FUJITSU SEMICONDUCTOR
DATA SHEET

DS04-20100-3E

ASSP

TIMING EXTRACTION BANDPASS FILTER (1.5 to 100MHz)

F1/F2/F3 SERIES

■ DESCRIPTION

The F1, F2 and F3 Series were developed as timing extraction filters for primary, secondary, and tertiary digital communication devices.

This new all-solid-state bandpass filter (BPF) uses a piezoelectric with a large electromechanical coefficient (lithium tantalate: $LiTaO_3$). The filter has a wide bandwidth, and is very stable.

■ FEATURES

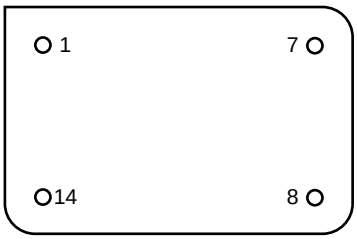
- Wide frequency range 1.5 to 100MHz
- Wide fractional bandwidth (%): 0.1 to 2.5
- Low insertion loss: 6dB or less
- Excellent temperature characteristics: 1.5 to 35MHz: ±400ppm or less (0 to 60°C)
  36 to 100MHz: –30ppm/°C (0 to 60°C)
- Small frequency deviation Δf_O < ±500ppm eliminating the need for adjustment
- Highly reliable hermetically sealed package
- Compatible with small 14-pin DIP IC

■ PACKAGE

14-PIN DIP SIZE METAL CASE

■ PIN ASSIGNMENT

(BOTTOM VIEW)



Pin No.	Pin name	Description
1	IN	Input pin
7	GND	Ground pin
8	NC	No connection
14	OUT	Output pin

■ MAXIMUM RATINGS

Item	Symbol	Rating	Unit
Operating temperature	T_a	–20 to 80	°C
Storage temperature	T_{stg}	–40 to 80	°C
Insulation resistance	IR	100 (100V DC)	MΩ
Frequency range	—	1.5 to 100	MHz

■ RECOMMENDED OPERATING CONDITIONS

Item	Symbol	Rating	Unit
Operating temperature	T_a	0 to 70	°C

■ STANDARD FREQUENCY

Series	Standard frequency	Application	Remarks
F1	1.544MHz	For the U.S. and Japan (primary group)	
	2.048MHz	For Europe (primary group)	
	3.088MHz	For the U.S. and Japan (primary group)	1.544 × 2
	3.152MHz	For the U.S. and Japan (primary group)	
	4.096MHz	For Europe (primary group)	2.048 × 2
	6.312MHz	For the U.S. and Japan (secondary group)	
	8.192MHz	For the U.S. and Japan (secondary group)	
	8.448MHz	For Europe (secondary group)	
	12.624MHz	For the U.S. and Japan (secondary group)	6.312 × 2
	16.384MHz	For the U.S. and Japan (secondary group)	8.192 × 2
F2	16.896MHz	For Europe (secondary group)	8.448 × 2
	32.064MHz	For Japan (tertiary group)	
	34.368MHz	For Europe (tertiary group)	
F3	44.736MHz	For the U.S. (tertiary group)	

■ ELECTRICAL CHARACTERISTICS

F1 Series

Item	Symbol	Condition	Rating			Unit	Remarks
			Min.	Typical	Max.		
Frequency deviation	Δf_O	—	–500	—	+500	ppm	f_O standard
Load Q	Q	—	1000	—	40	—	
Insertion loss	IL	—	—	—	6	dB	
Stop band attenuation	A_{OUT}	f_O ± 10MHz	20	—	—	dB	
Frequency stability with temperature	Δf (Ta)	—	–400	—	+400	ppm	25°C standard, Ta = 0 to 70°C

F2 Series

Item	Symbol	Condition	Rating			Unit	Remarks
			Min.	Typical	Max.		
Frequency deviation	Δf_O	—	–500	—	+500	ppm	f_O standard
Load Q	Q	—	1000	—	40	—	
Insertion loss	IL	—	—	—	6	dB	
Stop band attenuation	A_{OUT}	f_O ± 10MHz	20	—	—	dB	
Frequency stability with temperature	Δf (Ta)	—	–400	—	+400	ppm	25°C standard, Ta = 0 to 70°C

