

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



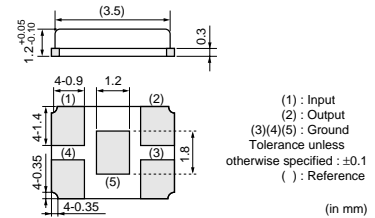
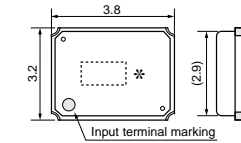
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## CERAFIL® kHz SMD Type CFXCE Series

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]

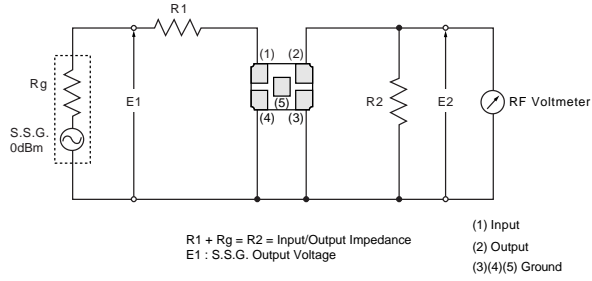
Input/Output Impedance: 2000 ohm

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.

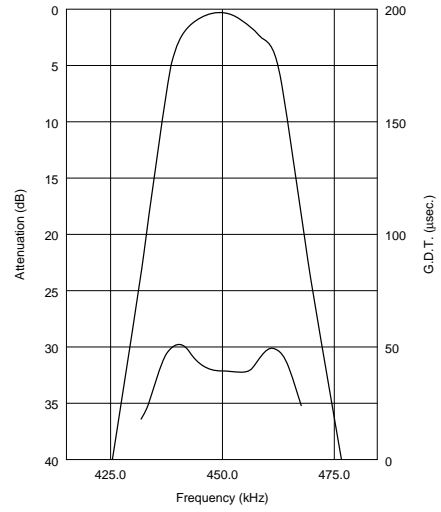
The order quantity should be an integral multiple of the "Minimum Quantity" shown in package page in this catalog.

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■ Test Circuit



■ Frequency Characteristics



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

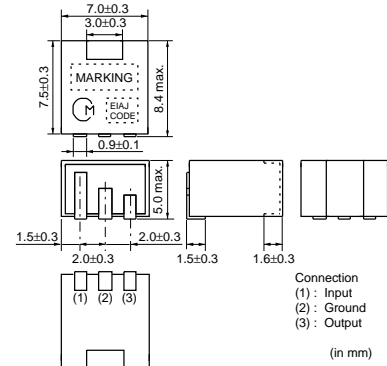


## CERAFIL® kHz SMD Type SFPKA Series

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) |
|-----------------|-----------------------------|---------------------|----------------------------|----------------------------|----------------------------------|---------------------------|------------------------------|
| SFPKA455KD4A-R1 | 455.0 ±1.5kHz               | fn±10.0 min.        | fn±20.0 max. [within 40dB] | 27 min. [within fn±100kHz] | 4.0 max. [at minimum loss point] | 2.0 max. [within fn±7kHz] | 1500                         |
| SFPKA455KE4A-R1 | 455.0 ±1.5kHz               | fn±7.5 min.         | fn±15.0 max. [within 40dB] | 27 min. [within fn±100kHz] | 6.0 max. [at minimum loss point] | 1.5 max. [within fn±5kHz] | 1500                         |
| SFPKA455KF4A-R1 | 455.0 ±1.5kHz               | fn±6.0 min.         | fn±12.5 max. [within 40dB] | 27 min. [within fn±100kHz] | 6.0 max. [at minimum loss point] | 1.5 max. [within fn±4kHz] | 1500                         |
| SFPKA455KG1A-R1 | 455.0 ±1.0kHz               | fn±4.5 min.         | fn±10.0 max. [within 40dB] | 25 min. [within fn±100kHz] | 6.0 max. [at minimum loss point] | 1.5 max. [within fn±3kHz] | 1500                         |
| SFPKA455KH1A-R1 | 455.0 ±1.0kHz               | fn±3.0 min.         | fn±9.0 max. [within 40dB]  | 35 min. [within fn±100kHz] | 6.0 max. [at minimum loss point] | 1.5 max. [within fn±2kHz] | 2000                         |

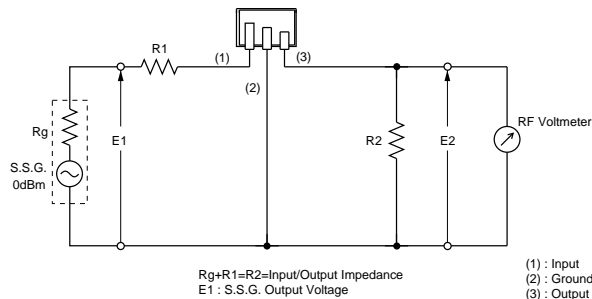
Center frequency (fo) defined by the center of 6dB bandwidth.

(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.

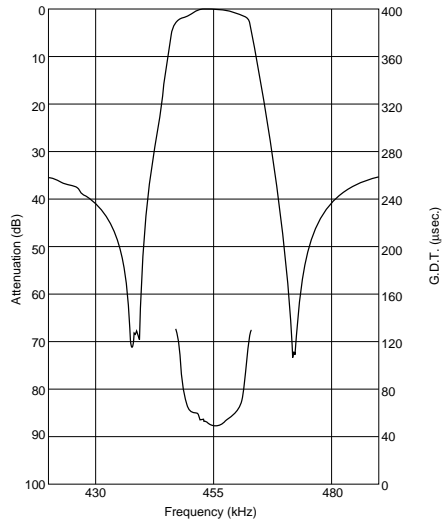
The order quantity should be an integral multiple of the "Minimum Quantity" shown in package page in this catalog.

### ■ Test Circuit

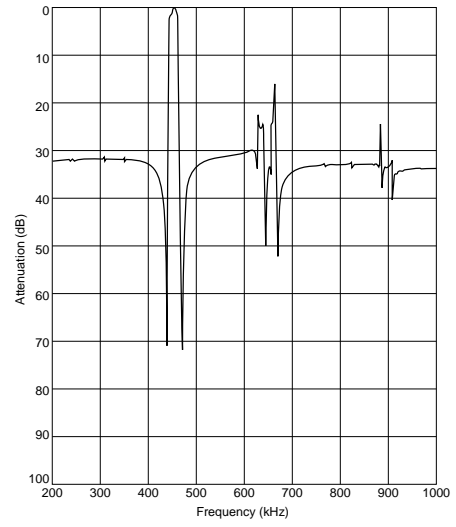


## ■ Frequency Characteristics

SFPKA455KE4A-R1



SFPKA455KE4A-R1



2

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



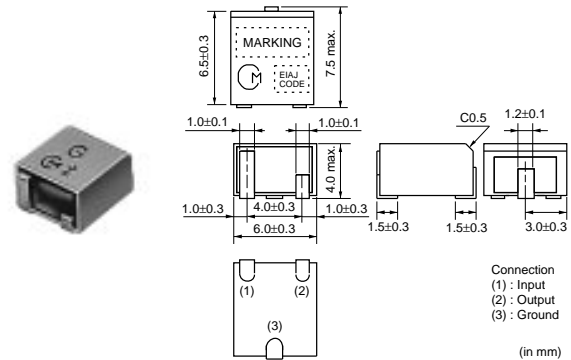
## CERAFIL® kHz SMD Type CFUKG Series

3

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                         |

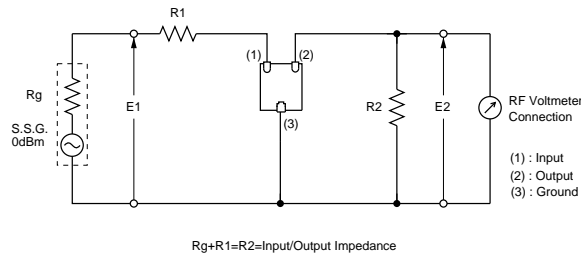
Center frequency (fo) defined by the center of 6dB bandwidth.

(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.

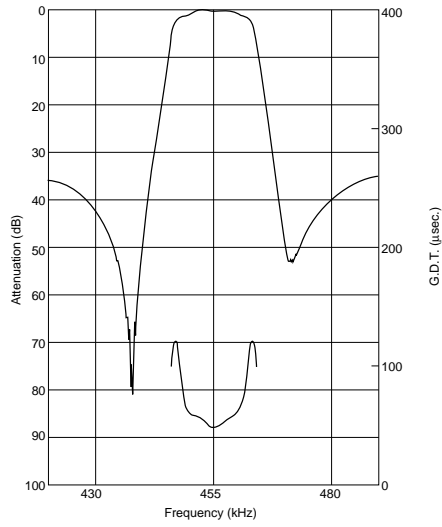
The order quantity should be an integral multiple of the "Minimum Quantity" shown in package page in this catalog.

### ■ Test Circuit

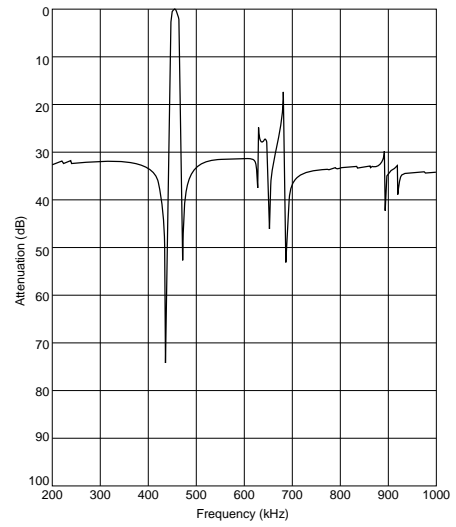


### ■ Frequency Characteristics

CFUKG455KE4A-R0



CFUKG455KE4A-R0



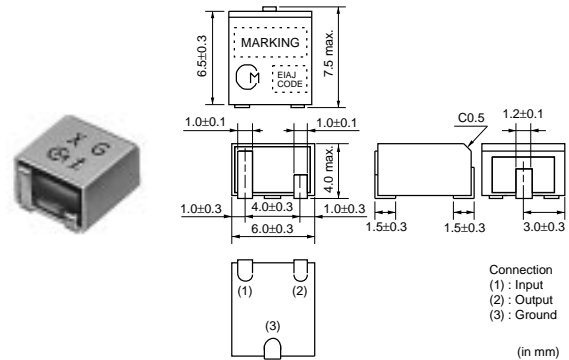
3

# 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.



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### ■ Features

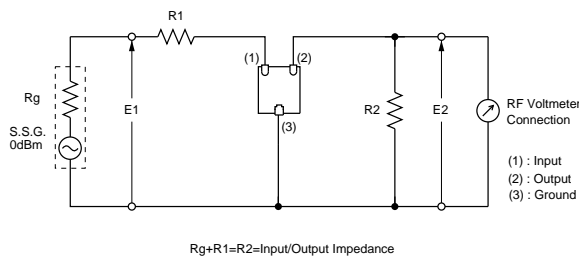
1. The filters are mountable by automatic placers.
2. The filters can be reflow soldered and withstand washing.
3. They are slim, at only 4.0mm maximum thickness, and have a small mounting area (7.5x6.0mm) enabling flexible PCB design.
4. The bandwidth ranges from E to H.
5. Operating temperature range: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

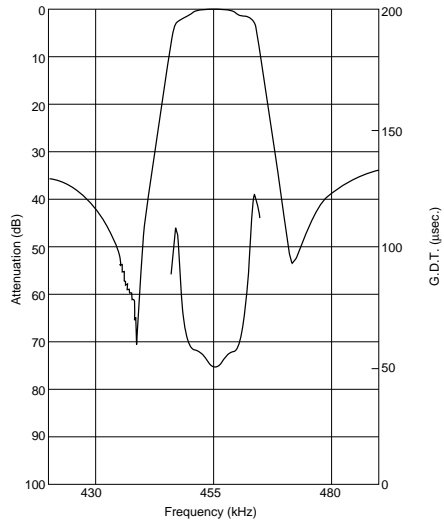
For safety purposes, connect the output of filters to the IF amplifier through a D.C. blocking capacitor. Avoid applying a direct current to the output of ceramic filters.  
The order quantity should be an integral multiple of the "Minimum Quantity" shown in package page in this catalog.

### ■ Test Circuit

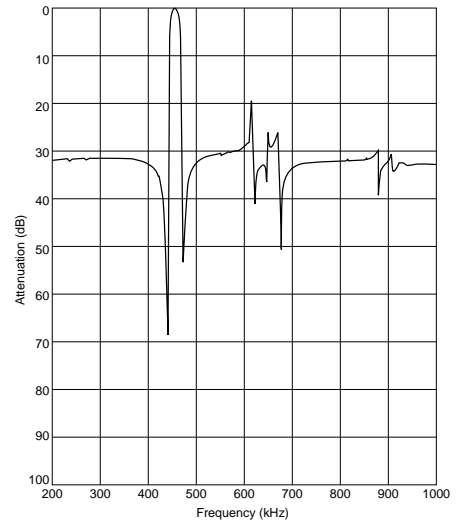


## Frequency Characteristics

CFUKG455KE4X-R0



CFUKG455KE4X-R0



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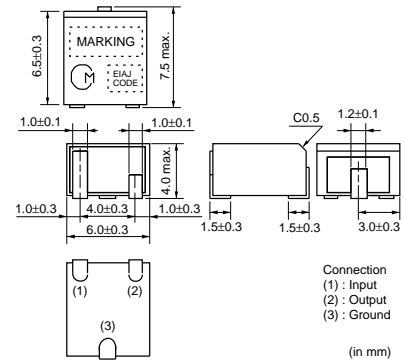


# Ceramic Filters (CERAFIL®)/Ceramic Discriminators for Communications Equipment



## 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.



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### ■ 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 ±2.0kHz               | fn±17.5 min.        | fn±40.0 max. [within 40dB] | 25 min. [within fn±100kHz] | 4.0 max. [at minimum loss point] | 1.0 max. [within fn±12kHz] | 15.0 max. [within fn±12kHz] | 1000                         |
| <b>CFUKF455KB4X-R0</b> | 455.0 ±1.5kHz               | fn±15.0 min.        | fn±35.0 max. [within 40dB] | 25 min. [within fn±100kHz] | 5.0 max. [at minimum loss point] | 1.0 max. [within fn±10kHz] | 15.0 max. [within fn±10kHz] | 1000                         |
| <b>CFUKF455KC4X-R0</b> | 455.0 ±1.5kHz               | fn±12.5 min.        | fn±30.0 max. [within 40dB] | 25 min. [within fn±100kHz] | 6.0 max. [at minimum loss point] | 1.0 max. [within fn±8kHz]  | 15.0 max. [within fn±8kHz]  | 1000                         |
| <b>CFUKF455KD1X-R0</b> | 455.0 ±1.0kHz               | fn±10.0 min.        | fn±25.0 max. [within 40dB] | 23 min. [within fn±100kHz] | 7.0 max. [at minimum loss point] | 1.0 max. [within fn±7kHz]  | 20.0 max. [within fn±7kHz]  | 1500                         |
| <b>CFUKF455KE1X-R0</b> | 455.0 ±1.0kHz               | fn±7.5 min.         | fn±20.0 max. [within 40dB] | 23 min. [within fn±100kHz] | 8.0 max. [at minimum loss point] | 1.0 max. [within fn±5kHz]  | 20.0 max. [within fn±5kHz]  | 1500                         |

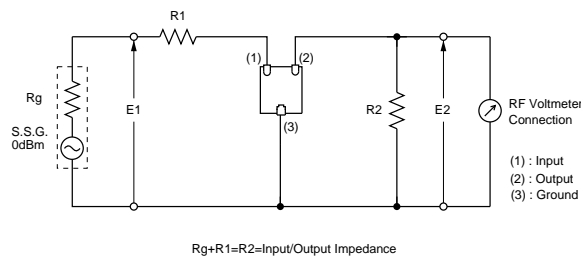
Center frequency (fo) defined by the center of 6dB bandwidth.

(fn) means nominal center frequency 455kHz.

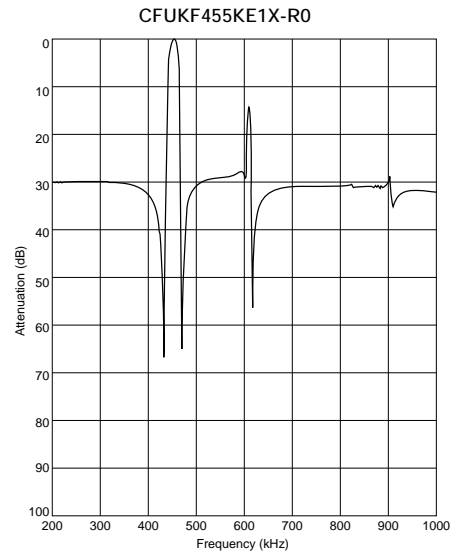
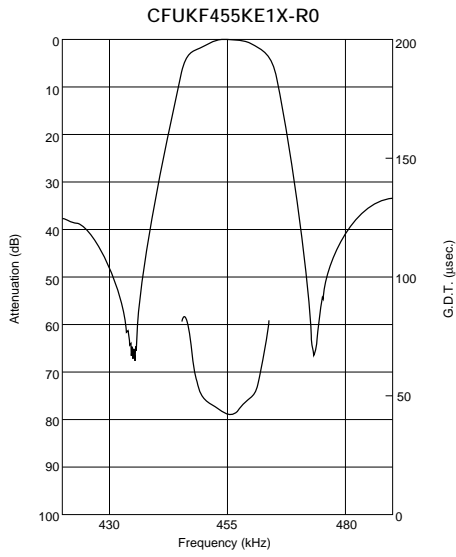
For safety purposes, connect the output of filters to the IF amplifier through a D.C. blocking capacitor. Avoid applying a direct current to the output of ceramic filters.

