

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

**muRata**

## kHz Type Ceramic Discriminators

Ceramic discriminator consists of wide band piezoelectric resonator.

It is ideal for mobile communication equipments due to its small size and light weight.

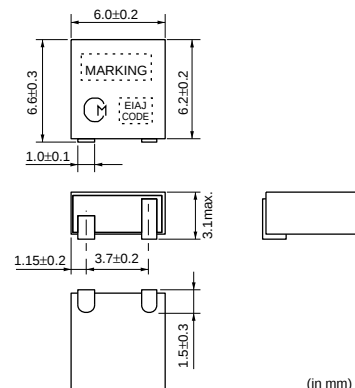
Standard line include products for wide range of application, from cordless telecom to cellular telephone, making non-adjustment and shrinking of the detection circuit possible.

### ■ Features

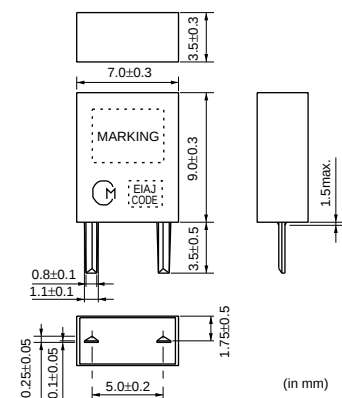
1. Small in size and light weight.
2. Realize no-adjustment in detection circuit.
3. High sensitivity and stability.
4. Wide range of standard products are available for various ICs.
5. Operating temperature range : -20 to +80 (degree C)  
Storage temperature range : -40 to +85 (degree C)



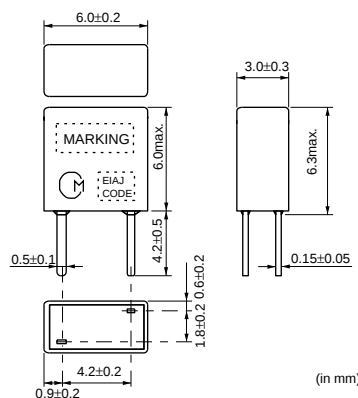
CDBC Series



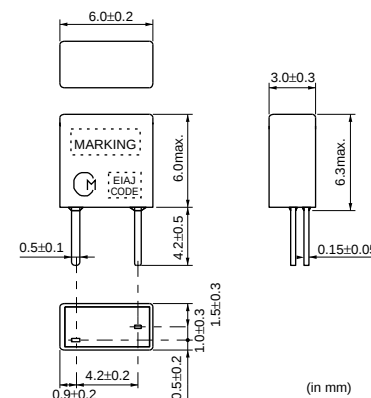
CDBLA Series



CDBLB\_CAX Series



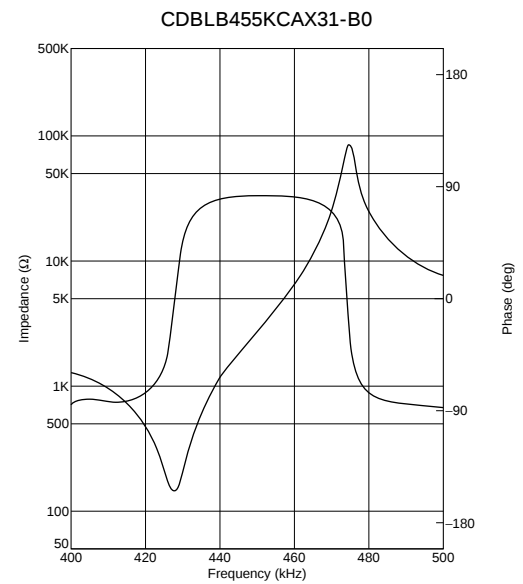
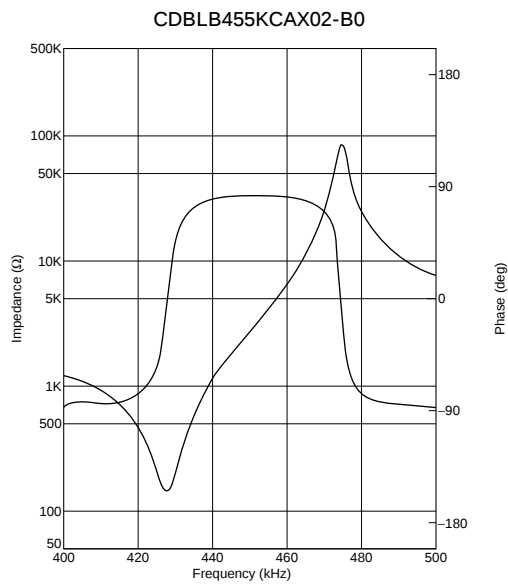
CDBLB\_CAY Series



## Specified by Impedance Characteristics 1

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

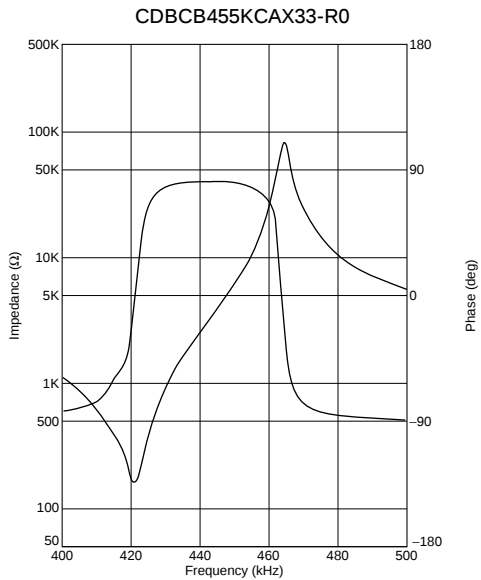
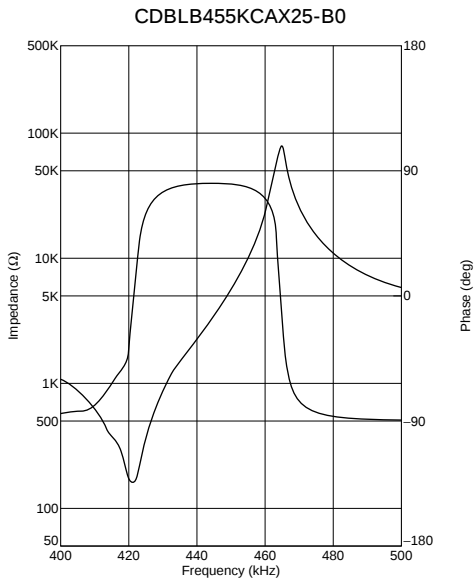
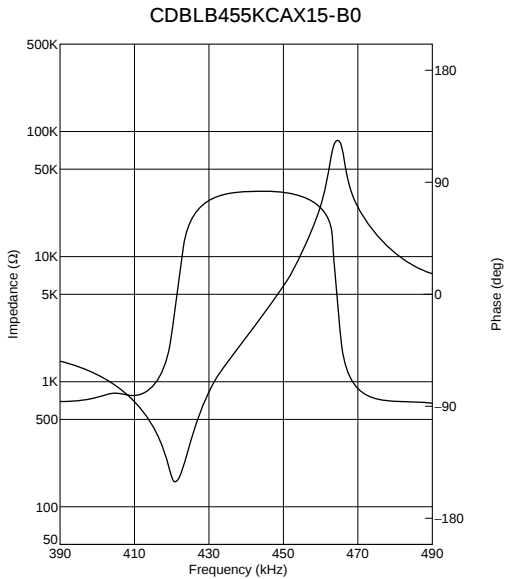
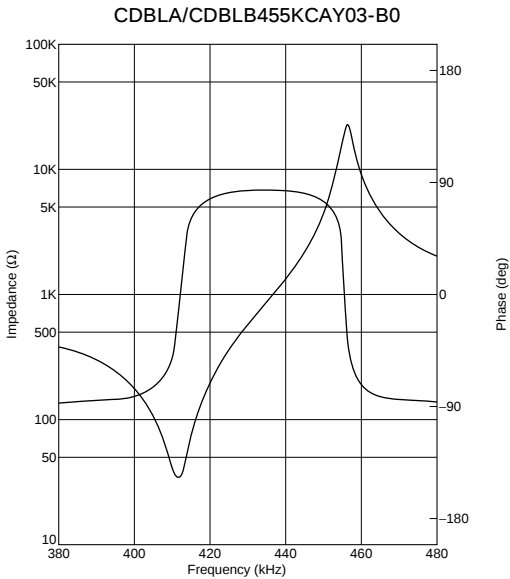
## ■ Impedance Curve Specification 1



Specified by Impedance Characteristics 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    |
|-------------------|-------------------------------------|------------------------------|-----------------|-------------------------|-----------------|----------|----------|---------|
| CDBC455KCAX33-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     | PLASTIC |
| CDBLB455KCAY03-B0 | -                                   | 455.0±1.5kHz                 | 46±5.0kHz       | 70ohm max.              | 550pF±20%       | CXA1184M | SONY     | PLASTIC |
| CDBLB455KCAX15-B0 | -                                   | 463.5±1.0kHz                 | 43±2.0kHz       | 300ohm max.             | 140pF±20%       | CXA1183M | SONY     | PLASTIC |
| CDBLB455KCAX25-B0 | 455                                 | 465.0±1.5kHz                 | 45±4.0kHz       | 300ohm max.             | 135pF±20%       | CXA1484  | SONY     | PLASTIC |
| CDBLB455KCAX33-B0 | 455                                 | 465.0±1.5kHz                 | 45±4.0kHz       | 300ohm max.             | 135pF±20%       | CXA1474  | SONY     | PLASTIC |

