

ELECTRONIC COMPONENTS



CERAMIC CAPACITOR
MONOLITHIC CERAMIC CAPACITOR



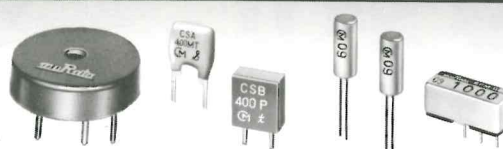
EMI SUPPRESSION FILTER



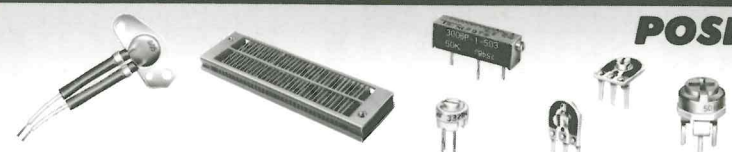
TRIMMER CAPACITOR



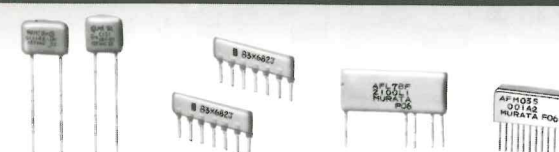
CERAMIC FILTER



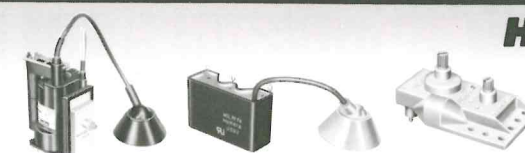
PIEZO ALARM • RESONATOR



POSISTOR® • RESISTOR



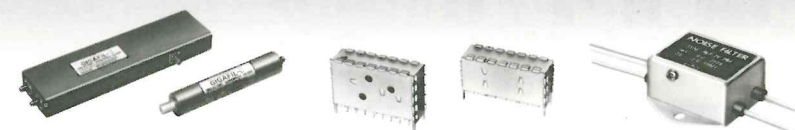
CR NETWORK • HIC®



HIGH VOLTAGE COMPONENTS



SENSOR



OTHERS

EUROPEAN DIVISION

MURATA ERIE ELEKTRONIK GMBH
GERMANY

8500 Nürnberg
Kreuzsteinstraße 1
Tel. (0911) 66065
Tx. 6-26365 u. 6-23763

8802 Bechhofen
Pestalozzistraße 11
Tel. (09822) 911
Tx. 6-1716

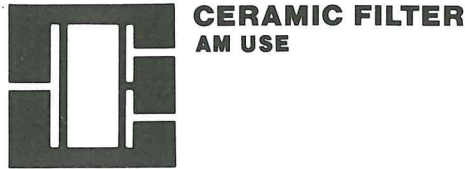
MURATA ERIE ELETTRONICA s.r.l.
ITALY

20125 Milano
Via Melchiorre Gioia, 66
Tel. (02) 6073786
Tx. 330385

00157 Roma
Via Maffio Maffii, 11
Tel. 435.341
Tx. 614461

MURATA ERIE ELECTRONIQUE S.A.
FRANCE

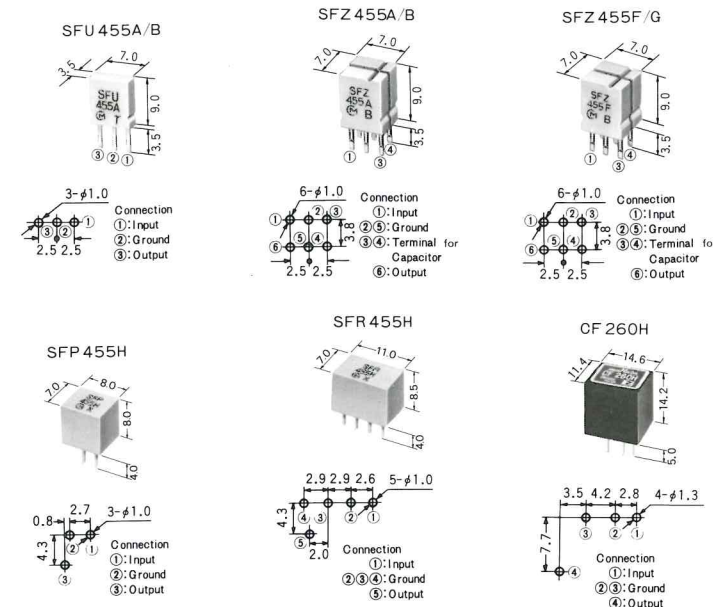
75015 Paris
45, Rue des Bergers
Tel. 558.09.01
Tx. 204520



Most suitable for IC circuits because of ultra-small size and high selectivity.