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

### ■ Test Circuit



## ■ Frequency Characteristics



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

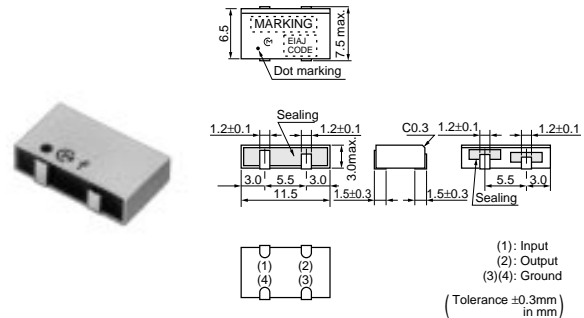


## CERAFIL® kHz SMD Type CFWKA Series

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)

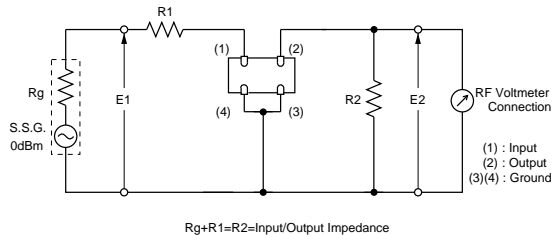


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| Part Number               | Nominal Center Frequency (fn) (kHz) | 3dB Bandwidth (kHz) | 6dB Bandwidth (kHz) | Stop Bandwidth (kHz)       | Stop Band Attenuation (dB) | Stop Band Att.(2) (dB)     | Insertion Loss (dB)              | Ripple (dB)                 | Input/Output Impedance (ohm) |
|---------------------------|-------------------------------------|---------------------|---------------------|----------------------------|----------------------------|----------------------------|----------------------------------|-----------------------------|------------------------------|
| <b>CFWKA450K DFA-R0</b>   | 450                                 | -                   | fn±10.0 min.        | fn±20.0 max. [within 50dB] | 50 min. [within fn±100kHz] | -                          | 4.0 max. [at minimum loss point] | 3.0 max. [within fn±7kHz]   | 1500                         |
| <b>CFWKA450KEFA-R0</b>    | 450                                 | -                   | fn±7.5 min.         | fn±15.0 max. [within 50dB] | 50 min. [within fn±100kHz] | -                          | 6.0 max. [at minimum loss point] | 3.0 max. [within fn±5kHz]   | 1500                         |
| <b>CFWKA450KEFA001-R0</b> | 450                                 | fn±6.5 min.         | -                   | fn±15.0 max. [within 50dB] | 55 min. [within fn±100kHz] | 50 min. [within fn±100kHz] | 4.0 max. [at fn]                 | 3.0 max. [within fn±6.5kHz] | 1500                         |
| <b>CFWKA450KFFA-R0</b>    | 450                                 | -                   | fn±6.0 min.         | fn±12.5 min. [within 50dB] | 50 min. [within fn±100kHz] | -                          | 6.0 max. [at minimum loss point] | 3.0 max. [within fn±4kHz]   | 1500                         |
| <b>CFWKA450KGFA-R0</b>    | 450                                 | -                   | fn±4.5 min.         | fn±11.0 max. [within 50dB] | 50 min. [within fn±100kHz] | -                          | 6.0 max. [at minimum loss point] | 2.0 max. [within fn±3kHz]   | 1500                         |

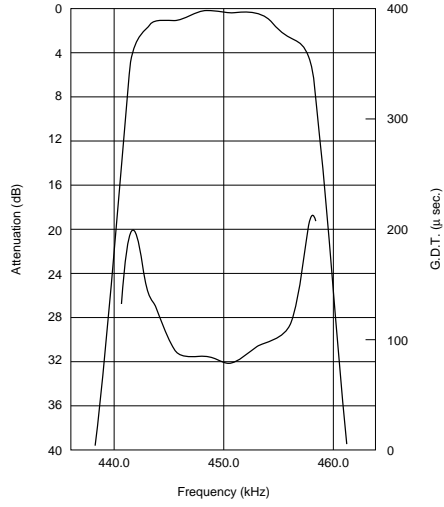
For safety purposes, connect the output of filters to the IF amplifier through a D.C. blocking capacitor. Avoid applying a direct current to the output of ceramic filters. The order quantity should be an integral multiple of the "Minimum Quantity" shown in package page in this catalog.

### ■ Test Circuit

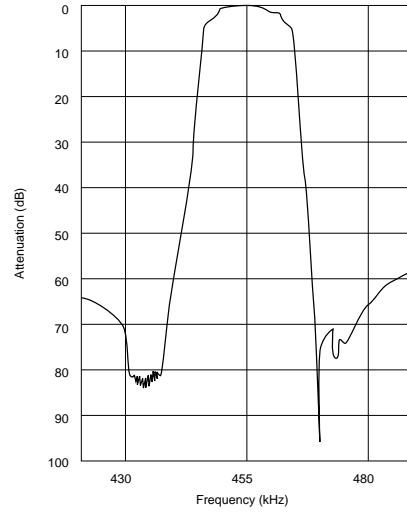


## ■ Frequency Characteristics

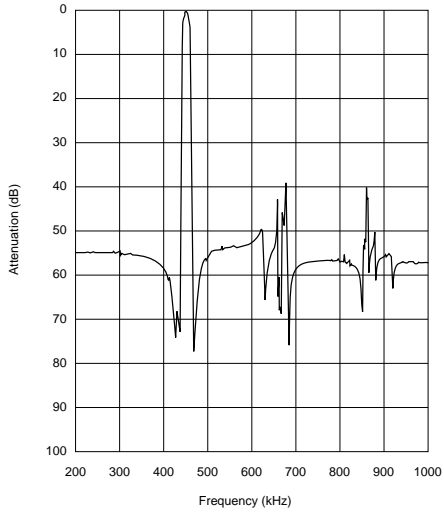
CFWKA450KEFA001-R0



CFWKA450KEFA001-R0



CFWKA450KEFA001-R0



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

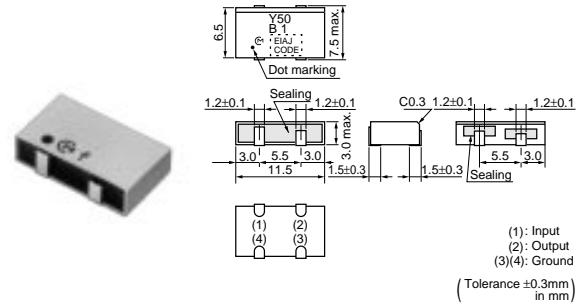


## CERAFIL® kHz SMD Type CFWKA\_Y Series

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)

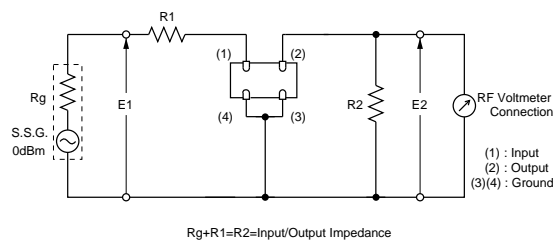


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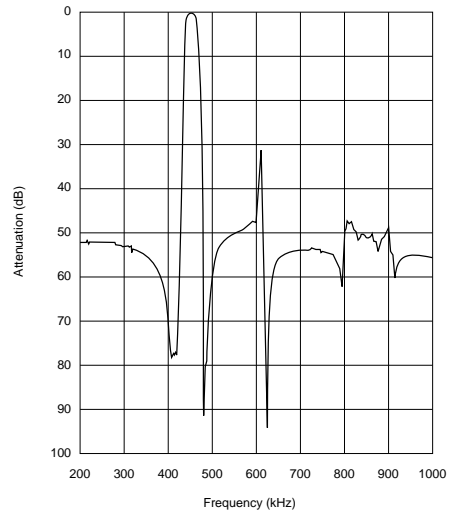
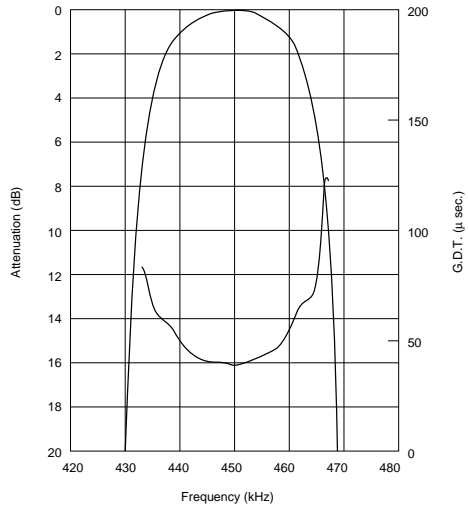
| Part Number               | Nominal Center Frequency (fn) (kHz) | 3dB Bandwidth (kHz) | 6dB Bandwidth (kHz) | Stop Bandwidth (kHz)       | Stop Band Attenuation (dB) | Insertion Loss (dB)              | Spurious Response (dB)         | GDT Deviation (μs)          | Input/Output Impedance (ohm) |
|---------------------------|-------------------------------------|---------------------|---------------------|----------------------------|----------------------------|----------------------------------|--------------------------------|-----------------------------|------------------------------|
| <b>CFWKA450KBFY001-R0</b> | 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



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

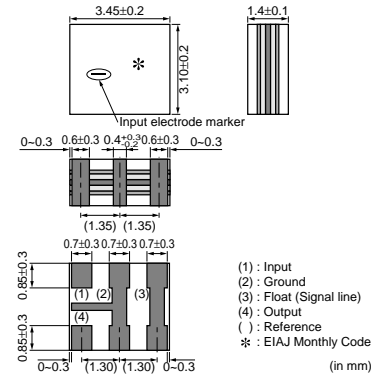


## CERAFIL® MHz SMD Type SF ECS10M8 Series

The SF ECS10M8 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.



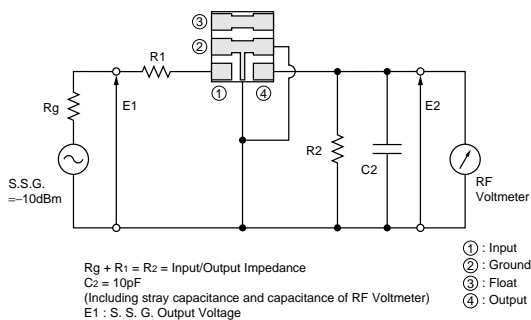
### ■ Features

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)

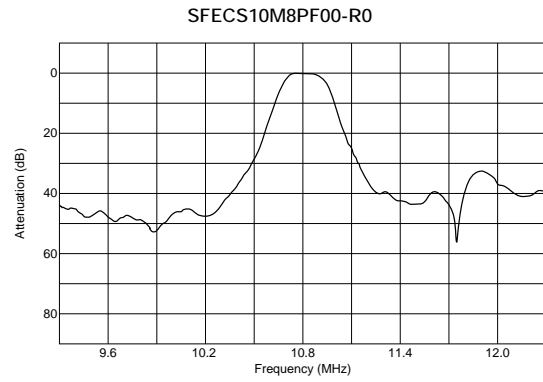
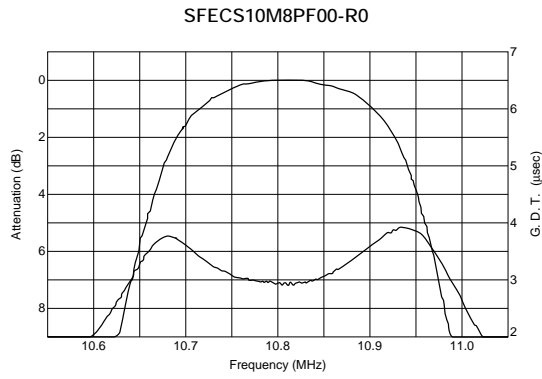
| Part Number              | Nominal Center Frequency (fn) (MHz) | 3dB Bandwidth (kHz) | Stop Bandwidth (kHz)      | Insertion Loss (dB) | Ripple (dB)                 | Spurious Response (dB)       | GDT Deviation (μs)          | Absolute GDT (μs)  | Input/Output Impedance (ohm) |
|--------------------------|-------------------------------------|---------------------|---------------------------|---------------------|-----------------------------|------------------------------|-----------------------------|--------------------|------------------------------|
| <b>SF ECS10M8PF00-R0</b> | 10.800                              | fn±110 min.         | fn±310 max. [within 20dB] | 6.0 max. [at fn]    | 0.5 max. [within fn±100kHz] | -                            | 1.5 max. [within fn±100kHz] | 2.8 ±1.0μs [at fn] | 330                          |
| <b>SF ECS10M8RF00-R0</b> | 10.800                              | fn±135 min.         | fn±350 max. [within 20dB] | 6.0 max. [at fn]    | 0.5 max. [within fn±100kHz] | -                            | 1.2 max. [within fn±100kHz] | 2.6 ±1.0μs [at fn] | 330                          |
| <b>SF ECS10M8SF00-R0</b> | 10.800                              | fn±150 min.         | fn±420 max. [within 20dB] | 5.0 max. [at fn]    | 1.0 max. [within fn±110kHz] | 25 min. [within 9 to 12 MHz] | 1.5 max. [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





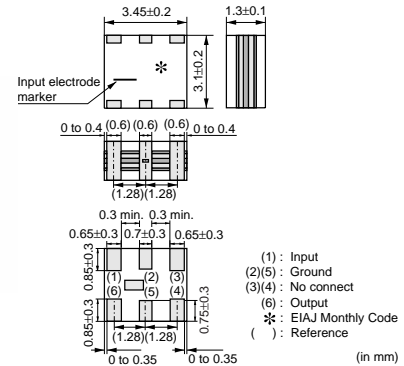
# Ceramic Filters (CERAFIL®)/Ceramic Discriminators for Communications Equipment



## CERAFIL® 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)

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| 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]

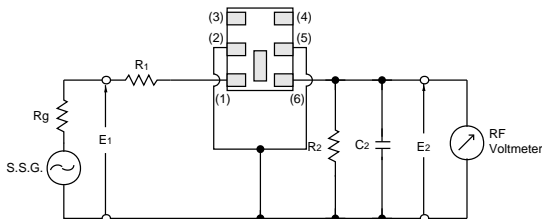
Area of Insertion Loss: at minimum loss point Area of Ripple: within 3dB B.W.

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.

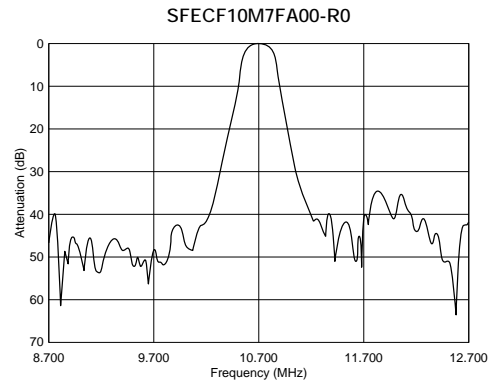
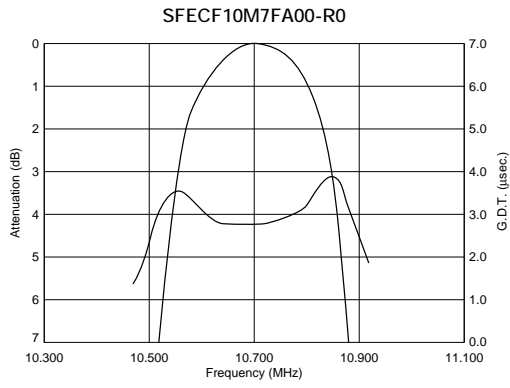
### ■ Test Circuit



Rg = 50Ω R1 = 280Ω ±5% R2 = 330Ω ±5%  
C2 = 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



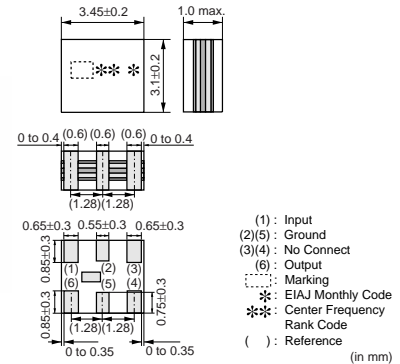
# Ceramic Filters (CERAFIL®)/Ceramic Discriminators for Communications Equipment



## CERAFIL® 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

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| 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) |
|-------------------------|-----------------------------|-------------------------------|---------------------|-------------------|---------------------|-------------|---------------------------|------------------------------|
| <b>SFECD10M7FA00-R0</b> | 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]

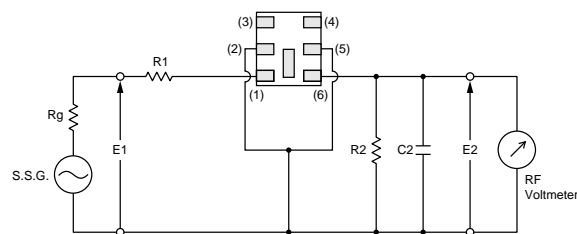
Area of Insertion Loss: at minimum loss point Area of Ripple: within 3dB B.W.