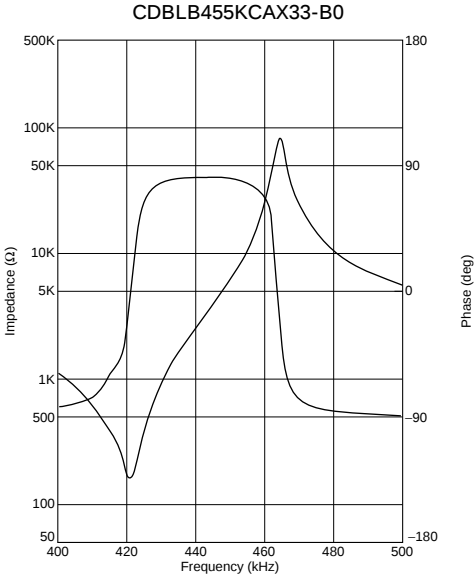
Impedance Curve Specification 2



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Impedance Curve Specification 2



## Specified by Recovered Audio Characteristics

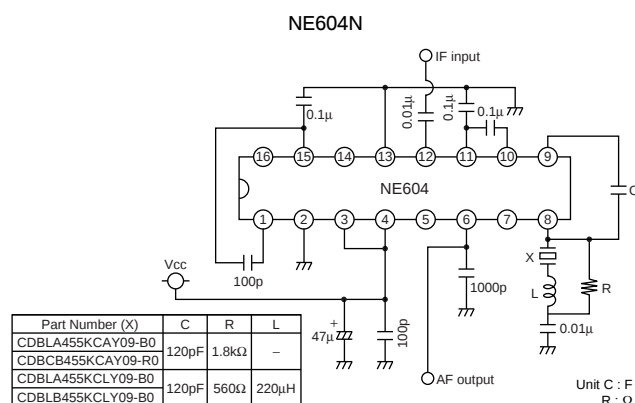
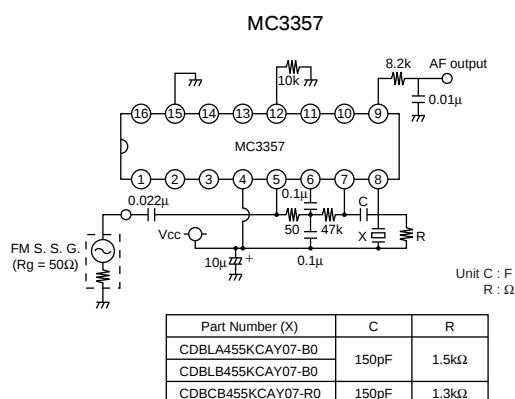
| Part Number        | Nominal Center Frequency (fn) (kHz) | Recovered Audio 3dB BW (kHz) | Recovered Audio Output (mV) | Distortion (at fn) (%) | Distortion (%)                  | IC                      | IC Maker | Type    |
|--------------------|-------------------------------------|------------------------------|-----------------------------|------------------------|---------------------------------|-------------------------|----------|---------|
| CDBCBA455KCAY07-R0 | 455                                 | fn±4.0 min.                  | 350 ±60                     | 3.0 max.               | -                               | MC3357                  | MOTOROLA | SMD     |
| CDBCBA455KCAY09-R0 | 455                                 | fn±4.0 min.                  | 120 ±40                     | 1.5 max.               | -                               | NE604N                  | PHILIPS  | SMD     |
| CDBCBA455KCAY13-R0 | 455                                 | fn±4.0 min.                  | 330 ±50                     | 4.0 max.               | -                               | CXA1003BM               | SONY     | SMD     |
| CDBCBA455KCAY16-R0 | 455                                 | fn±4.0 min.                  | 175 ±40                     | 2.0 max.               | -                               | MC3372                  | MOTOROLA | SMD     |
| CDBCBA455KCAY21-R0 | 455                                 | fn±4.0 min.                  | 55 ±20                      | 2.0 max.               | -                               | TA31132                 | TOSHIBA  | SMD     |
| CDBCBA455KCAY24-R0 | 455                                 | fn±4.0 min.                  | 100 ±40                     | 2.0 max.               | -                               | TA31136                 | TOSHIBA  | SMD     |
| CDBCBA455KCAY27-R0 | 455                                 | fn±4.0 min.                  | 90 ±30                      | 2.0 max.               | -                               | TK10487                 | TOKO     | SMD     |
| CDBCBA455KCAY28-R0 | 455                                 | fn±4.0 min.                  | 40 ±20                      | 3.0 max.               | -                               | TA31142F                | TOSHIBA  | SMD     |
| CDBCBA455KCAY29-R0 | 455                                 | fn±4.0 min.                  | 100 ±30                     | 2.5 max.               | -                               | NE605                   | PHILIPS  | SMD     |
| CDBCBA455KCAY32-R0 | 455                                 | fn±4.0 min.                  | 40 ±20                      | 3.0 max.               | -                               | TA31143                 | TOSHIBA  | SMD     |
| CDBCBA455KCAY35-R0 | 455                                 | fn±4.0 min.                  | 100 ±40                     | 2.5 max.               | -                               | TK10930                 | TOKO     | SMD     |
| CDBCBA455KCAY40-R0 | 455                                 | fn±4.0 min.                  | 40 ±20                      | 3.5 max.               | -                               | TA31145                 | TOSHIBA  | SMD     |
| CDBCBA455KCAY49-R0 | 455                                 | fn±4.0 min.                  | 45 ±10                      | 3.0 max.               | -                               | MC3361                  | MOTOROLA | SMD     |
| CDBCBA455KCAY50-R0 | 455                                 | fn±4.0 min.                  | 64 ±6.4                     | 4.0 max.               | -                               | CXA3117N                | SONY     | SMD     |
| CDBCBA455KCLX36-R0 | 455                                 | fn±13.0 min.                 | 90 ±30                      | 2.5 max.               | 5.0 max.<br>[within fn ±6kHz]   | NE(SA)606<br>/NE(SA)616 | PHILIPS  | SMD     |
| CDBCBA455KCLX39-R0 | 455                                 | fn±11.0 min.                 | 130 ±20                     | 2.5 max.               | 7.0 max.<br>[within fn ±8kHz]   | NE607<br>/NE617         | PHILIPS  | SMD     |
| CDBCBA455KCLY13-R0 | 455                                 | fn±13.0 min.                 | 120 ±30                     | 1.5 max.               | 5.0 max.<br>[within fn ±8kHz]   | CXA1003BM               | SONY     | SMD     |
| CDBCBA455KCLY21-R0 | 455                                 | fn±11.0 min.                 | 75 ±25                      | 2.5 max.               | 5.0 max.<br>[within fn ±5.5kHz] | TA31132                 | TOSHIBA  | SMD     |
| CDBLA455KCAY07-B0  | 455                                 | fn±4.0 min.                  | 340 ±60                     | 2.5 max.               | -                               | MC3357                  | MOTOROLA | PLASTIC |
| CDBLA455KCAY09-B0  | 455                                 | fn±5.0 min.                  | 100 min.                    | 1.5 max.               | -                               | NE604N                  | PHILIPS  | PLASTIC |
| CDBLA455KCAY13A-B0 | 455                                 | fn±4.0 min.                  | 350 ±50                     | 3.0 max.               | -                               | CXA1003BM               | SONY     | PLASTIC |
| CDBLA455KCAY16-B0  | 455                                 | fn±4.0 min.                  | 185 ±40                     | 2.0 max.               | -                               | MC3372                  | MOTOROLA | PLASTIC |
| CDBLA455KCAY24-B0  | 455                                 | fn±4.0 min.                  | 100 ±40                     | 2.0 max.               | -                               | TA31136                 | TOSHIBA  | PLASTIC |
| CDBLA455KCAY28-B0  | 455                                 | fn±4.0 min.                  | 40 ±20                      | 3.0 max.               | -                               | TA31142                 | TOSHIBA  | PLASTIC |
| CDBLA455KCAY34-B0  | 455                                 | fn±4.0 min.                  | 65 ±20                      | 2.5 max.               | -                               | MC13136                 | MOTOROLA | PLASTIC |
| CDBLA455KCLY09-B0  | 455                                 | fn±15.0 min.                 | 70 ±20                      | 1.5 max.               | 3.5 max.<br>[within fn ±8kHz]   | NE604N                  | PHILIPS  | PLASTIC |
| CDBLA455KCLY13-B0  | 455                                 | fn±15.0 min.                 | 110 ±30                     | 1.5 max.               | 5.0 max.<br>[within fn ±8kHz]   | CXA1003BM               | SONY     | PLASTIC |

