

# Ceramic Filters (CERAFIL®) / Ceramic Discriminators for Communications Equipment



**muRata**

*Innovator  
in Electronics*

Murata  
Manufacturing Co., Ltd.

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● Part Numbering

Ceramic Filters (CERAFIL<sup>®</sup>) for IF

(Part Number)

CF

X

CE

450K

CFA

001

-R0

SF

P

KA

455K

D4A

-R0

SF

E

CS

10M8

PF00

00

-R0

1

2

3

4

5

6

7

- 1Product ID
- 2Oscillating/Element

| Product ID |                 | Oscillating/Element |                                     |
|------------|-----------------|---------------------|-------------------------------------|
| CF         | Ceramic Filters | U                   | 4 Elements Area Expansion mode      |
|            |                 | W                   | 6 Elements Area Expansion mode      |
|            |                 | X                   | 4 Elements Length mode              |
| SF         |                 | P                   | 4 Elements Area Expansion mode      |
|            |                 | E                   | 2 Elements Thickness Expansion mode |
|            |                 | S                   | 2 Elements Thickness Shear mode     |
|            |                 | J                   | 4 Elements Thickness Shear mode     |

3Structure/Size

| Code  | Structure/Size |
|-------|----------------|
| C□/K□ | Chip Type      |
| L□    | Lead Type      |

□ is "A" or subsequent code, which indicates the size. It varies depending on vibration mode and number of elements.  
Chip type is only applied for SF series.

4Nominal Center Frequency

Expressed by four-digit alphanumerics. The unit is hertz (Hz). If the unit is "kHz", it is expressed by three figures plus "K". If the unit is "MHz", a decimal point is expressed by the capital letter "M".

5Product Specification

| Code | Product Specification                                                                          |
|------|------------------------------------------------------------------------------------------------|
| CFA  | Three-digit alphanumerics express pass band width, center frequency tolerance and design type. |

SFE/S/J series are expressed by four-digit alphanumerics.

6Individual Specification

| Code | Individual Specification Code           |
|------|-----------------------------------------|
| 001  | Expressed by three-digit alphanumerics. |

SFE/S/J series are expressed by two-digit alphanumerics.  
With standard type, 6 is omitted.

7Packaging

| Code | Packaging              |
|------|------------------------|
| -B0  | Bulk                   |
| -R0  | Plastic Taping ø=180mm |
| -R1  | Plastic Taping ø=330mm |
| -M0  | Magazine               |

Magazine cassette is applied to lead type and plastic taping to chip type.

## Ceramic Discriminators for IF (kHz)

(Part Number) 

|    |   |    |      |   |   |   |    |     |
|----|---|----|------|---|---|---|----|-----|
| CD | B | LB | 450K | C | A | X | 16 | -B0 |
|----|---|----|------|---|---|---|----|-----|

  
123456789

### ① Product ID

| Product ID |                        |
|------------|------------------------|
| CD         | Ceramic Discriminators |

### ② Oscillating

| Code | Oscillating         |
|------|---------------------|
| B    | Area Expansion mode |

### ③ Structure/Size

| Code  | Structure/Size |
|-------|----------------|
| C□/K□ | Chip Type      |
| L□    | Lead Type      |

□ is "A" or subsequent code, which indicates the size. It varies depending on vibration mode and number of elements.

### ④ Nominal Center Frequency

Expressed by four-digit alphanumerics. The unit is in hertz (Hz). Capital letter "K" following three figures expresses the unit of "kHz".

### ⑤ Detection

| Code | Detection            |
|------|----------------------|
| C    | Quadrature Detection |

### ⑥ Application

| Code | Application           |
|------|-----------------------|
| A    | Standard              |
| L    | Application with coil |

### ⑦ Element Type

| Code | Element Type     |
|------|------------------|
| X    | Low-capacitance  |
| Y    | High-capacitance |

### ⑧ IC

| Code | IC                         |
|------|----------------------------|
| 16   | Applicable IC Control code |

### ⑨ Packaging

| Code | Packaging              |
|------|------------------------|
| -B0  | Bulk                   |
| -R0  | Plastic Taping ø=180mm |
| -R1  | Plastic Taping ø=330mm |
| -M0  | Magazine               |

Magazine cassette is applied to lead type and plastic taping to chip type. With non-standard products, one letter indicating "Individual Specification" is added between "⑧Applicable IC" and "⑨Package Specification code".

## Ceramic Discriminators for IF (MHz)

(Part Number) 

|    |   |    |      |    |     |     |
|----|---|----|------|----|-----|-----|
| CD | S | CB | 10M7 | GF | 001 | -R0 |
|----|---|----|------|----|-----|-----|

  
1234567

### ① Product ID

| Product ID |                |
|------------|----------------|
| CD         | Discriminators |

### ② Oscillation

| Code | Oscillation          |
|------|----------------------|
| S    | Thickness Shear mode |

### ③ Structure/Size

| Code | Structure/Size |
|------|----------------|
| C□   | Chip Type      |

□ is expressed "A" or subsequent code, which indicates the size.

### ④ Nominal Center Frequency

Expressed by four-digit alphanumerics. The unit is in hertz (MHz). Decimal point is expressed by capital letter "M".

### ⑤ Product Specification

| Code | Product Specification                                                |
|------|----------------------------------------------------------------------|
| GF   | Two-digit alphanumerics express type, center frequency, rank, others |

### ⑥ IC

| Code | IC                         |
|------|----------------------------|
| 001  | Applicable IC Control Code |

### ⑦ Packaging

| Code | Packaging              |
|------|------------------------|
| -R0  | Plastic Taping ø=180mm |

With non-standard products, an alphanumerics indicating "Individual Specification" is added between "⑥IC" and "⑦Packaging".

## Products Guide

### ●SMD Type (kHz)

| Type                                                                         | Applications                 | General Use              |     |                   |                  |      |    |      |    |    |      |    | Attenuation<br>(dB) min. |
|------------------------------------------------------------------------------|------------------------------|--------------------------|-----|-------------------|------------------|------|----|------|----|----|------|----|--------------------------|
|                                                                              |                              | AMPS                     | PDC | PAGER<br>CORDLESS | TACS<br>CORDLESS | AM   |    |      |    |    |      |    |                          |
|                                                                              | Series                       | 6dB Bandwidth (kHz) min. |     |                   |                  |      |    |      |    |    |      |    |                          |
|                                                                              |                              | A                        | B   | C                 | D                | E    | F  | G    | H  | J  | K    | L  |                          |
|                                                                              |                              | ±17.5                    | ±15 | ±12.5             | ±10              | ±7.5 | ±6 | ±4.5 | ±3 | ±2 | ±1.5 | ±1 | Within 455±80 or ±100kHz |
| High Selectivity Series<br>(Plastic Case Type)                               | SFPKA455K□<br>(4 Elements)   | —                        | —   | —                 | ●                | ●    | ●  | ●    | ●  | —  | —    | —  | 27 (G to H ; 25)         |
|                                                                              | CFUKG455K□<br>(4 Elements)   | —                        | —   | —                 | ●                | ●    | ●  | ●    | ●  | —  | —    | —  | 27 (G ; 25)              |
| Narrow Bandwidth<br>GDT Flat Type<br>Miniature Series<br>(Plastic Case Type) | CFUKG455K□X<br>(4 Elements)  | —                        | —   | —                 | ●                | ●    | ●  | ●    | ●  | —  | —    | —  | 27 (G to H ; 25)         |
| GDT Flat Type<br>Miniature Series<br>(Plastic Case Type)                     | CFUKF455K□<br>(4 Elements)   | ●                        | ●   | ●                 | ●                | ●    | —  | —    | —  | —  | —    | —  | 25 (D to E ; 23)         |
| GDT Flat Type<br>High Selectivity<br>SMD Series<br>(Plastic Case Type)       | CFWKA450KBFY<br>(6 Elements) | —                        | ●   | —                 | —                | —    | —  | —    | —  | —  | —    | —  | 45                       |
| High Selectivity<br>SMD Series<br>(Plastic Case Type)                        | CFWKA450K□<br>(6 Elements)   | —                        | ●   | —                 | ●                | ●    | ●  | ●    | —  | —  | —    | —  | 50                       |
| Ultra Small<br>Package Series<br>(Cap Package)                               | CFXCE<br>(4 Elements)        | —                        | —   | ●                 | —                | —    | —  | —    | —  | —  | —    | —  | 47                       |

### ●Lead Type (kHz)

| Type                                   | Applications             | General Use              |     |                   |                  |      |    |      |    |    |      |    | Attenuation<br>(dB) min.                |
|----------------------------------------|--------------------------|--------------------------|-----|-------------------|------------------|------|----|------|----|----|------|----|-----------------------------------------|
|                                        |                          | AMPS                     | PDC | PAGER<br>CORDLESS | TACS<br>CORDLESS | AM   |    |      |    |    |      |    |                                         |
|                                        | Series                   | 6dB Bandwidth (kHz) min. |     |                   |                  |      |    |      |    |    |      |    |                                         |
|                                        |                          | A                        | B   | C                 | D                | E    | F  | G    | H  | J  | K    | L  |                                         |
|                                        |                          | ±17.5                    | ±15 | ±12.5             | ±10              | ±7.5 | ±6 | ±4.5 | ±3 | ±2 | ±1.5 | ±1 | Within 455±80 or ±100kHz                |
| High Selectivity<br>Low Profile Series | CFULA455K□ (4 Elements)  | —                        | ●   | ●                 | ●                | ●    | ●  | ●    | ●  | —  | —    | —  | 27 <sup>(G ; 25)</sup><br>(H, J ; 35)   |
|                                        | CFWLA455K□ (6 Elements)  | —                        | ●   | ●                 | ●                | ●    | ●  | ●    | ●  | ●  | —    | —  | 35 (H, J ; 60)                          |
| High Selectivity<br>Miniature Series   | CFULB455K□ (4 Elements)  | —                        | ●   | ●                 | ●                | ●    | ●  | ●    | ●  | ●  | —    | —  | 27 <sup>(G ; 25)</sup><br>(H, J ; 35)   |
|                                        | CFWLB455K□ (6 Elements)  | —                        | ●   | ●                 | ●                | ●    | ●  | ●    | ●  | ●  | —    | —  | 35 (H, J ; 65)                          |
| GDT Flat Type<br>Series                | CFULA455K□Y (4 Elements) | —                        | ●   | ●                 | ●                | ●    | ●  | ●    | —  | —  | —    | —  | 25 <sup>(D to F ; 23)</sup><br>(G ; 20) |
|                                        | CFWLA455K□Y (6 Elements) | ●                        | ●   | ●                 | ●                | ●    | ●  | ●    | —  | —  | —    | —  | 35                                      |
| GDT Flat Type<br>Miniature Series      | CFULB455K□Y (4 Elements) | —                        | ●   | ●                 | ●                | ●    | ●  | ●    | —  | —  | —    | —  | 25 <sup>(D to F ; 23)</sup><br>(G ; 20) |
|                                        | CFWLB455K□Y (6 Elements) | ●                        | ●   | ●                 | ●                | ●    | ●  | ●    | —  | —  | —    | —  | 35                                      |

# Ceramic Filters (CERAFIL®)/Ceramic Discriminators for Communications Equipment



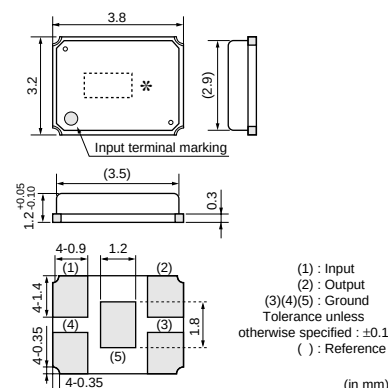
1

## CERAFIL® kHz SMD Type CFXCE Series

CFXCE series are very small and high-efficiency surface mount, ladder type 450/455 kHz ceramic filters "CERAFIL" for IF section.

Compared to our previous compact surface mounted 6-element product, this ceramic filter has been significantly downsized to approximately one-third the original volume and reduced to less than 2mm in height.

As for electrical performance, this product, which consists of 4 elements, provides stop band attenuation equivalent to that of our previous 6-element product. The input/output impedance characteristics are also equivalent to those of the previous product, and spurious responses in the vicinity of the passing band can now be eliminated. This allows mobile telecommunications equipment manufacturers to easily design the periphery of the IF section and thus greatly enhance the interference suppression capability of the equipment. In addition, this ceramic filter provides flatter group delay time characteristics than the previous product, and will effectively work as a component for data transmission in digital mobile telecommunications systems.



### ■ Features

1. Compact, thin, and lightweight  
Size: 3.8x3.2x1.25mm  
Weight: 40mg
2. Out-of-band attenuation is increased and spurious responses are greatly decreased.
3. Group delay time characteristics are flattened.
4. Surface mountable, and reflow soldering can be used for mounting. Available lead (Pb) free solder reflow

### ■ Applications

1. IF filters for PDCs
2. IF filters for various types of pagers
3. IF filters for various types of analog and digital cellular telephones
4. IF filters for radio communication circuits applicable for PDA or PCMCIA
5. IF filters for other general mobile wireless equipment

| Part Number            | Nominal Center Frequency (fn) (kHz) | 3dB Bandwidth (kHz)     | 6dB Bandwidth | Stop Bandwidth (kHz)       | Stop Band Attenuation (dB) | Stop Band Att.(2) (dB)              | Stop Band Att.(3) (dB)     | Insertion Loss (dB) | Ripple (dB)                  | GDT Deviation (μs)            |
|------------------------|-------------------------------------|-------------------------|---------------|----------------------------|----------------------------|-------------------------------------|----------------------------|---------------------|------------------------------|-------------------------------|
| <b>CFXCE450KCFA-R1</b> | 450                                 | fn±9.0 to ±12.0kHz max. | -             | fn±35.0 max. [within 50dB] | 30 min. [at fn±25kHz]      | 55 min. [within fn±40kHz to ±50kHz] | 47 min. [within fn±100kHz] | 6.0 max. [at fn]    | 0.5 max. [within fn±10.5kHz] | 27.0 max. [within fn±10.5kHz] |

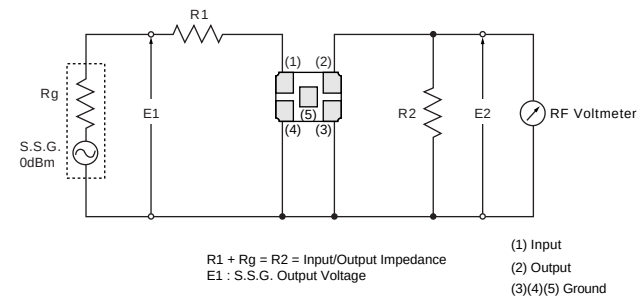
Spurious:40dB [within 0.1 to 1.0MHz]

Input/Output Impedance: 2000 ohm

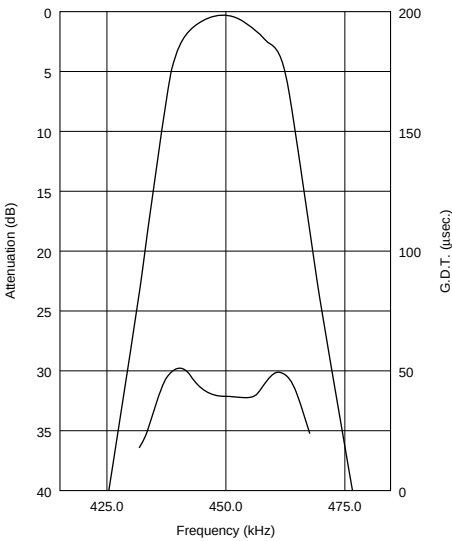
For safety purposes, connect the output of filters to the IF amplifier through a D.C. blocking capacitor. Avoid applying a direct current to the output of ceramic filters.

The order quantity should be an integral multiple of the "Minimum Quantity" shown in package page in this catalog.

■ Test Circuit



■ Frequency Characteristics



## Ceramic Filters (CERAFIL®)/Ceramic Discriminators for Communications Equipment

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### CERAFIL® kHz SMD Type SFPKA Series

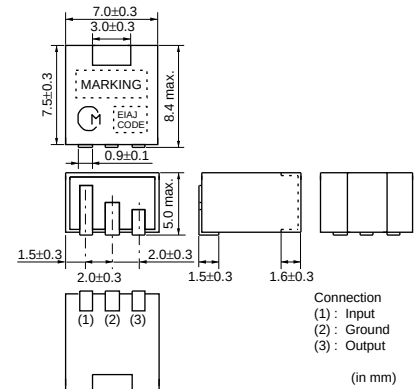
2

The SFPKA series is comprised of small, high performance, economical, thin (5.0mm) filters consisting of 4 ceramic elements.

Their innovative construction is perfect for shrinking mobile communication products such as cordless phones, pager and transceivers.

#### ■ Features

1. The filters are mountable by automatic placers.
2. The filters can be reflow soldered and withstand washing.
3. They are slim, at only 5.0mm maximum thickness.
4. The bandwidth ranges from D to H.
5. Operating temperature range: -20 to +80 (degree C)  
Storage temperature range: -40 to +85 (degree C)



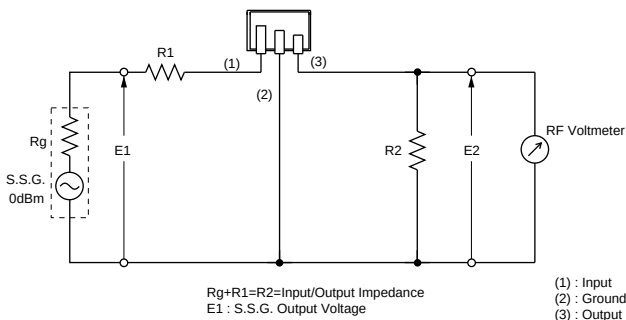
| Part Number            | Center Frequency (fo) (kHz) | 6dB Bandwidth (kHz) | Stop Bandwidth (kHz)          | Stop Band Attenuation (dB)    | Insertion Loss (dB)                 | Ripple (dB)                  | Input/Output Impedance (ohm) |
|------------------------|-----------------------------|---------------------|-------------------------------|-------------------------------|-------------------------------------|------------------------------|------------------------------|
| <b>SFPKA455KD4A-R1</b> | 455.0<br>±1.5kHz            | fn±10.0<br>min.     | fn±20.0 max.<br>[within 40dB] | 27 min.<br>[within fn±100kHz] | 4.0 max.<br>[at minimum loss point] | 2.0 max.<br>[within fn±7kHz] | 1500                         |
| <b>SFPKA455KE4A-R1</b> | 455.0<br>±1.5kHz            | fn±7.5<br>min.      | fn±15.0 max.<br>[within 40dB] | 27 min.<br>[within fn±100kHz] | 6.0 max.<br>[at minimum loss point] | 1.5 max.<br>[within fn±5kHz] | 1500                         |
| <b>SFPKA455KF4A-R1</b> | 455.0<br>±1.5kHz            | fn±6.0<br>min.      | fn±12.5 max.<br>[within 40dB] | 27 min.<br>[within fn±100kHz] | 6.0 max.<br>[at minimum loss point] | 1.5 max.<br>[within fn±4kHz] | 1500                         |
| <b>SFPKA455KG1A-R1</b> | 455.0<br>±1.0kHz            | fn±4.5<br>min.      | fn±10.0 max.<br>[within 40dB] | 25 min.<br>[within fn±100kHz] | 6.0 max.<br>[at minimum loss point] | 1.5 max.<br>[within fn±3kHz] | 1500                         |
| <b>SFPKA455KH1A-R1</b> | 455.0<br>±1.0kHz            | fn±3.0<br>min.      | fn±9.0 max.<br>[within 40dB]  | 35 min.<br>[within fn±100kHz] | 6.0 max.<br>[at minimum loss point] | 1.5 max.<br>[within fn±2kHz] | 2000                         |

Center frequency (fo) defined by the center of 6dB bandwidth.

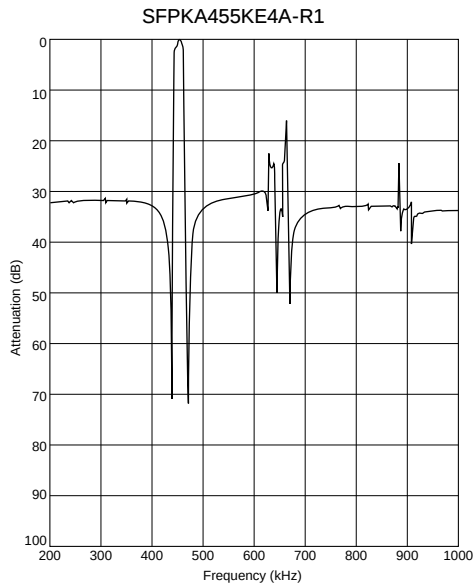
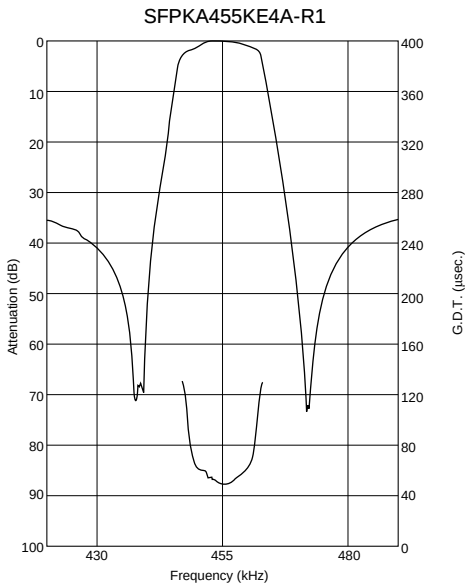
(fn) means nominal center frequency 455kHz.

For safety purposes, connect the output of filters to the IF amplifier through a D.C. blocking capacitor. Avoid applying a direct current to the output of ceramic filters.  
The order quantity should be an integral multiple of the "Minimum Quantity" shown in package page in this catalog.

#### ■ Test Circuit



■ Frequency Characteristics



## Ceramic Filters (CERAFIL®)/Ceramic Discriminators for Communications Equipment

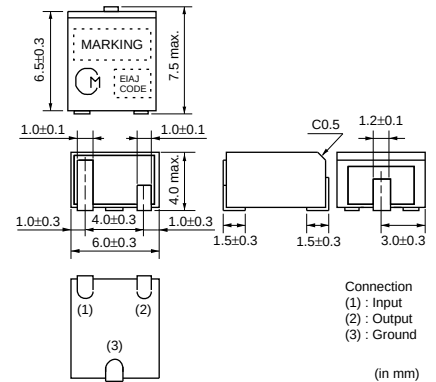
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### CERAFIL® kHz SMD Type CFUKG Series

The CFUKG series is comprised of small, high performance, thin (4.0mm) filters consisting of 4 ceramic elements. Their innovative construction is perfect for shrinking mobile communication products such as pocket pagers and cellular phones.

#### ■ Features

1. The filters are mountable by automatic placers.
2. The filters can be reflow soldered and withstand washing.
3. They are slim, at only 4.0mm maximum thickness, and have a small mounting area (7.5x6.0mm) enabling flexible PCB design.
4. The bandwidth ranges from D to G.
5. Operating temperature range: -20 to +80 (degree C)  
Storage temperature range: -40 to +85 (degree C)



| Part Number            | Center Frequency (fo) (kHz) | 6dB Bandwidth (kHz) | Stop Bandwidth (kHz)          | Stop Band Attenuation (dB)    | Insertion Loss (dB)                 | Ripple (dB)                  | Input/Output Impedance (ohm) |
|------------------------|-----------------------------|---------------------|-------------------------------|-------------------------------|-------------------------------------|------------------------------|------------------------------|
| <b>CFUKG455KD4A-R0</b> | 455.0<br>±1.5kHz            | fn±10.0<br>min.     | fn±20.0 max.<br>[within 40dB] | 27 min.<br>[within fn±100kHz] | 4.0 max.<br>[at minimum loss point] | 2.0 max.<br>[within fn±7kHz] | 1500                         |
| <b>CFUKG455KE4A-R0</b> | 455.0<br>±1.5kHz            | fn±7.5<br>min.      | fn±15.0 max.<br>[within 40dB] | 27 min.<br>[within fn±100kHz] | 6.0 max.<br>[at minimum loss point] | 1.5 max.<br>[within fn±5kHz] | 1500                         |
| <b>CFUKG455KF4A-R0</b> | 455.0<br>±1.5kHz            | fn±6.0<br>min.      | fn±12.5 max.<br>[within 40dB] | 27 min.<br>[within fn±100kHz] | 6.0 max.<br>[at minimum loss point] | 1.5 max.<br>[within fn±4kHz] | 1500                         |
| <b>CFUKG455KG1A-R0</b> | 455.0<br>±1.0kHz            | fn±4.5<br>min.      | fn±10.0 max.<br>[within 40dB] | 25 min.<br>[within fn±100kHz] | 6.0 max.<br>[at minimum loss point] | 1.5 max.<br>[within fn±3kHz] | 1500                         |

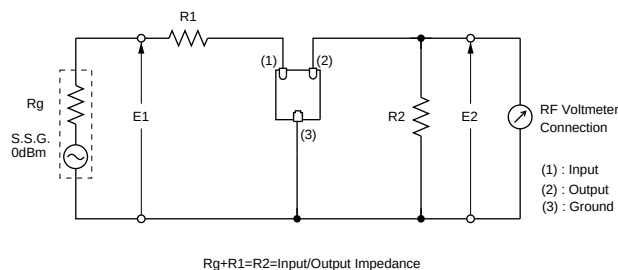
Center frequency (fo) defined by the center of 6dB bandwidth.

(fn) means nominal center frequency 455kHz.

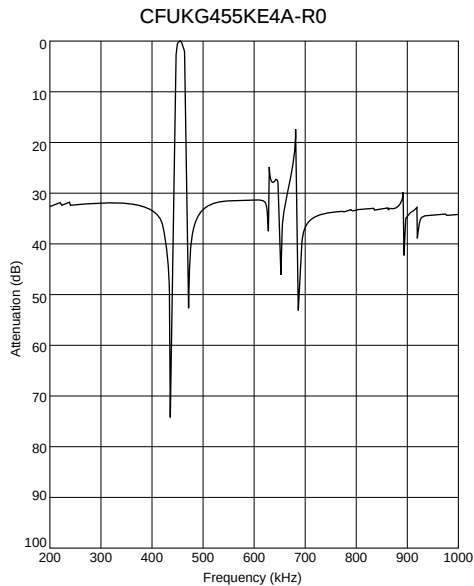
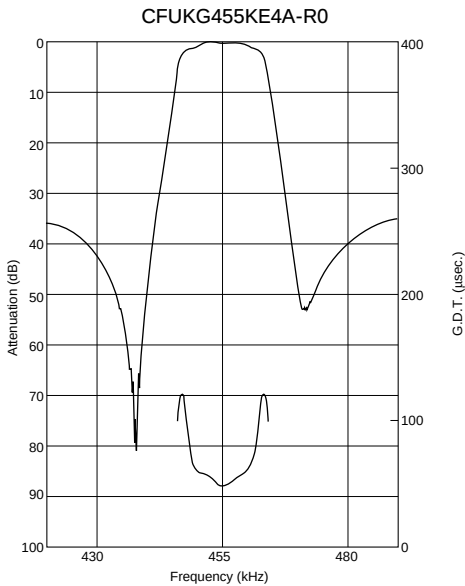
For safety purposes, connect the output of filters to the IF amplifier through a D.C. blocking capacitor. Avoid applying a direct current to the output of ceramic filters.

The order quantity should be an integral multiple of the "Minimum Quantity" shown in package page in this catalog.

#### ■ Test Circuit



■ Frequency Characteristics

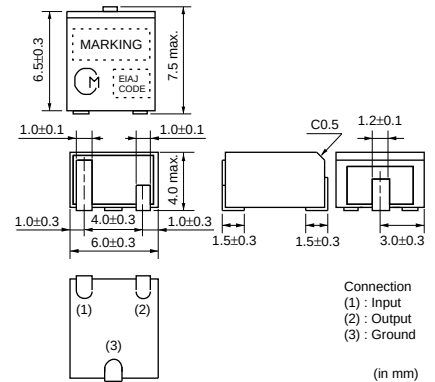


## Ceramic Filters (CERAFIL®)/Ceramic Discriminators for Communications Equipment



### CERAFIL® kHz SMD Type CFUKG\_X Series

The CFUKG\_X series is comprised of small, high performance, thin (4.0mm) filters consisting of 4 ceramic elements. The filters exhibit an extremely flat GDT characteristic combined with a narrow bandwidth. The filters are recommended for narrow band digital communication applications.



#### ■ Features

1. The filters are mountable by automatic placers.
2. The filters can be reflow soldered and withstand washing.
3. They are slim, at only 4.0mm maximum thickness, and have a small mounting area (7.5x6.0mm) enabling flexible PCB design.
4. The bandwidth ranges from E to H.
5. Operating temperature range: -20 to +80 (degree C)  
Storage temperature range: -40 to +85 (degree C)

| Part Number            | Center Frequency (fo) (kHz) | 6dB Bandwidth (kHz) | Stop Bandwidth (kHz)          | Stop Band Attenuation (dB)    | Insertion Loss (dB)                 | Ripple (dB)                  | GDT Deviation (μs)            | Input/Output Impedance (ohm) |
|------------------------|-----------------------------|---------------------|-------------------------------|-------------------------------|-------------------------------------|------------------------------|-------------------------------|------------------------------|
| <b>CFUKG455KE4X-R0</b> | 455.0<br>±1.5kHz            | fn±7.5<br>min.      | fn±17.5 max.<br>[within 40dB] | 27 min.<br>[within fn±100kHz] | 6.0 max.<br>[at minimum loss point] | 1.0 max.<br>[within fn±5kHz] | 25.0 max.<br>[within fn±5kHz] | 1500                         |
| <b>CFUKG455KF4X-R0</b> | 455.0<br>±1.5kHz            | fn±6.0<br>min.      | fn±15.0 max.<br>[within 40dB] | 27 min.<br>[within fn±100kHz] | 6.0 max.<br>[at minimum loss point] | 1.0 max.<br>[within fn±4kHz] | 25.0 max.<br>[within fn±4kHz] | 1500                         |
| <b>CFUKG455KG1X-R0</b> | 455.0<br>±1.0kHz            | fn±4.5<br>min.      | fn±12.5 max.<br>[within 40dB] | 25 min.<br>[within fn±100kHz] | 6.0 max.<br>[at minimum loss point] | 1.0 max.<br>[within fn±3kHz] | 25.0 max.<br>[within fn±3kHz] | 1500                         |
| <b>CFUKG455KH1X-R0</b> | 455.0<br>±1.0kHz            | fn±3.0<br>min.      | fn±10.0 max.<br>[within 40dB] | 25 min.<br>[within fn±100kHz] | 7.0 max.<br>[at minimum loss point] | 1.0 max.<br>[within fn±2kHz] | 25.0 max.<br>[within fn±2kHz] | 1500                         |

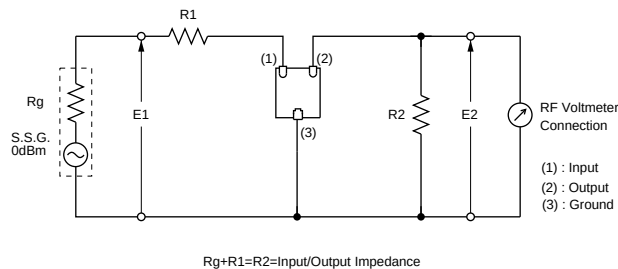
Center frequency (fo) defined by the center of 6dB bandwidth.

(fn) means nominal center frequency 455kHz.

