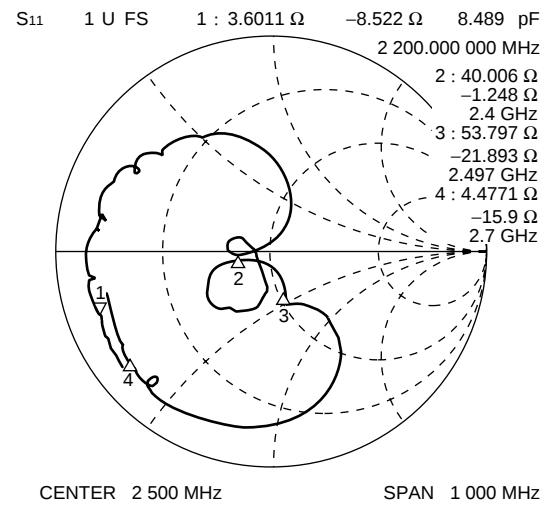
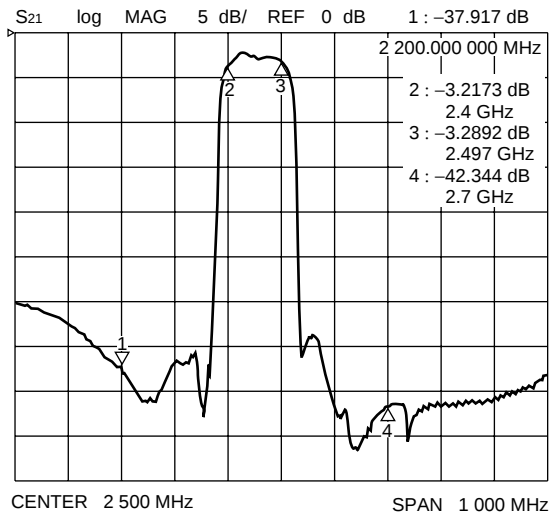
## 12. Korea-PCS (Rx)

Part number : FAR-F6CE-1G8550-L2TB



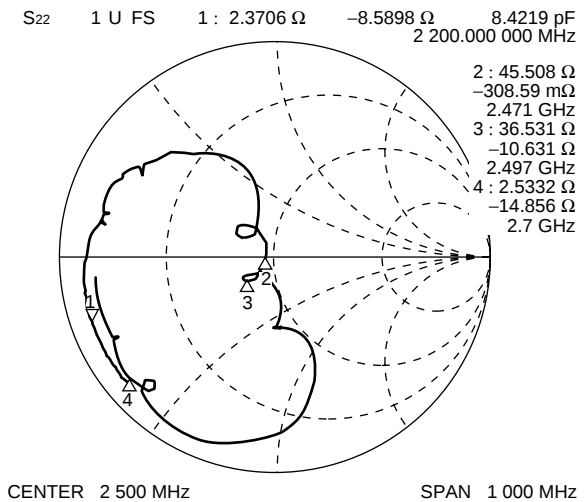
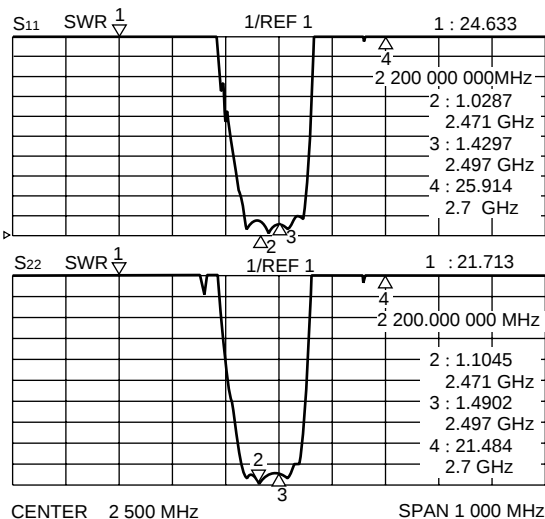
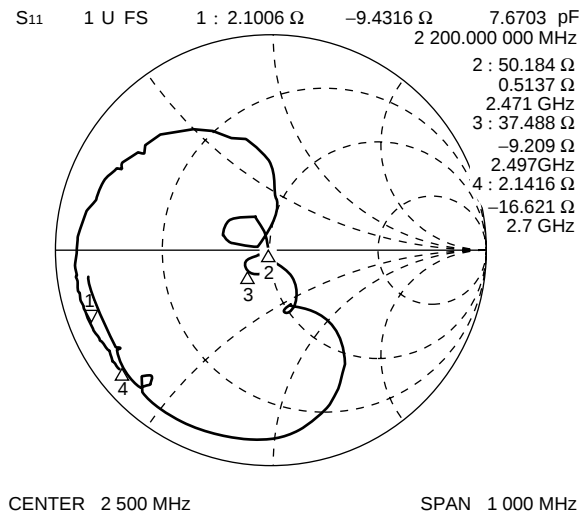
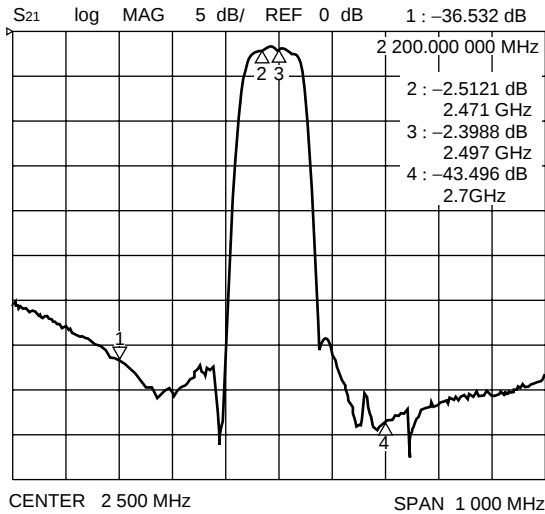
# F6 Series (L2 type)