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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>CDBLB455KCAY07-B0</b>  | 455                                 | fn±4.0 min.                  | 340 ±60                     | 3.0 max.               | -                             | MC3357           | MOTOROLA | PLASTIC |
| <b>CDBLB455KCAY13A-B0</b> | 455                                 | fn±4.0 min.                  | 350 ±50                     | 3.0 max.               | -                             | CXA1003BM        | SONY     | PLASTIC |
| <b>CDBLB455KCAY21-B0</b>  | 455                                 | fn±4.0 min.                  | 55 ±20                      | 2.0 max.               | -                             | TA31132          | TOSHIBA  | PLASTIC |
| <b>CDBLB455KCAY24-B0</b>  | 455                                 | fn±4.0 min.                  | 100 ±40                     | 2.0 max.               | -                             | TA31136          | TOSHIBA  | PLASTIC |
| <b>CDBLB455KCAY28-B0</b>  | 455                                 | fn±4.0 min.                  | 40 ±20                      | 3.0 max.               | -                             | TA31142FN        | TOSHIBA  | PLASTIC |
| <b>CDBLB455KCAY32-B0</b>  | 455                                 | fn±4.0 min.                  | 40 ±20                      | 3.0 max.               | -                             | TA31143          | TOSHIBA  | PLASTIC |
| <b>CDBLB455KCAY34-B0</b>  | 455                                 | fn±4.0 min.                  | 65 ±20                      | 2.5 max.               | -                             | MC13136          | MOTOROLA | PLASTIC |
| <b>CDBLB455KCAY40-B0</b>  | 455                                 | fn±4.0 min.                  | 40 ±20                      | 3.0 max.               | -                             | TA31145          | TOSHIBA  | PLASTIC |
| <b>CDBLB455KCAY42-B0</b>  | 455                                 | fn±4.0 min.                  | 40 ±15                      | 3.0 max.               | -                             | TK14590 /TK14591 | TOKO     | PLASTIC |
| <b>CDBLB455KCAY49-B0</b>  | 455                                 | fn±4.0 min.                  | 45 ±10                      | 3.0 max.               | -                             | MC3361           | MOTOROLA | PLASTIC |
| <b>CDBLB455KCAY50-B0</b>  | 455                                 | fn±4.0 min.                  | 64 ±6.4                     | 4.0 max.               | -                             | CXA3117N         | SONY     | PLASTIC |
| <b>CDBLB455KCLY09-B0</b>  | 455                                 | fn±15.0 min.                 | 70 ±20                      | 1.5 max.               | 3.5 max.<br>[within fn ±8kHz] | NE604N           | PHILIPS  | PLASTIC |
| <b>CDBLB455KCLY13-B0</b>  | 455                                 | fn±15.0 min.                 | 110 ±30                     | 1.5 max.               | 5.0 max.<br>[within fn ±8kHz] | CXA1003BM        | SONY     | PLASTIC |
| <b>CDBLB455KCLY21-B0</b>  | 455                                 | fn±13.0 min.                 | 65 ±20                      | 2.5 max.               | 5.0 max.<br>[within fn ±8kHz] | TA31132          | TOSHIBA  | PLASTIC |
| <b>CDBLB455KCAX16-B0</b>  | 455                                 | fn±4.0 min.                  | 185 ±40                     | 2.0 max.               | -                             | MC3372           | MOTOROLA | PLASTIC |
| <b>CDBLB455KCAX18-B0</b>  | 455                                 | fn±3.0 min.                  | 180 ±40                     | 2.0 max.               | -                             | MC3371           | MOTOROLA | PLASTIC |
| <b>CDBLB455KCAX36-B0</b>  | 455                                 | fn±3.5 min.                  | 100 ±25                     | 3.5 max.               | -                             | NE606 /616       | PHILIPS  | PLASTIC |

## ■ Test Circuit

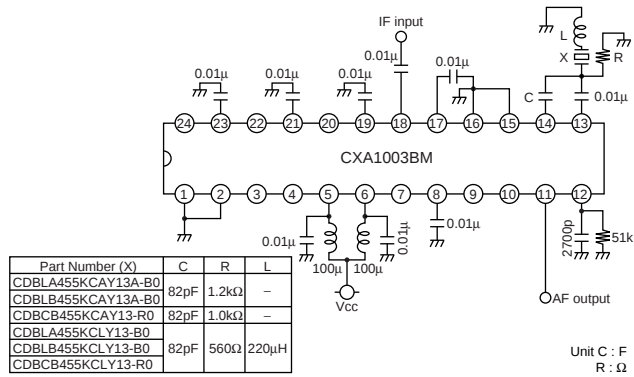


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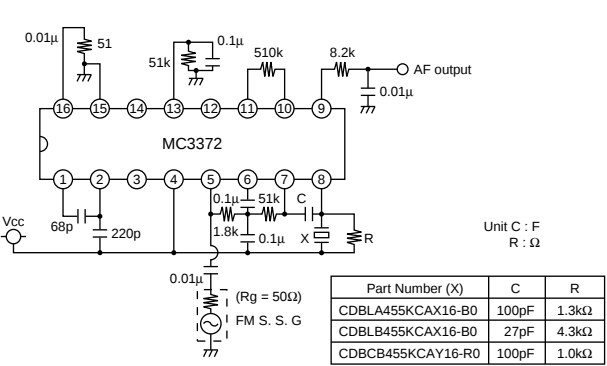
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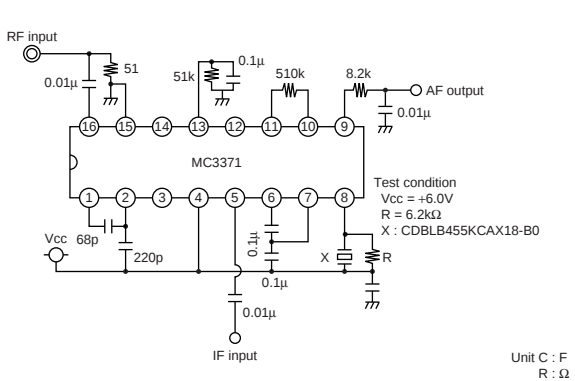
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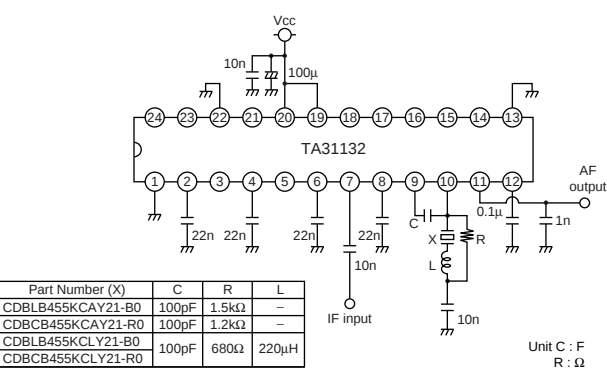
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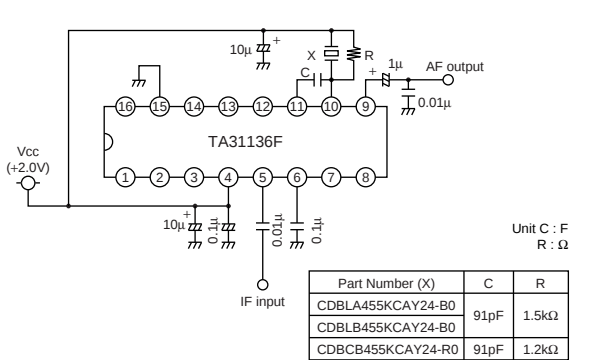
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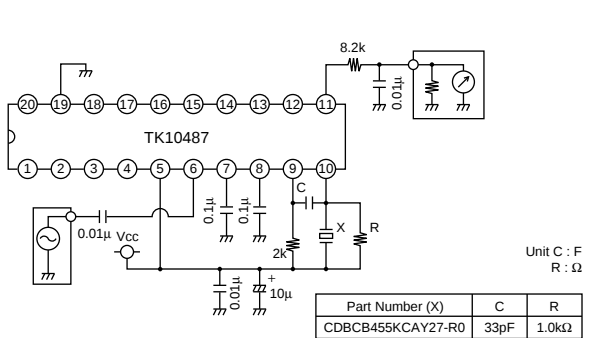
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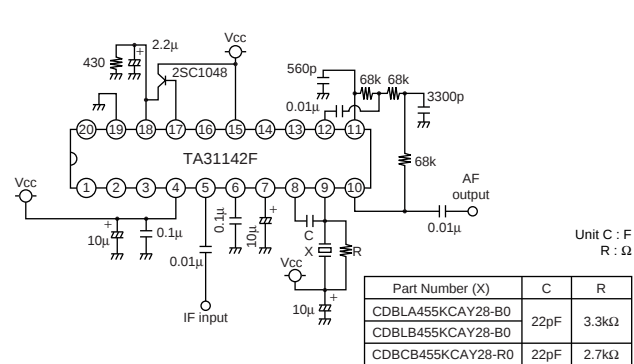
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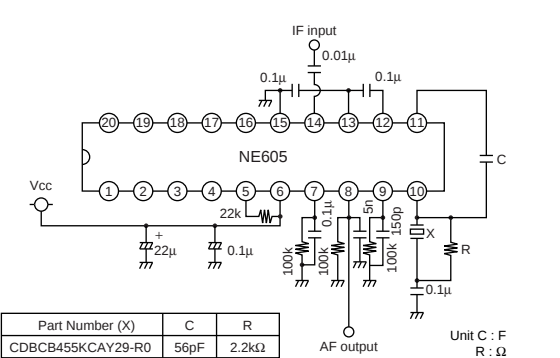
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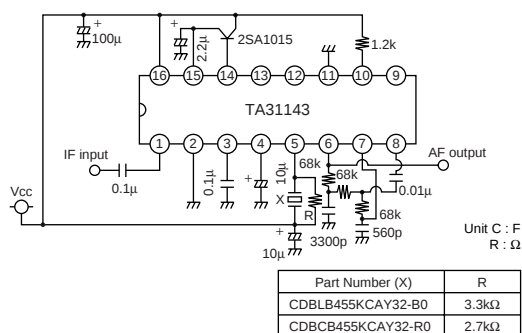
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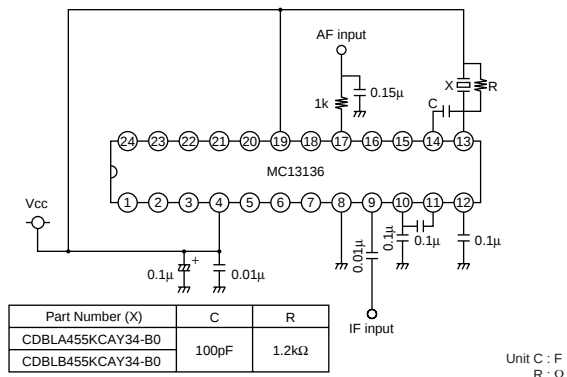
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## Test Circuit

