

Version:
December 1, 2022



Ceramic Discriminator Series

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Ceramic Discriminator Series

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Discriminator Application Notes

► Discriminator Application Notes

Application Notes

What is Discriminator?

The discriminator functions to convert the change of the frequency into audio frequency, a unique system of detection only used for FM broadcasting. The detection of FM wave is made through the circuit in which the relation between the frequency and the output voltage is linear. FM wave detection methods as known as ratio detection, Foster-Seeley detection, quadrature detection, differential peak detection, etc.

FM Wave Detection Methods

Ratio Detection

Ratio detection is the most popular method in use at present. The impedance characteristic of a ceramic resonator is designed into the circuit, and then a coil as a detector is unnecessary. The fact is that adjustment is eliminated.

Quadrature Detection

This detection method was originally developed as a sound detector for TV sets, but recently it has become popular in the consumer market (FM tuners, car radios, etc.). The Quadrature Detection Method utilizes the phase characteristic.

An FM signal is supplied directly to one side of the multiplier's input with an IC to the other side of the multiplier's input an FM-IF signal, which is passed through the phase shifting circuit mainly composed of a tank circuit tuned to FM-IF, is applied. By taking advantage of the phase characteristic of the ceramic resonator as a discriminator, we can eliminate adjustment of the FM-IF circuit.

Differential Peak Detection

This detection method was developed by RCA as a sound detector for TV sets. The method has following features.

1. Can output large level.
2. Can function with only 1 synchronous coil.

Non-linearity of synchronous characteristics are compensated each other by applying rectified intermediate frequency voltage. Thus, linearity can be obtained.



Ceramic Discriminator (JT10.7M)

▶ Product Introduction

Introduction (JT10.7M)

Features :

- Dimensions: (9.0 Max. × 7.0 Max. × 5.0 Max.) Unit: mm.
- Center Frequency: 10.64MHz±30KHz, 10.64MHz±30KHz, 10.70MHz±30KHz, 10.73MHz±30KHz, and 10.76MHz±30KHz.
- Available IC: TA7303P, TA7130, μ PC1028H, LA1150, TA8122AN, TA8132N, TA2007, TA2104AFN, TA2099N, TA2132P, CX-2009, CX-20111, CXA1019M, CX-20091.

Token Ceramic discriminator for FM (JT10.7M) is compatible to Murata CDA 10.7. Token ceramic discriminator is primarily designed for piezoelectric lines and conforms to the RoHS directive and Lead-free.

Ceramic discriminator can be customized designs and tighter tolerances available on request. Application of ceramic discriminator specific designs also available including different piezo band-pass devices and Q specifications adjusted to frequency requirements.



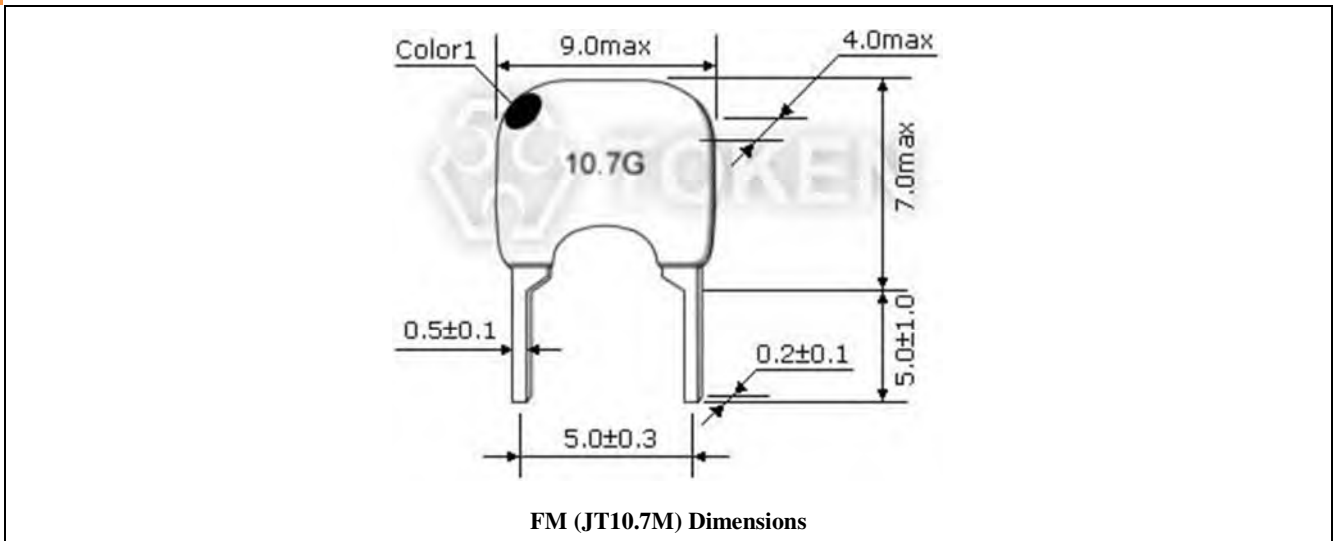
TOKEN ceramic filters, discriminator, and trap filters can supply you high performance, high quality and stability. Ceramic discriminator provides reliable start up and stable oscillation in microprocessor circuits across a wide variety of applications.

