

ASSP Mobile Communication Systems

Piezoelectric SAW BPF

(700 MHz to 1700 MHz)

F5CP/F6CP Series (D2 type)

■ DESCRIPTION

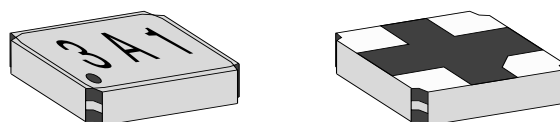
The F5CP/F6CP series of SAW band pass filters have $2.5\text{ mm} \times 2.0\text{ mm} \times 0.9\text{ mm}$ (h) of ultra small package, which are available in the 700 MHz to 1700 MHz frequency range. They exhibit high stability by using single crystal, Lithium Tantalate (LiTaO_3) with a large electro-mechanical coefficient.

Typical applications for the F5CP/F6CP series include RF interstage filtering in mobile communications systems. Standard devices are available for AMPS, GSM, EGSM, PDC800, PDC1.5G.

■ FEATURES

- Ultra compact and light package ($2.5\text{ mm} \times 2.0\text{ mm} \times 0.9\text{ mm}$ (h) *)
*: 1.0 mm height maximum
- Excellent stop band attenuation
- External matching are not required ($50\ \Omega$ I/O)
- Standard devices are available for mobile communication standards

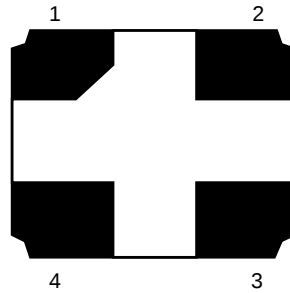
■ PACKAGE



F5CP/F6CP Series (D2 type)

■ PIN ASSIGNMENT

(BOTTOM VIEW)



■ PIN DESCRIPTION

Pin No.	Symbol	Descriptions
1	IN	Input pin
2	GND	Ground pin
3	OUT	Output pin
4	GND	Ground pin

F5CP/F6CP Series (D2 type)

■ ABSOLUTE MAXIMUM RATINGS

Parameter		Symbol	Rating		Unit
			Min	Max	
Ambient operating temperature		Ta	−30	+85	°C
Storage temperature		Tstg	−40	+100	°C
Input power	F5CP Series	Pin	—	+15	dBm
	F6CP Series		—	+10	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.

■ RECOMMENDED OPERATING CONDITIONS

Parameter	Symbol	Value		Unit
		Min	Max	
Operating temperature	Ta	−30	+85	°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 DEVICES

System		Center frequency (MHz)	Bandwidth (MHz)	Part symbol	Part number	Re-marks
AMPS/CDMA/TDMA	Tx	836.5	25	3	FAR-F5CP-836M50-D203	
	Rx	881.5	25	4	FAR-F5CP-881M50-D204	
PDC1.5G	Tx	1441.0	24	7	FAR-F6CP-1G4410-D207	
				R	FAR-F6CP-1G4410-D20R	

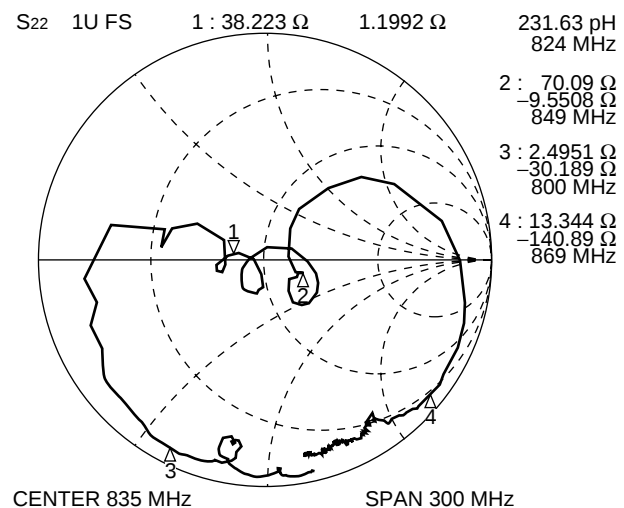
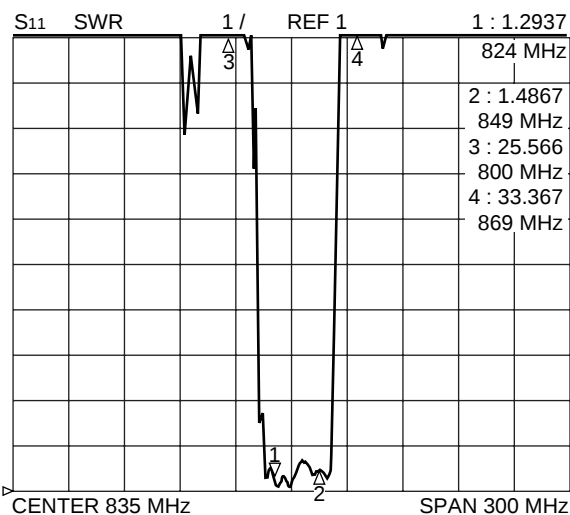
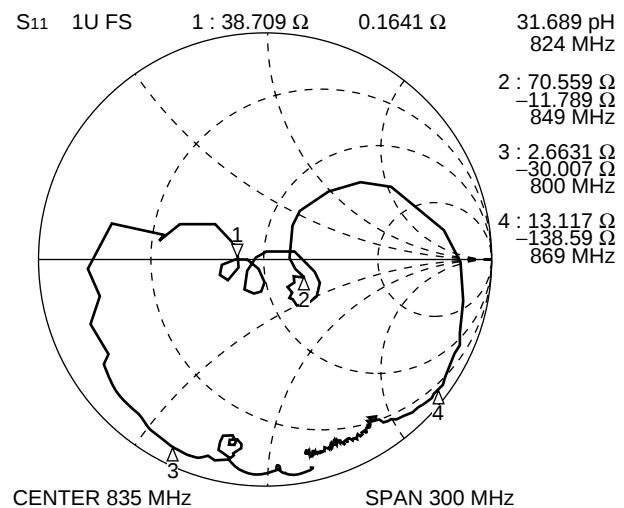
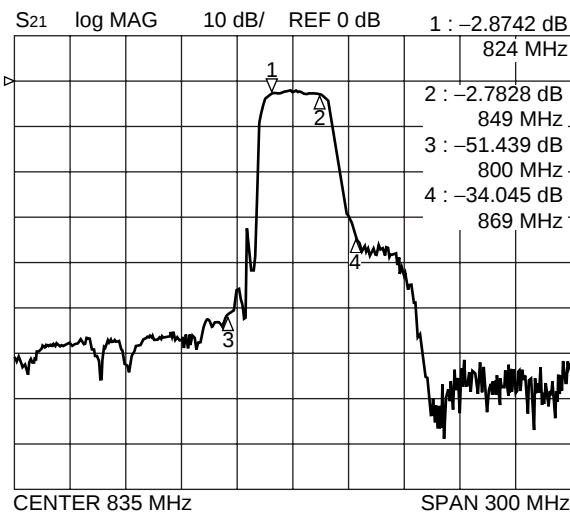
F5CP/F6CP Series (D2 type)