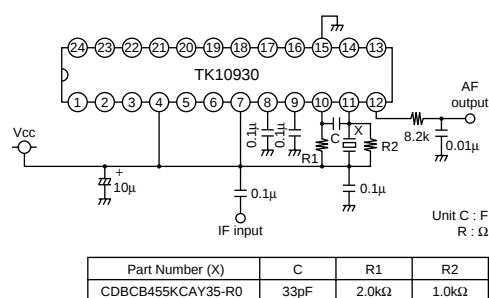
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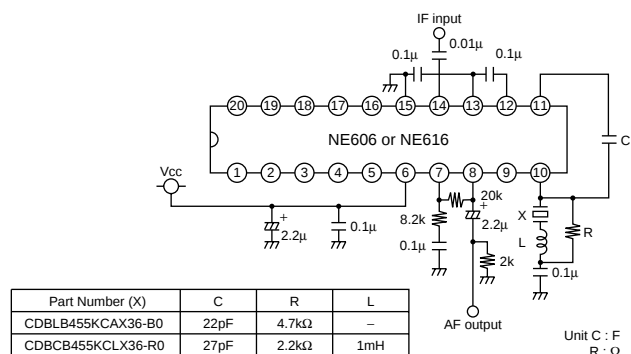
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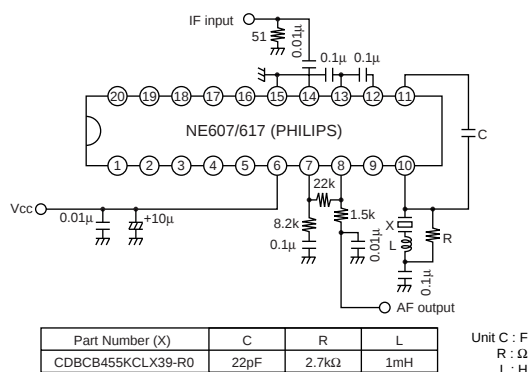
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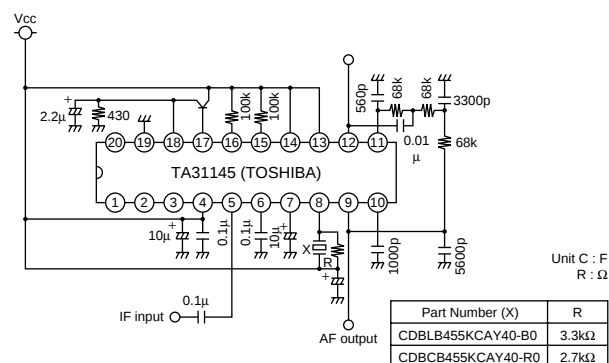
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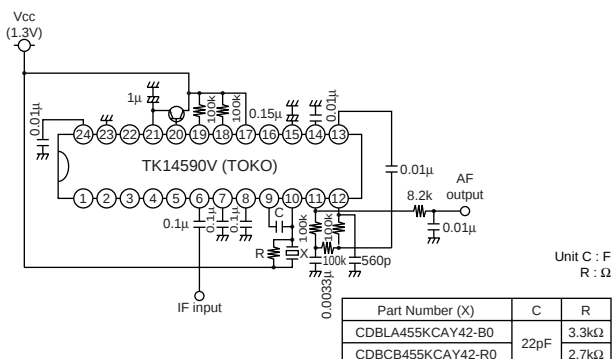
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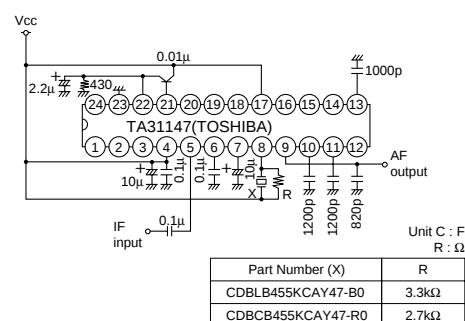
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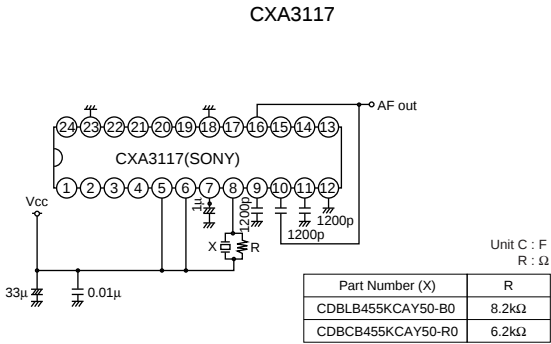
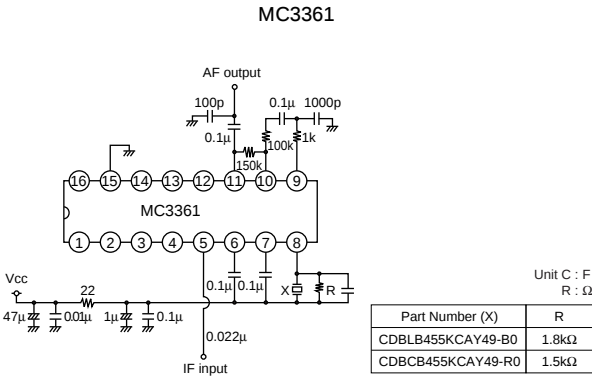
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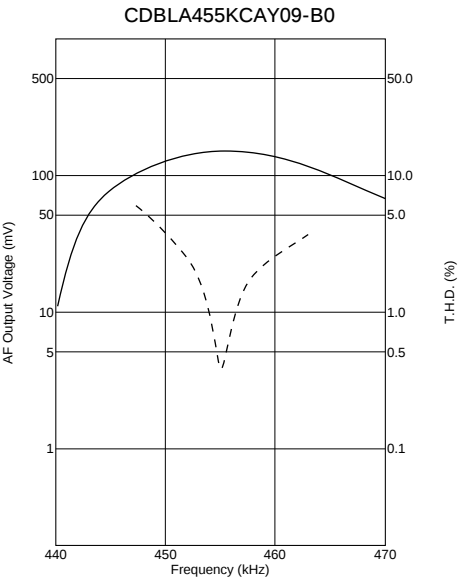
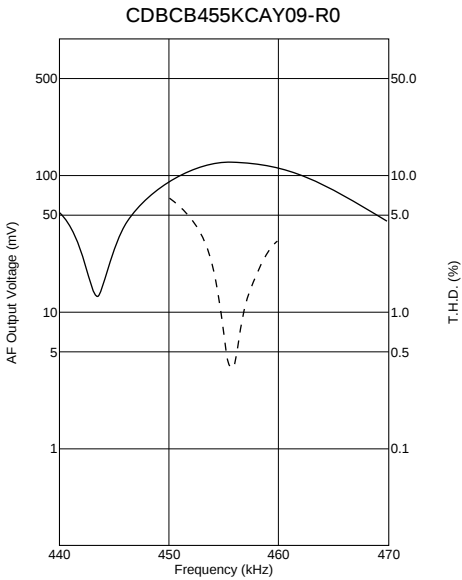
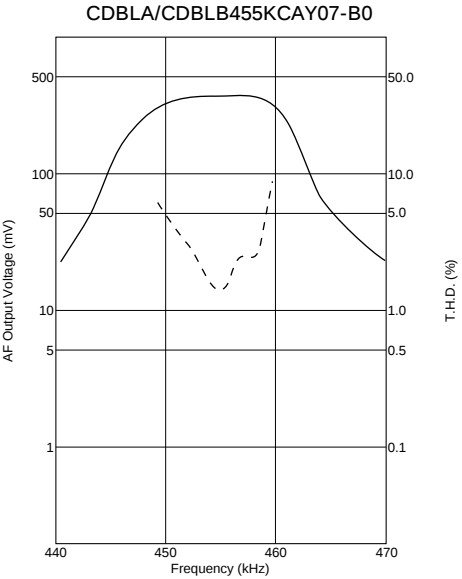
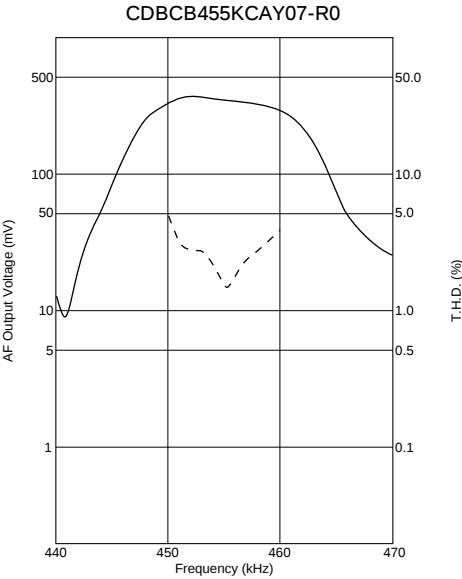
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Test Circuit