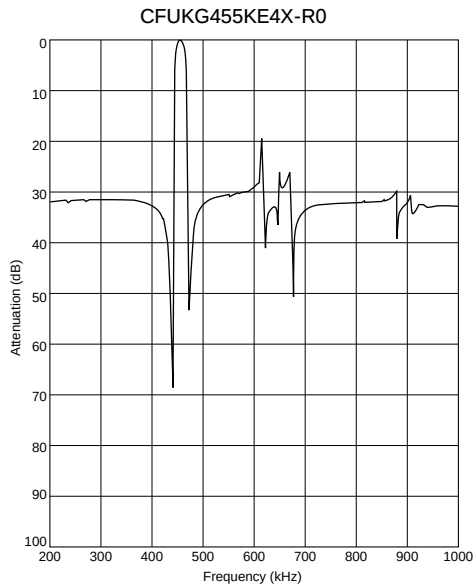
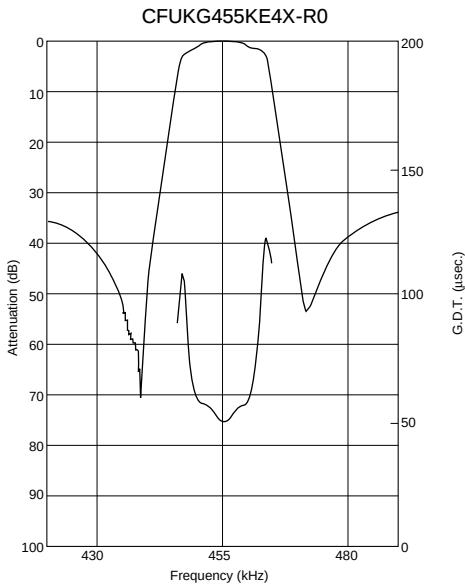
For safety purposes, connect the output of filters to the IF amplifier through a D.C. blocking capacitor. Avoid applying a direct current to the output of ceramic filters.

The order quantity should be an integral multiple of the "Minimum Quantity" shown in package page in this catalog.

#### ■ Test Circuit



Frequency Characteristics



## Ceramic Filters (CERAFIL®)/Ceramic Discriminators for Communications Equipment

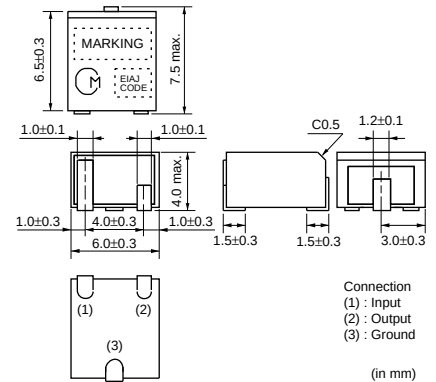
**muRata**

### CERAFIL® kHz SMD Type CFUKF Series

The CFUKF series is comprised of small, high performance, thin (4.0mm) filters consisting of 4 ceramic elements. The filters exhibit an extremely flat GDT characteristic. The filters are recommended for digital communication applications and are perfect in hand held cellular phones, etc.

#### ■ Features

1. The filters are mountable by automatic placers.
2. The filters can be reflow soldered and withstand washing.
3. They are slim, at only 4.0mm maximum thickness, and have a small mounting area (7.5x6.0mm) enabling flexible PCB design.
4. The bandwidth ranges from A to E.
5. Operating temperature range: -20 to +80 (degree C)  
Storage temperature range: -40 to +85 (degree C)



| Part Number            | Center Frequency (fo) (kHz) | 6dB Bandwidth (kHz) | Stop Bandwidth (kHz)          | Stop Band Attenuation (dB)    | Insertion Loss (dB)                 | Ripple (dB)                   | GDT Deviation (μs)             | Input/Output Impedance (ohm) |
|------------------------|-----------------------------|---------------------|-------------------------------|-------------------------------|-------------------------------------|-------------------------------|--------------------------------|------------------------------|
| <b>CFUKF455KA2X-R0</b> | 455.0<br>±2.0kHz            | fn±17.5<br>min.     | fn±40.0 max.<br>[within 40dB] | 25 min.<br>[within fn±100kHz] | 4.0 max.<br>[at minimum loss point] | 1.0 max.<br>[within fn±12kHz] | 15.0 max.<br>[within fn±12kHz] | 1000                         |
| <b>CFUKF455KB4X-R0</b> | 455.0<br>±1.5kHz            | fn±15.0<br>min.     | fn±35.0 max.<br>[within 40dB] | 25 min.<br>[within fn±100kHz] | 5.0 max.<br>[at minimum loss point] | 1.0 max.<br>[within fn±10kHz] | 15.0 max.<br>[within fn±10kHz] | 1000                         |
| <b>CFUKF455KC4X-R0</b> | 455.0<br>±1.5kHz            | fn±12.5<br>min.     | fn±30.0 max.<br>[within 40dB] | 25 min.<br>[within fn±100kHz] | 6.0 max.<br>[at minimum loss point] | 1.0 max.<br>[within fn±8kHz]  | 15.0 max.<br>[within fn±8kHz]  | 1000                         |
| <b>CFUKF455KD1X-R0</b> | 455.0<br>±1.0kHz            | fn±10.0<br>min.     | fn±25.0 max.<br>[within 40dB] | 23 min.<br>[within fn±100kHz] | 7.0 max.<br>[at minimum loss point] | 1.0 max.<br>[within fn±7kHz]  | 20.0 max.<br>[within fn±7kHz]  | 1500                         |
| <b>CFUKF455KE1X-R0</b> | 455.0<br>±1.0kHz            | fn±7.5<br>min.      | fn±20.0 max.<br>[within 40dB] | 23 min.<br>[within fn±100kHz] | 8.0 max.<br>[at minimum loss point] | 1.0 max.<br>[within fn±5kHz]  | 20.0 max.<br>[within fn±5kHz]  | 1500                         |

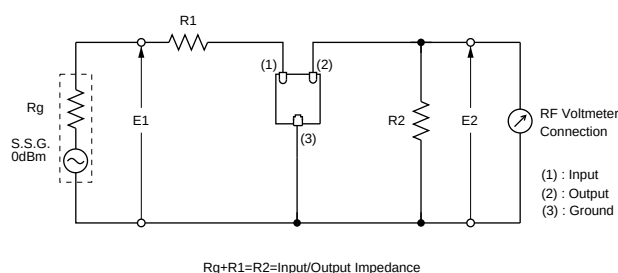
Center frequency (fo) defined by the center of 6dB bandwidth.

(fn) means nominal center frequency 455kHz.

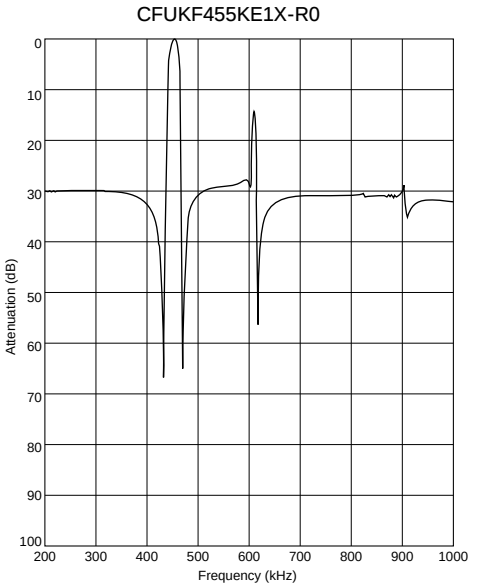
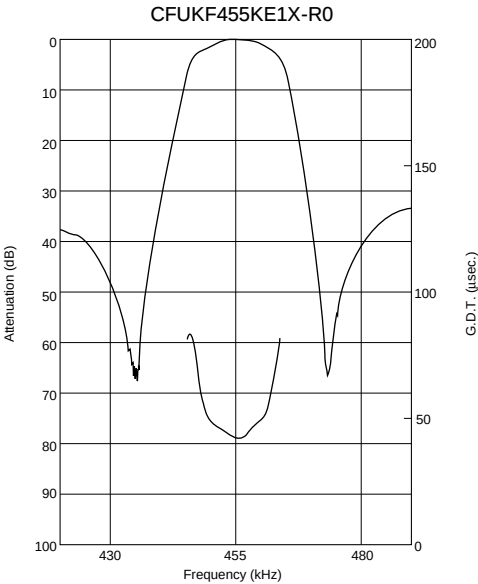
For safety purposes, connect the output of filters to the IF amplifier through a D.C. blocking capacitor. Avoid applying a direct current to the output of ceramic filters.

The order quantity should be an integral multiple of the "Minimum Quantity" shown in package page in this catalog.

#### ■ Test Circuit



■ Frequency Characteristics



## Ceramic Filters (CERAFIL®) / Ceramic Discriminators for Communications Equipment

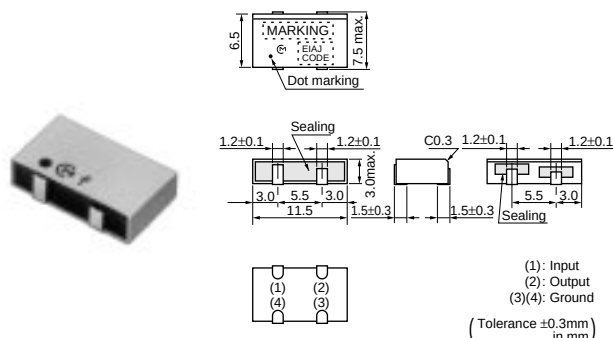


## CERAFIL® kHz SMD Type CFWKA Series

The CFWKA series is comprised of small, high performance, thin (3.0mm) filters consisting of 6 ceramic elements. The filters are recommend for pager or hand held cellular phones.

## ■ Features

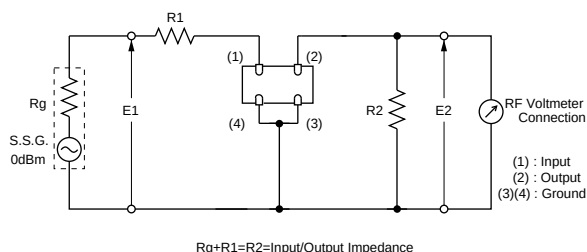
1. The filters are mountable by automatic placers.
2. The filters can be reflow soldered.
3. They are slim, at only 3.0mm maximum thickness.
4. The filters are wide bandwidth, flat GDT within pass band.
5. Operating temperature range: -20 to +80 (degree C)  
Storage temperature range: -40 to +85 (degree C)



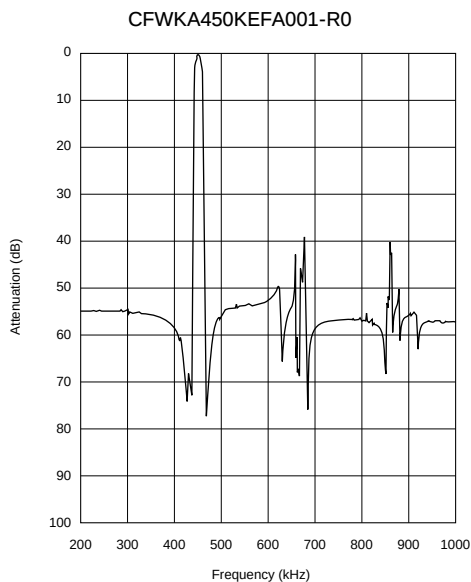
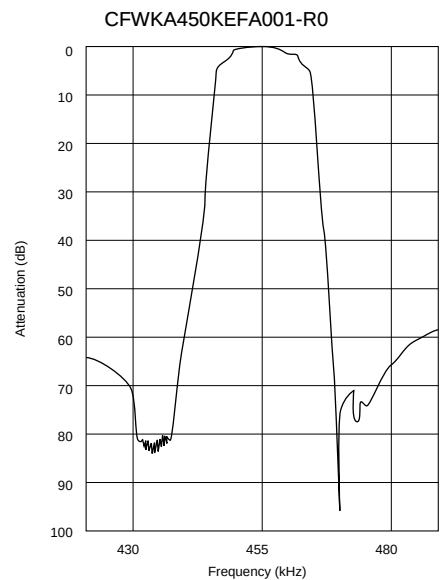
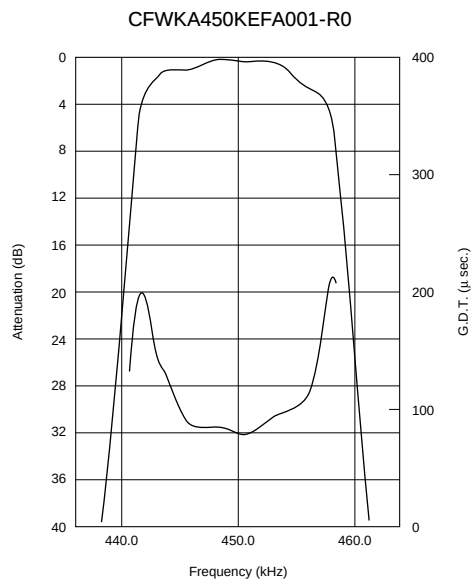
| Part Number               | Nominal Center Frequency (fn)<br>(kHz) | 3dB Bandwidth<br>(kHz) | 6dB Bandwidth<br>(kHz) | Stop Bandwidth<br>(kHz)       | Stop Band Attenuation<br>(dB) | Stop Band Att.(2)<br>(dB)     | Insertion Loss<br>(dB)              | Ripple<br>(dB)                 | Input/Output Impedance<br>(ohm) |
|---------------------------|----------------------------------------|------------------------|------------------------|-------------------------------|-------------------------------|-------------------------------|-------------------------------------|--------------------------------|---------------------------------|
| <b>CFWKA450KDFA-R0</b>    | 450                                    | -                      | fn±10.0 min.           | fn±20.0 max.<br>[within 50dB] | 50 min.<br>[within fn±100kHz] | -                             | 4.0 max.<br>[at minimum loss point] | 3.0 max.<br>[within fn±7kHz]   | 1500                            |
| <b>CFWKA450KEFA-R0</b>    | 450                                    | -                      | fn±7.5 min.            | fn±15.0 max.<br>[within 50dB] | 50 min.<br>[within fn±100kHz] | -                             | 6.0 max.<br>[at minimum loss point] | 3.0 max.<br>[within fn±5kHz]   | 1500                            |
| <b>CFWKA450KEFA001-R0</b> | 450                                    | fn±6.5 min.            | -                      | fn±15.0 max.<br>[within 50dB] | 55 min.<br>[fn±18 to ±33kHz]  | 50 min.<br>[within fn±100kHz] | 4.0 max.<br>[at fn]                 | 3.0 max.<br>[within fn±6.5kHz] | 1500                            |
| <b>CFWKA450KFFA-R0</b>    | 450                                    | -                      | fn±6.0 min.            | fn±12.5 min.<br>[within 50dB] | 50 min.<br>[within fn±100kHz] | -                             | 6.0 max.<br>[at minimum loss point] | 3.0 max.<br>[within fn±4kHz]   | 1500                            |
| <b>CFWKA450KGFA-R0</b>    | 450                                    | -                      | fn±4.5 min.            | fn±11.0 max.<br>[within 50dB] | 50 min.<br>[within fn±100kHz] | -                             | 6.0 max.<br>[at minimum loss point] | 2.0 max.<br>[within fn±3kHz]   | 1500                            |

For safety purposes, connect the output of filters to the IF amplifier through a D.C. blocking capacitor. Avoid applying a direct current to the output of ceramic filters. The order quantity should be an integral multiple of the "Minimum Quantity" shown in package page in this catalog.

## ■ Test Circuit



Frequency Characteristics



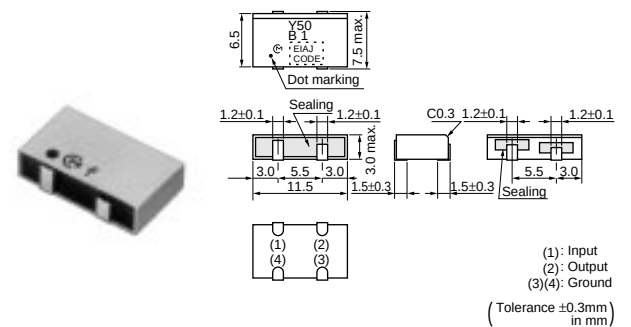
Ceramic Filters (CERAFIL®)/Ceramic Discriminators for Communications Equipment

**CERAFIL® kHz SMD Type CFWKA\_Y Series**

The CFWKA\_Y series is comprised of small, high performance, thin (3.0mm) filters consisting of 6 ceramic elements. The filters are recommend for digital communication applications and are perfect in hand held cellular phones.

■ Features

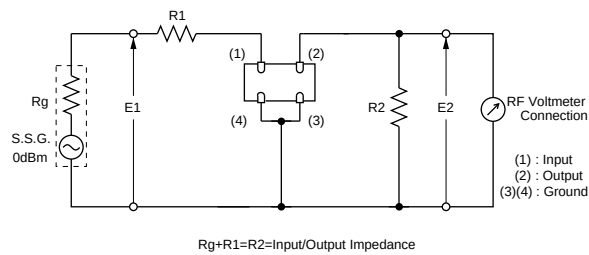
- 1. The filters are mountable by automatic placers, and can be reflow soldered.
- 2. They are slim, at only 3.0mm maximum thickness.
- 3. The filters are wide bandwidth, flat GDT within pass band.
- 4. Operating temperature range: -20 to +80 (degree C)  
Storage temperature range: -40 to +85 (degree C)



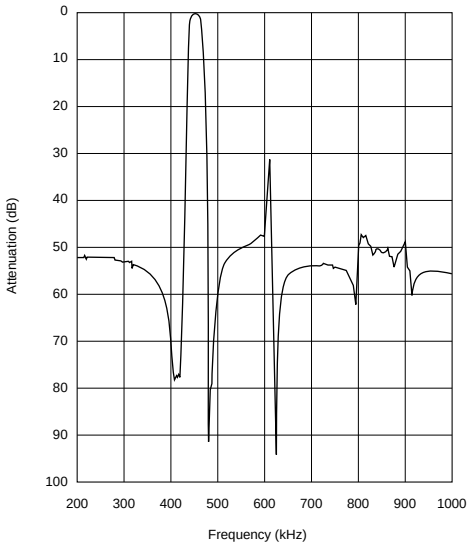
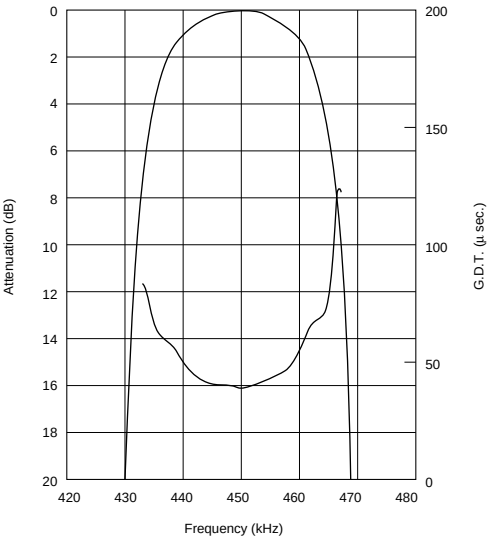
| Part Number        | Nominal Center Frequency (fn) (kHz) | 3dB Bandwidth (kHz) | 6dB Bandwidth (kHz) | Stop Bandwidth (kHz)       | Stop Band Attenuation (dB) | Insertion Loss (dB)              | Spurious Response (dB)         | GDT Deviation (μs)          | Input/Output Impedance (ohm) |
|--------------------|-------------------------------------|---------------------|---------------------|----------------------------|----------------------------|----------------------------------|--------------------------------|-----------------------------|------------------------------|
| CFWKA450KBFY001-R0 | 450                                 | fn±11.5 min.        | fn±13.0 min.        | fn±30.0 max. [within 50dB] | 45 min. [within fn±100kHz] | 4.0 max. [at minimum loss point] | 20 min. [within 0.1 to 1.0MHz] | 30.0 max. [within fn±10kHz] | 1000                         |

For safety purposes, connect the output of filters to the IF amplifier through a D.C. blocking capacitor. Avoid applying a direct current to the output of ceramic filters. The order quantity should be an integral multiple of the "Minimum Quantity" shown in package page in this catalog.

■ Test Circuit



■ Frequency Characteristics



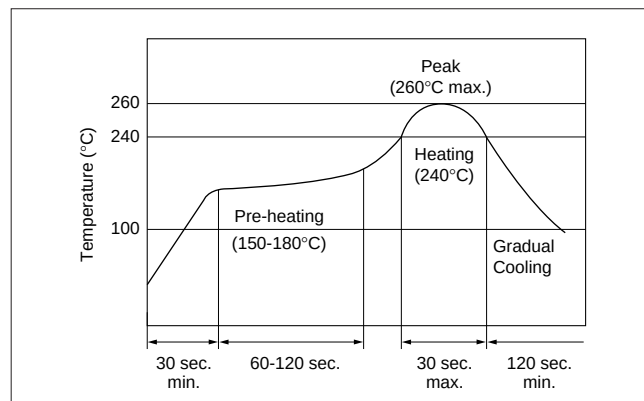
## kHz SMD Type CeraFIL® Notice

### ■ CFXCE Series Notice (Soldering and Mounting)

#### 1. Standard Reflow Soldering Conditions

##### (1) Reflow

Filter is soldered twice within the following temperature conditions.



##### (2) Soldering Iron

Electrode is directly soldered with the tip of soldering iron at  $+350 \pm 5^\circ\text{C}$  for  $3.0 \pm 0.5$  seconds.

#### 2. Wash

The component cannot withstand washing.

Continued on the following page. 

## kHz SMD Type CERAFIL® Notice

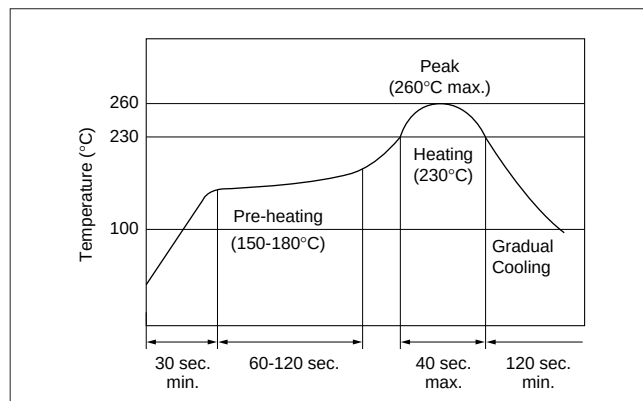
Continued from the preceding page.

### ■ SFPKA/CFUKG/CFUKF Series Notice (Soldering and Mounting)

#### 1. Standard Reflow Soldering Conditions

##### (1) Reflow

Filter is soldered twice within the following temperature conditions.



##### (2) Soldering Iron

Electrode is directly soldered with the tip of soldering iron at  $+350 \pm 5^\circ\text{C}$  for  $3.0 \pm 0.5$  seconds.

#### 2. Wash

##### (1) Cleaning Solvent

CFC alternatives (HCFC Series), Isopropyl Alcohol (IPA), Water (Demineralized Water), Cleaning Water Solution (Cleanthrough-750H, Pine Alpha 100S), Silicon (Technocare FRW)

##### (2) Cleaning Conditions

- Immersion Wash  
2 minutes max. in above solvent at  $+60^\circ\text{C}$  max.
- Shower or Rinse Wash  
2 minutes max. in above solvent at  $+60^\circ\text{C}$  max.

##### (3) Notice

- When components are immersed in solvent, be sure to maintain the temperature of components below the temperature of solvent.
- Please do not use ultrasonic cleaning.
- Total washing time should be within 4 minutes.
- Please ensure the component is thoroughly evaluated in your application circuit.
- Please do not use chlorine, petroleum and alkaline cleaning solvents.
- If you plan to use any other type of solvents, please consult with Murata or Murata representative prior to using.

Continued on the following page. ➤

## kHz SMD Type CERAFIL® Notice

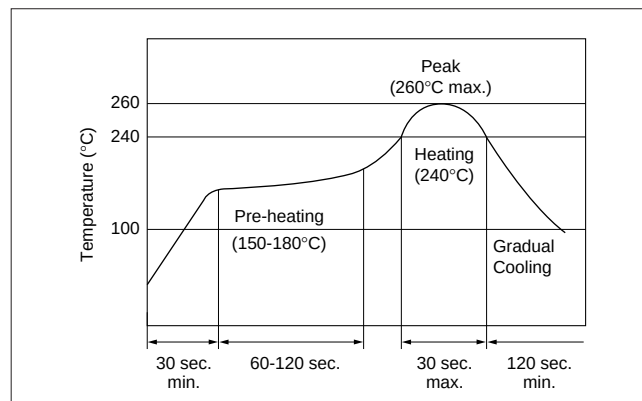
Continued from the preceding page.

### ■ CFWKA Series Notice (Soldering and Mounting)

#### 1. Standard Reflow Soldering Conditions

##### (1) Reflow

Filter is soldered twice within the following temperature conditions.



##### (2) Soldering Iron

Electrode is directly soldered with the tip of soldering iron at  $+350 \pm 5^\circ\text{C}$  for  $3.0 \pm 0.5$  seconds.

#### 2. Wash

The component cannot withstand washing.

### ■ CFXCE/CFWKA Series Notice (Handling)

1. The component will be damaged when an excessive stress is applied.
2. For safety purposes, connect the output of filters to the IF amplifier through a D.C. blocking capacitor. Avoid applying a direct current to the output of ceramic filters.
3. Do not clean or wash the component as it's not hermetically sealed.
4. Do not apply conformal coating onto the component as it's not hermetically sealed.
5. Do not use strong acidity flux, more than 0.2wt% chlorine content, in re-flow soldering.

### ■ SFPKA/CFUKG/CFUKF Series Notice (Handling)

1. The component will be damaged when an excessive stress is applied.
2. For safety purposes, connect the output of filters to the IF amplifier through a D.C. blocking capacitor. Avoid applying a direct current to the output of ceramic filters.
3. In the case that the component is cleaned, confirm that no reliability degradation is created.
4. In case of covering filter with over coat, conditions such as material of resin, cure temperature, and so on should be evaluated carefully.
5. Do not use strong acidity flux, more than 0.2wt% chlorine content, in re-flow soldering.
6. The product, packed in the moisture-proof bag (dry pack), is sensitive to moisture. The following treatment is required before applying re-flow soldering, to avoid package cracks or reliability degradation caused by thermal stress. When unpacked, store the component in an atmosphere of below 25 degree C and below 65% R.H., and solder within 48 hours.

## Ceramic Filters (CERAFIL®)/Ceramic Discriminators for Communications Equipment

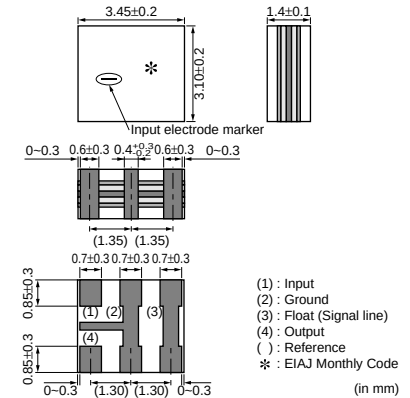
**muRata**

### CERAFIL® MHz SMD Type SFECS10M8 Series

The SFECS10M8 series are small, high performance and super thin (1.5mm max.) filters. Piezoelectric element is connected in the sandwich shape by heat resistant substrate.

The filters exhibit flat GDT characteristic in pass band.

The filters are recommended for digital communication applications and are perfect in hand held cellular phones, pocket cordless phones, etc.



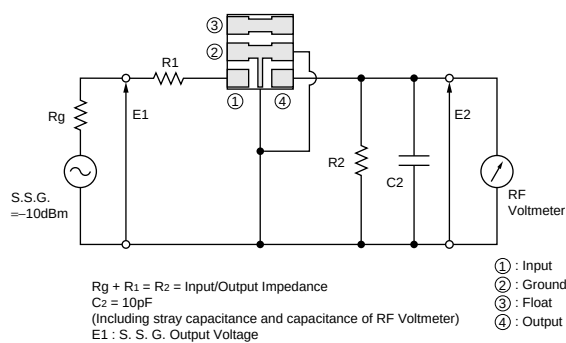
#### ■ Features

1. The filters are mountable by automatic placers.
2. They are slim, at only 1.5mm max. thickness, and have a small mounting area (3.45x3.1mm) enabling flexible PCB design.
3. Types with 10.7/10.75/10.8MHz of center frequency are available.
4. Operating temperature range: -10 to +50 (degree C)  
Storage temperature range: -40 to +85 (degree C)

| Part Number             | Nominal Center Frequency (fn) (MHz) | 3dB Bandwidth (kHz) | Stop Bandwidth (kHz)         | Insertion Loss (dB) | Ripple (dB)                    | Spurious Response (dB)          | GDT Deviation (μs)             | Absolute GDT (μs)     | Input/Output Impedance (ohm) |
|-------------------------|-------------------------------------|---------------------|------------------------------|---------------------|--------------------------------|---------------------------------|--------------------------------|-----------------------|------------------------------|
| <b>SFECS10M8PF00-R0</b> | 10.800                              | fn±110 min.         | fn±310 max.<br>[within 20dB] | 6.0 max.<br>[at fn] | 0.5 max.<br>[within fn±100kHz] | -                               | 1.5 max.<br>[within fn±100kHz] | 2.8 ±1.0μs<br>[at fn] | 330                          |
| <b>SFECS10M8RF00-R0</b> | 10.800                              | fn±135 min.         | fn±350 max.<br>[within 20dB] | 6.0 max.<br>[at fn] | 0.5 max.<br>[within fn±100kHz] | -                               | 1.2 max.<br>[within fn±100kHz] | 2.6 ±1.0μs<br>[at fn] | 330                          |
| <b>SFECS10M8SF00-R0</b> | 10.800                              | fn±150 min.         | fn±420 max.<br>[within 20dB] | 5.0 max.<br>[at fn] | 1.0 max.<br>[within fn±110kHz] | 25 min.<br>[within 9 to 12 MHz] | 1.5 max.<br>[within fn±110kHz] | -                     | 330                          |

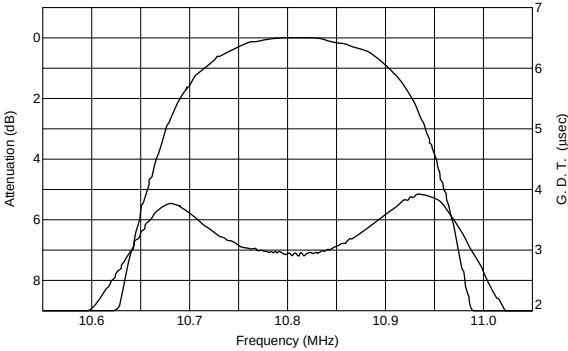
For safety purposes, connect the output of filters to the IF amplifier through a D.C. blocking capacitor. Avoid applying a direct current to the output of ceramic filters.  
The order quantity should be an integral multiple of the "Minimum Quantity" shown in package page in this catalog.

