

# 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.
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# Ceramic Filters

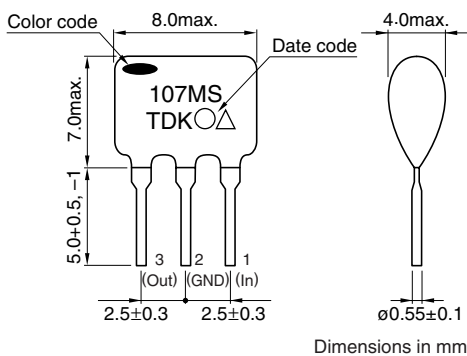
## FFE Series(Lead)

Conformity to RoHS Directive

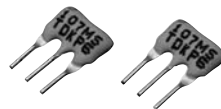
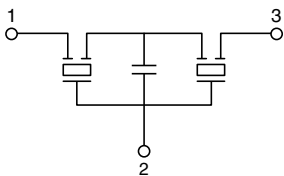
### FEATURES

- 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 :  $\pm 50\text{ppm}/^\circ\text{C}$ ).
- 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.

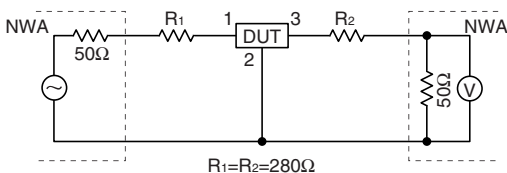
### SHAPES AND DIMENSIONS



### CIRCUIT DIAGRAM



### MEASUREMENT CIRCUIT



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

### PRODUCT IDENTIFICATIONS

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

#### (1) Series name

FFE	Ceramic filter
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#### (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 dimensions (mm)max.		Packaging style	BW3 symbol			
	Width	Height		MA	NA	MS	MJ
U	7.0	7.0	Bulk	✓	✓		
S	8.0	7.0	Bulk				✓
F	8.0	7.0	Bulk				✓
H	7.0	7.0	Ammo pack	✓	✓		
R	8.0	7.0	Ammo pack				✓
T	8.0	7.5	Ammo pack				✓

#### (6) Electrical characteristics

Symbol	Classification	BW3 symbol			
		MA	NA	MS	MJ
A	Low loss	✓	✓	✓	✓
B	Standard	✓	✓		
X	Standard	✓	✓		
Others	Custom made				

#### (7) Lead length

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

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## ELECTRICAL CHARACTERISTICS

Part No.	3dB band width (kHz)	20dB band width (kHz)max.	Insertion loss (dB)max.	SPR attenuation (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 type				
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 ±30kHz
- (2) 3dB band width: Within ±20kHz
- (3) 20dB band width: Within ±30kHz
- (4) Insertion loss: Within ±2dB
- (5) Attenuation: 25dB min.

Test items	Test conditions
Low temperature storage characteristics	Temperature: -40±3°C Time: 100h
High temperature storage characteristics	Temperature: +85±2°C Time: 100h
Humidity resistance	Loading: DC.5V(between in/out and ground terminal) 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
Drop	Drop 3 times onto a hard wooden board from a height of 1m
Vibration	Frequency: 10 ⇄ 55 ⇄ 10Hz/Amplitude: 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 eutectic solder.

Test conditions	Test result
With Rosin-methanol 25% by weight, dip in Sn-Pb eutectic solder bath at 230±5°C for 3±0.5sec. or Pb free solder(Sn-3Ag-0.5Cu) bath at 245±2°C for 3±0.2sec.	95% minimum of surface should be covered by new solder.

## 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