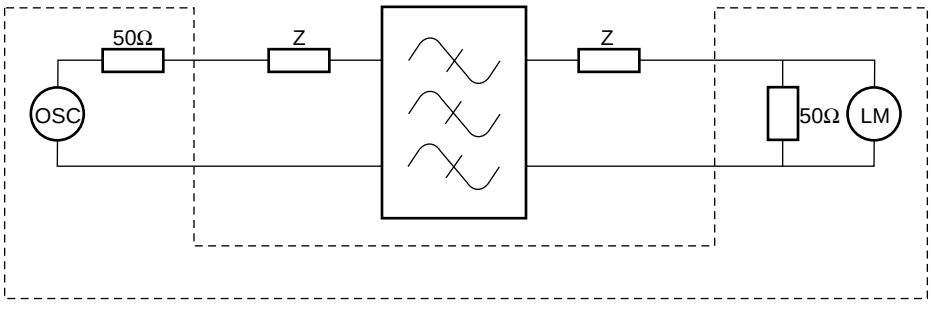
F3 Series

Item	Symbol	Condition	Rating			Unit	Remarks
			Min.	Typical	Max.		
Frequency deviation	Δf_O	—	–500	—	+500	ppm	f_O standard
Load Q	Q	—	200	—	50	—	
Insertion loss	IL	—	—	—	6	dB	
Stop band attenuation	A_{OUT}	f_O ± 10MHz	20	—	—	dB	
Frequency stability with temperature	Δf (Ta)	—	–1350	—	750	ppm	25°C standard, Ta = 0 to 70°C

■ ELECTRICAL CHARACTERISTICS

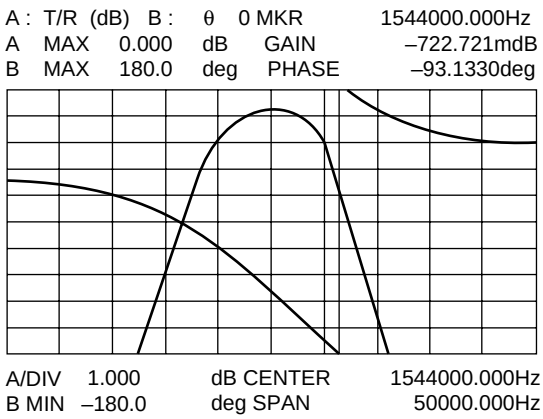
No.	Standard frequency (MHz)	Part number	Specification			
			Load Q	Insertion loss, IL (dB)	Phase rotation θ (degree)	Terminating impedance Z (Ω)
1	1.544	FAR-F1DA-1M5440-G201	110 ±20	3 or less	–90±20	790
2	1.544	FAR-F1DA-1M5440-G202	110 ±20	3 or less	–90±20	1000
3	1.544	FAR-F1DA-1M5440-G203	60 ±10	3 or less	–95±10	2035/20pF
4	1.544	FAR-F1DA-1M5440-G205	110 ±20	3 or less	–90±20	2000
5	2.048	FAR-F1DA-2M0480-G201	40 ±10	3 or less	–90±10	2035
6	2.048	FAR-F1DA-2M0480-G202	100 ±20	3 or less	–90±20	1000
7	3.088	FAR-F1DA-3M0880-G201	150 ±20	3 or less	–90±20	640
8	3.152	FAR-F1DA-3M1520-G201	85 ±15	3 or less	–90±15	1285
9	4.096	FAR-F1DA-4M0960-G201	110 ±20	3 or less	–90±20	750
10	6.312	FAR-F1DA-6M3120-G201	110 ±20	3 or less	–90±20	985
11	6.312	FAR-F1DA-6M3120-G202	110 ±20	3 or less	–90±20	1000
12	8.192	FAR-F1DA-8M1920-G201	100 ±20	3 or less	–90±20	980
13	8.448	FAR-F1DA-8M4480-G201	110 ±20	3 or less	–90±20	980
14	12.624	FAR-F1DA-12M624-G201	100 ±20	3 or less	–90±20	590
15	16.384	FAR-F1DA-16M384-G201	100 ±20	3 or less	–90±20	410
16	16.896	FAR-F1DA-16M896-G201	100 ±20	3 or less	–90±20	390
17	32.064	FAR-F2DA-32M064-G201	100 ±10	3 or less	–90±15	100
18	34.368	FAR-F2DA-34M368-G201	100 ±10	3 or less	–90±15	100
19	44.736	FAR-F3DA-44M736-G201	65 ±15	6 or less	38±10	105