JT10.7M for FM is resonated devices that offer adjustment free audio detection in both wide and narrow bandwidths. These IC dependent devices utilize FM specific detection methods to convert changes in frequency into an intelligible audio signal.

Contact us with your specific needs. For more information, please link to Token official website "[Ceramic Discriminator](#)".

► Dimensions

Dimensions (Unit: mm) (JT10.7M)



► **Technical Characteristics**

Technical Characteristics (JT10.7M)

Part Number	Demodulation Output at fo (mv) Min.	Distortion Factor at fo (%) Max.	Demodulation 3dB Band Width (KHz) Max.	Applicable IC
JT10.7MG1	25	1.0	345	CX-2009, CX-20111
JT10.7MG3	650	1.0	±150	TA7303P, TA7130, μPC1028H, LA1150
JT10.7MG16	60~90	0.9	300	TA8122AN
JT10.7MG18	60~90	0.9	300	TA8132N
JT10.7MG33	45	0.7	250	TA2007
JT10.7MG80	65	1.0	300	TA2104AFN
JT10.7MG82	90	0.8	320	TA2099N
JT10.7MG92	60	1.0	300	TA2132P
JT10.7MC1	35	1.0	242	CXA1019M, CX-20091

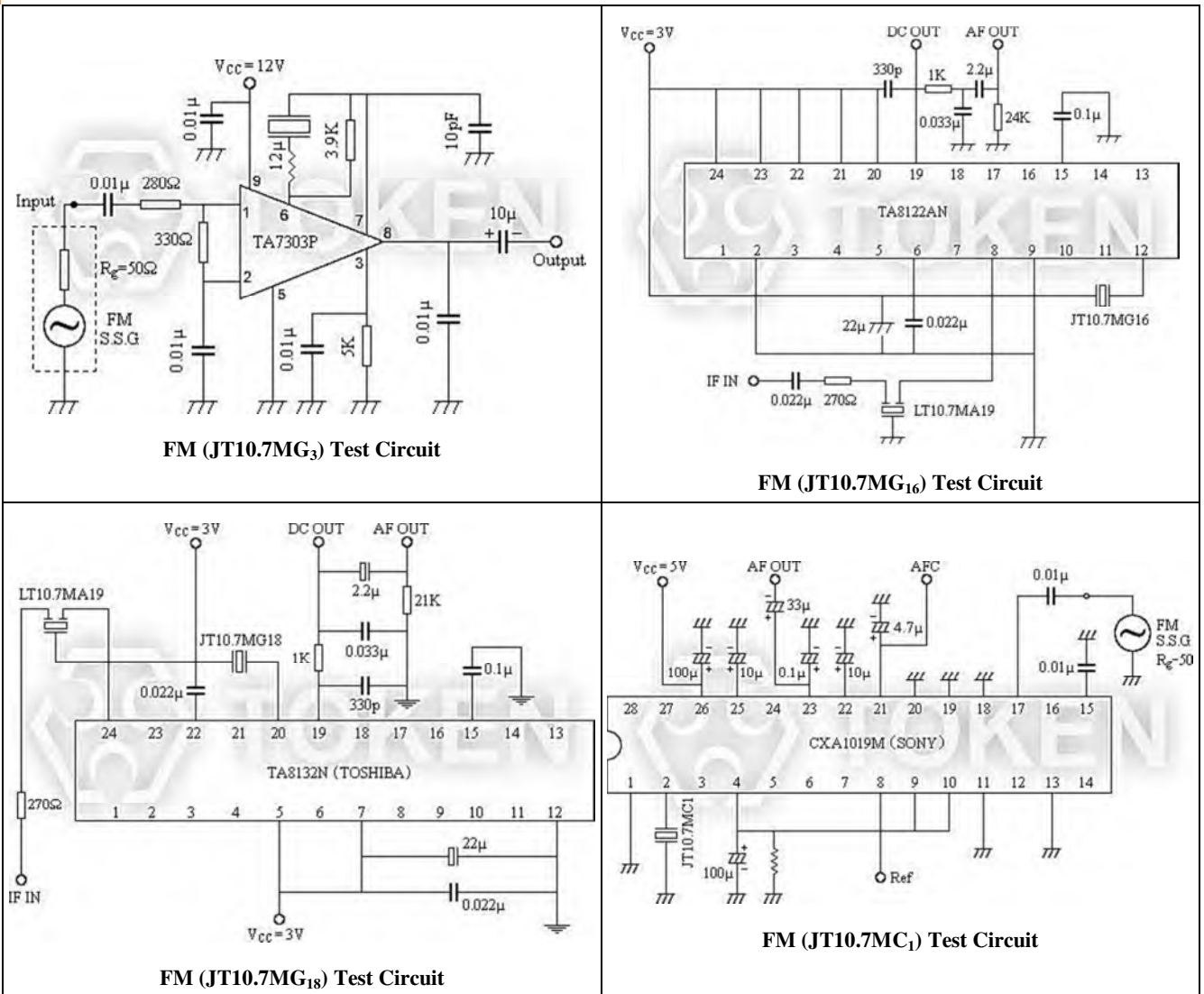
► **Standard Rule**

Standard Rule (JT10.7M)

Center Frequency	Color
D:10.64MHz±30KHz	Black
B:10.67MHz±30KHz	Blue
A:10.70MHz±30KHz	Red
C:10.73MHz±30KHz	Orange
E:10.76MHz±30KHz	White

► Test Circuit

