THE DATASHEET OF

CFWKA455KEFA-R0

⚠Note • Please read rating and ⚠CAUTION (for storage, operating, rating, soldering, mounting and handling) in this catalog to prevent smoking and/or burning, etc.
• This catalog has only typical specifications because there is no space for detailed specifications. Therefore, please review our product specifications or consult the approval sheet for product specifications before ordering.

P05E.pdf
Nov.24,2011

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

muRata Innovator in Electronics

Murata Manufacturing Co., Ltd.

Cat.No.P05E-16

EU RoHS Compliant

- All the products in this catalog comply with EU RoHS.
- EU RoHS is "the European Directive 2011/65/EU on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment."
- For more details, please refer to our website 'Murata's Approach for EU RoHS' (http://www.murata.com/info/rohs.html).

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● Part Numbering

Ceramic Filters (CERAFIL®) for IF

(Part Number)

SF	P	KA	455K	D4A		-R0
SF	E	CF	10M7	DF00	S0	-R0
❶	❷	❸	❹	❺	❻	❼

❶Product ID

❷Oscillating/Element

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

❸Structure/Size

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

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

❹Nominal Center Frequency

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

❺Product Specification

Code	Product Specification
D4A	Three-digit alphanumerics express pass bandwidth, center frequency tolerance and design type.

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

❻Individual Specification

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

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

❼Packaging

Code	Packaging
-B0	Bulk
-R0	Embossed Taping ø=180mm
-R1	Embossed Taping ø=330mm

Embossed taping is applied to chip type.

Ceramic Discriminators for IF (kHz)

(Part Number) CD B LB 450K C A X 16 -B0
❶ ❷ ❸ ❹ ❺ ❻ ❼ ❽ ❾

❶Product ID

Product ID	
CD	Ceramic Discriminators

❷Oscillating

Code	Oscillating
B	Area Expansion mode

❸Structure/Size

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

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

❹Nominal Center Frequency

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

❺Detection

Code	Detection
C	Quadrature Detection

❻Application

Code	Application
A	Standard
L	Application with coil

❼Element Type

Code	Element Type
X	Low-capacitance
Y	High-capacitance

❽IC

Code	IC
16	Applicable IC Control code

❾Packaging

Code	Packaging
-B0	Bulk
-R0	Embossed Taping ø=180mm
-R1	Embossed Taping ø=330mm

Embossed taping is applied to chip type. With non-standard products, one letter indicating "Individual Specification" is added between "❽Applicable IC" and "❾Package Specification code."

Ceramic Discriminators for IF (MHz)

(Part Number) CD S CB 10M7 GF 001 -R0
❶ ❷ ❸ ❹ ❺ ❻ ❼

❶Product ID

Product ID	
CD	Discriminators

❷Oscillation

Code	Oscillation
S	Thickness Shear mode

❸Structure/Size

Code	Structure/Size
C□	Chip Type

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

❹Nominal Center Frequency

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

❺Product Specification

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

❻IC

Code	IC
001	Applicable IC Control Code

❼Packaging

Code	Packaging
-R0	Embossed Taping ø=180mm

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

Products Guide

●SMD Type (kHz)

Type	Applications	General Use											Attenuation (dB) min.
	Series	6dB Bandwidth (kHz) min.											
		A	B	C	D	E	F	G	H	J	K	L	
		±17.5	±15	±12.5	±10	±7.5	±6	±4.5	±3	±2	±1.5	±1	Within 455±80 or ±100kHz
High Selectivity Series (Plastic Case Type)	**SFPKA455K□** (4 Elements)	–	–	–	●	●	●	●	●	–	–	–	27 (G to H; 25)
	CFUKG455K□ (4 Elements)	–	–	–	●	●	●	●	–	–	–	–	27 (G; 25)
Narrow Bandwidth GDT Flat Type Miniature Series (Plastic Case Type)	**CFUKG455K□X** (4 Elements)	–	–	–	–	●	●	●	●	–	–	–	27 (G to H; 25)
GDT Flat Type Miniature Series (Plastic Case Type)	**CFUKF455K□** (4 Elements)	●	●	●	●	●	–	–	–	–	–	–	25 (D to E; 23)
GDT Flat Type High Selectivity SMD Series (Plastic Case Type)	**CFWKA450KBFY** (6 Elements)	–	●	–	–	–	–	–	–	–	–	–	45
High Selectivity SMD Series (Plastic Case Type)	**CFWKA450K□** (6 Elements)	–	–	–	●	●	●	●	–	–	–	–	50

●Lead Type (kHz)

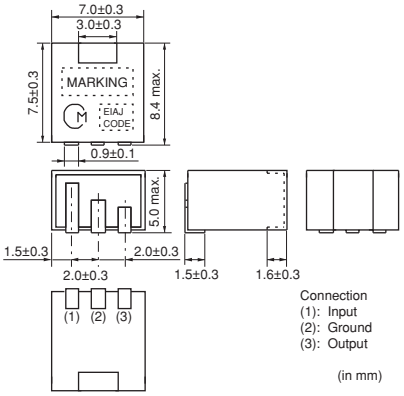
Type	Applications	General Use											Attenuation (dB) min.
	Series	6dB Bandwidth (kHz) min.											
		A	B	C	D	E	F	G	H	J	K	L	
		±17.5	±15	±12.5	±10	±7.5	±6	±4.5	±3	±2	±1.5	±1	Within 455±80 or ±100kHz
High Selectivity Low Profile Series	**CFULA455K□** (4 Elements)	–	●	●	●	●	●	●	●	–	–	–	27 (G; 25) (H; 35)
	CFWLA455K□ (6 Elements)	–	●	●	●	●	●	●	●	●	–	–	35 (H, J; 60)
High Selectivity Miniature Series	**CFULB455K□** (4 Elements)	–	●	●	●	●	●	●	●	●	–	–	27 (G; 25) (H, J; 35)
	CFWLB455K□ (6 Elements)	–	●	●	●	●	●	●	●	●	–	–	35 (H, J; 55)
GDT Flat Type Series	**CFULA455K□Y** (4 Elements)	–	●	●	●	●	●	●	–	–	–	–	25 (D to G; 23)
	CFWLA455K□Y (6 Elements)	●	●	●	●	●	●	●	–	–	–	–	40
GDT Flat Type Miniature Series	**CFULB455K□Y** (4 Elements)	–	●	●	●	●	●	●	–	–	–	–	25 (D to G; 23)
	CFWLB455K□Y (6 Elements)	●	●	●	●	●	●	●	–	–	–	–	40 (F; 35)

Ceramic Filters (CERAFIL®) for Communications Equipment

muRata

CERAFIL® kHz SMD Type SFPKA Series

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, pagers and transceivers.



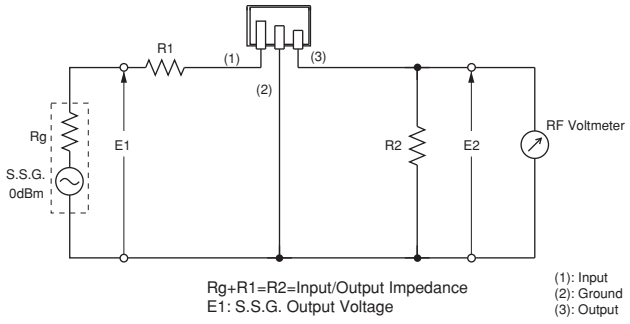
■ Features

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 (°C)
   Storage temperature range: -40 to +85 (°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 ±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 ±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 ±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 ±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 ±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

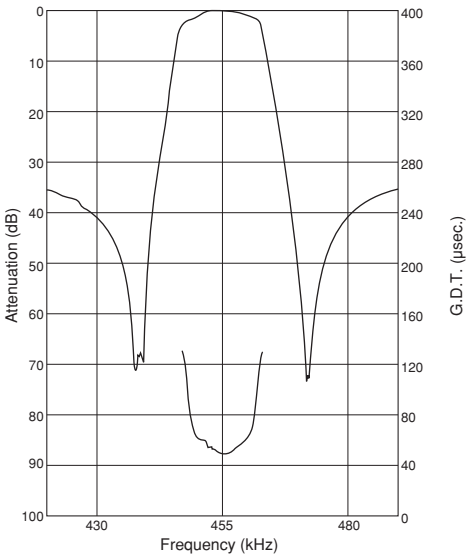
Center frequency (fo) defined by the center of 6dB bandwidth.
(fn) means nominal center frequency 455kHz.
For safety purposes, connect the output of filters to the IF amplifier through a DC blocking capacitor. Avoid applying a direct current to the output of ceramic filters.
The order quantity should be an integral multiple of the "Minimum Quantity" shown in package page in this catalog.

■ Test Circuit

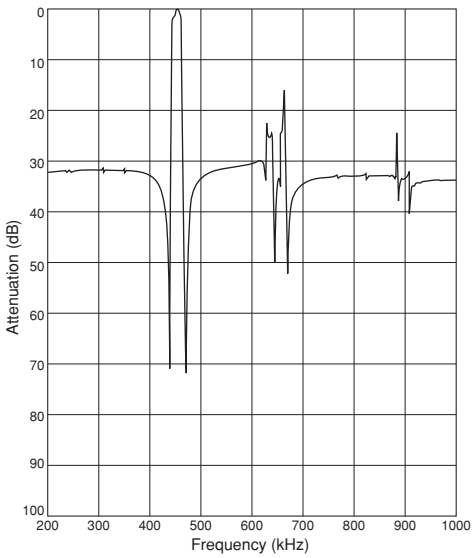


■ Frequency Characteristics

SFPKA455KE4A-R1



SFPKA455KE4A-R1

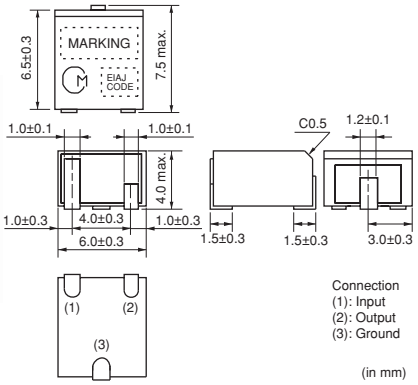


Ceramic Filters (CERAFIL®) for Communications Equipment

muRata

CERAFIL® kHz SMD Type CFUKG Series

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



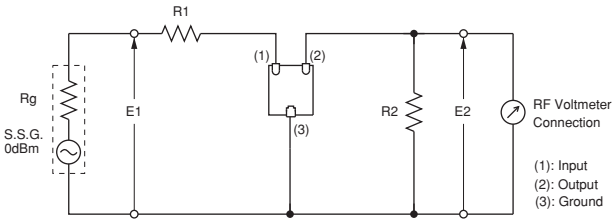
■ Features

1. The filters are mountable by automatic placers.
2. The filters can be reflow soldered and withstand washing.
3. They are slim, at only 4.0mm maximum thickness, and have a small mounting area (7.5x6.0mm) enabling flexible PCB design.
4. The bandwidth ranges from D to G.
5. Operating temperature range: -20 to +80 (°C)
   Storage temperature range: -40 to +85 (°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)
CFUKG455KD4A-R0	455 ±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
CFUKG455KE4A-R0	455 ±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
CFUKG455KF4A-R0	455 ±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
CFUKG455KG1A-R0	455 ±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

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 DC blocking capacitor. Avoid applying a direct current to the output of ceramic filters.
The order quantity should be an integral multiple of the "Minimum Quantity" shown in package page in this catalog.

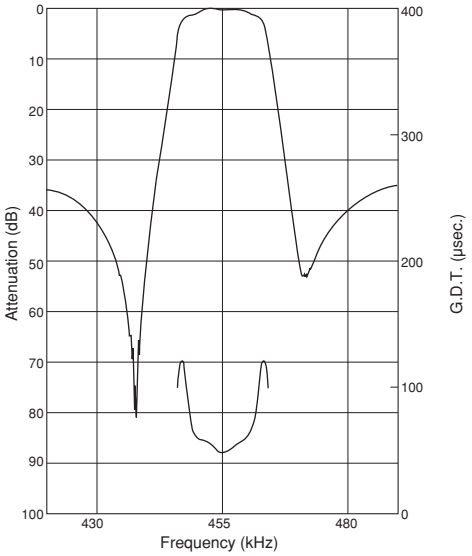
■ Test Circuit



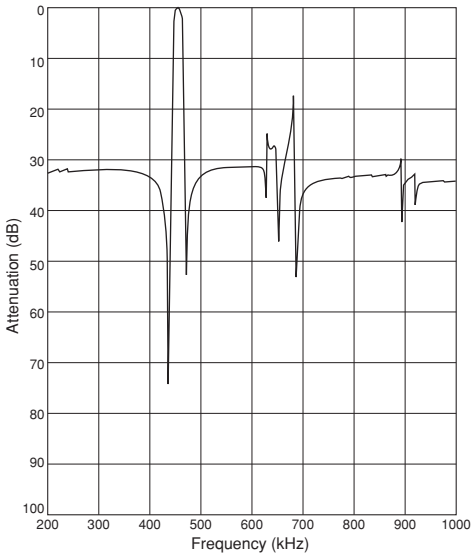
Rg+R1=R2=Input/Output Impedance

■ Frequency Characteristics

CFUKG455KE4A-R0



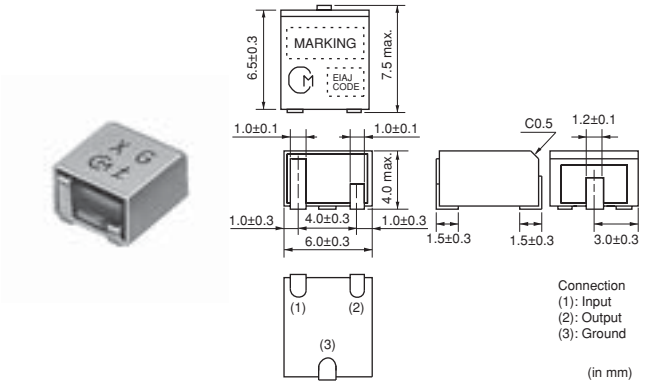
CFUKG455KE4A-R0



Ceramic Filters (CERAFIL®) for Communications Equipment

CERAFIL® kHz SMD Type CFUKG_X Series

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



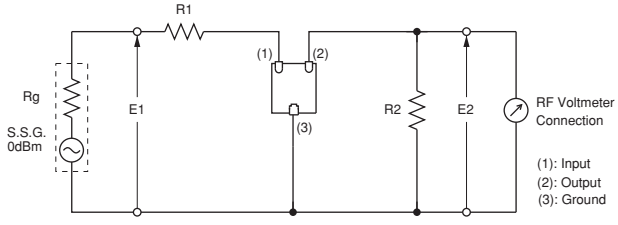
■ Features

1. The filters are mountable by automatic placers.
2. The filters can be reflow soldered and withstand washing.
3. They are slim, at only 4.0mm maximum thickness, and have a small mounting area (7.5x6.0mm) enabling flexible PCB design.
4. The bandwidth ranges from E to H.
5. Operating temperature range: -20 to +80 (°C)
   Storage temperature range: -40 to +85 (°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)
CFUKG455KE4X-R0	455 ±1.5kHz	fn±7.5 min.	fn±17.5 max. [within 40dB]	27 min. [within fn±100kHz]	6.0 max. [at minimum loss point]	1.0 max. [within fn±5kHz]	25.0 max. [within fn±5kHz]	1500
CFUKG455KF4X-R0	455 ±1.5kHz	fn±6.0 min.	fn±15.0 max. [within 40dB]	27 min. [within fn±100kHz]	6.0 max. [at minimum loss point]	1.0 max. [within fn±4kHz]	25.0 max. [within fn±4kHz]	1500
CFUKG455KG1X-R0	455 ±1.0kHz	fn±4.5 min.	fn±12.5 max. [within 40dB]	25 min. [within fn±100kHz]	6.0 max. [at minimum loss point]	1.0 max. [within fn±3kHz]	25.0 max. [within fn±3kHz]	1500
CFUKG455KH1X-R0	455 ±1.0kHz	fn±3.0 min.	fn±10.0 max. [within 40dB]	25 min. [within fn±100kHz]	7.0 max. [at minimum loss point]	1.0 max. [within fn±2kHz]	25.0 max. [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 DC blocking capacitor. Avoid applying a direct current to the output of ceramic filters.
The order quantity should be an integral multiple of the "Minimum Quantity" shown in package page in this catalog.

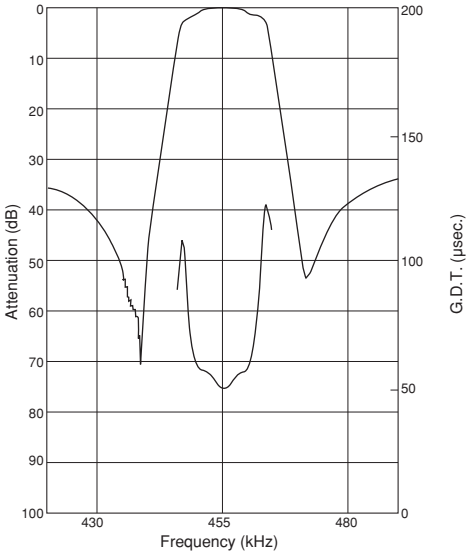
■ Test Circuit



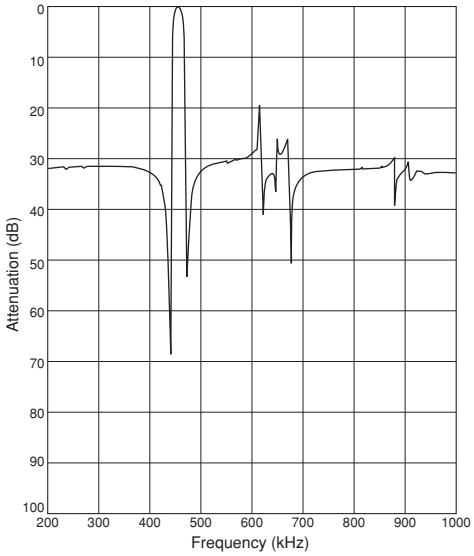
Rg+R1=R2=Input/Output Impedance

■ Frequency Characteristics

CFUKG455KE4X-R0



CFUKG455KE4X-R0

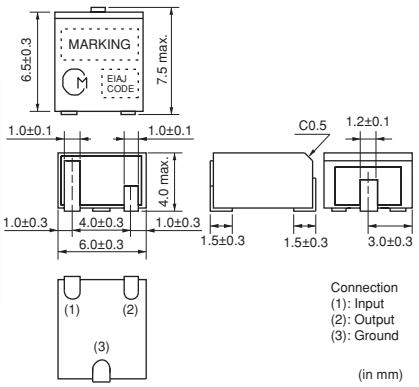


Ceramic Filters (CERAFIL®) for Communications Equipment

muRata

CERAFIL® kHz SMD Type CFUKF Series

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



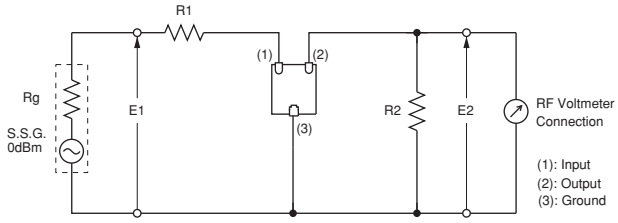
■ Features

1. The filters are mountable by automatic placers.
2. The filters can be reflow soldered and withstand washing.
3. They are slim, at only 4.0mm maximum thickness, and have a small mounting area (7.5x6.0mm) enabling flexible PCB design.
4. The bandwidth ranges from A to E.
5. Operating temperature range: -20 to +80 (°C)
   Storage temperature range: -40 to +85 (°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)
CFUKF455KA2X-R0	455 ±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
CFUKF455KB4X-R0	455 ±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
CFUKF455KC4X-R0	455 ±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
CFUKF455KD1X-R0	455 ±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
CFUKF455KE1X-R0	455 ±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 DC blocking capacitor. Avoid applying a direct current to the output of ceramic filters.
The order quantity should be an integral multiple of the "Minimum Quantity" shown in package page in this catalog.

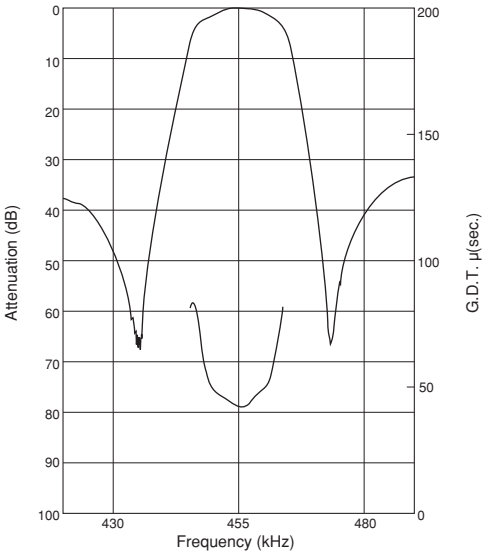
■ Test Circuit



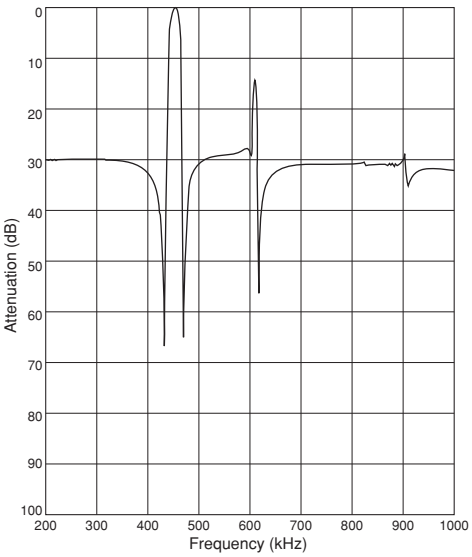
Rg+R1=R2=Input/Output Impedance

■ Frequency Characteristics

CFUKF455KE1X-R0



CFUKF455KE1X-R0

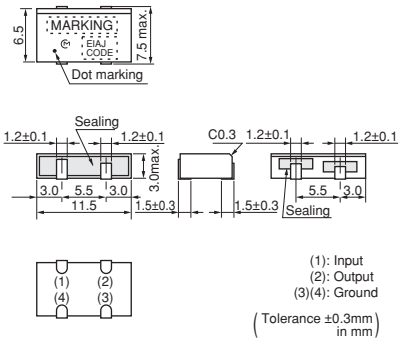


Ceramic Filters (CERAFIL®) for Communications Equipment

muRata

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.



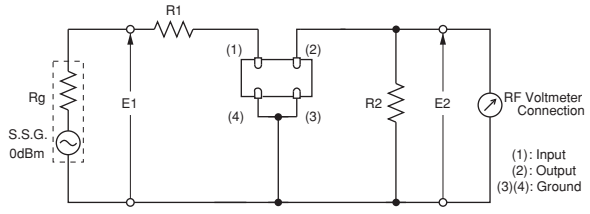
■ Features

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 (°C)
   Storage temperature range: -40 to +85 (°C)

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)
CFWKA450KDFA-R0	450.0	-	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
CFWKA450KEFA-R0	450.0	-	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
CFWKA450KEFA001-R0	450.0	fn±6.5 min.	-	fn±15.0 max. [within 50dB]	55 min. [fn±18 to ±33kHz]	50 min. [within fn±100kHz]	4.0 max. [at fn]	3.0 max. [within fn±6.5kHz]	1500
CFWKA450KFFA-R0	450.0	-	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
CFWKA450KGFA-R0	450.0	-	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 DC blocking capacitor. Avoid applying a direct current to the output of ceramic filters.
The order quantity should be an integral multiple of the "Minimum Quantity" shown in package page in this catalog.