■ TEST CIRCUIT

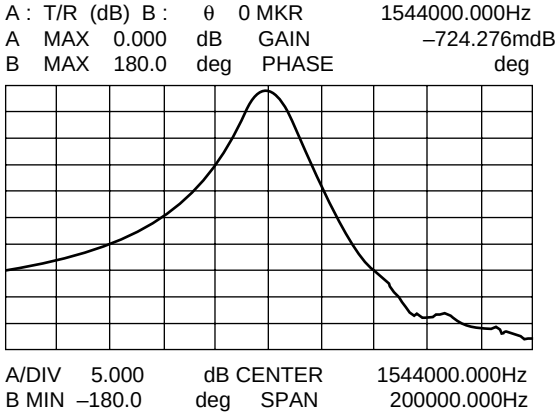


■ CHARACTERISTICS SAMPLE

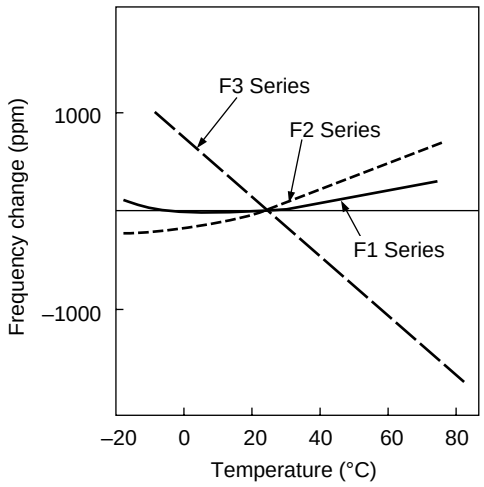
Pass band characteristic



Stop band characteristic



Temperature characteristic



■ PART NUMBERING SYSTEM

[Example]

FAR–F1DA–□□□□□□–G□□□

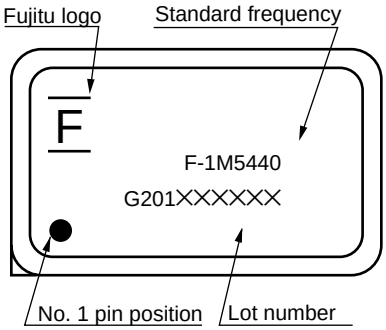
① ② ③

① Series designation

② Frequency designation: The standard frequency is designated in six alphanumeric characters. M is used to designate the decimal point in MHz. Refer to “ELECTRIC CHARACTERISTICS” in detail
Example: 1.544MHz: 1M5440

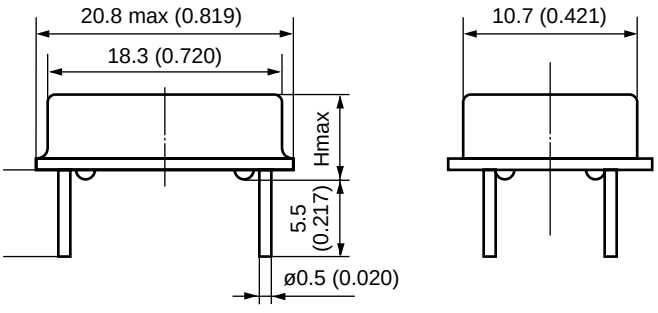
③ Serial number: The serial number is assigned from 201 to 999 (201 is normal).

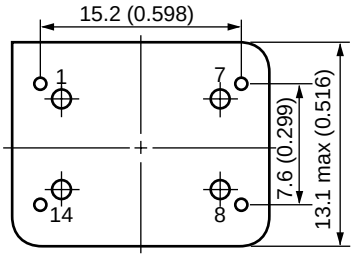
■ MARKING



■ DIMENSIONS

Unit: mm (in.)





Series	H
F1 < 3 MHz	8.5 (0.335)
F1 ≥ 3 MHz	5.8 (0.228)
F2	5.8 (0.228)
F3	5.8 (0.228)

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