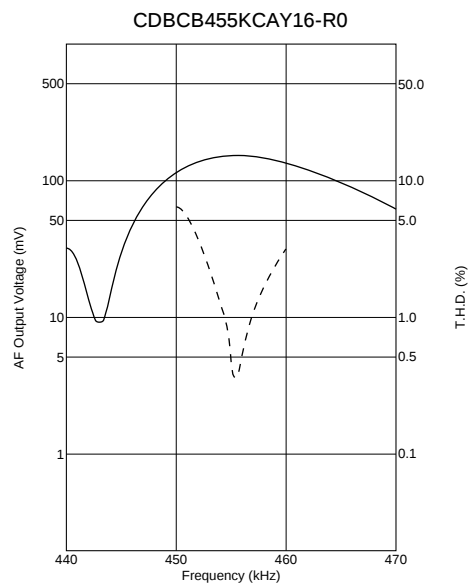
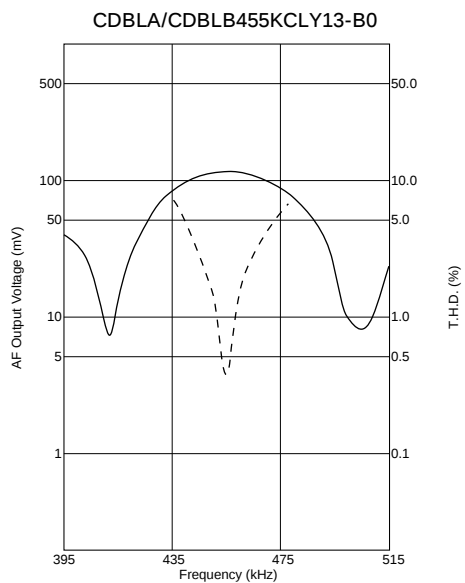
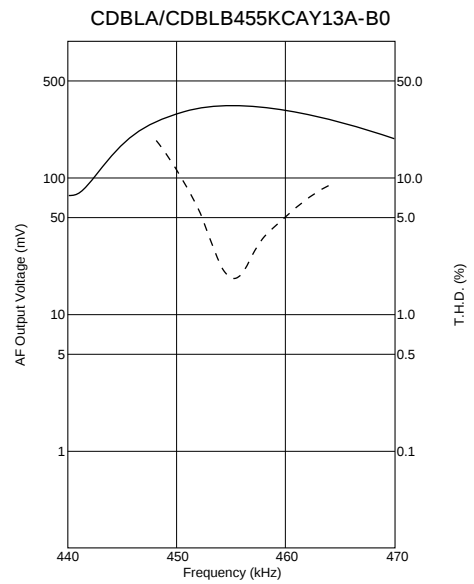
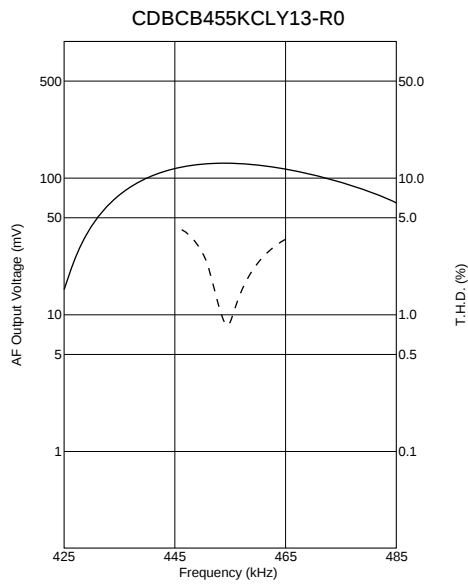
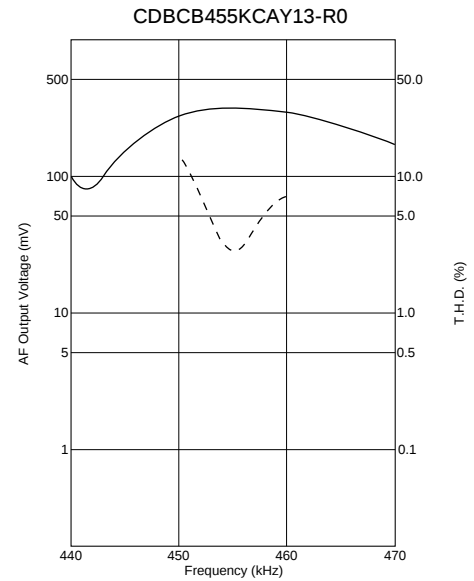
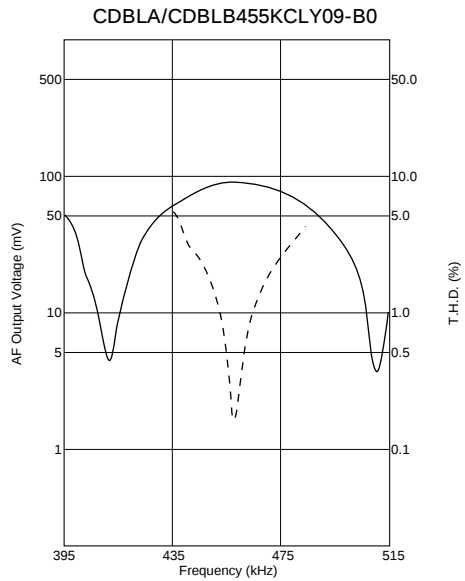
Recovered Audio Curve Specification



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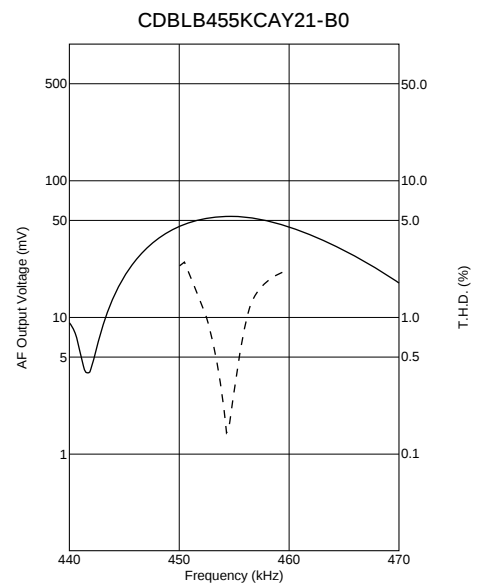
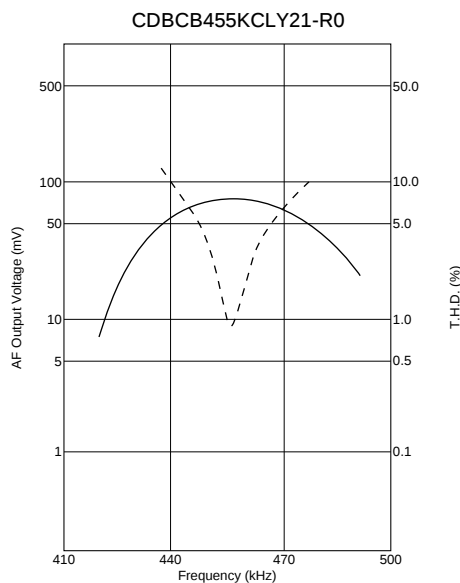
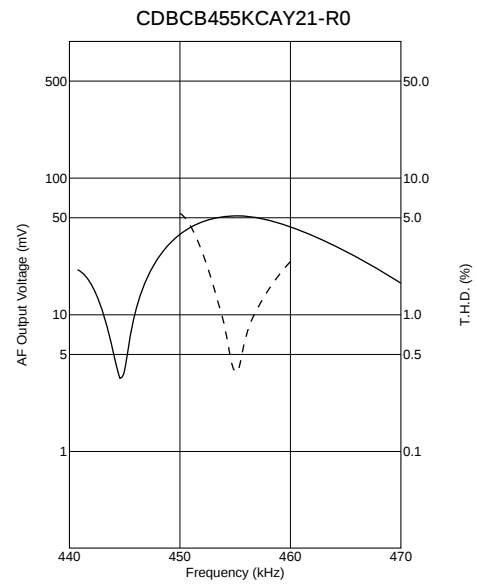
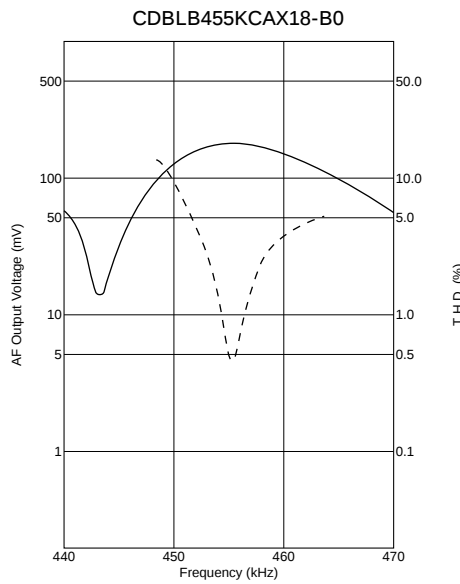
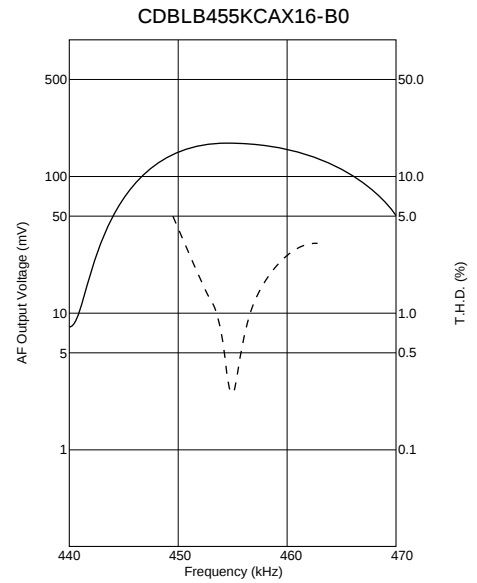
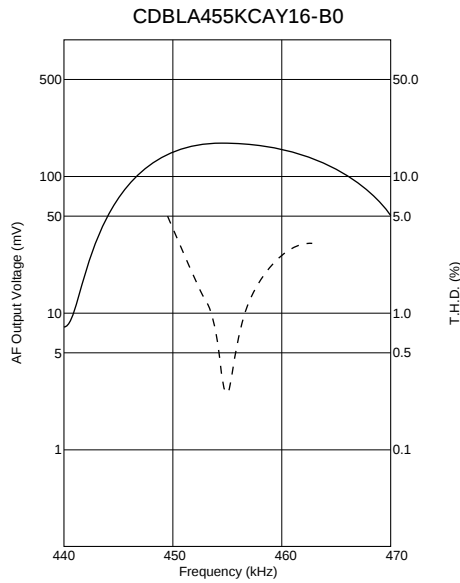
## Recovered Audio Curve Specification



