### Specifications (characteristics)

<table>
<thead>
<tr>
<th>Item</th>
<th>Symbol</th>
<th>TS2-21B14</th>
<th>TS2-21B15</th>
<th>TS2-45A01</th>
<th>TS3-45A01</th>
<th>TF4-73BA2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal frequency</td>
<td>( f_0 )</td>
<td>21.4 MHz</td>
<td>21.7 MHz</td>
<td>45 MHz</td>
<td>45 MHz</td>
<td>73.35 MHz</td>
</tr>
<tr>
<td>Storage temperature range</td>
<td>( T_{\text{stg}} )</td>
<td>-40 °C to +85 °C</td>
<td>-40 °C to +85 °C</td>
<td>-40 °C to +85 °C</td>
<td>-40 °C to +85 °C</td>
<td></td>
</tr>
<tr>
<td>Operating temperature range</td>
<td>( T_{\text{use}} )</td>
<td>-30 °C to +85 °C</td>
<td>-30 °C to +85 °C</td>
<td>-30 °C to +85 °C</td>
<td>-30 °C to +85 °C</td>
<td></td>
</tr>
<tr>
<td>Number of poles</td>
<td></td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Passband</td>
<td>( f_{\pm 7.5 \text{kHz}} ) Min. (3 dB down)</td>
<td>( f_{\pm 7.5 \text{kHz}} ) Min. (3 dB down)</td>
<td>( f_{\pm 15 \text{kHz}} ) Min. (3 dB down)</td>
<td>( f_{\pm 15 \text{kHz}} ) Min. (3 dB down)</td>
<td>( f_{\pm 7.5 \text{kHz}} ) Min. (3 dB down)</td>
<td></td>
</tr>
<tr>
<td>Insertion loss</td>
<td>( I_L )</td>
<td>1.5 dB Max.</td>
<td>1.5 dB Max.</td>
<td>3 dB Max.</td>
<td>3 dB Max.</td>
<td>5 dB Max.</td>
</tr>
<tr>
<td>Ripple</td>
<td>( R_i )</td>
<td>1 dB Max.</td>
<td>1 dB Max.</td>
<td>1 dB Max.</td>
<td>1 dB Max.</td>
<td>1 dB Max.</td>
</tr>
<tr>
<td>Stop band attenuation</td>
<td></td>
<td>( f_{\pm 25 \text{kHz}} ) Max. (15 dB down)</td>
<td>( f_{\pm 25 \text{kHz}} ) Max. (15 dB down)</td>
<td>( f_{\pm 50 \text{kHz}} ) Max. (15 dB down)</td>
<td>( f_{\pm 50 \text{kHz}} ) Max. (20 dB down)</td>
<td>( f_{\pm 25 \text{kHz}} ) Max. (30 dB down)</td>
</tr>
<tr>
<td>Attenuation</td>
<td>( \text{ATT} )</td>
<td>70 dB Min. (( f_{910 \text{kHz}} ))</td>
<td>70 dB Min. (( f_{910 \text{kHz}} ))</td>
<td>70 dB Min. (( f_{800 \text{kHz}} ) to ( f_{1000 \text{kHz}} ))</td>
<td>70 dB Min. (( f_{800 \text{kHz}} ) to ( f_{1000 \text{kHz}} ))</td>
<td>80 dB Min. (( f_{800 \text{kHz}} ) to ( f_{1000 \text{kHz}} ))</td>
</tr>
<tr>
<td>Terminating impedance</td>
<td>( Z )</td>
<td>1500 Ω /1.0 pF</td>
<td>1500 Ω /1.0 pF</td>
<td>1100 Ω /0 pF</td>
<td>1200 Ω /-1.0 pF</td>
<td>500 Ω /+3.5 pF Zc: 7.0 pF *1</td>
</tr>
<tr>
<td>Package</td>
<td></td>
<td>TS-75A</td>
<td>TS-75A</td>
<td>TS-75A</td>
<td>TS-75A</td>
<td>TS-75B</td>
</tr>
</tbody>
</table>

*1 Zc is connected from pin 2 and 5 to ground. (As per pin connection of TF4-73BA2)

### Electrical DATA

#### TS2-21B14

- **A**: Insertion Attenuation (dB)
- **B**: Group Delay Time (µs)
- **C**: Frequency (MHz)

#### TS2-21B15

- **A**: Insertion Attenuation (dB)
- **B**: Group Delay Time (µs)
- **C**: Frequency (MHz)

#### TS2-45A01

- **A**: Insertion Attenuation (dB)
- **B**: Group Delay Time (µs)
- **C**: Frequency (MHz)

#### TS3-45A01

- **A**: Insertion Attenuation (dB)
- **B**: Group Delay Time (µs)
- **C**: Frequency (MHz)
### Electrical DATA

**TF4-73BA2**

![Graph showing insertion attenuation and group delay time](image)

### Pin connection of TF4-73BA2

![Pin connection diagram](image)

### External dimensions (Unit:mm)

**TS-75A**

- Footprint: 7.0 x 5.0 mm
- Marking
- Pins: #1, #2, #3, #4, #5

**TS-75B**

- Footprint: 7.0 x 5.0 mm
- Marking
- Pins: #1, #2, #3, #4, #5

### Footprint (Recommended) (Unit:mm)

**TS-75A / TS-75B**

- Footprint: 6.0 x 2.0 mm
- Pins arrangement:
  - 6.0 mm distance between footprint centers
  - 2.54 mm pin spacing

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Epson Toyocom quickly began working to acquire company-wide ISO 9000 series certification, and has acquired ISO 9001 or ISO 9002 certification for all targeted products manufactured in Japanese and overseas plants. Epson Toyocom has acquired QS-9000 certification, which is of a higher level. Also, TS 16949 certification, which is also of a higher level, has been acquired.

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QS-9000 is an enhanced standard for quality assurance systems formulated by leading U.S. automobile manufacturers based on the international ISO 9000 series.

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  - Power stations and related
  - Fire work equipment and security equipment
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