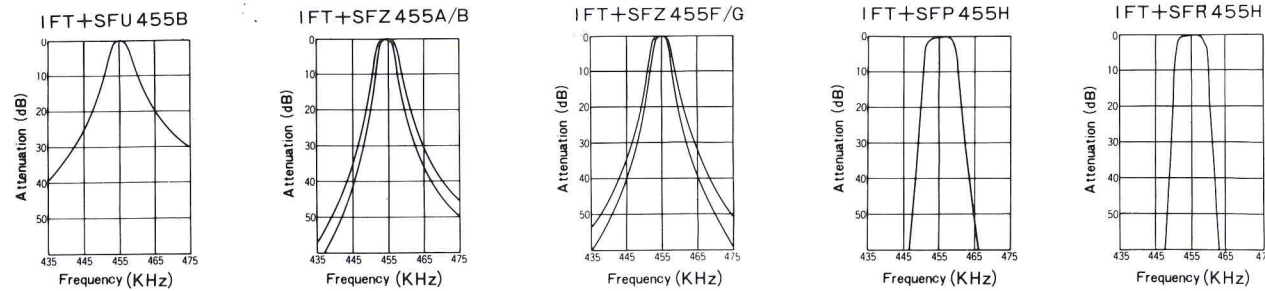
CERAMIC FILTER FOR AM

AM-IF
260KHz·450~482KHz



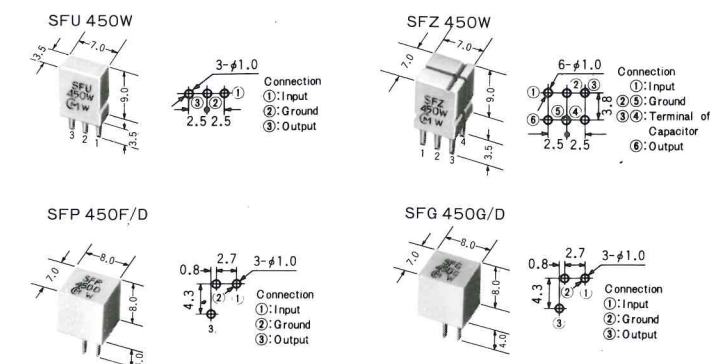
(Unit: mm)

Frequency characteristics



For AM Stereo

450/455KHz NEW

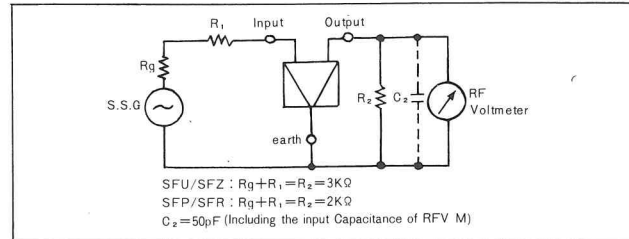


(Unit: mm)

Char. Part Number	3dB or 6dB Band Width (KHz)	Selectivity		Insertion Loss (dB) max.
		-9KHz off (dB) min.	+9KHz off (dB) min.	
SFU455A	10±3	5(7.5)	3(5.5)	5(3)
SFU455B (connected with IFT)	10±3	5(7.5)	3(5.5)	5(3)
SFZ455A	4.5±1	23(27)	18(22)	6(3)
SFZ455B	6.5±1	18(20)	14(16)	6(2)
SFZ455F	4.5±1	23(28)		6(4)
SFZ455G	6.5±1	18(20)		6(3)
SFP455H	6dB B.W±3.0 min. (±4.0)	40(60)		6(1.5)
SFR455H	6dB B.W±3.0 min. (±4.0)	50(75)		6(1.5)
CF260H	6dB B.W±3.0 min. (±4.0)	±10KHz off 50(60)		6(2)

(): Typ. Value

• Test Circuit



SFU/SFZ: $R_g + R_l = R_z = 3K\Omega$
SFP/SFR: $R_g + R_l = R_z = 2K\Omega$
 $C_2 = 50pF$ (Including the input Capacitance of RFV M)

Char. Part Number	6dB. Band Width (KHz)	Selectivity ±10KHz off (dB)	G.D.T (μsec.)	Elements
SFU450W	±5	15	20	1
SFZ450W	±6	15	5	2
SFP450F	±7	30	—	4
SFP450D	±12	(±20KHz off) 50	—	4
SFG450G	±6	30	20	4
SFG450D	±12	(±20KHz off) 40	20	4

• Typ. value: on connecting to IFT.

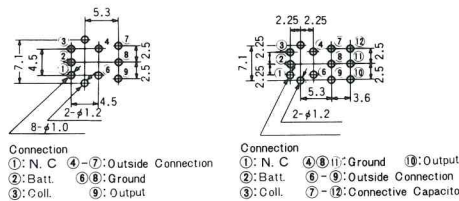
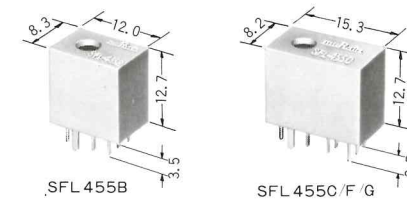
• SFP450 F/D series are smooth amplitude characteristic type,
SFG450 G/D series are smooth GDT characteristic type.

• Various Band Width of CERAFIL for AM stereo are also available.



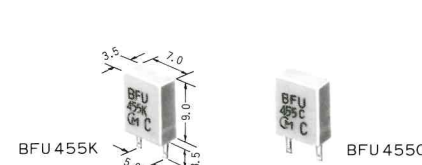
CERAMIC FILTER FOR AM

Ceramic Filter with IFT 450~482KHz



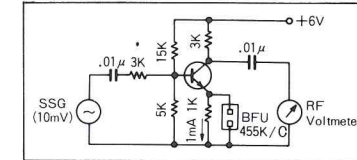
(Unit: mm)

Two-Terminal Resonator Type Ceramic Filter 450~482KHz



(Unit: mm)

• Test Circuit



Char. Part Number	3dB Band Width (KHz)	Selectivity		Resonant Impedance (Ω) max.
		-9KHz off (dB)	+9KHz off (dB)	
BFU455K	8±2	(8)	(12)	30(15)
BFU455C	2.5±1	(16)	(21)	20(10)

(): Typ. Value

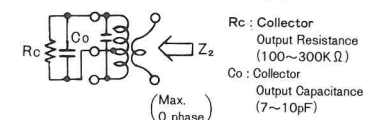
• Typical value of temperature coefficient for fo is 10 ppm/°C.

NOTE
for AM

- Center frequency (fo) is available in a range of 450 ~ 482 KHz. The tolerance of fo is ±2KHz, and ±1 KHz tolerance is available for synthesizers and digital indicators.
- Using SFP/ SFR series, can be obtained high selectivity at ± 9 KHz off, and also high-fidelity in MW-broadcasting.
- SFZ type should be used a coupling capacitance Cc (SL) of 47~56 pF. The band width is variable with Cc values.
- Matching IFT for SFU series should be designed based on following table. Zs indicates the impedance including the secondary side of IFT.