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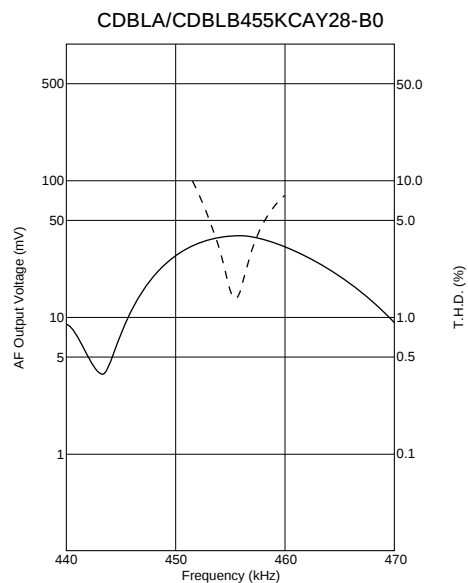
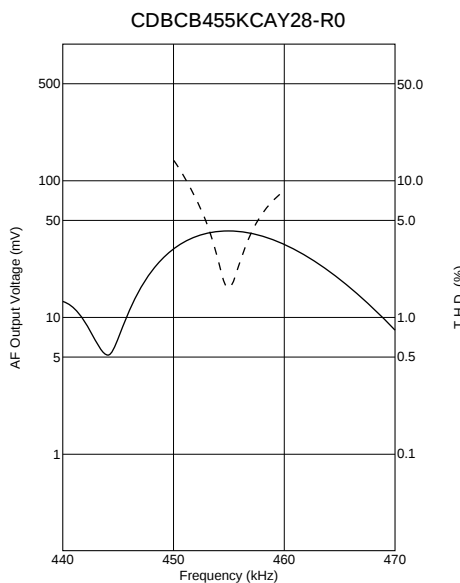
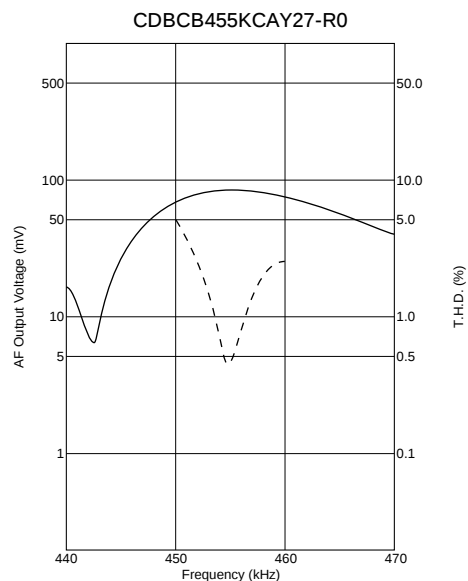
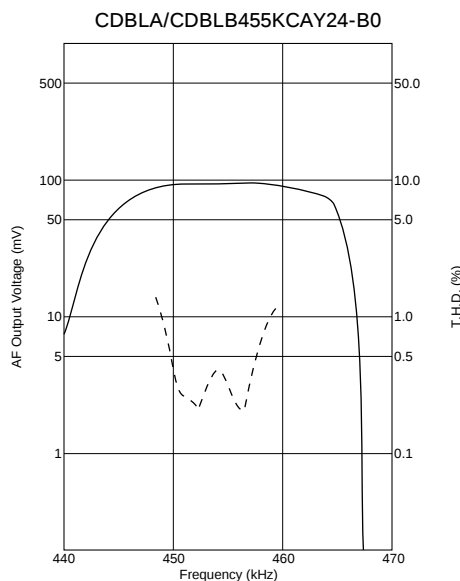
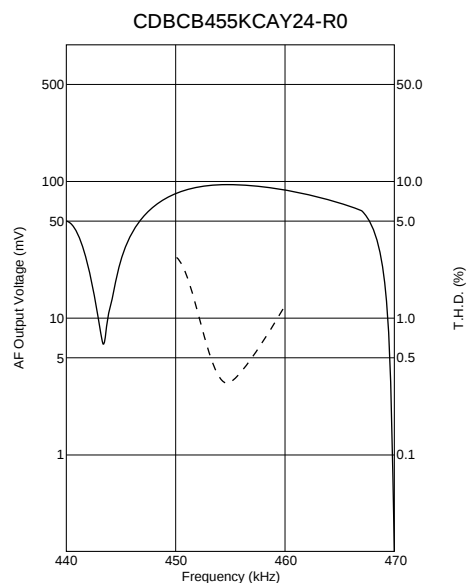
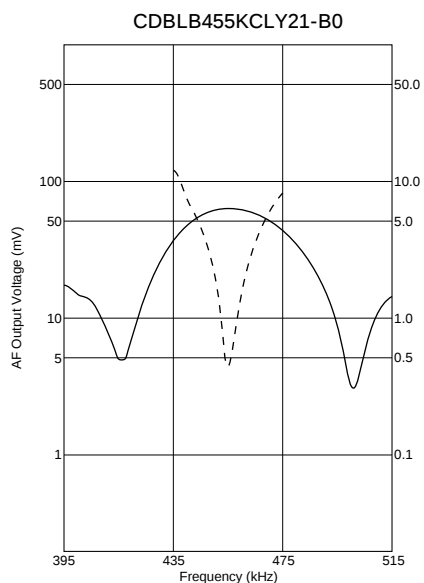
## Recovered Audio Curve Specification



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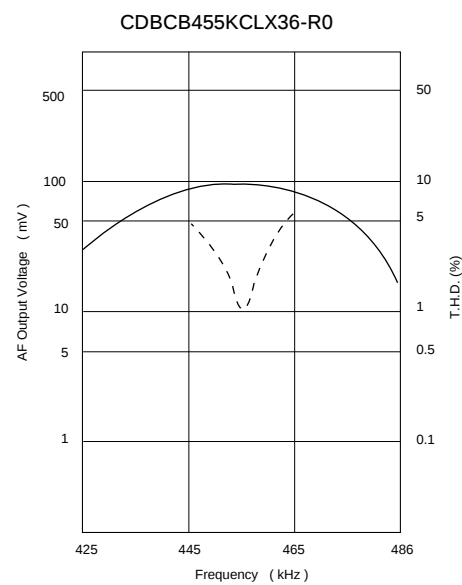
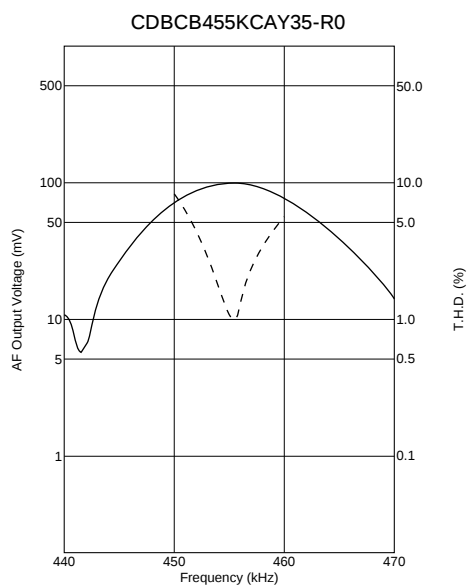
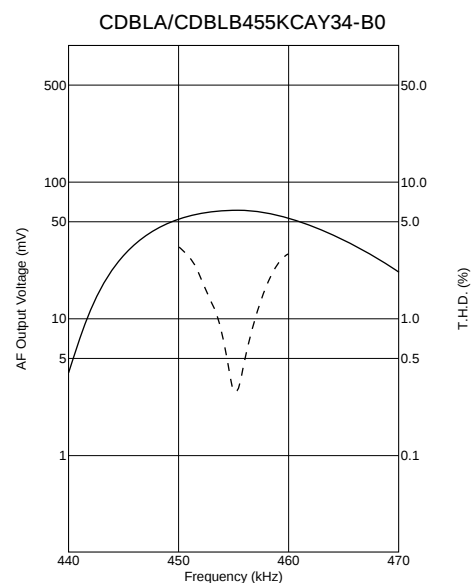
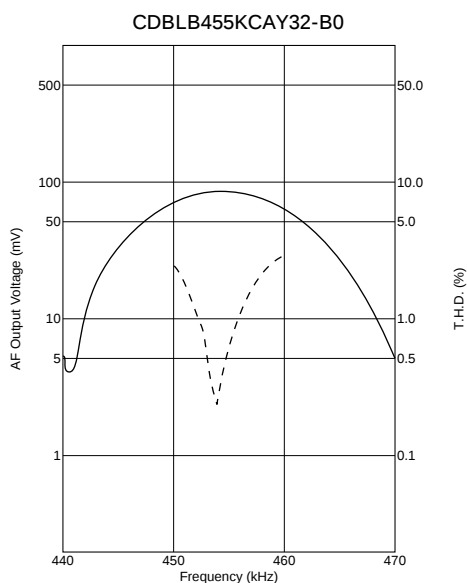
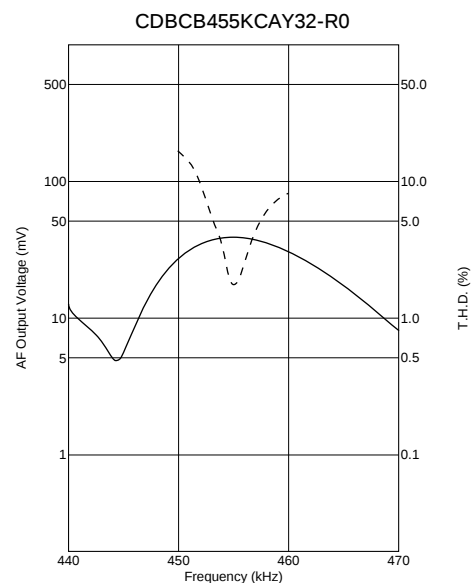
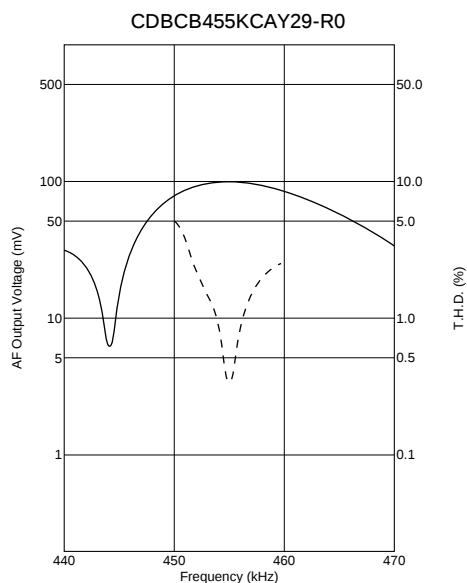
## Recovered Audio Curve Specification