■ ELECTRICAL CHARACTERISTICS AND TYPICAL FREQUENCY RESPONSE

1. SYSTEM : AMPS-Tx

PART NUMBER : FAR-F5CP-836M50-D203

Parameter	Conditions	Value			Unit	Remarks
		Min	Typ	Max		
Insertion loss	824 MHz to 849 MHz	—	3.0	3.5	dB	
In-band ripple	824 MHz to 849 MHz	—	1.1	1.6	dB	
Absolute attenuation	DC to 800 MHz	45	50	—	dB	
	869 MHz to 1049 MHz	29	35	—	dB	
	1049 MHz to 2000 MHz	45	50	—	dB	
In-band VSWR (Return loss)	824 MHz to 849 MHz	— (8.5)	1.9 (10.2)	2.2 (—)	— (dB)	

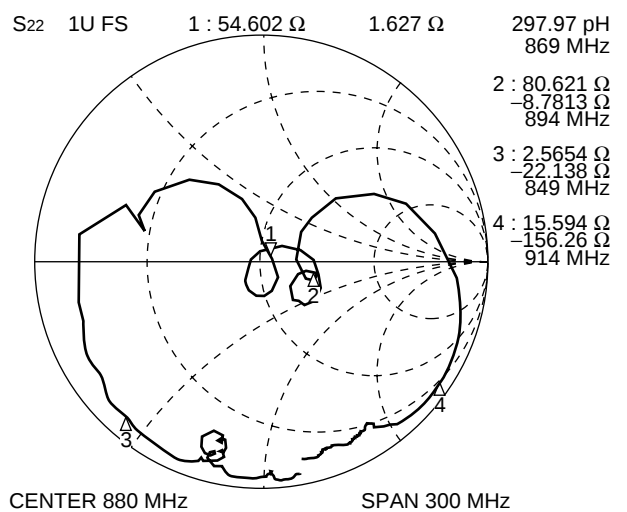
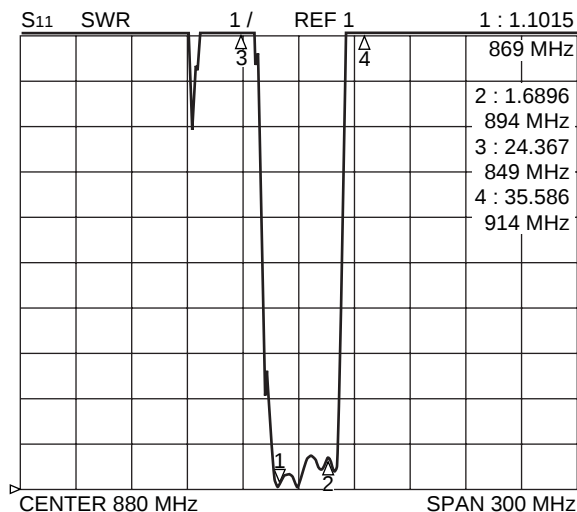
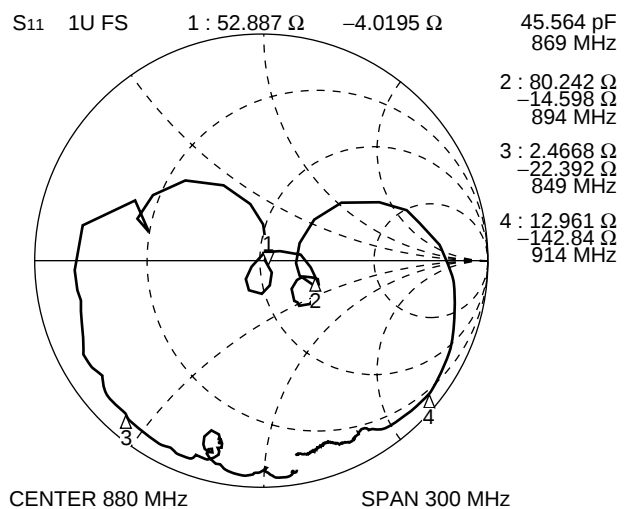
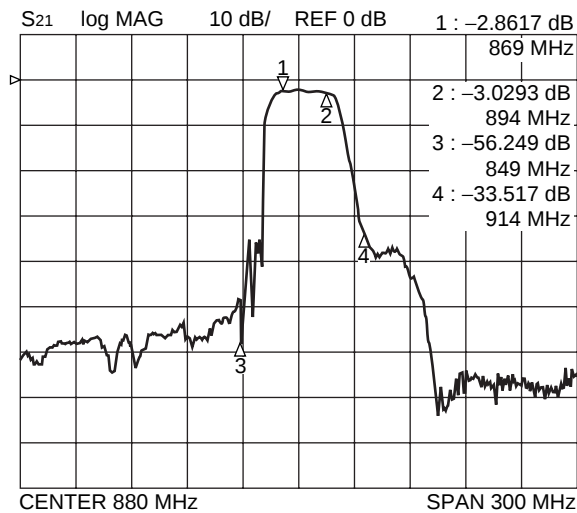