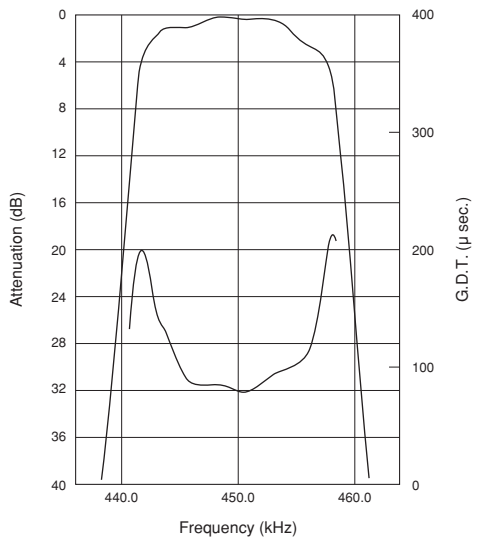
■ Test Circuit



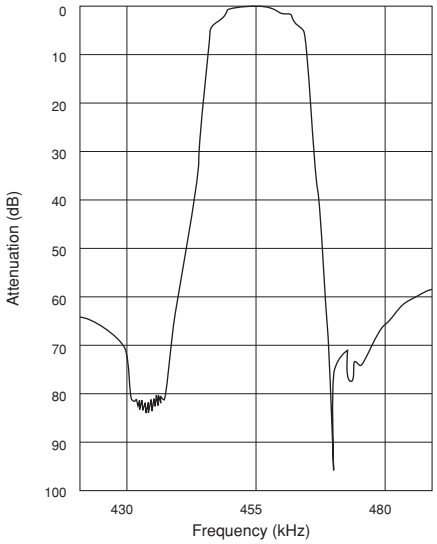
Rg+R1=R2=Input/Output Impedance

■ Frequency Characteristics

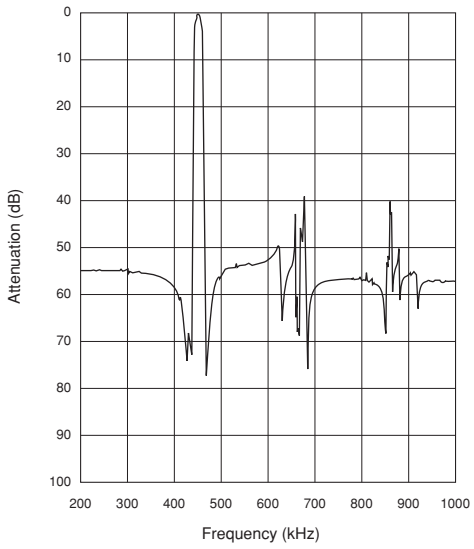
CFWKA450KEFA001-R0



CFWKA450KEFA001-R0



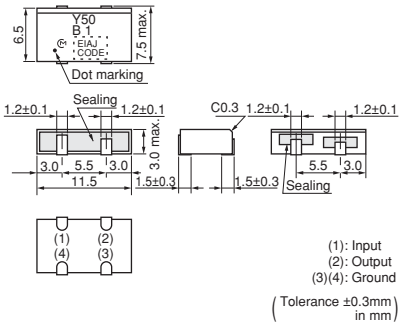
CFWKA450KEFA001-R0



Ceramic Filters (CERAFIL®) 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.



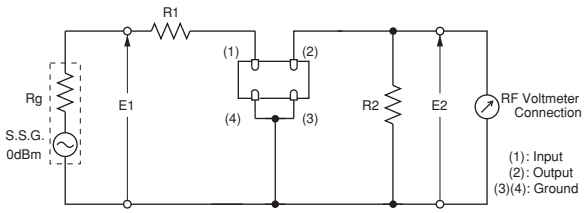
■ Features

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 (°C)
   Storage temperature range: -40 to +85 (°C)

Part Number	Nominal Center Frequency (fn) (kHz)	3dB Bandwidth (kHz)	6dB Bandwidth (kHz)	Stop Bandwidth (kHz)	Stop Band Attenuation (dB)	Insertion Loss (dB)	Spurious Response (dB)	GDT Deviation (μs)	Input/Output Impedance (ohm)
CFWKA450KBFY001-R0	450.0	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

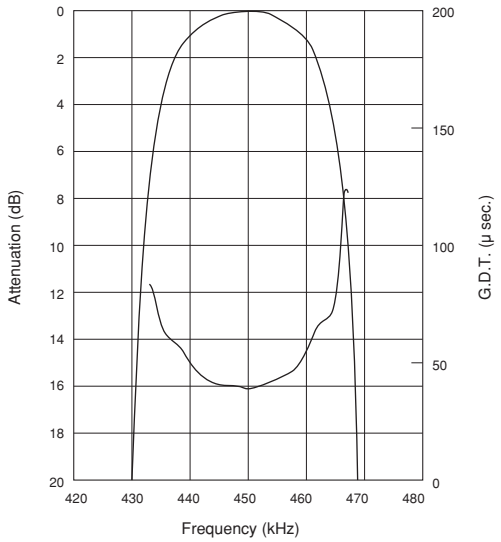
For safety purposes, connect the output of filters to the IF amplifier through a DC blocking capacitor. Avoid applying a direct current to the output of ceramic filters.
The order quantity should be an integral multiple of the "Minimum Quantity" shown in package page in this catalog.

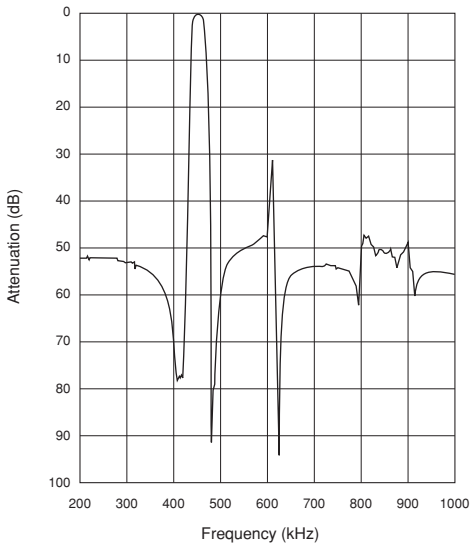
■ Test Circuit



Rg+R1=R2=Input/Output Impedance

■ Frequency Characteristics





6

kHz SMD Type CERAFIL® Notice

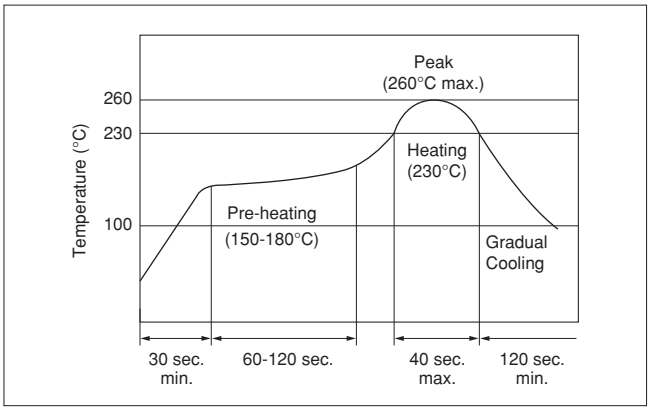
■ SFPKA/CFUKG/CFUKF Series Notice

● Soldering and Mounting

1. Standard Reflow Soldering Conditions

(1) Reflow

Filter is soldered twice within the following temperature conditions.



(2) Soldering Iron

Electrode is directly soldered with the tip of soldering iron at +350±5°C for 3.0±0.5 seconds.

(3) Other

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

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°C max.
- Shower or Rinse Wash
  2 minutes max. in above solvent at +60°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 4 minutes maximum.
- Please ensure the component is thoroughly evaluated in your application circuit.
- Please do not use chlorine, petroleum or alkali cleaning solvent.
- If you plan to use any other types of solvents, please consult with Murata or Murata representative prior to using.

3. Coating

In case of overcoating the component, conditions such as material of resin, cure temperature, and so on should be evaluated well.

Continued on the following page.

kHz SMD Type CERAFIL® Notice

Continued from the preceding page.

● Storage and Operating Conditions

1. Product Storage Condition
   Please store the products in a room where the temperature/humidity is stable, and avoid such places where there are large temperature changes. Please store the products under the following conditions:
   Temperature: -10 to +40°C
   Humidity: 15 to 85% R.H.
2. Expiration Date on Storage
   Expiration date (shelf life) of the products is six months after delivery under the conditions of a sealed and unopened package. Please use the products within six months after delivery. If you store the products for a long time (more than six months), use carefully because solderability may be degraded due to storage under poor conditions.
   Please confirm solderability and characteristics for the products regularly.
3. Notice on Product Storage
   (1) Please do not store the products in a chemical atmosphere (Acids, Alkali, Bases, Organic gas, Sulfides and so on), because the characteristics may be reduced in quality and may be degraded in solderability due to storage in a chemical atmosphere.
   (2) Please do not put the products directly on the floor without anything under them to avoid damp places and/or dusty places.
   (3) Please do not store the products in places such as a damp heated place or any place exposed to direct sunlight or excessive vibration.
   (4) Please use the products immediately after the package is opened, because the characteristics may be reduced in quality and/or be degraded in solderability due to storage under poor condition.
   (5) Please do not drop the products to avoid cracking of ceramic element.
4. Other
   Please be sure to consult with our sales representative or engineer whenever the products are to be used in conditions not listed above.

● Rating

The component may be damaged if excessive mechanical stress is applied.

● Handling

1. If the component is cleaned, please confirm that the reliability has not been degraded.
2. The components, packed in a moisture-proof bag (dry pack), are sensitive to moisture. The following treatment is required before applying reflow 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.
3. 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.

kHz SMD Type CERAFIL® Notice

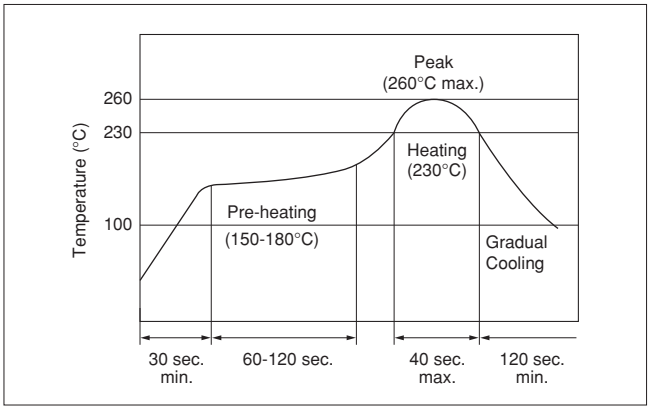
■ CFWKA Series Notice

● Soldering and Mounting

1. Standard Reflow Soldering Conditions

(1) Reflow

Filter is soldered twice within the following temperature conditions.



(2) Soldering Iron

Electrode is directly soldered with the tip of soldering iron at +350±5°C for 3.0±0.5 seconds.

(3) Other

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

2. Wash

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

3. Coating

Do not apply conformal coating onto the component as it's not hermetically sealed.

● Storage and Operating Conditions

1. Product Storage Condition

Please store the products in a room where the temperature/humidity is stable, and avoid places where there are large temperature changes. Please store the products under the following conditions:
Temperature: -10 to + 40°C
Humidity: 15 to 85% R.H.

2. Expiration Date on Storage

Expiration date (shelf life) of the products is six months after delivery under the conditions of a sealed and unopened package. Please use the products within six months after delivery. If you store the products for a long time (more than six months), use carefully because the solderability may be degraded due to storage under poor conditions.
Please confirm solderability and characteristics for the products regularly.

3. Notice on Product Storage

(1) Please do not store the products in a chemical atmosphere (Acids, Alkali, Bases, Organic gas, Sulfides and so on), because the characteristics may be reduced in quality and may be degraded in solderability due to storage in a chemical atmosphere.
(2) Please do not put the products directly on the floor without anything under them to avoid damp places and/or dusty places.
(3) Please do not store the products in places such as a damp heated place or any place exposed to direct sunlight or excessive vibration.
(4) Please use the products immediately after the package is opened, because the characteristics may be reduced in quality and/or be degraded in solderability due to storage under poor condition.
(5) Please do not drop the products to avoid cracking of ceramic element.

4. Other

Please be sure to consult with our sales representative or engineer whenever the products are to be used in conditions not listed above.

Continued on the following page.

kHz SMD Type CERAFIL® Notice

Continued from the preceding page.

● Rating

The component may be damaged if excessive mechanical stress is applied.

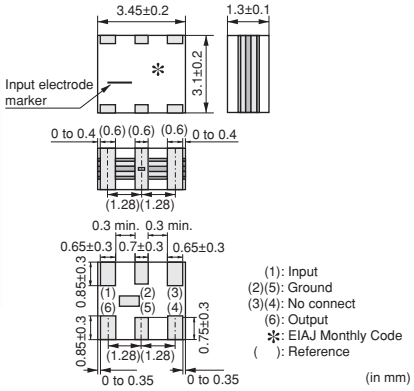
● Handling

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

Ceramic Filters (CERAFIL®) 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. The piezoelectric element is sandwiched by the ceramics substrate.
They have 1.4mm max. thickness and a small mounting area (3.45x3.1mm).
SFECF series and CDSCB series (MHz Discriminator) enable customers to make VICS/RKE/TPMS set very thin and small.



■ 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 (°C)(Standard Type)
   -40 to +85 (°C)(High-reliability Type)
   Storage Temperature Range:
   -40 to +85 (°C)(Standard Type)
   -55 to +85 (°C)(High-reliability Type)

Standard Type

Part Number	Center Frequency (fo) (MHz)	Nominal Center Frequency (fn) (MHz)	3dB Bandwidth (kHz)	Attenuation (kHz)	Insertion Loss (dB)	Ripple (dB)	Spurious Attenuation (1) (dB)	Spurious Attenuation (2) (dB)	Input/Output Impedance (ohm)
SFECF10M7HA00-R0	10.700 ±30kHz	-	180 ±40kHz	470 max.	4.0±2.0dB	1.0 max.	30 min. [within 9MHz to fo]	30 min. [within fo to 12MHz]	330
SFECF10M7HF00-R0	-	10.700	fn±25 min.	510 max.	8.0max. [at fn]	1.0 max.	30 min. [within 9MHz to fn]	25 min. [within fn to 12MHz]	330
SFECF10M7GA00-R0	10.700 ±30kHz	-	230 ±50kHz	510 max.	3.5±2.0dB	1.0 max.	30 min. [within 9MHz to fo]	30 min. [within fo to 12MHz]	330
SFECF10M7GF00-R0	-	10.700	fn±45 min.	560 max.	8.0max. [at fn]	1.0 max.	30 min. [within 9MHz to fn]	25 min. [within fn to 12MHz]	330
SFECF10M7FA00-R0	10.700 ±30kHz	-	280 ±50kHz	590 max.	3.0±2.0dB	1.0 max.	30 min. [within 9MHz to fo]	30 min. [within fo to 12MHz]	330
SFECF10M7FF00-R0	-	10.700	fn±65 min.	620 max.	7.0max. [at fn]	1.0 max.	30 min. [within 9MHz to fn]	25 min. [within fn to 12MHz]	330
SFECF10M7EA00-R0	10.700 ±30kHz	-	330 ±50kHz	700 max.	3.0±2.0dB	1.0 max.	30 min. [within 9MHz to fo]	30 min. [within fo to 12MHz]	330
SFECF10M7DA0001-R0	10.700 ±30kHz	-	420 min.	950 max.	3.0±2.0dB	3.0 max.	35 min. [within 9MHz to fo]	25 min. [within fo to 12MHz]	330
SFECF10M7DF00-R0	-	10.700	fn±150 min.	990 max.	6.0max. [at fn]	3.0 max.	20 min. [within 9MHz to fn]	20 min. [within fn to 12MHz]	330

Area of Attenuation: [within 20dB]
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 DC 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.

High-reliability Type

Part Number	Center Frequency (fo) (MHz)	Nominal Center Frequency (fn) (MHz)	3dB Bandwidth (kHz)	Attenuation (kHz)	Insertion Loss (dB)	Ripple (dB)	Spurious Attenuation (1) (dB)	Spurious Attenuation (2) (dB)	Input/Output Impedance (ohm)
SFECF10M7HA00S0-R0	10.700 ±30kHz	-	180 ±40kHz	470 max.	4.0±2.0dB	1.0 max.	30 min. [within 9MHz to fo]	30 min. [within fo to 12MHz]	330
SFECF10M7HF00S0-R0	-	10.700	fn±25 min.	510 max.	8.0max. [at fn]	1.0 max.	30 min. [within 9MHz to fn]	25 min. [within fn to 12MHz]	330
SFECF10M7GA00S0-R0	10.700 ±30kHz	-	230 ±50kHz	510 max.	3.5±2.0dB	1.0 max.	30 min. [within 9MHz to fo]	30 min. [within fo to 12MHz]	330
SFECF10M7GF00S0-R0	-	10.700	fn±45 min.	560 max.	8.0max. [at fn]	1.0 max.	30 min. [within 9MHz to fn]	25 min. [within fn to 12MHz]	330
SFECF10M7FA00S0-R0	10.700 ±30kHz	-	280 ±50kHz	590 max.	3.0±2.0dB	1.0 max.	30 min. [within 9MHz to fo]	30 min. [within fo to 12MHz]	330
SFECF10M7FF00S0-R0	-	10.700	fn±65 min.	630 max.	7.0max. [at fn]	1.0 max.	30 min. [within 9MHz to fn]	25 min. [within fn to 12MHz]	330
SFECF10M7EA00S0-R0	10.700 ±30kHz	-	330 ±50kHz	700 max.	3.0±2.0dB	1.0 max.	30 min. [within 9MHz to fo]	30 min. [within fo to 12MHz]	330
SFECF10M7DF00S0-R0	-	10.700	fn±145 min.	990 max.	6.0max. [at fn]	3.0 max.	20 min. [within 9MHz to fn]	20 min. [within fn to 12MHz]	330

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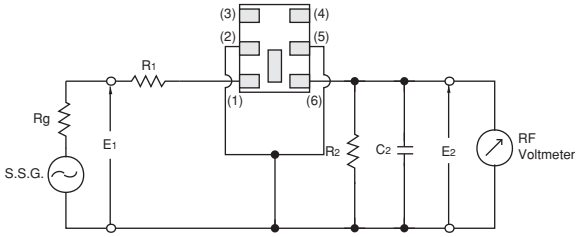
Area of Attenuation: [within 20dB]
Area of Insertion Loss: at minimum loss point Area of Ripple: within 3dB B.W.
Center frequency (fo) defined by center of 3dB bandwidth.
For safety purposes, connect the output of filters to the IF amplifier through a DC blocking capacitor. Avoid applying a direct current 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

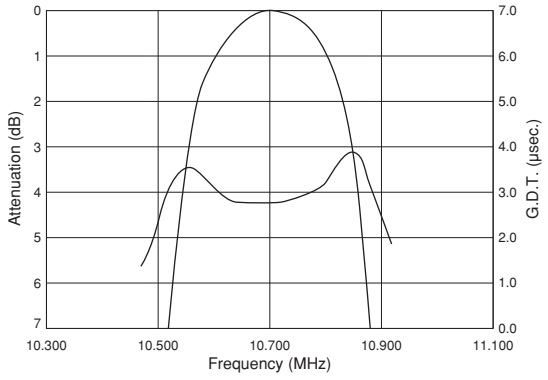


Rg = 50Ω R1 = 280Ω ±5% R2 = 330Ω ±5%
C2 = 10 ± 2 pF (Including stray capacitance and Input capacitance of RF Volt Meter)
E1: S.S.G. Output Voltage

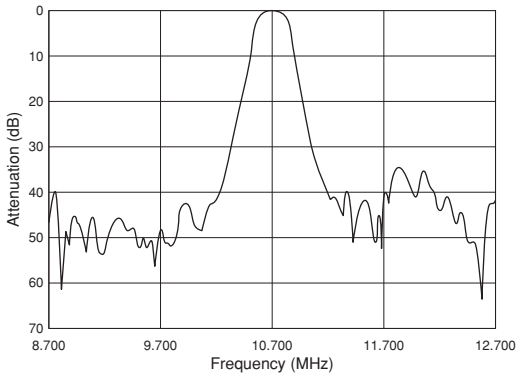
(1): Input
(2)(5): Ground
(3)(4): No connect
(6): Output

■ Frequency Characteristics

SFECF10M7FA00-R0



SFECF10M7FA00-R0

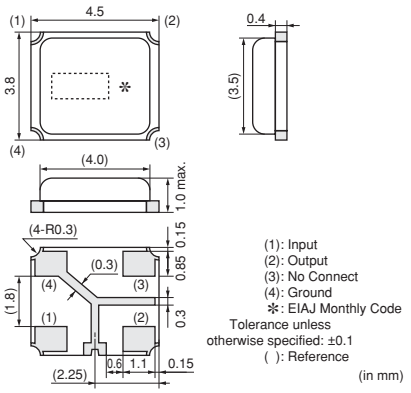


Ceramic Filters (CERAFIL®) for Communications Equipment

muRata

CERAFIL® MHz SMD Type SFSCE10M7 Series

SFSCE series are chip surface mount filters 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 (°C)
   Storage temperature range:
   -40 to +85 (°C)

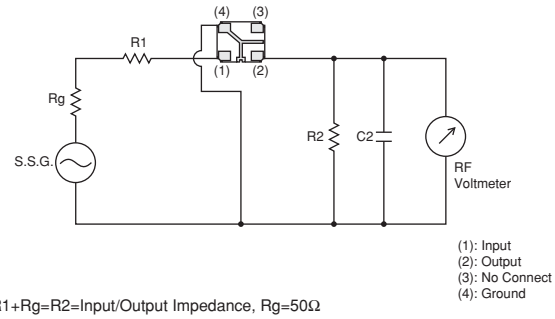
■ Applications

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)
SFSCE10M7WF03-R0	10.700	fn±500.0 min.	2.2 max. (Total) [within 20dB]	6.0 max. [at minimum loss point]	2.0 max. [within 3dB Bandwidth]	30/25 min. [within 5.7MHz to fn / fn to 15.7MHz]	0.6 max. [within fn±400kHz]	470
SFSCE10M7WF04-R0	10.700	fn±400.0 min.	1.8 max. (Total) [within 20dB]	6.0 max. [at minimum loss point]	1.5 max. [within 3dB Bandwidth]	35/25 min. [within 5.7MHz to fn / fn to 15.7MHz]	0.6 max. [within fn±325kHz]	470
SFSCE10M7WF05-R0	10.700	fn±325.0 min.	1.7 max. (Total) [within 20dB]	6.0 max. [at minimum loss point]	1.5 max. [within 3dB Bandwidth]	40/30 min. [within 5.7MHz to fn / fn to 15.7MHz]	0.6 max. [within fn±250kHz]	470

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

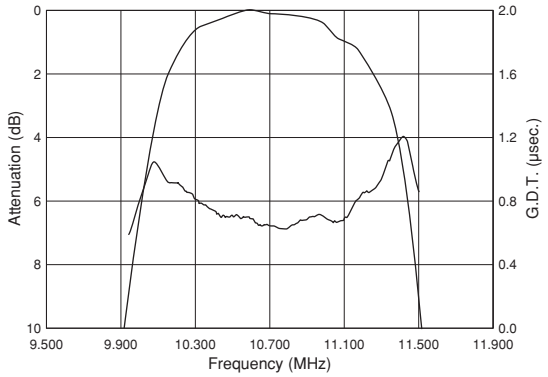
■ Test Circuit



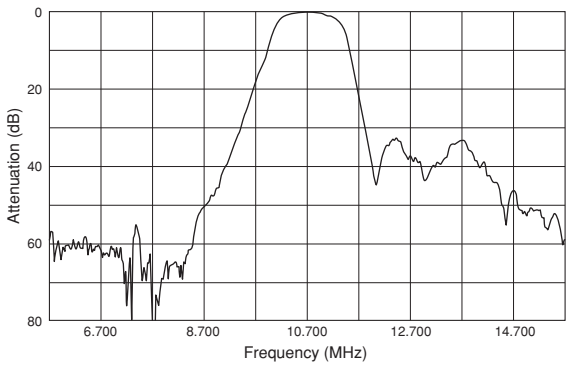
R1+Rg=R2=Input/Output Impedance, Rg=50Ω
C2=10pF (Including stray capacitance and Input capacitance of RF Voltmeter)
E1: S.S.G. Output Voltage

■ Frequency Characteristics

SFSCE10M7WF03-R0



SFSCE10M7WF03-R0



8

MHz SMD Type CERAFIL® Notice

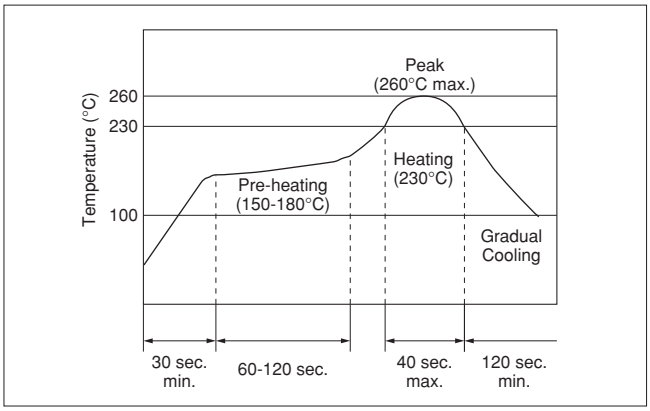
■ SFECF10M7 Series Notice

● Soldering and Mounting

1. Standard Reflow Soldering Conditions

(1) Reflow

Filter is soldered twice within the following temperature conditions.



(2) Soldering Iron

Filter is soldered at +350±5°C for 3.0±0.5 seconds. The soldering iron should not touch the filter while soldering.

(3) Condition for Placement Machines

The component is recommended with placement machines that employ optical placement capabilities. The component might be damaged by excessive mechanical force. Please make sure that you have evaluated by using placement machines before going into mass production. Do not use placement machines that utilize mechanical positioning. Please contact Murata for details beforehand.

(4) Other

(a) The component may be damaged if excess mechanical stress is applied to it mounted on the printed circuit board.

(b) Design layout of components on the PC board to minimize the stress imposed on the warp or flexure of the board.

(c) After installing components, if solder is excessively applied to the circuit board, mechanical stress will cause destruction resistance characteristics to degrade. To prevent this, be extremely careful in determining shape and dimension before designing the circuit board diagram.

(d) When the positioning claws and pick-up nozzle are worn, the load is applied to the components while positioning is concentrated on positioning accuracy, etc. Careful checking and maintenance are necessary to prevent unexpected trouble.