Test Circuit (JT10.7M)



▶ Order Codes

Order Codes (JT10.7M)

JT10.7MG3	-	A	P
Part Number		Center Frequency color code	Package
		A	10.70MHz±30KHz
		B	10.67MHz±30KHz
		C	10.73MHz±30KHz
		D	10.64MHz±30KHz
		E	10.76MHz±30KHz

Chip Ceramic Discriminator (JTC)

▶ Product Introduction

Introduction (JTC)

Features :

- Converters
- High sensitivity and stability.
- Small in size and light weight.
- Realize no-adjustment in detection circuit.
- Wide range of standard products are available for various ICs.

Characteristics :

- Center Frequency: 455 ± 2 (KHz).
- Storage temperature range: -40°C to $+85^{\circ}\text{C}$.
- Operating temperature range: -20°C to $+80^{\circ}\text{C}$.
- Dimensions: (6.5 Max. \times 6.0 \times 2.8 Max.) Unit: mm.
- Available IC: TA31136, TA31142, TA31143, NE605, MC3361, CXA3117N.

Chip ceramic discriminator (JTC) for communication is compatible Murata CDBC. Token Chip Ceramic Discriminator (JTC) series is a central player in providing small low-cost low-power semiconductors to aid the deployment of communication products. The incorporation of piezoelectric technology allows the product's function and feature set to be easily configured via surface mount installation.

