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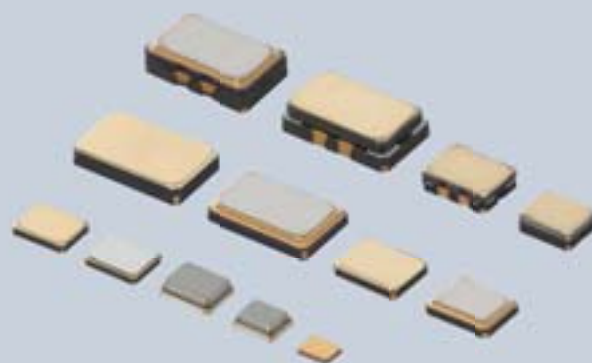
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# Crystal Units/Crystal Oscillators





### **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/en-eu/support/compliance/rohs>).

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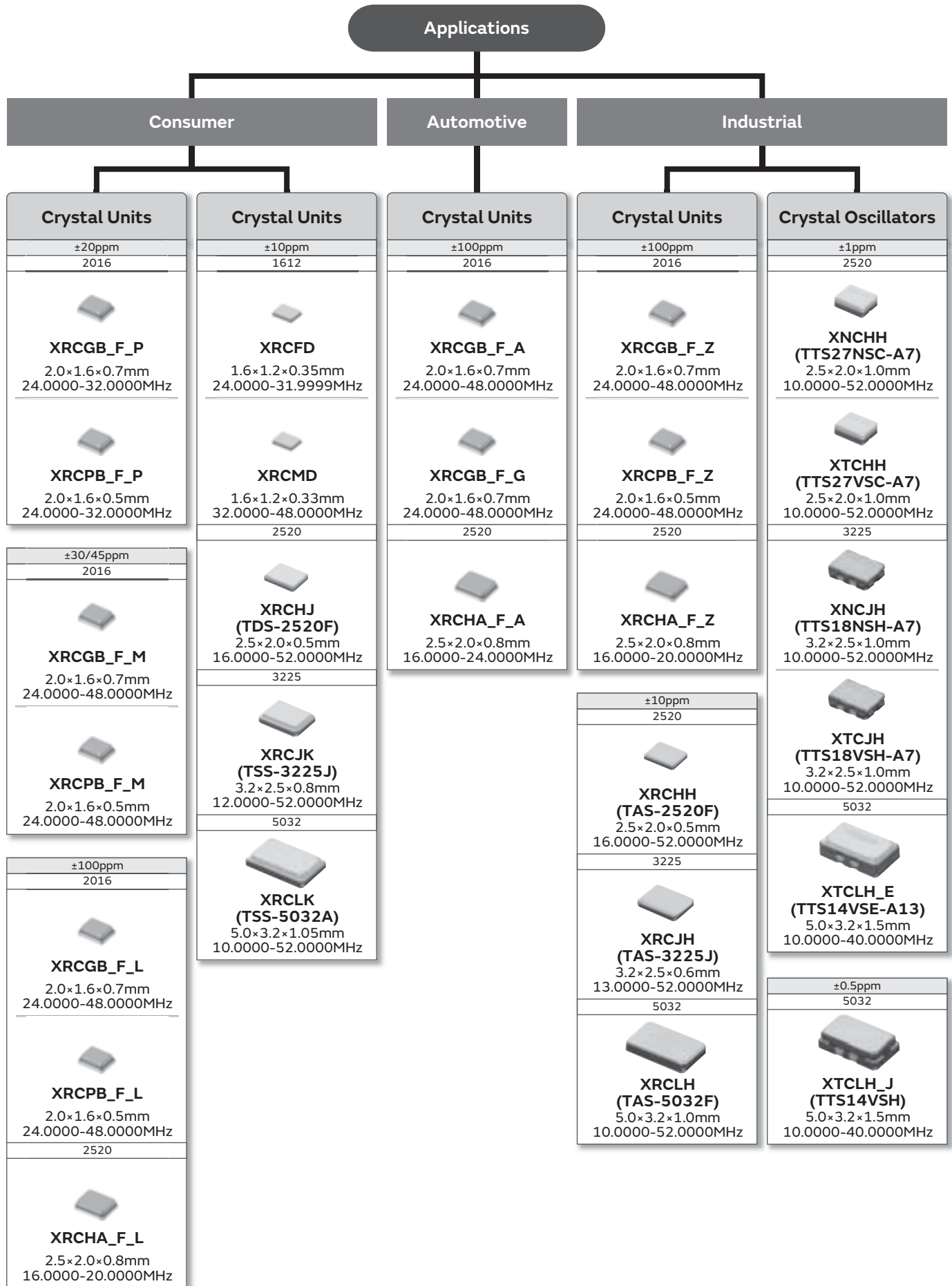
Product specifications are as of December 2015.