F5CP/F6CP Series (D2 type)

2. SYSTEM : AMPS-Rx

PART NUMBER : FAR-F5CP-881M50-D204

Parameter	Conditions	Value			Unit	Remarks
		Min	Typ	Max		
Insertion loss	869 MHz to 894 MHz	—	2.9	3.5	dB	
In-band ripple	869 MHz to 894 MHz	—	1.0	1.6	dB	
Absolute attenuation	DC to 779 MHz	45	50	—	dB	
	779 MHz to 849 MHz	40	47	—	dB	
	914 MHz to 970 MHz	28	33	—	dB	
	970 MHz to 1049 MHz	50	60	—	dB	
	1049 MHz to 2000 MHz	40	50	—	dB	
In-band VSWR (Return loss)	869 MHz to 894 MHz	— (8.5)	1.9 (10.2)	2.2 (—)	— (dB)	

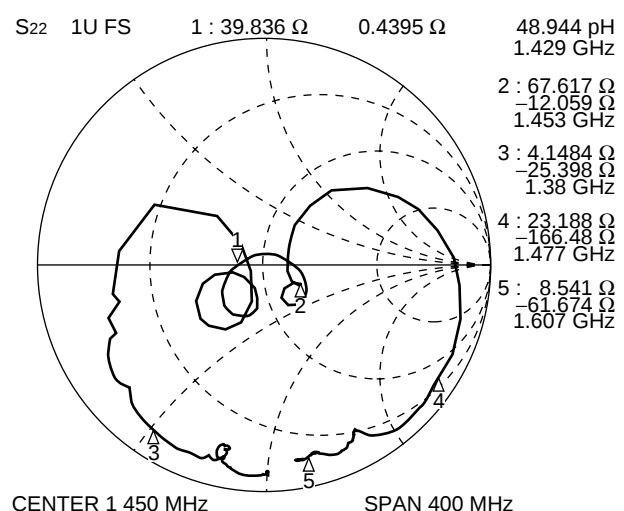
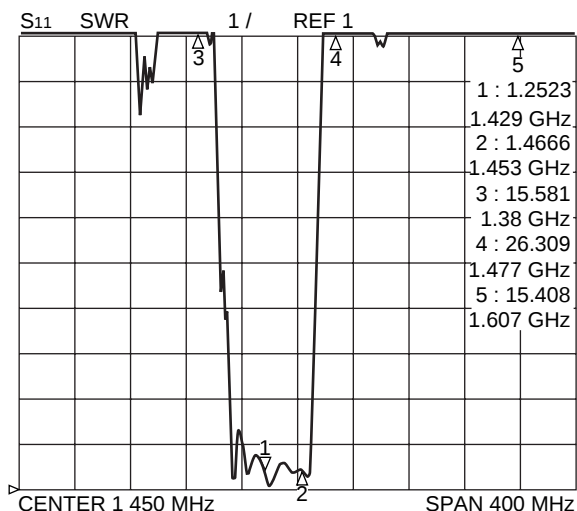
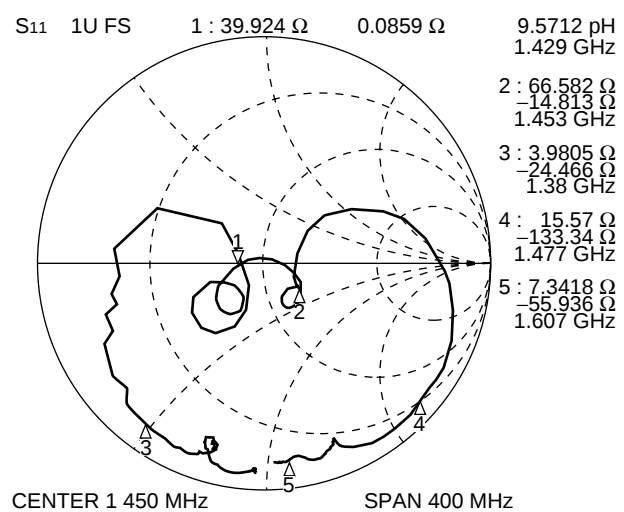
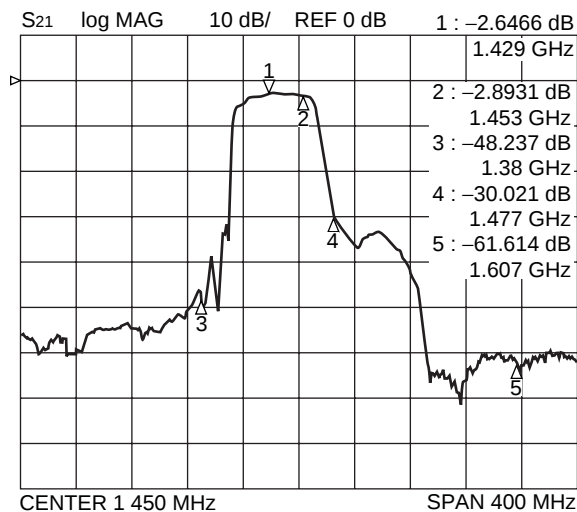