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

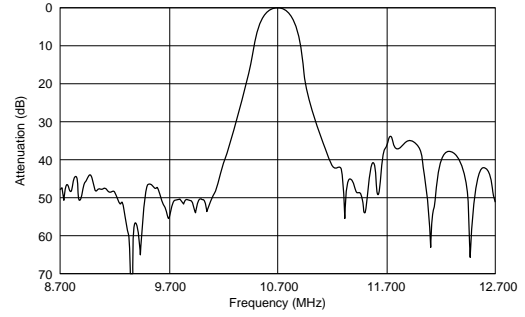
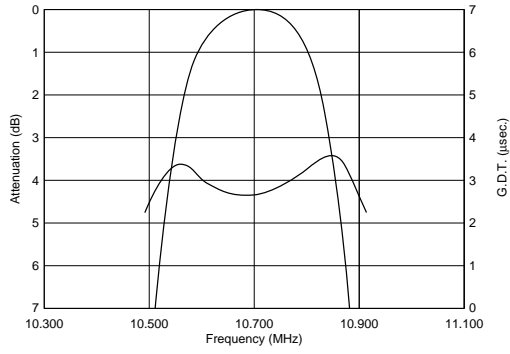
### ■ Test Circuit



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

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

## ■ Frequency Characteristics



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

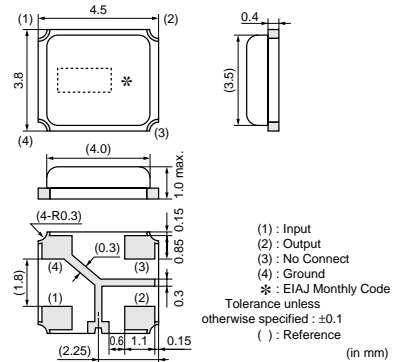
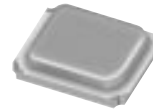


## CERAFIL® MHz SMD Type SFSCD20M0 Series

SFSCD series are chip surface mount filter, having center frequency 15 to 22 MHz and 3dB bandwidth 1.2 to 1.8MHz (at 20MHz).  
(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

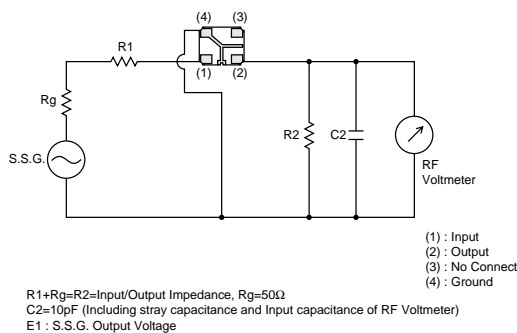
1. GPS
2. Wireless audio

11

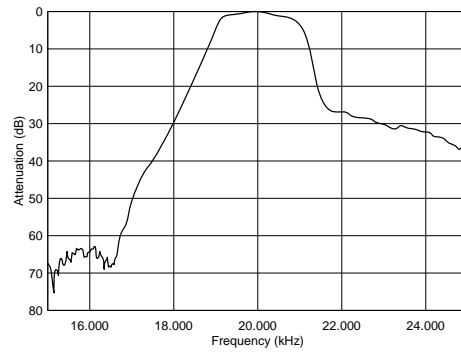
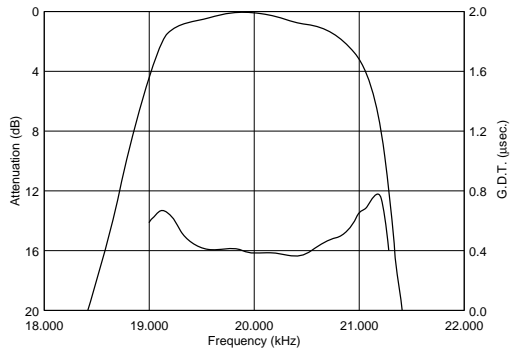
| Part Number             | Nominal Center Frequency (fn) (MHz) | 3dB Bandwidth (kHz) | Stop Bandwidth (MHz)              | Insertion Loss (dB)                 | Ripple (dB)                        | Spurious Response (dB)                           | GDT Deviation (μs)             | Input/Output Impedance (ohm) |
|-------------------------|-------------------------------------|---------------------|-----------------------------------|-------------------------------------|------------------------------------|--------------------------------------------------|--------------------------------|------------------------------|
| <b>SFSCD20M0WF01-R0</b> | 20.000                              | fn±820 min.         | 3.6 max. (Total)<br>[within 20dB] | 6.0 max.<br>[at minimum loss point] | 2.0 max.<br>[within 3dB Bandwidth] | 34/23 min.<br>[within 15MHz to fn / fn to 25MHz] | 0.4 max.<br>[within fn±750kHz] | 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



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



## CERAFIL® MHz SMD Type SFSCE10M7 Series

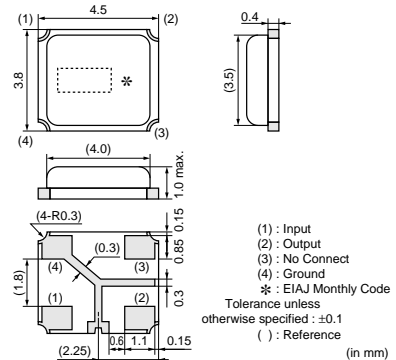
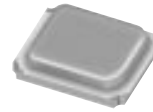
SFSCE series are chip surface mount filter and available for 3dB bandwidth at 700kHz to 1.3MHz. (more than twice width compared with current types) They have 1.0mm max. thickness and small mounting area. (4.5x3.8mm)

### ■ 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

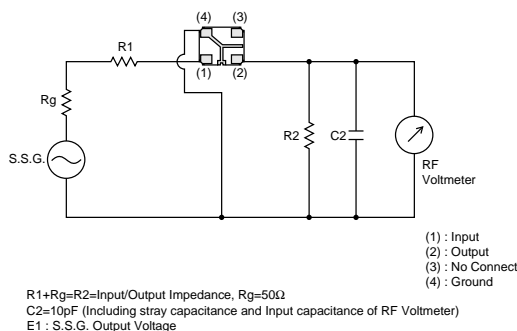
1. SS digital communication system
2. Digital wireless audio
3. PHS Evolution system
4. RFID Reader Writer
5. RKE



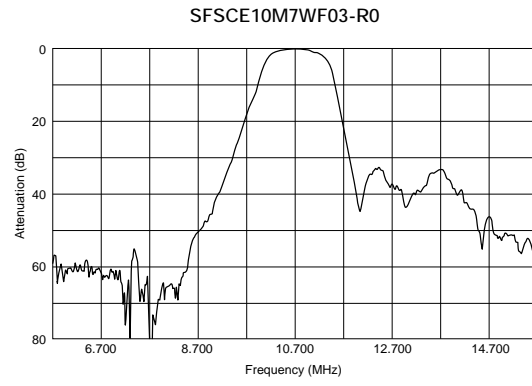
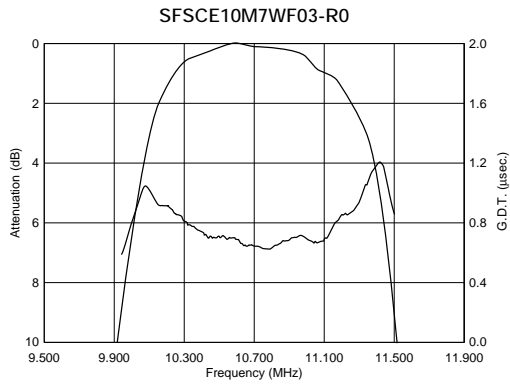
| Part Number             | Nominal Center Frequency (fn) (MHz) | 3dB Bandwidth (kHz) | Stop Bandwidth (MHz)              | Insertion Loss (dB)                 | Ripple (dB)                        | Spurious Response (dB)                              | GDT Deviation (μs)             | Input/Output Impedance (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





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

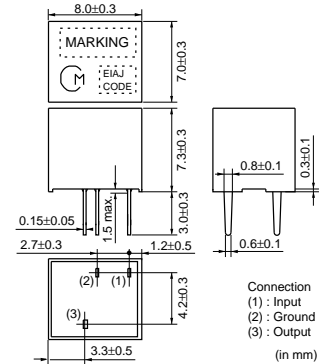


## CERAFIL® Plastic Case General Use CFULA Series

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)



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| 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                         |

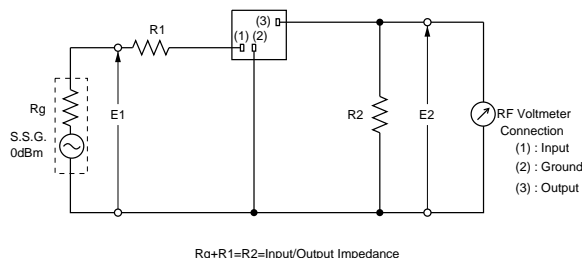
Center frequency (fo) defined by the center of 6dB bandwidth.

(fn) means nominal center frequency 455kHz.

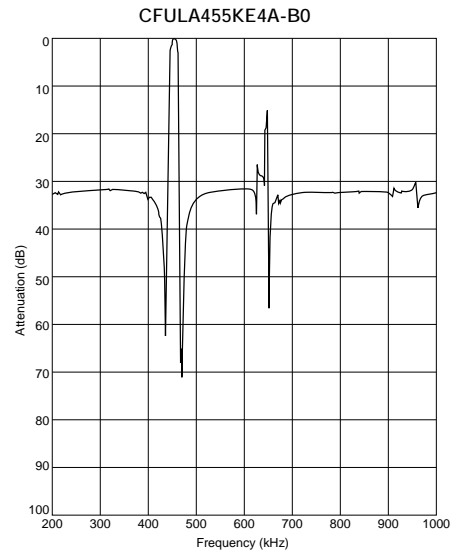
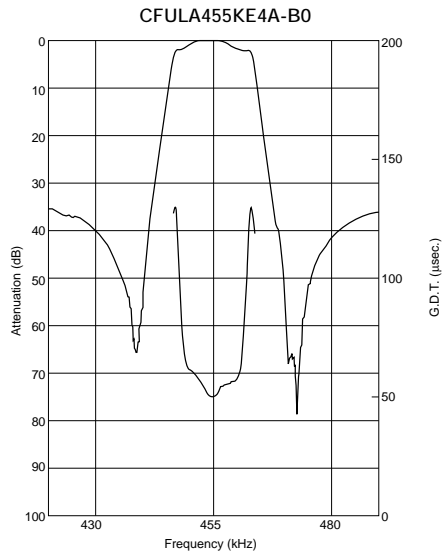
For safety purposes, connect the output of filters to the IF amplifier through a D.C. blocking capacitor. Avoid applying a direct current to the output of ceramic filters.

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



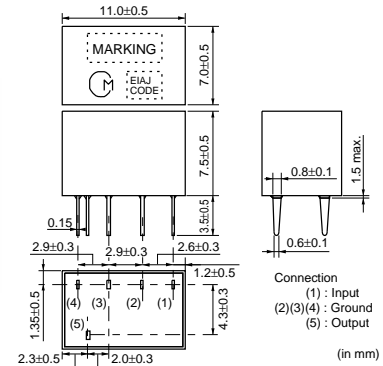
## CERAFIL® Plastic Case Miniaturized Type CFWLA Series

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

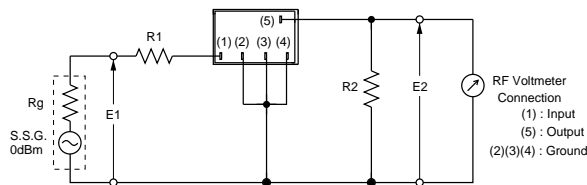
1. Low profile, high selectivity
2. Available bandwidths are B to J as standard
3. Easily mountable on any PC board
4. Operating temperature range: -20 to +80 (degree C)  
Storage temperature range: -40 to +85 (degree C)



| 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) |
|-----------------|-------------------------------------|---------------------|----------------------------|----------------------------|----------------------------------|-----------------------------|------------------------------|
| CFWLA455KBFA-B0 | 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                         |
| CFWLA455KCFA-B0 | 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                         |
| CFWLA455KDFA-B0 | 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                         |
| CFWLA455KEFA-B0 | 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                         |
| CFWLA455KFFA-B0 | 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                         |
| CFWLA455KGFA-B0 | 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                         |
| CFWLA455KHFA-B0 | 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                         |
| CFWLA455KJFA-B0 | 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                         |

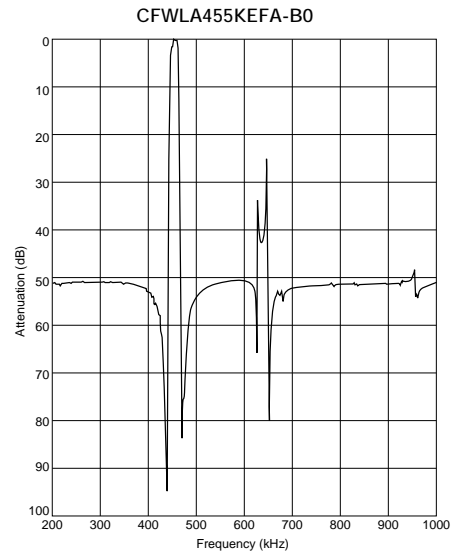
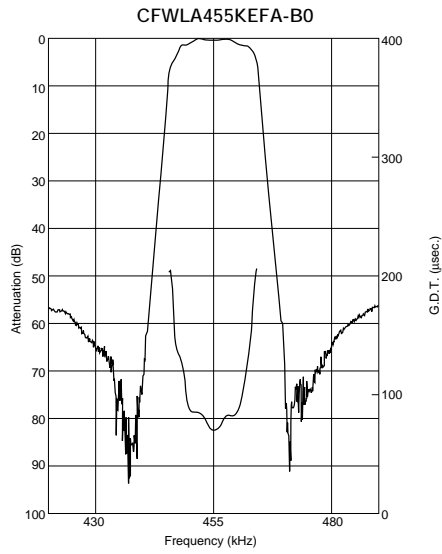
For safety purposes, connect the output of filters to the IF amplifier through a D.C. blocking capacitor. Avoid applying a direct current to the output of ceramic filters. The order quantity should be an integral multiple of the "Minimum Quantity" shown in package page in this catalog.

### ■ Test Circuit



$R_g + R_1 = R_2 = \text{Input/Output Impedance}$

## ■ Frequency Characteristics



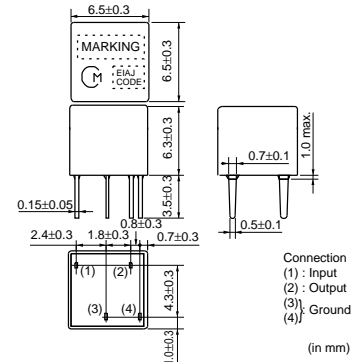
# Ceramic Filters (CERAFIL®)/Ceramic Discriminators for Communications Equipment



## 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.

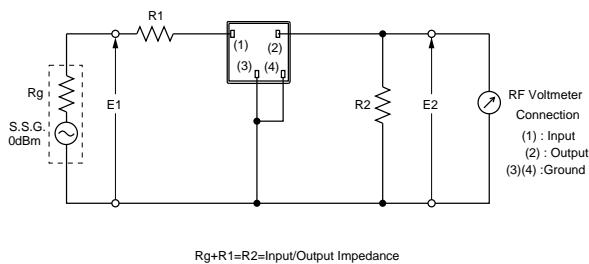
CFULB455K\_series filters are 4-element ceramic filters and miniature versions of CFULA455K\_series.

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.

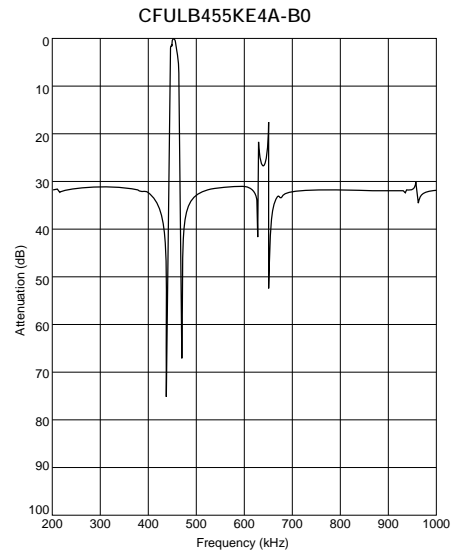
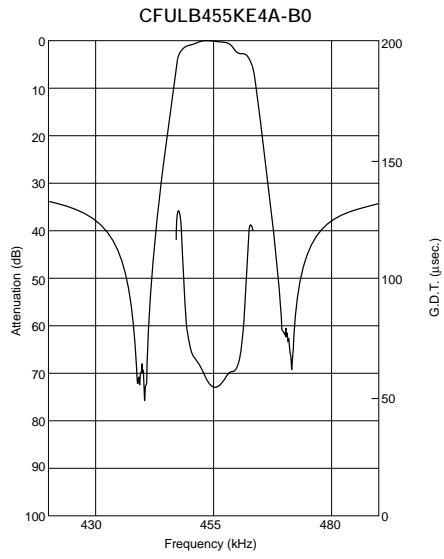
The order quantity should be an integral multiple of the "Minimum Quantity" shown in package page in this catalog.

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### ■ Test Circuit



## Frequency Characteristics



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

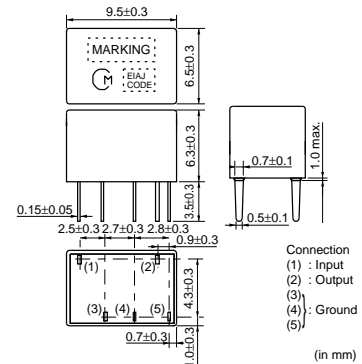


## CERAFIL® Plastic Case General Use CFWLB Series

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)

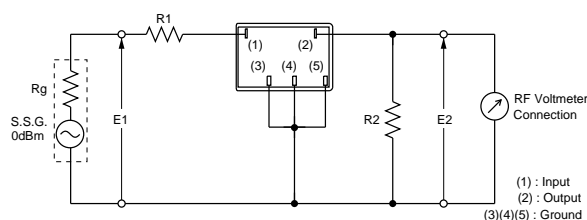
| Part Number        | Nominal Center Frequency (fn) (kHz) | 6dB Bandwidth (kHz) | Stop Bandwidth (kHz)       | Stop Band Attenuation (dB)         | Insertion Loss (dB)              | Input/Output Impedance (ohm) |
|--------------------|-------------------------------------|---------------------|----------------------------|------------------------------------|----------------------------------|------------------------------|
| 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.

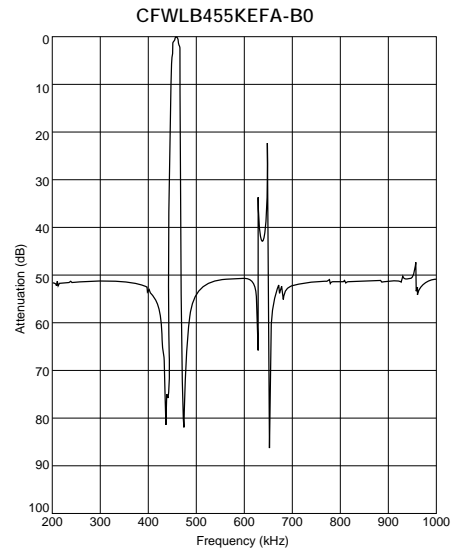
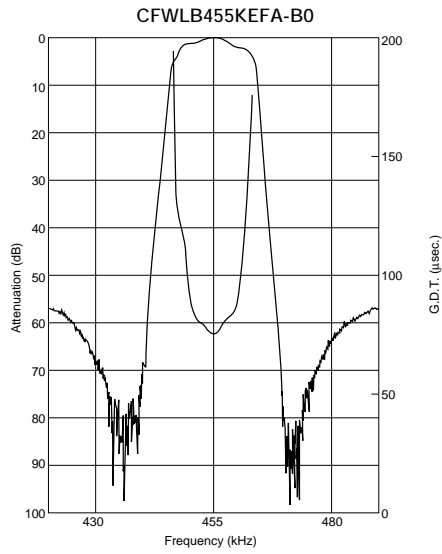
The order quantity should be an integral multiple of the "Minimum Quantity" shown in package page in this catalog.

### ■ Test Circuit



$Rg+R1=R2=Input/Output\ Impedance$

## ■ Frequency Characteristics





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

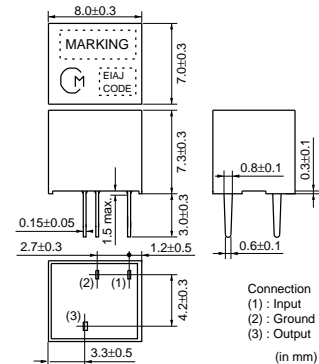


## CERAFIL® Plastic Case Group Delay Flat Type CFULA\_Y Series

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) |
|------------------------|-----------------------------|---------------------|-------------------------------|-------------------------------|--------------------------------------|--------------------------------|------------------------------|
| <b>CFULA455KB4Y-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>CFULA455KC4Y-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>CFULA455KD1Y-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>CFULA455KE1Y-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>CFULA455KF1Y-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>CFULA455KG1Y-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                         |

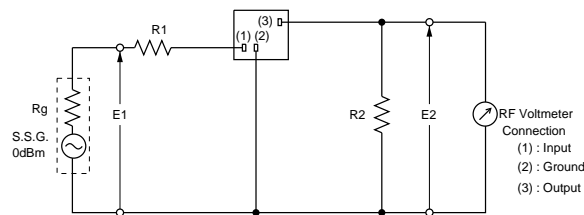
Center frequency (fo) defined by the center of 6dB bandwidth.