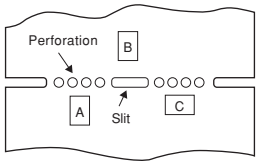
(e) When correcting components with a soldering iron, the tip of the soldering iron should not directly touch the component. Depending on the soldering conditions, the effective area of terminations may be reduced. Solder containing Ag should be used to prevent the electrode erosion.

(f) Do not use strong acidity flux, more than 0.2wt% chlorine content, in reflow soldering.

[Component Direction]

Place the component lateral to the direction in which stress acts.

[Component Layout Close to Board]



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

Continued on the following page.

MHz SMD Type CERAFIL® Notice

Continued from the preceding page.

2. Wash

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

3. Coating

In case of overcoating the component, conditions such as material of resin, cure temperature, and so on should be evaluated well.

● Storage and Operating Conditions

1. Product Storage Condition
   Please store the products in a room where the temperature/humidity is stable, and avoid places where there are large temperature changes. Please store the products under the following conditions:
   Temperature: -10 to +40°C
   Humidity: 15 to 85% R.H.
2. Expiration Date on Storage
   Expiration date (shelf life) of the products is six months after delivery under the conditions of a sealed and unopened package. Please use the products within six months after delivery. If you store the products for a long time (more than six months), use carefully because solderability may be degraded due to storage under poor conditions.
   Please confirm solderability and characteristics for the products regularly.
3. Notice on Product Storage
   (1) Please do not store the products in a chemical atmosphere (Acids, Alkali, Bases, Organic gas, Sulfides and so on), because the characteristics may be reduced in quality and may be degraded in solderability due to storage in a chemical atmosphere.
   (2) Please do not put the products directly on the floor without anything under them to avoid damp places and/or dusty places.
   (3) Please do not store the products in places such as a damp heated place or any place exposed to direct sunlight or excessive vibration.
   (4) Please use the products immediately after the package is opened, because the characteristics may be reduced in quality and/or be degraded in solderability due to storage under poor condition.
   (5) Please do not drop the products to avoid cracking of ceramic element.
4. Other
   Please be sure to consult with our sales representative or engineer whenever the products are to be used in conditions not listed above.

● Rating

The component may be damaged if excessive mechanical stress is applied.

● Handling

1. Accurate test circuit values are required to measure electrical characteristics. Miscorrelation may be caused if there is any deviation, especially stray capacitance, from the test circuit in the specification.
2. The components, packed in a moisture proof bag (dry pack), are sensitive to moisture. The following treatment is required before applying reflow soldering, to avoid reliability degradation caused by thermal stress. When unpacked, store the component in an atmosphere of reflow 30°C and below 60%R.H., and solder within 1 week.
3. 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.

MHz SMD Type CERAFIL® Notice

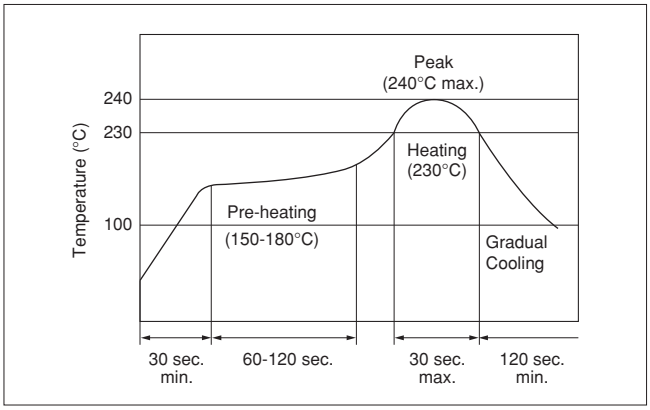
■ SFSCE10M7WF03-R0 Notice

● Soldering and Mounting

1. Standard Reflow Soldering Conditions

(1) Reflow

Filter is soldered twice within the following temperature conditions.



(2) Soldering Iron

Filter is soldered at +280±5°C for 3.0±0.5 seconds. The soldering iron should not touch the filter while soldering.

(3) Condition for Placement Machines

The component is recommended with placement machines that employ optical placement capabilities. The component might be damaged by excessive mechanical force. Please make sure that you have evaluated by using placement machines before going into mass production. Do not use placement machines that utilize mechanical positioning. Please contact Murata for details beforehand.

(4) Other

(a) The component may be damaged if excess mechanical stress is applied to it mounted on the printed circuit board.

(b) Design layout of components on the PC board to minimize the stress imposed on the warp or flexure of the board.

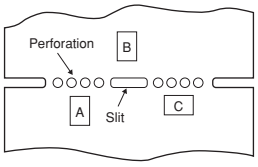
(c) After installing components, if solder is excessively applied to the circuit board, mechanical stress will cause destruction resistance characteristics to degrade. To prevent this, be extremely careful in determining shape and dimension before designing the circuit board diagram.

(d) When the positioning claws and pick-up nozzle are worn, the load is applied to the components while positioning is concentrated on positioning accuracy, etc. Careful checking and maintenance are necessary to prevent unexpected trouble.

(e) When correcting components with a soldering iron, the tip of the soldering iron should not directly touch the component.

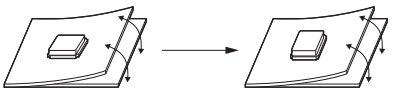
(f) Do not use strong acidity flux, more than 0.2wt% chlorine content, in reflow soldering.

[Component Layout Close to Board]



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

[Component Direction]



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

Continued on the following page.

MHz SMD Type CERAFIL® Notice

Continued from the preceding page.

2. Wash

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

3. Coating

In case of overcoating the component, conditions such as material of resin, cure temperature, and so on should be evaluated well.

● Storage and Operating Conditions

1. Product Storage Condition
   Please store the products in a room where the temperature/humidity is stable, and avoid places where there are large temperature changes. Please store the products under the following conditions:
   Temperature: -10 to + 40°C
   Humidity: 15 to 85% R.H.
2. Expiration Date on Storage
   Expiration date (shelf life) of the products is six months after delivery under the conditions of a sealed and unopened package. Please use the products within six months after delivery. If you store the products for a long time (more than six months), use carefully because solderability may be degraded due to storage under poor conditions.
   Please confirm solderability and characteristics for the products regularly.
3. Notice on Product Storage
   (1) Please do not store the products in a chemical atmosphere (Acids, Alkali, Bases, Organic gas, Sulfides and so on), because the characteristics may be reduced in quality and may be degraded in solderability due to storage in a chemical atmosphere.
   (2) Please do not put the products directly on the floor without anything under them to avoid damp places and/or dusty places.
   (3) Please do not store the products in places such as a damp heated place or any place exposed to direct sunlight or excessive vibration.
   (4) Please use the products immediately after the package is opened, because the characteristics may be reduced in quality and/or be degraded in solderability due to storage under poor condition.
   (5) Please do not drop the products to avoid cracking of ceramic element.
4. Other
   Please be sure to consult with our sales representative or engineer whenever the products are to be used in conditions not listed above.

● Rating

The component may be damaged if excessive mechanical stress is applied.

● Handling

1. Accurate test circuit values are required to measure electrical characteristics. Miscorrelation may be caused if there is any deviation, especially stray capacitance, from the test circuit in the specification.
2. For safety purposes, connect the output of filters to the IF amplifier through a D.C. blocking capacitor. Avoid applying a direct current to the output of ceramic filters.

MHz SMD Type CERAFIL® Notice

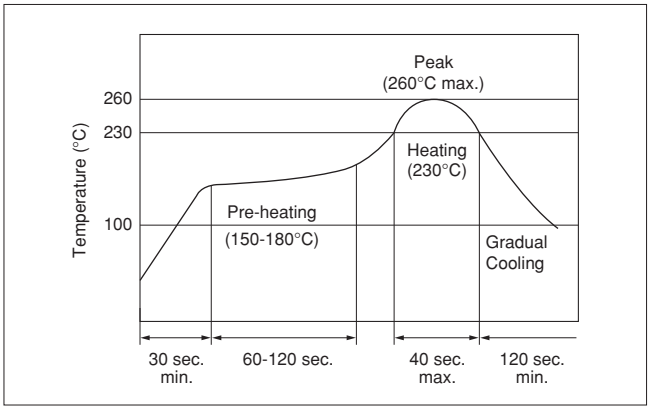
■ SFSCE10M7WF04/05-R0 Notice

● Soldering and Mounting

1. Standard Reflow Soldering Conditions

(1) Reflow

Filter is soldered twice within the following temperature conditions.



(2) Soldering Iron

Filter is soldered at +280±5°C for 3.0±0.5 seconds. The soldering iron should not touch the filter while soldering.

(3) Condition for Placement Machines

The component is recommended with placement machines that employ optical placement capabilities. The component might be damaged by excessive mechanical force. Please make sure that you have evaluated by using placement machines before going into mass production. Do not use placement machines that utilize mechanical positioning. Please contact Murata for details beforehand.

(4) Other

(a) The component may be damaged if excess mechanical stress is applied to it mounted on the printed circuit board.

(b) Design layout of components on the PC board to minimize the stress imposed on the warp or flexure of the board.

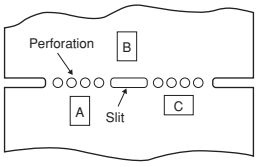
(c) After installing components, if solder is excessively applied to the circuit board, mechanical stress will cause destruction resistance characteristics to degrade. To prevent this, be extremely careful in determining shape and dimension before designing the circuit board diagram.

(d) When the positioning claws and pick-up nozzle are worn, the load is applied to the components while positioning is concentrated on positioning accuracy, etc. Careful checking and maintenance are necessary to prevent unexpected trouble.

(e) When correcting components with a soldering iron, the tip of the soldering iron should not directly touch the component.

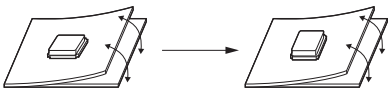
(f) Do not use strong acidity flux, more than 0.2wt% chlorine content, in reflow soldering.

[Component Layout Close to Board]



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

[Component Direction]



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

Continued on the following page.

MHz SMD Type CERAFIL® Notice

Continued from the preceding page.

2. Wash

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

3. Coating

In case of overcoating the component, conditions such as material of resin, cure temperature, and so on should be evaluated well.

● Storage and Operating Conditions

1. Product Storage Condition
   Please store the products in a room where the temperature/humidity is stable, and avoid places where there are large temperature changes. Please store the products under the following conditions:
   Temperature: -10 to + 40°C
   Humidity: 15 to 85% R.H.
2. Expiration Date on Storage
   Expiration date (shelf life) of the products is six months after delivery under the conditions of a sealed and unopened package. Please use the products within six months after delivery. If you store the products for a long time (more than six months), use carefully because solderability may be degraded due to storage under poor conditions.
   Please confirm solderability and characteristics for the products regularly.
3. Notice on Product Storage
   (1) Please do not store the products in a chemical atmosphere (Acids, Alkali, Bases, Organic gas, Sulfides and so on), because the characteristics may be reduced in quality and may be degraded in solderability due to storage in a chemical atmosphere.
   (2) Please do not put the products directly on the floor without anything under them to avoid damp places and/or dusty places.
   (3) Please do not store the products in places such as a damp heated place or any place exposed to direct sunlight or excessive vibration.
   (4) Please use the products immediately after the package is opened, because the characteristics may be reduced in quality and/or be degraded in solderability due to storage under poor condition.
   (5) Please do not drop the products to avoid cracking of ceramic element.
4. Other
   Please be sure to consult with our sales representative or engineer whenever the products are to be used in conditions not listed above.

● Rating

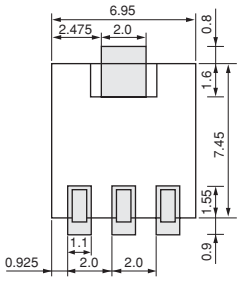
The component may be damaged if excessive mechanical stress is applied.

● Handling

1. Accurate test circuit values are required to measure electrical characteristics. Miscorrelation may be caused if there is any deviation, especially stray capacitance, from the test circuit in the specification.
2. For safety purposes, connect the output of filters to the IF amplifier through a D.C. blocking capacitor. Avoid applying a direct current to the output of ceramic filters.

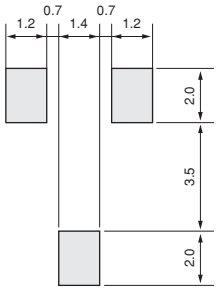
SMD Type CERAFIL® Standard Land Pattern Dimensions

■ SFPKA Series



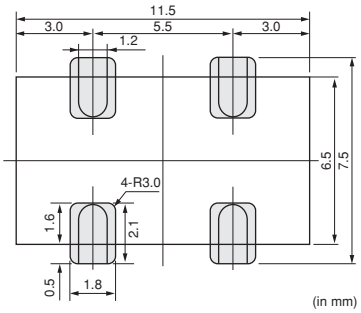
(in mm)

■ CFUKG/CFUKF Series



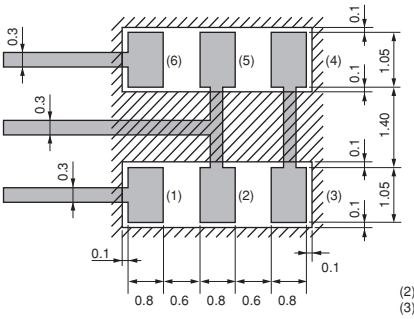
(in mm)

■ CFWKA Series



(in mm)

■ SFECF10M7 Series

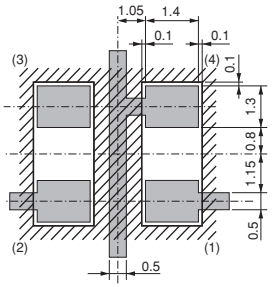


(1): Input
(2)(5): Ground
(3)(4): No connect
(6): Output

It shows solder resist land pattern.

(in mm)

■ SFSCE10M Series



(1): Input
(2): Output
(3): No Connect
(4): Ground

It shows solder resist land pattern.

(in mm)

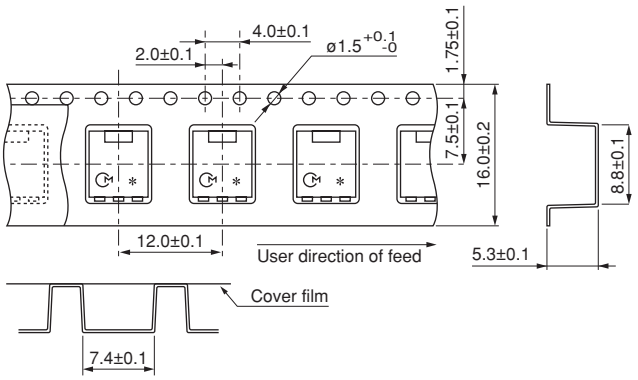
kHz SMD Type CERAFIL® Packaging

■ Minimum Quantity

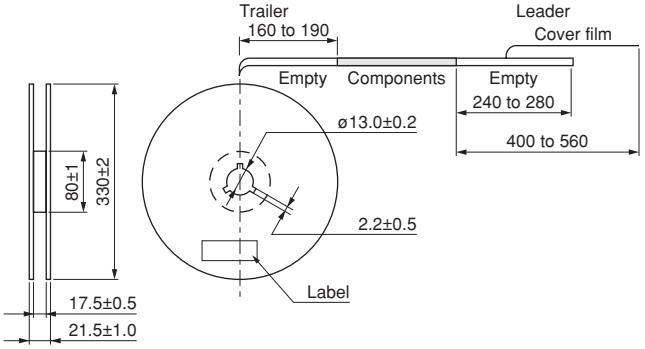
Part Number	ø180mm	ø330mm
SFPKA		1,000
CFUKG	450	
CFUKF	450	
CFWKA	350	

■ SFPKA Series

Dimensions of Carrier Tape



Dimensions of Reel

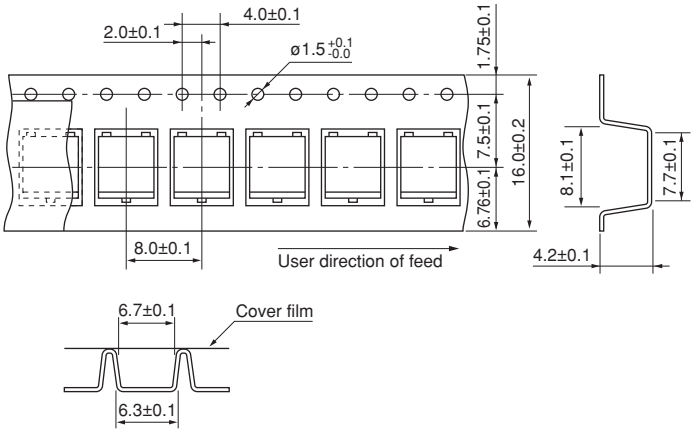


• Part number marked side is always facing up.

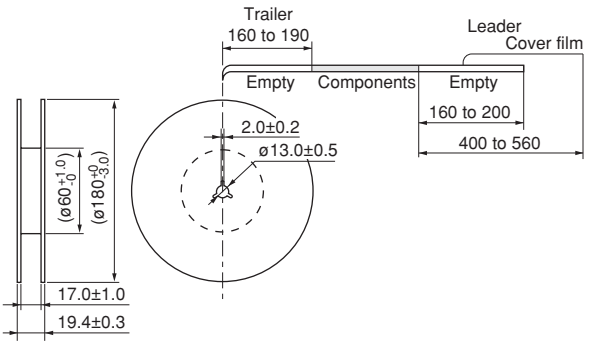
(in mm)

■ CFUKG/CFUKF Series

Dimensions of Carrier Tape



Dimensions of Reel



• Part number marked side is always facing up.

(in mm)

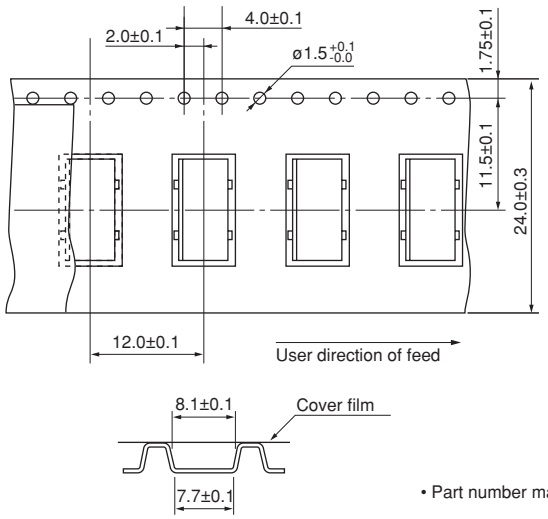
Continued on the following page.

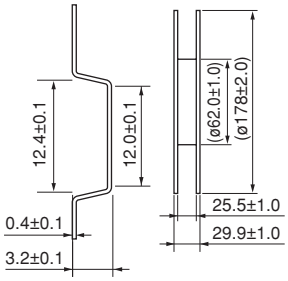
kHz SMD Type CERAFIL® Packaging

Continued from the preceding page.

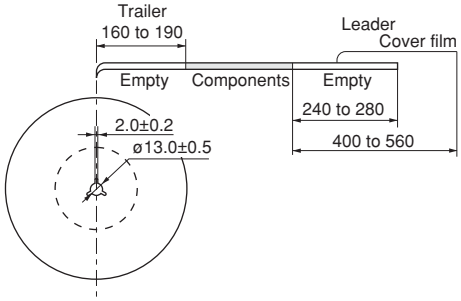
■ CFWKA Series

Dimensions of Carrier Tape





Dimensions of Reel



• Part number marked side is always facing up.

(in mm)

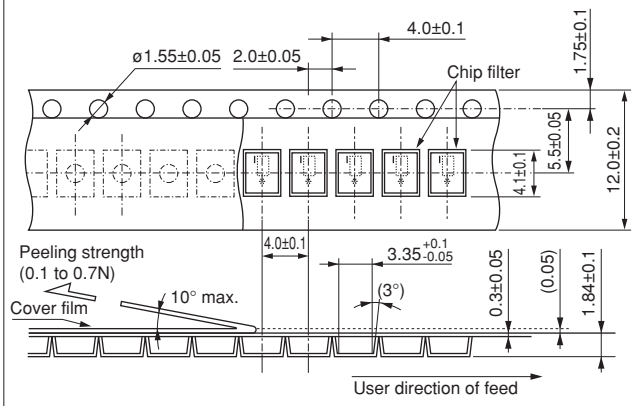
MHz SMD Type CERAFIL® Packaging

■ Minimum Quantity

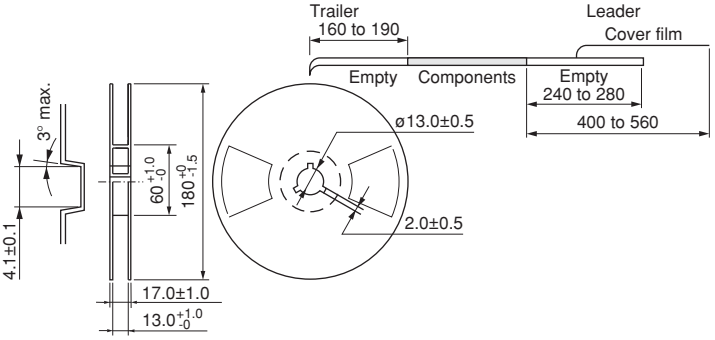
Part Number	ø180mm
SFECF	2,000
SFSCE	1,500

■ SFECF10M7 Series

Dimensions of Carrier Tape



Dimensions of Reel

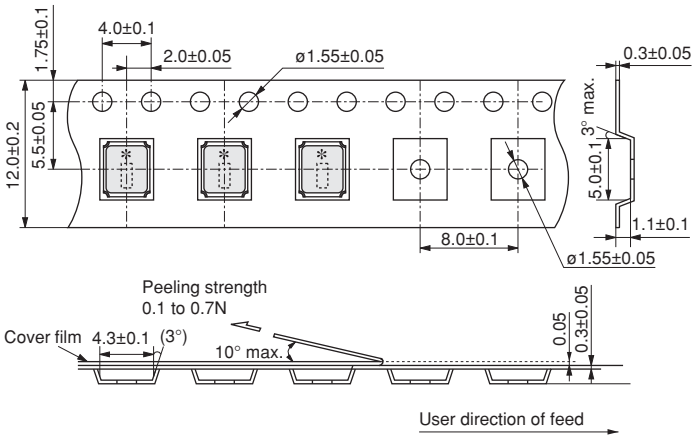


• Part number marked side is always facing up.

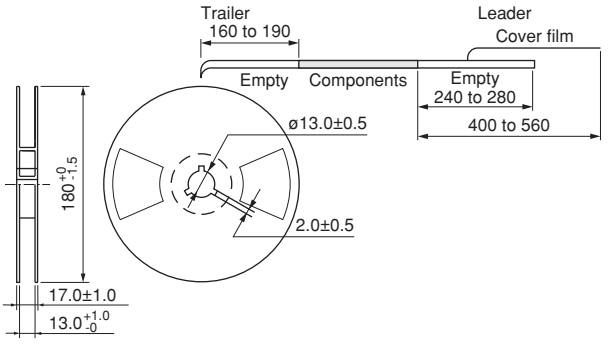
( ): Reference
(in mm)

■ SFSCE10M7 Series

Dimensions of Carrier Tape



Dimensions of Reel



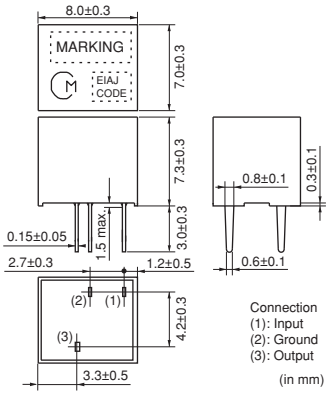
• Part Number marked side is always facing up.

(in mm)

Ceramic Filters (CERAFIL®) 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.
They are most suitable for digital communications and cellular phones because of their improved GDT characteristics.



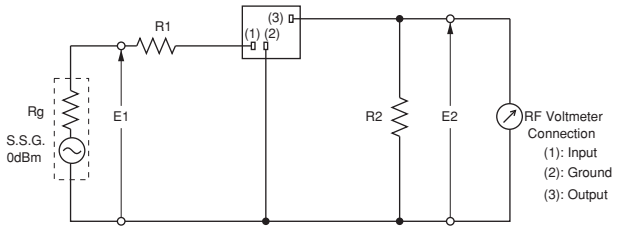
■ Features

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 (°C)
   Storage temperature range: -40 to +85 (°C)

Part Number	Center Frequency (fo) (kHz)	6dB Bandwidth (kHz)	Stop Bandwidth (kHz)	Stop Band Attenuation (dB)	Insertion Loss (dB)	Input/Output Impedance (ohm)
CFULA455KB2A-B0	455 ±2.0kHz	fn±15.0 min.	fn±30.0 max. [within 40dB]	27 min. [within fn±100kHz]	4.0 max. [at minimum loss point]	1500
CFULA455KC2A-B0	455 ±2.0kHz	fn±12.5 min.	fn±24.0 max. [within 40dB]	27 min. [within fn±100kHz]	4.0 max. [at minimum loss point]	1500
CFULA455KD4A-B0	455 ±1.5kHz	fn±10.0 min.	fn±20.0 max. [within 40dB]	27 min. [within fn±100kHz]	4.0 max. [at minimum loss point]	1500
CFULA455KE4A-B0	455 ±1.5kHz	fn±7.5 min.	fn±15.0 max. [within 40dB]	27 min. [within fn±100kHz]	6.0 max. [at minimum loss point]	1500
CFULA455KF4A-B0	455 ±1.5kHz	fn±6.0 min.	fn±12.5 max. [within 40dB]	27 min. [within fn±100kHz]	6.0 max. [at minimum loss point]	2000
CFULA455KG1A-B0	455 ±1.0kHz	fn±4.5 min.	fn±10.0 max. [within 40dB]	25 min. [within fn±100kHz]	6.0 max. [at minimum loss point]	2000
CFULA455KH1A-B0	455 ±1.0kHz	fn±3.0 min.	fn±9.0 max. [within 40dB]	35 min. [within fn±100kHz]	6.0 max. [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 DC blocking capacitor. Avoid applying a direct current to the output of ceramic filters.
The order quantity should be an integral multiple of the "Minimum Quantity" shown in package page in this catalog.