## 13. Wireless-LAN 97 MHz Band Width Part number : FAR-F6CE-2G4500-L2WA



# F6 Series (L2 type)

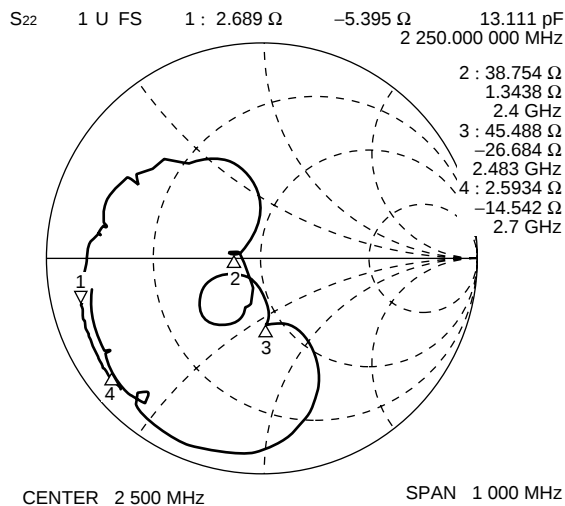
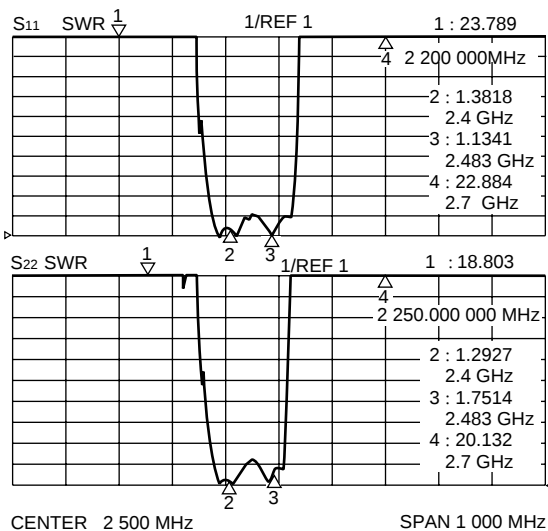
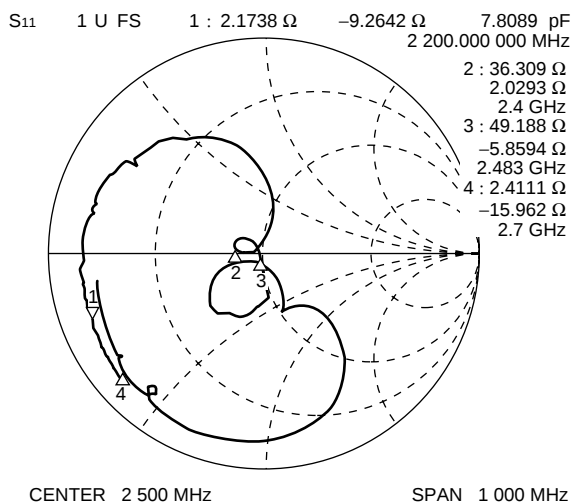
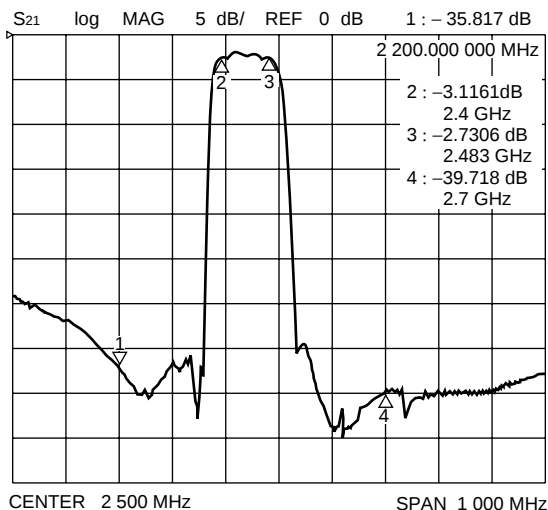
## 14. Wireless-LAN 26 MHz Band Width (For Japan) Part number : FAR-F6CE-2G4840-L2WC