(fn) means nominal center frequency 455kHz.

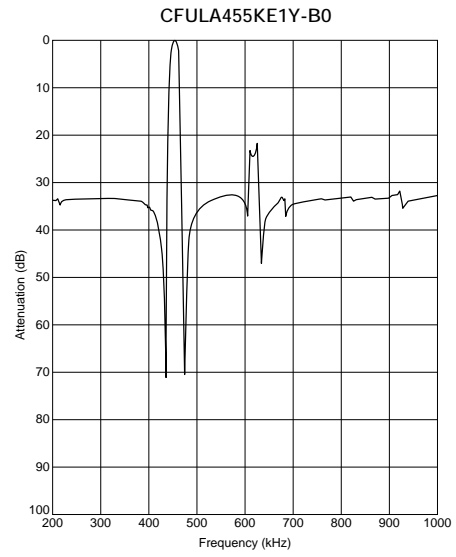
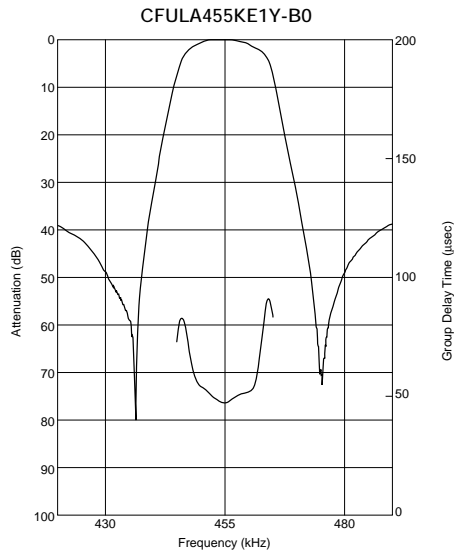
For safety purposes, connect the output of filters to the IF amplifier through a D.C. blocking capacitor. Avoid applying a direct current to the output of ceramic filters.

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

### ■ Test Circuit



## ■ Frequency Characteristics



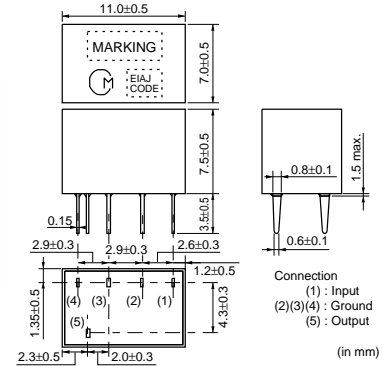
# Ceramic Filters (CERAFIL®)/Ceramic Discriminators for Communications Equipment



## CERAFIL® 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                         |

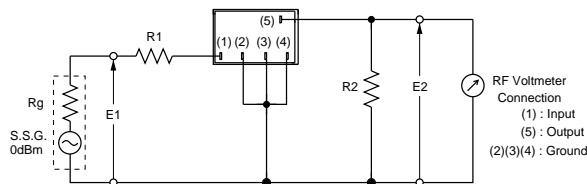
Center frequency (fo) defined by the center of 6dB bandwidth.

(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.

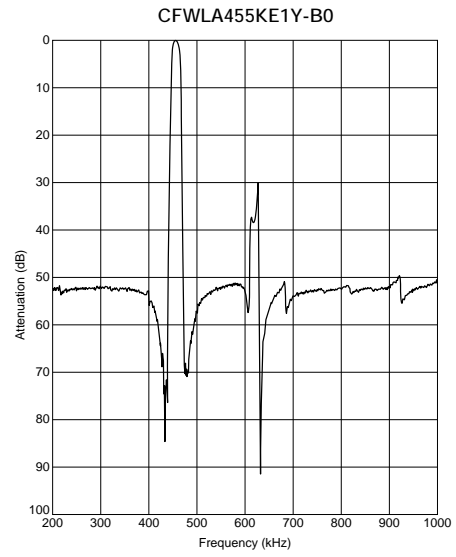
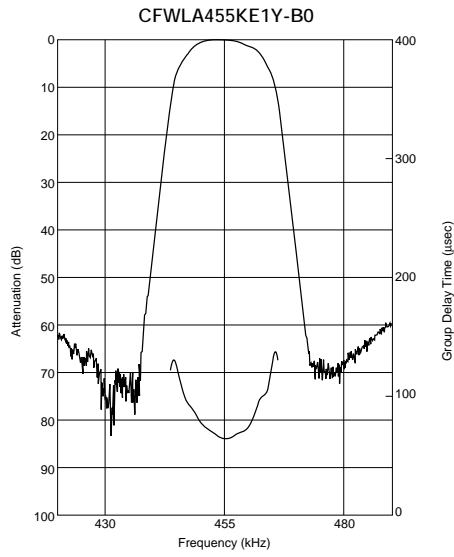
The order quantity should be an integral multiple of the "Minimum Quantity" shown in package page in this catalog.

### ■ Test Circuit



$R_g + R_1 = R_2 = \text{Input/Output Impedance}$

## ■ Frequency Characteristics



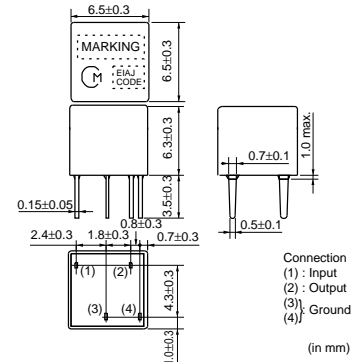
# Ceramic Filters (CERAFIL®)/Ceramic Discriminators for Communications Equipment



## 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.

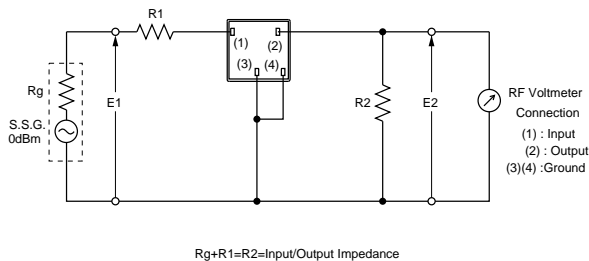
(fn) means nominal center frequency 455kHz.

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

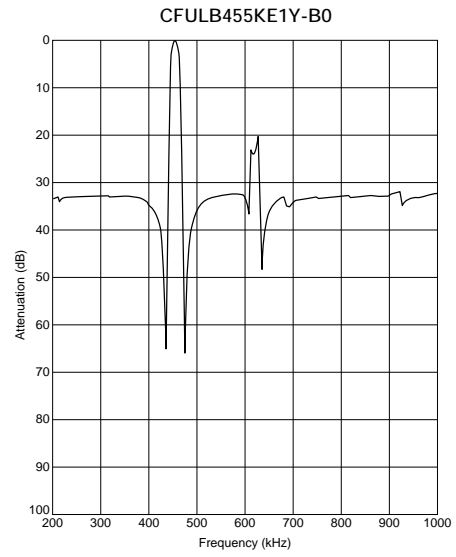
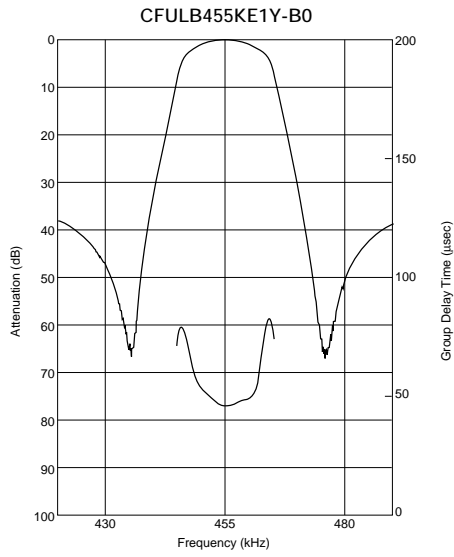
For safety purposes, connect the output of filters to the IF amplifier through a D.C. blocking capacitor. Avoid applying a direct current to the output of ceramic filters.

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

### ■ Test Circuit



## Frequency Characteristics



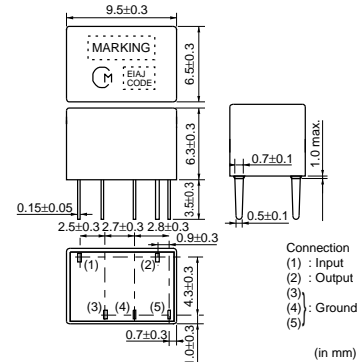
# Ceramic Filters (CERAFIL®)/Ceramic Discriminators for Communications Equipment



## 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.

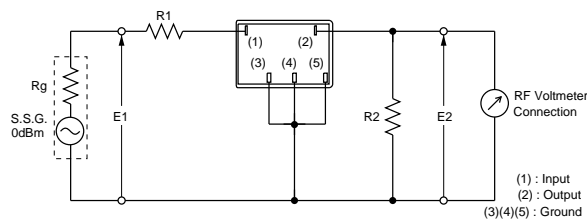
(fn) means nominal center frequency 455kHz.

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.

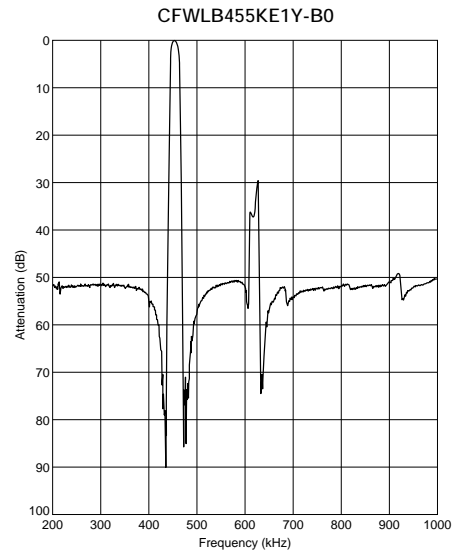
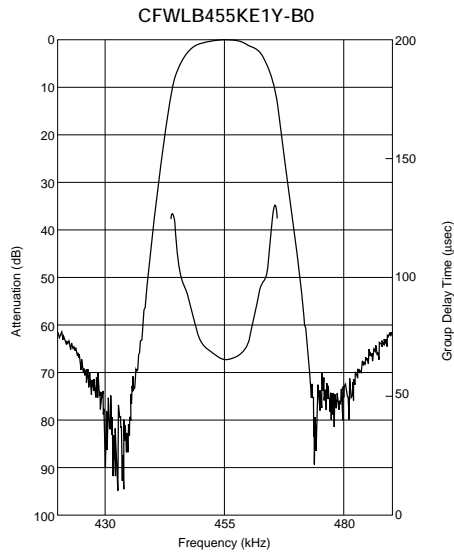
The order quantity should be an integral multiple of the "Minimum Quantity" shown in package page in this catalog.

### ■ Test Circuit



$R_g + R_1 = R_2 = \text{Input/Output Impedance}$

## ■ Frequency Characteristics





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



## kHz Type Ceramic Discriminators

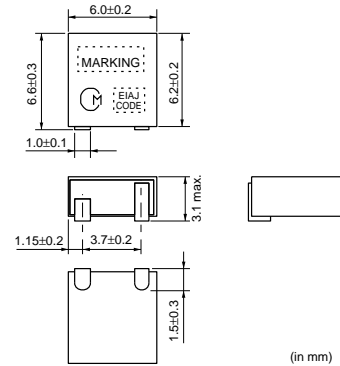
Ceramic discriminator consists of wide band piezoelectric resonator.  
It is ideal for mobile communications equipment due to its small size and light weight.  
Standard line include products for wide range of applications, from cordless telecom to cellular telephone. It helps to realize adjustment free at detection circuit and down sizing.

### ■ Features

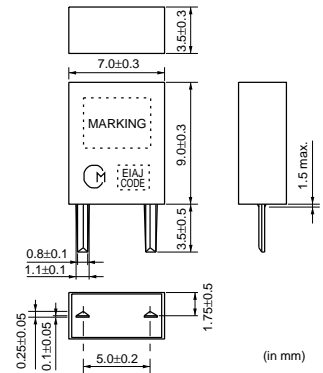
1. Small in size and light weight
2. Adjustment free at detection circuit
3. High sensitivity and stability
4. Wide range of standard products are available for various ICs.
5. Operating temperature range: -20 to +80 (degree C)  
Storage temperature range: -40 to +85 (degree C)



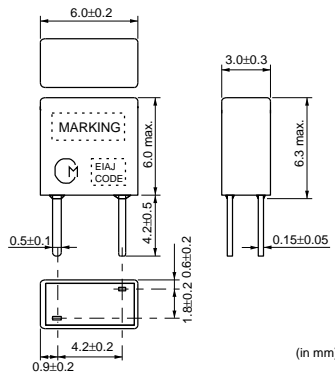
CDBKB Series



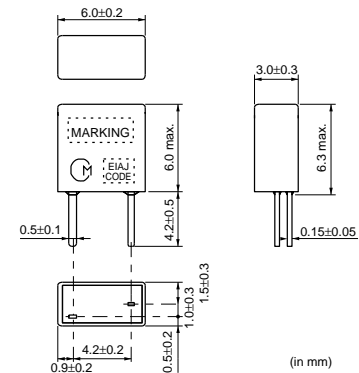
CDBLA Series



CDBLB\_CAX Series



CDBLB\_CAY Series

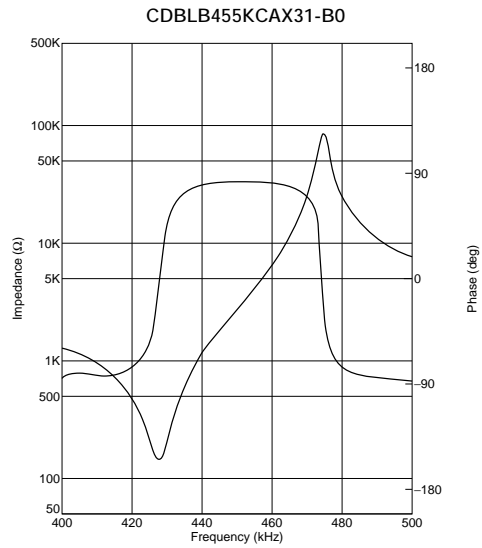
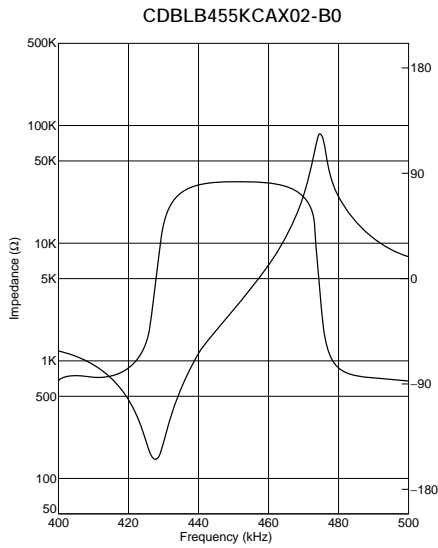


### Specified by Impedance Characteristics (Type 1)

| 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<br>(at  Z =2.05kohm) | 463.0±1.5kHz<br>(at  Z =10.0kohm) | 140pF±20%       | TA8104F | TOSHIBA  | Lead |
| CDBLB455KCAX31-B0 | 455                                 | 447.0±1.5kHz<br>(at  Z =2.05kohm) | 463.0±1.5kHz<br>(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

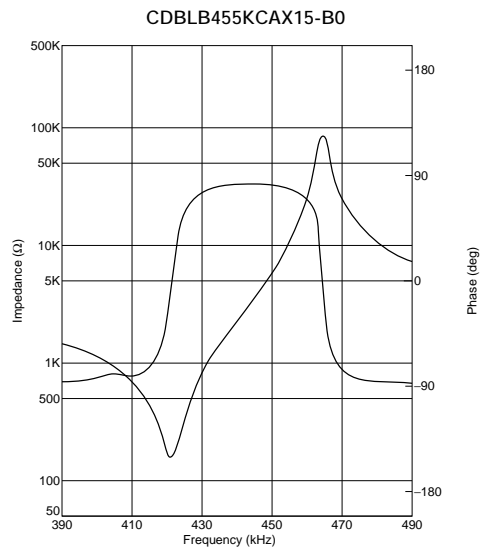
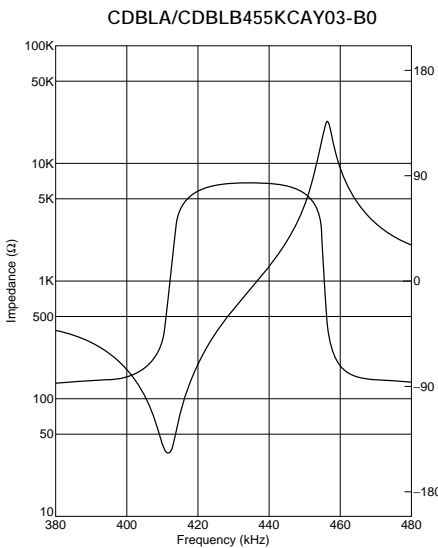


**Specified by Impedance Characteristics (Type 2)**

| 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 |

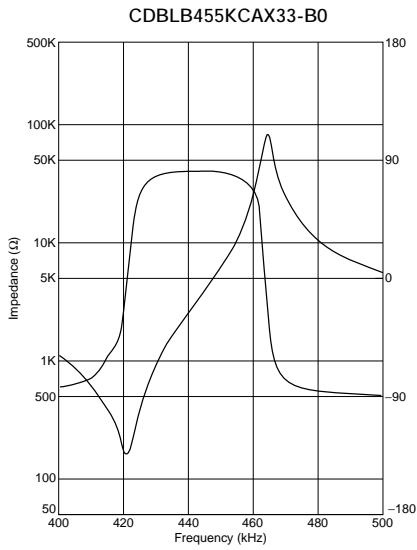
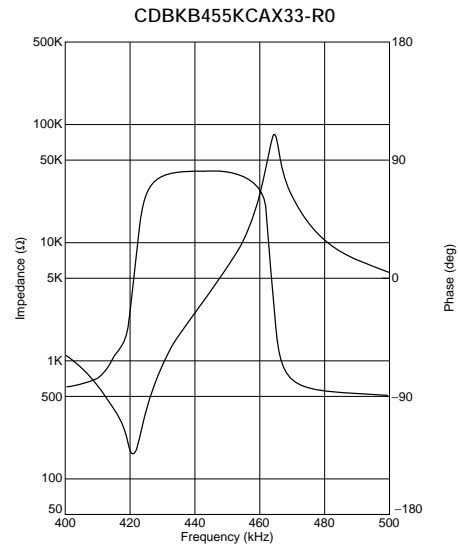
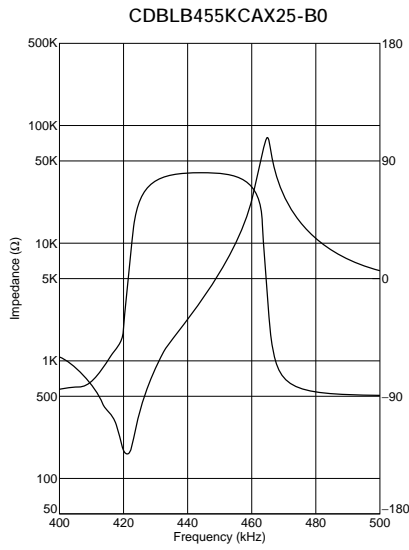
For safety purposes, connect the output of filters to the IF amplifier through a D.C. blocking capacitor. Avoid applying a direct current to the output of ceramic filters. The order quantity should be an integral multiple of the "Minimum Quantity" shown in package page in this catalog.

