Ceramic Discriminator Series

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Ceramic Discriminator Series

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Ceramic Discriminator Series

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Discriminator Application Notes

Application Notes

What is Discriminator?
The discriminator functions to convert the change of the frequency into audio frequency, an 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.

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 customed 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”.

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Dimensions

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

FM (JT10.7M) Dimensions
## Technical Characteristics

### Technical Characteristics (JT10.7M)

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Demodulation Output at fo (mv) min</th>
<th>Distortion Factor at fo (%) max</th>
<th>Demodulation 3dB Band Width (KHz) max</th>
<th>Applicable IC</th>
</tr>
</thead>
<tbody>
<tr>
<td>JT10.7MG1</td>
<td>25</td>
<td>1.0</td>
<td>345</td>
<td>CX-2009, CX-2011</td>
</tr>
<tr>
<td>JT10.7MG3</td>
<td>650</td>
<td>1.0</td>
<td>±150</td>
<td>TA7303P, TA7130, μPC1028H, LA1150</td>
</tr>
<tr>
<td>JT10.7MG16</td>
<td>60–90</td>
<td>0.9</td>
<td>300</td>
<td>TA8122AN</td>
</tr>
<tr>
<td>JT10.7MG18</td>
<td>60–90</td>
<td>0.9</td>
<td>300</td>
<td>TA8132N</td>
</tr>
<tr>
<td>JT10.7MG33</td>
<td>45</td>
<td>0.7</td>
<td>250</td>
<td>TA2007</td>
</tr>
<tr>
<td>JT10.7MG80</td>
<td>65</td>
<td>1.0</td>
<td>300</td>
<td>TA2104AFN</td>
</tr>
<tr>
<td>JT10.7MG82</td>
<td>90</td>
<td>0.8</td>
<td>320</td>
<td>TA2099N</td>
</tr>
<tr>
<td>JT10.7MG92</td>
<td>60</td>
<td>1.0</td>
<td>300</td>
<td>TA2132P</td>
</tr>
<tr>
<td>JT10.7MC1</td>
<td>35</td>
<td>1.0</td>
<td>242</td>
<td>CXA1019M, CX-2009</td>
</tr>
</tbody>
</table>

## Standard Rule

### Standard Rule (JT10.7M)

<table>
<thead>
<tr>
<th>Center Frequency</th>
<th>Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>D: 10.64MHz±30kHz</td>
<td>Black</td>
</tr>
<tr>
<td>B: 10.67MHz±30kHz</td>
<td>Blue</td>
</tr>
<tr>
<td>A: 10.70MHz±30kHz</td>
<td>Red</td>
</tr>
<tr>
<td>C: 10.73MHz±30kHz</td>
<td>Orange</td>
</tr>
<tr>
<td>E: 10.76MHz±30kHz</td>
<td>White</td>
</tr>
</tbody>
</table>
Test Circuit

Test Circuit (JT10.7M)

FM (JT10.7MG) Test Circuit

FM (JT10.7MGa) Test Circuit

FM (JT10.7MGb) Test Circuit

FM (JT10.7MC) Test Circuit
## Order Codes

### Order Codes (JT10.7M)

<table>
<thead>
<tr>
<th>JT10.7MG3</th>
<th>-</th>
<th>A</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Part Number</strong></td>
<td><strong>Center Frequency color code</strong></td>
<td><strong>Package</strong></td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>10.70MHz±30kHz</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>10.67MHz±30kHz</td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>10.73MHz±30kHz</td>
<td></td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>10.64MHz±30kHz</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E</td>
<td>10.76MHz±30kHz</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
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°C.
- Operating temperature range: -20°C to +80°C.
- Dimensions: (6.5 max × 6.0 × 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”.
Dimensions

Dimensions (Unit: mm) (JTC)

![Surface Mount (JTC) Dimensions]

Technical Characteristics

Technical Characteristics (JTC)

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Center Frequency (fo) (kHz)</th>
<th>Recovered Audio 3dB BW (kHz) min</th>
<th>Recovered Audio Output (mV) min</th>
<th>Distortion Factor (At fo) (%) max</th>
<th>Applicable IC</th>
</tr>
</thead>
<tbody>
<tr>
<td>JTC455C24</td>
<td>455±2</td>
<td>±4.0</td>
<td>100±40</td>
<td>2.0</td>
<td>TA31136</td>
</tr>
<tr>
<td>JTC455C28</td>
<td>455±2</td>
<td>±4.0</td>
<td>40±20</td>
<td>3.0</td>
<td>TA31142</td>
</tr>
<tr>
<td>JTC455C29</td>
<td>455±2</td>
<td>±4.0</td>
<td>125±30</td>
<td>2.5</td>
<td>NE605</td>
</tr>
<tr>
<td>JTC455C32</td>
<td>455±2</td>
<td>±4.0</td>
<td>40±20</td>
<td>3.0</td>
<td>TA31143</td>
</tr>
<tr>
<td>JTC455C49</td>
<td>455±2</td>
<td>±4.0</td>
<td>45±20</td>
<td>3.0</td>
<td>MC3361</td>
</tr>
<tr>
<td>JTC455C50</td>
<td>455±2</td>
<td>±4.0</td>
<td>65±20</td>
<td>4.0</td>
<td>CXA3117N</td>
</tr>
</tbody>
</table>