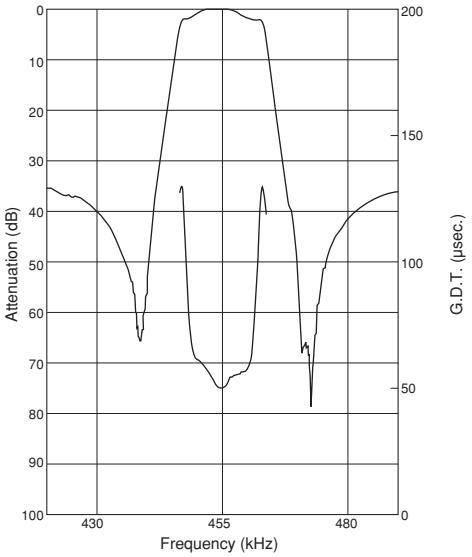
■ Test Circuit



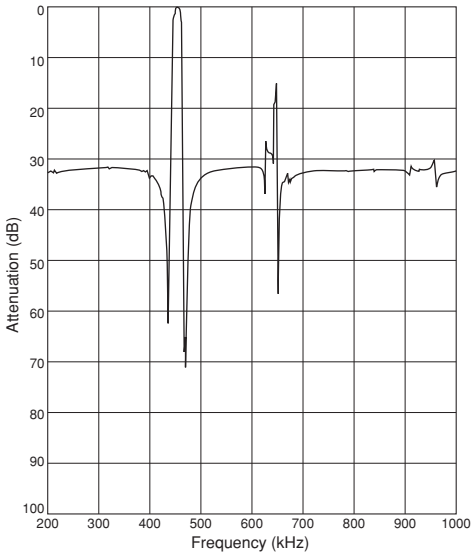
Rg+R1=R2=Input/Output Impedance

■ Frequency Characteristics

CFULA455KE4A-B0



CFULA455KE4A-B0

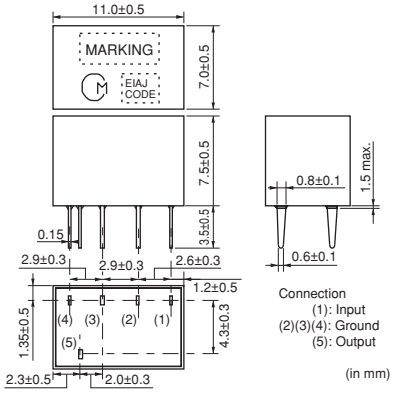


Ceramic Filters (CERAFIL®) for Communications Equipment

muRata

CERAFIL® Plastic Case General Use 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 (°C)
   Storage temperature range: -40 to +85 (°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	455.0	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	455.0	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	455.0	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	455.0	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	455.0	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	455.0	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	455.0	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	455.0	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 DC 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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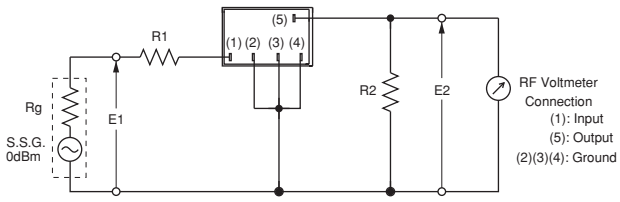
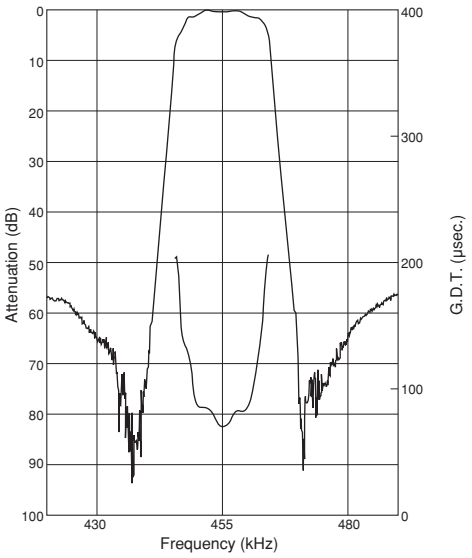
■ Test Circuit



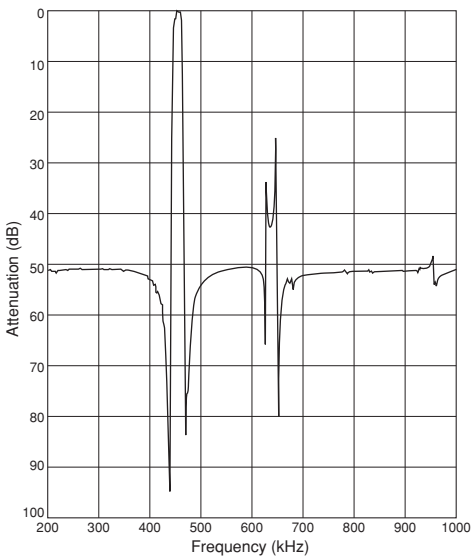
Rg+R1=R2=Input/Output Impedance

■ Frequency Characteristics

CFWLA455KEFA-B0



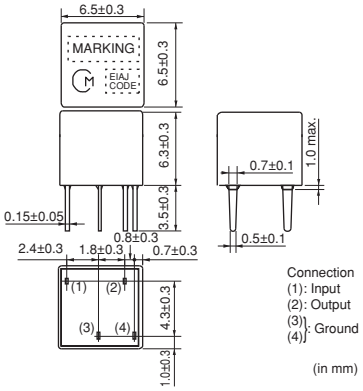
CFWLA455KEFA-B0



Ceramic Filters (CERAFIL®) 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.
They are well suited for miniaturizing various kinds of communications equipment, pocket pagers, car radios, cordless telephones and mobile telephones.



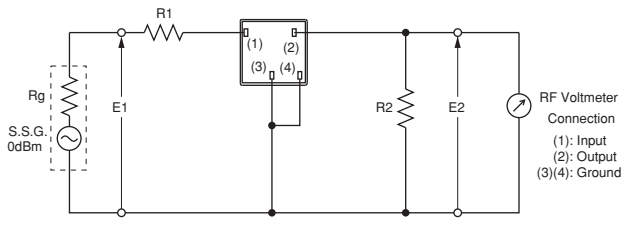
■ Features

1. Miniature and high selectivity
2. A variety of bandwidths are available
3. Operating temperature range: -20 to +80 (°C)
   Storage temperature range: -40 to +85 (°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 ±2.0kHz	fn±15.0 min.	fn±30.0 max. [within 40dB]	27 min. [within fn±100kHz]	4.0 max. [at minimum loss point]	1500
CFULB455KC2A-B0	455 ±2.0kHz	fn±12.5 min.	fn±24.0 max. [within 40dB]	27 min. [within fn±100kHz]	4.0 max. [at minimum loss point]	1500
CFULB455KD4A-B0	455 ±1.5kHz	fn±10.0 min.	fn±20.0 max. [within 40dB]	27 min. [within fn±100kHz]	4.0 max. [at minimum loss point]	1500
CFULB455KE4A-B0	455 ±1.5kHz	fn±7.5 min.	fn±15.0 max. [within 40dB]	27 min. [within fn±100kHz]	6.0 max. [at minimum loss point]	1500
CFULB455KF4A-B0	455 ±1.5kHz	fn±6.0 min.	fn±12.5 max. [within 40dB]	27 min. [within fn±100kHz]	6.0 max. [at minimum loss point]	2000
CFULB455KG1A-B0	455 ±1.0kHz	fn±4.5 min.	fn±10.0 max. [within 40dB]	25 min. [within fn±100kHz]	6.0 max. [at minimum loss point]	2000
CFULB455KH1A-B0	455 ±1.0kHz	fn±3.0 min.	fn±9.0 max. [within 40dB]	35 min. [within fn±100kHz]	6.0 max. [at minimum loss point]	2000
CFULB455KJ1A-B0	455 ±1.0kHz	fn±2.0 min.	fn±7.5 max. [within 40dB]	35 min. [within fn±100kHz]	6.0 max. [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 DC blocking capacitor. Avoid applying a direct current to the output of ceramic filters.
The order quantity should be an integral multiple of the "Minimum Quantity" shown in package page in this catalog.

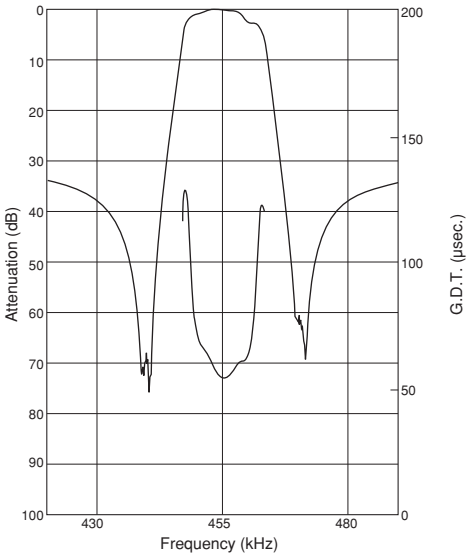
■ Test Circuit



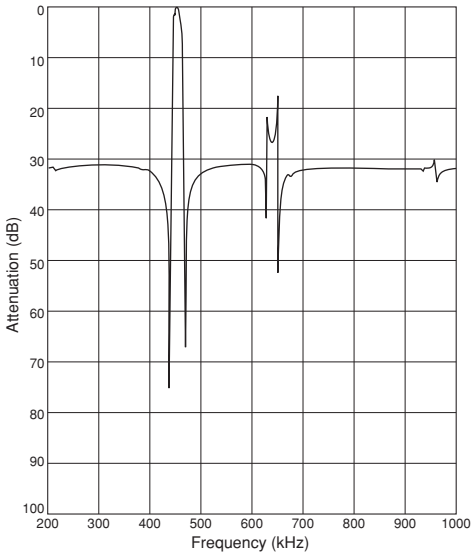
Rg+R1=R2=Input/Output Impedance

■ Frequency Characteristics

CFULB455KE4A-B0



CFULB455KE4A-B0

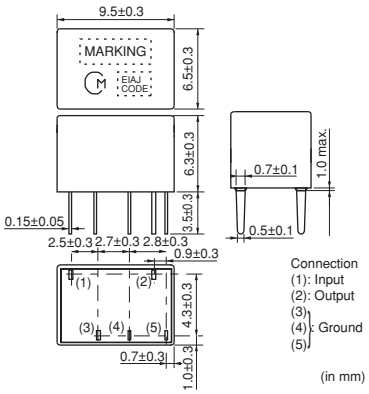


Ceramic Filters (CERAFIL®) for Communications Equipment

muRata

CERAFIL® Plastic Case Miniaturized Type 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.
They are well suited for miniaturizing various kinds of communications equipment, pocket pagers, pagers, car radios, cordless telephones and mobile telephones.



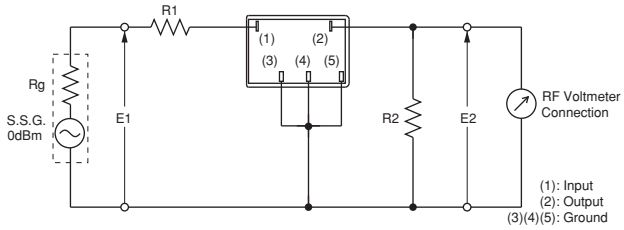
■ Features

1. Miniature and high selectivity
2. A variety of bandwidths are available.
3. Operating temperature range: -20 to +80 (°C)
   Storage temperature range: -40 to +85 (°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	455.0	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	455.0	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	455.0	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	455.0	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	455.0	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	455.0	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	455.0	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	455.0	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	455.0	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 DC blocking capacitor. Avoid applying a direct current to the output of ceramic filters.
The order quantity should be an integral multiple of the "Minimum Quantity" shown in package page in this catalog.

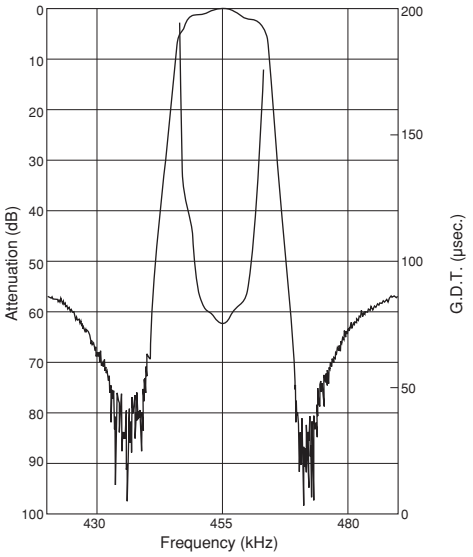
■ Test Circuit



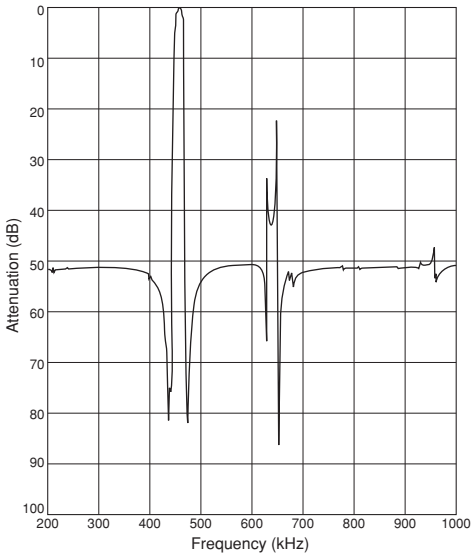
Rg+R1=R2=Input/Output Impedance

■ Frequency Characteristics

CFWLB455KEFA-B0



CFWLB455KEFA-B0



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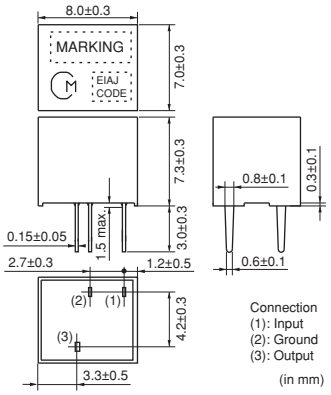
Ceramic Filters (CERAFIL®) for Communications Equipment

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.
They are 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 (°C)
   Storage temperature range: -40 to +85 (°C)

Part Number	Center Frequency (fo) (kHz)	6dB Bandwidth (kHz)	Stop Bandwidth (kHz)	Stop Band Attenuation (dB)	Insertion Loss (dB)	GDT Deviation (μs)	Input/Output Impedance (ohm)
CFULA455KB4Y-B0	455 ±1.5kHz	fn±15.0 min.	fn±35.0 max. [within 40dB]	25 min. [within fn±100kHz]	5.0 max. [at minimum loss point]	15.0 max. [within fn±10kHz]	1500
CFULA455KC4Y-B0	455 ±1.5kHz	fn±12.5 min.	fn±30.0 max. [within 40dB]	25 min. [within fn±100kHz]	6.0 max. [at minimum loss point]	15.0 max. [within fn±8kHz]	1500
CFULA455KD1Y-B0	455 ±1.0kHz	fn±10.0 min.	fn±25.0 max. [within 40dB]	23 min. [within fn±100kHz]	7.0 max. [at minimum loss point]	20.0 max. [within fn±7kHz]	1500
CFULA455KE1Y-B0	455 ±1.0kHz	fn±7.5 min.	fn±20.0 max. [within 40dB]	23 min. [within fn±100kHz]	8.0 max. [at minimum loss point]	20.0 max. [within fn±5kHz]	1500
CFULA455KF1Y-B0	455 ±1.0kHz	fn±6.0 min.	fn±17.5 max. [within 40dB]	23 min. [within fn±100kHz]	9.0 max. [at minimum loss point]	20.0 max. [within fn±4kHz]	2000
CFULA455KG1Y-B0	455 ±1.0kHz	fn±4.5 min.	fn±15.0 max. [within 40dB]	23 min. [within fn±100kHz]	10.0 max. [at minimum loss point]	20.0 max. [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 DC 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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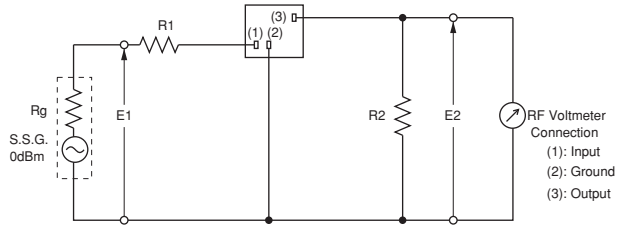
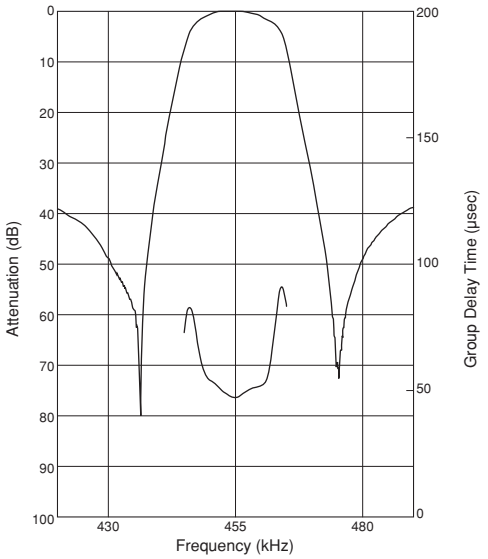
■ Test Circuit



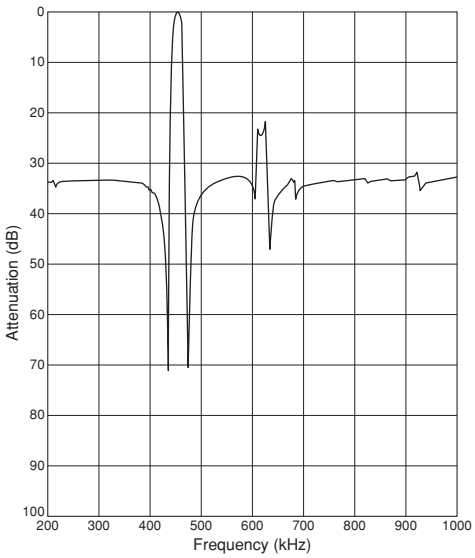
Rg+R1=R2=Input/Output Impedance

■ Frequency Characteristics

CFULA455KE1Y-B0



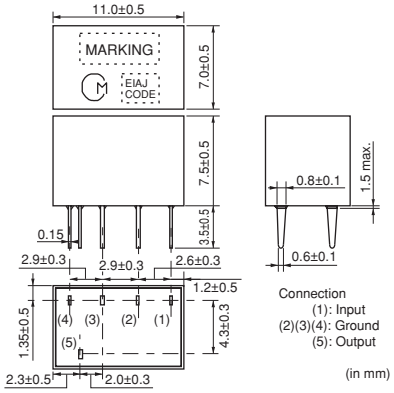
CFULA455KE1Y-B0



Ceramic Filters (CERAFIL®) 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.
They are 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 (°C)
   Storage temperature range: -40 to +85 (°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 ±1.5kHz	fn±15.0 min.	fn±30.0 max. [within 50dB]	40 min. [within fn±100kHz]	6.0 max. [at minimum loss point]	30.0 max. [within fn±10kHz]	1500
CFWLA455KC4Y-B0	455 ±1.5kHz	fn±12.5 min.	fn±27.5 max. [within 50dB]	40 min. [within fn±100kHz]	7.0 max. [at minimum loss point]	30.0 max. [within fn±8kHz]	1500
CFWLA455KD1Y-B0	455 ±1.0kHz	fn±10.0 min.	fn±25.0 max. [within 50dB]	40 min. [within fn±100kHz]	8.0 max. [at minimum loss point]	30.0 max. [within fn±7kHz]	1500
CFWLA455KE1Y-B0	455 ±1.0kHz	fn±7.5 min.	fn±20.0 max. [within 50dB]	40 min. [within fn±100kHz]	9.0 max. [at minimum loss point]	30.0 max. [within fn±5kHz]	1500
CFWLA455KF1Y-B0	455 ±1.0kHz	fn±6.0 min.	fn±17.5 max. [within 50dB]	40 min. [within fn±100kHz]	10.0 max. [at minimum loss point]	40.0 max. [within fn±4kHz]	2000
CFWLA455KG1Y-B0	455 ±1.0kHz	fn±4.5 min.	fn±15.0 max. [within 50dB]	40 min. [within fn±100kHz]	11.0 max. [at minimum loss point]	40.0 max. [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 DC 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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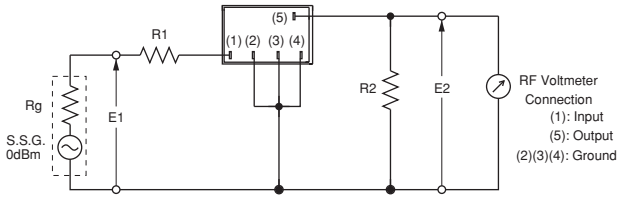
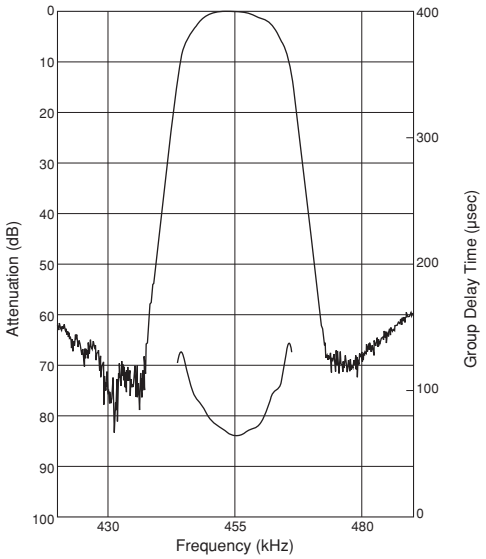
■ Test Circuit



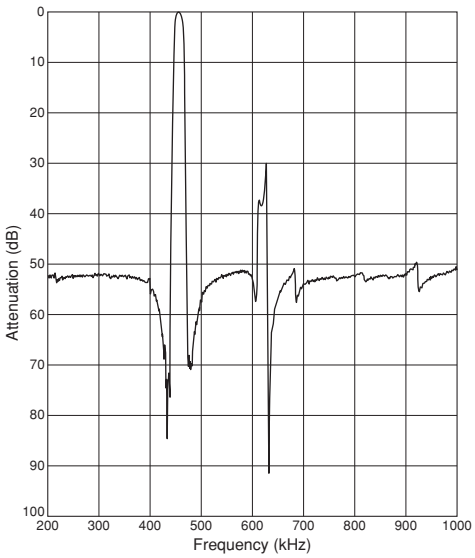
Rg+R1=R2=Input/Output Impedance

■ Frequency Characteristics

CFWLA455KE1Y-B0



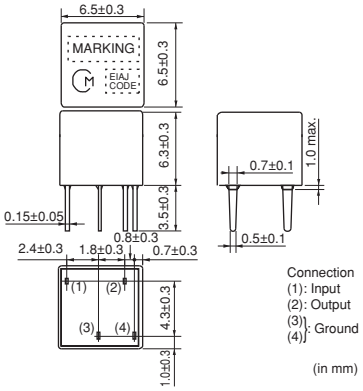
CFWLA455KE1Y-B0



Ceramic Filters (CERAFIL®) 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. Well suited for miniaturizing communications equipment, especially for a cellular phone.