	SFU□□□B	SFZ□□□A/B	SFZ□□□F/G	SFP/SFR□□□
Qo	105	85	85	40
Zs	300 Ω	600 Ω	450~453KHz 700 Ω	455~482KHz 1.2K Ω

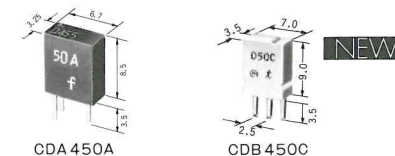
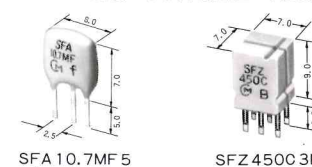
Qo: Unloaded Q
□□□: Frequency



CERAMIC FILTER FOR ELECTRONIC TUNED RADIO

For Search-Stop Signal Detection

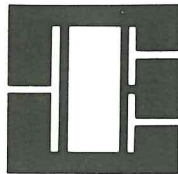
Ceramic Filter 10.7MHz·450KHz



(Unit: mm)

Part Number	Char. Center Frequency	3dB Band Width (KHz)	Selectivity	Peak Separation (KHz)	Applications
SFA10.7MF5	10.7MHz±30KHz	55±20	fo±100KHz (30dB)	—	IF Signal Detection
SFZ450C3N	450±1KHz	2.5±1	fo-9KHz, fo+9KHz (30dB)	—	IF Signal Detection
CDA450A	450±1KHz	—	—	(15)	Zero V Detection (Ratio Detection)
CDB450C	450±1KHz	—	—	(20)	Zero V Detection (Quadrature Detection)

(): Typ. Value



SURFACE ACOUSTIC WAVE FILTER CERAMIC FILTER FM USE

SURFACE ACOUSTIC WAVE FILTER FOR FM

FM Tuner SAF Filter 10.7MHz



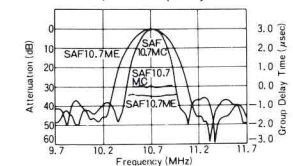
(Unit: mm)

Char. Part Number	Center Frequency	3dB Band Width (KHz)	20dB Band Width (KHz) max.	Insertion Loss (dB) max.	Spurious Response (dB) min.	G.D.T. 0.5μs Band Width (KHz) min.	Temp. Coeff. (ppm/°C)
SAF10.7ME-Z	A: 10.70MHz±30KHz (Red) B: 10.67MHz±30KHz (Blue)	270±50	700	22	33	400	-40±30
SAF10.7MC-Z	C: 10.73MHz±30KHz (Orange) D: 10.64MHz±30KHz (Black)	190±30	500	22	33	300	-40±30
SAF10.7MCI-Z	E: 10.76MHz±30KHz (White)	170±30	420	22	24	200	-40±30

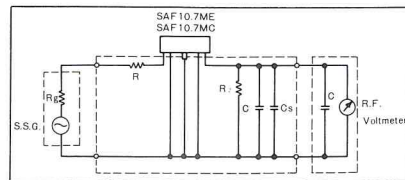
• Features

1. Amplitude characteristic and phase characteristic can be designed individually.
2. Excellent group delay time characteristic.
3. Less susceptible to external impedance change by virtue of being non-resonant type.

SAF10.7MC/ME Frequency Characteristics



• Test Circuit



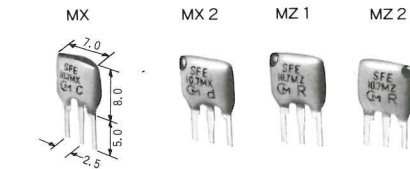
$R_g = 50 \Omega$ C_1 = attached capacitance for adjustment
 $R_1 = 280 \Omega \pm 1\%$ C_s = stray capacitance
 $R_2 = 330 \Omega \pm 1\%$ C_i = input capacitance of voltmeter
 $C_1 + C_i + C_s = 10 \pm 2 pF$

• Temp. Range: -20~+80°C

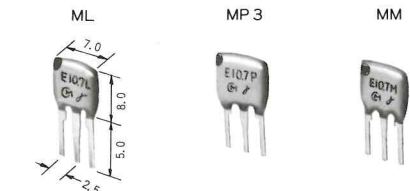
CERAMIC FILTER FOR FM

FM-IF Tuner 10.7MHz

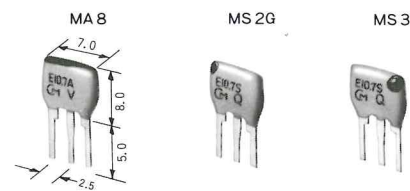
MX Series



ML Series

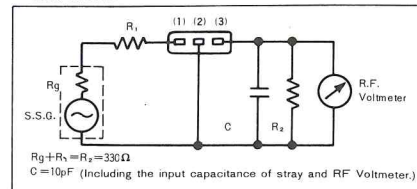


MA Series



(Unit: mm)

