

# **Piezoelectronic Ceramic Filters**

Lead type 10.7MHz

## **FFE** series

Issue date: August 2007

• All specifications are subject to change without notice.

• Conformity to RoHS Directive: This means that, in conformity with EU Directive 2002/95/EC, lead, cadmium, mercury, hexavalent chromium, and specific bromine-based flame retardants, PBB and PBDE, have not been used, except for exempted applications.

**Conformity to RoHS Directive** 

## Ceramic Filters FFE Series(Lead)

## FEATURES

- To small dispersion of center frequency in our products, devices in a single rank can be supplied. Consequently, adjustment-free IC circuits are easy produced.
- Because of the small characteristic dependence on temperature, IF circuit can be made to have a highly stabilized temperature(Temperature coefficient of center frequency : ±50ppm/°C).
- The size and weight are small and light.
- Because of the small loss dispersion as well as the low loss characteristics, a product of high sensitivity can be manufactured in the form of set.
- Ammo packing is available for various automatic insert machine (1800pieces/box). Short lead type and L-bend lead type are also available, please contact TDK.
- The products do not contain lead at solder of internal joint and solder plating of lead wire. You can use both Pb free solder (Sn-3Ag-0.5Cu) and Sn-Pb eutectic solder on your production.

## SHAPES AND DIMENSIONS



## **CIRCUIT DIAGRAM**





## **MEASUREMENT CIRCUIT**



Reference Level: Short condition between 1 and 3 without DUT.

## PRODUCT IDENTIFICATIONS

FFE	1070	MA	11	U	Х	L
(1)	(2)	(3)	(4)	(5)	(6)	(7)

(1) Series name

	Coramic filtor	
116	Ceramic filter	

#### (2) Center frequency

,	,	
1060	10.600MHz	
1070	10.700MHz	
1080	10.800MHz	

#### (3) 3dB band width(BW3)

MA	280±50kHz	
NA	230±50kHz	
MS	180±40kHz	
MJ	150±40kHz	

#### (4) Center frequency tolerance

,		
10	±20kHz	
11	±30kHz	

#### (5) Packaging style for product type

Symbol	Shapes (mm)ma	dimensions x.	Packaging	BW3 symbol		bol	
	Width	Height	– style	MA	NA	MS	MJ
U	7.0	7.0	Bulk	$\checkmark$	$\checkmark$		
S	8.0	7.0	Bulk			$\checkmark$	
F	8.0	7.0	Bulk				$\checkmark$
Н	7.0	7.0	Ammo pack	$\checkmark$	$\checkmark$		
R	8.0	7.0	Ammo pack			$\checkmark$	
Т	8.0	7.5	Ammo pack				$\checkmark$
-							

#### (6) Electrical characteristics

Cumahal	Classification	BW3 s	ymbol		
Symbol	Classification	MA	NA	MS	MJ
A	Low loss	$\checkmark$	$\checkmark$	$\checkmark$	$\checkmark$
В	Standard	$\checkmark$	$\checkmark$		
Х	Standard	$\checkmark$	$\checkmark$		
Others	Custom made				

#### (7) Lead length

L	5.0+0.5, -1.0mm Taping (Ammo pack)
Μ	3.0±0.5mm
Others	Custom made

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**<b>⊘TD**K

#### **ELECTRICAL CHARACTERISTICS**

De ut Nie	3dB band width	20dB band width	Insertion loss	SPR attenuation
Part No.	(kHz)	(kHz)max.	(dB)max.	(dB)min.
Standard type				
FFE1070MA11UXL	280±50	600	6.0	35
FFE1070NA11UXL	230±50	570	6.0	35
FFE1070MS11SBL	180±40	520	7.0	35
FFE1070MJ11FBL	150±40	400	10.0	35
Low loss type				
FFE1070MA11UAL	280±50	600	5.0	35
FFE1070NA11UAL	230±50	570	4.5	35
FFE1070MS11SAL	180±40	520	5.0	35
FFE1070MJ11FAL	150±40	400	7.0	35
Group delay time control typ	00			
FFE1070NA10UGL*	230±50	570	6.0	35
FFE1070MS10SGL*	180±40	520	7.0	35

\* Group delay time: 0.50max.

## **RELIABILITY AND TEST CONDITIONS**

The following test items are satisfied.

(1) Center frequency: Within  $\pm 30 \text{kHz}$ 

(2) 3dB band width: Within  $\pm 20 \text{kHz}$ 

(3) 20dB band width: Within  $\pm$ 30kHz

(4) Insertion loss: Within  $\pm 2dB$ 

(5) Attenuation: 25dB min.

Test items	Test conditions
Low temperature	Temperature: -40±3°C
storage characteristics	Time: 100h
High temperature	Temperature: +85±2°C
storage characteristics	Time: 100h
	Loading: DC.5V(between in/out and
	ground terminal)
Humidity resistance	Humidity: 90 to 95(%)RH
	Temperature: 60±2°C
	Time: 100h
Thermal shock	–40°C (30min), 85°C (30min) x 5 cycles
Soldering heat resistance	Solder temperature: peak 260°C, 10s flow
Dran	Drop 3 times onto a hard wooden board
Drop	from a height of 1m
	Frequency: 10 ⇔ 55 ⇔ 10Hz/Ampli-
Vibration	tude: 1.5mm
	X, Y and Z directions for 2h each

## SOLDERABILITY

The lead wires are adopted Pb free plating wire to apply Pb free

soldering. You can also use current Sn-Pb e	utectic solder.
Test conditions	Test result
eutectic solder bath at 230±5°C for 3±0.5sec. or	surface should be
Pb free solder(Sn-3Ag-0.5Cu) bath at 245±2°C	covered by new solder.
for 3±0.2sec.	

## **RECOMMENDED SOLDERING CONDITIONS**

This is the fit product for flow soldering.

## FLOW SOLDERING CONDITION

Heat-resistant temperature	260±5°C
Heat-resistant time	10±1sec.
Number of times	1time