#### ■ Test Circuit

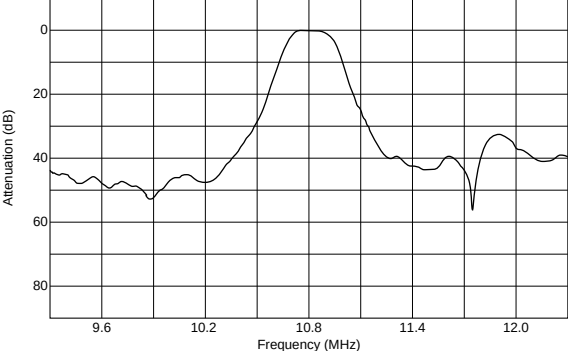


■ Frequency Characteristics

SFECS10M8PF00-R0



SFECS10M8PF00-R0

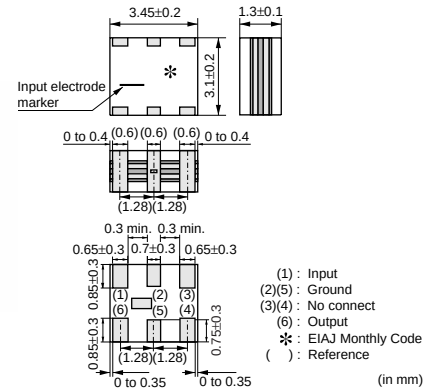


## Ceramic Filters (CERAFIL<sup>®</sup>)/Ceramic Discriminators for Communications Equipment

**muRata**

### CERAFIL<sup>®</sup> MHz SMD Type SFECF10M7 Series

SFECF10M7 series for FM-receivers are small, high performance and super thin (1.4mm max.) filters. Piezoelectric element is connected in the sandwich shape by ceramics substrate. They have 1.4mm max. thickness and small mounting area. (3.45x3.1mm)  
SFECF series and CDSCB series (MHz Discriminator) enable customers to make VICS/RKE/TPMS set so thin and small sized.



#### ■ Features

1. The filters are mountable by automatic placers.
2. They are slim, at only 1.4mm max. thickness, and have a small mounting area (3.45x3.1mm) enabling flexible PCB design.
3. Various bandwidths are available. Select a suitable type in accordance with the desired selectivity.
4. Operating temperature range: -20 to +80 (degree C)  
Storage temperature range: -40 to +85 (degree C)

| Part Number      | Center Frequency (fo) (MHz) | Nominal Center Frequency (fn) (MHz) | 3dB Bandwidth (kHz) | Attenuation (kHz) | Insertion Loss (dB) | Ripple (dB) | Spurious Attenuation (dB) | Input/Output Impedance (ohm) |
|------------------|-----------------------------|-------------------------------------|---------------------|-------------------|---------------------|-------------|---------------------------|------------------------------|
| SFECF10M7HA00-R0 | 10.700 ±30kHz               | -                                   | 180 ±40kHz          | 470 max.          | 4.0 ±2.0dB          | 1.0 max.    | 30 min.                   | 330                          |
| SFECF10M7GA00-R0 | 10.700 ±30kHz               | -                                   | 230 ±50kHz          | 510 max.          | 3.5 ±2.0dB          | 1.0 max.    | 30 min.                   | 330                          |
| SFECF10M7FA00-R0 | 10.700 ±30kHz               | -                                   | 280 ±50kHz          | 590 max.          | 3.0 ±2.0dB          | 1.0 max.    | 30 min.                   | 330                          |
| SFECF10M7EA00-R0 | 10.700 ±30kHz               | -                                   | 330 ±50kHz          | 700 max.          | 3.0 ±2.0dB          | 1.0 max.    | 30 min.                   | 330                          |
| SFECF10M7DF00-R0 | -                           | 10.700                              | fn±150 min.         | 990 max.          | 6.0 max. [at fn]    | 3.0 max.    | 20 min.                   | 330                          |

Area of Attenuation: [within 20dB] Area of Spurious Attenuation: [within 9MHz to 12MHz]

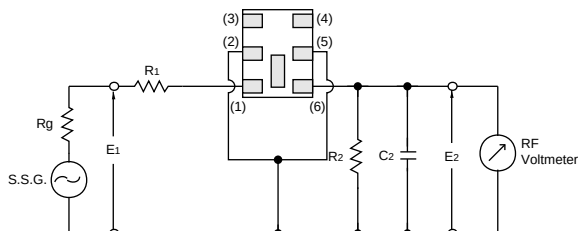
Area of Insertion Loss: at minimum loss point Area of Ripple: within 3dB B.W.

Center frequency (fo) defined by center of 3dB bandwidth.

For safety purposes, connect the output of filters to the IF amplifier through a D.C. blocking capacitor. Avoid applying a direct current to the output of ceramic filters.

The order quantity should be an integral multiple of the "Minimum Quantity" shown in package page in this catalog.

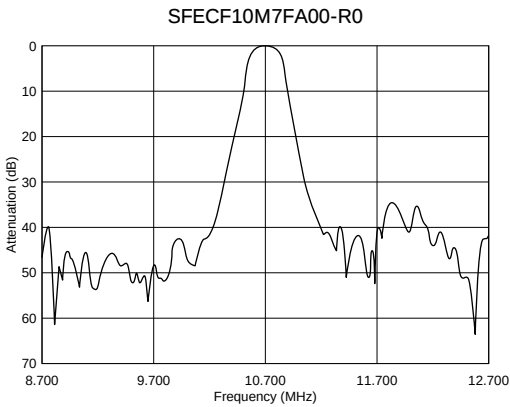
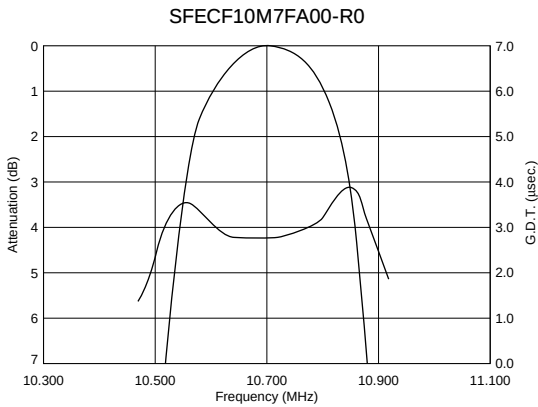
#### ■ Test Circuit



Rg = 50Ω R1 = 280Ω ±5% R2 = 330Ω ±5%  
Cz = 10 ± 2 pF (Including stray capacitance and Input capacitance of RF Volt Meter)  
E1 : S.S.G. Output Voltage

(1) : Input  
(2)(5) : Ground  
(3)(4) : No connect  
(6) : Output

Frequency Characteristics

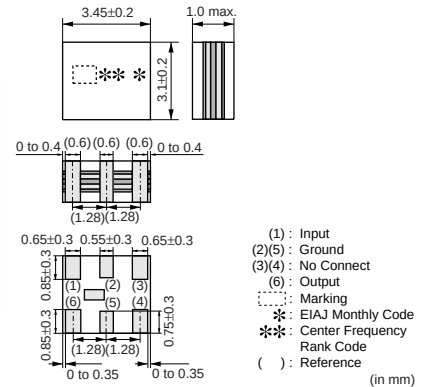


# Ceramic Filters (CERAFIL<sup>®</sup>) / Ceramic Discriminators for Communications Equipment



## CERAFIL<sup>®</sup> MHz SMD Type SFECD10M7 Series

SFECD10M7 series for FM-receivers are small, high performance and ultra thin (1.0mm max.) filters. Piezoelectric element is connected in the sandwich shape by very thin ceramics substrate. They have 1.0mm max. thickness and small mounting area. (3.45x3.1mm)  
SFECD series enable customers to make RF modules so thin and small sized.



### ■ Features

1. The filters are mountable by automatic placers.
2. They are slim, at only 1.0mm max. thickness, and have a small mounting area (3.45x3.1mm) enabling flexible PCB design.
3. Operating temperature range: -20 to +80 (degree C)  
Storage temperature range: -40 to +85 (degree C)

### ■ Applications

1. Card type radios
2. Card type RKE modules
3. Card type PHS modules

| Part Number      | Center Frequency (fo) (MHz) | Nominal Center Frequency (fn) | 3dB Bandwidth (kHz) | Attenuation (kHz) | Insertion Loss (dB) | Ripple (dB) | Spurious Attenuation (dB) | Input/Output Impedance (ohm) |
|------------------|-----------------------------|-------------------------------|---------------------|-------------------|---------------------|-------------|---------------------------|------------------------------|
| SFECD10M7FA00-R0 | 10.700 ±30kHz               | -                             | 280 ±50kHz          | 590 max.          | 3.0 ±2.0dB          | 1.0 max.    | 30 min.                   | 330                          |

Area of Attenuation: [within 20dB] Area of Spurious Attenuation: [within 9MHz to 12MHz]

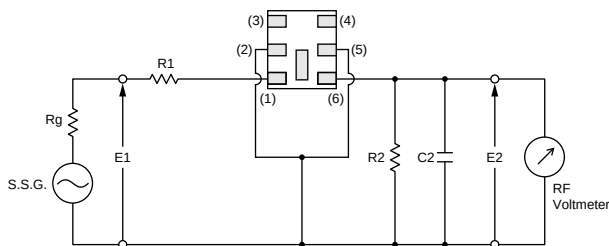
Area of Insertion Loss: at minimum loss point Area of Ripple: within 3dB B.W.

Center frequency (fo) defined by center of 3dB B.W.

For safety purposes, connect the output of filters to the IF amplifier through a D.C. blocking capacitor. Avoid applying a direct current to the output of ceramic filters.

The order quantity should be an integral multiple of the "Minimum Quantity" shown in package page in this catalog.

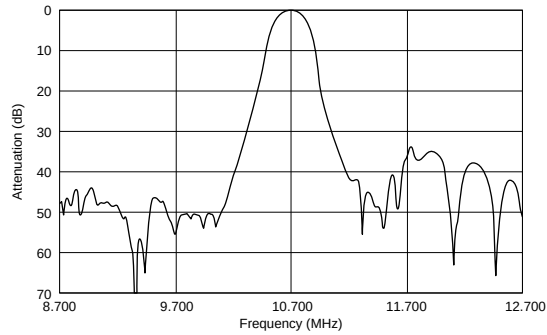
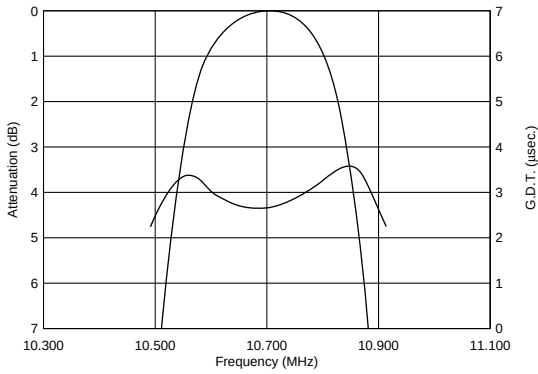
### ■ Test Circuit



R1+Rg=R2=330Ω±5%, Rg=50Ω  
C2=10pF (Including stray capacitance and Input capacitance of RF Voltmeter)  
E1 : S.S.G. Output Voltage

(1) : Input  
(2)(5) : Ground  
(3)(4) : Float  
(6) : Output

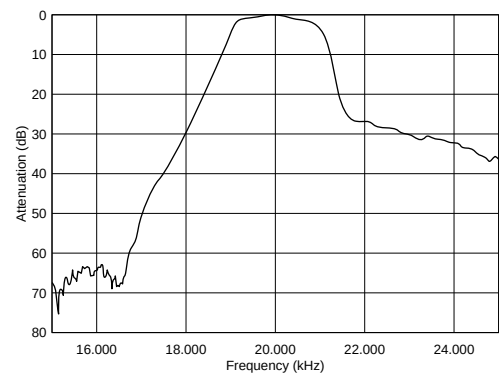
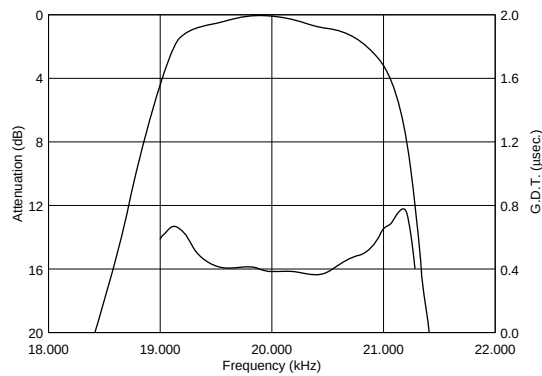
■ Frequency Characteristics



***muRata***



Frequency Characteristics



## Ceramic Filters (CERAFIL®) / Ceramic Discriminators for Communications Equipment

**muRata**

### CERAFIL® MHz SMD Type SFSCE10M7 Series

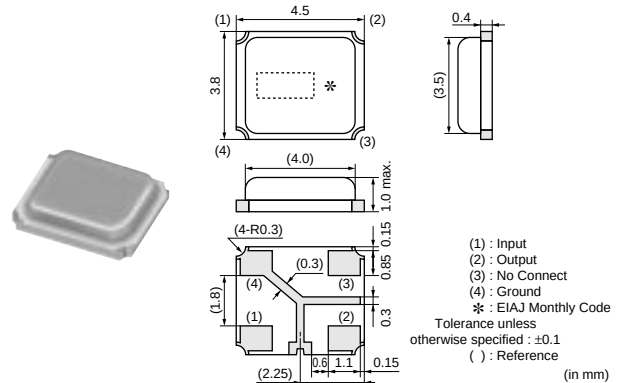
SFSCE series are chip surface mount filter and available for 3dB bandwidth at 700kHz to 1.3MHz. (more than twice width compared with current types) They have 1.0mm max. thickness and small mounting area. (4.5x3.8mm)

#### ■ Features

1. The filters are mountable by automatic placers.
2. They are slim, at only 1.0mm max. thickness, and have a small mounting area (4.5x3.8mm) enabling flexible PCB design.
3. Available lead (Pb) free solder reflow.
4. Operating temperature range: -20 to +80 (degree C)  
Storage temperature range: -40 to +85 (degree C)

#### ■ Applications

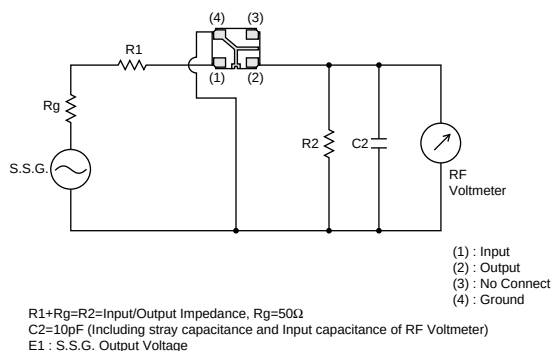
1. SS digital communication system
2. Digital wireless audio
3. PHS Evolution system
4. RFID Reader Writer
5. RKE



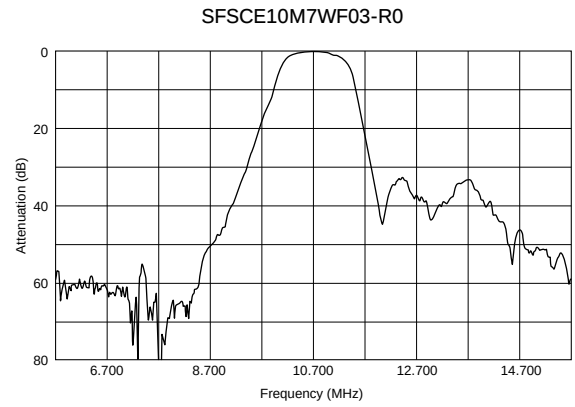
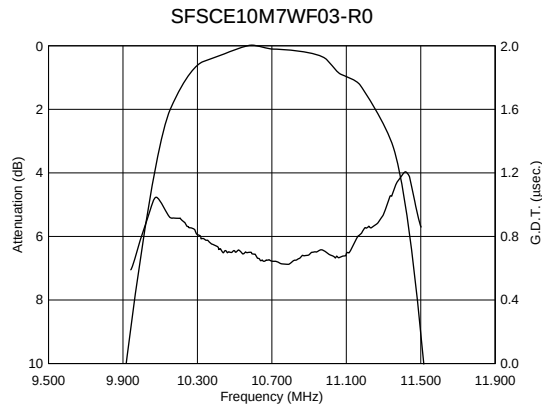
| Part Number             | Nominal Center Frequency (fn) (MHz) | 3dB Bandwidth (kHz) | Stop Bandwidth (MHz)              | Insertion Loss (dB)                 | Ripple (dB)                        | Spurious Response (dB)                              | GDT Deviation (μs)             | Input/Output Impedance (ohm) |
|-------------------------|-------------------------------------|---------------------|-----------------------------------|-------------------------------------|------------------------------------|-----------------------------------------------------|--------------------------------|------------------------------|
| <b>SFSCE10M7WF03-R0</b> | 10.700                              | fn±500 min.         | 2.2 max. (Total)<br>[within 20dB] | 6.0 max.<br>[at minimum loss point] | 2.0 max.<br>[within 3dB Bandwidth] | 30/25 min.<br>[within 5.7MHz to fn / fn to 15.7MHz] | 0.6 max.<br>[within fn±400kHz] | 470                          |
| <b>SFSCE10M7WF04-R0</b> | 10.700                              | fn±400 min.         | 1.8 max. (Total)<br>[within 20dB] | 6.0 max.<br>[at minimum loss point] | 1.5 max.<br>[within 3dB Bandwidth] | 35/25 min.<br>[within 5.7MHz to fn / fn to 15.7MHz] | 0.6 max.<br>[within fn±325kHz] | 470                          |
| <b>SFSCE10M7WF05-R0</b> | 10.700                              | fn±325 min.         | 1.7 max. (Total)<br>[within 20dB] | 6.0 max.<br>[at minimum loss point] | 1.5 max.<br>[within 3dB Bandwidth] | 40/30 min.<br>[within 5.7MHz to fn / fn to 15.7MHz] | 0.6 max.<br>[within fn±250kHz] | 470                          |

For safety purposes, connect the output of filters to the IF amplifier through a D.C. blocking capacitor. Avoid applying a direct current to the output of ceramic filters.  
The order quantity should be an integral multiple of the "Minimum Quantity" shown in package page in this catalog.

#### ■ Test Circuit



■ Frequency Characteristics



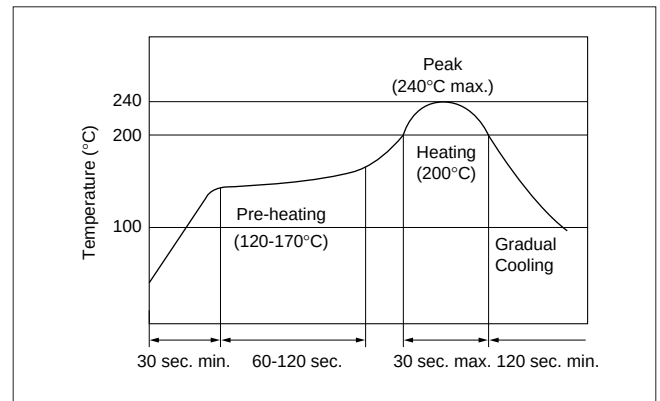
## MHz SMD Type CERAFIL<sup>®</sup> Notice

### ■ SFECS10M8 Series Notice (Soldering and Mounting)

#### 1. Standard Reflow Soldering Conditions

##### (1) Reflow

Filter is soldered twice within the following temperature conditions.



##### (2) Soldering Iron

Filter is soldered at  $+280 \pm 5^\circ\text{C}$  for  $3.0 \pm 1.0$  seconds. The soldering iron should not touch the filter while soldering.

#### 2. Wash

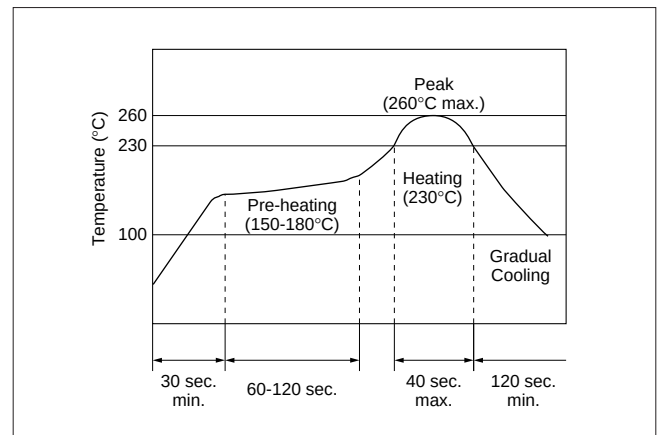
The component cannot withstand washing.

### ■ SFECS10M7 Series Notice (Soldering and Mounting)

#### 1. Standard Reflow Soldering Conditions

##### (1) Reflow

Filter is soldered twice within the following temperature conditions.



##### (2) Soldering Iron

Filter is soldered at  $+350 \pm 5^\circ\text{C}$  for  $3.0 \pm 0.5$  seconds. The soldering iron should not touch the filter while soldering.

#### 2. Wash

The component cannot withstand washing.

Continued on the following page.

## MHz SMD Type CERAFIL® Notice

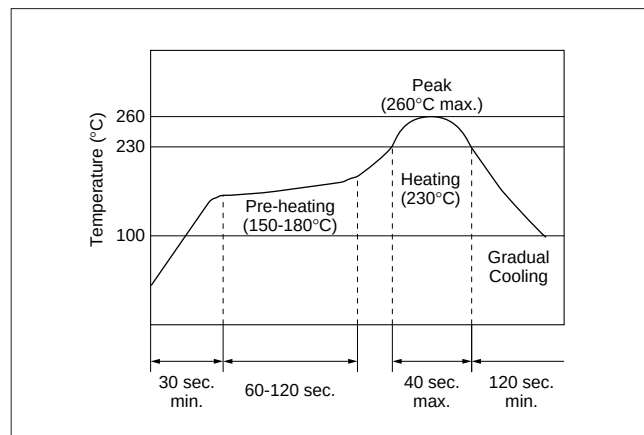
☐ Continued from the preceding page.

### ■ SFECD10M7 Series Notice (Soldering and Mounting)

#### 1. Standard Reflow Soldering Conditions

##### (1) Reflow

Filter is soldered twice within the following temperature conditions.



##### (2) Soldering Iron

Filter is soldered at  $+350\pm 5^{\circ}\text{C}$  for  $3.0\pm 0.5$  seconds. The soldering iron should not touch the filter while soldering.

#### 2. Wash

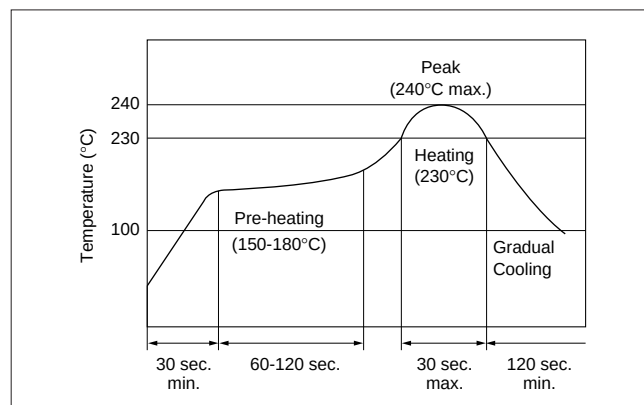
The component cannot withstand washing.

### ■ SFSCD20M0 Series Notice (Soldering and Mounting)

#### 1. Standard Reflow Soldering Conditions

##### (1) Reflow

Filter is soldered twice within the following temperature conditions.



##### (2) Soldering Iron

Filter is soldered at  $+320\pm 5^{\circ}\text{C}$  for  $3.0\pm 0.5$  seconds. The soldering iron should not touch the filter while soldering.

#### 2. Wash

The component cannot withstand washing.

Continued on the following page. ☐

## MHz SMD Type CERAFIL® Notice

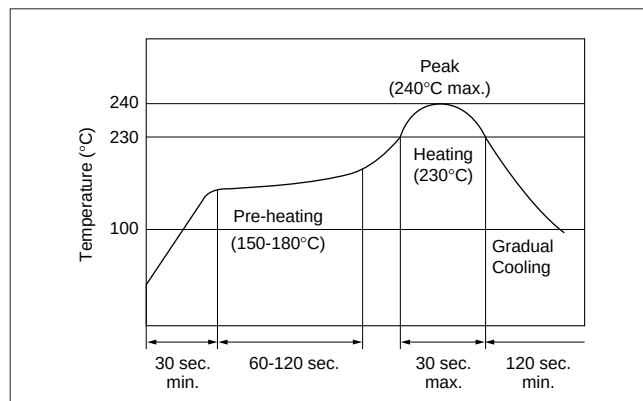
Continued from the preceding page.

### ■ SFSCE10M7WF03-R0 Notice (Soldering and Mounting)

#### 1. Standard Reflow Soldering Conditions

##### (1) Reflow

Filter is soldered twice within the following temperature conditions.



##### (2) Soldering Iron

Filter is soldered at  $+320 \pm 5^\circ\text{C}$  for  $3.0 \pm 0.5$  seconds. The soldering iron should not touch the filter while soldering.

#### 2. Wash

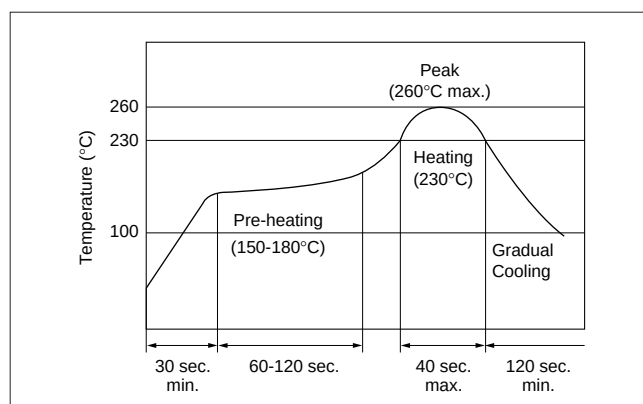
The component cannot withstand washing.

### ■ SFSCE10M7WF04/05-R0 Notice (Soldering and Mounting)

#### 1. Standard Reflow Soldering Conditions

##### (1) Reflow

Filter is soldered twice within the following temperature conditions.



##### (2) Soldering Iron

Filter is soldered at  $+320 \pm 5^\circ\text{C}$  for  $3.0 \pm 0.5$  seconds. The soldering iron should not touch the filter while soldering.

#### 2. Wash

The component cannot withstand washing.

Continued on the following page. ➤

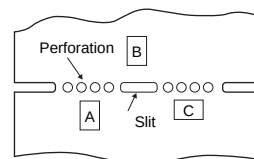
## MHz SMD Type CERAFIL® Notice

☐ Continued from the preceding page.

### ■ SFECS10M8 Series Notice (Handling)

1. The component will be damaged when an excessive stress is applied.
2. The component may be damaged if excess mechanical stress is applied to it mounted on the printed circuit board.
3. Design layout of components on the PC board to minimize the stress imposed on the warp or flexure of the board.
4. After installing chips, if solder is excessively applied to the circuit board, mechanical stress will cause destruction resistance characteristics to lower. To prevent this, be extremely careful in determining shape and dimension before designing the circuit board diagram.
5. The component may be damaged during mounting process if some part of mounter such as positioning claws, nozzle are worn down. The regular maintenance recommended for mounters should be done to prevent the troubles.
6. When correcting chips with a soldering iron, the tip of the soldering iron should not directly touch the chip component. Depending on the soldering conditions, the effective area of terminations may be reduced. The use of solder containing Ag should be done to prevent the electrode erosion.
7. Do not clean or wash the component as it is not hermetically sealed.
8. In case of covering discriminator with over coat, conditions such as material of resin, cure temperature, and so on should be evaluated carefully.
9. Do not use strong acidity flux, more than 0.2wt% chlorine content, in re-flow soldering.
10. Accurate test circuit values are required to measure electrical characteristics.  
It may be a cause of mis-correlation if there is any deviation, especially stray capacitance, from the test circuit in the specification.
11. For safety purposes, connect the output of filters to the IF amplifier through a D.C. blocking capacitor. Avoid applying a direct current to the output of ceramic filters.

[Component layout close to board]



Susceptibility to stress is in the order of; A>C>B

Continued on the following page. ☐

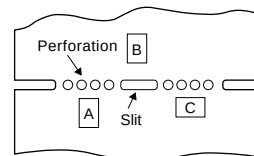
## MHz SMD Type CERAFIL<sup>®</sup> Notice

☐ Continued from the preceding page.

### ■ SFECF10M7/SFEC10M7 Series Notice (Handling)

1. The component will be damaged when an excessive stress is applied.
2. The component may be damaged if excess mechanical stress is applied to it mounted on the printed circuit board.
3. Design layout of components on the PC board to minimize the stress imposed on the warp or flexure of the board.
4. After installing chips, if solder is excessively applied to the circuit board, mechanical stress will cause destruction resistance characteristics to lower. To prevent this, be extremely careful in determining shape and dimension before designing the circuit board diagram.
5. The component may be damaged during mounting process if some part of mounter such as positioning claws, nozzle are worn down. The regular maintenance recommended for mounters should be done to prevent the troubles.
6. The component is recommended with placement machines which employ optical placement capabilities. The component might be damaged by excessive mechanical force. Please make sure that you have evaluated by using placement machines before going into mass production. Do not use placement machines which utilize mechanical positioning. Please contact Murata for details beforehand.
7. When correcting chips with a soldering iron, the tip of the soldering iron should not directly touch the chip component. Depending on the soldering conditions, the effective area of terminations may be reduced. The use of solder containing Ag should be done to prevent the electrode erosion.
8. Do not clean or wash the component as it is not hermetically sealed.
9. In case of covering filter with over coat, conditions such as material of resin, cure temperature, and so on should be evaluated carefully.
10. Do not use strong acidity flux, more than 0.2wt% chlorine content, in re-flow soldering.
11. Accurate test circuit values are required to measure electrical characteristics.  
It may be a cause of miscorrelation if there is any deviation, especially stray capacitance, from the test circuit in the specification.
12. The components, packed in the moisture proof bag (dry pack), are sensitive to moisture. The following treatment is required before applying re-flow soldering. To avoid reliability degradation caused by thermal stress. When unpacked, store the component in an atmosphere at 30°C and below 60%R.H., and solder within 1 week.
13. For safety purposes, connect the output of filters to the IF amplifier through a D.C. blocking capacitor. Avoid applying a direct current to the output of ceramic filters.

[Component layout close to board]



Susceptibility to stress is in the order of : A>C>B

Continued on the following page. ☐

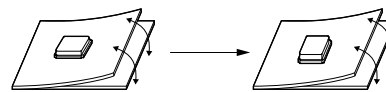
## MHz SMD Type CERAFIL® Notice

☐ Continued from the preceding page.

### ■ SFSCD20M0/SFSCE10M7 Series Notice (Handling)

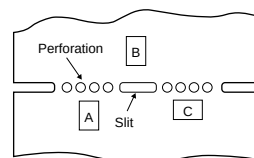
1. The component will be damaged when an excessive stress is applied.
2. The component mounted on the PCB may be damaged if excess mechanical stress is applied.
3. Layout the components on the PCB to minimize the stress imposed on the warp or flexure of the board.
4. After installing chips, if solder is excessively applied to the circuit board, mechanical stress will cause destruction resistance characteristics to lower. To prevent this, be extremely careful in determining shape and dimension before designing the circuit board diagram.
5. The component may be damaged during mounting process if some part of mounter such as positioning claws, nozzle are worn down. The regular maintenance recommended for mounters should be done to prevent the troubles.
6. When correcting component's position with a soldering iron, the tip of the soldering iron should not directly touch the chip component.
7. Do not clean or wash the component as it is not hermetically sealed.
8. In case of overcoating the part, coating conditions such as material of resin, curing temperature, and so on should be evaluated carefully.
9. Do not use strong acidity flux, more than 0.2wt% chlorine content, in re-flow soldering.
10. Accurate test circuit values are required to measure electrical characteristics. It may be a cause of mis-correlation if there is any deviation, especially stray capacitance, from the test circuit in the specification.
11. The component is recommended with placement machines which employ optical placement capabilities. The component might be damaged by excessive mechanical force. Please make sure that you have evaluated by using placement machines before going into mass production. Do not use placement machines which utilize mechanical positioning. Please contact Murata for details beforehand.
12. For safety purposes, connect the output of filters to the IF amplifier through a D.C. blocking capacitor. Avoid applying a direct current to the output of ceramic filters.

[Component direction]



Put the component laterally to the direction in which stress acts.