• Test Circuit

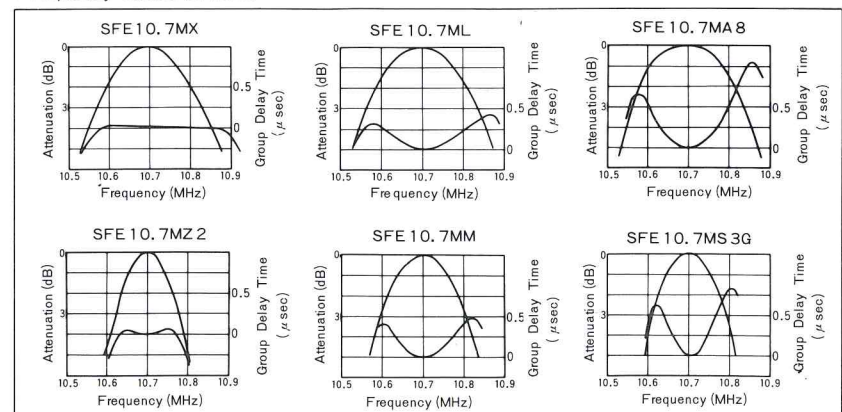


Char. Part Number	3dB Band Width (KHz)	20dB Band Width (KHz) max.	Insertion Loss (dB) max.	Spurious (8~12MHz) (dB) min.	G. D. T. Band Width (KHz) min.
SFE10.7MX	250±40	670 (620)	12 (10)	25 (33)	0.2μsec $f_o \pm 110$
SFE10.7MX2	220±40	610 (560)	12.5 (10.5)	30 (37)	0.15μsec. $f_o \pm 80$
SFE10.7MZ1	180±30	530 (460)	14 (12.3)	33 (38)	0.15μsec. $f_o \pm 60$
SFE10.7MZ2	150±30	500 (420)	14 (12.6)	35 (41)	0.15μsec. $f_o \pm 50$
SFE10.7ML	280±50	650 (610)	9 (7)	25 (33)	0.25μsec. $f_o \pm 70 (\pm 105)$
SFE10.7MP3	250±50	650 (550)	10 (8)	30 (35)	0.25μsec. $f_o \pm 65 (\pm 90)$
SFE10.7MM	230±50	600 (510)	11 (9)	30 (38)	0.25μsec. $f_o \pm 60 (\pm 85)$
SFE10.7MA8	280±50	650 (520)	6 (4)	30 (43)	0.5μsec. $f_o \pm 80 (\pm 100)$
SFE10.7MS2G	230±50	600 (420)	7 (4.5)	40 (45)	0.5μsec. $f_o \pm 60 (\pm 75)$
SFE10.7MS3G	180±40	520 (380)	9 (5)	40 (45)	0.5μsec. $f_o \pm 45 (\pm 60)$

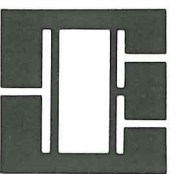
• In Output Impedance: 330Ω

• The rank of center frequencies is available in two series; 30KHz steps and 25KHz steps.

Frequency characteristics



CERAMIC FILTER FM USE

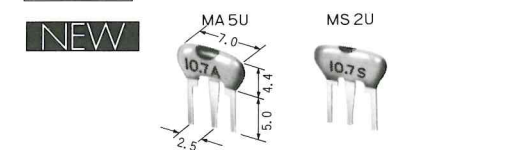


CERAMIC FILTER FOR FM

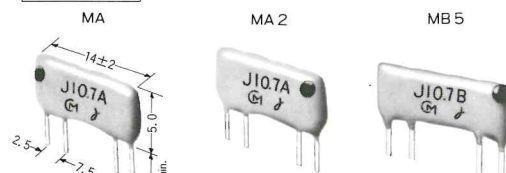
Radio Ceramic Filter 10.7MHz



μ Series Ceramic Filter 10.7MHz



FM-Stage 10.7MHz



(Unit: mm)

Char. Part Number	3dB Band Width (KHz)	20dB Band Width (KHz) max.	Insertion Loss (dB) max.	Spurious (8~12MHz) (dB) min.
SFE10.7MA5	280±50	650 (520)	6 (4)	30 (43)
SFE10.7MS2	230±50	600 (420)	6 (4)	40 (45)
SFE10.7MS3	180±40	520 (380)	7 (4.5)	40 (45)
SFE10.7MJ	150±40	400 (300)	10 (5)	40 (45)

• Input, Output Impedance: 330Ω

• () : Typ. Value

Char. Part Number	3dB Band Width (KHz)	20dB Band Width (KHz) max.	Insertion Loss (dB) max.	Spurious (8~12MHz) (dB) min.
SFE10.7MA5U	280±50	650	6	30
SFE10.7MS2U	230±50	600	6	40

• Input Output Impedance: 330Ω

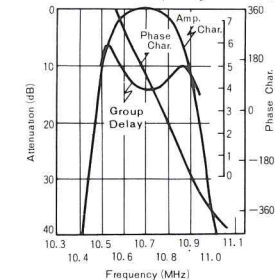
• Most suitable for a thin type set.

Char. Part Number	3dB Band Width (KHz)	50dB Band Width (KHz) max.	Insertion Loss (dB)	Spurious (8~12MHz) (dB) min.
SFJ10.7MA	280±50	750 (620)	7±2	55 (80)
SFJ10.7MA2	230±50	700 (580)	7±2	60 (90)
SFJ10.7MB5	180±40	590 (490)	9.5±2	60 (90)

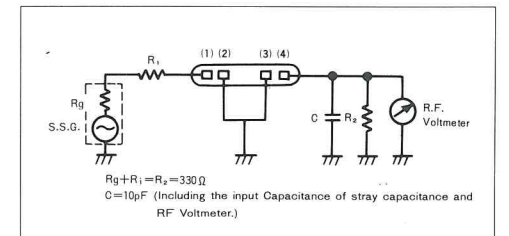
• Input, Output Impedance: 330Ω

• () : Typ. Value

SFJ10.7MA Frequency Characteristic



• Test Circuit



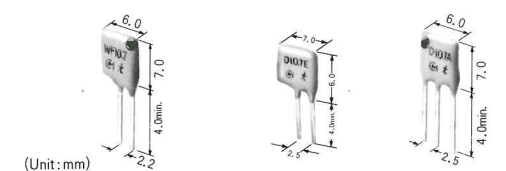
NOTE for FM

1. The rank of center frequency is available in two series; 30KHz steps and 25KHz steps. The series of 25KHz steps are most suitable to synthesizer tuners. This type are distinguished by adding H to the end of part number.
2. The group delay time characteristics is checked in all items for stereo tuners.
3. The best matching with Cerafil® is obtained with input/output matching impedance of 330Ω.
4. The temperature coefficient of center frequency is $\pm 50 p.p.m/^{\circ}C$ or less at -20°C to +80°C for all types.