■ 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 |
|----------------------------|-------------------------------------|------------------------------|-----------------------------|------------------------|-------------------------------|-------------------------|----------|------|
| <b>CDBKB455KCAY07-R0</b>   | 455                                 | fn±4.0 min.                  | 350 ±60                     | 3.0 max.               | -                             | MC3357                  | MOTOROLA | SMD  |
| <b>CDBKB455KCAY09-R0</b>   | 455                                 | fn±4.0 min.                  | 120 ±40                     | 1.5 max.               | -                             | NE604N                  | PHILIPS  | SMD  |
| <b>CDBKB455KCAY13-R0</b>   | 455                                 | fn±4.0 min.                  | 330 ±50                     | 4.0 max.               | -                             | CXA1003BM               | SONY     | SMD  |
| <b>CDBKB455KCAY16-R0</b>   | 455                                 | fn±4.0 min.                  | 175 ±40                     | 2.0 max.               | -                             | MC3372                  | MOTOROLA | SMD  |
| <b>CDBKB455KCAY24-R0</b>   | 455                                 | fn±4.0 min.                  | 100 ±40                     | 2.0 max.               | -                             | TA31136                 | TOSHIBA  | SMD  |
| <b>CDBKB455KCAY27-R0</b>   | 455                                 | fn±4.0 min.                  | 90 ±30                      | 2.0 max.               | -                             | TK10487                 | TOKO     | SMD  |
| <b>CDBKB455KCAY28-R0</b>   | 455                                 | fn±4.0 min.                  | 40 ±20                      | 3.0 max.               | -                             | TA31142F                | TOSHIBA  | SMD  |
| <b>CDBKB455KCAY29-R0</b>   | 455                                 | fn±4.0 min.                  | 100 ±30                     | 2.5 max.               | -                             | NE605                   | PHILIPS  | SMD  |
| <b>CDBKB455KCAY35-R0</b>   | 455                                 | fn±4.0 min.                  | 100 ±40                     | 2.5 max.               | -                             | TK10930                 | TOKO     | SMD  |
| <b>CDBKB455KCAY40-R0</b>   | 455                                 | fn±4.0 min.                  | 40 ±20                      | 3.5 max.               | -                             | TA31145                 | TOSHIBA  | SMD  |
| <b>CDBKB455KCAY49-R0</b>   | 455                                 | fn±4.0 min.                  | 45 ±10                      | 3.0 max.               | -                             | MC3361                  | MOTOROLA | SMD  |
| <b>CDBKB455KCAY50-R0</b>   | 455                                 | fn±4.0 min.                  | 64 ±6.4                     | 4.0 max.               | -                             | CXA3117N                | SONY     | SMD  |
| <b>CDBKB455KCAY66-R0</b>   | 455                                 | fn±4.2 min.                  | 40 ±10                      | 4.0 max.               | -                             | NJM2590                 | JRC      | SMD  |
| <b>CDBKB455KCLX36-R0</b>   | 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  |
| <b>CDBKB455KCLX39-R0</b>   | 455                                 | fn±11.0 min.                 | 130 ±20                     | 2.5 max.               | 7.0 max.<br>[within fn ±8kHz] | NE607<br>/NE617         | PHILIPS  | SMD  |
| <b>CDBKB455KCLY13-R0</b>   | 455                                 | fn±13.0 min.                 | 120 ±30                     | 1.5 max.               | 5.0 max.<br>[within fn ±8kHz] | CXA1003BM               | SONY     | SMD  |
| <b>CDBLA455KCA Y07-B0</b>  | 455                                 | fn±4.0 min.                  | 340 ±60                     | 2.5 max.               | -                             | MC3357                  | MOTOROLA | Lead |
| <b>CDBLA455KCA Y09-B0</b>  | 455                                 | fn±5.0 min.                  | 100 min.                    | 1.5 max.               | -                             | NE604N                  | PHILIPS  | Lead |
| <b>CDBLA455KCA Y13A-B0</b> | 455                                 | fn±4.0 min.                  | 350 ±50                     | 3.0 max.               | -                             | CXA1003BM               | SONY     | Lead |
| <b>CDBLA455KCA Y16-B0</b>  | 455                                 | fn±4.0 min.                  | 185 ±40                     | 2.0 max.               | -                             | MC3372                  | MOTOROLA | Lead |
| <b>CDBLA455KCA Y24-B0</b>  | 455                                 | fn±4.0 min.                  | 100 ±40                     | 2.0 max.               | -                             | TA31136                 | TOSHIBA  | Lead |
| <b>CDBLA455KCA Y28-B0</b>  | 455                                 | fn±4.0 min.                  | 40 ±20                      | 3.0 max.               | -                             | TA31142                 | TOSHIBA  | Lead |
| <b>CDBLA455KCA Y34-B0</b>  | 455                                 | fn±4.0 min.                  | 65 ±20                      | 2.5 max.               | -                             | MC13136                 | MOTOROLA | Lead |
| <b>CDBLA455KCLY09-B0</b>   | 455                                 | fn±15.0 min.                 | 70 ±20                      | 1.5 max.               | 3.5 max.<br>[within fn ±8kHz] | NE604N                  | PHILIPS  | Lead |
| <b>CDBLA455KCLY13-B0</b>   | 455                                 | fn±15.0 min.                 | 110 ±30                     | 1.5 max.               | 5.0 max.<br>[within fn ±8kHz] | CXA1003BM               | SONY     | Lead |
| <b>CDBLB455KCA Y07-B0</b>  | 455                                 | fn±4.0 min.                  | 340 ±60                     | 3.0 max.               | -                             | MC3357                  | MOTOROLA | Lead |
| <b>CDBLB455KCA Y13A-B0</b> | 455                                 | fn±4.0 min.                  | 350 ±50                     | 3.0 max.               | -                             | CXA1003BM               | SONY     | Lead |

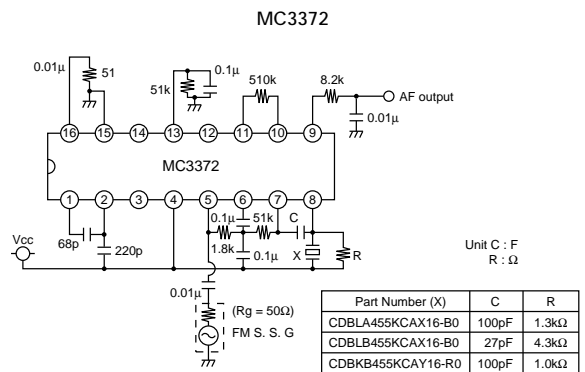
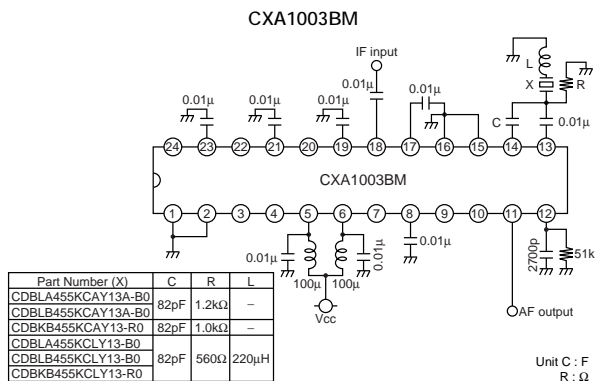
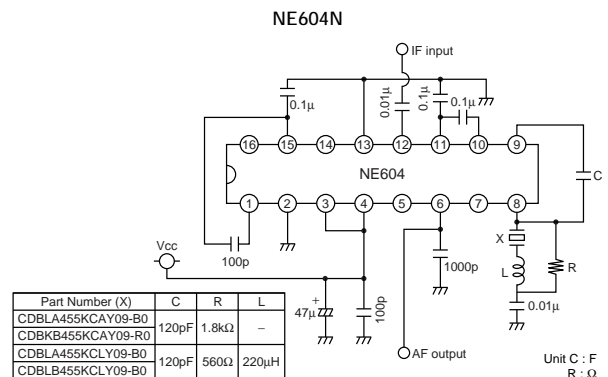
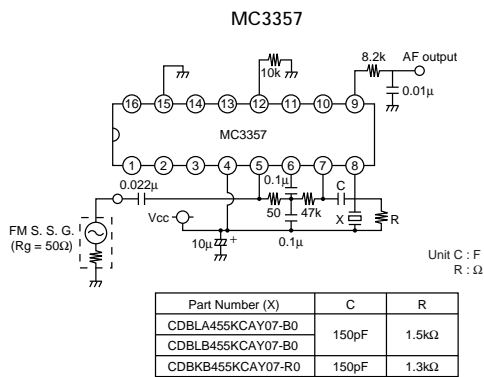
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| Part Number              | Nominal Center Frequency (fn) (kHz) | Recovered Audio 3dB BW (kHz) | Recovered Audio Output (mV) | Distortion (at fn) (%) | Distortion (%)             | IC               | IC Maker | Type |
|--------------------------|-------------------------------------|--------------------------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

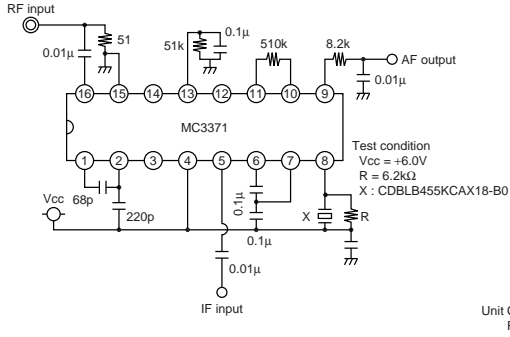
■ Test Circuit



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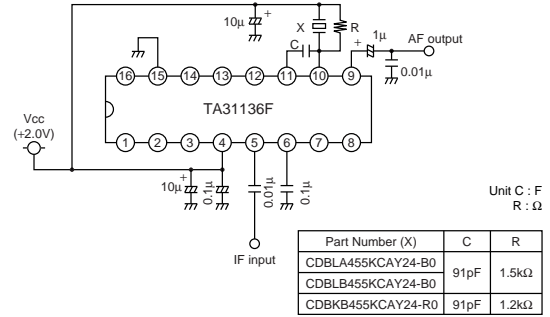
Test Circuit

MC3371



Unit C : F  
R : Ω

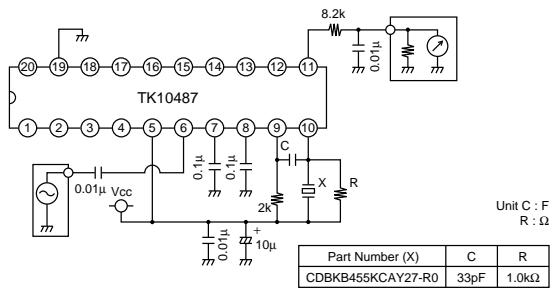
TA31136



Unit C : F  
R : Ω

| Part Number (X)   | C    | R     |
|-------------------|------|-------|
| CDBLA455KCAY24-B0 | 91pF | 1.5kΩ |
| CDBLB455KCAY24-B0 | 91pF | 1.2kΩ |
| CDBKB455KCAY24-R0 | 91pF | 1.2kΩ |

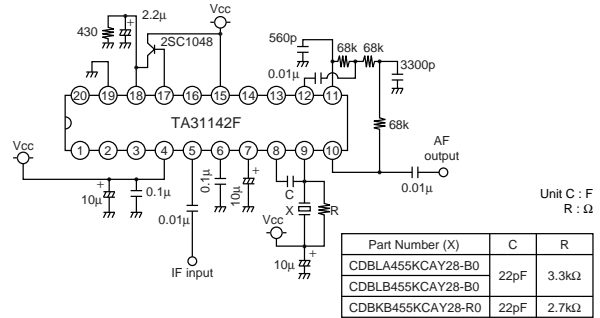
TK10487



Unit C : F  
R : Ω

| Part Number (X)   | C    | R     |
|-------------------|------|-------|
| CDBKB455KCAY27-R0 | 33pF | 1.0kΩ |

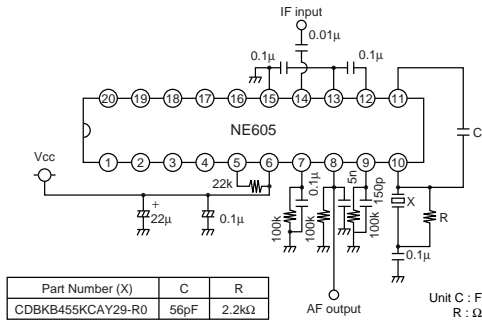
TA31142



Unit C : F  
R : Ω

| Part Number (X)   | C    | R     |
|-------------------|------|-------|
| CDBLA455KCAY28-B0 | 22pF | 3.3kΩ |
| CDBLB455KCAY28-B0 | 22pF | 2.7kΩ |
| CDBKB455KCAY28-R0 | 22pF | 2.7kΩ |

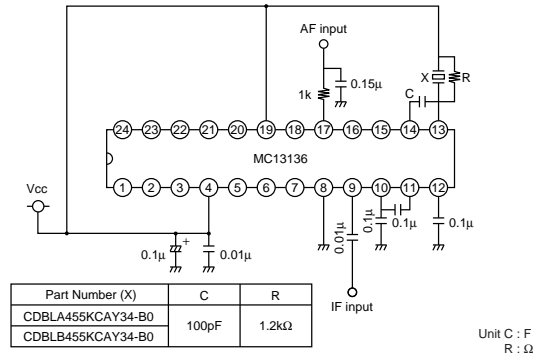
NE605



Unit C : F  
R : Ω

| Part Number (X)   | C    | R     |
|-------------------|------|-------|
| CDBKB455KCAY29-R0 | 56pF | 2.2kΩ |

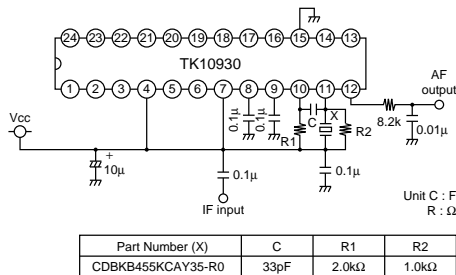
MC13136



Unit C : F  
R : Ω

| Part Number (X)   | C     | R     |
|-------------------|-------|-------|
| CDBLA455KCAY34-B0 | 100pF | 1.2kΩ |
| CDBLB455KCAY34-B0 | 100pF | 1.2kΩ |

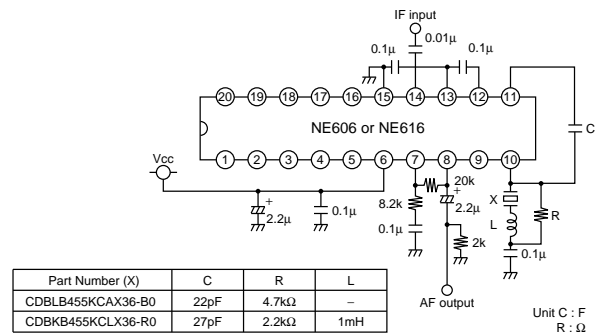
TK10930



Unit C : F  
R : Ω

| Part Number (X)   | C    | R1    | R2    |
|-------------------|------|-------|-------|
| CDBKB455KCAY35-R0 | 33pF | 2.0kΩ | 1.0kΩ |

NE(SA)606/616

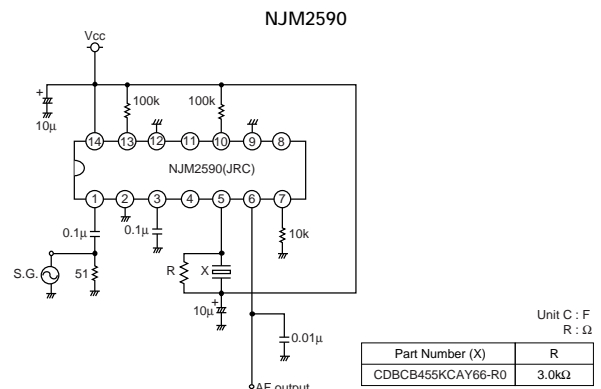
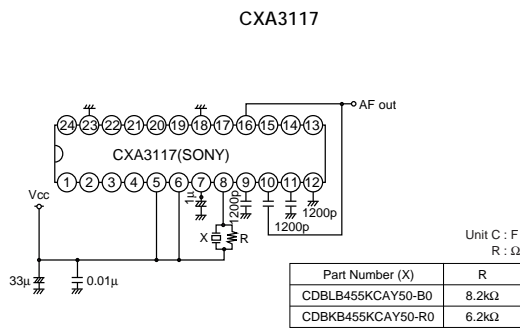
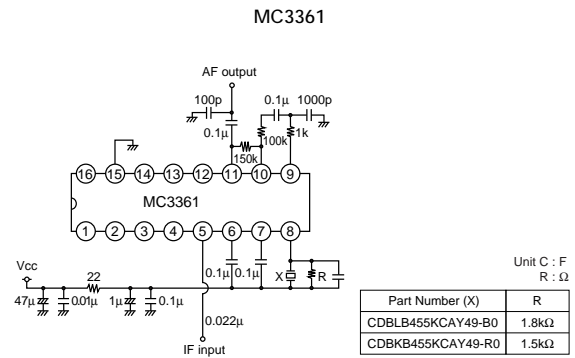
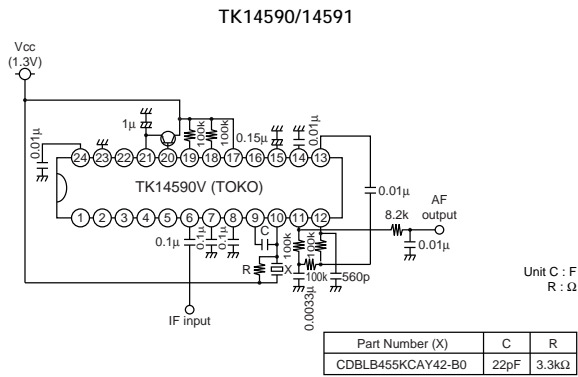
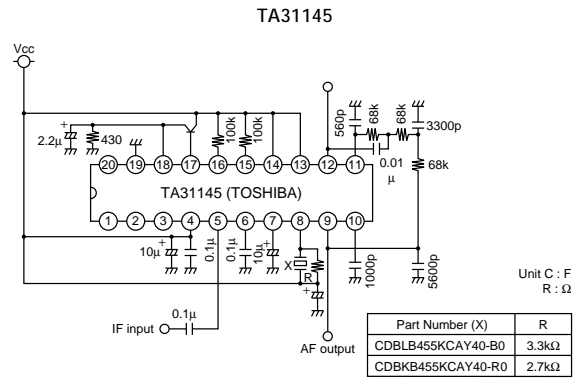
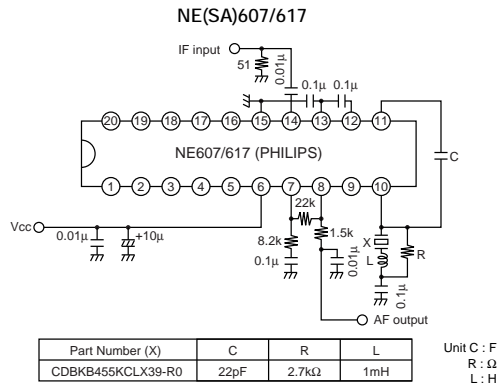