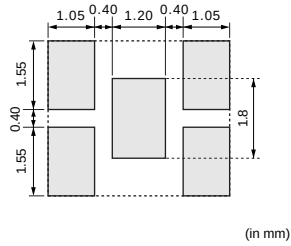
[Component layout close to board]



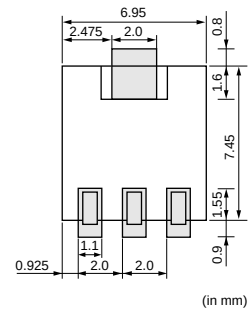
Susceptibility to stress is in the order of : A>C>B

## SMD Type CERAFIL® Standard Land Pattern Dimensions

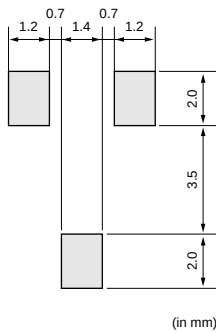
### CFXCE Series



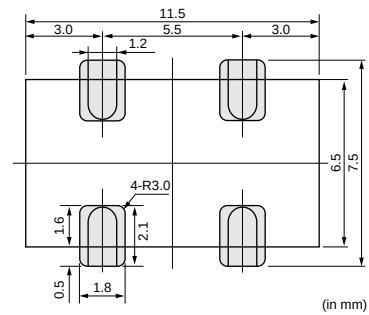
### SFPKA Series



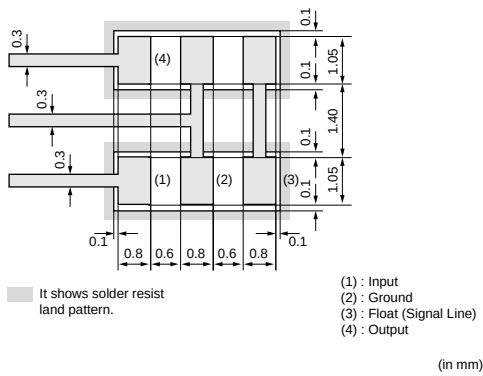
### CFUKG/CFUKF Series



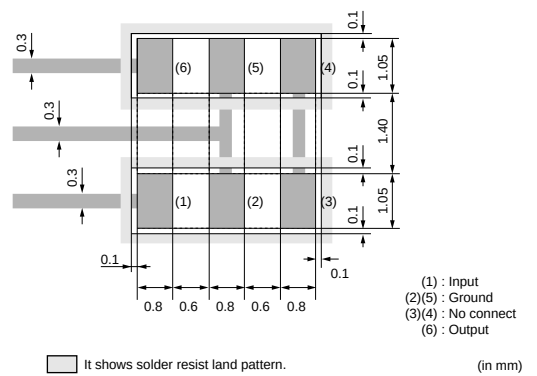
### CFWKA Series



### SFECS10M8 Series



### SFECS10M7 Series



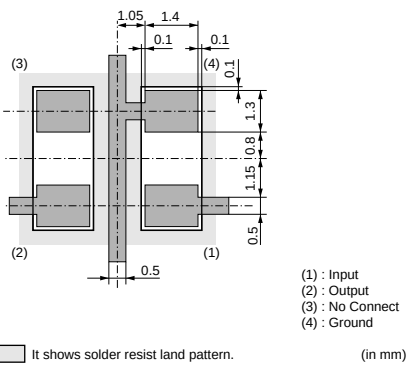
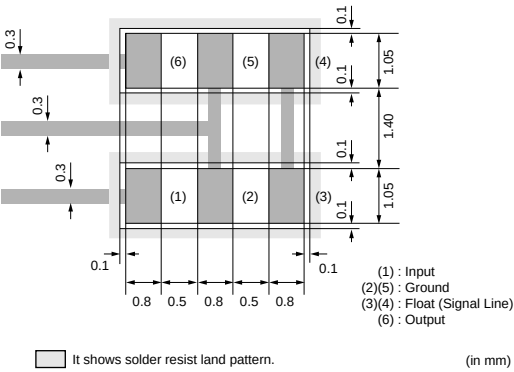
Continued on the following page. ➤

SMD Type CERAFIL® Standard Land Pattern Dimensions

Continued from the preceding page.

■ SFECD10M7 Series

■ SFSCD20M0/SFSCE10M7 Series

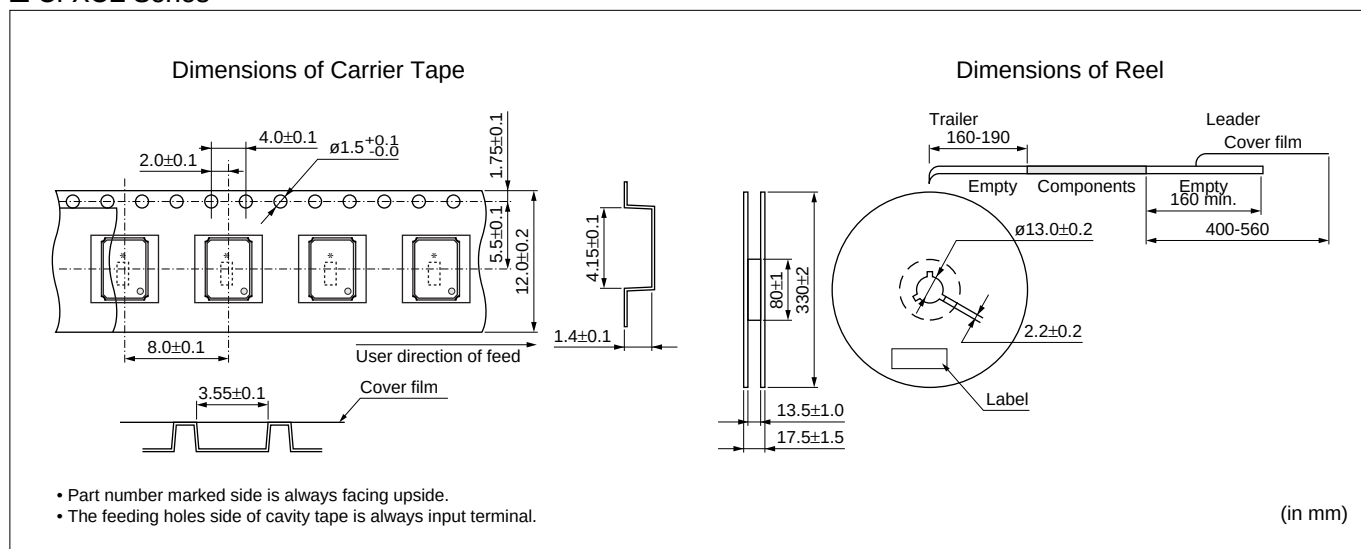


## KHz SMD Type CERAFIL® Packaging

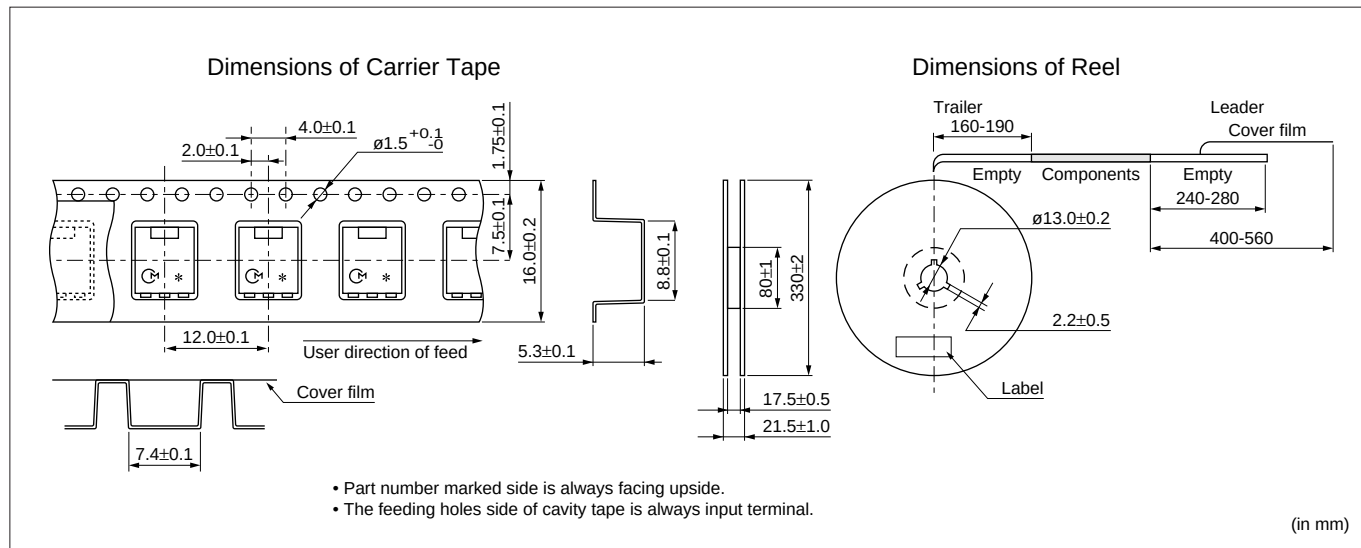
### ■ Minimum Quantity

| Part Number | ø180mm | ø330mm |
|-------------|--------|--------|
| CFXCE       |        | 2,500  |
| SFPKA       |        | 1,000  |
| CFUKG       | 450    |        |
| CFUKF       | 450    |        |
| CFWKA       | 350    |        |

### ■ CFXCE Series



### ■ SFPKA Series



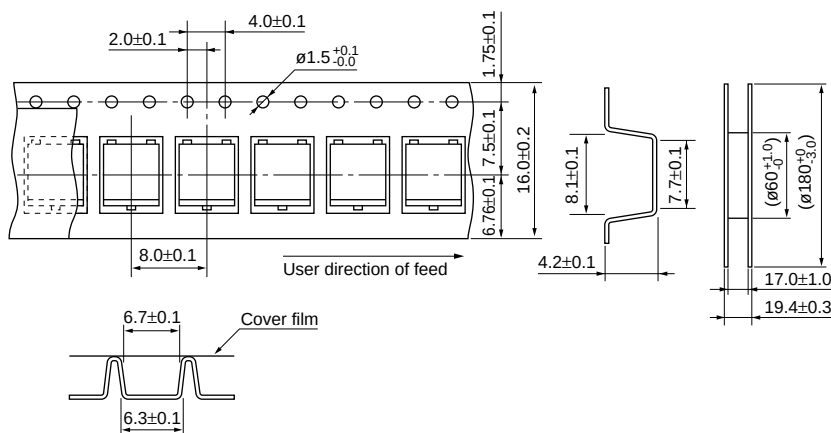
Continued on the following page. ➤

## kHz SMD Type CeraFIL® Packaging

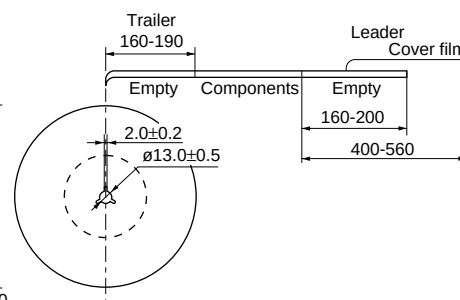
Continued from the preceding page.

### CFUKG/CFUKF Series

Dimensions of Carrier Tape



Dimensions of Reel

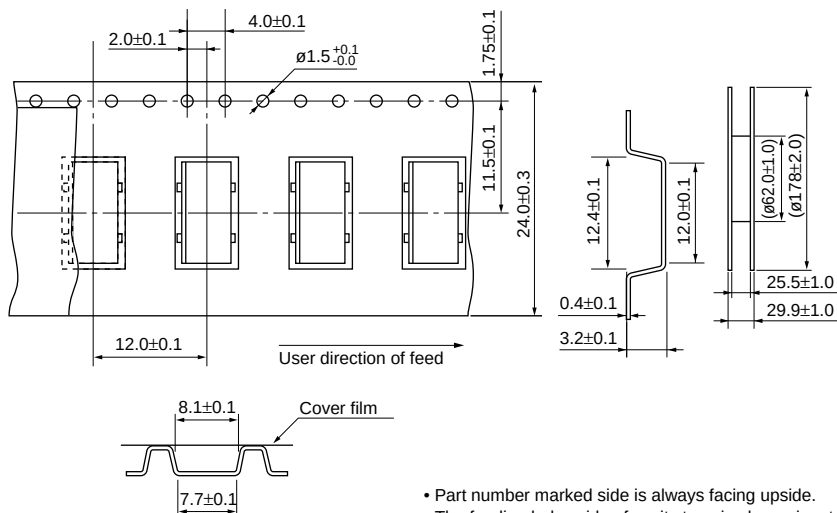


- Part number marked side is always facing upside.
- The feeding holes side of cavity tape is always input terminal.

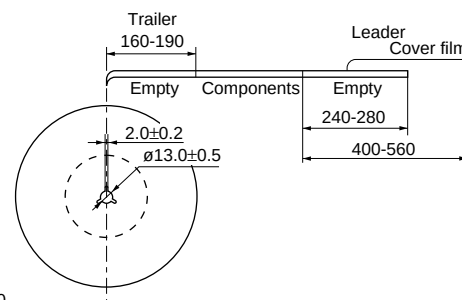
(in mm)

### CFWKA Series

Dimensions of Carrier Tape



Dimensions of Reel



- Part number marked side is always facing upside.
- The feeding holes side of cavity tape is always input terminal.

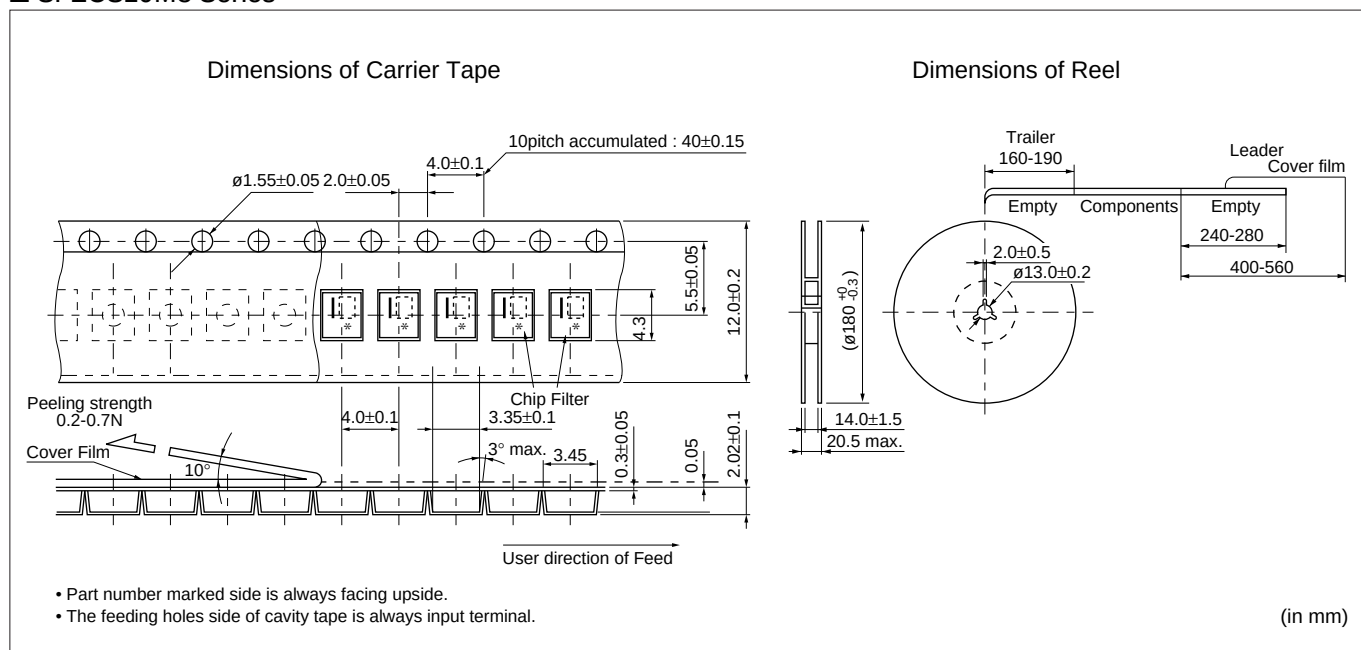
(in mm)

## MHz SMD Type CERAFIL® Packaging

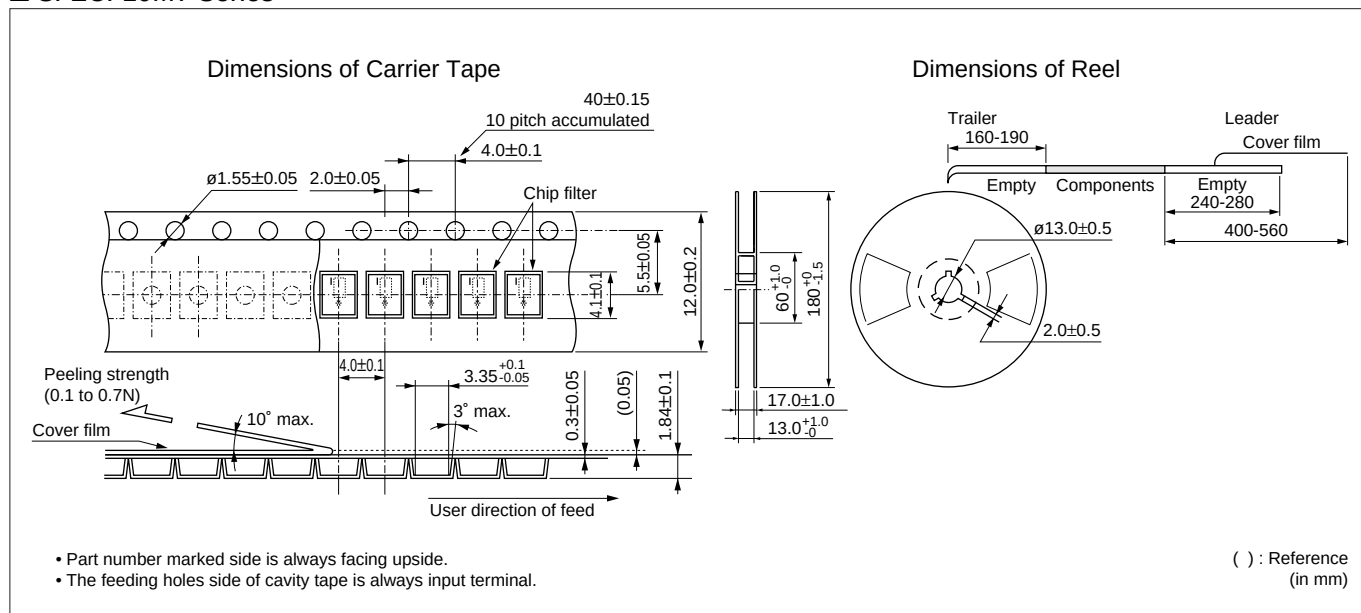
### ■ Minimum Quantity

| Part Number | ø180mm | ø330mm |
|-------------|--------|--------|
| SFECS       | 2,000  |        |
| SFECSF      | 2,000  |        |
| SFECD       | 2,000  |        |
| SFSCD       | 1,500  |        |
| SFSCE       | 1,500  |        |

### ■ SFECS10M8 Series



### ■ SFECSF10M7 Series



Continued on the following page. ➤



## Ceramic Filters (CERAFIL®)/Ceramic Discriminators for Communications Equipment

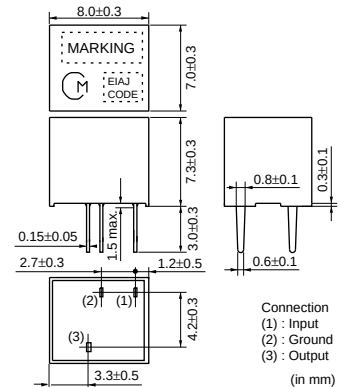
**muRata**

### CERAFIL® Plastic Case General Use CFULA Series

CFULA series are high selectivity ceramic filters, which consist of 4 ceramic elements connected in a ladder form.  
Most suitable for digital communications and cellular phones because of their improved GDT characteristics.

#### ■ Features

1. High selectivity
2. A variety of bandwidths available
3. Excellent GDT characteristics are available within pass bandwidth.
4. Easily mounted on a printed circuit board
5. Operating temperature range: -20 to +80 (degree C)  
Storage temperature range: -40 to +85 (degree C)



| Part Number            | Center Frequency (fo) (kHz) | 6dB Bandwidth (kHz) | Stop Bandwidth (kHz)          | Stop Band Attenuation (dB)    | Insertion Loss (dB)                 | Input/Output Impedance (ohm) |
|------------------------|-----------------------------|---------------------|-------------------------------|-------------------------------|-------------------------------------|------------------------------|
| <b>CFULA455KB2A-B0</b> | 455.0<br>±2.0kHz            | fn±15.0<br>min.     | fn±30.0 max.<br>[within 40dB] | 27 min.<br>[within fn±100kHz] | 4.0 max.<br>[at minimum loss point] | 1500                         |
| <b>CFULA455KC2A-B0</b> | 455.0<br>±2.0kHz            | fn±12.5<br>min.     | fn±24.0 max.<br>[within 40dB] | 27 min.<br>[within fn±100kHz] | 4.0 max.<br>[at minimum loss point] | 1500                         |
| <b>CFULA455KD4A-B0</b> | 455.0<br>±1.5kHz            | fn±10.0<br>min.     | fn±20.0 max.<br>[within 40dB] | 27 min.<br>[within fn±100kHz] | 4.0 max.<br>[at minimum loss point] | 1500                         |
| <b>CFULA455KE4A-B0</b> | 455.0<br>±1.5kHz            | fn±7.5<br>min.      | fn±15.0 max.<br>[within 40dB] | 27 min.<br>[within fn±100kHz] | 6.0 max.<br>[at minimum loss point] | 1500                         |
| <b>CFULA455KF4A-B0</b> | 455.0<br>±1.5kHz            | fn±6.0<br>min.      | fn±12.5 max.<br>[within 40dB] | 27 min.<br>[within fn±100kHz] | 6.0 max.<br>[at minimum loss point] | 2000                         |
| <b>CFULA455KG1A-B0</b> | 455.0<br>±1.0kHz            | fn±4.5<br>min.      | fn±10.0 max.<br>[within 40dB] | 25 min.<br>[within fn±100kHz] | 6.0 max.<br>[at minimum loss point] | 2000                         |
| <b>CFULA455KH1A-B0</b> | 455.0<br>±1.0kHz            | fn±3.0<br>min.      | fn±9.0 max.<br>[within 40dB]  | 35 min.<br>[within fn±100kHz] | 6.0 max.<br>[at minimum loss point] | 2000                         |

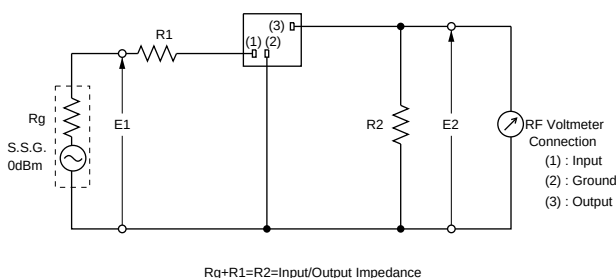
Center frequency (fo) defined by the center of 6dB bandwidth.

(fn) means nominal center frequency 455kHz.

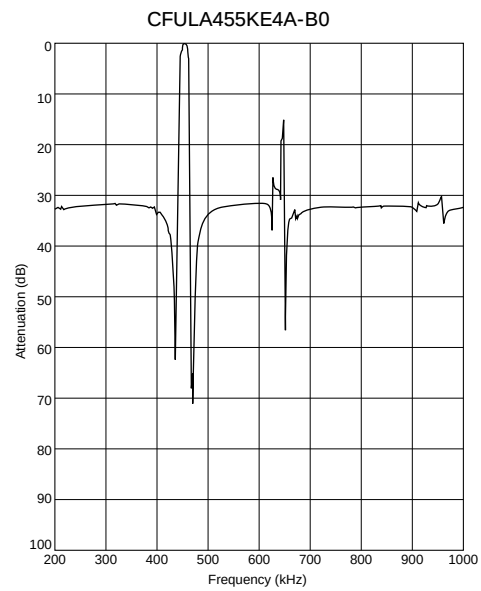
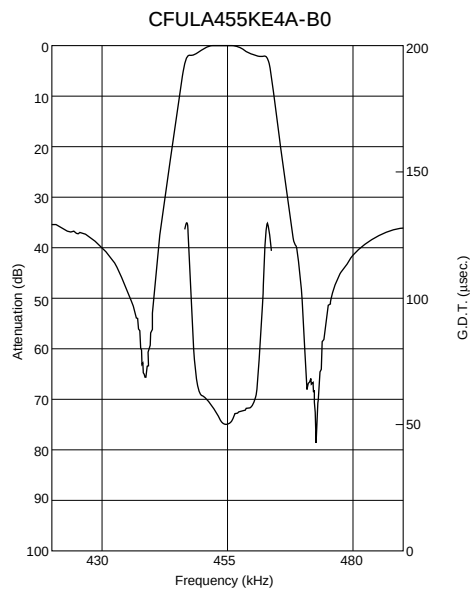
For safety purposes, connect the output of filters to the IF amplifier through a D.C. blocking capacitor. Avoid applying a direct current to the output of ceramic filters.

The order quantity should be an integral multiple of the "Minimum Quantity" shown in package page in this catalog.

#### ■ Test Circuit



Frequency Characteristics



## Ceramic Filters (CERAFIL®)/Ceramic Discriminators for Communications Equipment

**muRata**

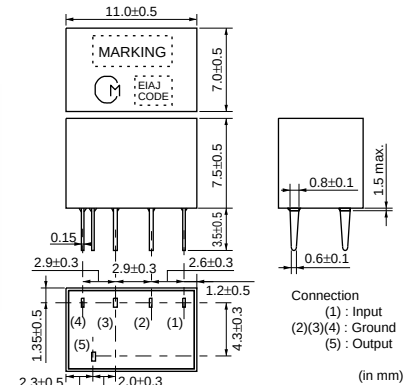
### CERAFIL® Plastic Case Miniaturized Type CFWLA Series

Ceramic filter CFWLA series are low profile high selectivity ceramic filters which use 6 elements in ladder form.

They are best suitable to high-class transceivers, cordless telephones and amateur radios.

#### ■ Features

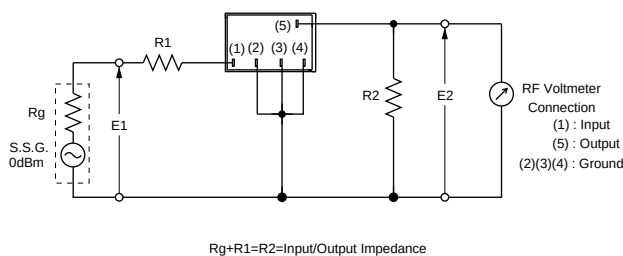
1. Low profile, high selectivity
2. Available bandwidths are B to J as standard
3. Easily mountable on any PC board
4. Operating temperature range: -20 to +80 (degree C)  
Storage temperature range: -40 to +85 (degree C)



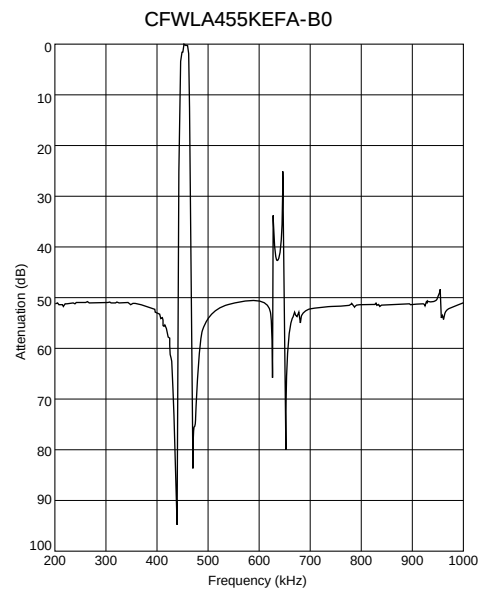
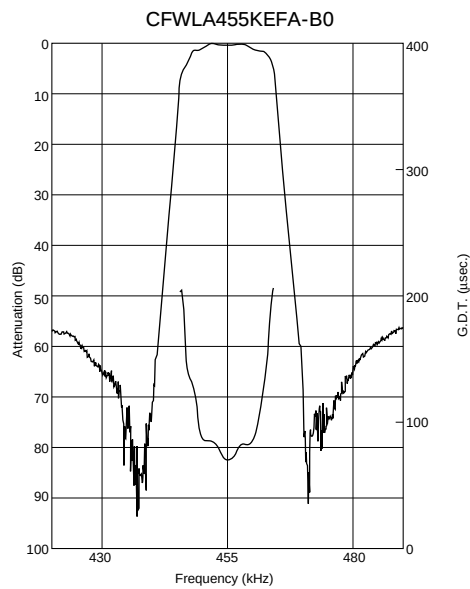
| Part Number             | Nominal Center Frequency (fn) (kHz) | 6dB Bandwidth (kHz) | Stop Bandwidth (kHz)       | Stop Band Attenuation (dB) | Insertion Loss (dB)              | Ripple (dB)                 | Input/Output Impedance (ohm) |
|-------------------------|-------------------------------------|---------------------|----------------------------|----------------------------|----------------------------------|-----------------------------|------------------------------|
| <b>CFWLA455KBFA-B0</b>  | 455                                 | fn±15.0 min.        | fn±30.0 max. [within 50dB] | 35 min. [within fn±100kHz] | 4.0 max. [at minimum loss point] | 3.0 max. [within fn±10kHz]  | 1500                         |
| <b>CFWLA455KCF A-B0</b> | 455                                 | fn±12.5 min.        | fn±24.0 max. [within 50dB] | 35 min. [within fn±100kHz] | 4.0 max. [at minimum loss point] | 3.0 max. [within fn±8kHz]   | 1500                         |
| <b>CFWLA455KDFA-B0</b>  | 455                                 | fn±10.0 min.        | fn±20.0 max. [within 50dB] | 35 min. [within fn±100kHz] | 4.0 max. [at minimum loss point] | 3.0 max. [within fn±7kHz]   | 1500                         |
| <b>CFWLA455KEFA-B0</b>  | 455                                 | fn±7.5 min.         | fn±15.0 max. [within 50dB] | 35 min. [within fn±100kHz] | 6.0 max. [at minimum loss point] | 3.0 max. [within fn±5kHz]   | 1500                         |
| <b>CFWLA455KFFA-B0</b>  | 455                                 | fn±6.0 min.         | fn±12.5 max. [within 50dB] | 35 min. [within fn±100kHz] | 6.0 max. [at minimum loss point] | 3.0 max. [within fn±4kHz]   | 2000                         |
| <b>CFWLA455KGFA-B0</b>  | 455                                 | fn±4.5 min.         | fn±10.0 max. [within 50dB] | 35 min. [within fn±100kHz] | 6.0 max. [at minimum loss point] | 2.0 max. [within fn±3kHz]   | 2000                         |
| <b>CFWLA455KHFA-B0</b>  | 455                                 | fn±3.0 min.         | fn±9.0 max. [within 50dB]  | 60 min. [within fn±100kHz] | 6.0 max. [at minimum loss point] | 2.0 max. [within fn±2kHz]   | 2000                         |
| <b>CFWLA455KJFA-B0</b>  | 455                                 | fn±2.0 min.         | fn±7.5 max. [within 50dB]  | 60 min. [within fn±100kHz] | 7.0 max. [at minimum loss point] | 2.0 max. [within fn±1.5kHz] | 2000                         |

For safety purposes, connect the output of filters to the IF amplifier through a D.C. blocking capacitor. Avoid applying a direct current to the output of ceramic filters.  
The order quantity should be an integral multiple of the "Minimum Quantity" shown in package page in this catalog.