30KHz step	Color	25KHz step
D: 10.64MHz±30KHz	Black	D: 10.650MHz±25KHz
B: 10.67MHz±30KHz	Blue	B: 10.675MHz±25KHz
A: 10.70MHz±30KHz	Red	A: 10.700MHz±25KHz
C: 10.73MHz±30KHz	Orange	C: 10.725MHz±25KHz
E: 10.76MHz±30KHz	White	E: 10.750MHz±25KHz

FM Detector Ceramic Discriminator 10.7MHz

WFA 10.7MA CDA 10.7ME CDA 10.7MA

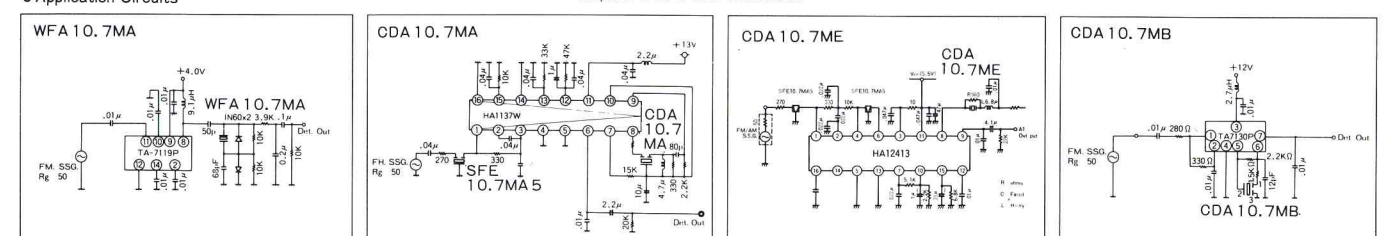


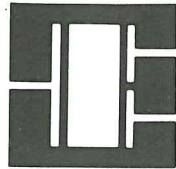
(Unit: mm)

Char. Part Number	Recovered Audio Volt. (mV)	Distortion Factor (%)	Recovered Audio 3dB Band Width (KHz)	Detection System	Applied IC
WFA10.7MA	30	0.1	500	Ratio	TA7119P, μPC1018C
CDA10.7MA	80	0.1	350	Quadrature	HA1137W, μPC1167C LA1230, M51173P
CDA10.7ME	95	0.2	260	Quadrature	HA12413
CDA10.7MB	150	0.1	230	Differential Peak	TA7130P, μPC1028H LA1150

• 30% Dev. Type, Value.

• Adaptable to ICs of other manufactures.



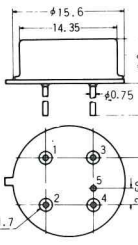


SURFACE ACOUSTIC WAVE FILTER CERAMIC FILTER TV/VTR USE

SURFACE ACOUSTIC WAVE FILTER FOR TV

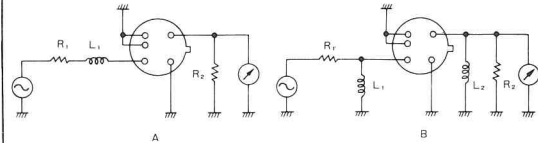
VIF SAF Filter

38/45/58MHz



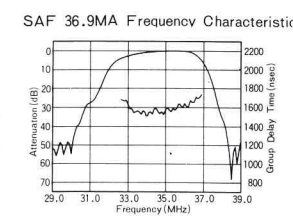
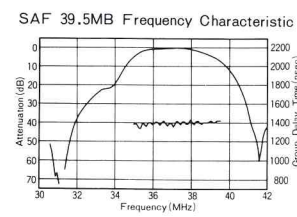
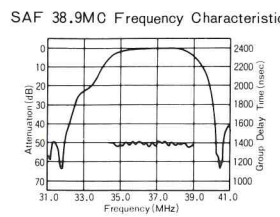
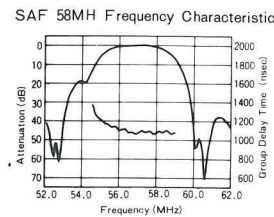
(Unit: mm)

Test Circuit



	SAF58MH	SAF58ME	SAF45MA	SAF45MM	SAF38.9MC	SAF39.5MB	SAF36.9MA
Mesuring Cir Cuit	(B)	(A)	(B)	(B)	(B)	(B)	(B)
R ₁ (Ω)	330	75	390	75	75	75	75
L ₁ (μH)	0.75	0.82	1.2	—	0.23	0.23	0.23
R ₂ (Ω)	560	75	680	75	75	75	75
L ₂ (μH)	1.0	—	1.5	—	—	—	—

Char. Part Number	Insertion Loss (dB) max.	Picture Carrier (dB)	Chroma Carrier (dB)	Sound Carrier (dB)	Adjacent Sound Carrier (dB) min.	Adjacent Picture Carrier (dB) min.	Spurious Response (dB) min.	Triple Transit Echo (dB) max.	Group Delay Time (nsec) max.	Temperature Coefficient (ppm/°C)
SAF58MH	20	4.5±1.5	4.5±2	20.0±3	43	43	30	-35	±40	-25±15
SAF58ME	22	5.0±1.5	5.5±2	17.0±3	43	43	30	-35	±40	-25±15
SAF45MA	20	4.0±1.5	4.5±2	18.0±4	43	43	30	-35	±40	-25±15
SAF45MM	23	4.0±1.5	4.0±2	20.0±4	43	43	30	-35	±50	-40±15
SAF38.9MC	21	4.0±1.5	4.0±2	19.0±3	43	43	30	-40	±50	-40±15
SAF39.5MB	21	5.0±1.5	4.0±2	22.0±4	43	43	30	-40	±50	-40±15
SAF36.9MA	21	5.5±1.5	4.5±2	23.0±4	43	43	30	-40	±50	-40±15