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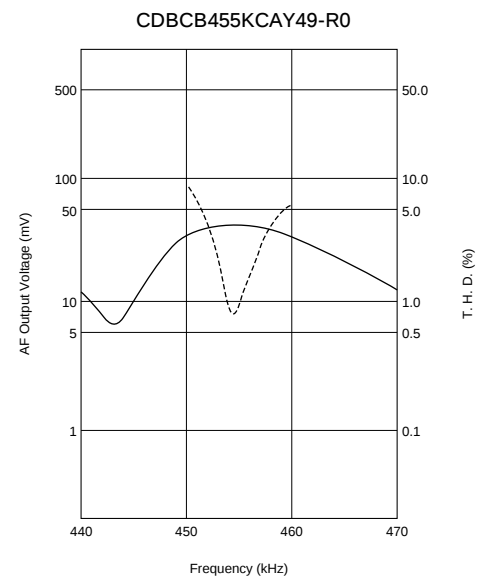
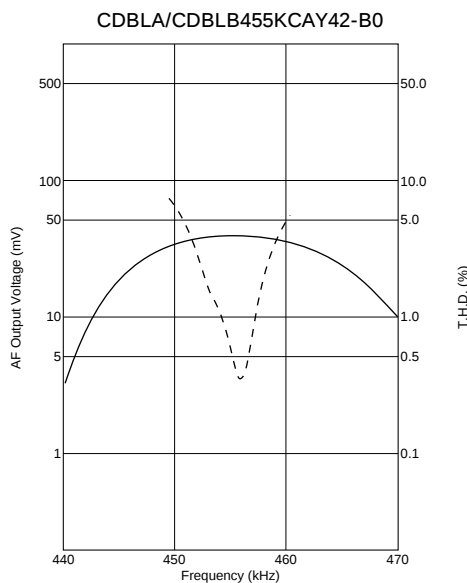
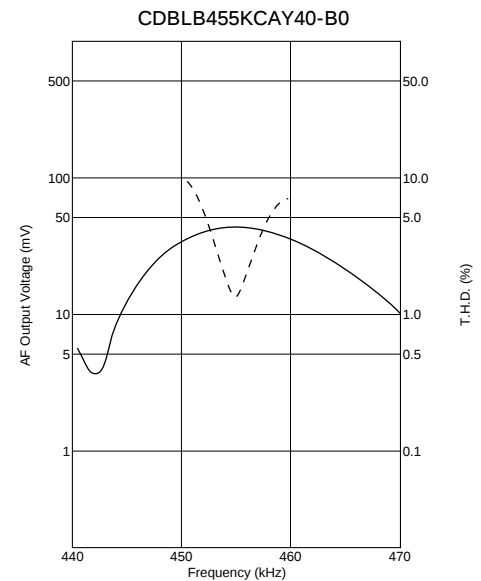
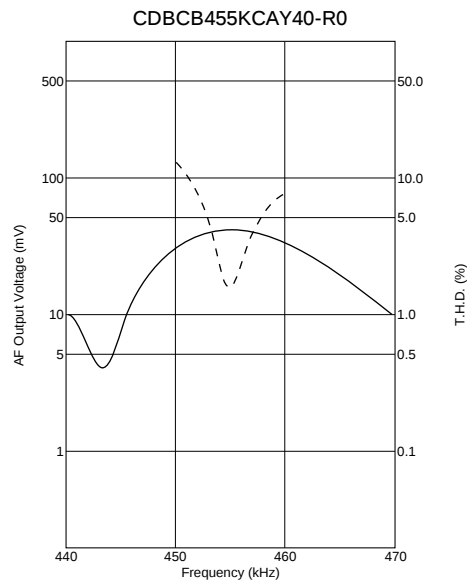
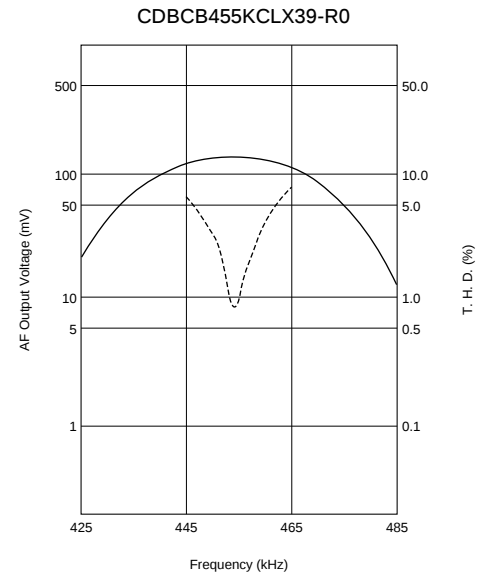
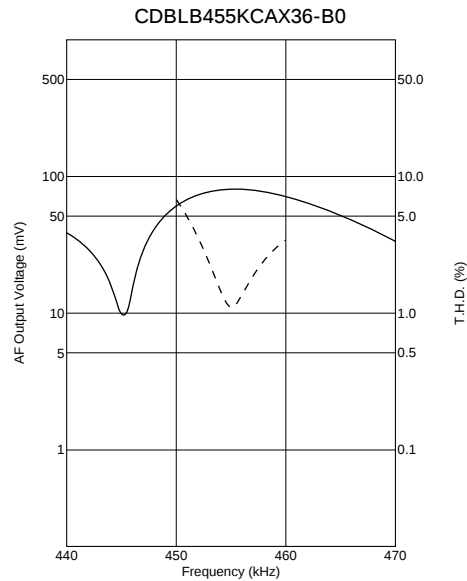
## Recovered Audio Curve Specification



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## Recovered Audio Curve Specification

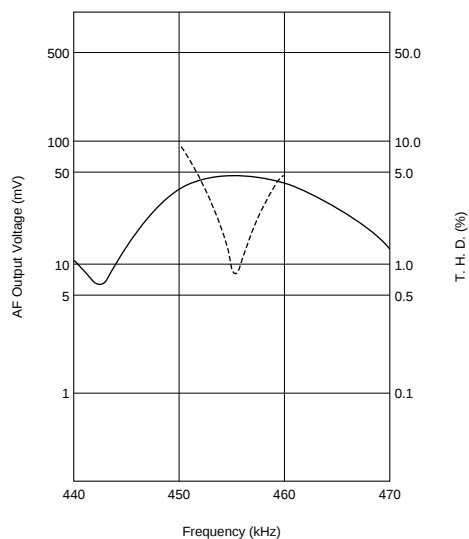


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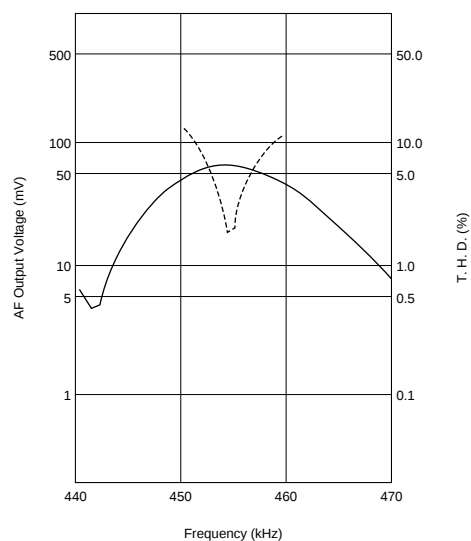
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## Recovered Audio Curve Specification