F5CP/F6CP Series (D2 type)

3. SYSTEM : PDC1.5G-Tx

PART NUMBER : FAR-F6CP-1G4410-D207

Parameter	Conditions	Value			Unit	Remarks
		Min	Typ	Max		
Insertion loss	1429 MHz to 1453 MHz	—	3.5	3.8	dB	
In-band ripple	1429 MHz to 1453 MHz	—	1.3	1.6	dB	
Absolute attenuation	DC to 1380 MHz	40	45	—	dB	
	1477 MHz to 1501 MHz	25	28	—	dB	
	1501 MHz to 1607 MHz	28	30	—	dB	
	1607 MHz to 1900 MHz	45	55	—	dB	
	1900 MHz to 3000 MHz	30	33	—	dB	
In-band VSWR (Return loss)	1429 MHz to 1453 MHz	— (7.0)	2.4 (7.7)	2.6 (—)	— (dB)	

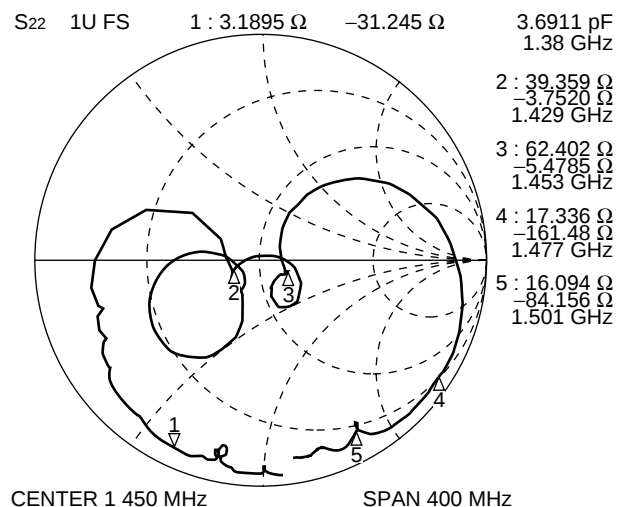
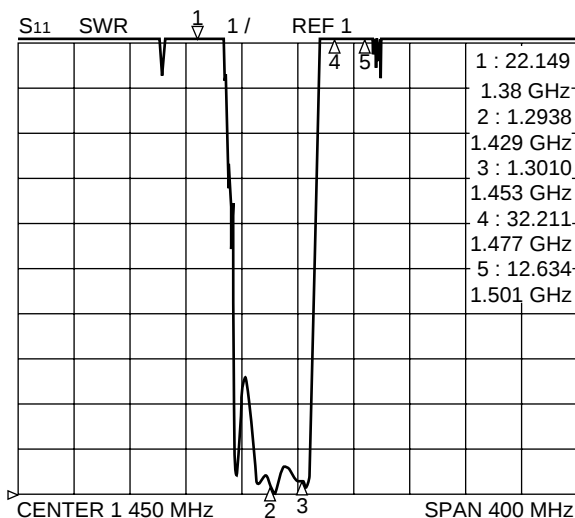
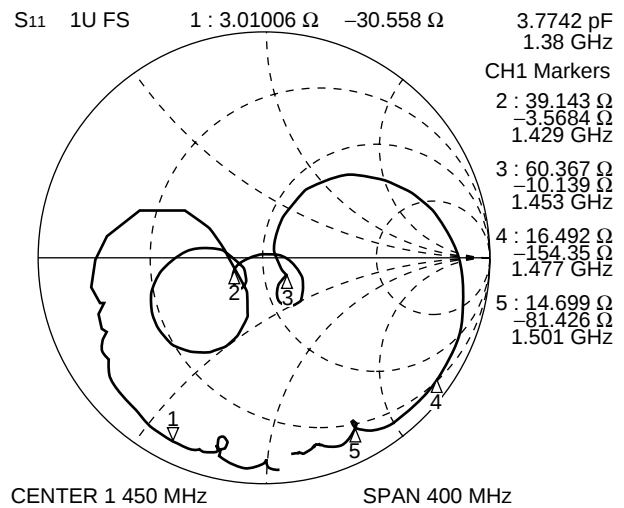
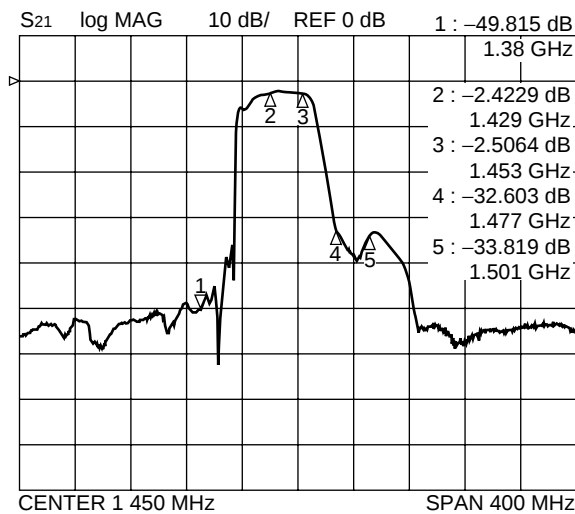