Unit C : F  
R : Ω

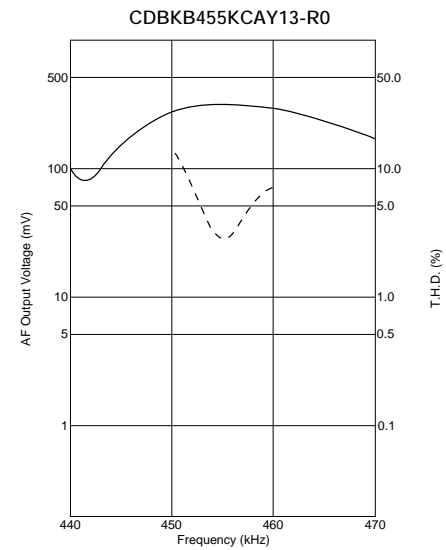
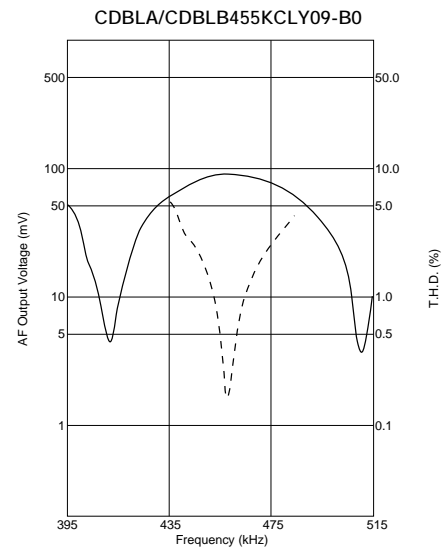
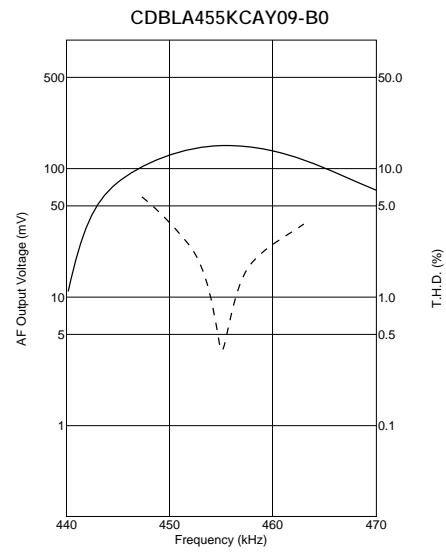
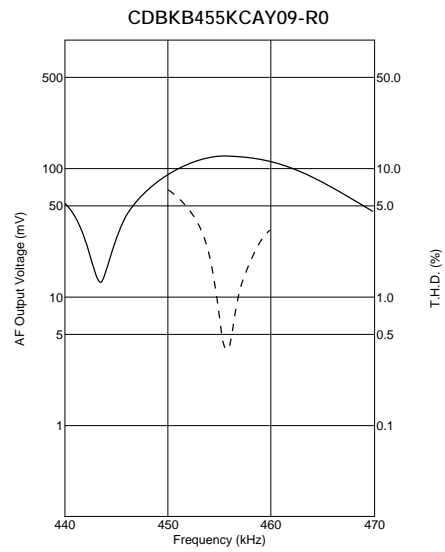
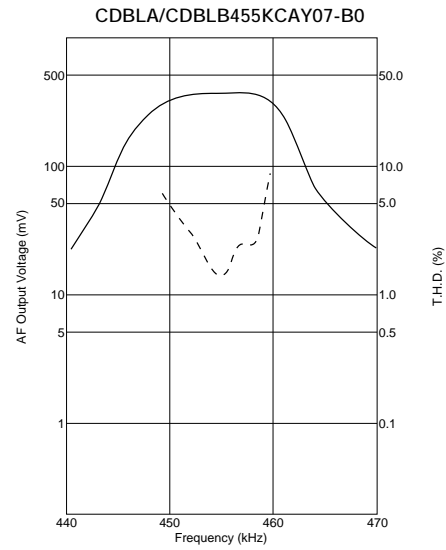
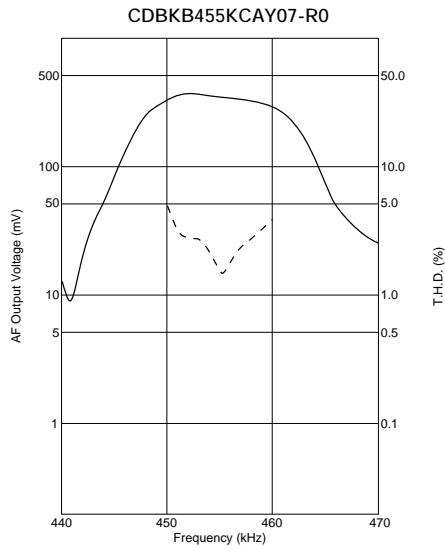
| Part Number (X)   | C    | R     | L   |
|-------------------|------|-------|-----|
| CDBLB455KCAX36-B0 | 22pF | 4.7kΩ | -   |
| CDBKB455KCLX36-R0 | 27pF | 2.2kΩ | 1mH |

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Test Circuit



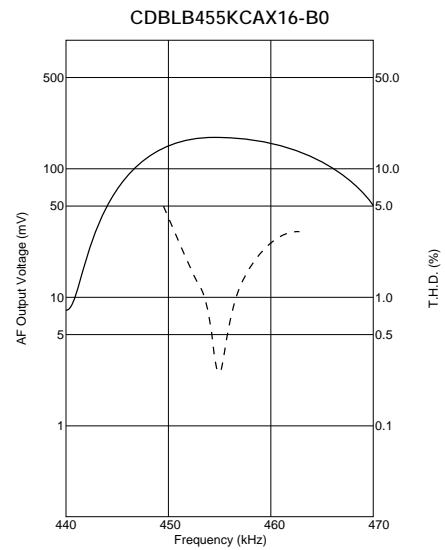
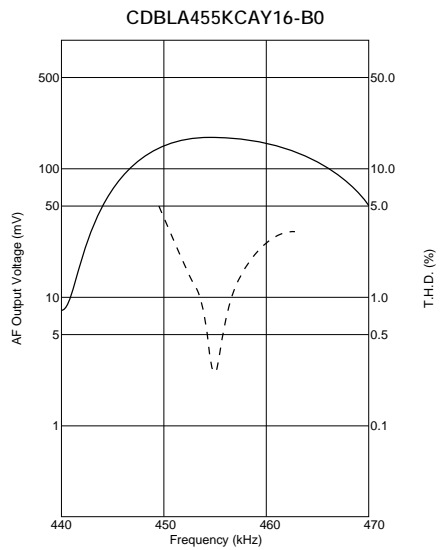
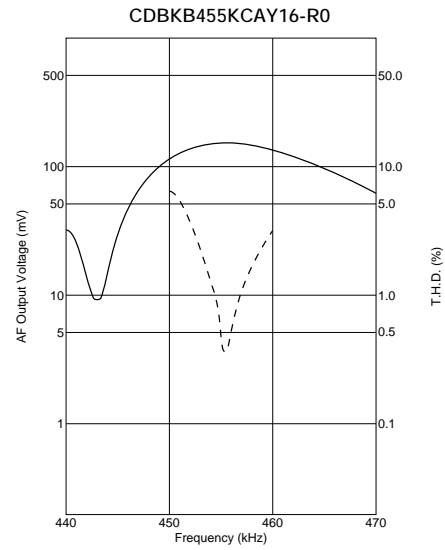
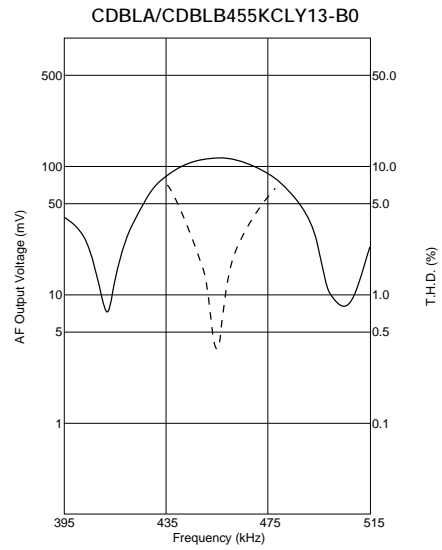
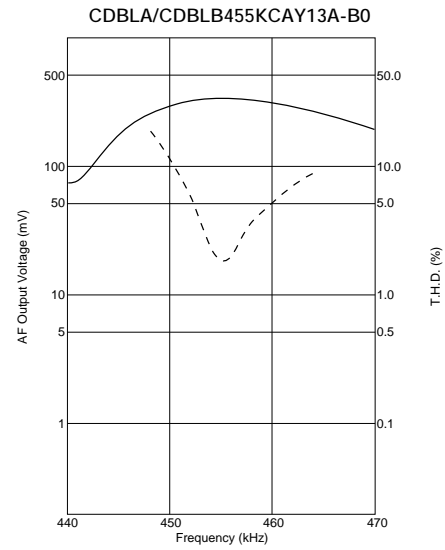
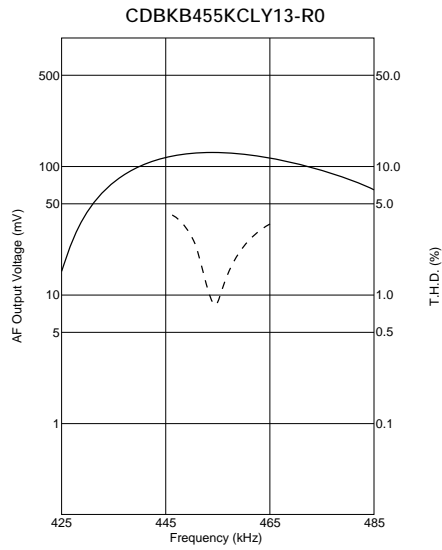
■ Recovered Audio Curve





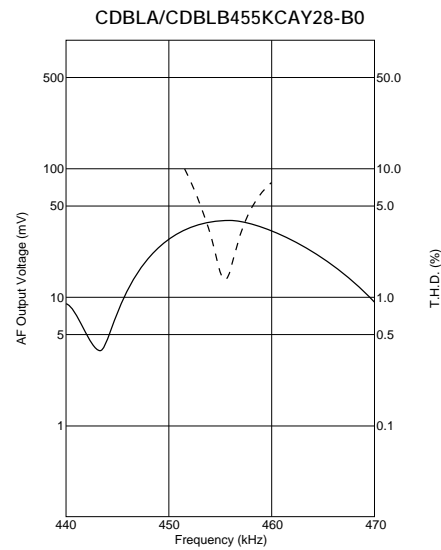
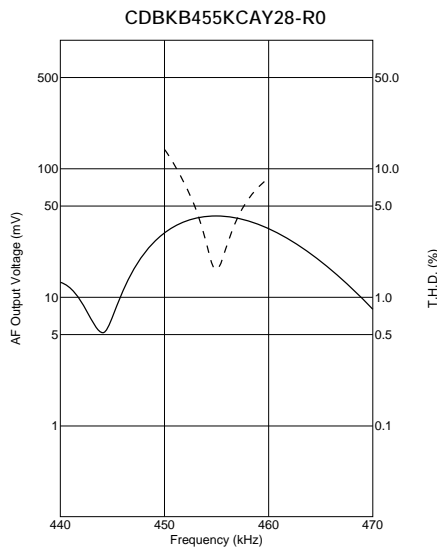
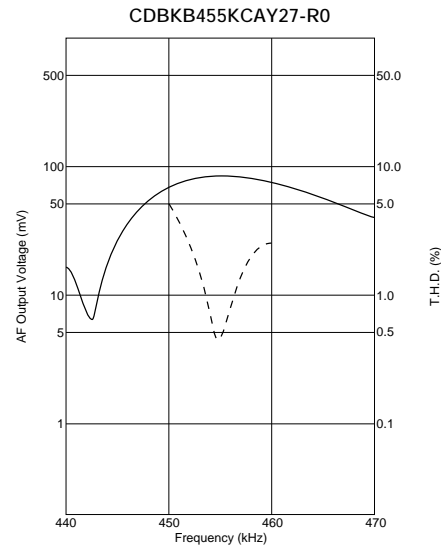
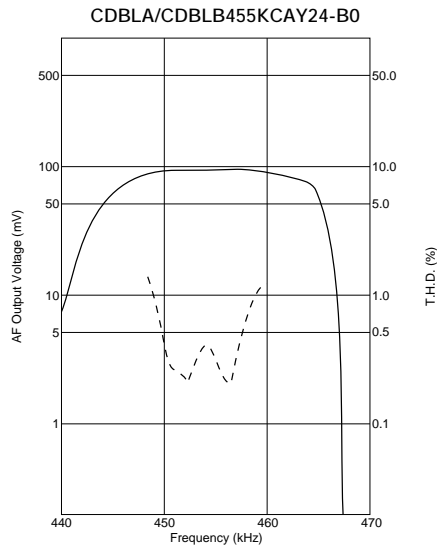
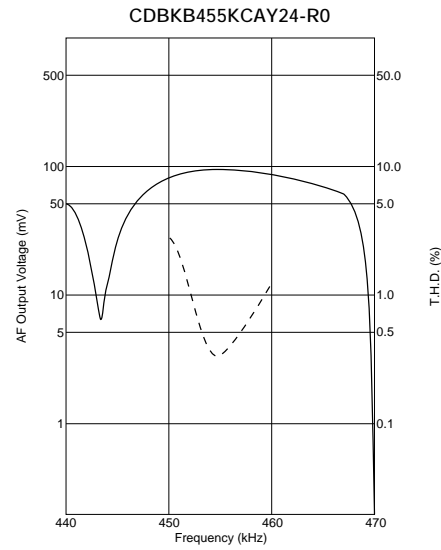
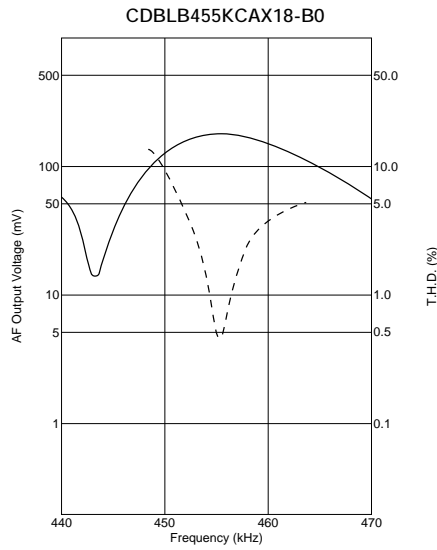
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Recovered Audio Curve



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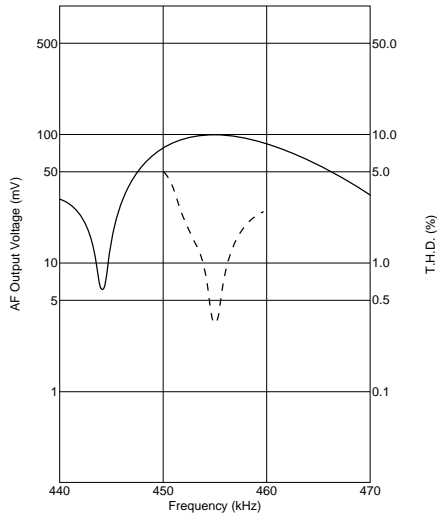
Recovered Audio Curve



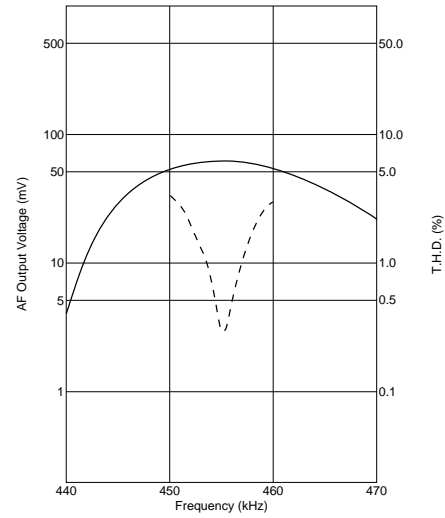
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Recovered Audio Curve