# F6 Series (L2 type)

## 15. Wireless-LAN 83.5 MHz Band Width (For Europe, USA)

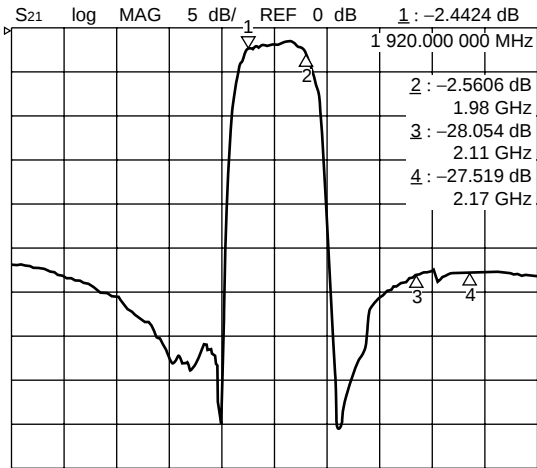
Part number : FAR-F6CE-2G4418-L2WD



# F6 Series (L2 type)

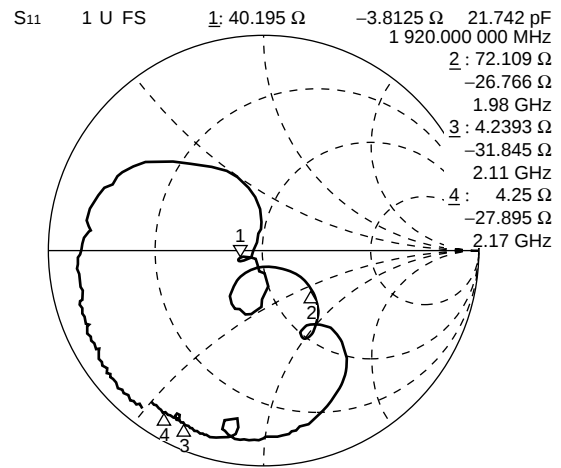
## 16. W-CDMA (Tx)

Part number : FAR-F6CE-1G9500-L2ZP



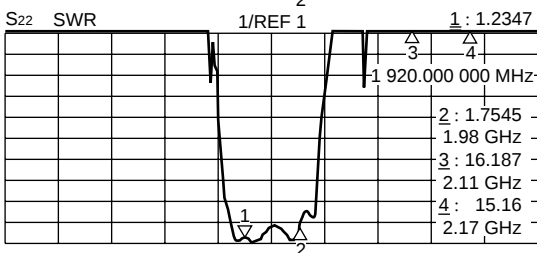
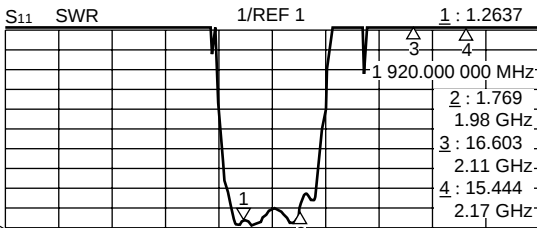
CENTER 1 950 MHz

SPAN 600 MHz



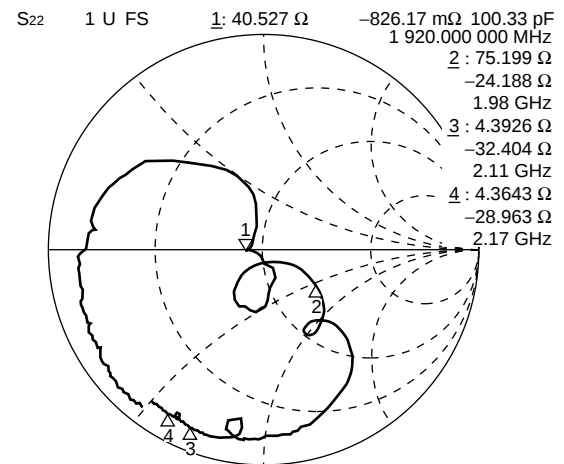
CENTER 1 950 MHz

SPAN 600 MHz



CENTER 1 950 MHz

SPAN 600 MHz



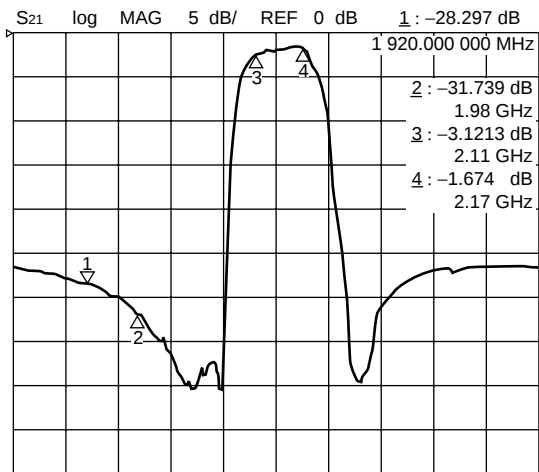
CENTER 1 950 MHz

SPAN 600 MHz

# F6 Series (L2 type)

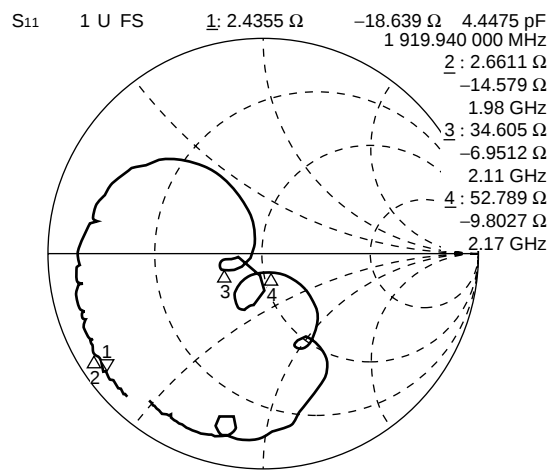
## 17. W-CDMA (Rx)