F5CP/F6CP Series (D2 type)

4. SYSTEM : PDC1.5G-Tx

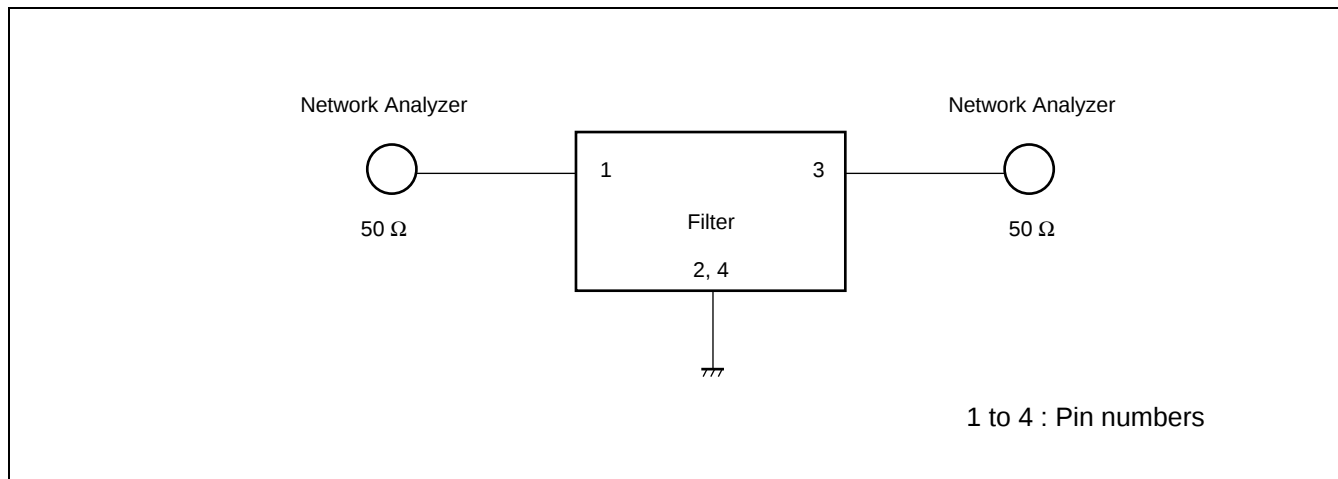
PART NUMBER : FAR-F6CP-1G4410-D20R

Parameter	Conditions	Value			Unit	Remarks
		Min	Typ	Max		
Insertion loss	1429 MHz to 1453 MHz	—	2.5	3.0	dB	
In-band ripple	1429 MHz to 1453 MHz	—	0.8	1.4	dB	
Absolute attenuation	DC to 1380 MHz	40	45	—	dB	
	1477 MHz to 1501 MHz	20	32	—	dB	
	1501 MHz to 1607 MHz	28	32	—	dB	
	1607 MHz to 1900 MHz	45	51	—	dB	
	1900 MHz to 3000 MHz	30	45	—	dB	
In-band VSWR (Return loss)	1429 MHz to 1453 MHz	— (7.4)	1.7 (11.7)	2.5 (—)	— (dB)	



F5CP/F6CP Series (D2 type)

MEASUREMENT CIRCUIT



PART NUMBER DESIGNATION

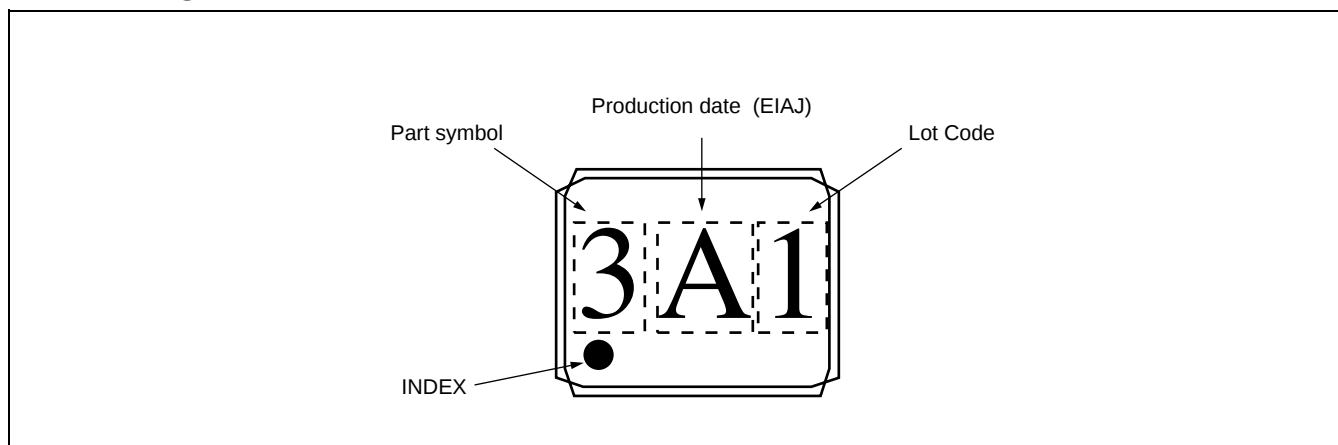
[Designation example]

FAR-F5CP- -D2 -

(1) (2) (3) (4) (5)