CERAMIC FILTER FOR TV/VTR

TV SIF Stage

4.5/5.5/6.0/6.5MHz



4.5MB



5.5MB



6.0MB



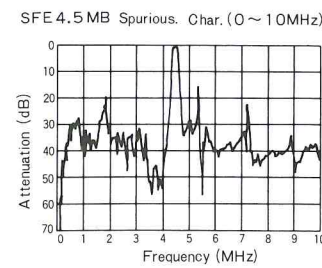
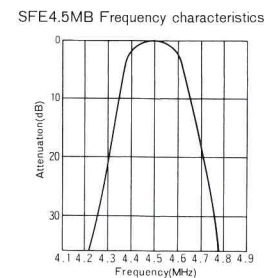
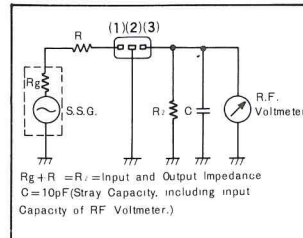
6.5MB

(Unit: mm)

Char. Part Number	3dB Band Width (KHz) min.	20dB Band Width (KHz) max.	Insertion Loss (dB) max.	Spurious (dB) min.	In. Output Impedance (Ω)
SFE4.5MB	±60 (±105)	530 (420)	6 (4)	20 (Within 4.5±0.8MHz)	1K
SFE5.5MB	±75 (±120)	550 (470)	6 (3)	25 (Within 5.5±1.0MHz)	600
SFE6.0MB	±80 (±130)	600 (500)	6 (2.5)	25 (Within 6.0±1.0MHz)	470
SFE6.5MB	±80 (±130)	630 (530)	6 (2.5)	25 (Within 6.5±1.0MHz)	470

• 3.58 and 4.43MHz for chroma and versions with various other frequencies for VTR are also available.
(): Typ. Value

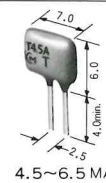
Test Circuit



CERAMIC FILTER FOR TV/VTR

Ceramic Trap 4.5/5.5/6.0/6.5MHz

Two-terminal type

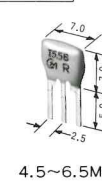


4.5~6.5MA

Three-terminal type

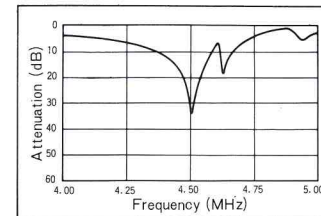


4.5MC



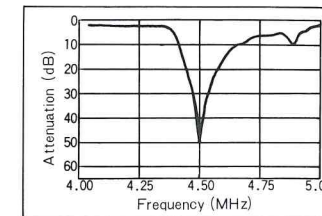
4.5~6.5MB

TPS4.5MA Freq. Char.

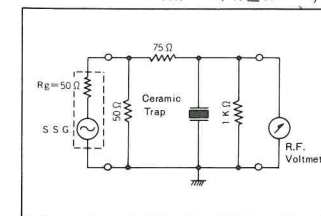


(Unit: mm)

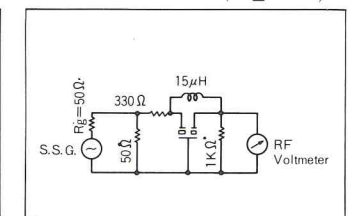
TPS4.5MC Freq. Char. (within 4.5±0.5MHz)



TPS4.5MA Test Circuit (4.5±0.5MHz)



TPS4.5MC Test Circuit (4.5±0.5MHz)



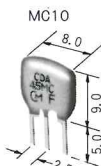
NOTE for TV/VTR

• The center frequency of ceramic filters and traps other than 4.5/5.5/6.0/6.5MHz for TV SIF are available e.g. 3.58, 4.43MHz for chroma and 4.21, 4.27, 5.06, 5.12MHz for VTR.

Using 3-terminal trap, bigger trap value can be obtained. Frequency characteristics are adjusted with coupling inductance. with resistance coupling is also available.

TV SIF Stage Ceramic Discriminator

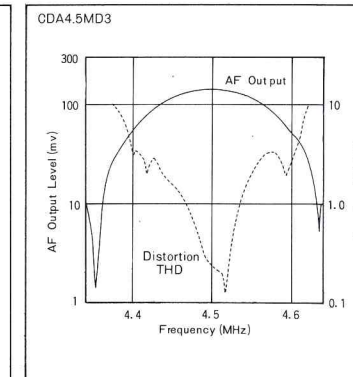
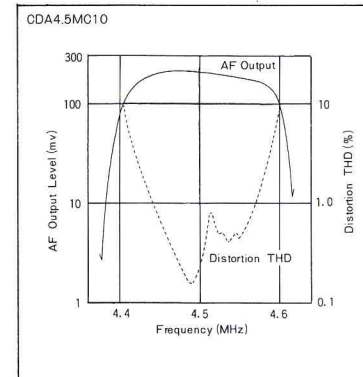
4.5/5.5/6.0/6.5MHz



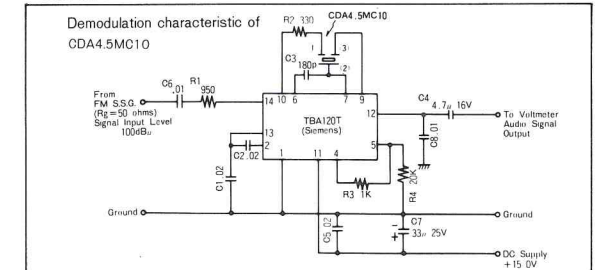
(Unit: mm)