Bluetooth® is a registered trademark or trademark of Bluetooth SIG, Inc. in the United States and other countries.

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Please check the MURATA website (<http://www.murata.com/>) if you cannot find a part number in this catalog.

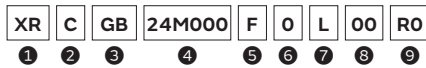
# Selection Guides



● Part Numbering

Crystal Unit

(Part Number)



① Product ID

| Product ID |              |
|------------|--------------|
| XR         | Crystal Unit |

② Lead Style

| Code | Lead Style |
|------|------------|
| C/T  | SMD        |

③ Size · Structure

| Code | Size · Structure                 |
|------|----------------------------------|
| FD   | 1612 (STD) Metal Sealing         |
| MD   | 1612 (Low Profile) Metal Sealing |
| GB   | 2016 (STD) Resin Sealing         |
| PB   | 2016 (Low Profile) Resin Sealing |
| HA   | 2520 Resin Sealing               |
| HH   | 2520 Metal Sealing               |
| HJ   | 2520 Seam Sealing                |
| JH   | 3225 Metal Sealing               |
| JK   | 3225 Seam Sealing                |
| LH   | 5032 Metal Sealing               |
| LK   | 5032 Seam Sealing                |

④ Nominal Center Frequency

Expressed by six-digit alphanumeric. The unit is in hertz (Hz).  
 Decimal point is expressed by capital letter "M".

⑤ Overtone Order

| Code | Overtone Order         |
|------|------------------------|
| F    | Fundamental            |
| K    | Customized Fundamental |

⑥ Frequency Tolerance

| Code | Frequency Tolerance |
|------|---------------------|
| 0    | ±100ppm             |
| 1    | ±10ppm              |
| 2    | ±20ppm              |
| 3    | ±30ppm              |
| 4    | ±45ppm/±40ppm*1     |
| 5    | ±50ppm              |
| A    | ±25ppm/±15ppm*2     |
| Y    | Total*3±20ppm       |

\*1 \*2 When ③ is "HH" or "JK"

\*3 Including Initial Tolerance+Temperature Characteristics+Aging+Reflow

⑦ Frequency Shift by Temperature

| Code | Frequency Shift by Temperature      |
|------|-------------------------------------|
| A    | ±100ppm max. (Automotive Grade)     |
| G    | ±50ppm (Car Multimedia Grade)       |
| L    | ±50ppm min.                         |
| M    | ±40ppm                              |
| N    | ±25ppm or 30ppm                     |
| P    | ±20ppm                              |
| Q    | ±10ppm to ±15ppm/±10ppm to ±19ppm*1 |
| Z    | ±100ppm (for Industrial)            |

\*1 When ③ is "HH" or "JK"

⑧ Individual Specification

| Code |   |
|------|---|
| **   | Two-digit alphanumerics express Individual Specification. |

00: Standard specification type.