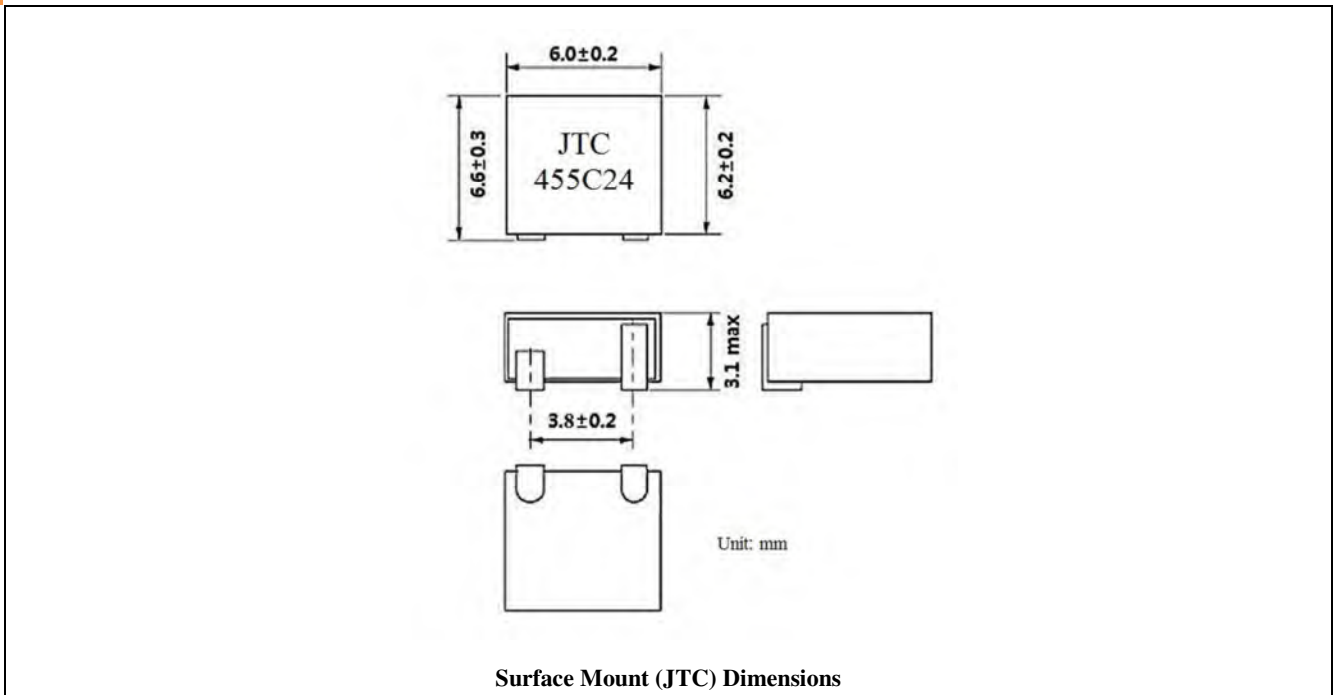
(JTC) consists of wide band piezoelectric resonator. It is ideal for mobile communication equipment due to its small size and light weight. Standard line includes products for wide range of application, from cordless telecom to cellular telephone, making non-adjustment and shrinking of the detection circuit possible.

Contact us with your specific needs. For more information, please link to Token official website "[Ceramic Discriminator](http://www.token.com.tw)".



► Dimensions

Dimensions (Unit: mm) (JTC)



► Technical Characteristics

Technical Characteristics (JTC)

Part Number	Center Frequency (fo)(KHz)	Recovered Audio 3dB BW (KHz)min	Recovered Audio Output (mV)Min.	Distortion Factor (At fo) (%)Max.	Applicable IC
JTC455C24	455±2	±4.0	100±40	2.0	TA31136
JTC455C28	455±2	±4.0	40±20	3.0	TA31142
JTC455C29	455±2	±4.0	125±30	2.5	NE605
JTC455C32	455±2	±4.0	40±20	3.0	TA31143
JTC455C49	455±2	±4.0	45±20	3.0	MC3361
JTC455C50	455±2	±4.0	65±20	4.0	CXA3117N

► Order Codes

Order Codes (JTC)

JTC455C24	TR
Part Number	Package (TR: Taping Reel)

SMD Ceramic Discriminator (JTCV10.7M)

▶ Product Introduction

Introduction (JTCV10.7M)

Features :

- High sensitivity and stability.
- Small in size and light weight.
- Wide range of standard products are available for various ICs.