Part number : FAR-F6CE-2G1400-L2ZQ



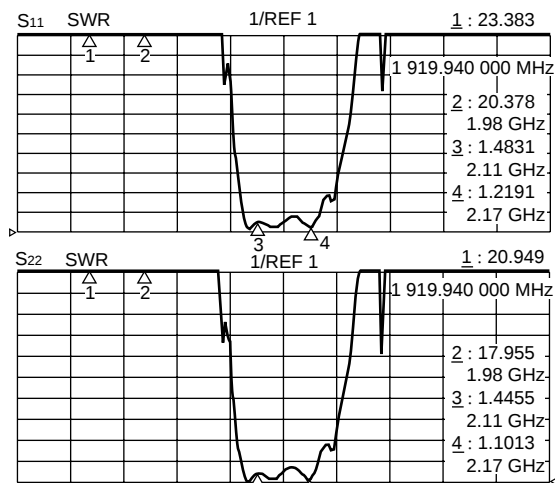
CENTER 2 140 MHz

SPAN 600 MHz



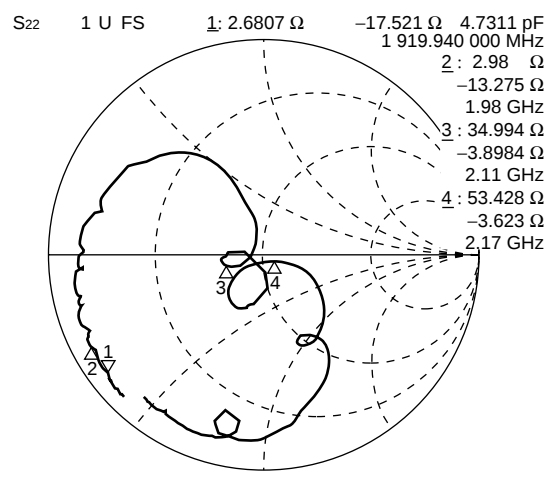
CENTER 2 140 MHz

SPAN 600 MHz



CENTER 2 140 MHz

SPAN 600 MHz

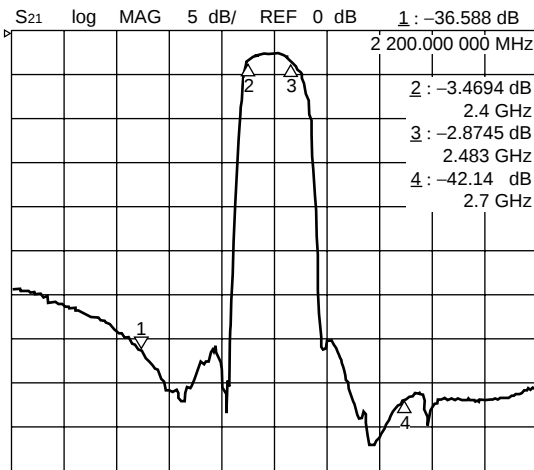


CENTER 2 140 MHz

SPAN 600 MHz

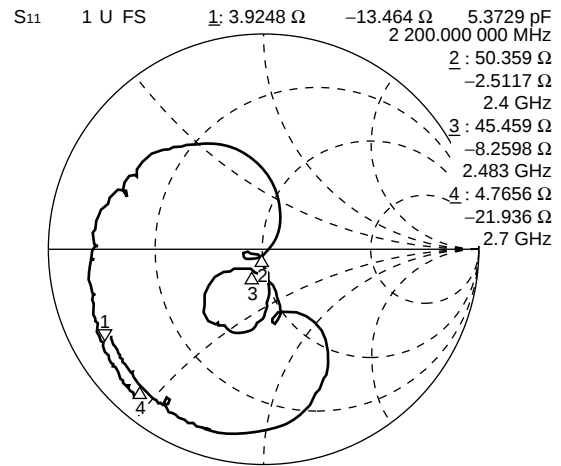
## 18. Bluetooth

Part number : FAR-F6CE-2G4418-L2RB



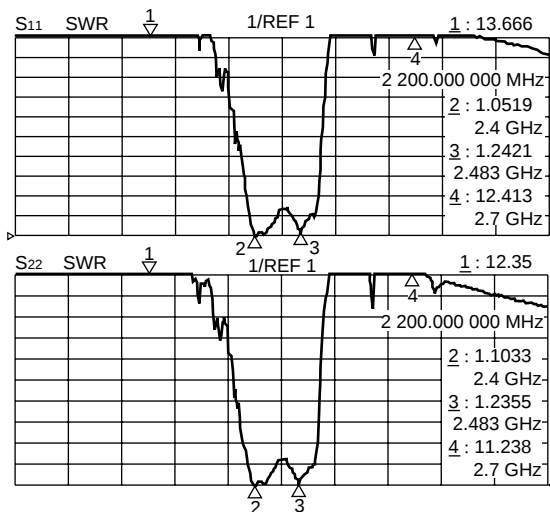
CENTER 2 450 MHz

SPAN 1 000 MHz



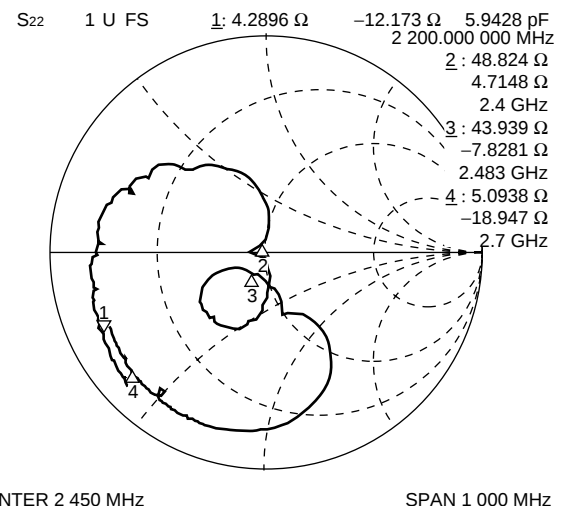
CENTER 2 450 MHz

SPAN 1 000 MHz



CENTER 2 450 MHz