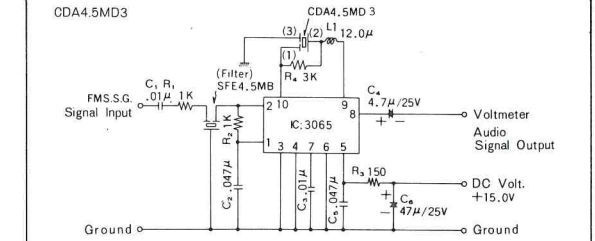
Recover Audio Characteristics



Test Circuit



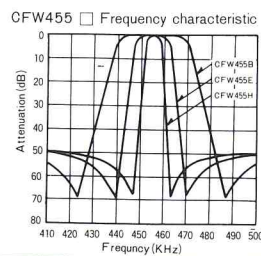
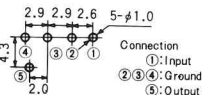
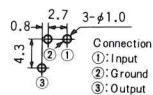
Demodulation characteristic of CDA4.5MD3





CERAMIC FILTER FOR COMMUNICATION

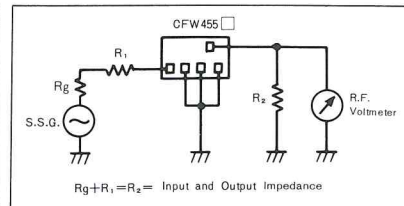
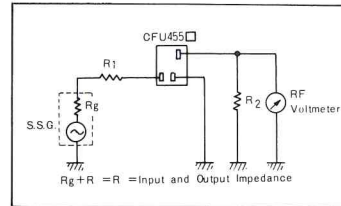
Ceramic Filter For Transceiver 455KHz



Char.		6dB Band Width (KHz) min.	Att. Band Width (KHz) max.	Stop Band Att. (dB) min.		Insertion Loss (dB) max.	In./Output Impedance (K Ω)
Part Number				CFU	CFW		
CFU455B2	CFW455B	± 15	± 30	27	35	4	1.5
CFU455C2	CFW455C	± 12.5	± 24	27	35	4	1.5
CFU455D2	CFW455D	± 10	± 20	27	35	4	1.5
CFU455E2	CFW455E	± 7.5	± 15	27	35	6	1.5
CFU455F2	CFW455F	± 6	± 12.5	27	35	6	2
CFU455G2	CFW455G	± 4.5	± 10	25	35	6	2
CFU455H2	CFW455H	± 3	± 9	25	35	6	2
CFU455I2	CFW455I	± 2	± 7.5	25	35	6	2
CFU455HT	CFW455HT	± 3	± 9	35	60	6	2
CFU455IT	CFW455IT	± 2	± 7.5	35	60	6	2

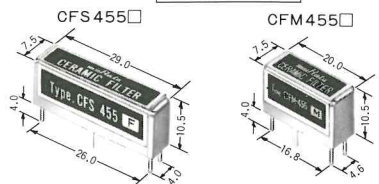
• Stop band attenuation is specified within 455 $\pm$ 100KHz.
• The attenuation band width is specified by the width in CFU: 40dB and CFW: 50dB.

• Test Circuit

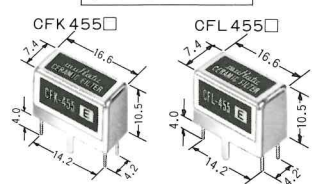


Communication Use Ceramic Filter 455KHz

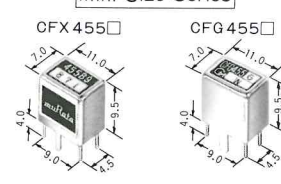
General Series



Small Size Series



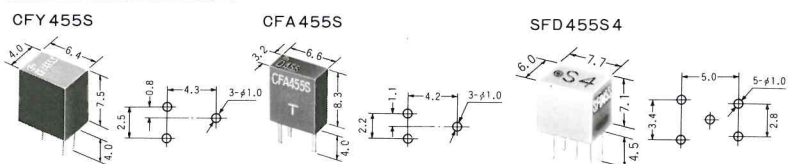
Mini Size Series



Band Width Rank	Pass Band Width		Attenuation Band Width (KHz) max.	Insertion Loss (dB) max.			In. / Output Impedance (K Ω)			
	Band Width (KHz) min.	Band Width (KHz) max.		CFS	CFM	CFK $\cdot$ CFL CFX $\cdot$ CFG	CFS	CFM	CFK	CFL CFX $\cdot$ CFG
A	± 13	± 17.5	± 30	4	3	—	1.5	1	—	—
B	± 10	± 15	± 25	4	3	4	1.5	1	1	1
C	± 9	± 13	± 23	4	3	4	1.5	1	1	1
D	± 7	± 10	± 20	4	3	4	1.5	1.5	1.5	1.5
E	± 5.5	± 8	± 16 (CFS: ± 15)	6	5	6	1.5	1.5	1.5	1.5
E10	± 5.0	± 7.5	± 12.5	—	—	6	—	—	1.5	1.5
F	± 4.2	± 6	± 12	6	6	6	2	2	2	1.5
G	—	± 4	± 10	6	6	6	2	2	2	1.5
H	—	± 3	± 7.5	7	6	7 (CFG: 6)	2	2	2	1.5
I	—	± 2	± 5	8	7	8	2	2	2	2
J	—	± 1.5	± 4.5	8	—	8	2	—	2	2

• Attenuation Band is specified the following band width. CFS: 80dB B. W. CFK: 70dB B. W. CFX: 70dB B. W. CFM: 60dB B. W. CFL: 70dB B. W. CFG: 60dB B. W.
• Ripple is 3dB max. (Within pass band width)

Communication Use Ceramic Discriminator 455KHz

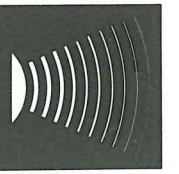


Char.	Center Frequency (KHz)	Peak Separation (KHz) min.	Voltage Sensitivity (mV/KHz) ※
Part Number			
CFY455S	455 $\pm$ 1	15 (17)	20 $\pm$ 5
CFA455S	455 $\pm$ 1	20 (22)	13 min.
SFD455S4	455 $\pm$ 2	28 (32)	13 $\pm$ 5