Characteristics :

- Center Frequency: 10.7MHz.
- Storage temperature range: -40°C to +85°C.
- Operating temperature range: -20°C to +80°C.
- Dimensions: (3.7±0.2 × 3.1±0.2 × 1.4±0.2) Unit: mm.
- Available IC: CX-2009, CX-20111, CXA1019M, CX-20091, μPC1028H, LA1150, TA7303P, TA7130, TA8122AN, TA8132N, TA2007, TA2104AFN, TA2099N, TA2132P.

Token offers compact low-cost low power processor SMD ceramic discriminator for FM. Token takes advantages of SMD ceramic discriminators which convert the changes in frequency into an audio signal via the various detection methods based on impedance or phase characteristics of piezoelectric technology. The incorporation of piezoelectric technology allows the product's function and feature set to be easily configured via surface mount installation.

The discriminator functions to convert the change of the frequency into audio frequency, and unique system of detection only used for FM broadcasting. The detection of FM wave is made through the circuit in which the relation between the frequency and the output voltage is linear. FM wave detection methods, such as ratio detection, Foster-Seeley detection, quadrature detection, differential peak detection, etc. are known.

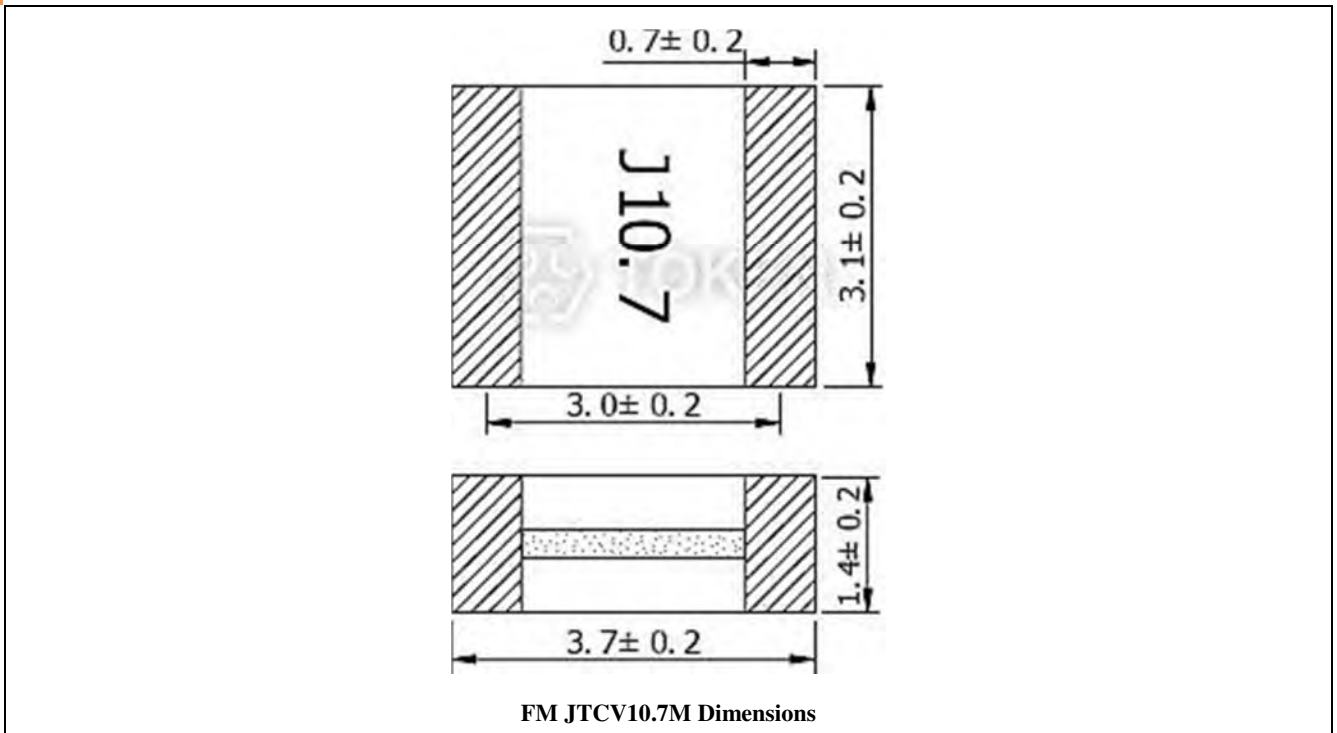
Surface mount ceramic discriminators (JTCV10.7M) for FM are resonated devices that offer adjustment free audio detection in both wide and narrow bandwidths. These IC dependent devices utilize FM specific detection methods to convert changes in frequency into an intelligible audio signal.