⑨ Packaging (Quantity and Plastic taping reel diameter are expressed by one-digit number in "\*\*")

| Code        | Packaging      |
|-------------|----------------|
| R*/E*/J*/P* | Plastic Taping |

## Crystal Oscillator

(Part Number)

|    |   |    |        |   |   |   |    |    |
|----|---|----|--------|---|---|---|----|----|
| XN | C | HH | 19M200 | T | J | E | A5 | P0 |
| ①  | ② | ③  | ④      | ⑤ | ⑥ | ⑦ | ⑧  | ⑨  |

### ① Product ID

| Product ID |         |
|------------|---------|
| XT         | VC-TCXO |
| XN         | TCXO    |

### ② Lead Style

| Code | Lead Style |
|------|------------|
| C    | SMD        |

### ③ Size · Structure

| Code | Size · Structure   |
|------|--------------------|
| HH   | 2520 Metal Sealing |
| JH   | 3225 Metal Sealing |
| LH   | 5032 Metal Sealing |

### ④ Nominal Center Frequency

Expressed by six-digit alphanumeric. The unit is in hertz (Hz).  
 Decimal point is expressed by capital letter "M".

### ⑤ Output Wave

| Code | Output Wave       |
|------|-------------------|
| T    | Clipped Sign Wave |

### ⑥ Frequency Tolerance

| Code | Frequency Tolerance |
|------|---------------------|
| J    | ±1.0 to ±1.4ppm     |

### ⑦ Frequency Shift by Temperature

| Code | Frequency Shift by Temperature |
|------|--------------------------------|
| E    | ±0.5ppm max.                   |
| J    | Less than ±0.3ppm              |

### ⑧ Individual Specification

| Code |   |
|------|---|
| **   | Two-digit alphanumerics express Individual Specification. |

### ⑨ Packaging (Quantity and Plastic taping reel diameter are expressed by one-digit number in "\*\*")

| Code     | Packaging      |
|----------|----------------|
| E*/G*/P* | Plastic Taping |

# Crystal Units

for Consumer



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These crystal units feature a small package and highly accurate frequency, based on Murata's excellent package technology and high grade quartz crystal elements.

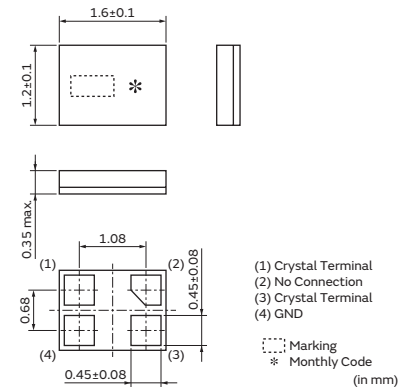
## Features

1. This series is ideal for applications requiring high accuracy crystal units, especially communication clocks such as GPS, Wi-Fi, B.T. (Bluetooth®), BLE (Bluetooth® Low Energy), SATA and USB3.0.
2. The crystal units are extremely small, contributing to a reduction in the mounting area.
3. The series complies to RoHS directive, being lead-free (phase 3).

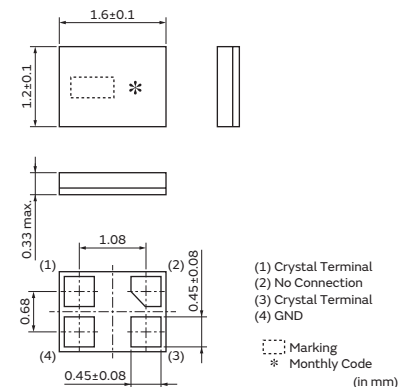
## Applications

1. Clock for GPS controller ICs:  
 smartphone, wearable equipment, module, etc.
2. Clock for Wi-Fi, B.T. and ACPU controller ICs:  
 smartphone, wearable device, module, etc.
3. Clock for BLE controller ICs:  
 wearable, fitness and healthcare devices, module, etc.
4. Storage devices with SATA interface:  
 HDD, SSD, Optical storage device, etc.
5. Clock for USB (Ultra-Speed and High-Speed) controller ICs: Mobile phone, DVC, DSC, Portable audio, PC peripheral, etc.
6. Clock for PC, visual equipment controller ICs
7. Audio equipment and musical instrument, etc.
8. Other applications for replacement of other crystal units or oscillators.