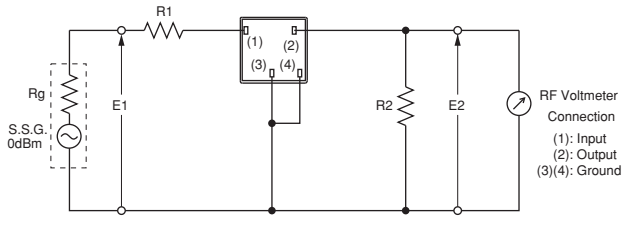
■ Features

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 (°C)
   Storage temperature range: -40 to +85 (°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)
CFULB455KB4Y-B0	455 ±1.5kHz	fn±15.0 min.	fn±35.0 max. [within 40dB]	25 min. [within fn±100kHz]	5.0 max. [at minimum loss point]	15.0 max. [within fn±10kHz]	1500
CFULB455KC4Y-B0	455 ±1.5kHz	fn±12.5 min.	fn±30.0 max. [within 40dB]	25 min. [within fn±100kHz]	6.0 max. [at minimum loss point]	15.0 max. [within fn±8kHz]	1500
CFULB455KD1Y-B0	455 ±1.0kHz	fn±10.0 min.	fn±25.0 max. [within 40dB]	23 min. [within fn±100kHz]	7.0 max. [at minimum loss point]	20.0 max. [within fn±7kHz]	1500
CFULB455KE1Y-B0	455 ±1.0kHz	fn±7.5 min.	fn±20.0 max. [within 40dB]	23 min. [within fn±100kHz]	8.0 max. [at minimum loss point]	20.0 max. [within fn±5kHz]	1500
CFULB455KF1Y-B0	455 ±1.0kHz	fn±6.0 min.	fn±17.5 max. [within 40dB]	23 min. [within fn±100kHz]	9.0 max. [at minimum loss point]	20.0 max. [within fn±4kHz]	2000
CFULB455KG1Y-B0	455 ±1.0kHz	fn±4.5 min.	fn±15.0 max. [within 40dB]	23 min. [within fn±100kHz]	10.0 max. [at minimum loss point]	20.0 max. [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 DC blocking capacitor. Avoid applying a direct current to the output of ceramic filters.
The order quantity should be an integral multiple of the "Minimum Quantity" shown in package page in this catalog.

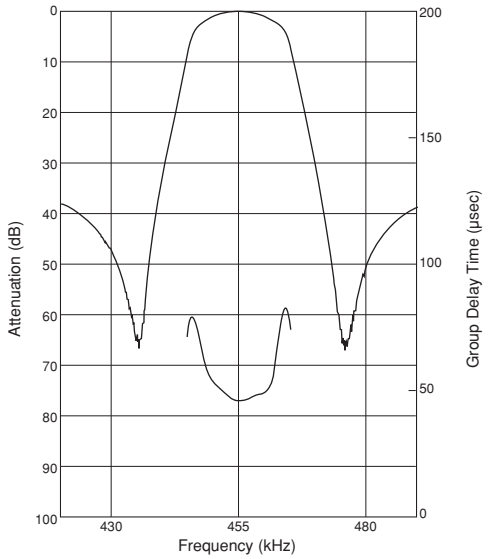
■ Test Circuit



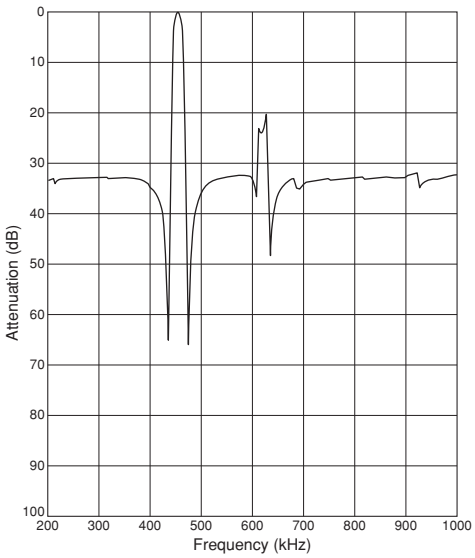
Rg+R1=R2=Input/Output Impedance

■ Frequency Characteristics

CFULB455KE1Y-B0



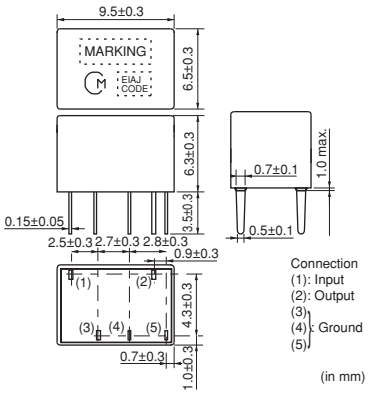
CFULB455KE1Y-B0



Ceramic Filters (CERAFIL®) 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. Well suited for miniaturizing communications equipment, especially for a cellular phone.



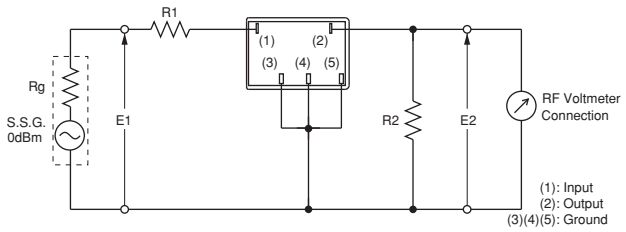
■ Features

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 (°C)
   Storage temperature range: -40 to +85 (°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)
CFWLB455KB4Y-B0	455 ±1.5kHz	fn±15.0 min.	fn±30.0 max. [within 50dB]	40 min. [within fn±100kHz]	6.0 max. [at minimum loss point]	30.0 max. [within fn±10kHz]	1500
CFWLB455KC4Y-B0	455 ±1.5kHz	fn±12.5 min.	fn±27.5 max. [within 50dB]	40 min. [within fn±100kHz]	7.0 max. [at minimum loss point]	30.0 max. [within fn±8kHz]	1500
CFWLB455KD1Y-B0	455 ±1.0kHz	fn±10.0 min.	fn±25.0 max. [within 50dB]	40 min. [within fn±100kHz]	8.0 max. [at minimum loss point]	30.0 max. [within fn±7kHz]	1500
CFWLB455KE1Y-B0	455 ±1.0kHz	fn±7.5 min.	fn±20.0 max. [within 50dB]	40 min. [within fn±100kHz]	9.0 max. [at minimum loss point]	30.0 max. [within fn±5kHz]	1500
CFWLB455KF1Y-B0	455 ±1.0kHz	fn±6.0 min.	fn±17.5 max. [within 50dB]	35 min. [within fn±100kHz]	10.0 max. [at minimum loss point]	40.0 max. [within fn±4kHz]	2000
CFWLB455KG1Y-B0	455 ±1.0kHz	fn±4.5 min.	fn±15.0 max. [within 50dB]	40 min. [within fn±100kHz]	11.0 max. [at minimum loss point]	40.0 max. [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 DC blocking capacitor. Avoid applying a direct current to the output of ceramic filters.
The order quantity should be an integral multiple of the "Minimum Quantity" shown in package page in this catalog.

■ Test Circuit

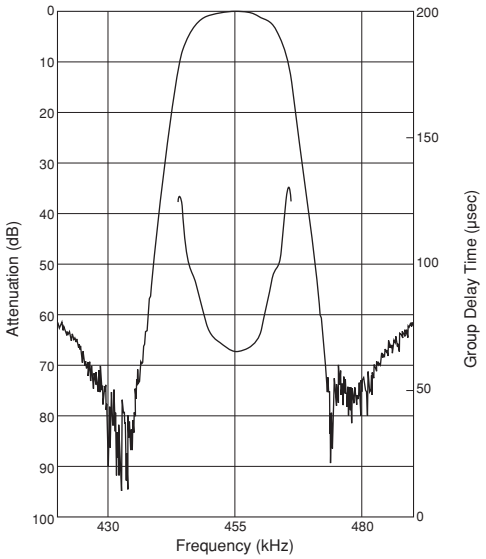


Rg+R1=R2=Input/Output Impedance

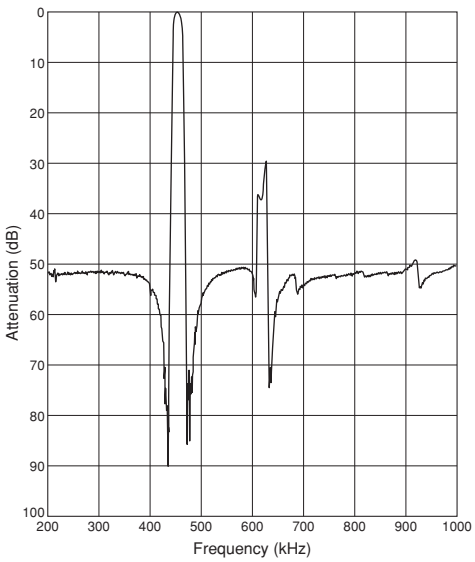
16

■ Frequency Characteristics

CFWLB455KE1Y-B0



CFWLB455KE1Y-B0



Plastic Case Type CERAFIL® Minimum Quantity/Notice

■ Minimum Quantity

Part Number	Bulk
CFULA Series	200
CFULB Series	250
CFWLA Series	150
CFWLB Series	150

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

■ Notice

● Soldering and Mounting

The component cannot withstand washing.

● Storage and Operating Conditions

1. Product Storage Condition
   Please store the products in a room where the temperature/humidity is stable, and avoid places where there are large temperature changes. Please store the products under the following conditions:
   Temperature: -10 to +40°C
   Humidity: 15 to 85% R.H.
2. Expiration Date on Storage
   Expiration date (shelf life) of the products is six months after delivery under the conditions of a sealed and unopened package. Please use the products within six months after delivery. If you store the products for a long time (more than six months), use carefully because solderability may be degraded due to storage under poor conditions.
   Please confirm solderability and characteristics for the products regularly.
3. Notice on Product Storage
   (1) Please do not store the products in a chemical atmosphere (Acids, Alkali, Bases, Organic gas, Sulfides and so on), because the characteristics may be reduced in quality and may be degraded in solderability due to storage in a chemical atmosphere.
   (2) Please do not put the products directly on the floor without anything under them to avoid damp places and/or dusty places.
   (3) Please do not store the products in places such as a damp heated place or any place exposed to direct sunlight or excessive vibration.
   (4) Please use the products immediately after the package is opened, because the characteristics may be reduced in quality and/or be degraded in solderability due to storage under poor condition.
   (5) Please do not drop the products to avoid cracking of ceramic element.
4. Other
   Please be sure to consult with our sales representative or engineer whenever the products are to be used in conditions not listed above.

● Rating

The component may be damaged if excessive mechanical stress is applied.

● Handling

1. Do not use this product with bend. The component may be damaged if excessive mechanical stress is applied to it mounted on the printed circuit board.
2. All kinds of reflow soldering must not be applied on the component.
3. Do not clean or wash the component as it is not hermetically sealed.
4. Do not use strong acidity flux, more than 0.2wt% chlorine content, in flow soldering.
5. Conformal coating of the component is not acceptable due to non-sealed construction.
6. Accurate test circuit values are required to measure electrical characteristics. Miscorrelation may be caused if there is any deviation, especially stray capacitance, from the test circuit in the specification.
7. For safety purposes, connect the output of filters to the IF amplifier through a D.C. blocking capacitor. Avoid applying a direct current to the output of ceramic filters.

Ceramic Discriminators for Communications Equipment

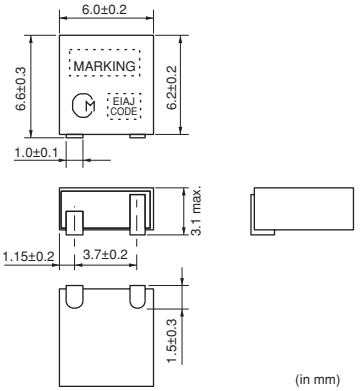
kHz Type Ceramic Discriminators

Ceramic discriminator consists of a wide band piezoelectric resonator.
It is ideal for mobile communications equipment due to its small size and light weight.
Standard line includes products for a wide range of applications, from cordless telecom to cellular telephone. Practically adjustment free at the detection circuit, small size is suitable for downsizing.

■ Features

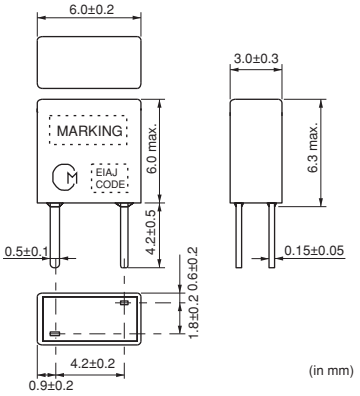
1. Small in size and light weight
2. Adjustment free at detection circuit
3. High sensitivity and stability
4. Wide range of standard products are available for various ICs.
5. Operating temperature range: -20 to +80 (°C)
   Storage temperature range: -40 to +85 (°C)

CDBKB Series



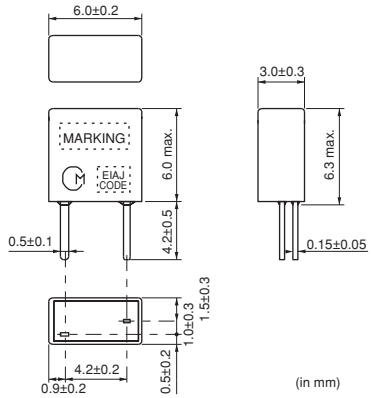
(in mm)

CDBLB_CAX Series



(in mm)

CDBLB_CAY Series



(in mm)

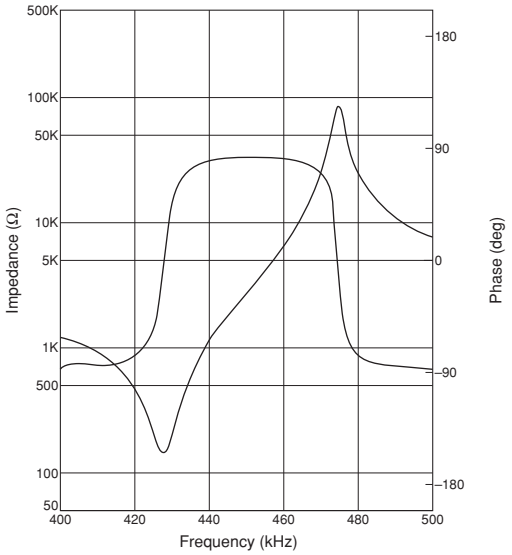
Specified by Impedance Characteristics (Type 1)

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

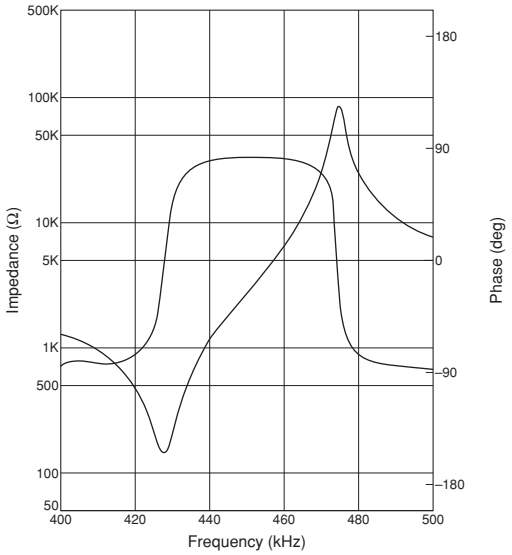
For safety purposes, avoid applying a direct current between the terminals.
The order quantity should be an integral multiple of the "Minimum Quantity" shown in package page in this catalog.

■ Impedance Curve

CDBLB455KCAX02-B0



CDBLB455KCAX31-B0



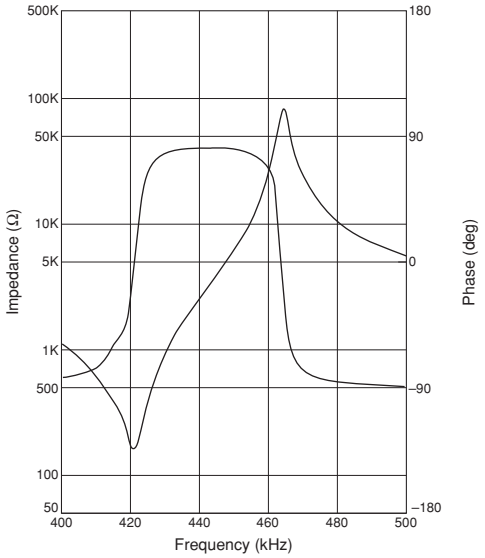
Specified by Impedance Characteristics (Type 2)

Part Number	Nominal Center Frequency (fn)	Anti-resonant Frequency (Fa)	Delta F (Fa-Fr)	Resonant Resistance (R)	Capacitance (C)	IC	IC Maker	Type
CDBKB455KCAX33-R0	-	462.0±1.5kHz	40±4.0kHz	200ohm max.	150pF±20%	CXA1474	SONY	SMD
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	-	465.0±1.5kHz	45±4.0kHz	300ohm max.	135pF±20%	CXA1474	SONY	Lead
CDBLB455KCAX33-B0	-	465.0±1.5kHz	45±4.0kHz	300ohm max.	135pF±20%	CXA1474	SONY	Lead

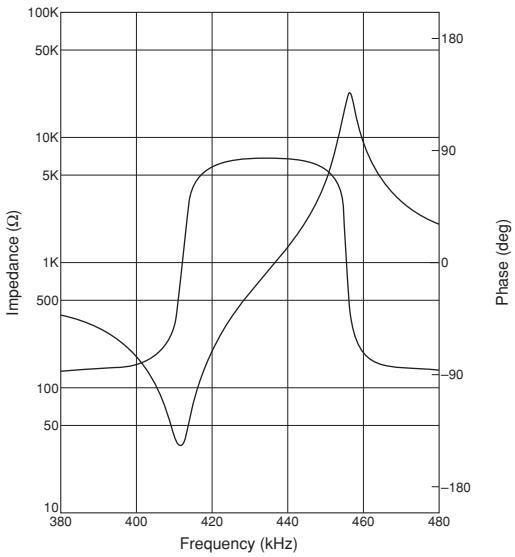
For safety purposes, avoid applying a direct current between the terminals.
The order quantity should be an integral multiple of the "Minimum Quantity" shown in package page in this catalog.

■ Impedance Curve

CDBKB455KCAX33-R0



CDBLB455KCAY03-B0



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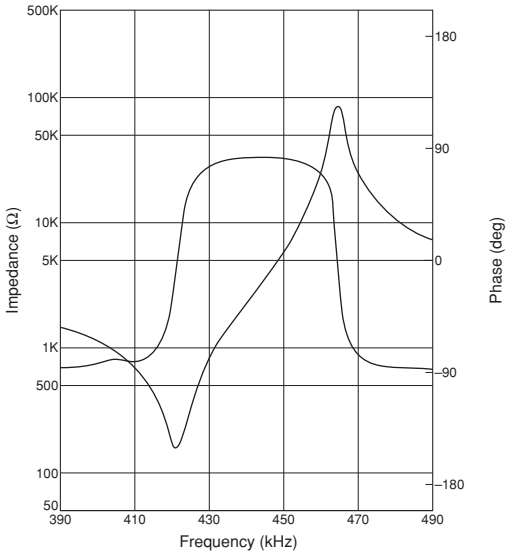
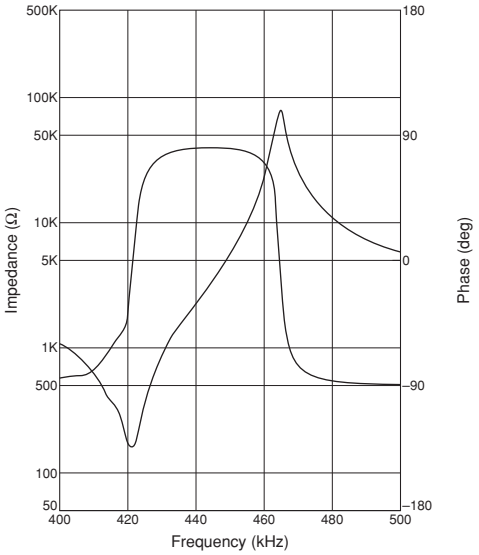
■ Impedance Curve

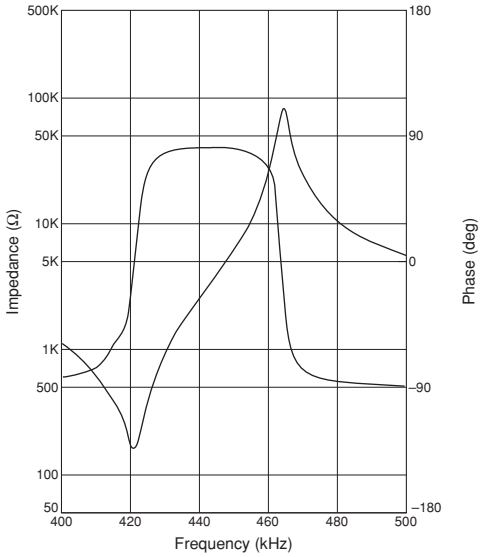
CDBLB455KCAX15-B0



CDBLB455KCAX25-B0



CDBLB455KCAX33-B0



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
CDBKB450KCAY79-R0	450	fn±3.0 min.	145 ±40	-	-	TB32302FG	TOSHIBA	SMD
CDBKB455KCAY07-R0	455	fn±4.0 min.	350 ±60	3.0 max.	-	MC3357	MOTOROLA	SMD
CDBKB455KCAY09-R0	455	fn±4.0 min.	120 ±40	1.5 max.	-	NE604N	PHILIPS	SMD
CDBKB455KCAY13-R0	455	fn±4.0 min.	330 ±50	4.0 max.	-	CXA1003BM	SONY	SMD
CDBKB455KCAY16-R0	455	fn±4.0 min.	175 ±40	2.0 max.	-	MC3372	MOTOROLA	SMD
CDBKB455KCAY24-R0	455	fn±4.0 min.	100 ±40	2.0 max.	-	TA31136	TOSHIBA	SMD
CDBKB455KCAY27-R0	455	fn±4.0 min.	90 ±30	2.0 max.	-	TK10487	TOKO	SMD
CDBKB455KCAY28-R0	455	fn±4.0 min.	40 ±20	3.0 max.	-	TA31142F	TOSHIBA	SMD
CDBKB455KCAY29-R0	455	fn±4.0 min.	100 ±30	2.5 max.	-	NE605	PHILIPS	SMD
CDBKB455KCAY35-R0	455	fn±4.0 min.	100 ±40	2.5 max.	-	TK10930	TOKO	SMD
CDBKB455KCAY40-R0	455	fn±4.0 min.	40 ±20	3.5 max.	-	TA31145	TOSHIBA	SMD
CDBKB455KCAY49-R0	455	fn±4.0 min.	45 ±10	3.0 max.	-	MC3361	MOTOROLA	SMD
CDBKB455KCAY50-R0	455	fn±4.0 min.	64 ±6.4	4.0 max.	-	CXA3117N	SONY	SMD
CDBKB455KCAY66-R0	455	fn±4.2 min.	40 ±10	4.0 max.	-	NJM2590	JRC	SMD
CDBKB455KCLX36-R0	455	fn±13.0 min.	90 ±30	2.5 max.	5.0 max. [within fn ±6kHz]	NE(SA)606/NE(SA)616	PHILIPS	SMD
CDBKB455KCLX39-R0	455	fn±11.0 min.	130 ±20	2.5 max.	7.0 max. [within fn ±8kHz]	NE607/NE617	PHILIPS	SMD
CDBKB455KCLY13-R0	455	fn±13.0 min.	120 ±30	1.5 max.	5.0 max. [within fn ±8kHz]	CXA1003BM	SONY	SMD
CDBLB455KCAY07-B0	455	fn±4.0 min.	340 ±60	3.0 max.	-	MC3357	MOTOROLA	Lead
CDBLB455KCAY13A-B0	455	fn±4.0 min.	350 ±50	3.0 max.	-	CXA1003BM	SONY	Lead
CDBLB455KCAY24-B0	455	fn±4.0 min.	100 ±40	2.0 max.	-	TA31136	TOSHIBA	Lead
CDBLB455KCAY28-B0	455	fn±4.0 min.	40 ±20	3.0 max.	-	TA31142FN	TOSHIBA	Lead
CDBLB455KCAY34-B0	455	fn±4.0 min.	65 ±20	2.5 max.	-	MC13136	MOTOROLA	Lead
CDBLB455KCAY40-B0	455	fn±4.0 min.	40 ±20	3.0 max.	-	TA31145	TOSHIBA	Lead
CDBLB455KCAY42-B0	455	fn±4.0 min.	40 ±15	3.0 max.	-	TK14590/TK14591	TOKO	Lead
CDBLB455KCAY49-B0	455	fn±4.0 min.	45 ±10	3.0 max.	-	MC3361	MOTOROLA	Lead
CDBLB455KCAY50-B0	455	fn±4.0 min.	64 ±6.4	4.0 max.	-	CXA3117N	SONY	Lead
CDBLB455KCLY09-B0	455	fn±15.0 min.	70 ±20	1.5 max.	3.5 max. [within fn ±8kHz]	NE604N	PHILIPS	Lead

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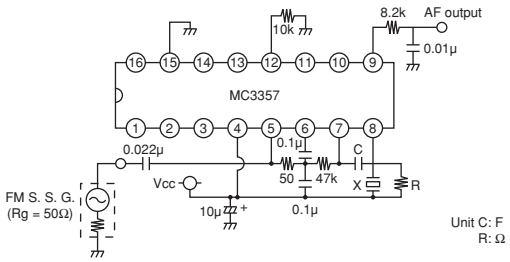
Part Number	Nominal Center Frequency (fn) (kHz)	Recovered Audio 3dB BW (kHz)	Recovered Audio Output (mV)	Distortion (at fn) (%)	Distortion (%)	IC	IC Maker	Type
CDBLB455KCLY13-B0	455	fn±15.0 min.	110 ±30	1.5 max.	5.0 max. [within fn ±8kHz]	CXA1003BM	SONY	Lead
CDBLB455KCAX16-B0	455	fn±4.0 min.	185 ±40	2.0 max.	-	MC3372	MOTOROLA	Lead
CDBLB455KCAX18-B0	455	fn±3.0 min.	180 ±40	2.0 max.	-	MC3371	MOTOROLA	Lead
CDBLB455KCAX36-B0	455	fn±3.5 min.	100 ±25	3.5 max.	-	NE606/NE616	PHILIPS	Lead

For safety purposes, avoid applying a direct current between the terminals.
The order quantity should be an integral multiple of the "Minimum Quantity" shown in package page in this catalog.