Custom parts are available on request. Token will also produce devices outside these specifications to meet specific customer requirements, contact us with your specific needs. For more information, please link to Token official website "[Ceramic Discriminator](http://www.token.com.tw)".



► **Dimensions**

Dimensions (Unit: mm) (JTCV10.7M)



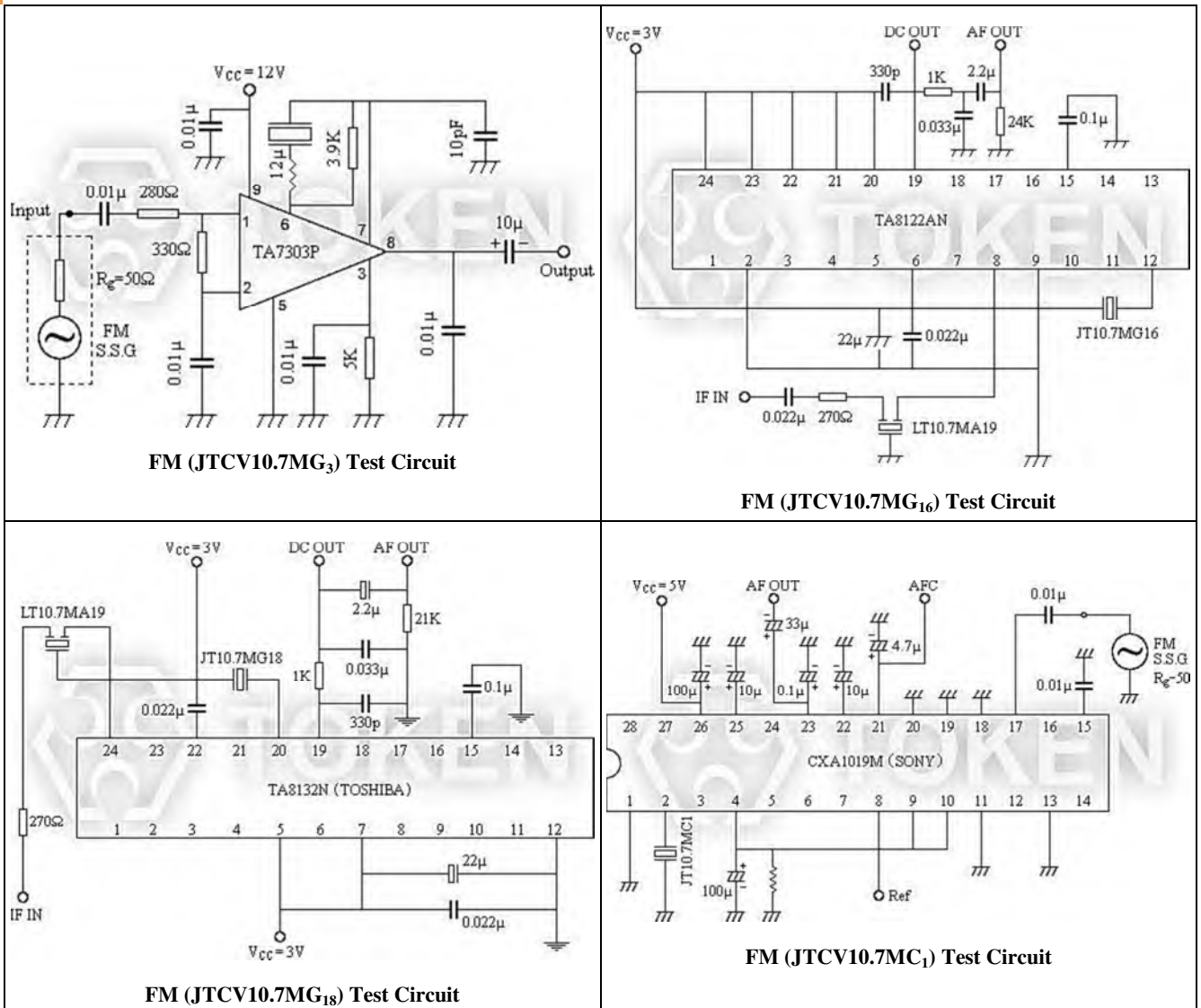
► **Technical Characteristics**

Technical Characteristics (JTCV10.7M)