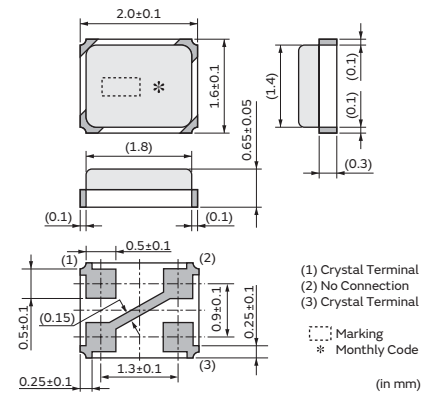
**XRCFD**  
 24.0000-31.9999MHz



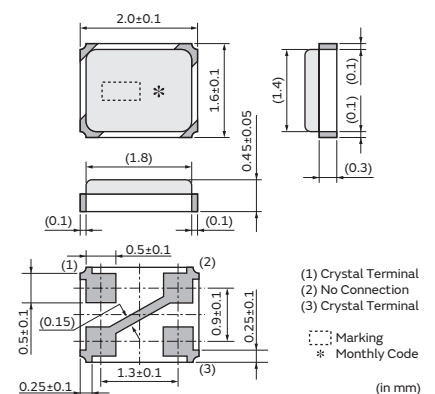
**XRCMD**  
 32.0000-48.0000MHz



**XRCGB\_F\_P**  
 24.0000-32.0000MHz  
**XRCGB\_F\_L/M**  
 24.0000-48.0000MHz



**XRCPB\_F\_P**  
 24.0000-32.0000MHz  
**XRCPB\_F\_L/M**  
 24.0000-48.0000MHz

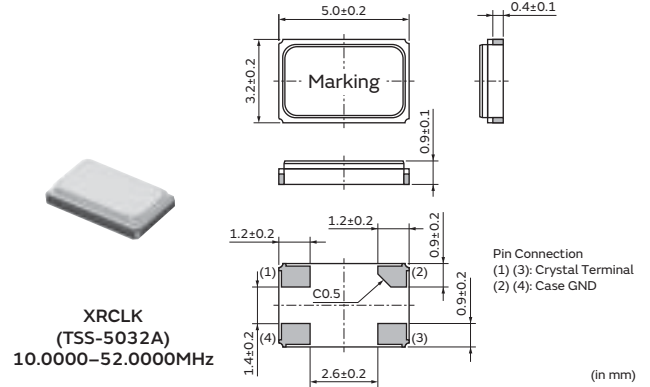
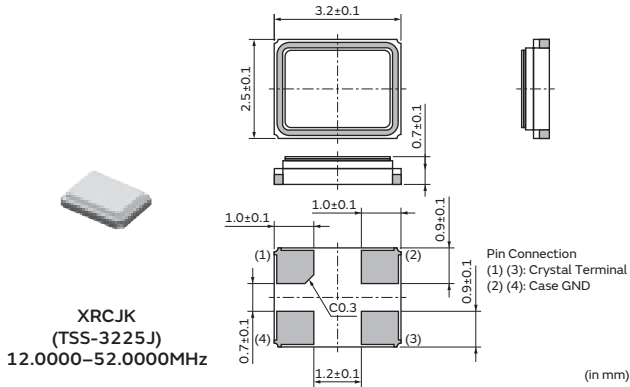
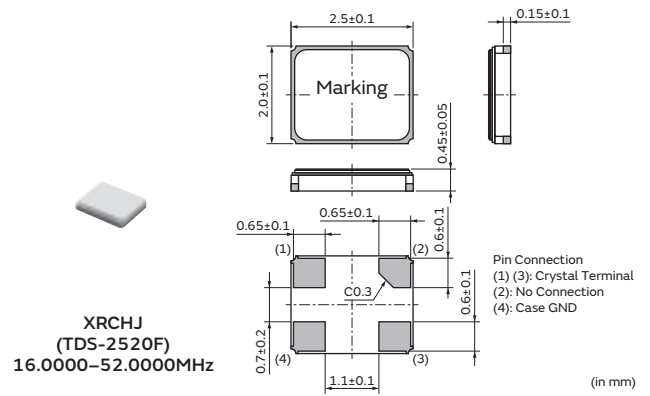
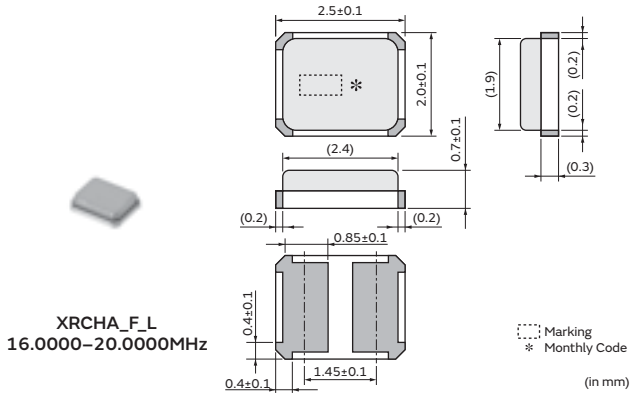