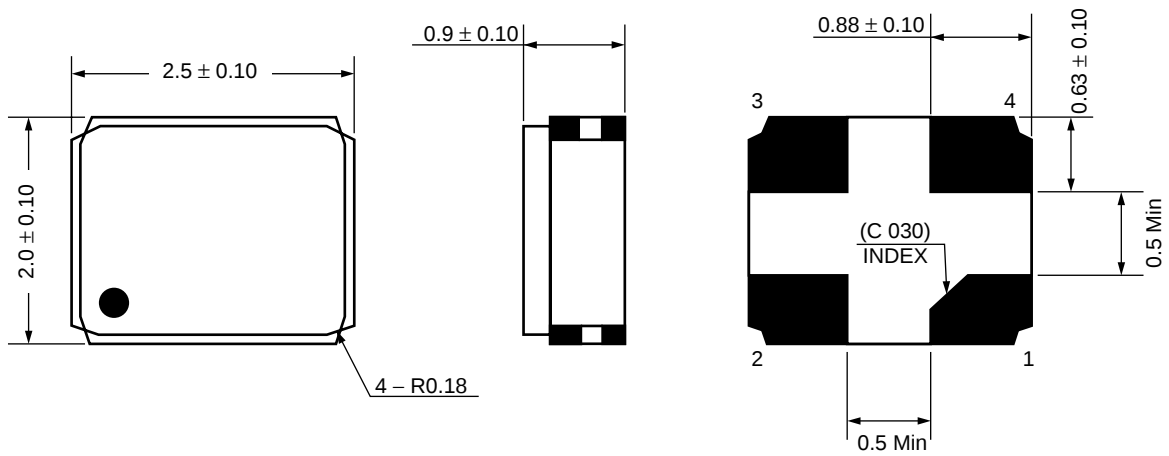
- | | |
|---------------------------|--|
| (1) Frequency range | 5 : 700 MHz to 1000 MHz
6 : 1000 MHz to 1700 MHz |
| (2) Package size | P : 2.5 mm $\times$ 2.0 mm $\times$ 0.9 mm |
| (3) Frequency | This specifies the nominal center frequency using six alphanumeric.
M (for MHz) or G (for GHz) indicates the decimal point.
[Example] 836.5 MHz $\rightarrow$ 836M50
1.441 GHz $\rightarrow$ 1G4410 |
| (4) Part symbol | Numbers specified by Fujitsu
Refer to ■STANDARD DEVICES |
| (5) Packing (Reeled tape) | K : 1000 pcs / reel
J : 5000 pcs / reel |

MARKING



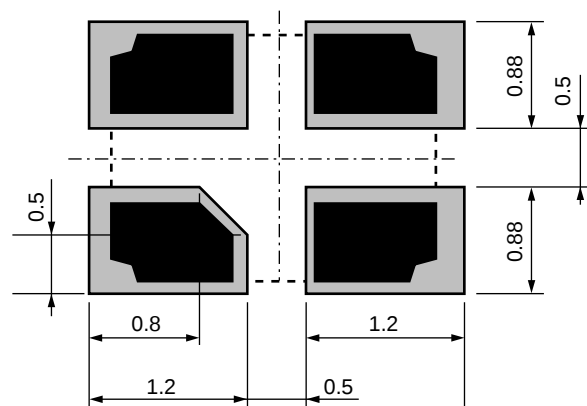
F5CP/F6CP Series (D2 type)

■ PACKAGE DIMENSION



Dimensions in mm.

■ RECOMMENDED FOOT PATTERN ON PCB

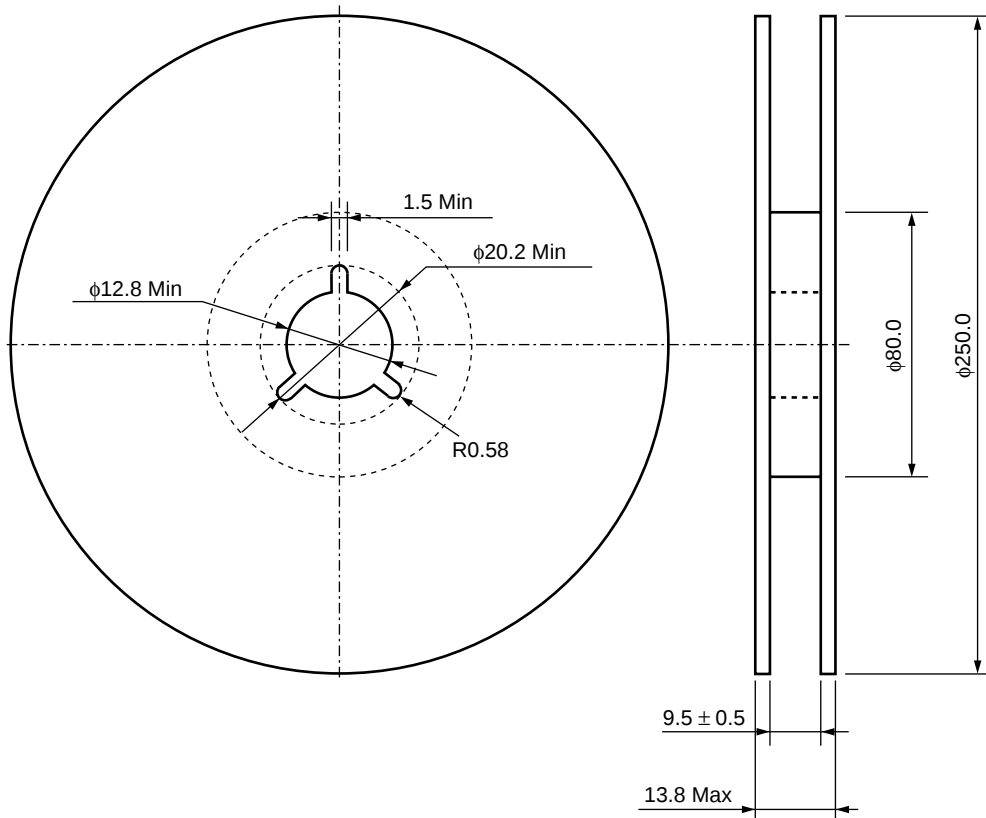


Dimensions in mm.