Part Number	Demodulation Output at fo (mv) Min.	Distortion Factor at fo (%) Max.	Demodulation 3dB Band Width (KHz) Max.	Applicable IC
JTCV10.7MG1	25	1.0	345	CX-2009, CX-20111
JTCV10.7MG3	650	1.0	±150	TA7303P, TA7130, μPC1028H, LA1150
JTCV10.7MG16	60~90	0.9	300	TA8122AN
JTCV10.7MG18	60~90	0.9	300	TA8132N
JTCV10.7MG33	45	0.7	250	TA2007
JTCV10.7MG80	65	1.0	300	TA2104AFN
JTCV10.7MG82	90	0.8	320	TA2099N
JTCV10.7MG92	60	1.0	300	TA2132P
JTCV10.7MC1	35	1.0	242	CXA1019M, CX-20091

► Test Circuit

Test Circuit (JTCV10.7M)



► Order Codes

Order Codes (JTCV10.7M)

JTCV10.7MG3	TR
Part Number	Package (TR: Taping Reel)



Ceramic Discriminators (JTM)

▶ Product Introduction

Introduction (JTM)

Characteristics :

- Dimensions: (6.0 × 6.0 × 3.0) Unit: mm.
- Storage temperature range: -40°C to +85°C.
- Operating temperature range: -20°C to +80°C.
- Center Frequency: 455±2 (KHz), 447.5±1.5 (KHz), 429.0±2.0 (KHz).
- Available IC: CXA1483M, CXA1484, CXA1184M, CXA3117N, LA8610, NE605, MC3371, TA31136, TA31142, TA31143, TA31147, TA8104, TA8103F.

Ceramic discriminator for communication (JTM) is compatible to Murata CDB/CDBC/CDBM. (JTM) For Communication consists of wide band piezoelectric resonator. It is ideal for mobile communication equipment due to its small size and light weight. Standard line includes products for a wide range of applications, from cordless telephones to cellular telephones, making non-adjustment and shrinking of the detection circuit possible.