#### ■ Test Circuit



Frequency Characteristics



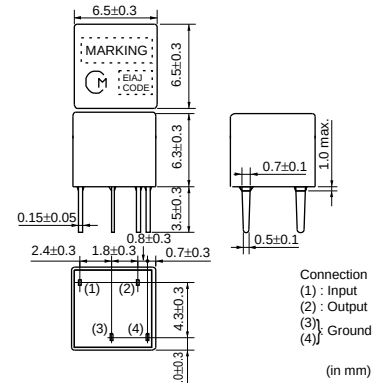
## Ceramic Filters (CERAFIL®)/Ceramic Discriminators for Communications Equipment

**muRata**

### CERAFIL® Plastic Case Miniaturized Type CFULB Series

CFULB series ceramic filters are miniature, high performance ceramic filters composed of piezoelectric elements connected in a ladder form.

These filters, only 6.3mm high, are 65% the volume of conventional types. (CFULA455K series) They are well suited for miniaturizing various kinds of communications equipment, pocket pagers, car radios, cordless telephones and mobile telephones.



#### ■ Features

1. Miniature and high selectivity
2. A variety of bandwidths are available
3. Operating temperature range: -20 to +80 (degree C)  
Storage temperature range: -40 to +85 (degree C)

| Part Number     | Center Frequency (fo) (kHz) | 6dB Bandwidth (kHz) | Stop Bandwidth (kHz)          | Stop Band Attenuation (dB)    | Insertion Loss (dB)                 | Input/Output Impedance (ohm) |
|-----------------|-----------------------------|---------------------|-------------------------------|-------------------------------|-------------------------------------|------------------------------|
| CFULB455KB2A-B0 | 455.0<br>±2.0kHz            | fn±15.0<br>min.     | fn±30.0 max.<br>[within 40dB] | 27 min.<br>[within fn±100kHz] | 4.0 max.<br>[at minimum loss point] | 1500                         |
| CFULB455KC2A-B0 | 455.0<br>±2.0kHz            | fn±12.5<br>min.     | fn±24.0 max.<br>[within 40dB] | 27 min.<br>[within fn±100kHz] | 4.0 max.<br>[at minimum loss point] | 1500                         |
| CFULB455KD4A-B0 | 455.0<br>±1.5kHz            | fn±10.0<br>min.     | fn±20.0 max.<br>[within 40dB] | 27 min.<br>[within fn±100kHz] | 4.0 max.<br>[at minimum loss point] | 1500                         |
| CFULB455KE4A-B0 | 455.0<br>±1.5kHz            | fn±7.5<br>min.      | fn±15.0 max.<br>[within 40dB] | 27 min.<br>[within fn±100kHz] | 6.0 max.<br>[at minimum loss point] | 1500                         |
| CFULB455KF4A-B0 | 455.0<br>±1.5kHz            | fn±6.0<br>min.      | fn±12.5 max.<br>[within 40dB] | 27 min.<br>[within fn±100kHz] | 6.0 max.<br>[at minimum loss point] | 2000                         |
| CFULB455KG1A-B0 | 455.0<br>±1.0kHz            | fn±4.5<br>min.      | fn±10.0 max.<br>[within 40dB] | 25 min.<br>[within fn±100kHz] | 6.0 max.<br>[at minimum loss point] | 2000                         |
| CFULB455KH1A-B0 | 455.0<br>±1.0kHz            | fn±3.0<br>min.      | fn±9.0 max.<br>[within 40dB]  | 35 min.<br>[within fn±100kHz] | 6.0 max.<br>[at minimum loss point] | 2000                         |
| CFULB455KJ1A-B0 | 455.0<br>±1.0kHz            | fn±2.0<br>min.      | fn±7.5 max.<br>[within 40dB]  | 35 min.<br>[within fn±100kHz] | 6.0 max.<br>[at minimum loss point] | 2000                         |

Center frequency (fo) defined by the center of 6dB bandwidth.

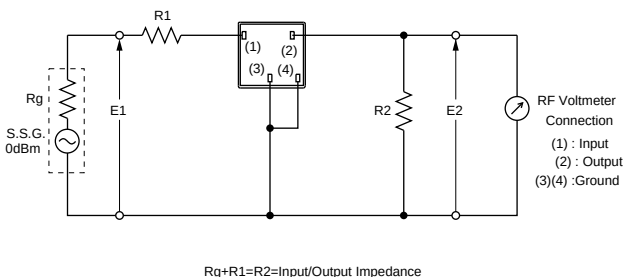
(fn) means nominal center frequency 455kHz.

CFULB455K\_series filters are 4-element ceramic filters and miniature versions of CFULA455K\_series.

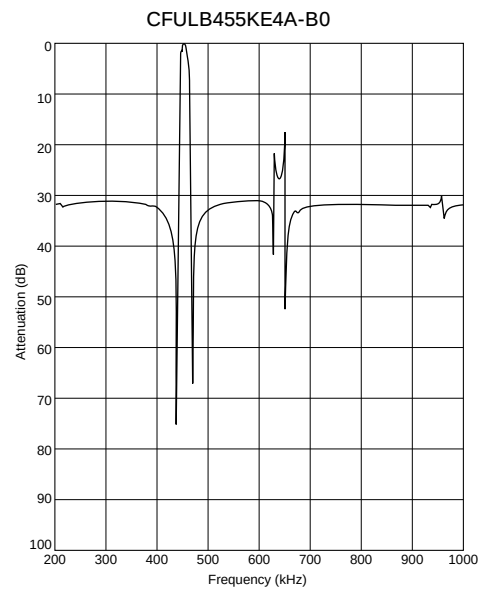
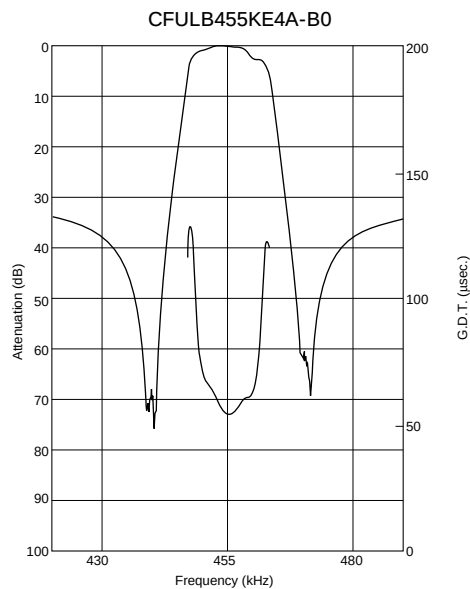
For safety purposes, connect the output of filters to the IF amplifier through a D.C. blocking capacitor. Avoid applying a direct current to the output of ceramic filters.

The order quantity should be an integral multiple of the "Minimum Quantity" shown in package page in this catalog.

#### ■ Test Circuit



■ Frequency Characteristics

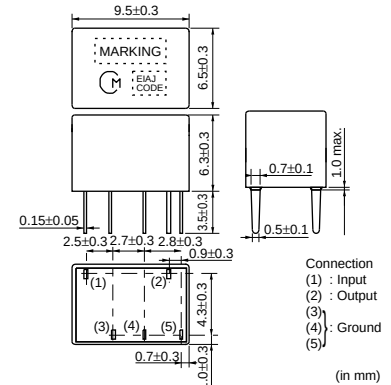


## Ceramic Filters (CERAFIL®)/Ceramic Discriminators for Communications Equipment

**muRata**

### CERAFIL® Plastic Case General Use CFWLB Series

CFWLB series ceramic filters are miniature, high performance ceramic filters composed of piezoelectric elements connected in a ladder form. These filters, only 6.3mm high, are 67% the volume of conventional types. (CFWLB series)  
They are well suited for miniaturizing various kinds of communications equipment, pocket pagers, pagers, car radios, cordless telephones and mobile telephones.



#### ■ Features

1. Miniature and high selectivity
2. A variety of bandwidths are available.
3. Operating temperature range: -20 to +80 (degree C)  
Storage temperature range: -40 to +85 (degree C)

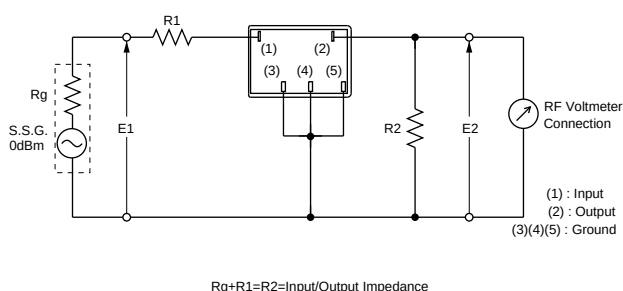
| Part Number        | Nominal Center Frequency (fn) (kHz) | 6dB Bandwidth (kHz) | Stop Bandwidth (kHz)       | Stop Band Attenuation (dB)         | Insertion Loss (dB)              | Input/Output Impedance (ohm) |
|--------------------|-------------------------------------|---------------------|----------------------------|------------------------------------|----------------------------------|------------------------------|
| CFWLB455KBFA-B0    | 455                                 | fn±15.0 min.        | fn±30.0 max. [within 50dB] | 35 min. [within fn±100kHz]         | 4.0 max. [at minimum loss point] | 1500                         |
| CFWLB455KCFA-B0    | 455                                 | fn±12.5 min.        | fn±24.0 max. [within 50dB] | 35 min. [within fn±100kHz]         | 4.0 max. [at minimum loss point] | 1500                         |
| CFWLB455KDFA-B0    | 455                                 | fn±10.0 min.        | fn±20.0 max. [within 50dB] | 35 min. [within fn±100kHz]         | 4.0 max. [at minimum loss point] | 1500                         |
| CFWLB455KEFA-B0    | 455                                 | fn±7.5 min.         | fn±15.0 max. [within 50dB] | 35 min. [within fn±100kHz]         | 6.0 max. [at minimum loss point] | 1500                         |
| CFWLB455KEFA004-B0 | 455                                 | fn±7.5 min.         | fn±15.0 max. [within 60dB] | 60 min. [within fn±15kHz to 30kHz] | 5.0 max. [at fn]                 | 1500                         |
| CFWLB455KFFA-B0    | 455                                 | fn±6.0 min.         | fn±12.5 max. [within 50dB] | 35 min. [within fn±100kHz]         | 6.0 max. [at minimum loss point] | 2000                         |
| CFWLB455KGFA-B0    | 455                                 | fn±4.5 min.         | fn±10.0 max. [within 50dB] | 35 min. [within fn±100kHz]         | 6.0 max. [at minimum loss point] | 2000                         |
| CFWLB455KHFA-B0    | 455                                 | fn±3.0 min.         | fn±9.0 max. [within 50dB]  | 55 min. [within fn±100kHz]         | 6.0 max. [at minimum loss point] | 2000                         |
| CFWLB455KJFA-B0    | 455                                 | fn±2.0 min.         | fn±7.0 max. [within 50dB]  | 55 min. [within fn±100kHz]         | 7.0 max. [at minimum loss point] | 2000                         |

CFWLB455K\_series filters are 4-element ceramic filters and miniature versions of CFWLA455K\_series.

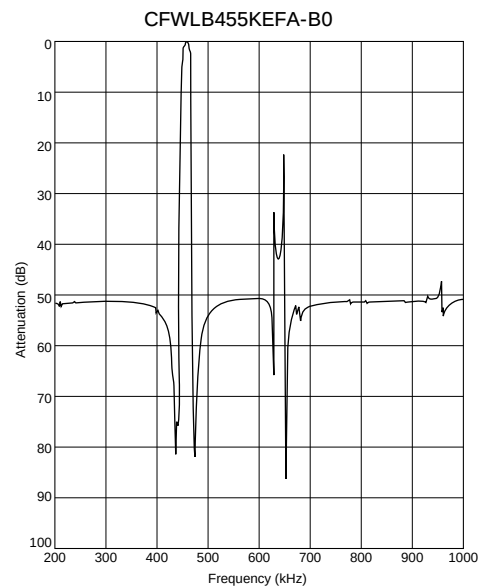
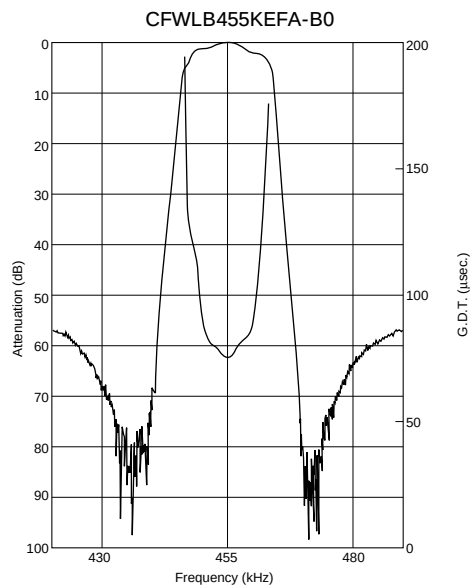
For safety purposes, connect the output of filters to the IF amplifier through a D.C. blocking capacitor. Avoid applying a direct current to the output of ceramic filters.

The order quantity should be an integral multiple of the "Minimum Quantity" shown in package page in this catalog.

#### ■ Test Circuit



Frequency Characteristics



## Ceramic Filters (CERAFIL®)/Ceramic Discriminators for Communications Equipment

**muRata**

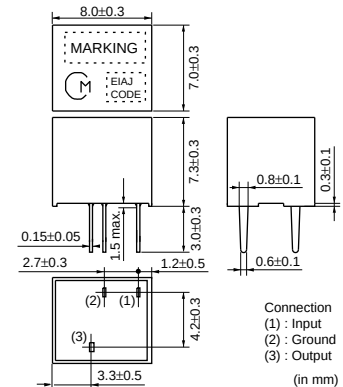
### CERAFIL® Plastic Case Group Delay Flat Type CFULA\_Y Series

CFULA\_Y series are high selectivity ceramic filters, which consist of 4 ceramic elements connected in a ladder form.

Most suitable for digital communications and cellular phones because of their improved GDT characteristics.

#### ■ Features

1. High selectivity
2. A variety of bandwidths are available.
3. Excellent GDT characteristics are available within pass bandwidth.
4. Easily mounted on a printed circuit board
5. Operating temperature range: -20 to +80 (degree C)  
Storage temperature range: -40 to +85 (degree C)



| Part Number     | Center Frequency (fo) (kHz) | 6dB Bandwidth (kHz) | Stop Bandwidth (kHz)          | Stop Band Attenuation (dB)    | Insertion Loss (dB)                  | GDT Deviation (μs)             | Input/Output Impedance (ohm) |
|-----------------|-----------------------------|---------------------|-------------------------------|-------------------------------|--------------------------------------|--------------------------------|------------------------------|
| CFULA455KB4Y-B0 | 455.0<br>±1.5kHz            | fn±15.0<br>min.     | fn±35.0 max.<br>[within 40dB] | 25 min.<br>[within fn±100kHz] | 5.0 max.<br>[at minimum loss point]  | 15.0 max.<br>[within fn±10kHz] | 1500                         |
| CFULA455KC4Y-B0 | 455.0<br>±1.5kHz            | fn±12.5<br>min.     | fn±30.0 max.<br>[within 40dB] | 25 min.<br>[within fn±100kHz] | 6.0 max.<br>[at minimum loss point]  | 15.0 max.<br>[within fn±8kHz]  | 1500                         |
| CFULA455KD1Y-B0 | 455.0<br>±1.0kHz            | fn±10.0<br>min.     | fn±25.0 max.<br>[within 40dB] | 23 min.<br>[within fn±100kHz] | 7.0 max.<br>[at minimum loss point]  | 20.0 max.<br>[within fn±7kHz]  | 1500                         |
| CFULA455KE1Y-B0 | 455.0<br>±1.0kHz            | fn±7.5<br>min.      | fn±20.0 max.<br>[within 40dB] | 23 min.<br>[within fn±100kHz] | 8.0 max.<br>[at minimum loss point]  | 20.0 max.<br>[within fn±5kHz]  | 1500                         |
| CFULA455KF1Y-B0 | 455.0<br>±1.0kHz            | fn±6.0<br>min.      | fn±17.5 max.<br>[within 40dB] | 23 min.<br>[within fn±100kHz] | 9.0 max.<br>[at minimum loss point]  | 20.0 max.<br>[within fn±4kHz]  | 2000                         |
| CFULA455KG1Y-B0 | 455.0<br>±1.0kHz            | fn±4.5<br>min.      | fn±15.0 max.<br>[within 40dB] | 23 min.<br>[within fn±100kHz] | 10.0 max.<br>[at minimum loss point] | 20.0 max.<br>[within fn±3kHz]  | 2000                         |

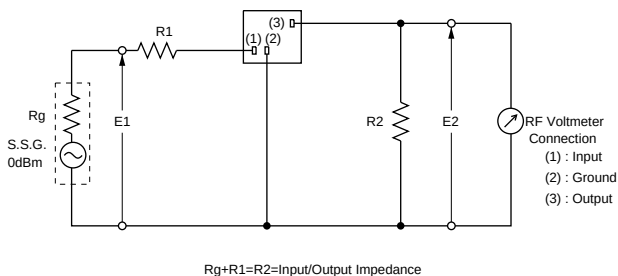
Center frequency (fo) defined by the center of 6dB bandwidth.

(fn) means nominal center frequency 455kHz.

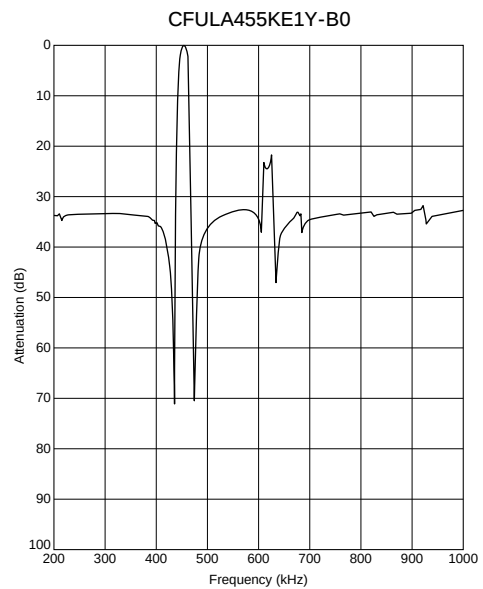
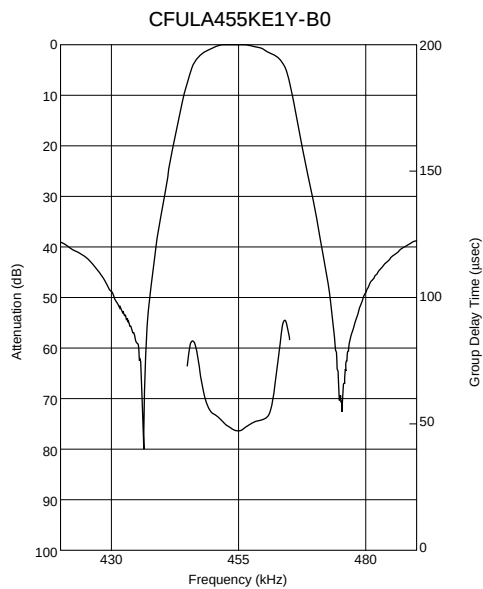
For safety purposes, connect the output of filters to the IF amplifier through a D.C. blocking capacitor. Avoid applying a direct current to the output of ceramic filters.

The order quantity should be an integral multiple of the "Minimum Quantity" shown in package page in this catalog.

#### ■ Test Circuit



Frequency Characteristics



## Ceramic Filters (CERAFIL®)/Ceramic Discriminators for Communications Equipment

**muRata**

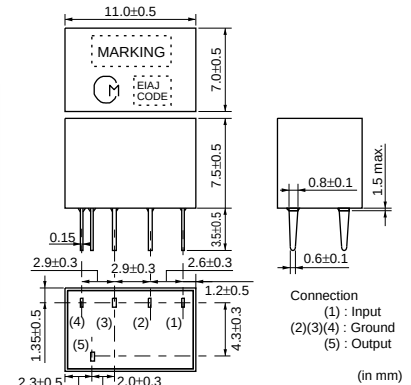
### CERAFIL® Plastic Case Group Delay Flat Type CFWLA\_Y Series

CFWLA\_Y series are high selectivity ceramic filters, which consist of 6 ceramic elements connected in a ladder form.

Most suitable for digital communications and mobile telephones because of their improved GDT characteristics.

#### ■ Features

1. High selectivity
2. A variety of bandwidths are available
3. Excellent GDT characteristics are available within pass bandwidth.
4. Easily mounted on a printed circuit board
5. Operating temperature range: -20 to +80 (degree C)  
Storage temperature range: -40 to +85 (degree C)



| Part Number     | Center Frequency (fo) (kHz) | 6dB Bandwidth (kHz) | Stop Bandwidth (kHz)          | Stop Band Attenuation (dB)    | Insertion Loss (dB)                  | GDT Deviation (μs)             | Input/Output Impedance (ohm) |
|-----------------|-----------------------------|---------------------|-------------------------------|-------------------------------|--------------------------------------|--------------------------------|------------------------------|
| CFWLA455KB4Y-B0 | 455.0<br>±1.5kHz            | fn±15.0<br>min.     | fn±35.0 max.<br>[within 50dB] | 40 min.<br>[within fn±100kHz] | 6.0 max.<br>[at minimum loss point]  | 30.0 max.<br>[within fn±10kHz] | 1500                         |
| CFWLA455KC4Y-B0 | 455.0<br>±1.5kHz            | fn±12.5<br>min.     | fn±30.0 max.<br>[within 50dB] | 40 min.<br>[within fn±100kHz] | 7.0 max.<br>[at minimum loss point]  | 30.0 max.<br>[within fn±8kHz]  | 1500                         |
| CFWLA455KD1Y-B0 | 455.0<br>±1.0kHz            | fn±10.0<br>min.     | fn±25.0 max.<br>[within 50dB] | 40 min.<br>[within fn±100kHz] | 8.0 max.<br>[at minimum loss point]  | 30.0 max.<br>[within fn±7kHz]  | 1500                         |
| CFWLA455KE1Y-B0 | 455.0<br>±1.0kHz            | fn±7.5<br>min.      | fn±20.0 max.<br>[within 50dB] | 40 min.<br>[within fn±100kHz] | 9.0 max.<br>[at minimum loss point]  | 30.0 max.<br>[within fn±5kHz]  | 1500                         |
| CFWLA455KF1Y-B0 | 455.0<br>±1.0kHz            | fn±6.0<br>min.      | fn±17.5 max.<br>[within 50dB] | 40 min.<br>[within fn±100kHz] | 10.0 max.<br>[at minimum loss point] | 40.0 max.<br>[within fn±4kHz]  | 2000                         |
| CFWLA455KG1Y-B0 | 455.0<br>±1.0kHz            | fn±4.5<br>min.      | fn±15.0 max.<br>[within 50dB] | 40 min.<br>[within fn±100kHz] | 11.0 max.<br>[at minimum loss point] | 40.0 max.<br>[within fn±3kHz]  | 2000                         |

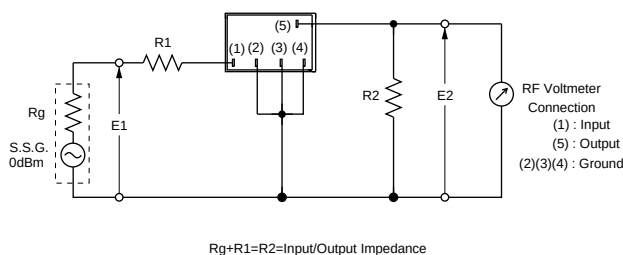
Center frequency (fo) defined by the center of 6dB bandwidth.

(fn) means nominal center frequency 455kHz.

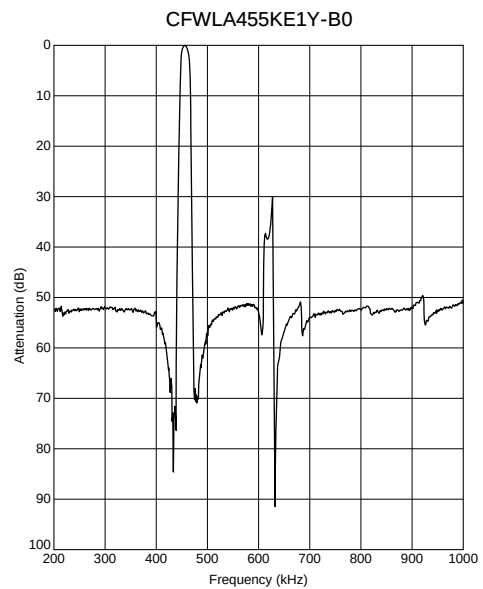
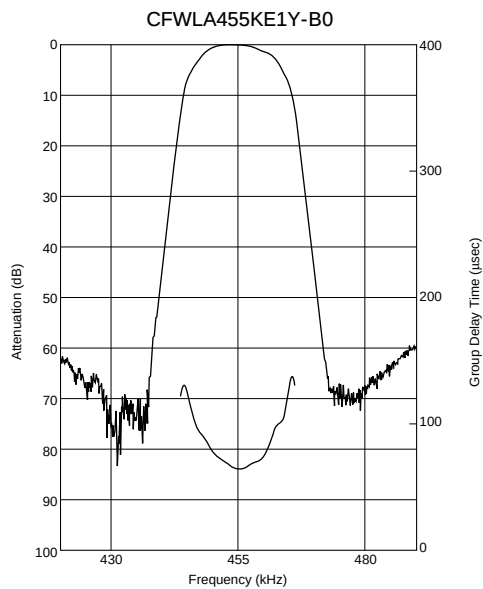
For safety purposes, connect the output of filters to the IF amplifier through a D.C. blocking capacitor. Avoid applying a direct current to the output of ceramic filters.

The order quantity should be an integral multiple of the "Minimum Quantity" shown in package page in this catalog.

#### ■ Test Circuit



Frequency Characteristics



## Ceramic Filters (CERAFIL®)/Ceramic Discriminators for Communications Equipment

**muRata**

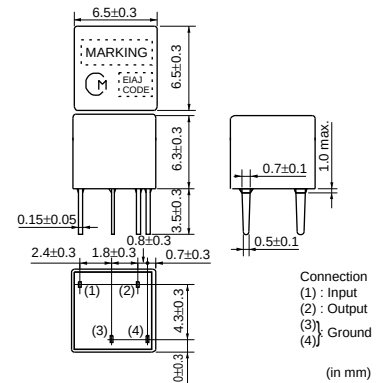
### CERAFIL® Plastic Case Group Delay Flat Type Miniaturized Type CFULB\_Y Series

Ceramic filter CFULB\_Y series are miniature and high performance filters. These filters, only 6.3mm high, are 65% the volume of conventional types (CFULA455K\_Y series).

Well suited for miniaturizing communications equipment, especially for a cellular phone.

#### ■ Features

1. Miniature, flat GDT characteristics
2. Suitable for a cellular phone
3. A variety of bandwidths are available.
4. Operating temperature range: -20 to +80 (degree C)  
Storage temperature range: -40 to +85 (degree C)



| Part Number            | Center Frequency (fo) (kHz) | 6dB Bandwidth (kHz) | Stop Bandwidth (kHz)          | Stop Band Attenuation (dB)    | Insertion Loss (dB)                  | GDT Deviation (μs)             | Input/Output Impedance (ohm) |
|------------------------|-----------------------------|---------------------|-------------------------------|-------------------------------|--------------------------------------|--------------------------------|------------------------------|
| <b>CFULB455KB4Y-B0</b> | 455.0<br>±1.5kHz            | fn±15.0<br>min.     | fn±35.0 max.<br>[within 40dB] | 25 min.<br>[within fn±100kHz] | 5.0 max.<br>[at minimum loss point]  | 15.0 max.<br>[within fn±10kHz] | 1500                         |
| <b>CFULB455KC4Y-B0</b> | 455.0<br>±1.5kHz            | fn±12.5<br>min.     | fn±30.0 max.<br>[within 40dB] | 25 min.<br>[within fn±100kHz] | 6.0 max.<br>[at minimum loss point]  | 15.0 max.<br>[within fn±8kHz]  | 1500                         |
| <b>CFULB455KD1Y-B0</b> | 455.0<br>±1.0kHz            | fn±10.0<br>min.     | fn±25.0 max.<br>[within 40dB] | 23 min.<br>[within fn±100kHz] | 7.0 max.<br>[at minimum loss point]  | 20.0 max.<br>[within fn±7kHz]  | 1500                         |
| <b>CFULB455KE1Y-B0</b> | 455.0<br>±1.0kHz            | fn±7.5<br>min.      | fn±20.0 max.<br>[within 40dB] | 23 min.<br>[within fn±100kHz] | 8.0 max.<br>[at minimum loss point]  | 20.0 max.<br>[within fn±5kHz]  | 1500                         |
| <b>CFULB455KF1Y-B0</b> | 455.0<br>±1.0kHz            | fn±6.0<br>min.      | fn±17.5 max.<br>[within 40dB] | 23 min.<br>[within fn±100kHz] | 9.0 max.<br>[at minimum loss point]  | 20.0 max.<br>[within fn±4kHz]  | 2000                         |
| <b>CFULB455KG1Y-B0</b> | 455.0<br>±1.0kHz            | fn±4.5<br>min.      | fn±15.0 max.<br>[within 40dB] | 23 min.<br>[within fn±100kHz] | 10.0 max.<br>[at minimum loss point] | 20.0 max.<br>[within fn±3kHz]  | 2000                         |

Center frequency (fo) defined by the center of 6dB bandwidth.

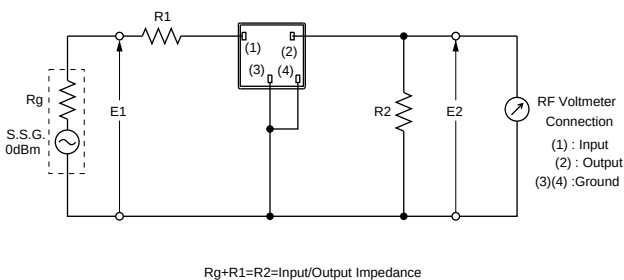
(fn) means nominal center frequency 455kHz.

CFULB455K\_Y series filters are 4-element ceramic filters and miniature versions of CFULA455K\_Y series.

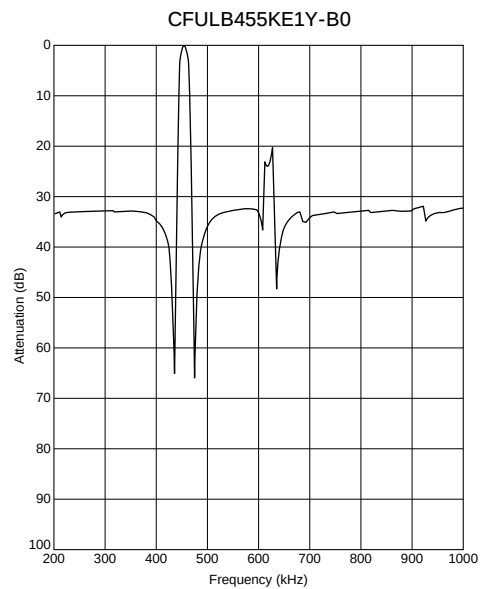
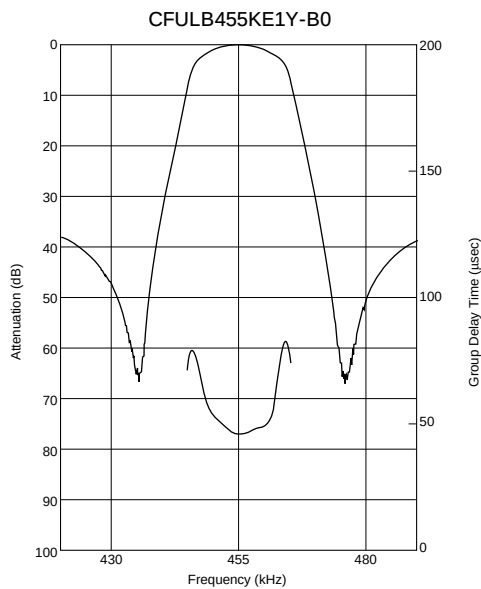
For safety purposes, connect the output of filters to the IF amplifier through a D.C. blocking capacitor. Avoid applying a direct current to the output of ceramic filters.