F5CP/F6CP Series (D2 type)

■ PACKING

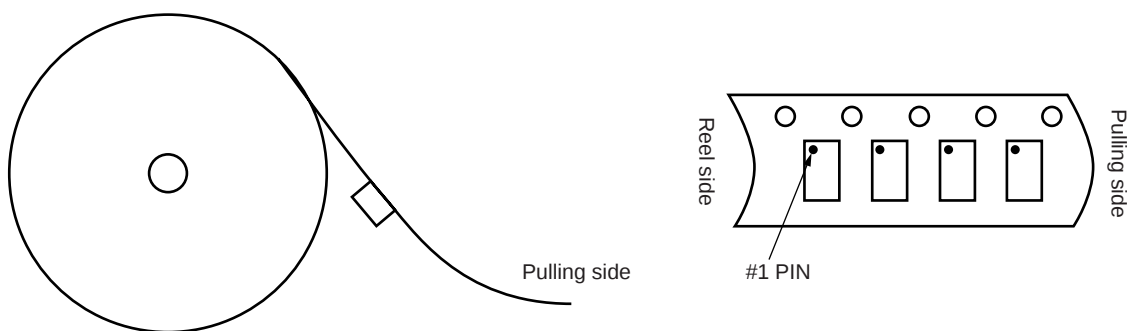
(1) Reel dimensions



Type	Volume
K	1000 pcs
J	5000 pcs

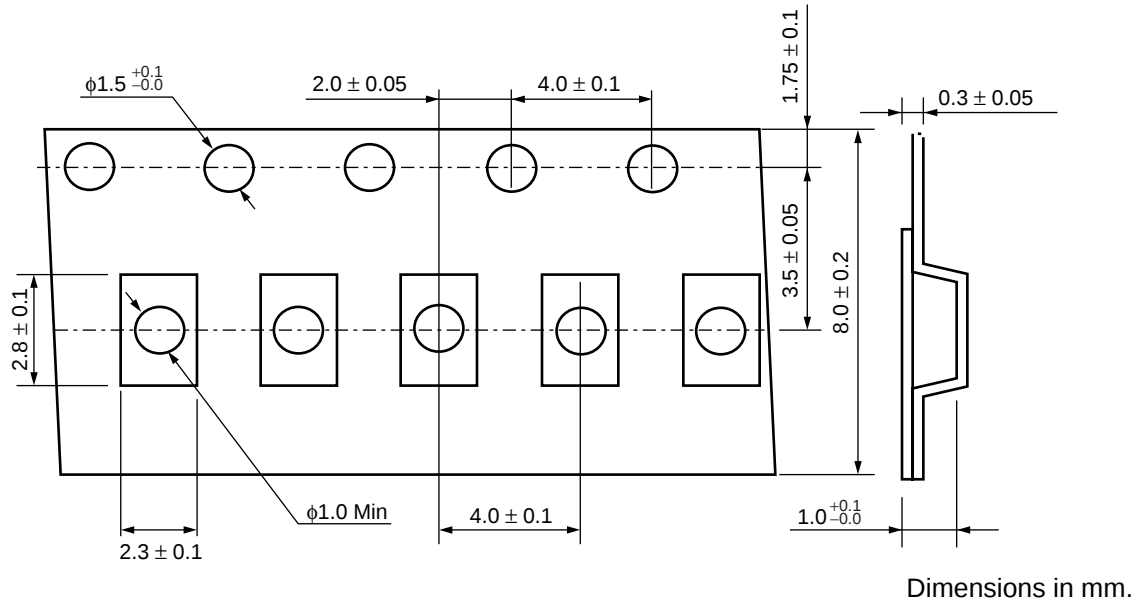
Dimensions in mm.

(2) Packing style



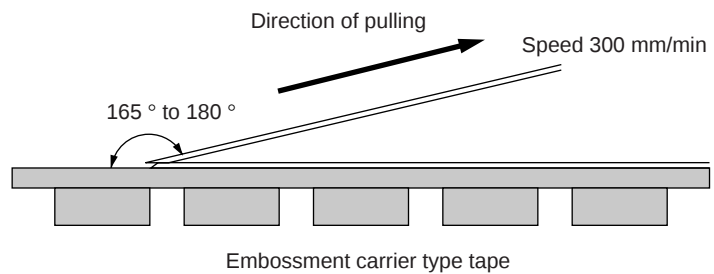
F5CP/F6CP Series (D2 type)