SPAN 1 000 MHz

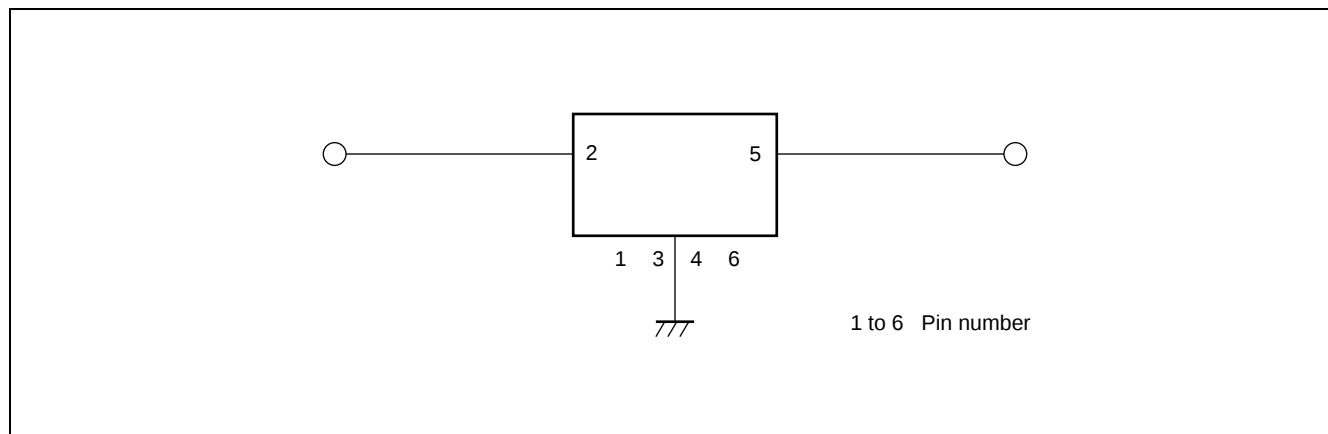


CENTER 2 450 MHz

SPAN 1 000 MHz

# F6 Series (L2 type)

## MEASUREMENT CIRCUIT



## PART NUMBER DESIGNATION

[Designation example]

FAR-F6CE-                               -L2           -       
 (1) (2) (3) (4)

(1) Package designation : E : 3.0 mm × 3.0 mm × 1.2 mm (height)

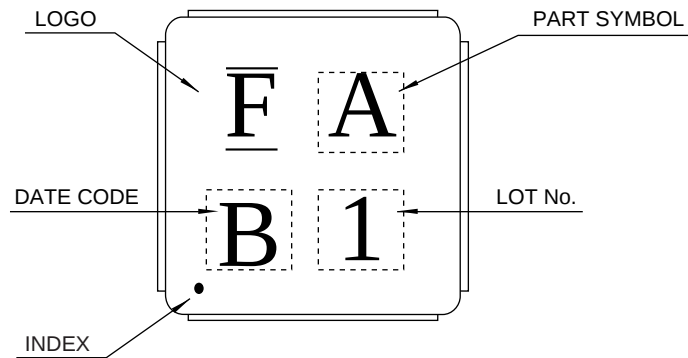
(2) Frequency designation : Specify the nominal frequency in six alphanumeric characters.  
 Enter G (for GHz) at the decimal point.  
 Refer to standard frequencies.