The order quantity should be an integral multiple of the "Minimum Quantity" shown in package page in this catalog.

#### ■ Test Circuit



Frequency Characteristics



## Ceramic Filters (CERAFIL®)/Ceramic Discriminators for Communications Equipment

**muRata**

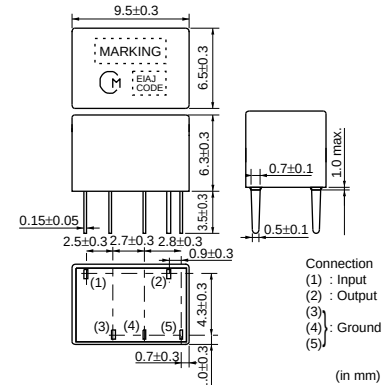
### CERAFIL® Plastic Case Group Delay Flat Type CFWLB\_Y Series

Ceramic filter CFWLB\_Y series are miniature and high-performance filters. These filters, only 6.3mm high, are 67% the volume of conventional types (CFWLA455K\_Y series).

Well suited for miniaturizing communications equipment, especially for a cellular phone.

#### ■ Features

1. Miniature, flat GDT characteristics
2. Suitable for a cellular phone
3. A variety of bandwidths are available.
4. Operating temperature range: -20 to +80 (degree C)  
Storage temperature range: -40 to +85 (degree C)



| Part Number            | Center Frequency (fo) (kHz) | 6dB Bandwidth (kHz) | Stop Bandwidth (kHz)          | Stop Band Attenuation (dB)    | Insertion Loss (dB)                  | GDT Deviation (μs)             | Input/Output Impedance (ohm) |
|------------------------|-----------------------------|---------------------|-------------------------------|-------------------------------|--------------------------------------|--------------------------------|------------------------------|
| <b>CFWLB455KB4Y-B0</b> | 455.0<br>±1.5kHz            | fn±15.0<br>min.     | fn±30.0 max.<br>[within 50dB] | 40 min.<br>[within fn±100kHz] | 6.0 max.<br>[at minimum loss point]  | 30.0 max.<br>[within fn±10kHz] | 1500                         |
| <b>CFWLB455KC4Y-B0</b> | 455.0<br>±1.5kHz            | fn±12.5<br>min.     | fn±27.5 max.<br>[within 50dB] | 40 min.<br>[within fn±100kHz] | 7.0 max.<br>[at minimum loss point]  | 30.0 max.<br>[within fn±8kHz]  | 1500                         |
| <b>CFWLB455KD1Y-B0</b> | 455.0<br>±1.0kHz            | fn±10.0<br>min.     | fn±25.0 max.<br>[within 50dB] | 40 min.<br>[within fn±100kHz] | 8.0 max.<br>[at minimum loss point]  | 30.0 max.<br>[within fn±7kHz]  | 1500                         |
| <b>CFWLB455KE1Y-B0</b> | 455.0<br>±1.0kHz            | fn±7.5<br>min.      | fn±20.0 max.<br>[within 50dB] | 40 min.<br>[within fn±100kHz] | 9.0 max.<br>[at minimum loss point]  | 30.0 max.<br>[within fn±5kHz]  | 1500                         |
| <b>CFWLB455KF1Y-B0</b> | 455.0<br>±1.0kHz            | fn±6.0<br>min.      | fn±17.5 max.<br>[within 50dB] | 40 min.<br>[within fn±100kHz] | 10.0 max.<br>[at minimum loss point] | 40.0 max.<br>[within fn±4kHz]  | 2000                         |
| <b>CFWLB455KG1Y-B0</b> | 455.0<br>±1.0kHz            | fn±4.5<br>min.      | fn±15.0 max.<br>[within 50dB] | 40 min.<br>[within fn±100kHz] | 11.0 max.<br>[at minimum loss point] | 40.0 max.<br>[within fn±3kHz]  | 2000                         |

Center frequency (fo) defined by the center of 6dB bandwidth.

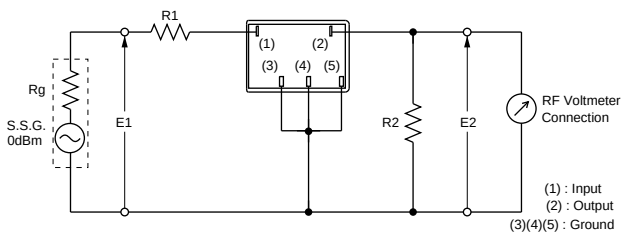
(fn) means nominal center frequency 455kHz.

CFWLB455K\_Y series filters are 4-element ceramic filters and miniature versions of CFWLA455K\_Y series.

For safety purposes, connect the output of filters to the IF amplifier through a D.C. blocking capacitor. Avoid applying a direct current to the output of ceramic filters.

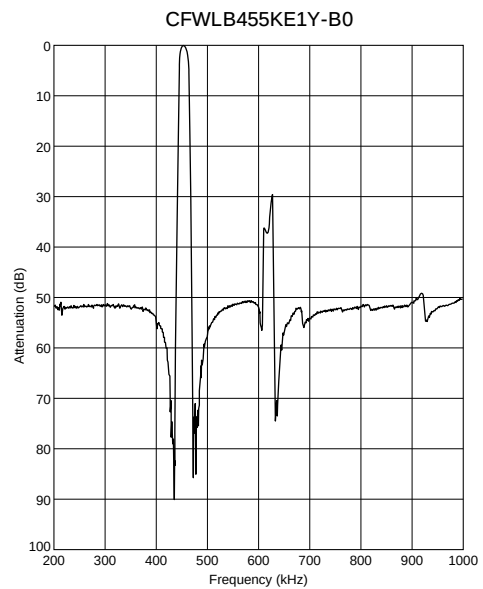
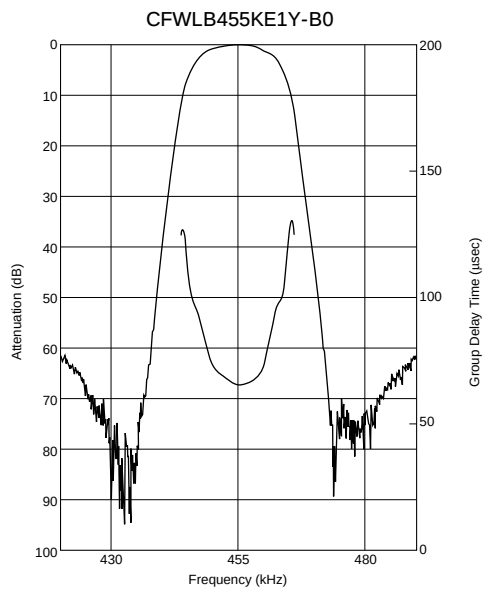
The order quantity should be an integral multiple of the "Minimum Quantity" shown in package page in this catalog.

#### ■ Test Circuit



Rg+R1=R2=Input/Output Impedance

Frequency Characteristics



## Plastic Case Type CERAFIL<sup>®</sup> Minimum Quantity/Notice

### ■ Minimum Quantity

| Part Number  | Bulk | Magazine |
|--------------|------|----------|
| CFULA Series | 200  |          |
| CFULB Series | 250  | 80       |
| CFWLA Series | 150  | 50       |
| CFWLB Series | 150  | 55       |

The order quantity should be an integral multiple of the "Minimum Quantity" shown above.

(pcs.)

### ■ Notice (Handling)

1. Do not use this product with bend. The component may be damaged if excessive mechanical stress is applied to it mounted on the printed circuit board.
2. The component will be damaged when an excessive stress is applied.
3. All kinds of re-flow soldering must not be applied on the component.
4. Do not clean or wash the component as it is not hermetically sealed.
5. Do not use strong acidity flux, more than 0.2wt% chlorine content, in flow soldering.
6. In case of covering filter with over coat, conditions such as material of resin, cure temperature, and so on should be evaluated carefully.
7. Accurate test circuit values are required to measure electrical characteristics.  
It may be a cause of miscorrelation if there is any deviation, especially stray capacitance, from the test circuit in the specification.
8. For safety purposes, connect the output of filters to the IF amplifier through a D.C. blocking capacitor. Avoid applying a direct current to the output of ceramic filters.

# Ceramic Filters (CERAFIL®)/Ceramic Discriminators for Communications Equipment



## kHz Type Ceramic Discriminators

Ceramic discriminator consists of wide band piezoelectric resonator.

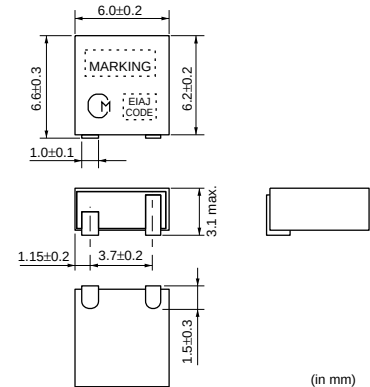
It is ideal for mobile communications equipment due to its small size and light weight.

Standard line include products for wide range of applications, from cordless telecom to cellular telephone. It helps to realize adjustment free at detection circuit and down sizing.

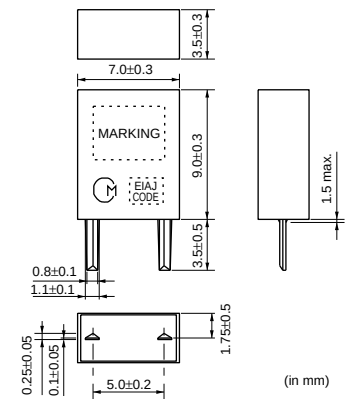
### ■ Features

1. Small in size and light weight
2. Adjustment free at detection circuit
3. High sensitivity and stability
4. Wide range of standard products are available for various ICs.
5. Operating temperature range: -20 to +80 (degree C)  
Storage temperature range: -40 to +85 (degree C)

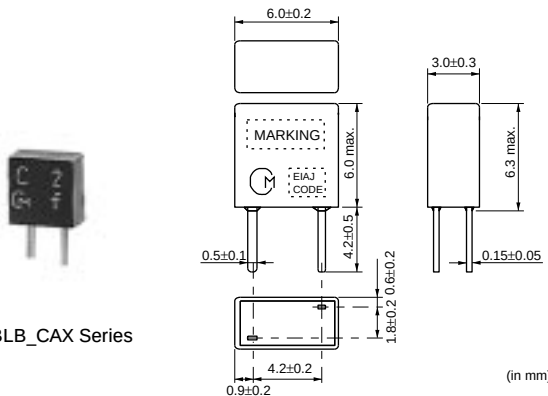
CDBKB Series



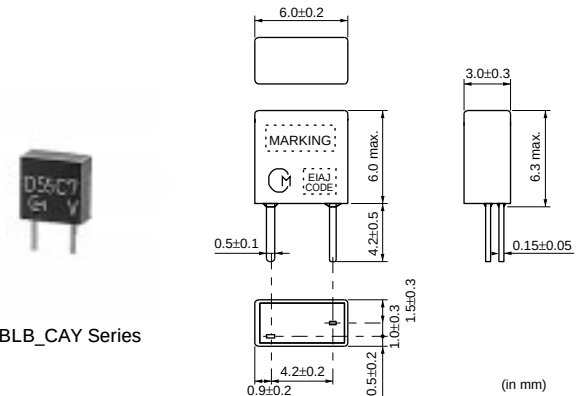
CDBLA Series



CDBLB\_CAX Series



CDBLB\_CAY Series

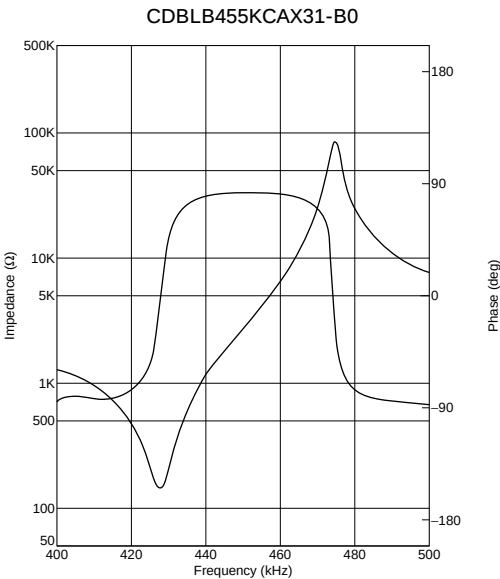
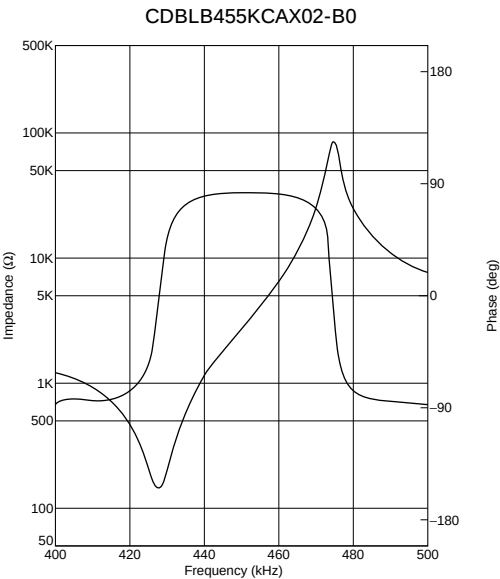


## Specified by Impedance Characteristics (Type 1)

| Part Number       | Nominal Center Frequency (fn) (kHz) | Inclination of Impedance Curve(1) | Inclination of Impedance Curve(2) | Capacitance (C) | IC      | IC Maker | Type |
|-------------------|-------------------------------------|-----------------------------------|-----------------------------------|-----------------|---------|----------|------|
| CDBLB455KCAX02-B0 | 455                                 | 447.0±1.5kHz (at  Z =2.05kohm)    | 463.0±1.5kHz (at  Z =10.0kohm)    | 140pF±20%       | TA8104F | TOSHIBA  | Lead |
| CDBLB455KCAX31-B0 | 455                                 | 447.0±1.5kHz (at  Z =2.05kohm)    | 463.0±1.5kHz (at  Z =10.0kohm)    | 140pF±20%       | TA31141 | TOSHIBA  | Lead |

For safety purposes, connect the output of filters to the IF amplifier through a D.C. blocking capacitor. Avoid applying a direct current to the output of ceramic filters.  
The order quantity should be an integral multiple of the "Minimum Quantity" shown in package page in this catalog.

■ Impedance Curve

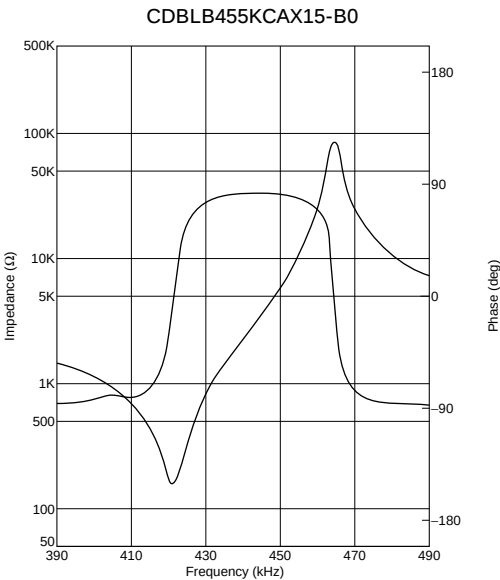
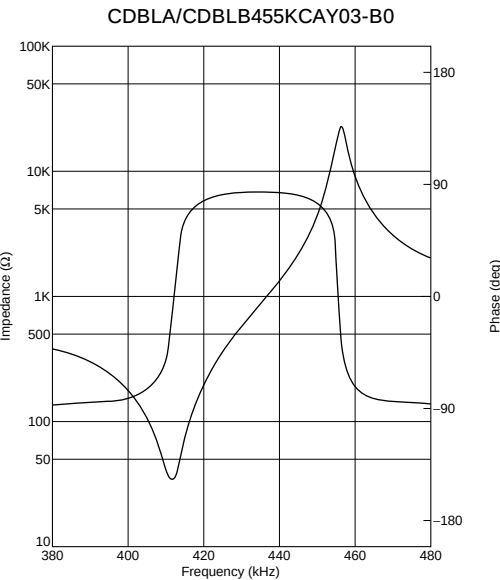


Specified by Impedance Characteristics (Type 2)

| Part Number       | Nominal Center Frequency (fn) (kHz) | Anti-resonant Frequency (Fa) | Delta F (Fa-Fr) | Resonant Resistance (R) | Capacitance (C) | IC       | IC Maker | Type |
|-------------------|-------------------------------------|------------------------------|-----------------|-------------------------|-----------------|----------|----------|------|
| CDBKB455KCAX33-R0 | -                                   | 458.0±1.5kHz                 | 42±4.0kHz       | 300ohm max.             | 280pF±20%       | CXA1474  | SONY     | SMD  |
| CDBLA455KCAY03-B0 | -                                   | 455.0±1.5kHz                 | 48±5.0kHz       | 70ohm max.              | 600pF±20%       | CXA1184  | SONY     | Lead |
| CDBLB455KCAY03-B0 | -                                   | 455.0±1.5kHz                 | 46±5.0kHz       | 70ohm max.              | 550pF±20%       | CXA1184M | SONY     | Lead |
| CDBLB455KCAX15-B0 | -                                   | 463.5±1.0kHz                 | 43±2.0kHz       | 300ohm max.             | 140pF±20%       | CXA1183M | SONY     | Lead |
| CDBLB455KCAX25-B0 | 455                                 | 465.0±1.5kHz                 | 45±4.0kHz       | 300ohm max.             | 135pF±20%       | CXA1484  | SONY     | Lead |
| CDBLB455KCAX33-B0 | 455                                 | 465.0±1.5kHz                 | 45±4.0kHz       | 300ohm max.             | 135pF±20%       | CXA1474  | SONY     | Lead |

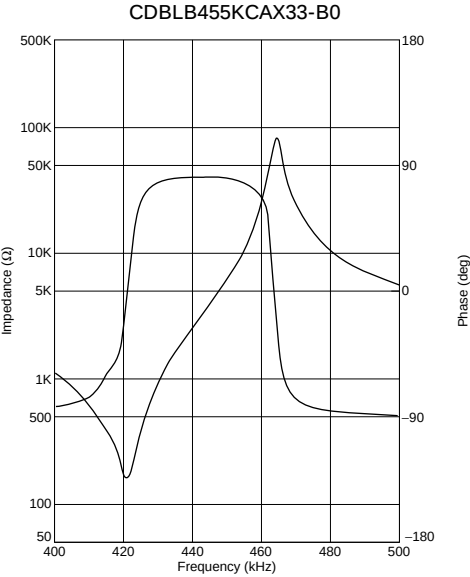
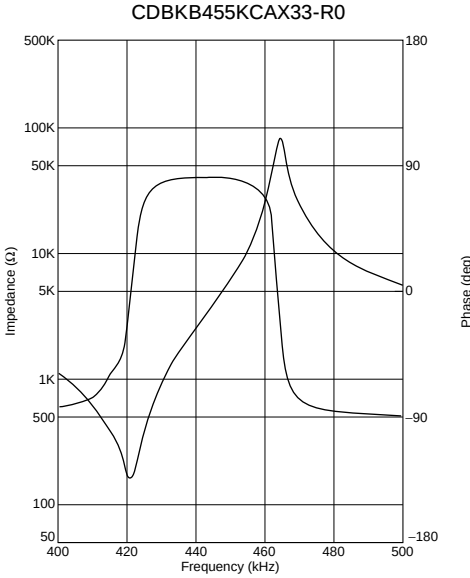
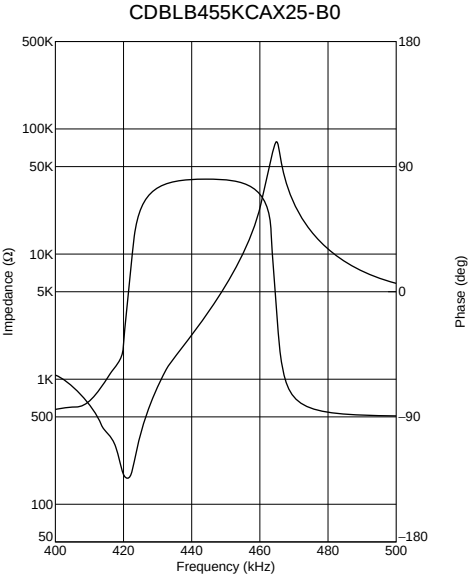
For safety purposes, connect the output of filters to the IF amplifier through a D.C. blocking capacitor. Avoid applying a direct current to the output of ceramic filters.  
The order quantity should be an integral multiple of the "Minimum Quantity" shown in package page in this catalog.

■ Impedance Curve



 Continued from the preceding page.

■ Impedance Curve



## Specified by Recovered Audio Characteristics

| Part Number        | Nominal Center Frequency (fn) (kHz) | Recovered Audio 3dB BW (kHz) | Recovered Audio Output (mV) | Distortion (at fn) (%) | Distortion (%)                | IC                      | IC Maker | Type |
|--------------------|-------------------------------------|------------------------------|-----------------------------|------------------------|-------------------------------|-------------------------|----------|------|
| CDBKB455KCAY07-R0  | 455                                 | fn±4.0 min.                  | 350 ±60                     | 3.0 max.               | -                             | MC3357                  | MOTOROLA | SMD  |
| CDBKB455KCAY09-R0  | 455                                 | fn±4.0 min.                  | 120 ±40                     | 1.5 max.               | -                             | NE604N                  | PHILIPS  | SMD  |
| CDBKB455KCAY13-R0  | 455                                 | fn±4.0 min.                  | 330 ±50                     | 4.0 max.               | -                             | CXA1003BM               | SONY     | SMD  |
| CDBKB455KCAY16-R0  | 455                                 | fn±4.0 min.                  | 175 ±40                     | 2.0 max.               | -                             | MC3372                  | MOTOROLA | SMD  |
| CDBKB455KCAY24-R0  | 455                                 | fn±4.0 min.                  | 100 ±40                     | 2.0 max.               | -                             | TA31136                 | TOSHIBA  | SMD  |
| CDBKB455KCAY27-R0  | 455                                 | fn±4.0 min.                  | 90 ±30                      | 2.0 max.               | -                             | TK10487                 | TOKO     | SMD  |
| CDBKB455KCAY28-R0  | 455                                 | fn±4.0 min.                  | 40 ±20                      | 3.0 max.               | -                             | TA31142F                | TOSHIBA  | SMD  |
| CDBKB455KCAY29-R0  | 455                                 | fn±4.0 min.                  | 100 ±30                     | 2.5 max.               | -                             | NE605                   | PHILIPS  | SMD  |
| CDBKB455KCAY35-R0  | 455                                 | fn±4.0 min.                  | 100 ±40                     | 2.5 max.               | -                             | TK10930                 | TOKO     | SMD  |
| CDBKB455KCAY40-R0  | 455                                 | fn±4.0 min.                  | 40 ±20                      | 3.5 max.               | -                             | TA31145                 | TOSHIBA  | SMD  |
| CDBKB455KCAY49-R0  | 455                                 | fn±4.0 min.                  | 45 ±10                      | 3.0 max.               | -                             | MC3361                  | MOTOROLA | SMD  |
| CDBKB455KCAY50-R0  | 455                                 | fn±4.0 min.                  | 64 ±6.4                     | 4.0 max.               | -                             | CXA3117N                | SONY     | SMD  |
| CDBKB455KCAY66-R0  | 455                                 | fn±4.2 min.                  | 40 ±10                      | 4.0 max.               | -                             | NJM2590                 | JRC      | SMD  |
| CDBKB455KCLX36-R0  | 455                                 | fn±13.0 min.                 | 90 ±30                      | 2.5 max.               | 5.0 max.<br>[within fn ±6kHz] | NE(SA)606<br>/NE(SA)616 | PHILIPS  | SMD  |
| CDBKB455KCLX39-R0  | 455                                 | fn±11.0 min.                 | 130 ±20                     | 2.5 max.               | 7.0 max.<br>[within fn ±8kHz] | NE607<br>/NE617         | PHILIPS  | SMD  |
| CDBKB455KCLY13-R0  | 455                                 | fn±13.0 min.                 | 120 ±30                     | 1.5 max.               | 5.0 max.<br>[within fn ±8kHz] | CXA1003BM               | SONY     | SMD  |
| CDBLA455KCAY07-B0  | 455                                 | fn±4.0 min.                  | 340 ±60                     | 2.5 max.               | -                             | MC3357                  | MOTOROLA | Lead |
| CDBLA455KCAY09-B0  | 455                                 | fn±5.0 min.                  | 100 min.                    | 1.5 max.               | -                             | NE604N                  | PHILIPS  | Lead |
| CDBLA455KCAY13A-B0 | 455                                 | fn±4.0 min.                  | 350 ±50                     | 3.0 max.               | -                             | CXA1003BM               | SONY     | Lead |
| CDBLA455KCAY16-B0  | 455                                 | fn±4.0 min.                  | 185 ±40                     | 2.0 max.               | -                             | MC3372                  | MOTOROLA | Lead |
| CDBLA455KCAY24-B0  | 455                                 | fn±4.0 min.                  | 100 ±40                     | 2.0 max.               | -                             | TA31136                 | TOSHIBA  | Lead |
| CDBLA455KCAY28-B0  | 455                                 | fn±4.0 min.                  | 40 ±20                      | 3.0 max.               | -                             | TA31142                 | TOSHIBA  | Lead |
| CDBLA455KCAY34-B0  | 455                                 | fn±4.0 min.                  | 65 ±20                      | 2.5 max.               | -                             | MC13136                 | MOTOROLA | Lead |
| CDBLA455KCLY09-B0  | 455                                 | fn±15.0 min.                 | 70 ±20                      | 1.5 max.               | 3.5 max.<br>[within fn ±8kHz] | NE604N                  | PHILIPS  | Lead |
| CDBLA455KCLY13-B0  | 455                                 | fn±15.0 min.                 | 110 ±30                     | 1.5 max.               | 5.0 max.<br>[within fn ±8kHz] | CXA1003BM               | SONY     | Lead |
| CDBLB455KCAY07-B0  | 455                                 | fn±4.0 min.                  | 340 ±60                     | 3.0 max.               | -                             | MC3357                  | MOTOROLA | Lead |
| CDBLB455KCAY13A-B0 | 455                                 | fn±4.0 min.                  | 350 ±50                     | 3.0 max.               | -                             | CXA1003BM               | SONY     | Lead |

Continued on the following page. 

Continued from the preceding page.

| Part Number       | Nominal Center Frequency (fn) (kHz) | Recovered Audio 3dB BW (kHz) | Recovered Audio Output (mV) | Distortion (at fn) (%) | Distortion (%)                | IC               | IC Maker | Type |
|-------------------|-------------------------------------|------------------------------|-----------------------------|------------------------|-------------------------------|------------------|----------|------|
| CDBLB455KCAY24-B0 | 455                                 | fn±4.0 min.                  | 100 ±40                     | 2.0 max.               | -                             | TA31136          | TOSHIBA  | Lead |
| CDBLB455KCAY28-B0 | 455                                 | fn±4.0 min.                  | 40 ±20                      | 3.0 max.               | -                             | TA31142FN        | TOSHIBA  | Lead |
| CDBLB455KCAY34-B0 | 455                                 | fn±4.0 min.                  | 65 ±20                      | 2.5 max.               | -                             | MC13136          | MOTOROLA | Lead |
| CDBLB455KCAY40-B0 | 455                                 | fn±4.0 min.                  | 40 ±20                      | 3.0 max.               | -                             | TA31145          | TOSHIBA  | Lead |
| CDBLB455KCAY42-B0 | 455                                 | fn±4.0 min.                  | 40 ±15                      | 3.0 max.               | -                             | TK14590 /TK14591 | TOKO     | Lead |
| CDBLB455KCAY49-B0 | 455                                 | fn±4.0 min.                  | 45 ±10                      | 3.0 max.               | -                             | MC3361           | MOTOROLA | Lead |
| CDBLB455KCAY50-B0 | 455                                 | fn±4.0 min.                  | 64 ±6.4                     | 4.0 max.               | -                             | CXA3117N         | SONY     | Lead |
| CDBLB455KCLY09-B0 | 455                                 | fn±15.0 min.                 | 70 ±20                      | 1.5 max.               | 3.5 max.<br>[within fn ±8kHz] | NE604N           | PHILIPS  | Lead |
| CDBLB455KCLY13-B0 | 455                                 | fn±15.0 min.                 | 110 ±30                     | 1.5 max.               | 5.0 max.<br>[within fn ±8kHz] | CXA1003BM        | SONY     | Lead |
| CDBLB455KCAX16-B0 | 455                                 | fn±4.0 min.                  | 185 ±40                     | 2.0 max.               | -                             | MC3372           | MOTOROLA | Lead |
| CDBLB455KCAX18-B0 | 455                                 | fn±3.0 min.                  | 180 ±40                     | 2.0 max.               | -                             | MC3371           | MOTOROLA | Lead |
| CDBLB455KCAX36-B0 | 455                                 | fn±3.5 min.                  | 100 ±25                     | 3.5 max.               | -                             | NE606 /616       | PHILIPS  | Lead |

For safety purposes, connect the output of filters to the IF amplifier through a D.C. blocking capacitor. Avoid applying a direct current to the output of ceramic filters. The order quantity should be an integral multiple of the "Minimum Quantity" shown in package page in this catalog.