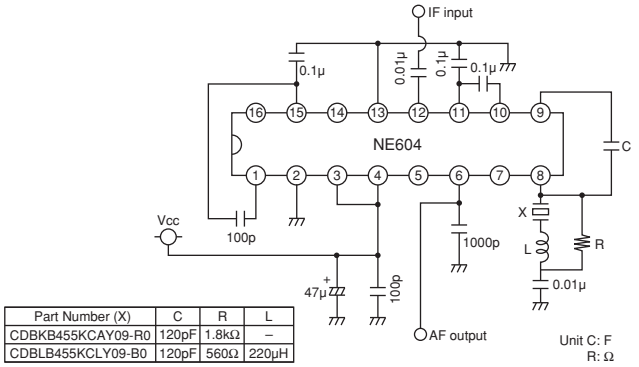
■ Test Circuit

MC3357



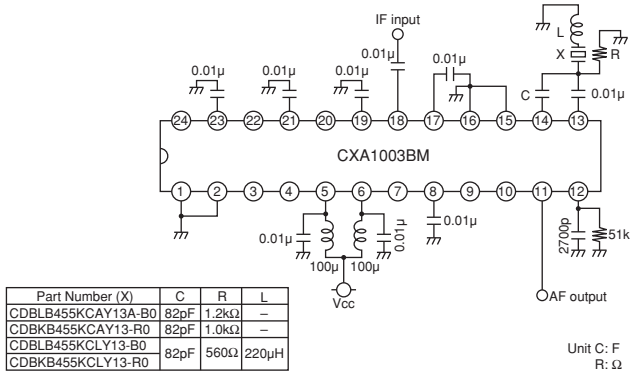
Part Number (X)	C	R
CDBLB455KCAY07-B0	150pF	1.5kΩ
CDBKB455KCAY07-R0	150pF	1.3kΩ

NE604N



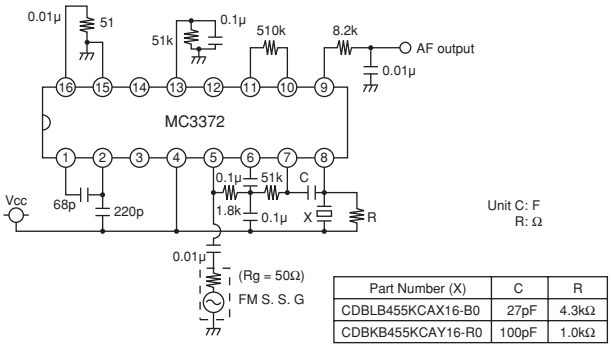
Part Number (X)	C	R	L
CDBKB455KCAY09-R0	120pF	1.8kΩ	–
CDBLB455KCLY09-B0	120pF	560Ω	220µH

CXA1003BM



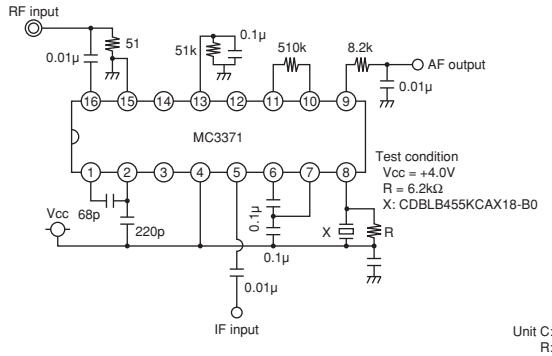
Part Number (X)	C	R	L
CDBLB455KCAY13A-B0	82pF	1.2kΩ	–
CDBKB455KCAY13-R0	82pF	1.0kΩ	–
CDBLB455KCLY13-B0	82pF	560Ω	220µH
CDBKB455KCLY13-R0			

MC3372

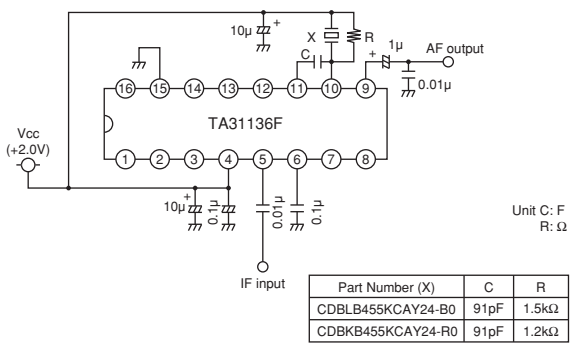


Part Number (X)	C	R
CDBLB455KCAX16-B0	27pF	4.3kΩ
CDBKB455KCAY16-R0	100pF	1.0kΩ

MC3371



TA31136



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

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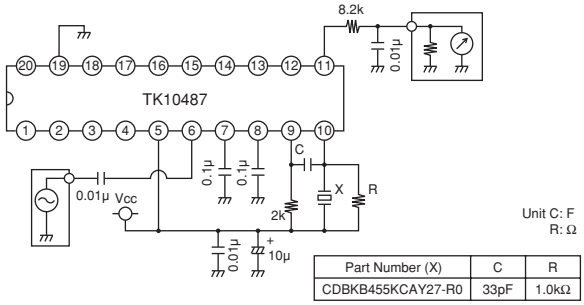
■ Test Circuit

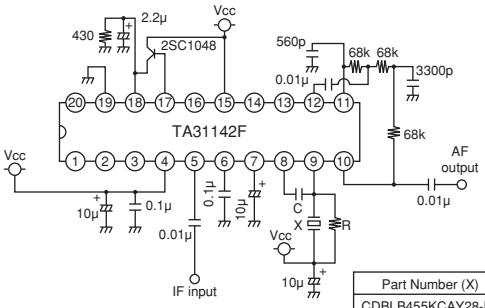
TK10487



Unit C: F
R: Ω

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

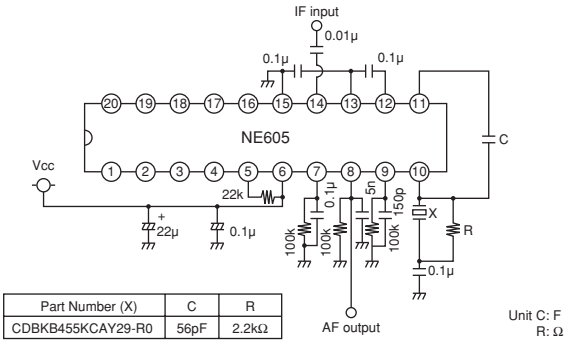
TA31142



Unit C: F
R: Ω

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

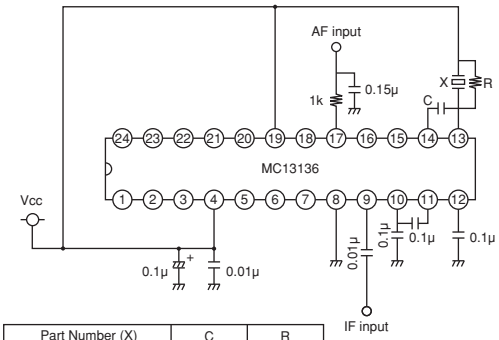
NE605



Unit C: F
R: Ω

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

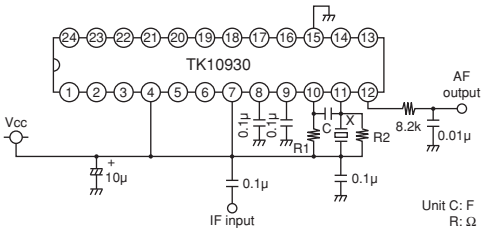
MC13136



Unit C: F
R: Ω

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

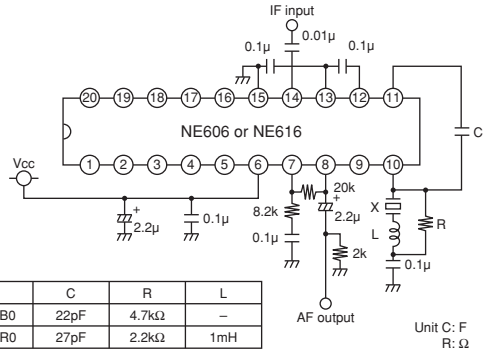
TK10930



Unit C: F
R: Ω

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

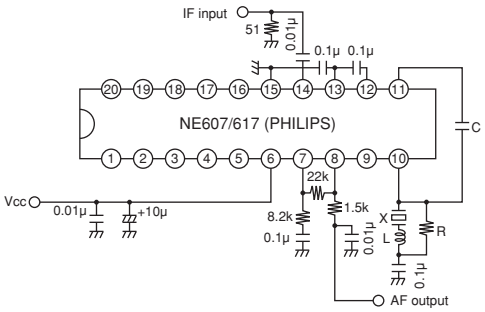
NE(SA)606/616



Unit C: F
R: Ω

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

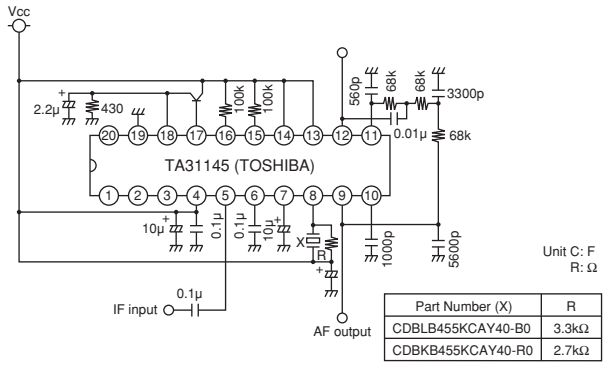
NE(SA)607/617



Unit C: F
R: Ω
L: H

Part Number (X)	C	R	L
CDBKB455KCLX39-R0	22pF	2.7kΩ	1mH

TA31145



Unit C: F
R: Ω

Part Number (X)	R
CDBLB455KCAY40-B0	3.3kΩ
CDBKB455KCAY40-R0	2.7kΩ

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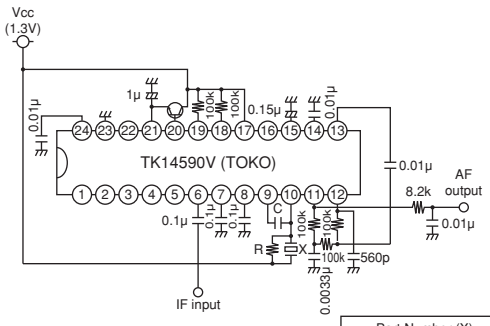
■ Test Circuit

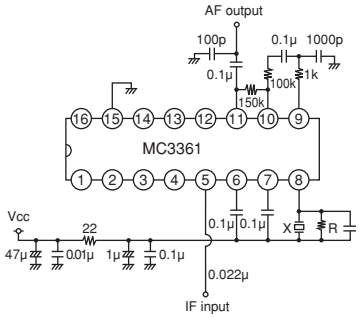
TK14590/14591



Unit C: F
R: Ω

Part Number (X)	C	R
CDBLB455KCAY42-B0	22pF	3.3kΩ

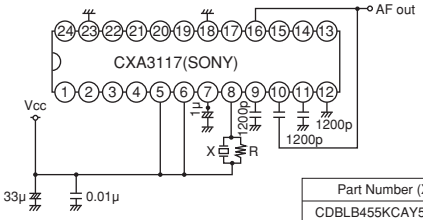
MC3361



Unit C: F
R: Ω

Part Number (X)	R
CDBLB455KCAY49-B0	1.8kΩ
CDBKB455KCAY49-R0	1.5kΩ

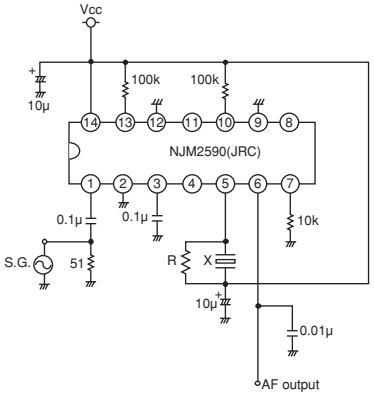
CXA3117



Unit C: F
R: Ω

Part Number (X)	R
CDBLB455KCAY50-B0	8.2kΩ
CDBKB455KCAY50-R0	6.2kΩ

NJM2590

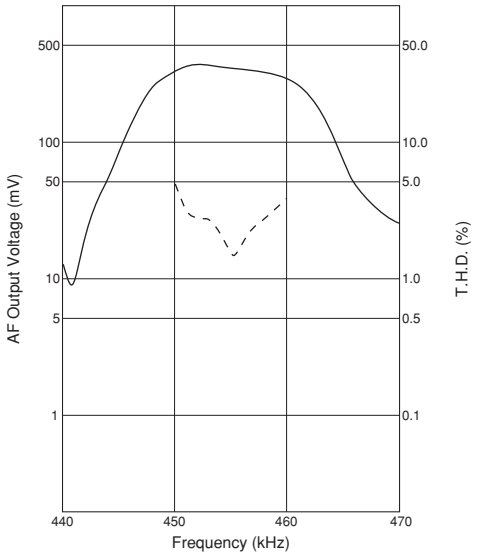


Unit C: F
R: Ω

Part Number (X)	R
CDBKB455KCAY66-R0	3.0kΩ

■ Recovered Audio Curve

CDBKB455KCAY07-R0



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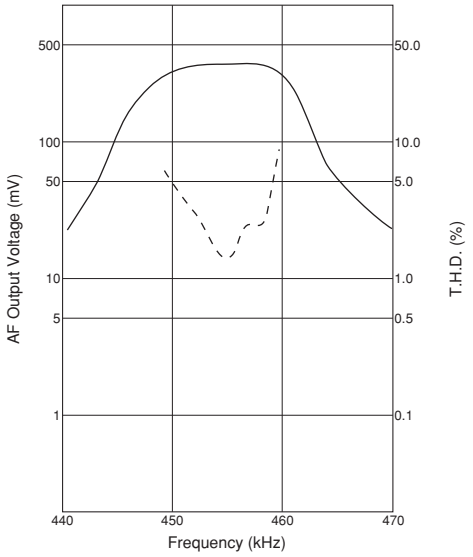

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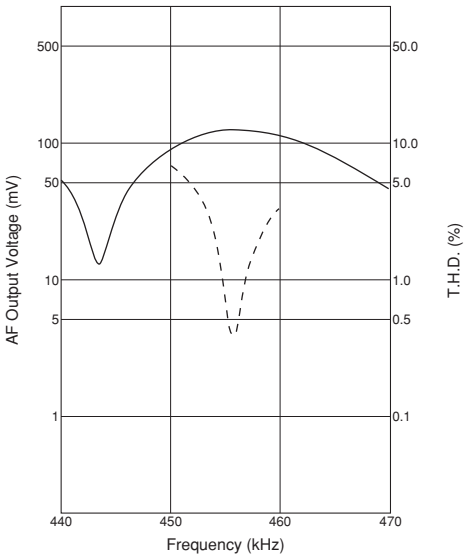
■ Recovered Audio Curve

CDBKB455KCAY09-R0



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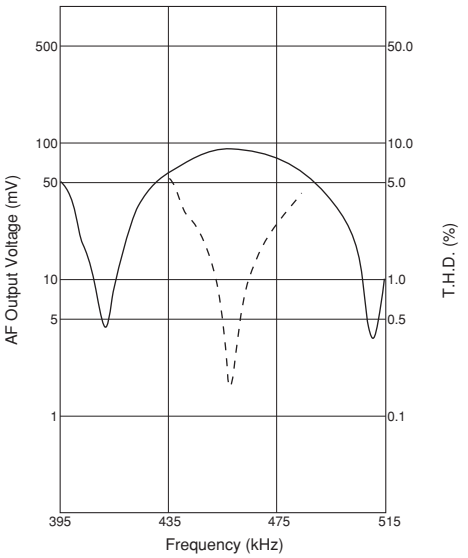

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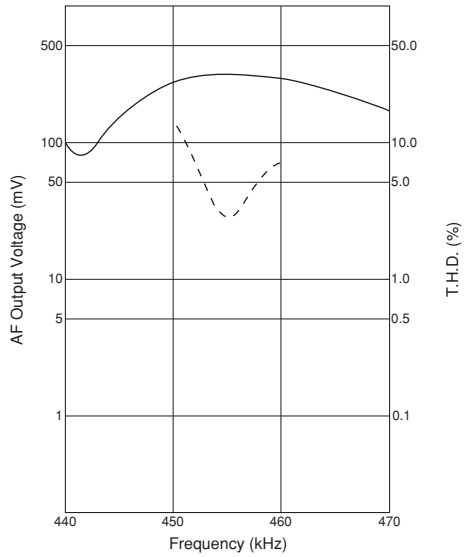

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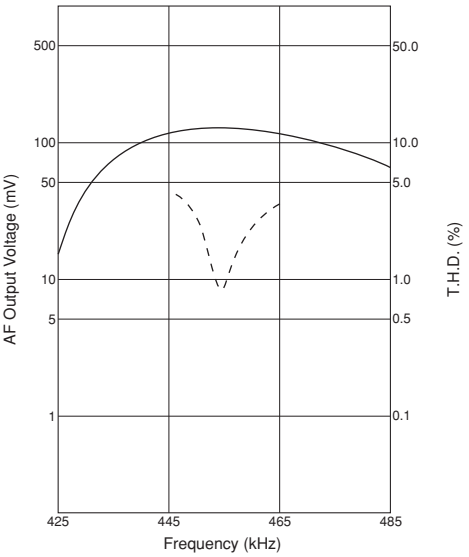

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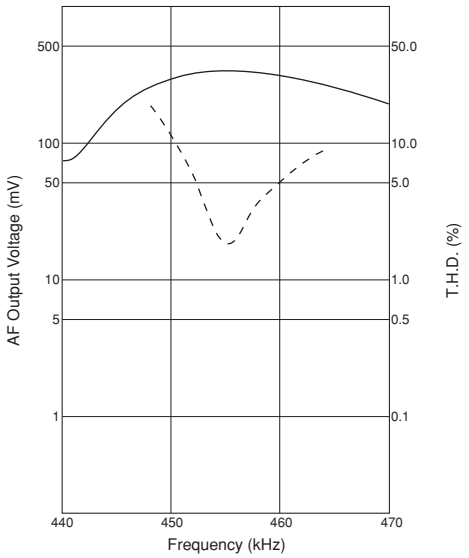

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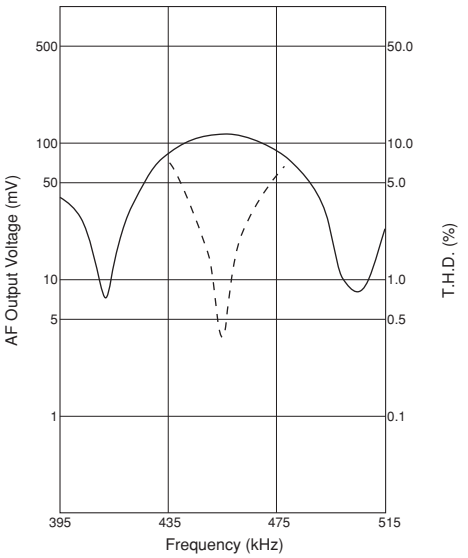

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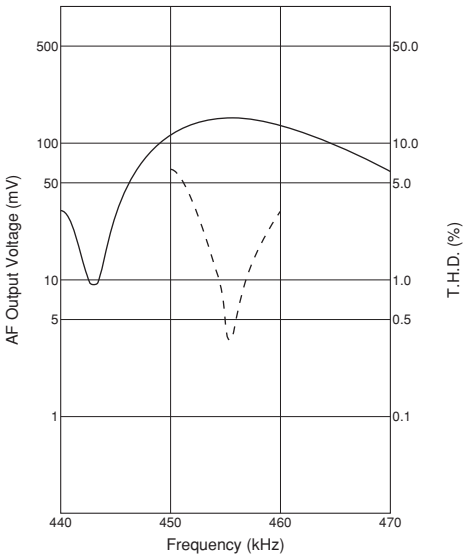
■ Recovered Audio Curve

CDBKB455KCAY16-R0



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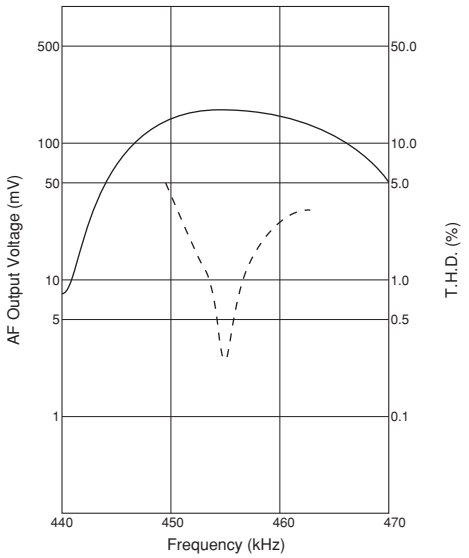

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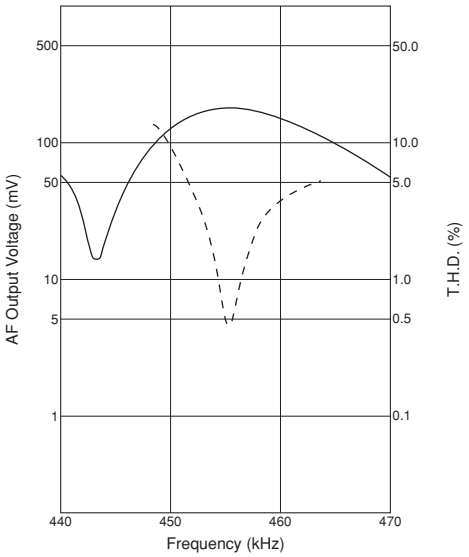

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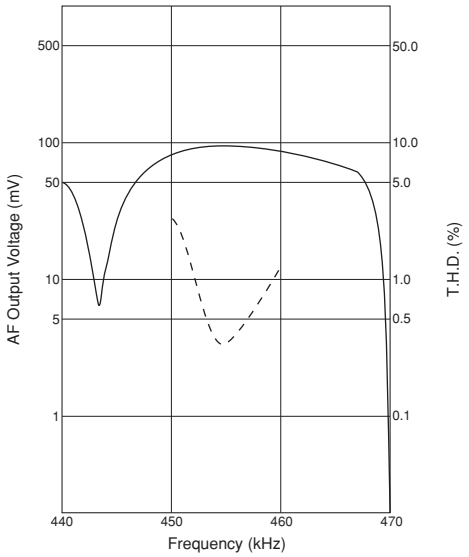

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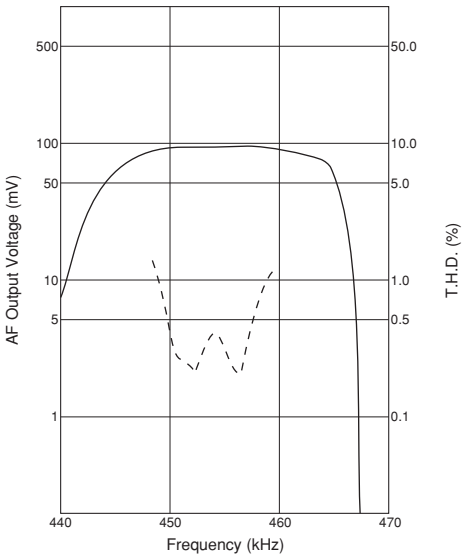

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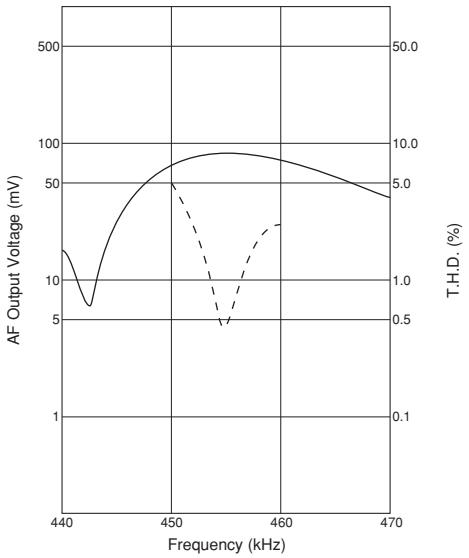