• Center Frequency: Specified at DC 0 V point.
※ Voltage sensitivity: 450~460KHz

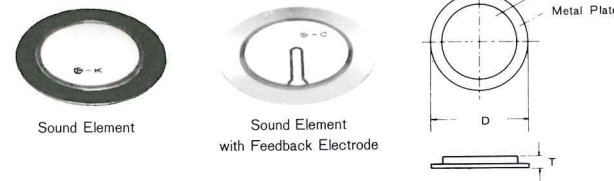
(Unit: mm)

PIEZO ALARM



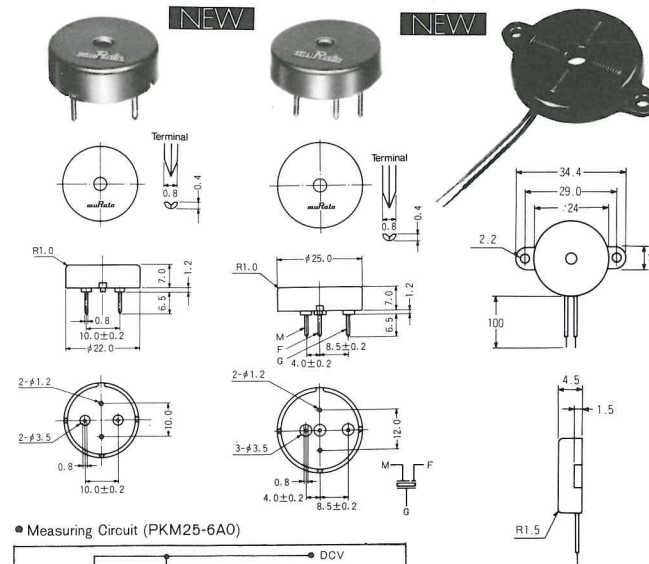
PIEZO ALARM

Sound Element

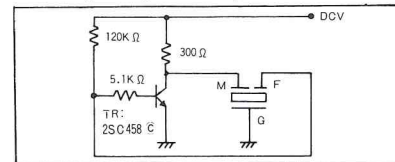


Housing Type

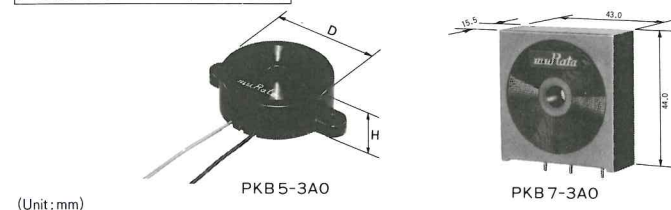
PKM24-4A0 (External-drive Type) PKM25-6A0 (Self-drive Type) PKM11-4A0



• Measuring Circuit (PKM25-6A0)



Piezo Alarm with Circuit



(Unit: mm)

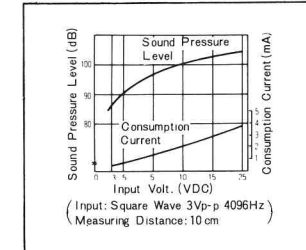
Part Number	7BB-20-6	7BB-27-4	7BB-35-3
Resonant Frequency	6.3 $\pm$ 0.6KHz	4.6 $\pm$ 0.5KHz	2.8 $\pm$ 0.5KHz
Resonant Impedance	350 Ω max.	200 Ω max.	200 Ω max.
Capacitance	10000pF $\pm$ 30%	20000pF $\pm$ 30%	30000pF $\pm$ 30%
Input Voltage	30Vp-p max.	30Vp-p max.	30Vp-p max.
Diameter (D)	20.0mm	27.0mm	35.0mm
Thickness (T)	0.42mm	0.54mm	0.54mm

• Also available in lead type and stainless plate type.

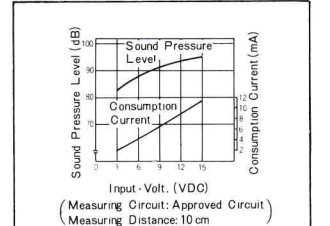
Part Number	PKM11-4A0 Lead Type	PKM24-4A0 Pin Type	PKM11-6A0 Lead Type	PKM25-6A0 Pin Type
Input Volt.	Square Wave 3V p-p		6.5VDC	
Sound Level	70dB min. (2048Hz, 10cm) 75dB min. (4096Hz, 10cm)		75dB min. (Measuring Distance: 10cm)	
Current Consump.	1mA max.		4mA max.	
Capacitance	10,000pF $\pm$ 30%	12,000pF $\pm$ 30%		

• Characteristics

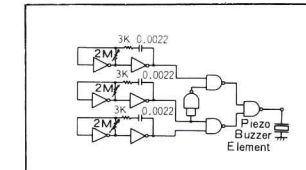
PKM11-4A0
External-drive Type



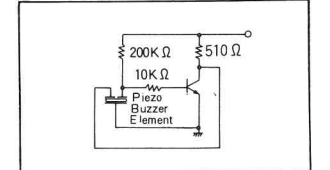
PKM11-6A0
Self-drive Type



• Application Circuit Oscillation.
Multi-tone Circuit of External-drive



Self-drive Type



Part Number	PKB5-3A0	PKB5-3B0	PKB6-5A0	PKB7-3A0
Rated Voltage	3~20VDC	1.5~9VDC	3~20VDC	3~20VDC
Resonant Freq.	2.8 $\pm$ 0.5KHz	2.8 $\pm$ 0.5KHz	4.7 $\pm$ 0.7KHz	2.8 $\pm$ 0.5KHz
Temp. Range	-20~+60 $^{\circ}$ C	-20~+60 $^{\circ}$ C	-20~+60 $^{\circ}$ C	-20~+60 $^{\circ}$ C
Diameter (D)	ϕ 42mm	ϕ 42mm	ϕ 34mm	
Height (H)	14.5mm	14.5mm	13.5mm	