Test Circuit

MC3357

| Part Number (X)   | C     | R     |
|-------------------|-------|-------|
| CDBLA455KCAY07-B0 | 150pF | 1.5kΩ |
| CDBLB455KCAY07-B0 | 150pF | 1.3kΩ |
| CDBKB455KCAY07-R0 | 150pF | 1.3kΩ |

Unit C : F  
R : Ω

NE604N

| Part Number (X)   | C     | R     | L     |
|-------------------|-------|-------|-------|
| CDBLA455KCAY09-B0 | 120pF | 1.8kΩ | -     |
| CDBKB455KCAY09-R0 | 120pF | 560Ω  | 220µH |
| CDBLA455KCLY09-B0 | 120pF | 560Ω  | 220µH |
| CDBLB455KCLY09-B0 | 120pF | 560Ω  | 220µH |

Unit C : F  
R : Ω

CXA1003BM

| Part Number (X)    | C    | R     | L     |
|--------------------|------|-------|-------|
| CDBLA455KCAY13A-B0 | 82pF | 1.2kΩ | -     |
| CDBLB455KCAY13A-B0 | 82pF | 1.0kΩ | -     |
| CDBKB455KCAY13-R0  | 82pF | 1.0kΩ | -     |
| CDBLA455KCLY13-B0  | 82pF | 560Ω  | 220µH |
| CDBLB455KCLY13-B0  | 82pF | 560Ω  | 220µH |
| CDBKB455KCLY13-R0  | 82pF | 560Ω  | 220µH |

Unit C : F  
R : Ω

MC3372

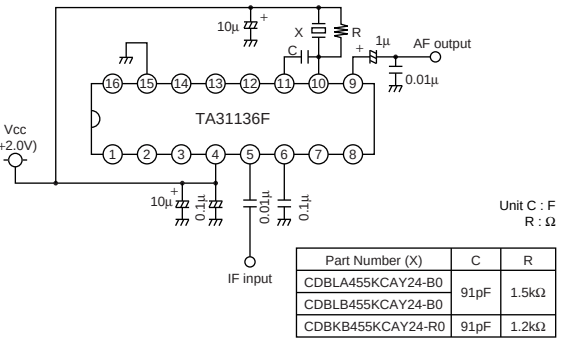
| Part Number (X)   | C     | R     |
|-------------------|-------|-------|
| CDBLA455KCAX16-B0 | 100pF | 1.3kΩ |
| CDBLB455KCAX16-B0 | 27pF  | 4.3kΩ |
| CDBKB455KCAY16-R0 | 100pF | 1.0kΩ |

Unit C : F  
R : Ω

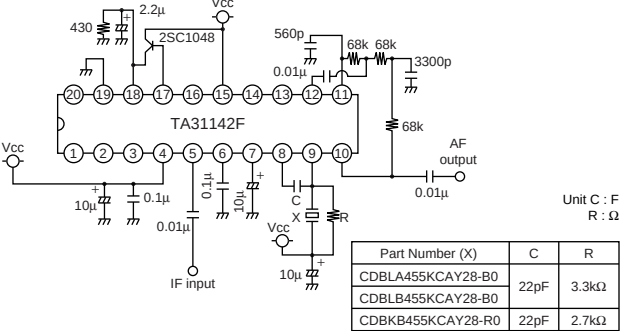
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## ■ Test Circuit

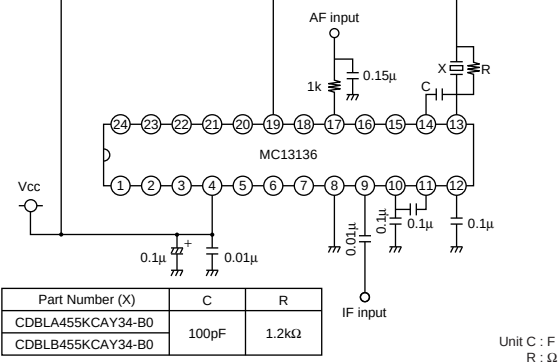
TA31136



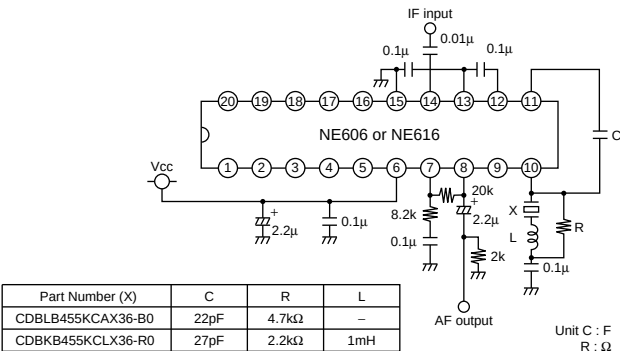
TA31142



MC13136



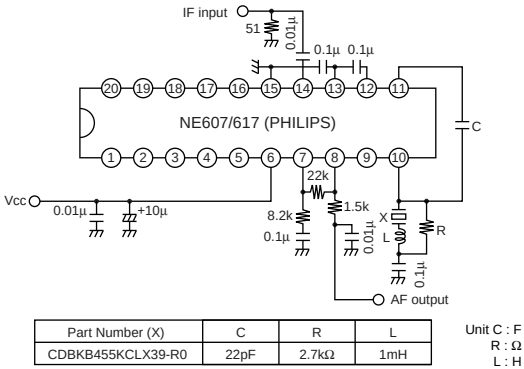
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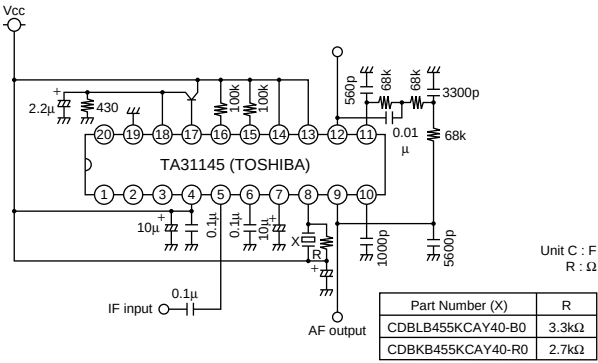
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Test Circuit

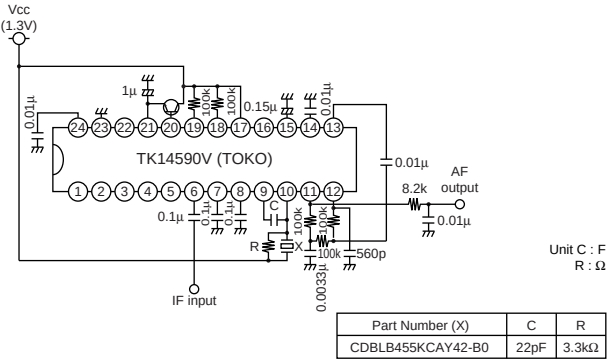
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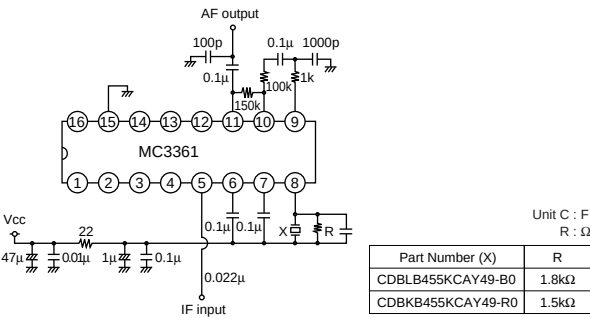
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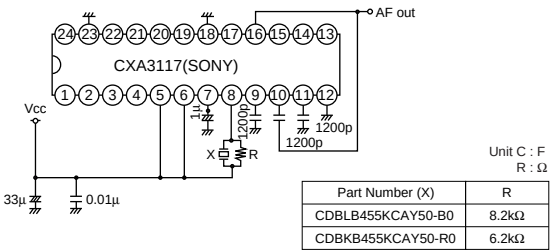
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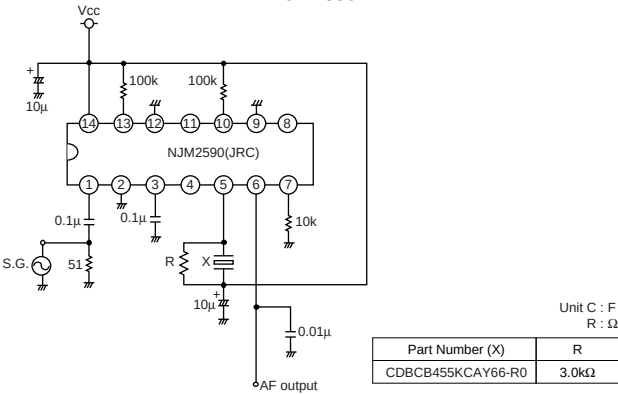
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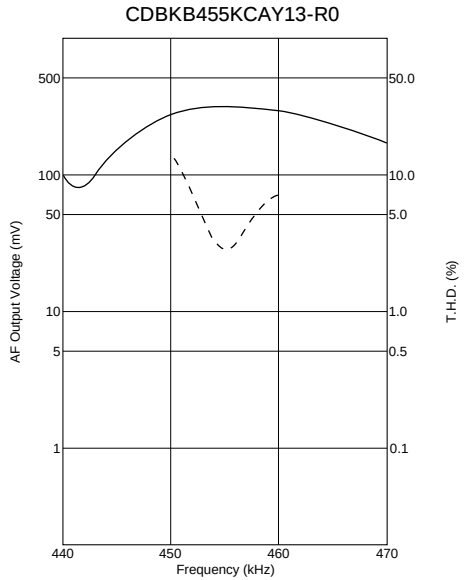
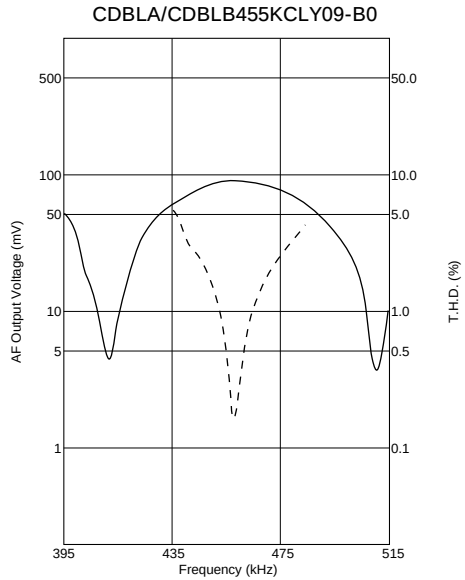
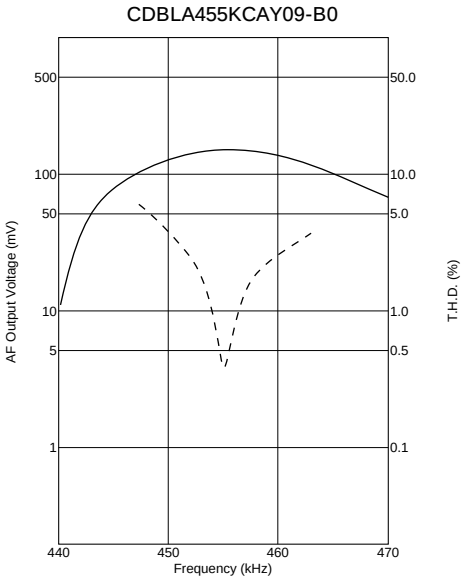
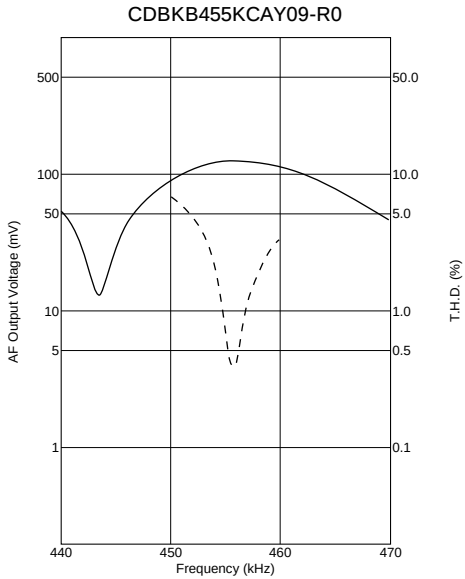
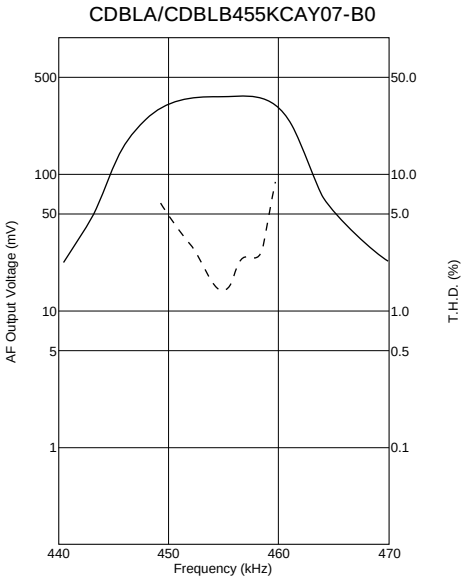
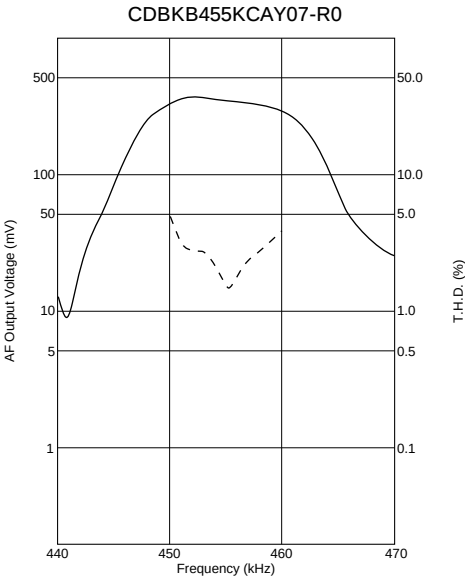
CXA3117



NJM2590

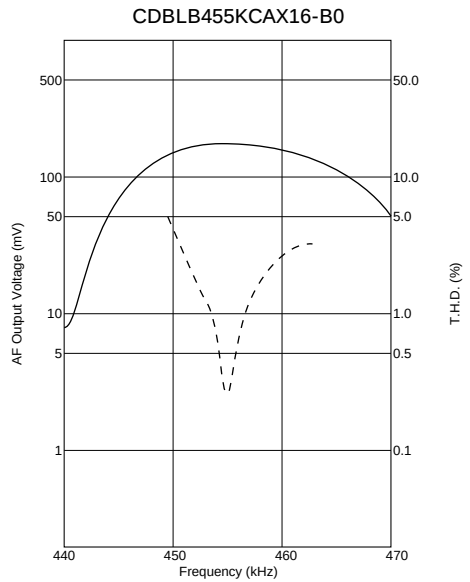
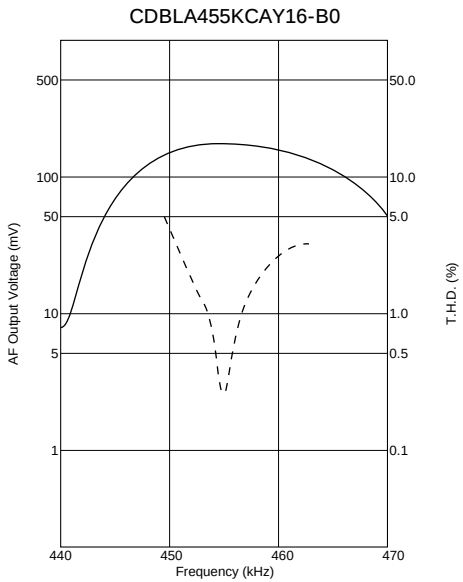
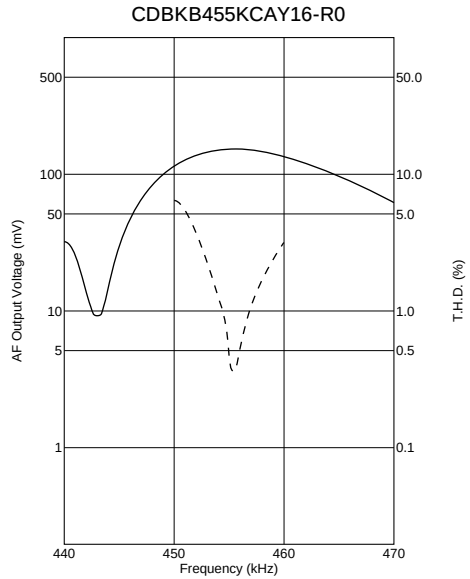
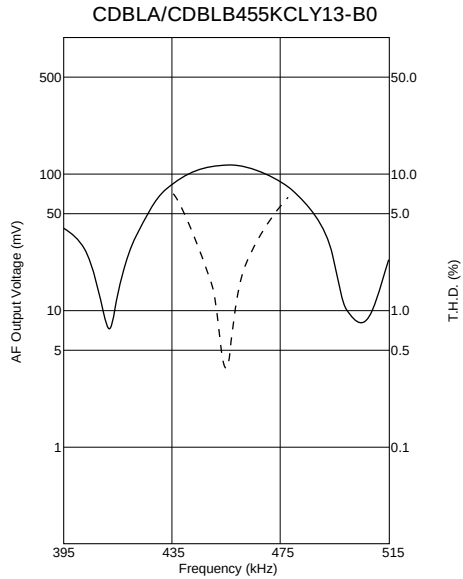
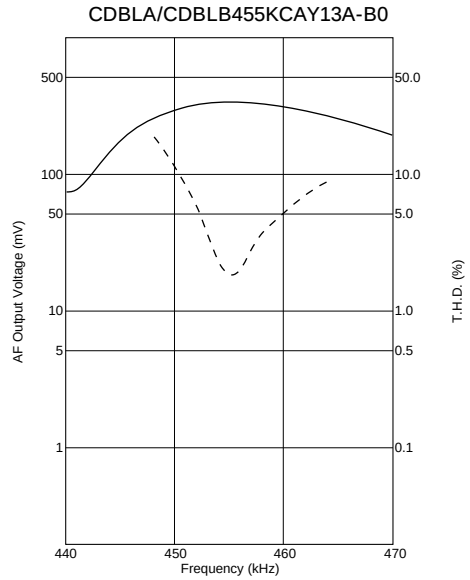
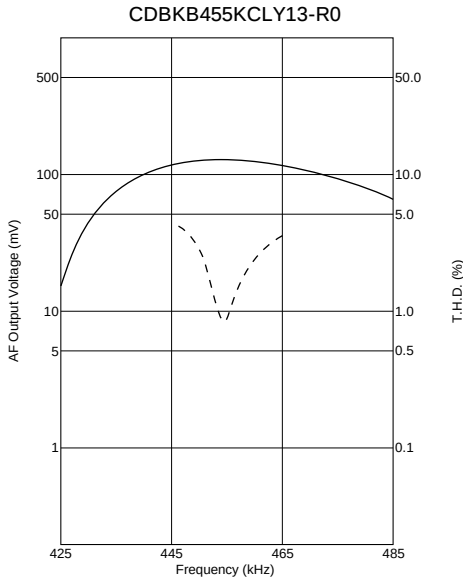


Recovered Audio Curve



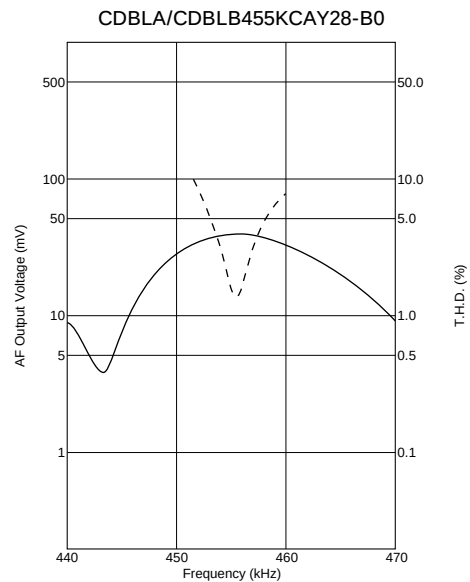
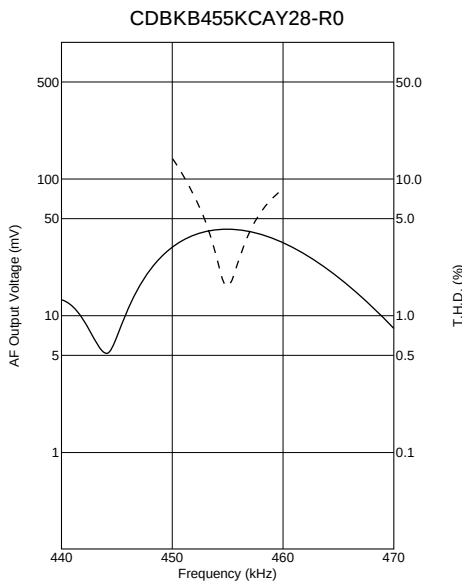
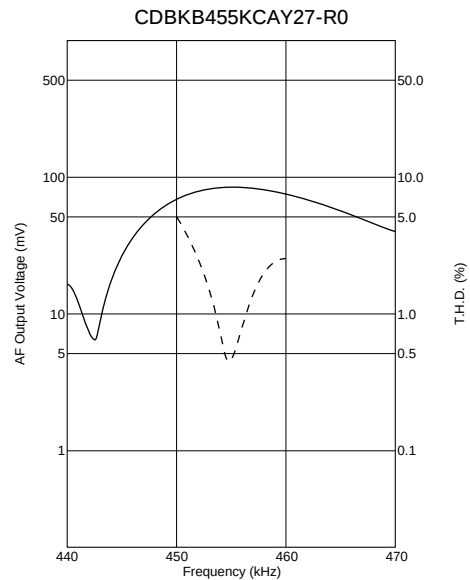
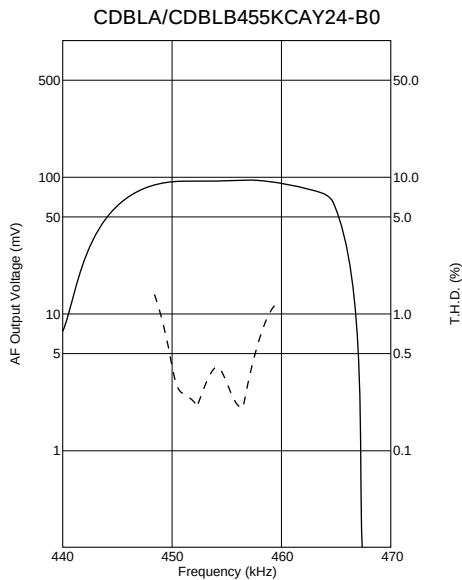
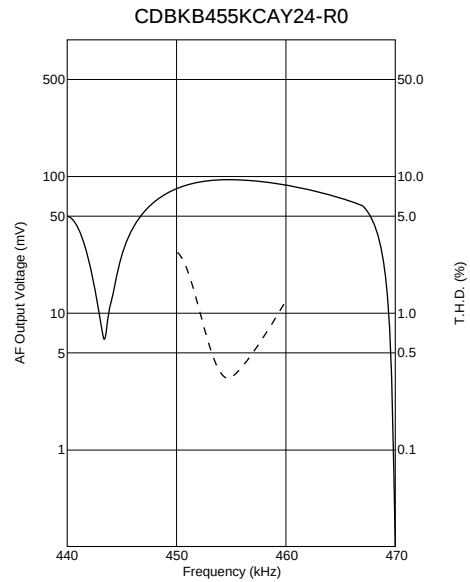
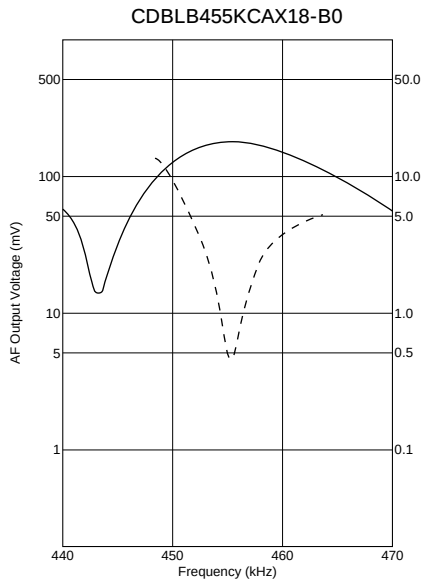
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Recovered Audio Curve



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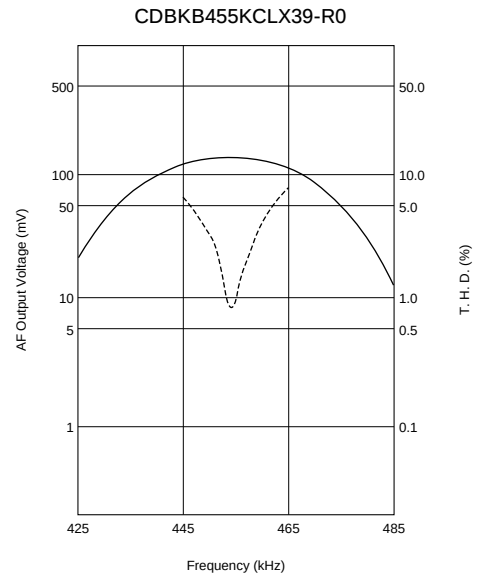
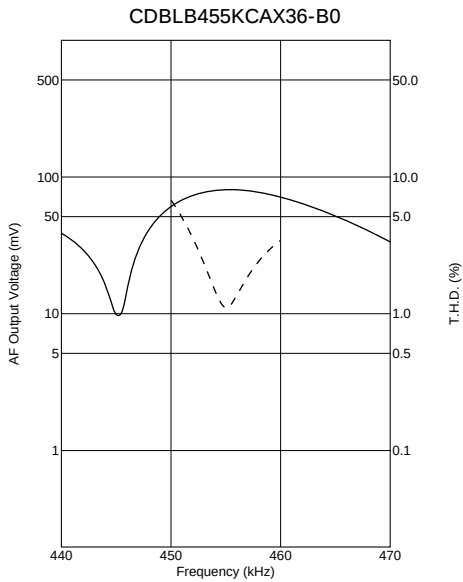
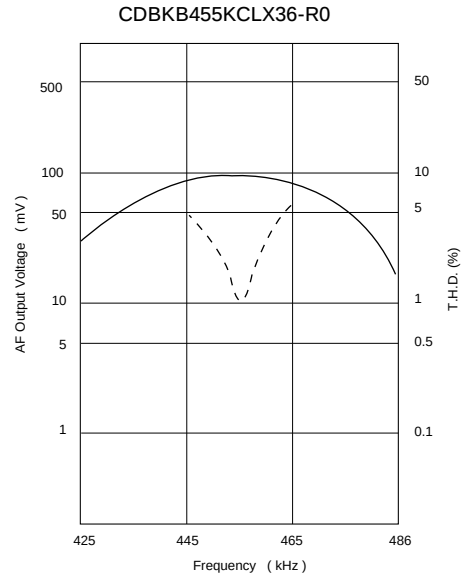
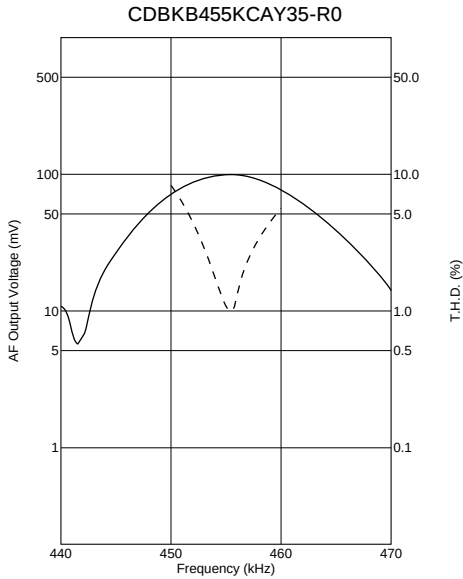
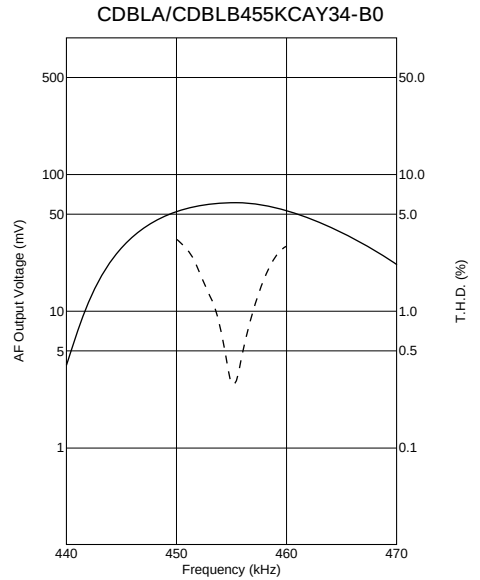
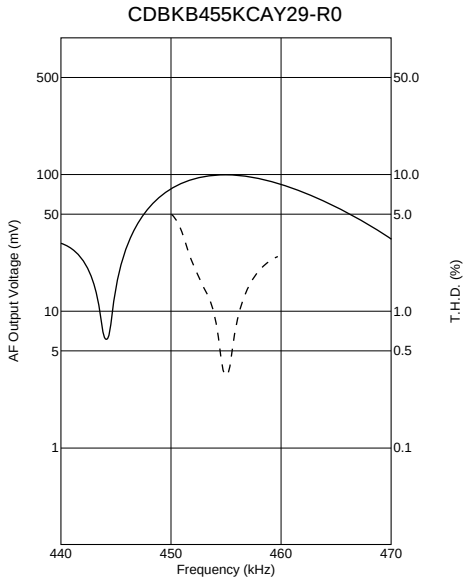
## Recovered Audio Curve



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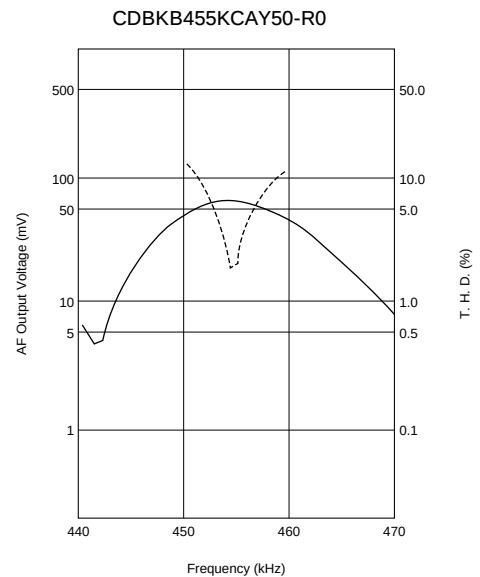
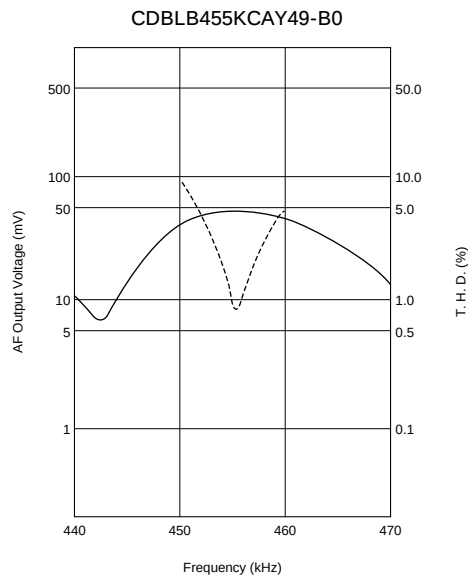
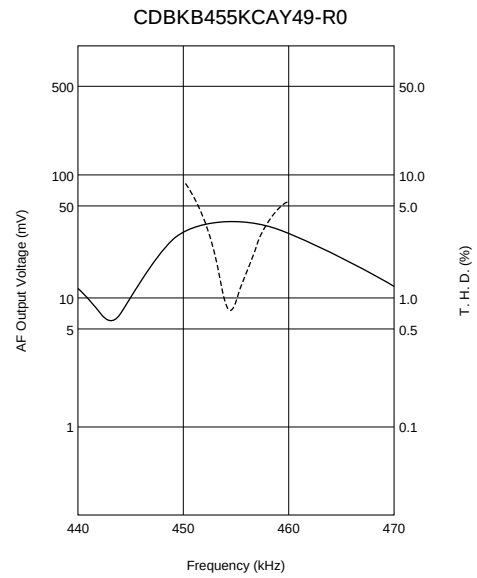
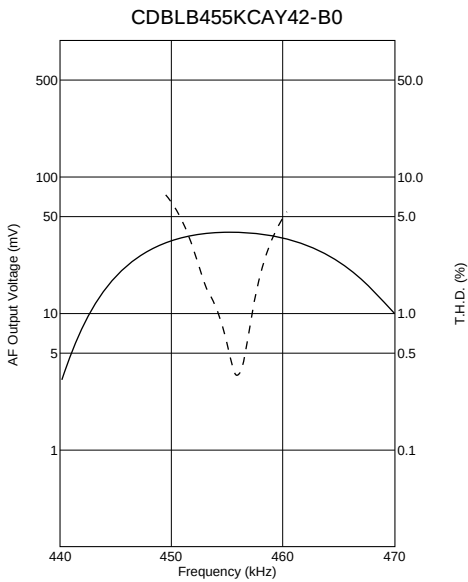
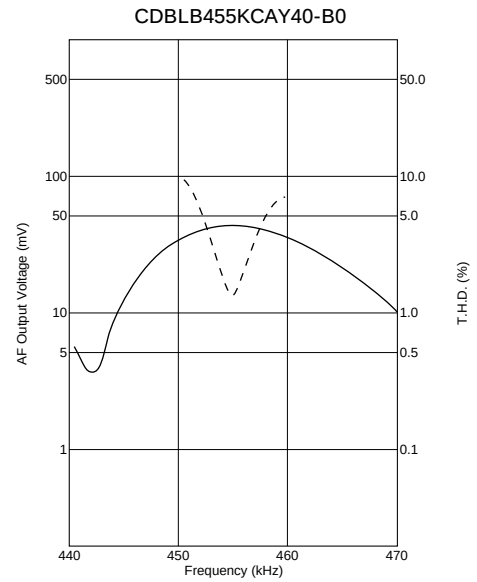
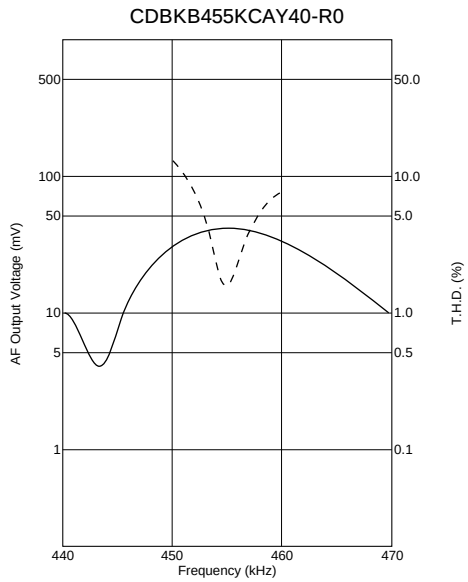
Recovered Audio Curve



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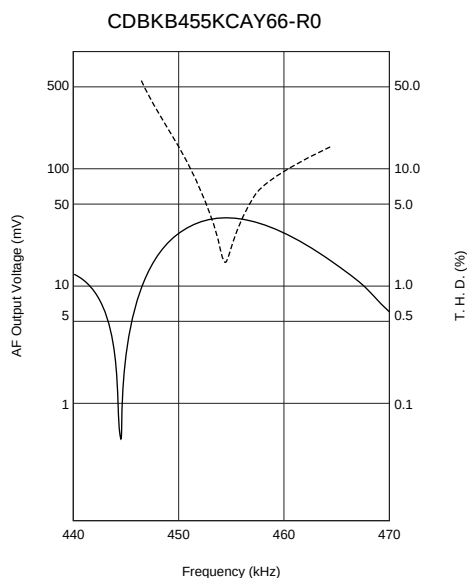
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## Recovered Audio Curve



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■ Recovered Audio Curve



| Part Number              | Nominal Center Frequency (fn) (kHz) | S Curve (1) Output Volt. at fn (mV) | S Curve (2) at fn±4.8kHz (mV) | IC      | IC Maker | Type |
|--------------------------|-------------------------------------|-------------------------------------|-------------------------------|---------|----------|------|
| <b>CDBKB455KCAY54-R0</b> | 455                                 | 165 ±20                             | 170 ±20                       | TA31149 | TOSHIBA  | SMD  |

### ■ Test Circuit



# Ceramic Filters (CERAFIL<sup>®</sup>)/Ceramic Discriminators for Communications Equipment

**muRata**

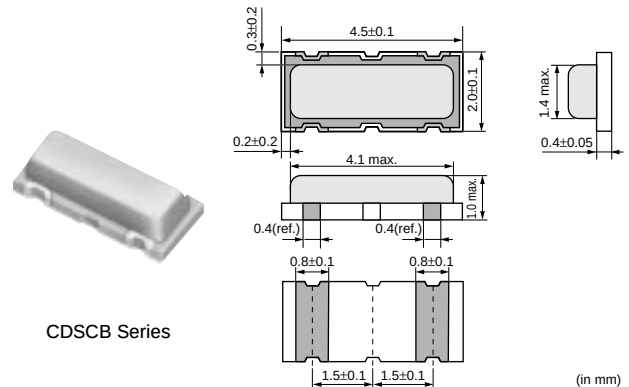
## MHz Type Ceramic Discriminators

CDSCB10M7 series forms a resonator on a piezoelectric ceramic substrate. In combination with ICs, this type obtains stable demodulation characteristics in a wide bandwidth.