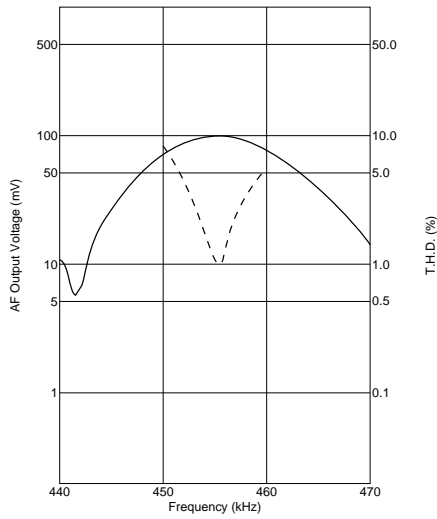
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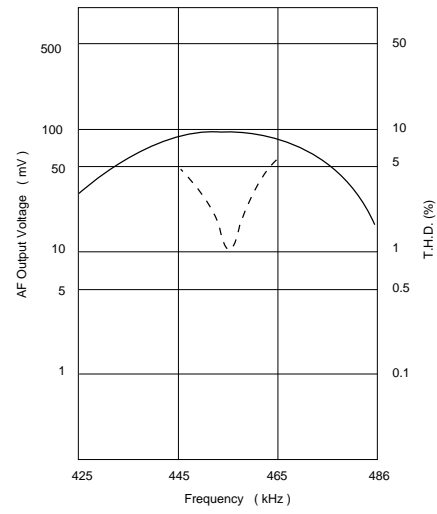
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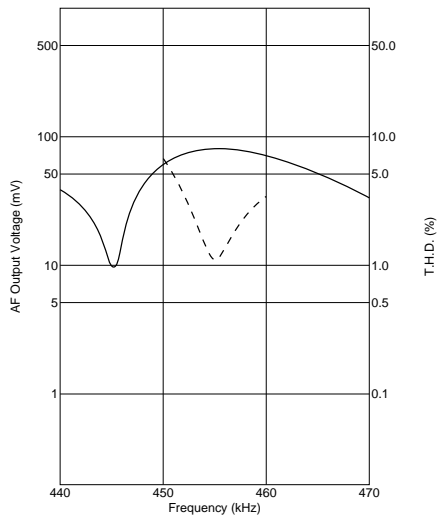
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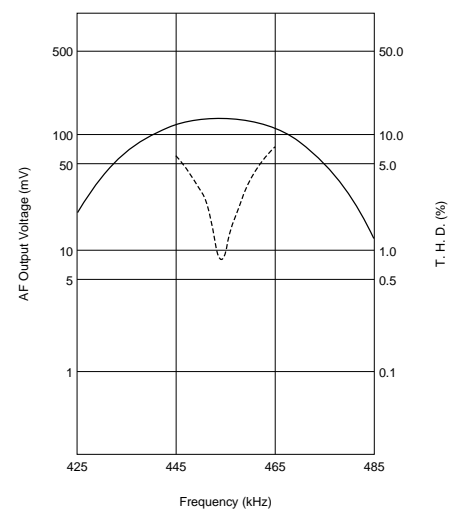
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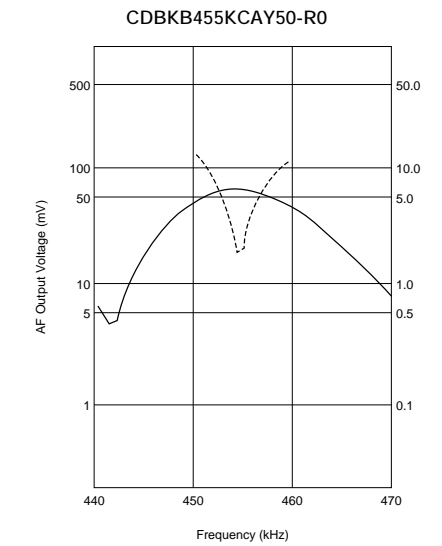
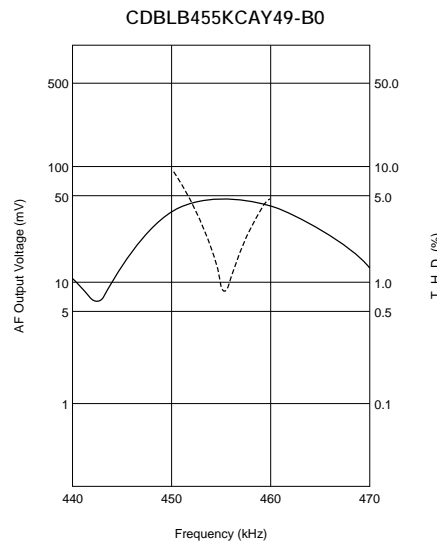
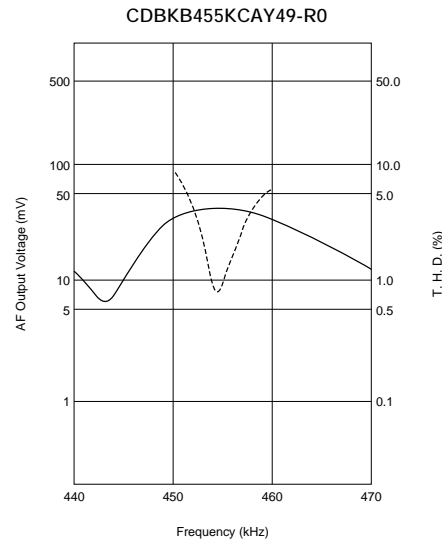
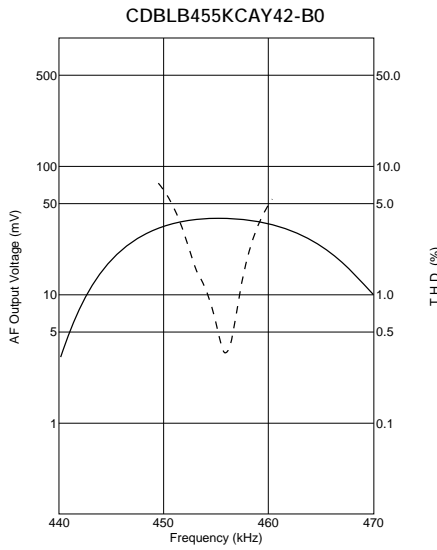
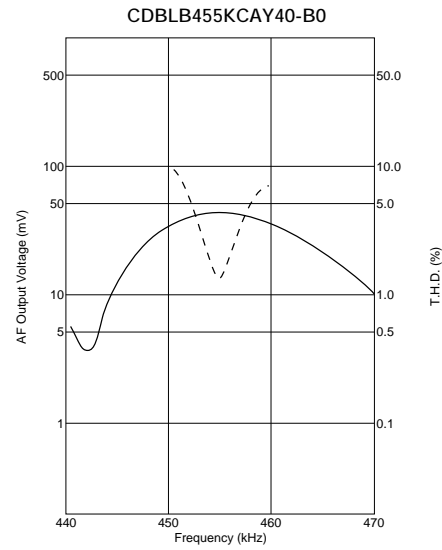
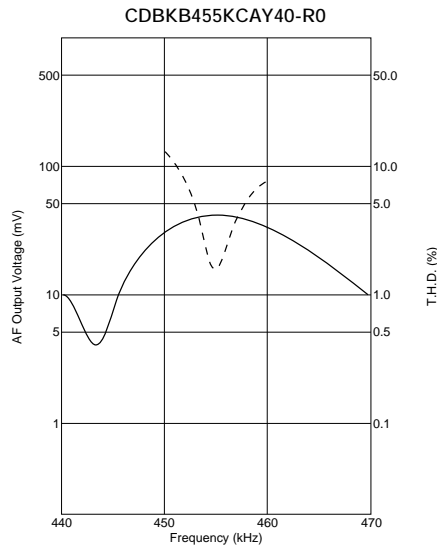


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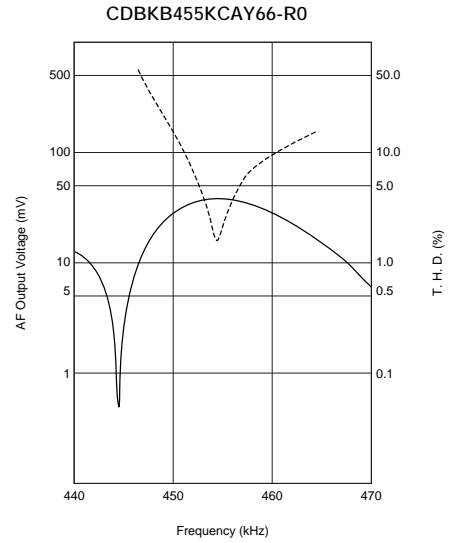
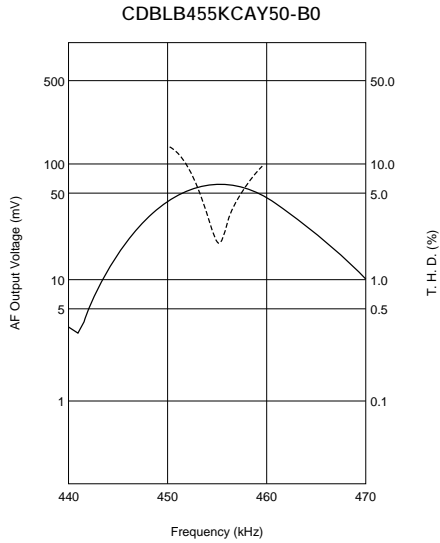
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Recovered Audio Curve



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Recovered Audio Curve

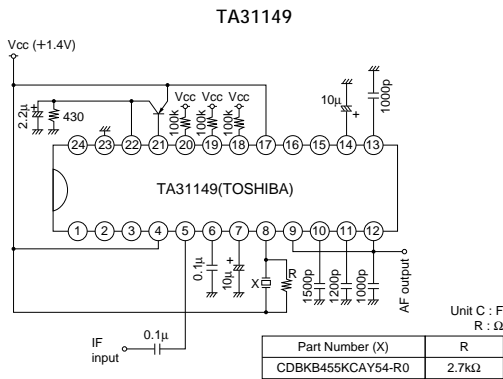


Specified by S Curve Characteristics

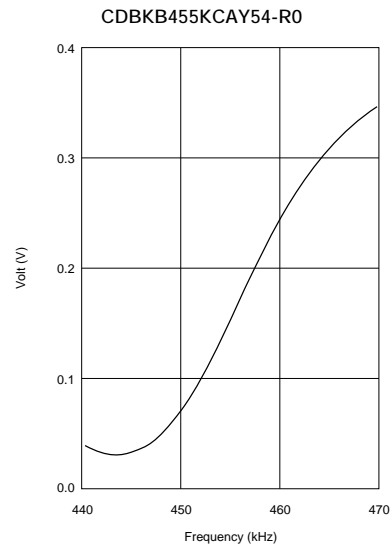
| Part Number       | Nominal Center Frequency (fn) (kHz) | S Curve (1) Output Volt. at fn (mV) | S Curve (2) at fn±4.8kHz (mV) | IC      | IC Maker | Type |
|-------------------|-------------------------------------|-------------------------------------|-------------------------------|---------|----------|------|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

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



S Curve



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

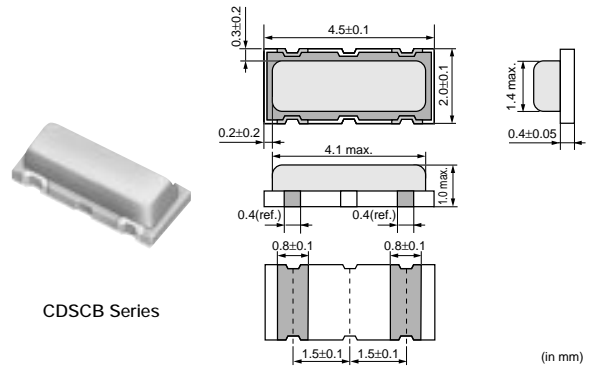


## MHz Type Ceramic Discriminators

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



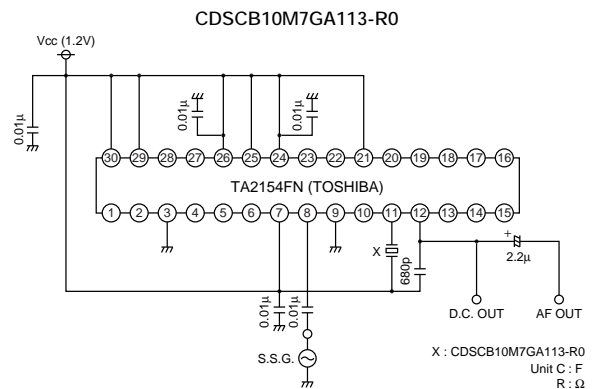
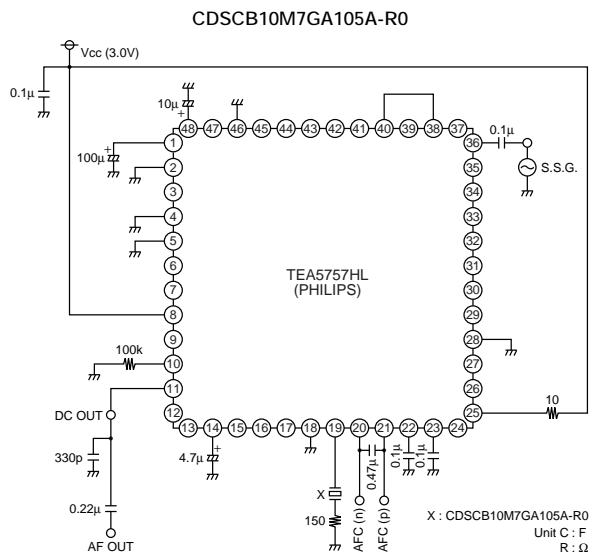
| Part Number        | Center Frequency (fo) (MHz) | Recovered Audio 3dB BW (kHz) | Recovered Audio Output (mV) | Distortion (%) | IC        |
|--------------------|-----------------------------|------------------------------|-----------------------------|----------------|-----------|
| CDSCB10M7GA105A-R0 | 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.

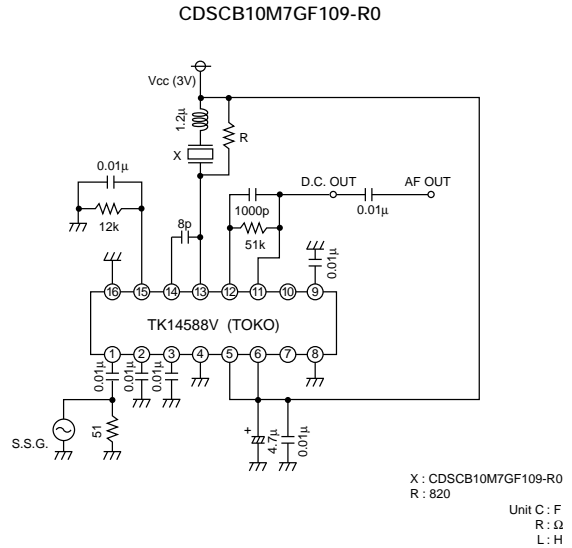
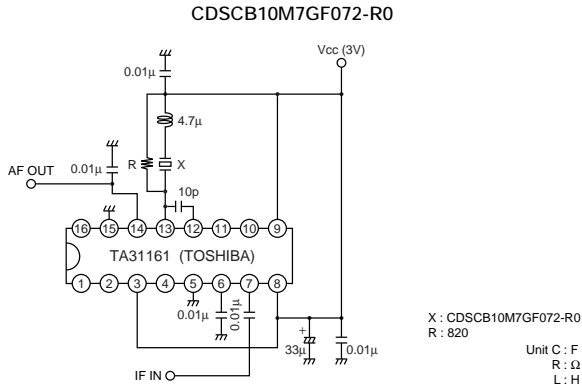
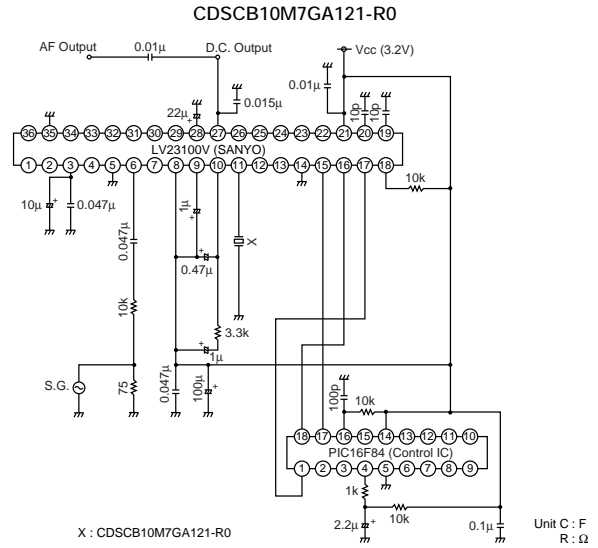
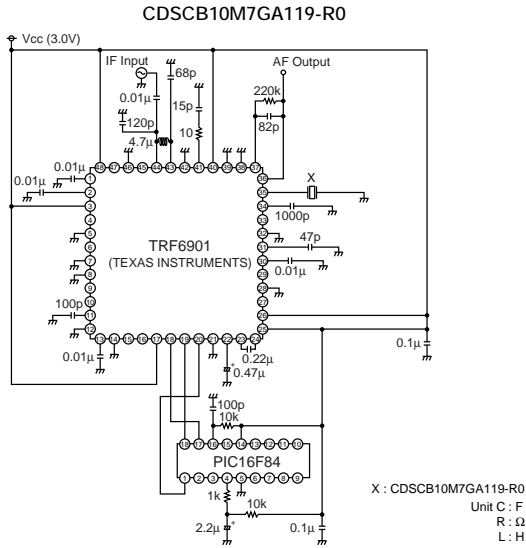
### ■ Test Circuit



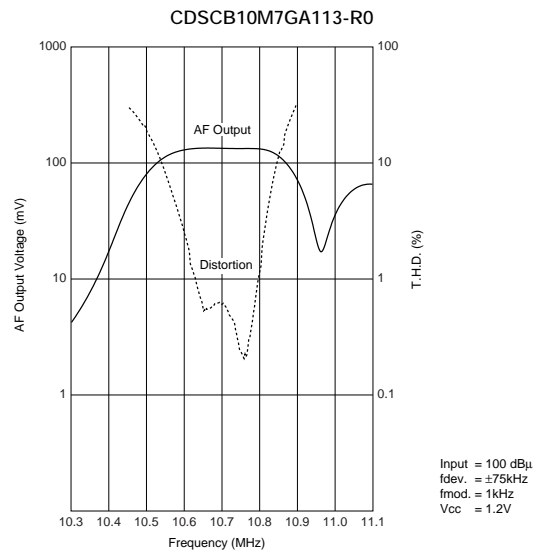
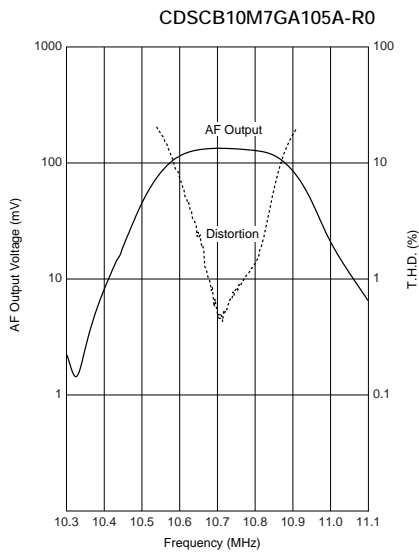
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Test Circuit