[Example] 1.8800 GHz ⇒ 1G8800

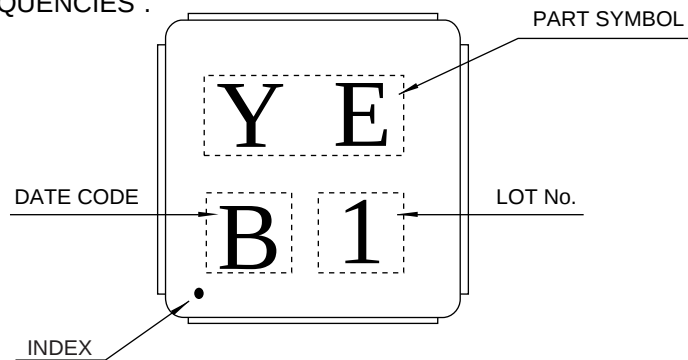
(3) Serial number : Specify a characters from WA to ZZ.  
 Refer to standard frequencies.

(4) Packing (Reeled tape) : W : 1000 pcs/reel  
 V : 3000 pcs/reel  
 U : 5000 pcs/reel

## ■ MARKING

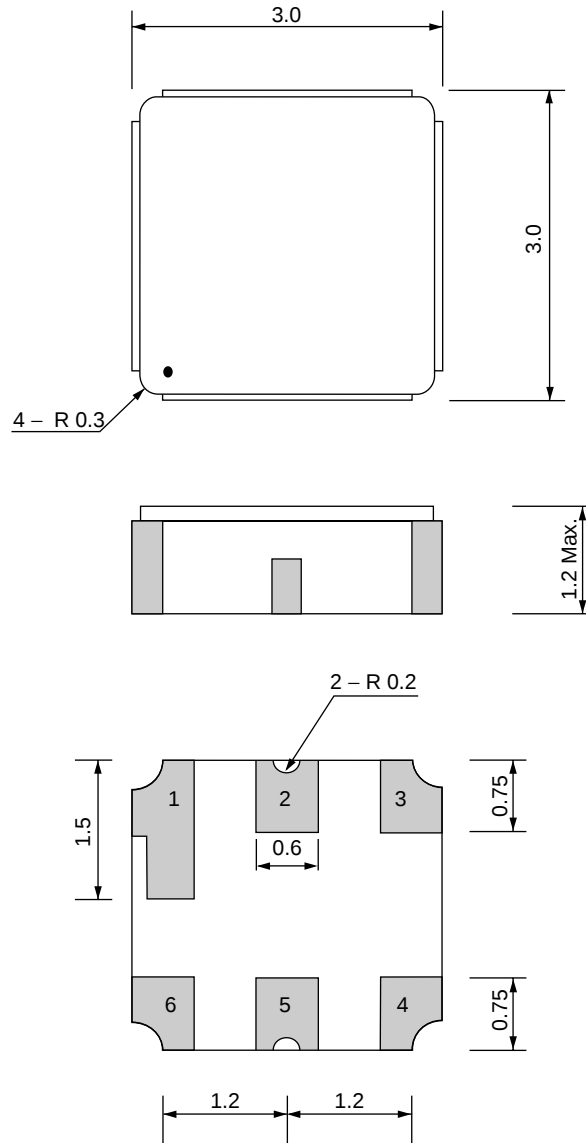


- In case that part symbol consists of two characters according to the part symbol specified in "■STANDARD FREQUENCIES".



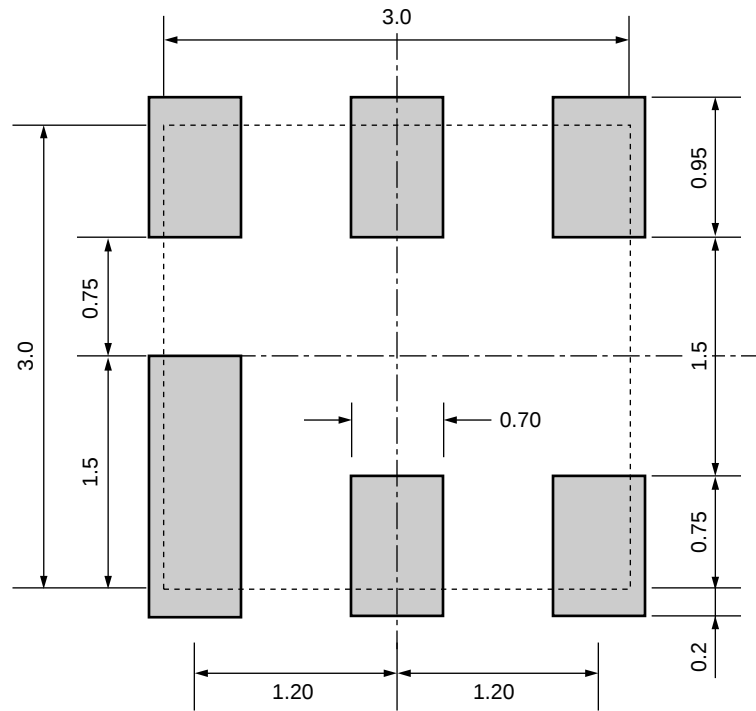
# F6 Series (L2 type)

## ■ PACKAGE DIMENSIONS



Dimensions in mm.