They have 1.0mm max. thickness and small mounting area (4.5x2.0mm).

### ■ Features

1. Compact and high reliability and recommended for automotive applications.
2. Can be combined with various ICs. The IC is determined by the last number in the part number.
3. Stable demodulation characteristics can be obtained without adjustment.
4. Stable temperature characteristics
5. Recommended for Pb free soldering



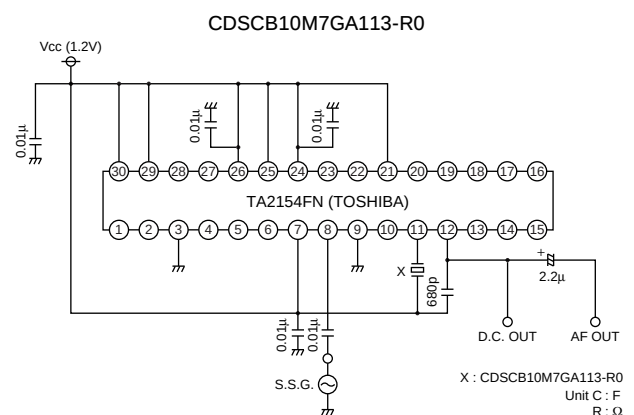
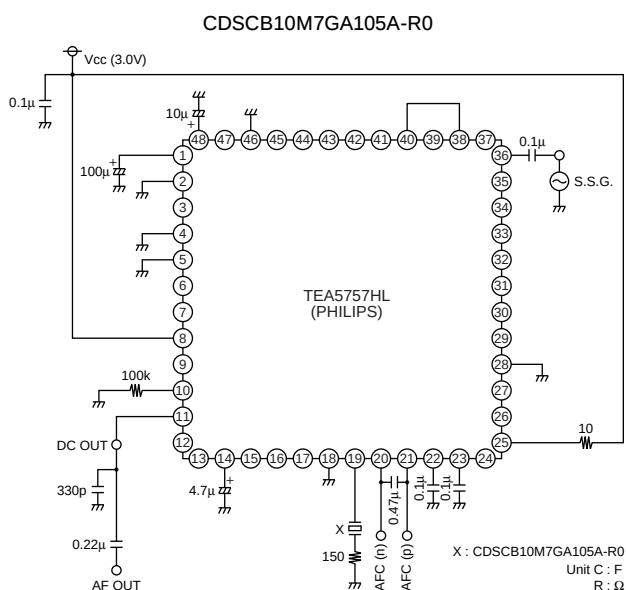
| Part Number        | Center Frequency (fo) (MHz) | Recovered Audio 3dB BW (kHz) | Recovered Audio Output (mV) | Distortion (%) | IC        |
|--------------------|-----------------------------|------------------------------|-----------------------------|----------------|-----------|
| CDSCB10M7GA105A-R0 | 10.700 ±30kHz               | 220 min.                     | 110 min.                    | 1.5 max.       | TEA5757HL |
| CDSCB10M7GA113-R0  | 10.700 ±30kHz               | 300 min.                     | 110 min.                    | 1.0 max.       | TA2154FN  |
| CDSCB10M7GA119-R0  | 10.700 ±30kHz               | 500 min.                     | 75 min.                     | 1.0 max.       | TRF6901   |
| CDSCB10M7GA121-R0  | 10.700 ±30kHz               | 390 min.                     | 80 min.                     | 1.0 max.       | LV23100V  |
| CDSCB10M7GF072-R0  | 10.700 (fn)                 | fn±150 min.                  | 130 min.                    | 2.0 max.       | TA31161   |
| CDSCB10M7GF109-R0  | 10.700 (fn)                 | fn±100 min.                  | 170 min.                    | 3.0 max.       | TK14588V  |

(fn) means nominal center frequency.

The order quantity should be an integral multiple of the "Minimum Quantity" shown in the package page.

For safety purposes, connect the output of filters to the IF amplifier through a D.C. blocking capacitor. Avoid applying a direct current to the output of ceramic filters.

### ■ Test Circuit

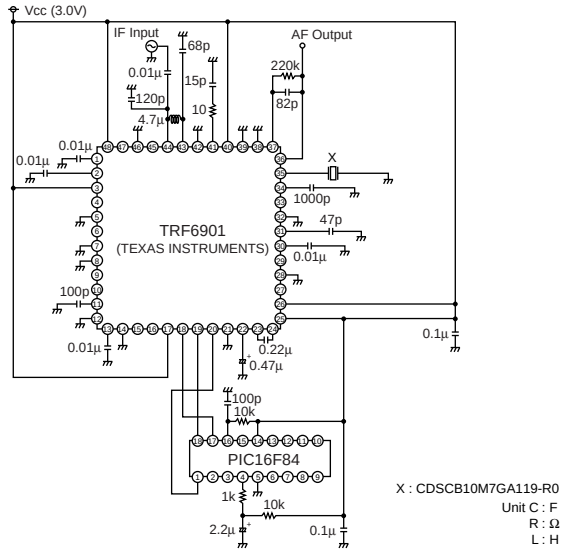


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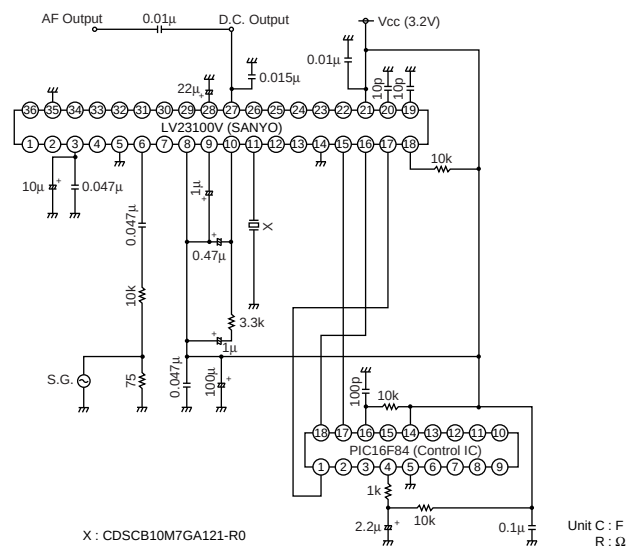
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## Test Circuit

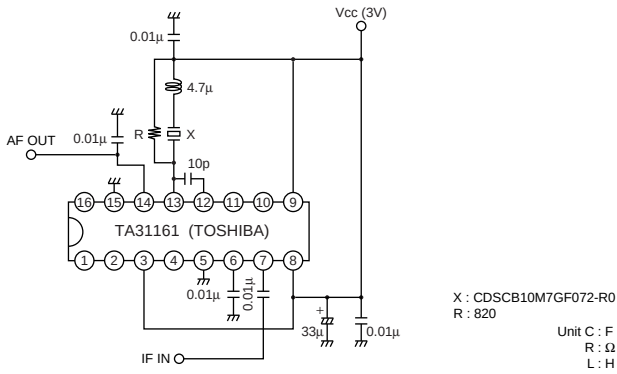
CDSCB10M7GA119-R0



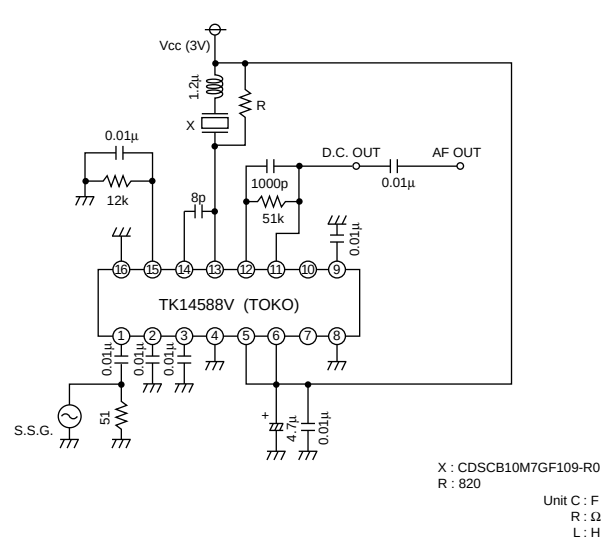
CDSCB10M7GA121-R0



CDSCB10M7GF072-R0

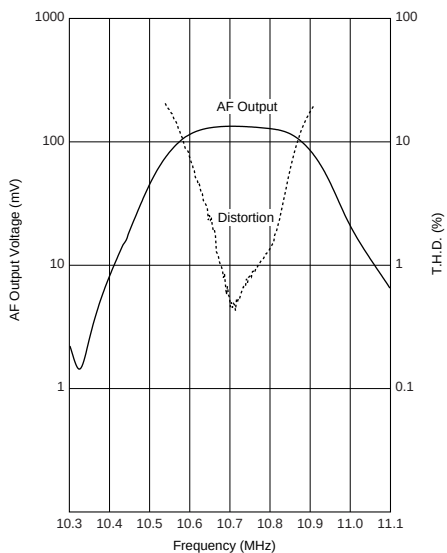


CDSCB10M7GF109-R0

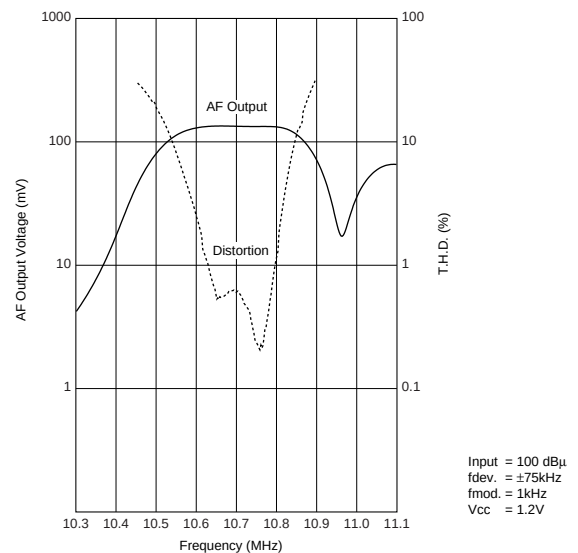


## Frequency Characteristics

CDSCB10M7GA105A-R0



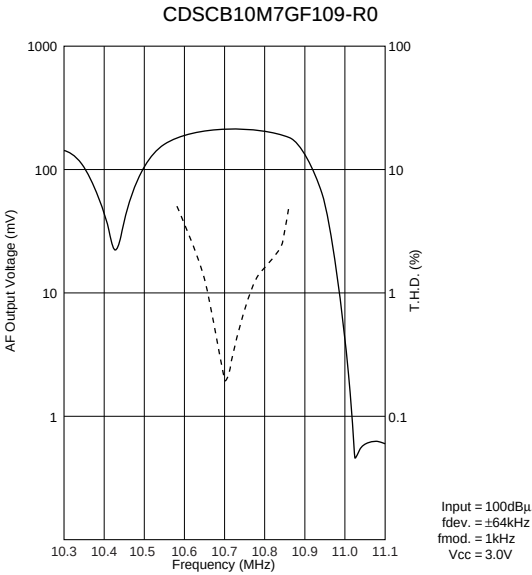
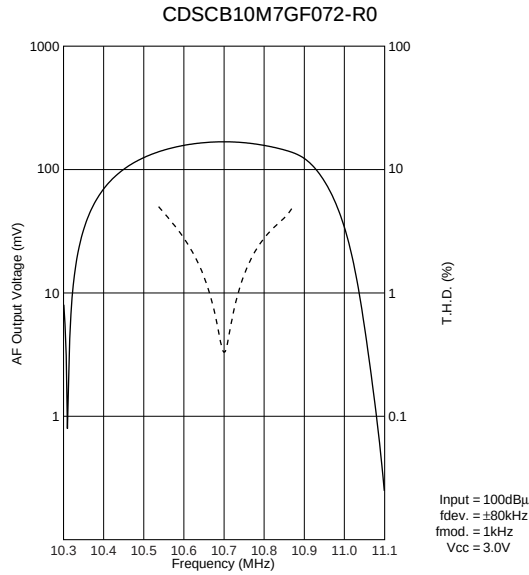
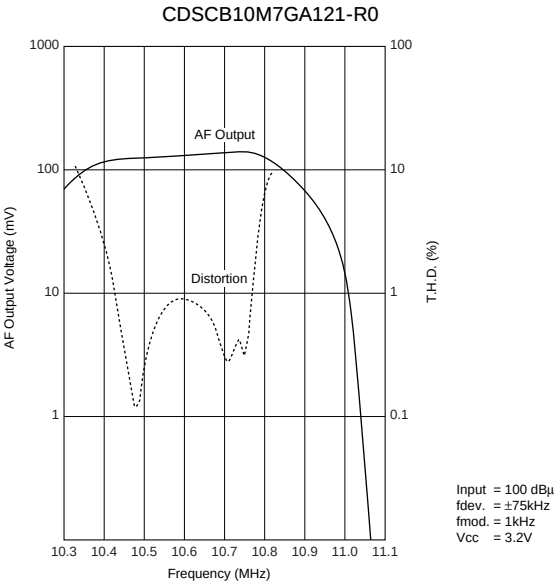
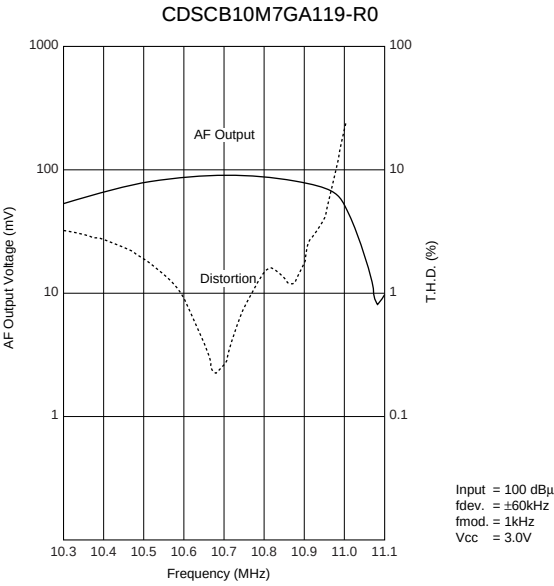
CDSCB10M7GA113-R0



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Frequency Characteristics



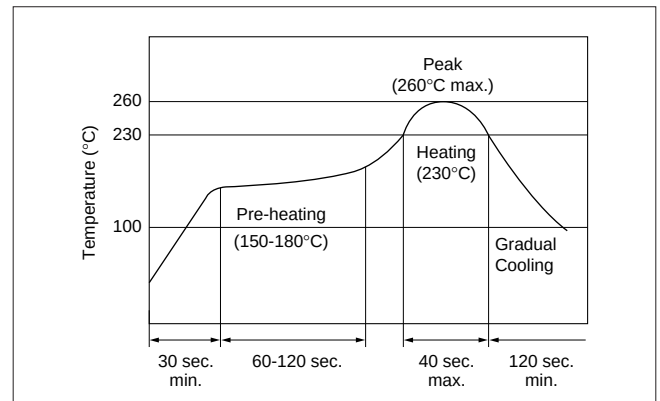
## Ceramic Discriminators Notice

### ■ CDBKB Series Notice (Soldering and Mounting)

#### 1. Standard Reflow Soldering Conditions

##### (1) Reflow

Filter is soldered twice within the following temperature conditions.



##### (2) Soldering Iron

Electrode is directly soldered with the tip of soldering iron at  $+350 \pm 5^\circ\text{C}$  for  $3.0 \pm 0.5$  seconds.

#### 2. Wash

##### (1) Cleaning Solvent

CFC alternatives (HCFC Series), Isopropyl Alcohol (IPA), Water (Demineralized Water), Cleaning Water Solution (Cleanthrough-750H, Pine Alpha 100S), Silicon (Technocare FRW)

##### (2) Cleaning Conditions

- Immersion Wash  
2 minutes max. in above solvent at  $+60^\circ\text{C}$  max.
- Shower or Rinse Wash  
2 minutes max. in above solvent at  $+60^\circ\text{C}$  max.

##### (3) Notice

- When components are immersed in solvent, be sure to maintain the temperature of components below the temperature of solvent.
- Please do not use ultrasonic cleaning.
- Total washing time should be within 4 minutes.
- Please ensure the component is thoroughly evaluated in your application circuit.
- Please do not use chlorine, petroleum and alkaline cleaning solvents.
- If you plan to use any other type of solvents, please consult with Murata or Murata representative prior to using.

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## Ceramic Discriminators Notice

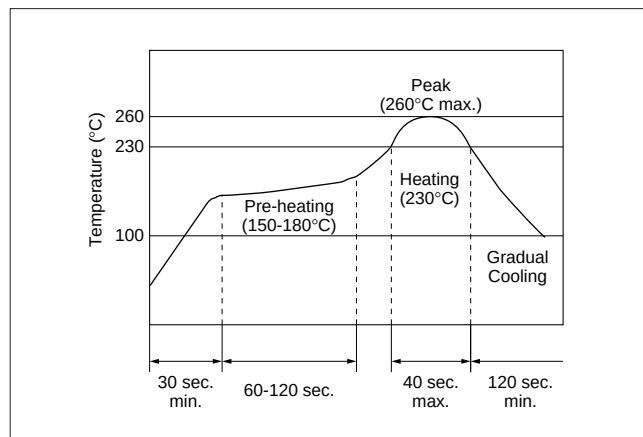
Continued from the preceding page.

### ■ CDSCB Series Notice (Soldering and Mounting)

#### 1. Standard Reflow Soldering Conditions

##### (1) Reflow

Filter is soldered twice within the following temperature conditions.



##### (2) Soldering Iron

Filter is soldered at  $+300 \pm 5^\circ\text{C}$  for  $3.0 \pm 0.5$  seconds. The soldering iron should not touch the filter while soldering.

#### 2. Wash

The component cannot withstand washing.

### ■ CDBKB Series Notice (Handling)

1. The component will be damaged when an excessive stress is applied.
2. In the case that the component is cleaned, confirm no reliability degradation is created.
3. In case of covering filter with over coat, conditions such as material of resin, cure temperature, and so on should be evaluated carefully.
4. Do not use strong acidity flux, more than 0.2wt% chlorine content, in re-flow soldering.

5. The product, packed in the moisture-proof bag (dry pack), is sensitive to moisture.  
The following treatment is required before applying re-flow soldering, to avoid package cracks or reliability degradation caused by thermal stress. When unpacked, store the component in an atmosphere of below 25 degree C. and below 65%R.H., and solder within 48 hours.
6. For safety purposes, connect the output of filters to the IF amplifier through a D.C. blocking capacitor. Avoid applying a direct current to the output of ceramic filters.

### ■ CDBLA/CDBLB Series Notice (Handling)

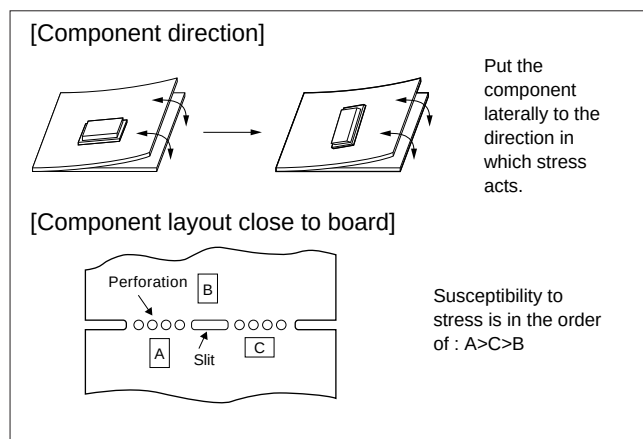
1. Do not use this product with bend. The component may be damaged if excessive mechanical stress is applied to it mounted on the printed circuit board.
2. The component will be damaged when an excessive stress is applied.
3. All kinds of re-flow soldering must not be applied on the component.
4. Do not clean or wash the component as it is not hermetically sealed.
5. Do not use strong acidity flux, more than 0.2wt% chlorine content, in flow soldering.

6. In case of covering discriminator with over coat, conditions such as material of resin, cure temperature, and so on should be evaluated carefully.
7. For safety purposes, connect the output of filters to the IF amplifier through a D.C. blocking capacitor. Avoid applying a direct current to the output of ceramic filters.

## Ceramic Discriminators Notice

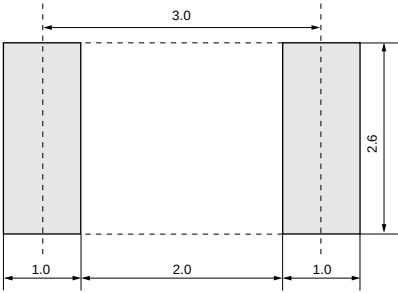
### ■ CDSCB Series Notice (Handling)

1. The component mounted on the PCB may be damaged if excess mechanical stress is applied.
2. Layout the components on the PCB to minimize the stress imposed on the warp or flexure of the board.
3. After installing components, if solder is excessively applied to the circuit board, mechanical stress will cause destruction resistance characteristics to lower. To prevent this, be extremely careful in determining shape and dimension before designing the circuit board diagram.
4. The component may be damaged during mounting process if some part of mounter such as positioning claws, nozzle are worn down. The regular maintenance recommended for mounters should be done to prevent the troubles.
5. When correcting component's position with a soldering iron, the tip of the soldering iron should not directly touch the chip component. Depending on the soldering conditions, the effective area of terminations may be reduced. The use of solder containing Ag should be considered to prevent the electrode erosion.
6. Do not clean or wash the component as it is not hermetically sealed.
7. In case of overcoating the part, coating conditions such as material of resin, curing temperature, and so on should be evaluated carefully.
8. Accurate test circuit values are required to measure electrical characteristics.  
It may be a cause of miscorrelation if there is any deviation, especially stray capacitance, from the test circuit in the specification.
9. For safety purposes, connect the output of filters to the IF amplifier through a D.C. blocking capacitor. Avoid applying a direct current to the output of ceramic filters.



## ■ Standard Land Pattern Dimensions

CDSCB Series



(in mm)

| Part Number         | Taping ø180mm | Bulk | Magazine |
|---------------------|---------------|------|----------|
| <b>CDBKB Series</b> | 500           |      |          |
| <b>CDBLA Series</b> |               | 500  | 50       |
| <b>CDBLB Series</b> |               | 500  | 80       |
| <b>CDSCB Series</b> | 2000          |      |          |

The order quantity should be an integral multiple of the "Minimum Quantity" shown above. (pcs.)

### Dimensions of Carrier Tape

Technical drawing of a carrier tape showing dimensions in mm:

- Top View:**
  - Overall width:  $16.0 \pm 0.15$
  - Distance between feeding holes:  $4.0 \pm 0.1$
  - Distance from edge to first feeding hole:  $2.0 \pm 0.1$
  - Feeding hole diameter:  $\phi 1.5^{+0.1}_{-0.0}$
  - Distance between components:  $8.0 \pm 0.1$
  - Distance from edge to first component:  $7.5 \pm 0.1$
  - Overall length:  $17.5 \pm 0.1$
  - Direction of feed: Indicated by an arrow labeled "User direction of feed".
- Side View:**
  - Height of the carrier tape:  $7.2 \pm 0.1$
  - Distance between the two sides of the carrier tape:  $3.3 \pm 0.1$
- Cross-sectional View:**
  - Maximum angle of the carrier tape:  $3^\circ \text{ max.}$
  - Distance between the two sides of the carrier tape:  $6.3 \pm 0.1$
  - Label: "Cover film"

### Dimensions of Reel

Technical drawing of a reel showing dimensions in mm:

- Top View:**
  - Trailer length:  $160-190$
  - Empty length:  $160-200$
  - Components length:  $160-200$
  - Leader length:  $400-560$
  - Cover film length:  $400-560$
  - Distance between feeding holes:  $2.0 \pm 0.2$
  - Feeding hole diameter:  $\phi 13.0 \pm 0.5$
- Side View:**
  - Inner diameter:  $\phi 60^{+0.1}_{-0.0}$
  - Outer diameter:  $\phi 180^{+0.1}_{-0.0}$
  - Distance between the two sides of the reel:  $17.0 \pm 0.3$
  - Distance between the two sides of the reel:  $19.4 \pm 1.0$

- Part number marked side is always facing upside.
- The feeding holes side of cavity tape is always input terminal.

(in mm)

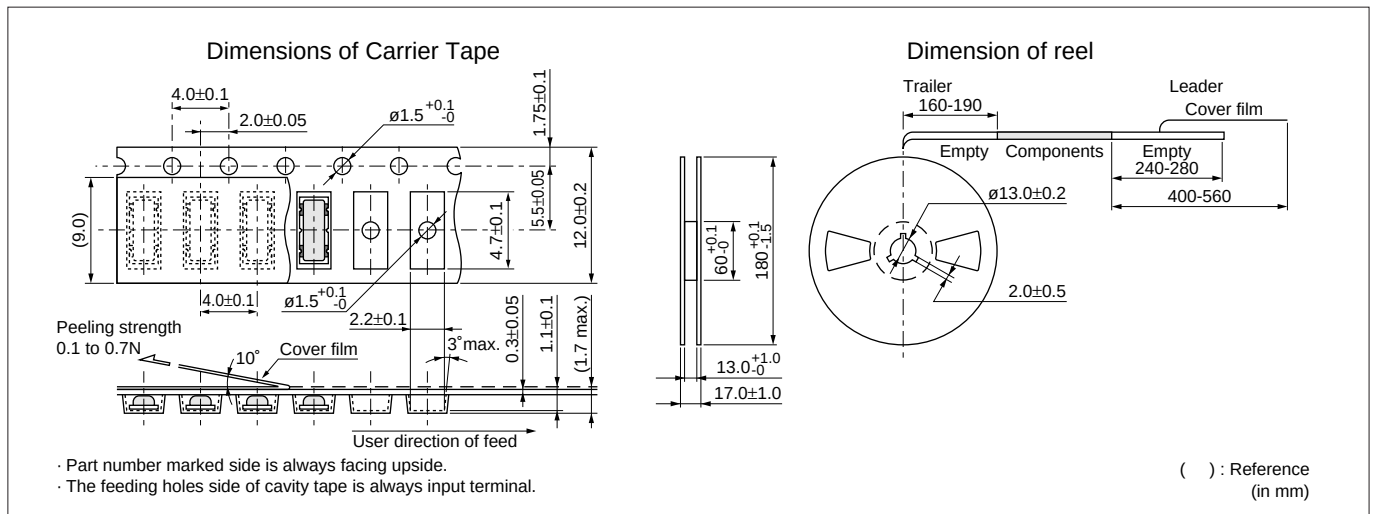
(in mm)

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## Ceramic Discriminators Standard Land Pattern Dimensions/Packaging

Continued from the preceding page.

### CDSCB Series



⚠Note:

1. Export Control  
    <For customers outside Japan>  
    Murata products should not be used or sold for use in the development, production, stockpiling or utilization of any conventional weapons or mass-destructive weapons (nuclear weapons, chemical or biological weapons, or missiles), or any other weapons.  
    <For customers in Japan>  
    For products which are controlled items subject to the "Foreign Exchange and Foreign Trade Law" of Japan, the export license specified by the law is required for export.
2. Please contact our sales representatives or product engineers before using the products in this catalog for the applications listed below, which require especially high reliability for the prevention of defects which might directly damage to a third party's life, body or property, or when one of our products is intended for use in applications other than those specified in this catalog.
  - ① Aircraft equipment
  - ② Aerospace equipment
  - ③ Undersea equipment
  - ④ Power plant equipment
  - ⑤ Medical equipment
  - ⑥ Transportation equipment (vehicles, trains, ships, etc.)
  - ⑦ Traffic signal equipment
  - ⑧ Disaster prevention / crime prevention equipment
  - ⑨ Data-processing equipment
  - ⑩ Application of similar complexity and/or reliability requirements to the applications listed in the above
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