Order Codes

Order Codes (JTC)

<table>
<thead>
<tr>
<th>JTC455C24</th>
<th>TR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part Number</td>
<td>Package (TR: Taping Reel)</td>
</tr>
</tbody>
</table>
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 x 3.1±0.2 x 1.4±0.2) Unit: mm.

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”. 

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Dimensions

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

Technical Characteristics

Technical Characteristics (JTCV10.7M)

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

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Test Circuit

Test Circuit (JTCV10.7M)

Order Codes

Order Codes (JTCV10.7M)

<table>
<thead>
<tr>
<th>JTCV10.7MG3</th>
<th>TR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part Number</td>
<td>Package (TR: Taping Reel)</td>
</tr>
</tbody>
</table>
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.

Contact us with your specific needs. For more information, please link to Token official website “Ceramic Discriminator”.
# Dimensions

<table>
<thead>
<tr>
<th>Dimensions (Unit: mm) (JTM)</th>
</tr>
</thead>
</table>

![Diagram showing dimensions](image)

- **Dimensions (Unit: mm) (JTM):**
  - Length: 6.0 mm
  - Width: 3.0 mm
  - Height: 4.2 mm
  - Diameter: 1.0 mm
  - Pin Diameter: 1.0 mm

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**Communication (JTM) Dimensions**

- **Length:** 6.0 mm
- **Width:** 4.0 mm
- **Height:** 4.2 mm
- **Diameter:** 1.0 mm
- **Pin Diameter:** 1.0 mm
## Technical Characteristics

### Technical Characteristics - Group A (JTM)

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Center Frequency (fo) (kHz)</th>
<th>Recovered Audio 3dB BW (kHz)min</th>
<th>Recovered Audio Output (mV)min</th>
<th>Distortion Factor (At fo) (%)max</th>
<th>Applicable IC</th>
</tr>
</thead>
<tbody>
<tr>
<td>JTM455C18</td>
<td>455±2</td>
<td>±3.0</td>
<td>180±40</td>
<td>2.0</td>
<td>MC3371</td>
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<tr>
<td>JTM455C24</td>
<td>455±2</td>
<td>±4.0</td>
<td>100±40</td>
<td>2.0</td>
<td>TA31136</td>
</tr>
<tr>
<td>JTM455C28</td>
<td>455±2</td>
<td>±4.0</td>
<td>40±20</td>
<td>3.0</td>
<td>TA31142</td>
</tr>
<tr>
<td>JTM455C29</td>
<td>455±2</td>
<td>±4.0</td>
<td>125±30</td>
<td>2.5</td>
<td>NE605</td>
</tr>
<tr>
<td>JTM455C32</td>
<td>455±2</td>
<td>±4.0</td>
<td>40±20</td>
<td>3.0</td>
<td>TA31143</td>
</tr>
<tr>
<td>JTM455C47</td>
<td>455±2</td>
<td>-</td>
<td>140±20(fo) 140±20(fo±4.8)</td>
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<td>TA31147</td>
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<tr>
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<td>4.0</td>
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### Technical Characteristics - Group B (JTM)

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Resonant Frequency (Fr)(kHz)</th>
<th>Antiresonant Frequency (Fa)(kHz)</th>
<th>Band Width Fa-Fr(kHz)</th>
<th>Resonant Resistance (Ω)max</th>
<th>Capacitance pF±20%</th>
<th>Applicable IC</th>
</tr>
</thead>
<tbody>
<tr>
<td>JTM455C2</td>
<td>447.5±1.5 (at</td>
<td>Z</td>
<td>=2.05kΩ)</td>
<td>463.0±1.5 (at</td>
<td>Z</td>
<td>=10kΩ)</td>
</tr>
<tr>
<td>JTM455C3</td>
<td>455.0±1.5</td>
<td>48.0±5.0</td>
<td>70</td>
<td>140</td>
<td>600</td>
<td>CXA1184M</td>
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<td>470.0±1.0</td>
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<td>300</td>
<td>140</td>
<td>600</td>
<td>LA8610</td>
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<tr>
<td>JTM455C10</td>
<td>429.0±2.0</td>
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<td>580</td>
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<td>600</td>
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<td>135</td>
<td>600</td>
<td>CXA1484</td>
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## Order Codes

### Order Codes (JTM)

<table>
<thead>
<tr>
<th>Part Number</th>
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<tbody>
<tr>
<td>JTM455C24</td>
<td>P</td>
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</tbody>
</table>
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.