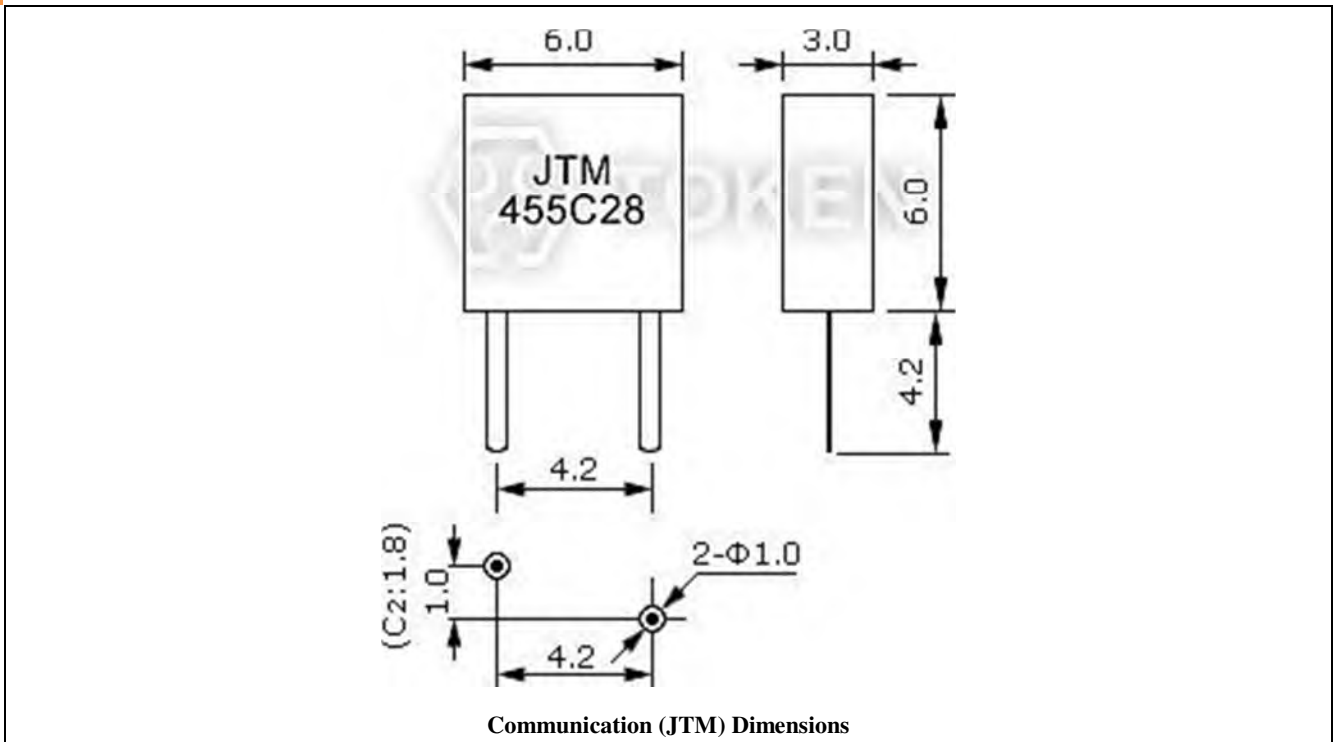
Token (JTM) including features with small in size and lightweight, realize non-adjustment in detection circuit, high sensitivity and stability, wide range of standard products are available for various ICs, operating temperature range: -20°C to +80°C and storage temperature range: -40°C to +85°C.

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► Dimensions

Dimensions (Unit: mm) (JTM)



Technical Characteristics

Technical Characteristics - Group A (JTM)

Part Number	Center Frequency (fo) (KHz)	Recovered Audio 3dB BW (KHz)Min.	Recovered Audio Output (mV)Min.	Distortion Factor (At fo) (%)Max.	Applicable IC
JTM455C18	455±2	±3.0	180±40	2.0	MC3371
JTM455C24	455±2	±4.0	100±40	2.0	TA31136
JTM455C28	455±2	±4.0	40±20	3.0	TA31142
JTM455C29	455±2	±4.0	125±30	2.5	NE605
JTM455C32	455±2	±4.0	40±20	3.0	TA31143
JTM455C47	455±2	-	140±20(fo) 140±20(fo±4.8)	-	TA31147
JTM455C50	455±2	±4.0	64±6.4	4.0	CXA3117N

Technical Characteristics - Group B (JTM)

Part Number	Resonant Frequency (Fr)(KHz)	Antiresonant Frequency (Fa)(KHz)	Band Width Fa-Fr(KHz)	Resonant Resistance (Ω)Max.	Capacitance pF±20%	Applicable IC
JTM455C2	447.5±1.5 (at Z =2.05kΩ)	463.0±1.5 (at Z =10kΩ)			140	TA8104
JTM455C3		455.0±1.5	48.0±5.0	70	600	CXA1184M
JTM455C4		470.0±1.0	43.0±2.0	300	140	LA8610
JTM455C10	429.0±2.0		51.0±5.0	70	580	TA8103F
JTM455C15		463.5±1.0	43.0±2.0	300	140	CXA1483M
JTM455C25		465.0±1.5	45.0±4.0	300	135	CXA1484

Order Codes

Order Codes (JTM)

JTM455C24	P
Part Number	Package

▶ General Information

Advantage of Token Piezoelectric Ceramics

Token Electronics had been able to develop specialized piezo materials which when combined with an advance design have resulted in a complete line of practical, inexpensive piezo devices for entertainment and communications applications.

Token reliably deliver high-quality components according to the each customer special needs with respect to performance, costs, and technology modifications.

For marketing discontinuations or sourcing activities concerning Piezoelectric **Discriminator** products, you are encouraged to contact our Sales Department so the request can be properly directed within Token.