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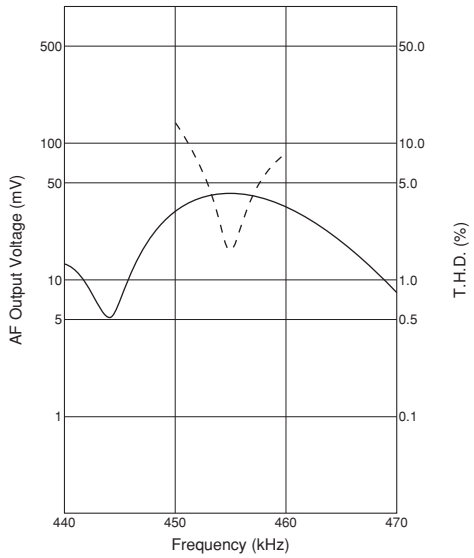
■ Recovered Audio Curve

CDBKB455KCAY28-R0



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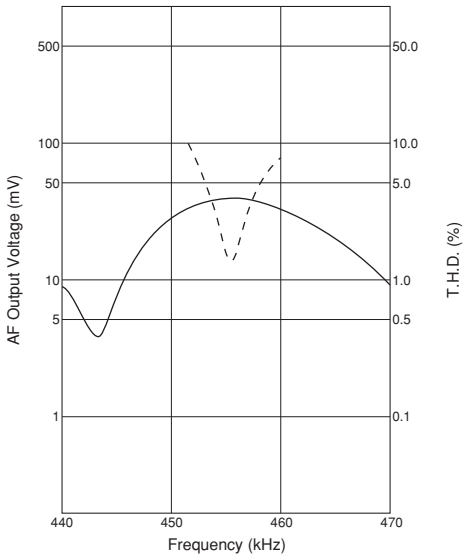

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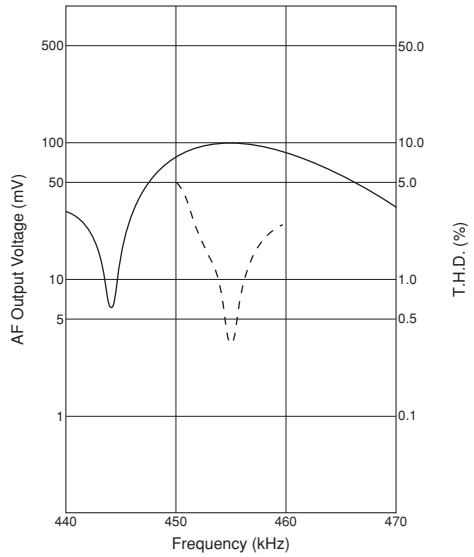

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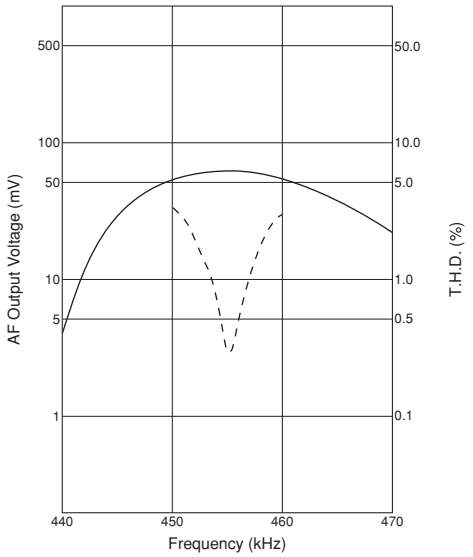

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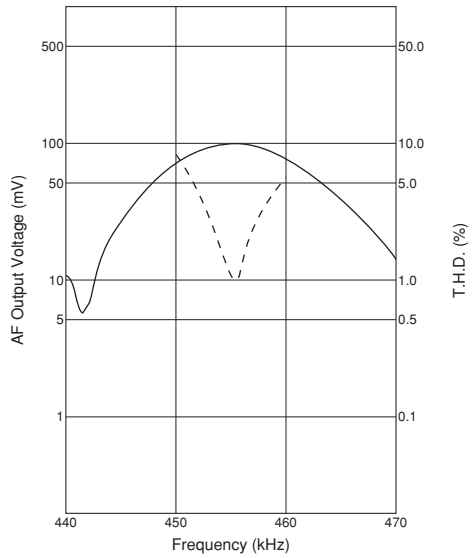

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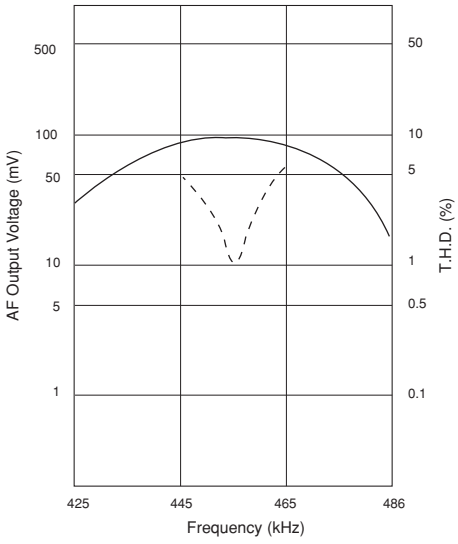

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■ Recovered Audio Curve

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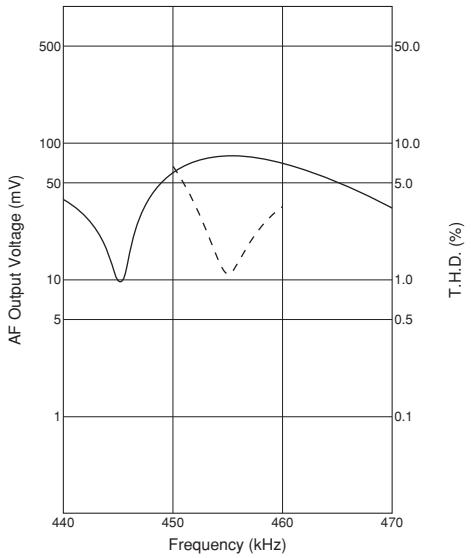

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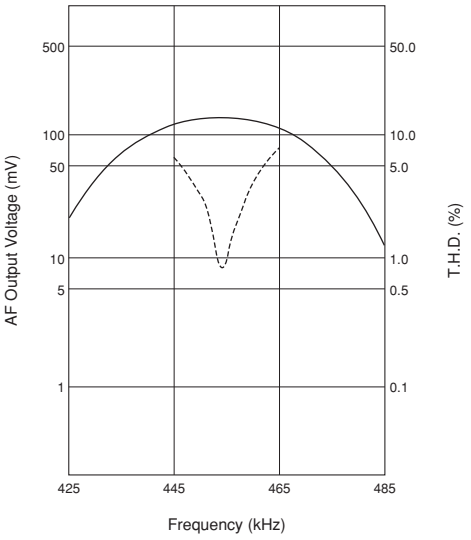

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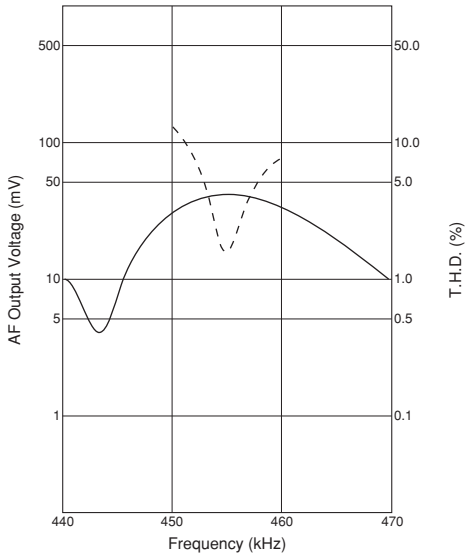
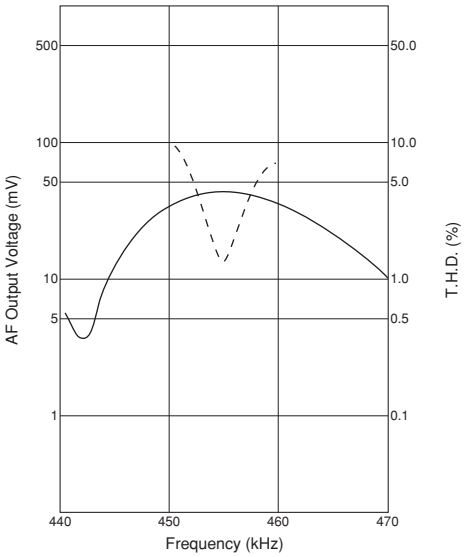


CDBLB455KCAY40-B0



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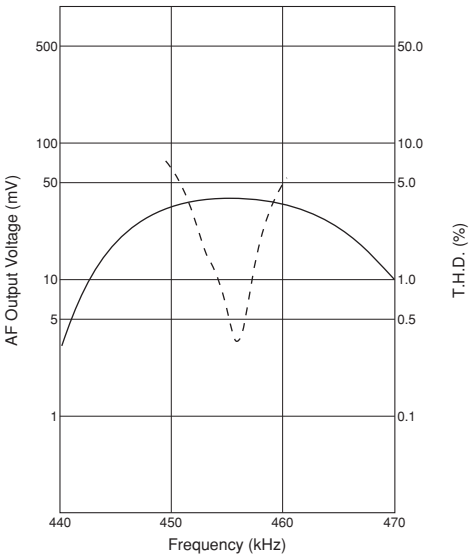

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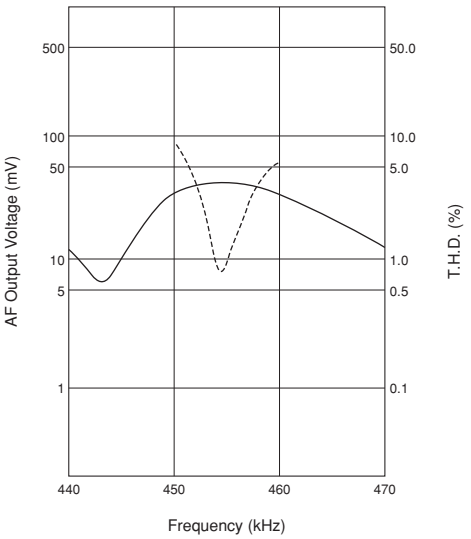

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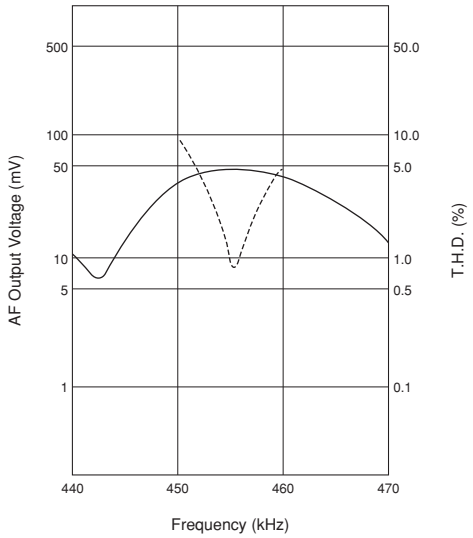
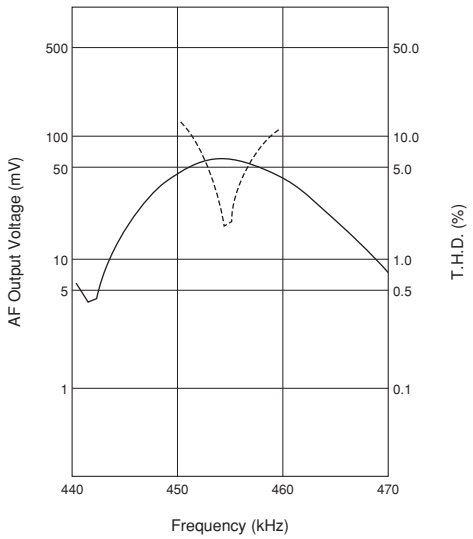
■ Recovered Audio Curve

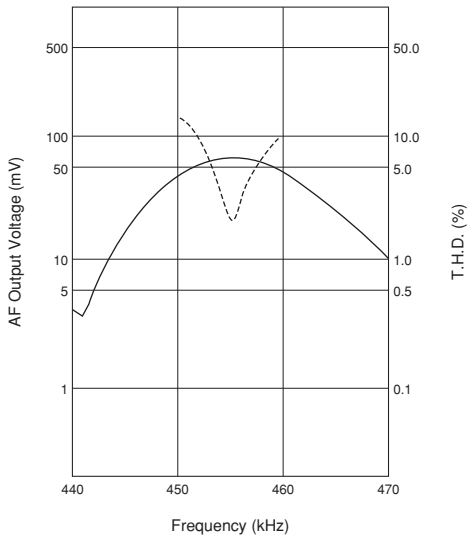
CDBLB455KCAY49-B0



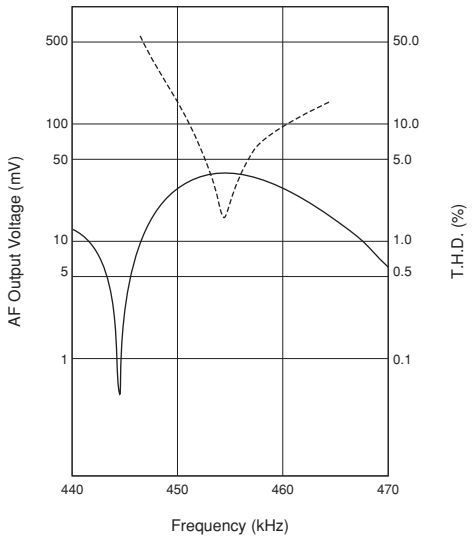
CDBKB455KCAY50-R0



CDBLB455KCAY50-B0



CDBKB455KCAY66-R0

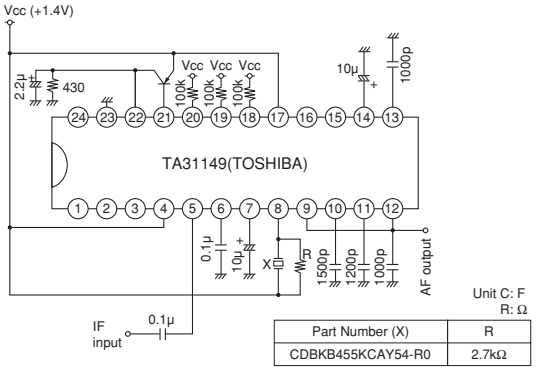


Specified by S Curve Characteristics

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

■ Test Circuit

TA31149

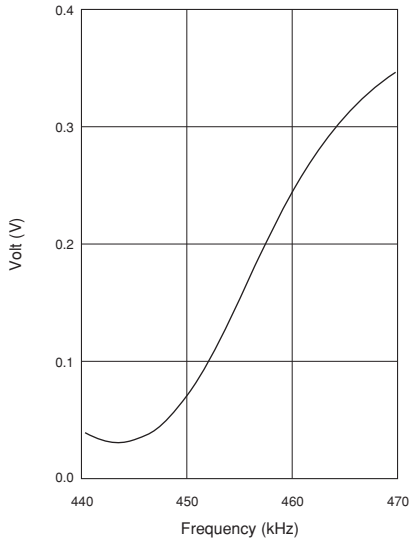


Unit C: F
R: Ω

Part Number (X)	R
CDBKB455KCAY54-R0	2.7kΩ

■ S Curve

CDBKB455KCAY54-R0



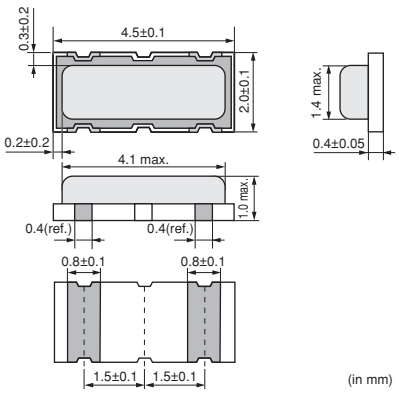
Ceramic Discriminators for Communications Equipment

muRata

MHz Type Ceramic Discriminators

CDSCB10M7 series forms a resonator on a piezoelectric ceramic substrate. In combination with ICs, this type obtains stable demodulation characteristics in a wide bandwidth.
They have 1.0mm max. thickness and small mounting area (4.5x2.0mm).

CDSCB Series



(in mm)

■ Features

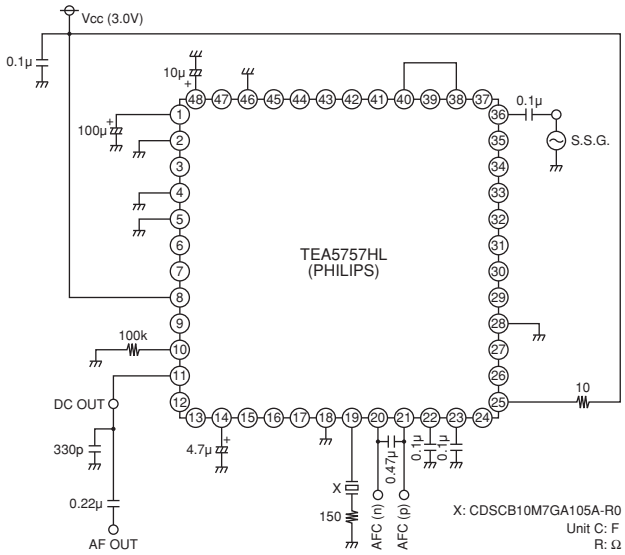
1. Compact and high reliability and recommended for automotive applications.
2. Can be combined with various ICs. The IC is determined by the last number in the part number.
3. Stable demodulation characteristics can be obtained without adjustment.
4. Stable temperature characteristics
5. Available lead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

Part Number	Center Frequency (fo) (MHz)	Recovered Audio 3dB BW (kHz)	Recovered Audio Output (mV)	Distortion (%)	S Curve (mV)	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
CDSCB10M7GA135-R0	10.700 ±30kHz	155 min.	75 min.	-	-	TH71101
CDSCB10M7GA136-R0	10.700 ±30kHz	140 min.	120 min.	-	-	TH7122
CDSCB10M7GF072-R0	10.700 (fn)	fn±150 min.	130 min.	2.0 max.	-	TA31161
CDSCB10M7GF107S-R0	10.700 (fn)	fn±80 min.	52 min.	3.0 max.	-	TA31272FN
CDSCB10M7GF109-R0	10.700 (fn)	fn±100 min.	170 min.	3.0 max.	-	TK14588V
CDSCB10M7GF123-R0	10.700 (fn)	-	-	-	900 min.	TA31275FN
CDSCB10M7GF123S-R0	10.700 (fn)	-	-	-	900 min.	TA31275FN
CDSCB10M7GF126-R0	10.700 (fn)	-	-	-	400 min.	NJM2295AV

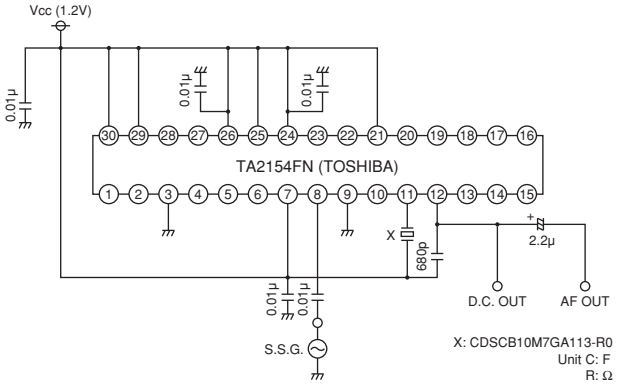
(fn) means nominal center frequency.
The order quantity should be an integral multiple of the "Minimum Quantity" shown in the package page.
For safety purposes, avoid applying a direct current between the terminals.

■ Test Circuit

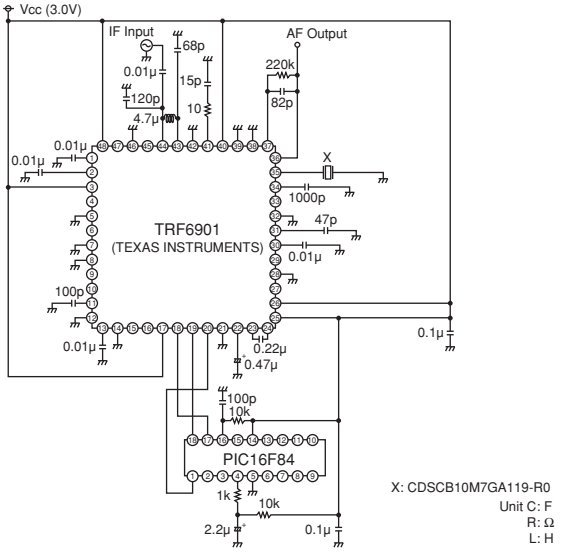
CDSCB10M7GA105A-R0



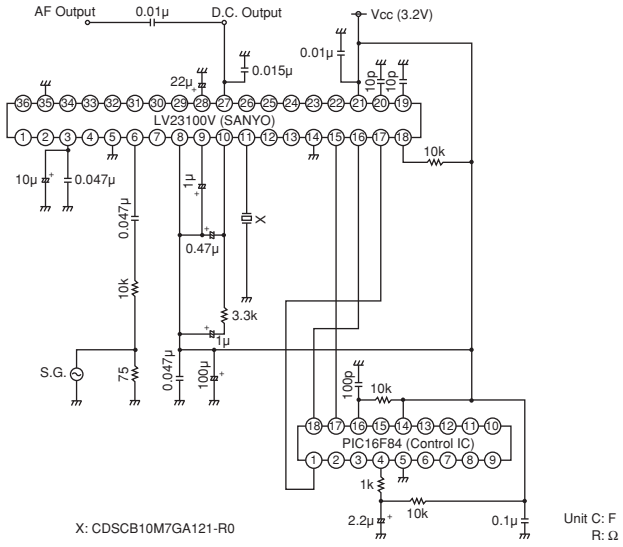
CDSCB10M7GA113-R0



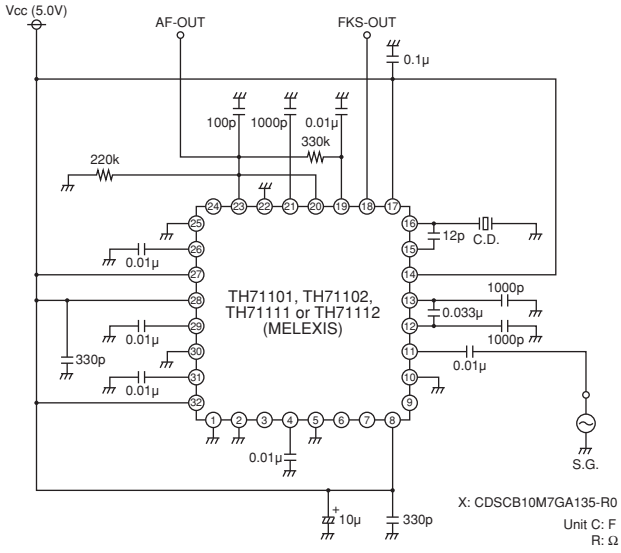
CDSCB10M7GA119-R0



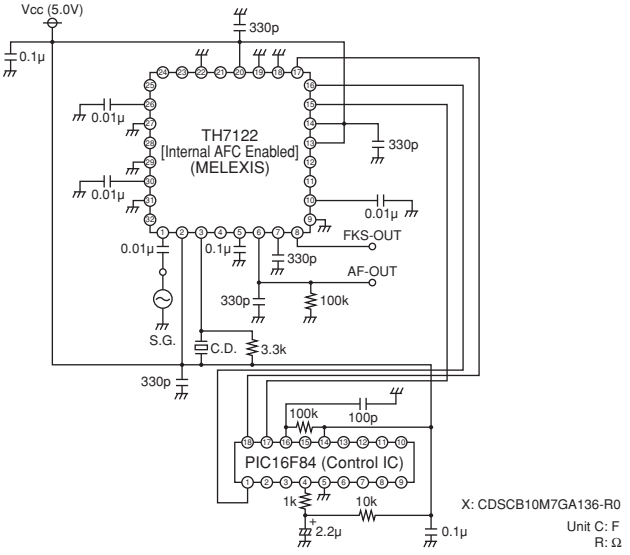
CDSCB10M7GA121-R0



CDSCB10M7GA135-R0



CDSCB10M7GA136-R0



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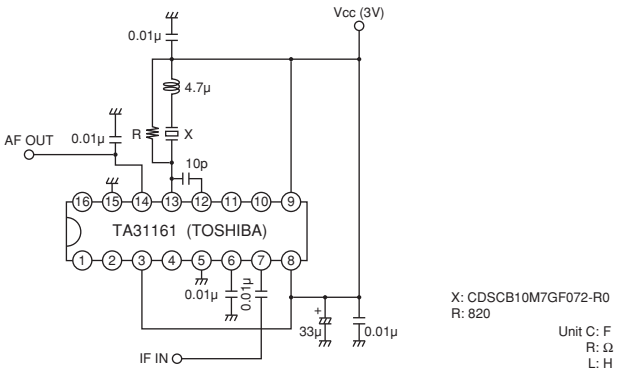
■ Test Circuit