(3) Tape dimensions



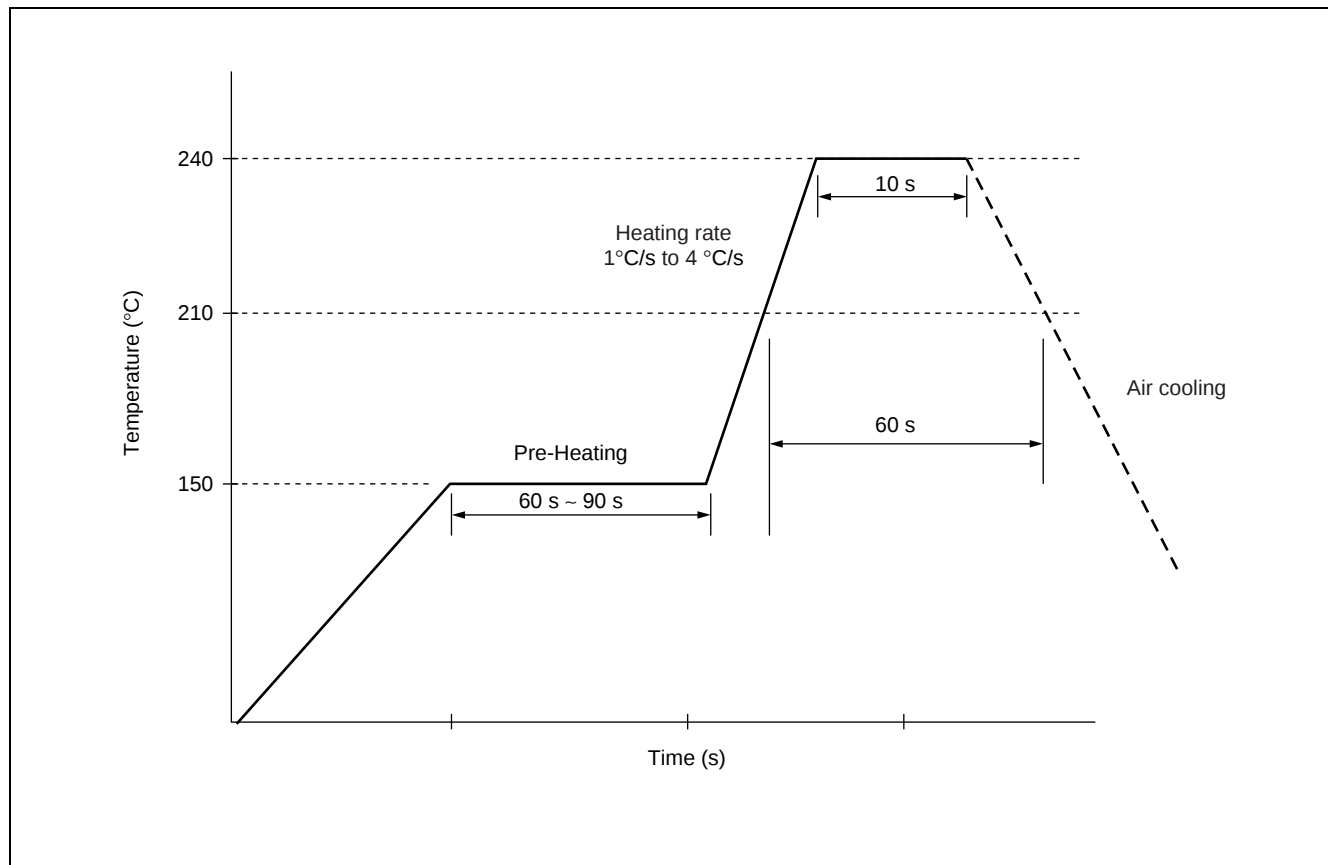
(4) Peel strength of top cover tape

Peel off by the force of 0.1 N to 1.0 N under the condition at the right .
(Conforms to EIA)



F5CP/F6CP Series (D2 type)

■ RECOMMENDED REFLOW PROFILE



■ NOTE

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

F5CP/F6CP Series (D2 type)

FUJITSU MEDIA DEVICES LIMITED

All Rights Reserved.

The contents of this document are subject to change without notice. Customers are advised to consult with FUJITSU MEDIA DEVICES sales representatives before ordering.

The information, such as descriptions of function and application circuit examples, in this document are presented solely for the purpose of reference to show examples of operations and uses of FUJITSU MEDIA DEVICES electronic device; FUJITSU MEDIA DEVICES does not warrant proper operation of the device with respect to use based on such information. When you develop equipment incorporating the device based on such information, you must assume any responsibility arising out of such use of the information. FUJITSU MEDIA DEVICES assumes no liability for any damages whatsoever arising out of the use of the information. Any information in this document, including descriptions of function and schematic diagrams, shall not be construed as license of the use or exercise of any intellectual property right, such as patent right or copyright, or any other right of FUJITSU MEDIA DEVICES or any third party or does FUJITSU MEDIA DEVICES warrant non-infringement of any third-party's intellectual property right or other right by using such information. FUJITSU MEDIA DEVICES assumes no liability for any infringement of the intellectual property rights or other rights of third parties which would result from the use of information contained herein.

The products described in this document are designed, and manufactured as contemplated for general use, including without limitation, ordinary industrial use, general office use, personal use, and household use, but are not designed, developed and manufactured as contemplated (1) for use accompanying fatal risks or dangers that, unless extremely high safety is secured, could have a serious effect to the public, and could lead directly to death, personal injury, severe physical damage or other loss (i.e., nuclear reaction control in nuclear facility, aircraft flight control, air traffic control, mass transport control, medical life support system, missile launch control in weapon system), or (2) for use requiring extremely high reliability (i.e., submersible repeater and artificial satellite).

Please note that FUJITSU MEDIA DEVICES will not be liable against you and/or any third party for any claims or damages arising in connection with above-mentioned uses of the products.

Any electronic devices have inherently a certain rate of failure. You must protect against injury, damage or loss from such failures by incorporating safety design measures into your facility and equipment such as redundancy, fire protection, and prevention of over-current levels and other abnormal operating conditions.

If any products described in this document represent goods or technologies subject to certain restrictions on export under the Foreign Exchange and Foreign Trade Control Law of Japan, the prior authorization by Japanese government should be required for export of those products from Japan.