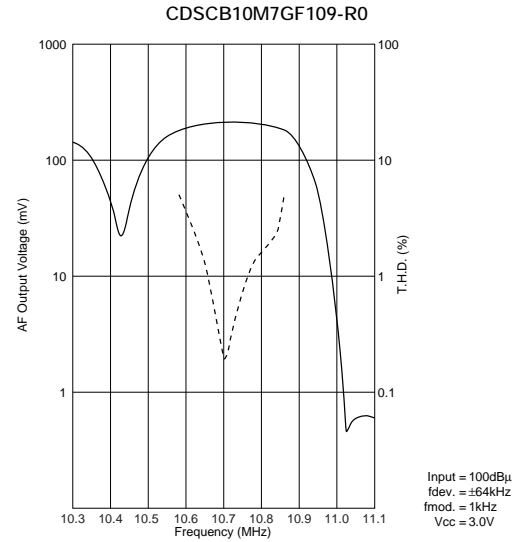
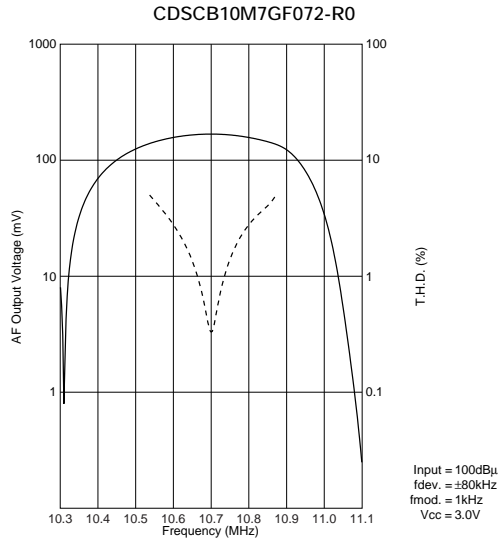
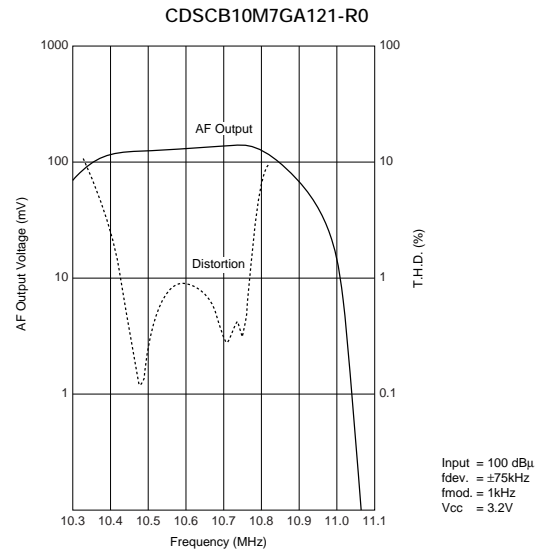
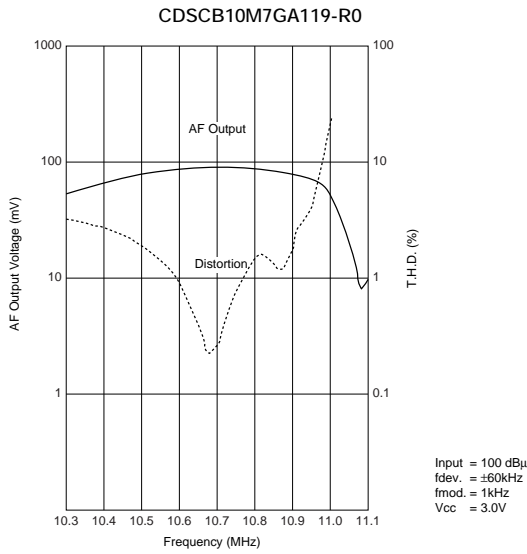
Frequency Characteristics



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■ Frequency Characteristics

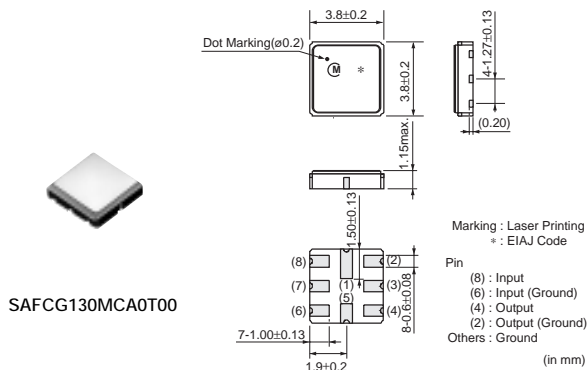




**for IF**

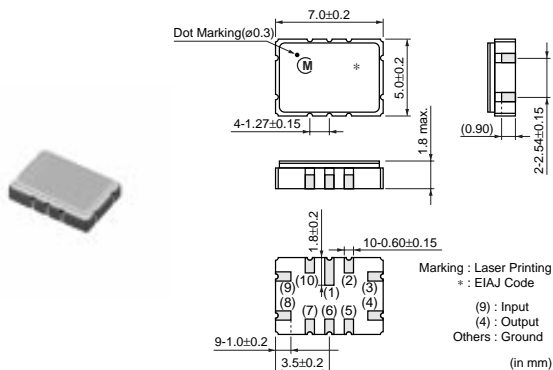
**SAW Filters**

● AMPS/ADC



| Part Number            | Center Frequency (MHz) | 3dB Bandwidth (kHz) | Insertion Loss (dB)              | Ripple (dB max.)  | Input/Output Impedance                              |
|------------------------|------------------------|---------------------|----------------------------------|-------------------|-----------------------------------------------------|
| <b>SAFCG130MCA0T00</b> | 130.380                | ±630 min.           | 5.5 max.<br>(at fo point)        | -                 | 310ohm//1.6μH (Input)<br>310ohm//1.6μH (Output)     |
| <b>SAFCT85M3JB0X05</b> | 85.380                 | ±12 min.            | 5.5 max.<br>(at min. loss point) | 1.5<br>(fo±12kHz) | 870ohm// -1.8pF (Input)<br>870ohm// -1.8pF (Output) |

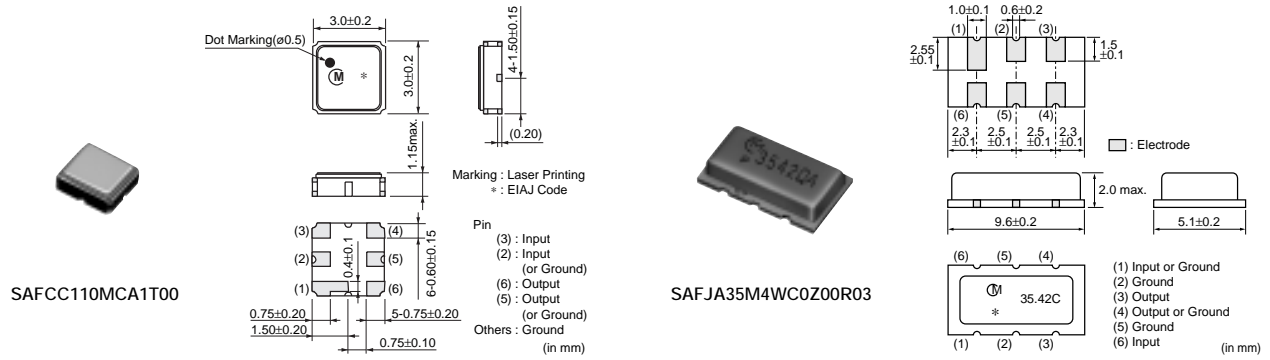
● DECT



| Part Number            | Center Frequency (MHz) | 3dB Bandwidth (kHz) | Insertion Loss (dB)              | Ripple (dB max.) | Input/Output Impedance                          |
|------------------------|------------------------|---------------------|----------------------------------|------------------|-------------------------------------------------|
| <b>SAFCT110MCB1T00</b> | 110.592                | ±576 min.           | 4.5 max.<br>(at min. loss point) | -                | 300ohm//1.2μH (Input)<br>300ohm//1.2μH (Output) |

△Note • This catalog has only typical specifications because there is no space for detailed specifications. Therefore, please approve our product specifications or transact the approval sheet for product specifications before ordering. Especially, please read rating and △CAUTION (for storage, operating, rating, soldering, mounting and handling) in them to prevent smoking and/or burning, etc.  
• You are able to read a detailed specifications in the website (<http://search.murata.co.jp/>) before to require our product specifications or to transact the approval sheet for product specifications.

● GPS

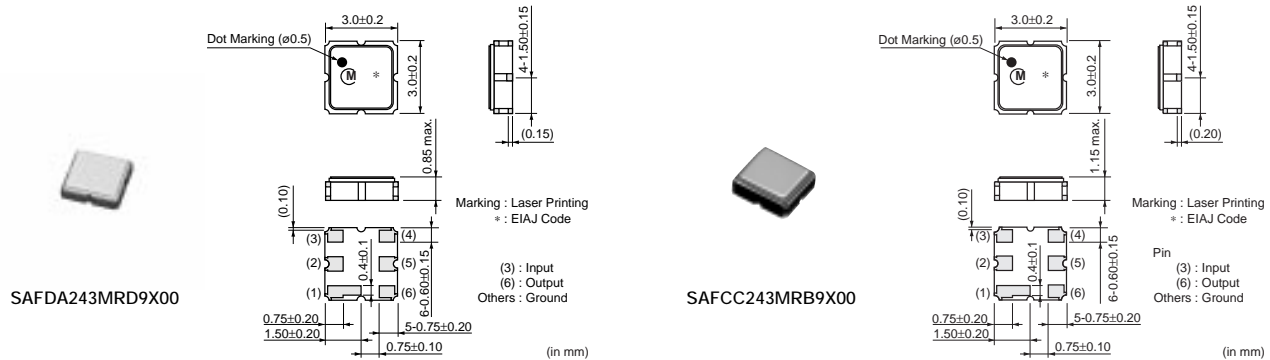


| Part Number               | Center Frequency (MHz) | 3dB Bandwidth (MHz)       | Insertion Loss (dB)           | Ripple (dB max.)               | Input/Output Impedance                              |
|---------------------------|------------------------|---------------------------|-------------------------------|--------------------------------|-----------------------------------------------------|
| <b>SAFCC110MCA1T00</b>    | 110.0                  | ±1.023 min.               | 3.7 max. (at min. loss point) | 0.6                            | 480ohm// -1.6μH (Input)<br>650ohm// -1.6μH (Output) |
| <b>SAFJA35M4WC0Z00R03</b> | 35.42 (fn)             | 1.90 min. (1dB Bandwidth) | 20.5 max. (at fn)             | 1.6 (within 34.62 to 36.22MHz) | 14.3k ohm//5.1pF (Input)<br>4k ohm//5.1pF (Output)  |
| <b>SAFJA35M4WC0Z00R10</b> | 35.42 (fn)             | 1.9 min. (1dB Bandwidth)  | 20.5 max. (at fn)             | 1.6 (within 34.62 to 36.22MHz) | 14.3k ohm//5.1pF (Input)<br>4k ohm//5.1pF (Output)  |

● PHS

7

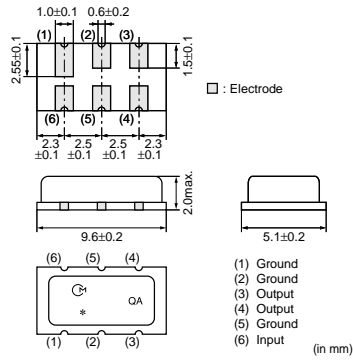
Filters for Communication Equipment



| Part Number            | Center Frequency (MHz) | 3dB Bandwidth (kHz) | Insertion Loss (dB)           | Ripple (dB max.) | Input/Output Impedance                              |
|------------------------|------------------------|---------------------|-------------------------------|------------------|-----------------------------------------------------|
| <b>SAFDA243MRD9X00</b> | 243.95                 | ±130 min.           | 4.5 max. (at fo point)        | 1.0 (fo±100kHz)  | 760ohm// -1.0pF (Input)<br>760ohm// -0.8pF (Output) |
| <b>SAFDA265MRD5X00</b> | 265.55                 | ±130 min.           | 4.5 max. (at fo point)        | 1 (fo±100kHz)    | 740ohm// -1.0pF (Input)<br>820ohm// -0.9pF (Output) |
| <b>SAFCC243MRB9X00</b> | 243.95                 | ±130 min.           | 4.5 max. (at min. loss point) | 1.0 (fo±100kHz)  | 760ohm// -1.0pF (Input)<br>760ohm// -0.8pF (Output) |
| <b>SAFCC265MRB5X01</b> | 265.55                 | ±130 min.           | 4.5 max. (at fo point)        | 1.0 (fo±100kHz)  | 740ohm// -1.0pF (Input)<br>820ohm// -0.9pF (Output) |

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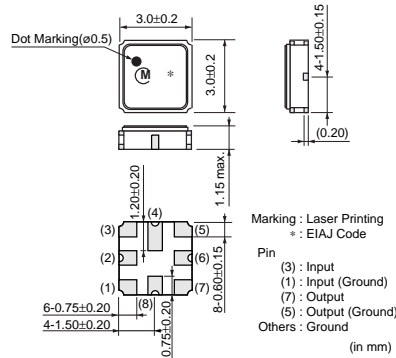
● Wireless LAN



| Part Number               | Center Frequency (MHz) | 3dB Bandwidth (MHz) | Insertion Loss (dB)     | Ripple (dB max.) | Input/Output Impedance |
|---------------------------|------------------------|---------------------|-------------------------|------------------|------------------------|
| <b>SAFJA43M0WC0Z00R03</b> | 43.00 ±0.1MHz (fo)     | 1.25 min.           | 21.0 max. (at fo point) | -                | -                      |

● 5G W-LAN

SAFCD450MCL0N00

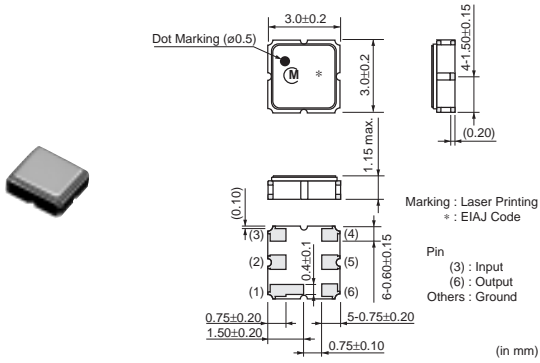


| Part Number            | Center Frequency (MHz) | 3dB Bandwidth (MHz)       | Insertion Loss (dB)           | Ripple (dB max.) | Input/Output Impedance                          |
|------------------------|------------------------|---------------------------|-------------------------------|------------------|-------------------------------------------------|
| <b>SAFCD450MCL0N00</b> | 450                    | ±8.2 min.                 | 4.5 max. (at min. loss point) | 1.5 (fo±8.2MHz)  | 200ohm//150nH (Input)<br>200ohm//150nH (Output) |
| <b>SAFCD570MCL0N00</b> | 570                    | ±8.5 min. (2dB Bandwidth) | 7.0 max. (fo±8.5MHz)          | 2.0 (fo±8.5MHz)  | 200ohm//100nH (Input)<br>200ohm//100nH (Output) |

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**for IF**

**BGS Filters**



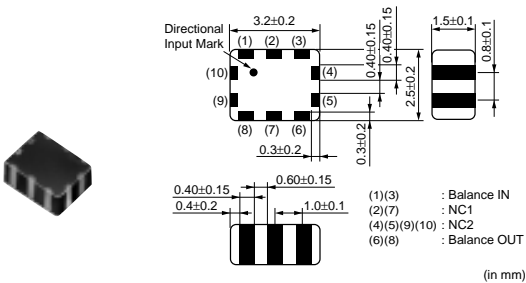
| Part Number               | Nominal Center Frequency(fn)<br>(MHz) | 3dB Bandwidth<br>(MHz) |
|---------------------------|---------------------------------------|------------------------|
| <b>MKFCC40M0CC0P00R05</b> | 40.00                                 | $f_n \pm 1.75$ min.    |

**for IF**

**Chip LC Filters (Balance-balance Type)**

7

Filters for Communication Equipment



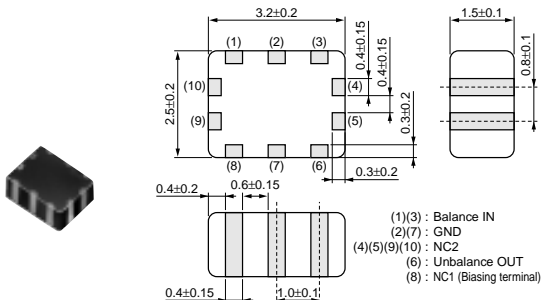
LFB32130MSH3A569

\*Terminal of "NC1" should be fixed to the no connected pattern.  
Terminal of "NC2" should not be fixed to any pattern.  
All the technical data and Information contained herein are subject to change without prior notice.

| Part Number             | Nominal Center Frequency (fo)<br>(MHz) | Bandwidth (BW)<br>(MHz) | Insertion Loss in BW<br>(dB) | Input Balance Impedance<br>(Differential) (Nom.)<br>(ohm) | Output Balance Impedance<br>(Differential) (Nom.)<br>(ohm) |
|-------------------------|----------------------------------------|-------------------------|------------------------------|-----------------------------------------------------------|------------------------------------------------------------|
| <b>LFB32130MSH3A569</b> | 130.38                                 | $f_o \pm 0.7$           | 5 max. (at 25°C)             | 1000                                                      | 250                                                        |
| <b>LFB32166MSH2A570</b> | 166.85                                 | $f_o \pm 0.65$          | 5 max. (at 25°C)             | 300                                                       | 300                                                        |

**for IF**

**Chip LC Filters (Balance-unbalance Type)**



LFB32130MSQ1A552

\*Terminal of "NC1" should be fixed to the no connected pattern.  
 Terminal of "NC2" should not be fixed to any pattern.  
 All the technical data and Information contained herein are subject to change without prior notice.  
 (in mm)

| Part Number      | Nominal Center Frequency (fo) (MHz) | Bandwidth (BW) (MHz) | Insertion Loss in BW (dB) | Balance Impedance (Differential) (Nom.) (ohm) | Unbalance Impedance (Nom.) (ohm) |
|------------------|-------------------------------------|----------------------|---------------------------|-----------------------------------------------|----------------------------------|
| LFB32130MSQ1A552 | 130.38                              | fo±0.65              | 5.5 max. (at 25°C)        | 1000                                          | 50                               |
| LFB32166MSQ1A527 | 166.85                              | fo±0.7               | 4 max. (at 25°C)          | 200                                           | 50                               |

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