

## Ceramic Filter

### 1 · SCOPE

This specification shall cover the characteristics of the ceramic filter with the type SFSH4.5MCB.

### 2 · PART NO. : SFSH4.5MCB

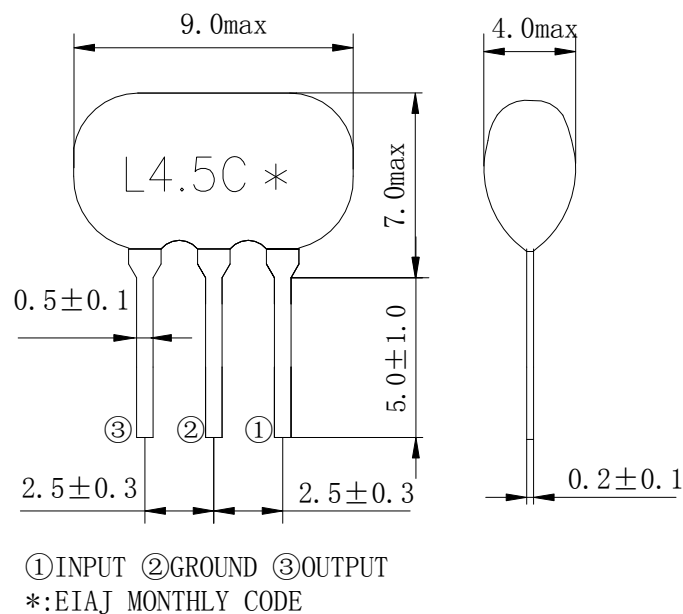
### 3 · OUTLINE DIMENSIONS AND MARK

3.1 Appearance: No visible damage and dirt.

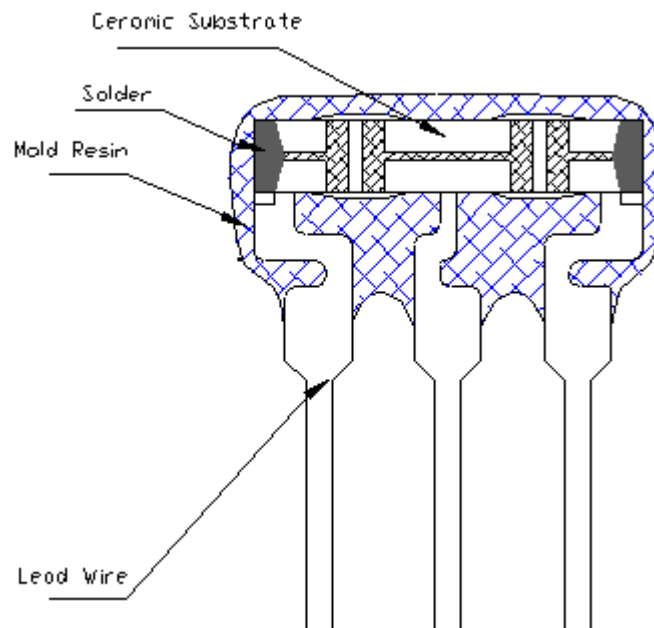
3.2 Construction: Leads are soldered on electrode and body is molded by resin.

3.3 The products conform to the RoHS directive and national environment protection law.

### 3.4 Dimensions and mark



### 3.5 Structure



Component	Material
Lead Wire	Solder plating copper or iron wire
Mold Resin	epoxy resin
Solder	High-melting solder
Ceramic Substrate	Lead titanate-zirconate

## 4 · ELECTRICAL SPECIFICATIONS

### 4.1 RATING

Items	Requirement
Withstanding Voltage (V)	50 (DC , 1min)
Insulation Resistance Ri, ( MΩ ) min.	100 ( 10V , 1min )
Operating temperature	-25°C ~ 85°C
Storage temperature	-40°C ~ 85°C

## 4.2 ELECTRICAL SPECIFICATIONS

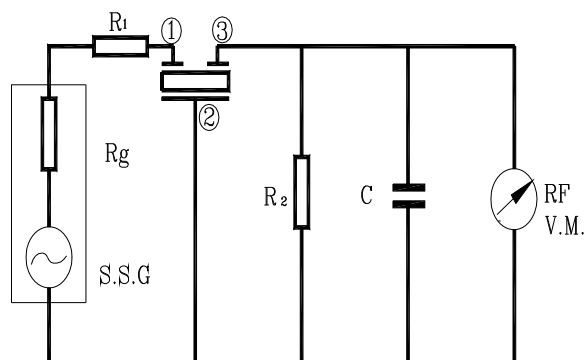
Items	Content
Nominal Center Frequency Fn (MHz)	4.500
3dB Band Width (kHz) min	$F_n \pm 60$
20dB Band Width (kHz) max	600
Insertion Loss (dB) max	6.0
Spurious Response (dB) min	30 (0-Fn)
	15 (Fn~7.0MHz)
	30 (7.0~10.0MHz)
Input/Output Impedance( $\Omega$ )	1000
Temp. Coefficient of Frequency ppm/ $^{\circ}$ C max	$\pm 100$ (Center Frequency drift , -25 $^{\circ}$ C ~85 $^{\circ}$ C)

## 5 · TEST

### 5.1 Test Conditions

Parts shall be tested under the condition ( Temp. :  $20 \pm 15^{\circ}\text{C}$  , Humidity :  $65 \pm 20\%$  R.H.) unless the standard condition (Temp. :  $25 \pm 2^{\circ}\text{C}$  , Humidity :  $65 \pm 5\%$  R.H.) is regulated to measure.