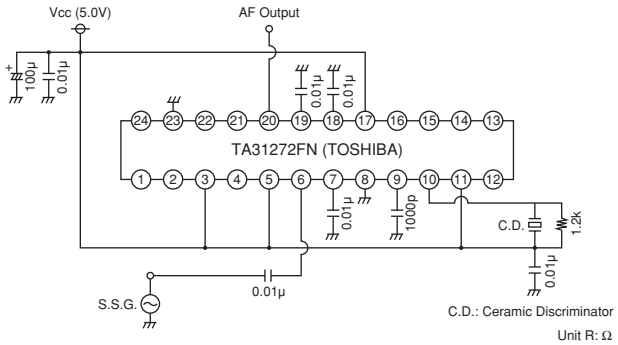
CDSCB10M7GF072-R0



X: CDSCB10M7GF072-R0
R: 820

Unit C: F
R: Ω
L: H

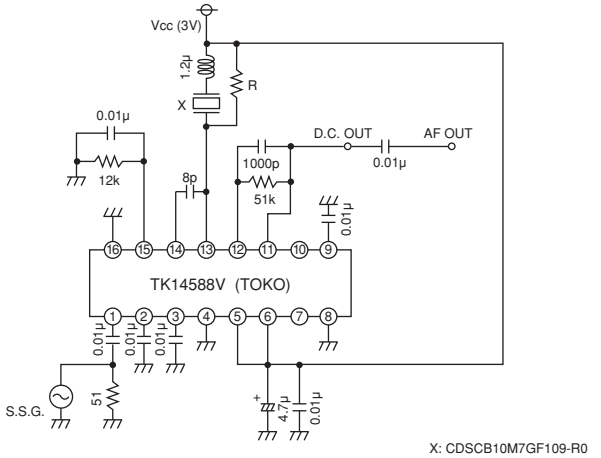
CDSCB10M7GF107S-R0



C.D.: Ceramic Discriminator

Unit R: Ω
C: F
L: H

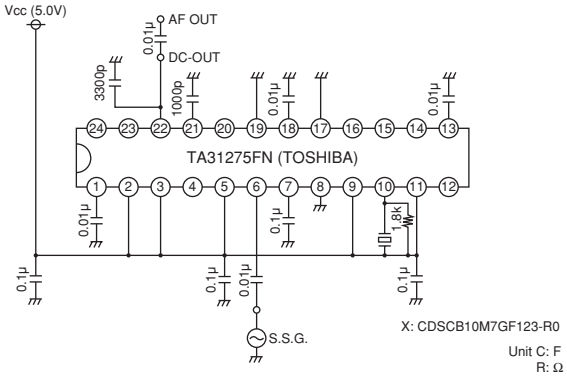
CDSCB10M7GF109-R0



X: CDSCB10M7GF109-R0
R: 820

Unit C: F
R: Ω
L: H

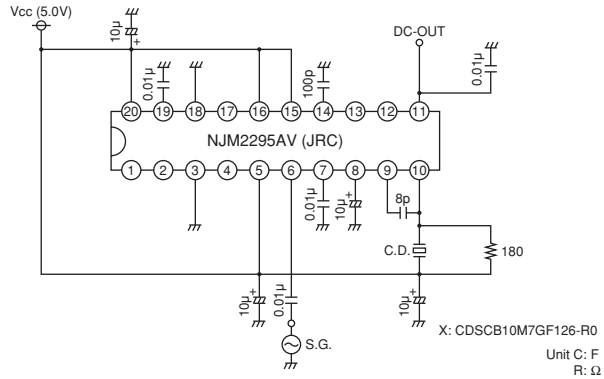
CDSCB10M7GF123-R0



X: CDSCB10M7GF123-R0

Unit C: F
R: Ω

CDSCB10M7GF126-R0

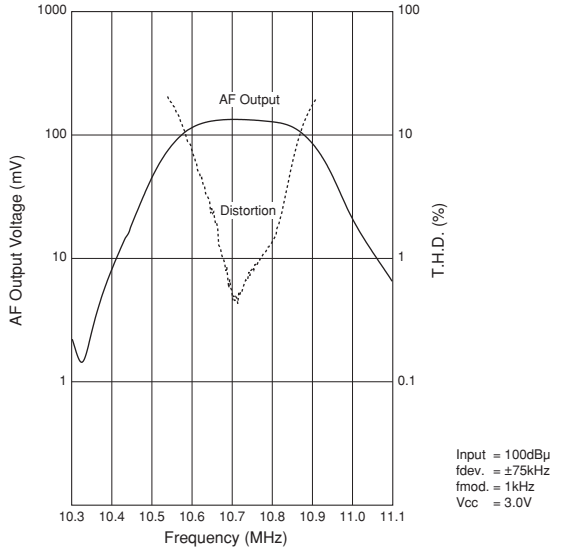


X: CDSCB10M7GF126-R0

Unit C: F
R: Ω

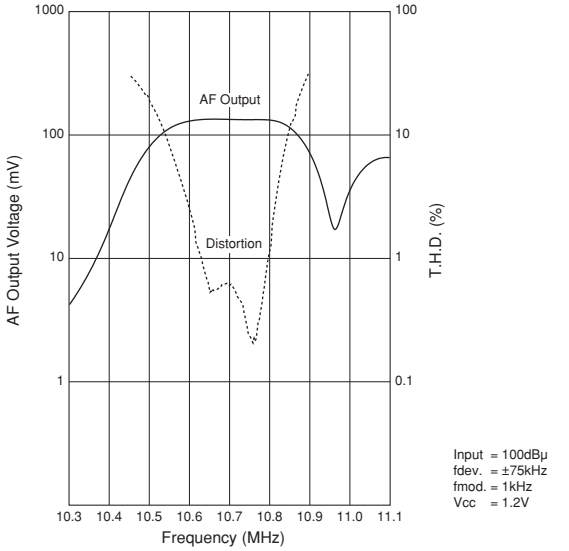
■ Recovered Audio Curve

CDSCB10M7GA105A-R0



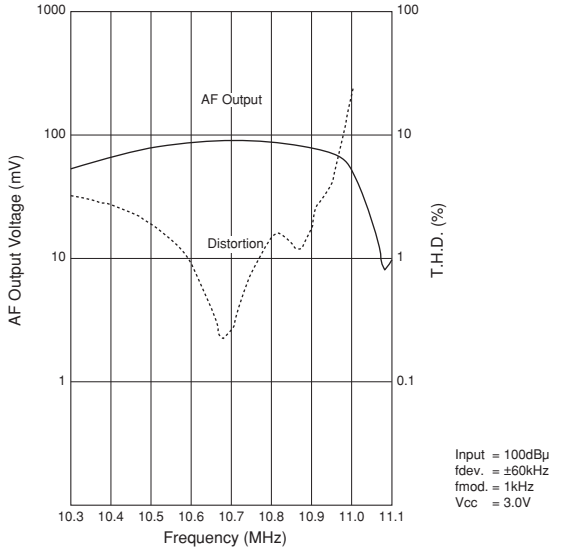
Input = 100dBμ
fdev. = ±75kHz
fmod. = 1kHz
Vcc = 3.0V

CDSCB10M7GA113-R0



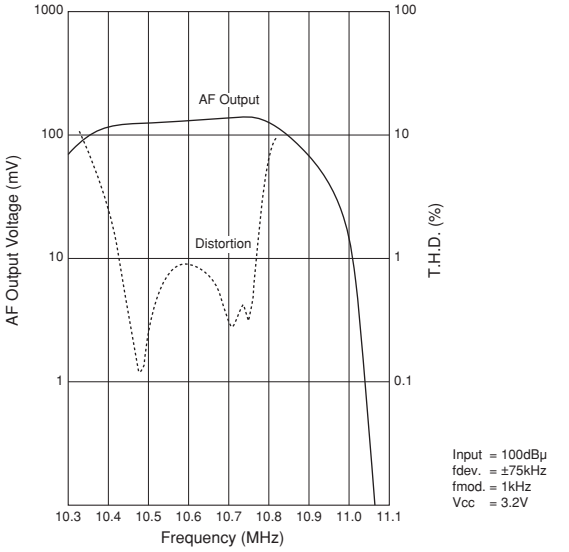
Input = 100dBμ
fdev. = ±75kHz
fmod. = 1kHz
Vcc = 1.2V

CDSCB10M7GA119-R0



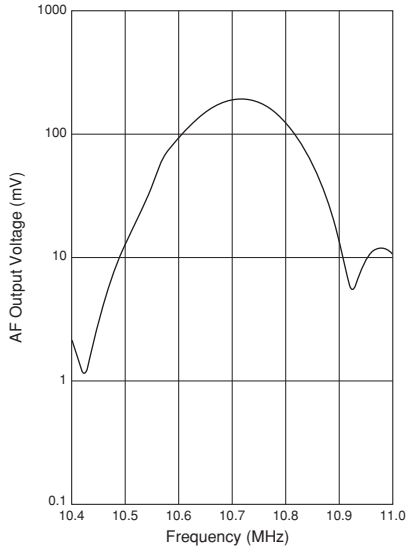
Input = 100dBμ
fdev. = ±60kHz
fmod. = 1kHz
Vcc = 3.0V

CDSCB10M7GA121-R0



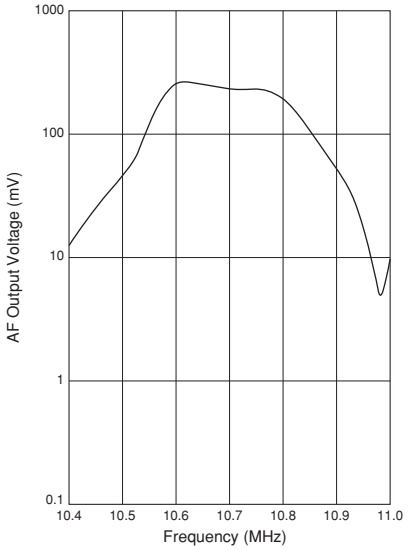
Input = 100dBμ
fdev. = ±75kHz
fmod. = 1kHz
Vcc = 3.2V

CDSCB10M7GA135-R0



Input = 100dBμ
fdev. = ±50kHz
fmod. = 1kHz
Vcc = 5.0V

CDSCB10M7GA136-R0



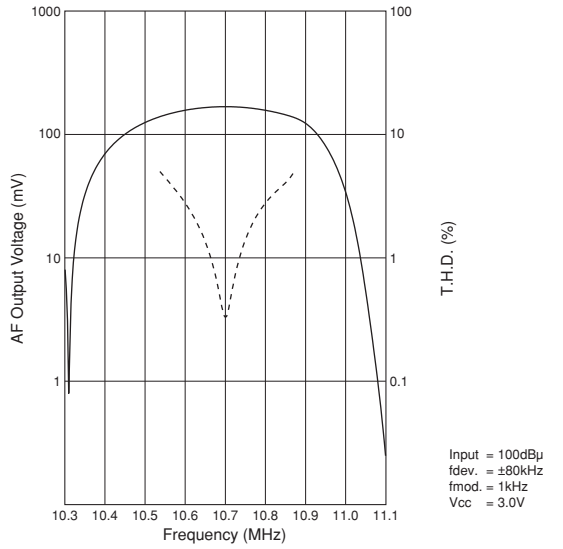
Input = 100dBμ
fdev. = ±50kHz
fmod. = 1kHz
Vcc = 5.0V

Continued on the following page.

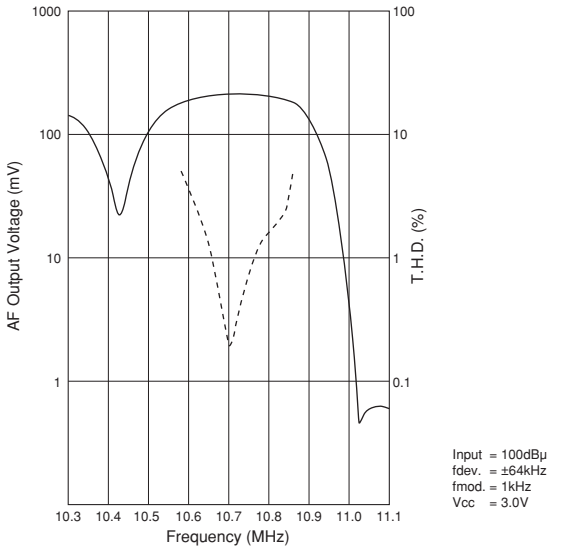
Continued from the preceding page.

■ Recovered Audio Curve

CDSCB10M7GF072-R0

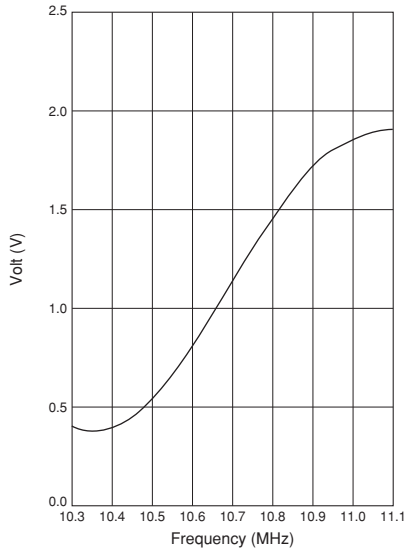


CDSCB10M7GF109-R0

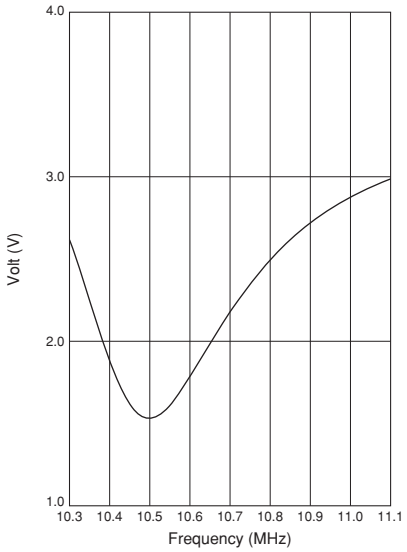


■ S Curve

CDSCB10M7GF123-R0



CDSCB10M7GF126-R0



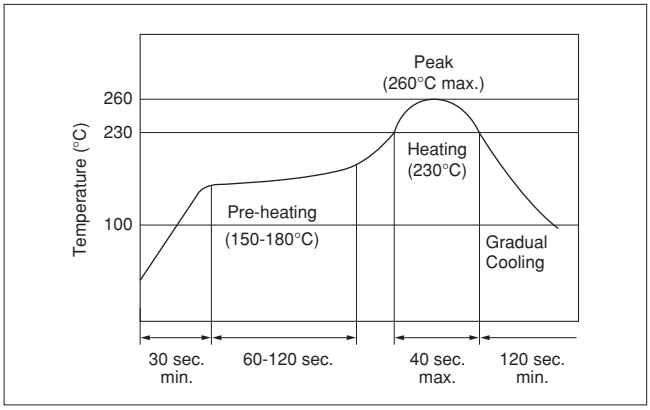
Ceramic Discriminators Notice

■ CDBKB Series Notice (Soldering and Mounting)

1. Standard Reflow Soldering Conditions

(1) Reflow

Filter is soldered twice within the following temperature conditions.



(2) Soldering Iron

Electrode is directly soldered with the tip of soldering iron at +350±5°C for 3.0±0.5 seconds.

2. Wash

(1) Cleaning Solvent

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

(2) Cleaning Conditions

- Immersion Wash
  2 minutes max. in above solvent at +60°C max.
- Shower or Rinse Wash
  2 minutes max. in above solvent at +60°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 or alkaline cleaning solvents.
- If you plan to use any other type of solvents, please consult with Murata or Murata representative prior to using.

■ CDBKB Series Notice (Handling)

1. The component will be damaged when an excessive stress is applied.
2. If the component is cleaned, please confirm that the reliability has not been degraded.
3. In case of covering filter with over coating, conditions such as material of resin, cure temperature, and so on should be evaluated carefully.
4. Do not use strong acidity flux, more than 0.2wt% chlorine content, in reflow soldering.
5. The product, packed in a moisture-proof bag (dry pack), is sensitive to moisture.
   The following treatment is required before applying reflow soldering, to avoid package cracks or reliability degradation caused by thermal stress. When unpacked, store the component in an atmosphere of below 25 degrees C. and below 65%R.H., and solder within 48 hours.

Continued on the following page.

Ceramic Discriminators Notice

Continued from the preceding page.

■ 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. No type of reflow soldering should be applied to this component.
4. Do not clean or wash the component as it is not hermetically sealed.
5. Do not use strong acidity flux, more than 0.2wt% chlorine content, in flow soldering.
6. In case of covering discriminator with over coating, conditions such as material of resin, cure temperature, and so on should be evaluated carefully.

Ceramic Discriminators Notice

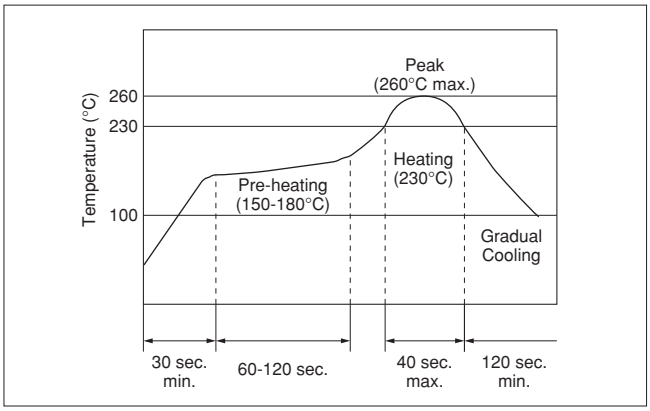
■ CDSCB Series Notice

● Soldering and Mounting

1. Standard Reflow Soldering Conditions

(1) Reflow

Filter is soldered twice within the following temperature conditions.



(2) Soldering Iron

Filter is soldered at +300±5°C for 3.0±0.5 seconds. The soldering iron should not touch the filter while soldering.

(3) Condition for Placement Machines

The component is recommended with placement machines that employ optical placement capabilities. The component might be damaged by excessive mechanical force. Please make sure that you have evaluated by using placement machines before going into mass production. Do not use placement machines that utilize mechanical positioning. Please contact Murata for details beforehand.

(4) Other

(a) The component may be damaged if excess mechanical stress is applied to it mounted on the printed circuit board.

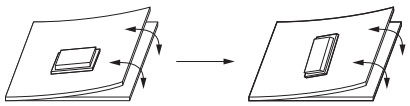
(b) Design layout of components on the PC board to minimize the stress imposed on the warp or flexure of the board.

(c) After installing components, if solder is excessively applied to the circuit board, mechanical stress will cause destruction resistance characteristics to degrade. To prevent this, be extremely careful in determining shape and dimension before designing the circuit board diagram.

(d) When the positioning claws and pick-up nozzle are worn, the load is applied to the components while positioning is concentrated on positioning accuracy, etc. Careful checking and maintenance are necessary to prevent unexpected trouble.

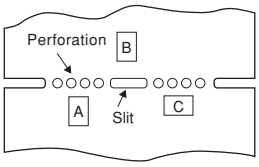
(e) When correcting components with a soldering iron, the tip of the soldering iron should not directly touch the component. Depending on the soldering conditions, the effective area of terminations may be reduced. Solder containing Ag should be used to prevent the electrode erosion.

[Component Direction]



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

[Component Layout Close to Board]



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

Continued on the following page.

Ceramic Discriminators Notice

Continued from the preceding page.

2. Wash

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

3. Coating

In case of overcoating the component, conditions such as material of resin, cure temperature, and so on should be evaluated well.

● Storage and Operating Conditions

1. Product Storage Condition
   Please store the products in a room where the temperature/humidity is stable, and avoid places where there are large temperature changes. Please store the products under the following conditions:
   Temperature: -10 to +40°C
   Humidity: 15 to 85% R.H.
2. Expiration Date on Storage
   Expiration date (shelf life) of the products is six months after delivery under the conditions of a sealed and unopened package. Please use the products within six months after delivery. If you store the products for a long time (more than six months), use carefully because solderability may be degraded due to storage under poor conditions.
   Please confirm solderability and characteristics for the products regularly.
3. Notice on Product Storage
   (1) Please do not store the products in a chemical atmosphere (Acids, Alkali, Bases, Organic gas, Sulfides and so on), because the characteristics may be reduced in quality and may be degraded in solderability due to storage in a chemical atmosphere.
   (2) Please do not put the products directly on the floor without anything under them to avoid damp places and/or dusty places.
   (3) Please do not store the products in places such as a damp heated place or any place exposed to direct sunlight or excessive vibration.
   (4) Please use the products immediately after the package is opened, because the characteristics may be reduced in quality and/or be degraded in solderability due to storage under poor condition.
   (5) Please do not drop the products to avoid cracking of ceramic element.
4. Other
   Please be sure to consult with our sales representative or engineer whenever the products are to be used in conditions not listed above.

● Rating

The component may be damaged if excessive mechanical stress is applied.

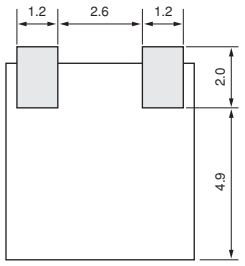
● Handling

1. Accurate test circuit values are required to measure electrical characteristics. Miscorrelation may be caused if there is any deviation, especially stray capacitance, from the test circuit in the specification.
2. For safety purposes, avoid applying a direct current between the terminals.

Ceramic Discriminators Standard Land Pattern Dimensions/Packaging

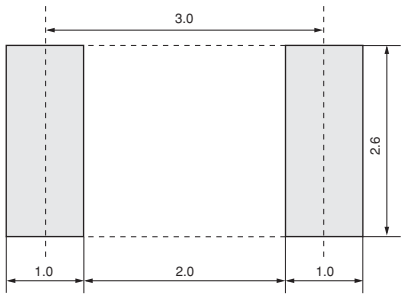
■ Standard Land Pattern Dimensions

CDBKB Series



(in mm)

CDSCB Series



(in mm)

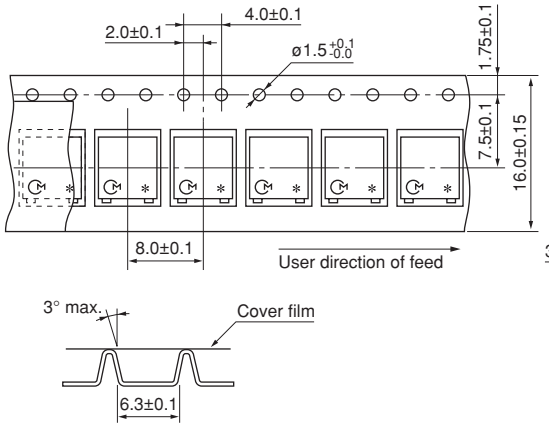
■ Minimum Quantity

Part Number	Taping ø180mm	Bulk
CDBKB Series	500	
CDBLB Series		500
CDSCB Series	2000	

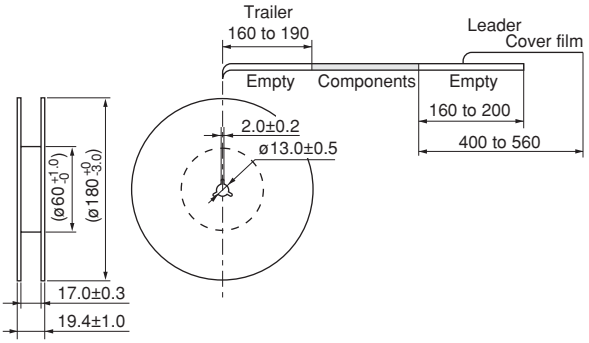
The order quantity should be an integral multiple of the "Minimum Quantity" shown above. (pcs.)

■ CDBKB Series

Dimensions of Carrier Tape



Dimensions of Reel



• Part number marked side is always facing up.

(in mm)

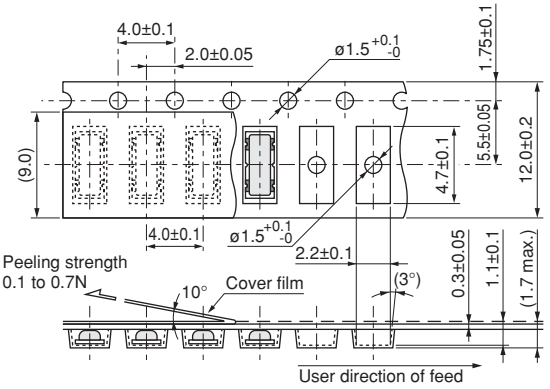
Continued on the following page.

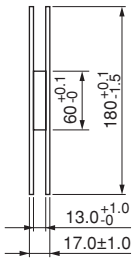
Ceramic Discriminators Standard Land Pattern Dimensions/Packaging

Continued from the preceding page.

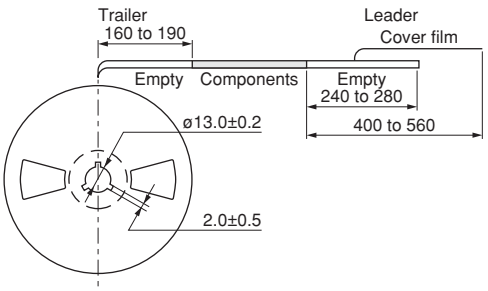
■ CDSCB Series

Dimensions of Carrier Tape





Dimension of reel



• Part number marked side is always facing up.

( ): Reference
(in mm)

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