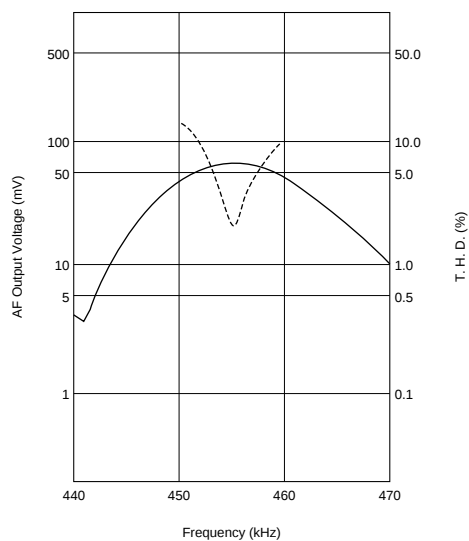
CDBLB455KCAY49-B0



CDBC455KCAY50-R0



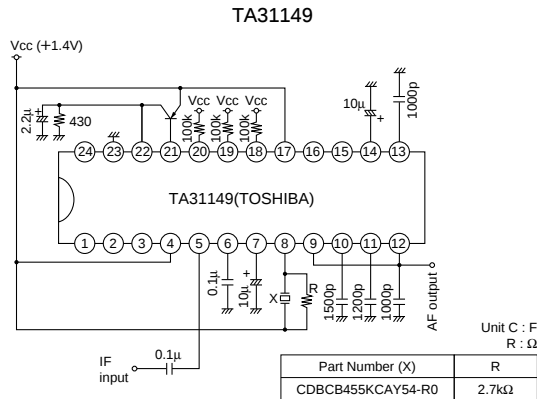
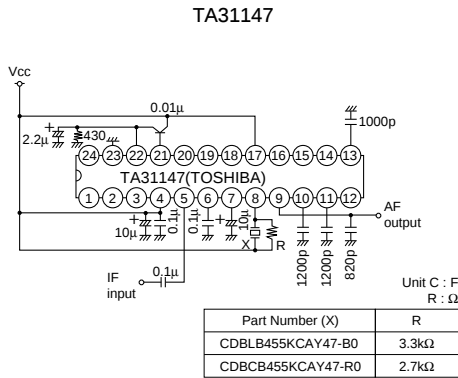
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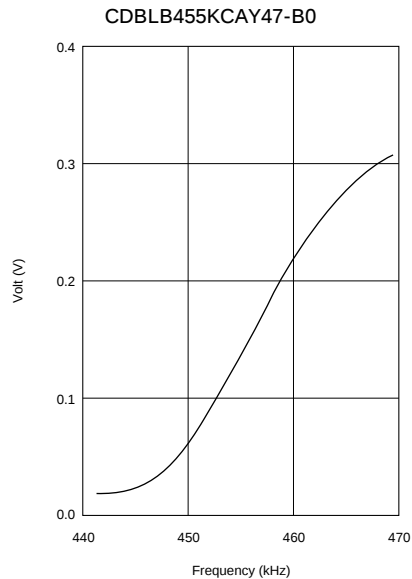
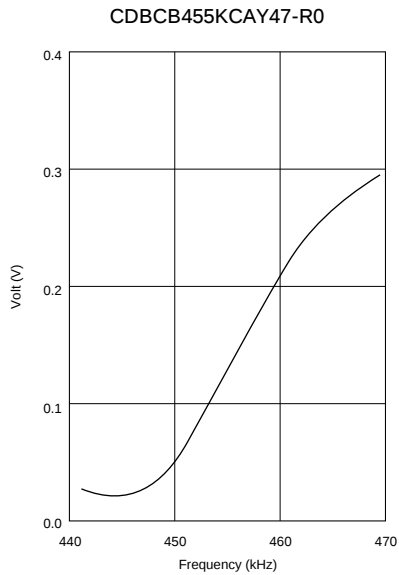
Specified by S Curve Characteristics

| 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    |
|--------------------|-------------------------------------|-------------------------------------|-------------------------------|---------|----------|---------|
| CDBCBC455KCAY47-R0 | 455                                 | 130 ±20                             | 150 ±15                       | TA31147 | TOSHIBA  | SMD     |
| CDBCBC455KCAY54-R0 | 455                                 | 165 ±20                             | 170 ±20                       | TA31149 | TOSHIBA  | SMD     |
| CDBLB455KCAY47-B0  | 455                                 | 140 ±20                             | 150 ±15                       | TA31147 | TOSHIBA  | PLASTIC |

Test Circuit



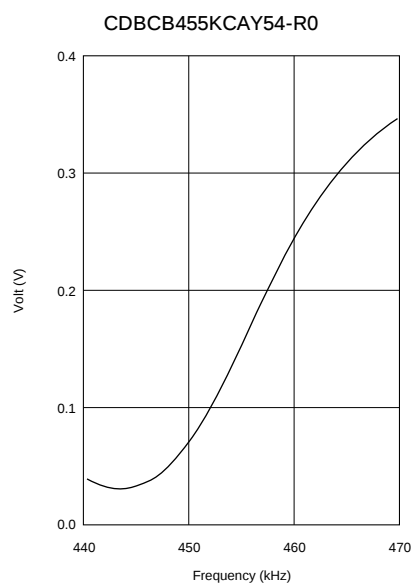
S Curve Specification



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## ■ S Curve Specification



## Ceramic Discriminators Notice

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

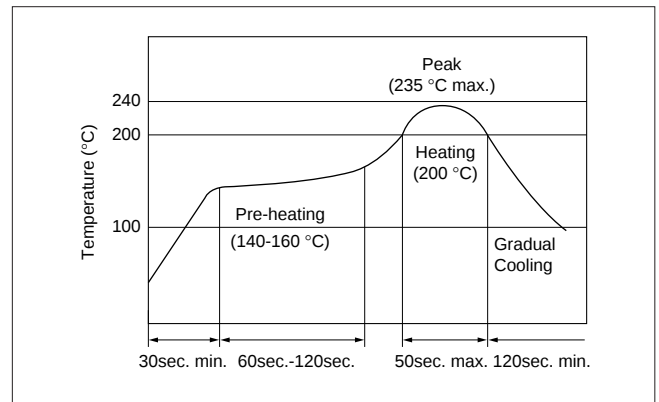
#### 1. Standard Reflow Soldering Condition

##### (1) Reflow

Filter is soldered one time within the following temperature condition and then being placed in natural condition for 24 hours.

##### (2) Soldering Iron

Electrode is directly with the tip of soldering iron of  $+350 \pm 5^\circ\text{C}$  for  $3 \pm 1$  seconds, and then being placed in natural condition for 24 hours.



#### 2. Wash

##### (1) Cleaning Solvent

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

##### (2) Cleaning Conditions

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

##### (3) Notice

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

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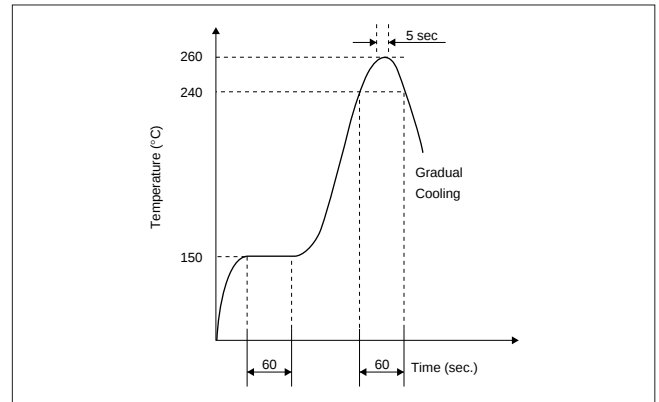
## Ceramic Discriminators Notice

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

#### 1. Standard Reflow Soldering Condition

##### (1) Reflow



##### (2) Soldering Iron

Lead terminal is directly contacted with the tip of soldering iron of  $+280 \pm 5^{\circ}\text{C}$  for  $3.0 \text{ seconds} \pm 0.5 \text{ seconds}$ .

#### 2. Wash

The component cannot be withstand washing.

## Ceramic Discriminators Notice

### ■ CDBC Series Notice (Handling)

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

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

1. Do not use this product with bend. The component may be damaged if excess mechanical stress is applied to it mounted on the printed circuit board.
2. The component will be damaged when an excessive stress is applied.
3. All kinds of re-flow soldering must not be applied on the component.

### ■ CDSCA Series Notice (Handling)

1. The component mounted on the PCB may be damaged if excess mechanical stress is applied.
2. Layout the components on the PCB to minimize the stress imposed by the warp or flexure of the board.
3. After installing components, if solder is excessively applied to the circuit board, mechanical stress will cause destruction resistance characteristics to be lower. To prevent this, be extremely careful in determining shape and dimension before designing the circuit board diagram.
4. When the positioning claw or pick up nozzle are worn, the excess load is applied to the components while positioning or placing are performed. Careful checking and maintenance are necessary to prevent unexpected trouble.
5. When correcting component's position with a soldering iron, the tip of the soldering iron should not directly touch the chip component. Depending on the soldering conditions, the effective area of terminations may be reduced. The use of solder containing Ag should be considered to prevent the electrode erosion.
6. Do not clean or wash the component as it is not hermetically sealed.
7. In case of overcoating the part, coating conditions such as material, curing temperature, and so on must be evaluated deeply.
8. Accurate test circuit values are required to measure electrical characteristics.  
It may be a cause of mis-correlation if there is any deviation, especially stray capacitance, from the test circuit in the specification.

5. The product, packed in the moisture-proof bag (dry pack), is sensitive to moisture.

The following treatment is required before applying re-flow soldering, to avoid package cracks or reliability degradation caused by thermal stress.

When unpacked, store the component in an atmosphere of below 25°C. and below 65%R.H., and solder within 48 hours.

4. Do not clean or wash the component as it is not hermetically sealed.
5. Do not use strong acidity flux, more than 0.2wt% chlorine content, in flow soldering.
6. In case of covering discriminator with over coat, conditions such as material of resin, cure temperature, and so on should be evaluated well.