## ■ RECOMMENDED LAND PATTERN

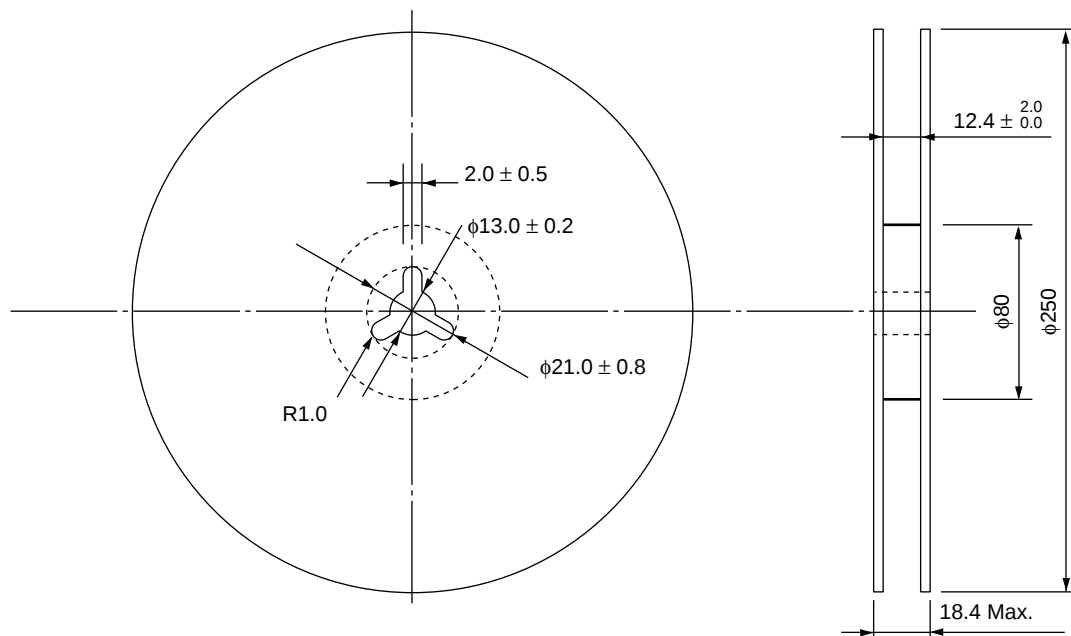


Dimensions in mm.

# F6 Series (L2 type)

## ■ PACKING : Reel type

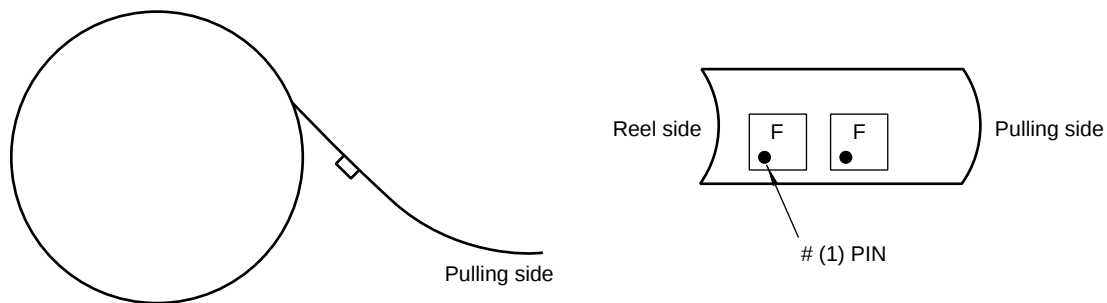
### (1) Reel dimensions



| Type | Volume  |
|------|---------|
| -W   | 1 k pcs |
| -V   | 3 k pcs |
| -U   | 5 k pcs |

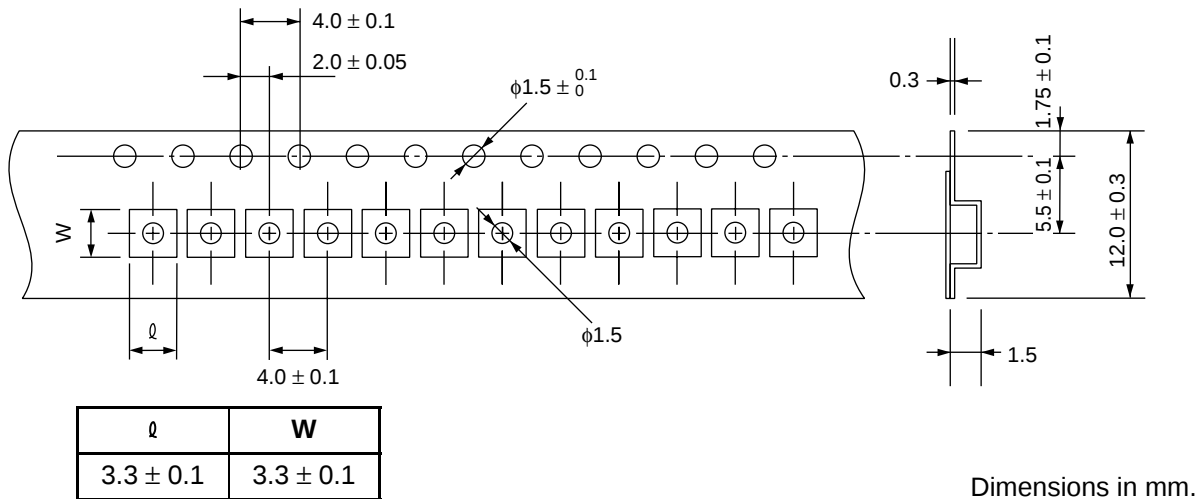
Dimensions in mm.