### 5.2 Test Circuit



$R_g + R_1 = R_2 =$  Input/Output Impedance( $\Omega$ )

$C = 10$  pF (Including stray capacitance and input capacitance of RF voltmeter)

## 6 · PHYSICAL AND ENVIRONMENTAL CHARACTERISTICS

No.	Item	Condition of Test	Performance Requirement	
6.1	Humidity	Subject the filter at $40\pm 2^{\circ}\text{C}$ and 90%-95% R.H. for 96h, Filter shall be measured after being placed in natural conditions for 1h.	It shall fulfill Table 1.	
6.2	High Temperature Exposure	Subject the filter to $85\pm 2^{\circ}\text{C}$ for 96h, Filter shall be measured after being placed in natural conditions for 1h.	It shall fulfill Table 1.	
6.3	Low Temperature Exposure	Subject the filter to $-40\pm 2^{\circ}\text{C}$ for 96h, Filter shall be measured after being placed in natural conditions for 1h.	It shall fulfill Table 1.	
6.4	Temperature Cycling	After temperature cycling of blow table was performed 5 times, Filter shall be measured after being placed in natural conditions for 1h.	It shall fulfill Table 1.	
		Temperature		Time
		$-25\pm 3^{\circ}\text{C}$		30 $\pm$ 3 min
		$85\pm 3^{\circ}\text{C}$		30 $\pm$ 3 min
6.5	Vibration	Subject the filter to vibration for 2h. Each in x y and z axis with the amplitude of 1.5mm, The frequency shall be varied uniformly between the limits of 10Hz-55Hz-10Hz and then filter shall be measured.	It shall fulfill Table 1.	
6.6	Mechanical Shock	Filter shall be measured after 3 times random dropping from the height of 1m on concrete floor.	No visible damage and it shall fulfill Table 1.	
6.7	Resistance to Soldering Heat	1) Lead terminals are immersed up to 2 mm from filter's body in soldering bath of $260\pm 5^{\circ}\text{C}$ for $10\pm 1\text{s}$ and then filter shall be measured after being placed in natural conditions for 1h. 2) Lead terminals is directly contacted with the tip of soldering iron of $350\pm 5^{\circ}\text{C}$ for $5.0\pm 0.5\text{s}$ and then filter shall be measured after being placed in natural conditions for 1h.	It shall fulfill Table 1.	

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## 6 · PHYSICAL AND ENVIRONMENTAL CHARACTERISTICS

No.	Item	Condition of Test	Performance Requirements
6.8	Solderability	Lead terminals are immersed up to 2mm from filter's body in soldering bath of $250\pm 5^{\circ}\text{C}$ for $3\pm 0.5\text{s}$ .	More than 95% of the terminal surface of the filter shall be covered with fresh solder.
6.9	Terminal Strength	Force of 5N is applied to each lead in axial direction for $10\text{s}\pm 1\text{s}$ . When force of 5N is applied to each lead in axial direction, the lead shall folded up $90^{\circ}$ from the axial direction and folded back to the axial direction. The speed of folding shall be each 3s.	No visible damage and it shall fulfill Table 1.
6.9.1	Terminal Pulling		
6.9.2	Terminal Bending		

Table 1

Item	Characteristics after test
Insertion Loss drift max	$\pm 2\text{dB}$ .
3dB Band Width drift max.	$\pm 25\text{kHz}$
20dB Band Width drift max.	$\pm 40\text{kHz}$
Note : The limits in the above table are referenced to the initial measurements.	

## 7 · EIAJ Monthly Code

2013 / 2015 / 2017		2012 / 2014 / 2016	
MONTH	CODE	MONTH	CODE
JAN	A	JAN	N
FEB	B	FEB	P
MAR	C	MAR	Q
APR	D	APR	R
MAY	E	MAY	S
JUN	F	JUN	T
JUL	G	JUL	U
AUG	H	AUG	V
SEP	J	SEP	W
OCT	K	OCT	X
NOV	L	NOV	Y
DEC	M	DEC	Z

## 8 · OTHER

### 8.1 Caution

8.1.1 Don't apply excess mechanical stress to the component and terminals at soldering. Do not use this product with bend.

8.1.2 Do not clean or wash the component for it is not hermetically sealed.

8.1.3 Do not use strong acidity flux , more than 0.2wt% chlorine content , in flow soldering.

8.1.4 Don't be close to fire.

8.1.5 All kinds of re-flow soldering must not be applied on the component.

8.1.6 This specification mentions the quality of the component as a single unit. Please insure the component is thoroughly evaluated in your application circuit

8.1.7 Expire date (Shelf life) of the products is one year after delivery under the conditions of a sealed and an unopened package. Please use the products within 6 months after delivery. If you store the products for a long time (more than 6 months), use carefully because the products may be degraded in the solderability or rusty. Please confirm solderability and characteristics for the products regularly.

8.1.8 Please contact us before using the product as automobile electronic component.

### 8.2 Notice

8.2.1 Please return one of this specification after your signature of acceptance.

8.2.2 When something gets doubtful with this specifications, we shall jointly work to get an agreement.