### (2) Packing style



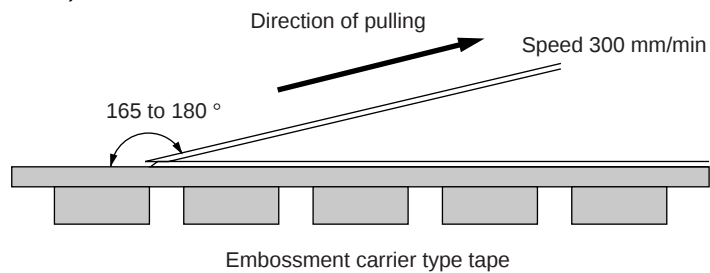
# F6 Series (L2 type)

## (3) Tape dimensions



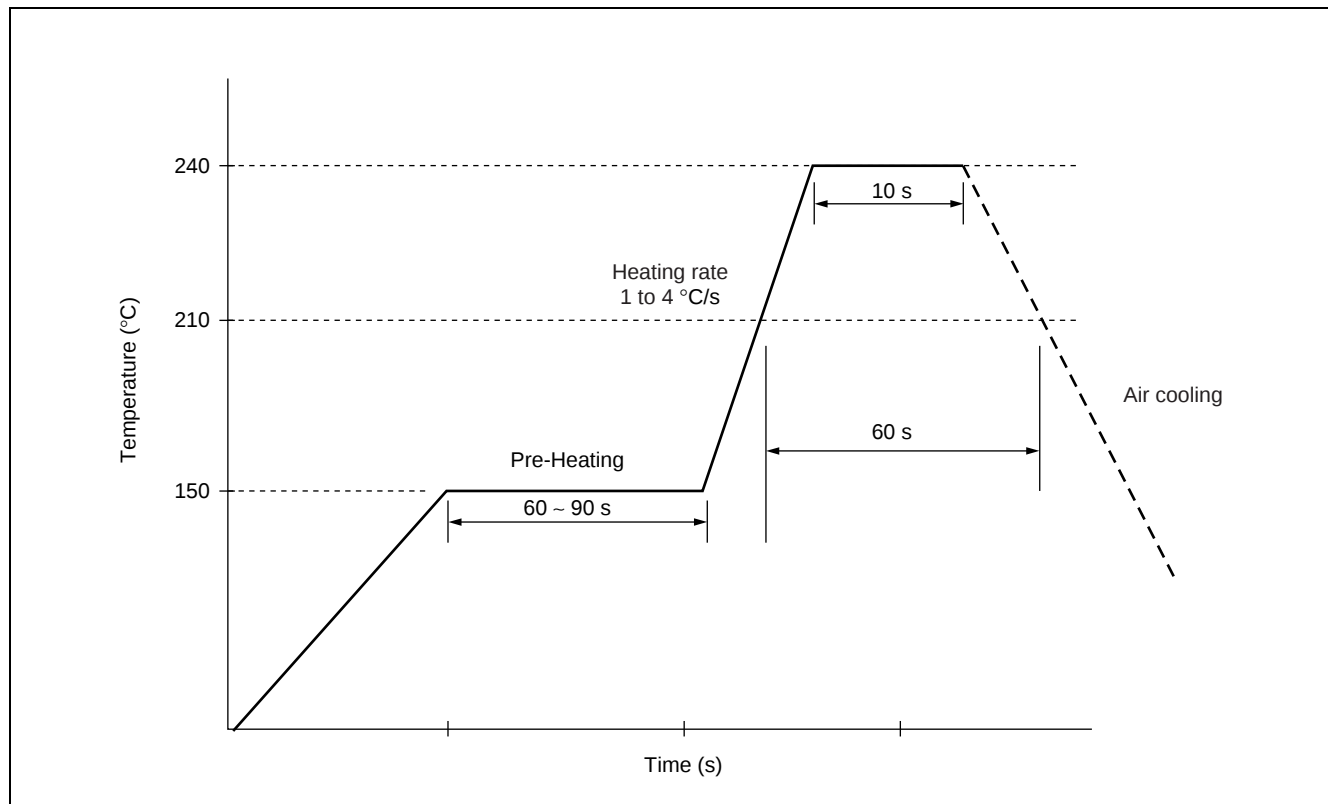
## (4) Peel strength of top cover tape

Peel off by the force of 0.1 N to 0.7 N under the condition at the right.  
(Conforms to JIS C 0806 section 5.2)



# F6 Series (L2 type)

## RECOMMENDED REFLOW PROFILE



## NOTE

Mass-produced product order is accepted by a unit of 1000.

# F6 Series (L2 type)

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