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**Series**

| Series     | Type               | Size | Package | Frequency (MHz)    | Frequency Tolerance (ppm max.) [at 25°C±3°C] | Frequency Shift by Temperature (ppm max.) [Standard Condition: +25°C] | Frequency Aging (ppm max./Year) | Drive Level (µW max.) | Operating Temperature Range (°C) |
|------------|--------------------|------|---------|--------------------|--|---|---------------------------------|-----------------------|----------------------------------|
| XRCFD      | -                  | 1612 | Metal   | 24.0000 to 31.9999 | ±10  | ±10   | ±1                              | 100                   | -20 to +70                       |
| XRCMD      |                    |      |         | 32.0000 to 48.0000 |  |   |                                 |                       |                                  |
| XRCGB_F_P  |                    | 2016 | Resin   | 24.0000 to 32.0000 | ±20  | ±20   | ±5                              | 300                   |                                  |
| XRCPB_F_P  |                    |      |         | 24.0000 to 48.0000 |  |   |                                 |                       |                                  |
| XRCGB_F_M  |                    |      |         | ±30/±45            | ±40  |   |                                 |                       |                                  |
| XRCPB_F_M  |                    |      |         |                    |  | ±100  |                                 |                       |                                  |
| XRCGB_F_L  |                    | ±100 | ±50     |                    |  |   |                                 |                       |                                  |
| XRCPB_F_L  |                    |      |         | ±100               | ±50  |   |                                 |                       |                                  |
| XRCCHA_F_L | 16.0000 to 20.0000 | ±100 | ±100    |                    |  | 60  | -30 to +85                      |                       |                                  |
| XRCHJ      | 16.0000 to 52.0000 | ±10  | ±15     |                    |  |   |                                 |                       |                                  |
| XRCJK      | TSS-3225J          | 3225 | Seam    | 12.0000 to 52.0000 | ±10  | ±15   | ±3                              | 60                    | -30 to +85                       |
| XRCLK      | TSS-5032A          | 5032 | Seam    | 10.0000 to 52.0000 | ±10  | ±15   | ±3                              | 60                    | -30 to +85                       |

XRCPB series is a low profile type of XRCGB series.

**Part Number List**

| Series    | Type | Part Number        | Frequency (MHz) | Frequency Tolerance (ppm max.) [at 25°C±3°C] | Frequency Shift by Temperature (ppm max.) [Standard Condition: +25°C] | Frequency Aging (ppm max./Year) | ESR* (Ωmax.) | Load Capacitance (pF) | Drive Level (µW max.) |
|-----------|------|--------------------|-----------------|--|---|---------------------------------|--------------|-----------------------|-----------------------|
| XRCMD     | -    | XRCMD37M400F1Q01R0 | 37.4000         | ±10  | ±10 (-20 to +70°C)  | ±1                              | 60           | 8                     | 100                   |
| XRCGB_F_P | -    | XRCGB24M000F2P00R0 | 24.0000         | ±20  | ±20 (-30 to +85°C)  | ±5                              | 150          | 6                     | 300                   |
| XRCGB_F_P | -    | XRCGB25M000F2P00R0 | 25.0000         | ±20  | ±20 (-30 to +85°C)  | ±5                              | 150          | 6                     | 300                   |
| XRCGB_F_P | -    | XRCGB26M000F2P00R0 | 26.0000         | ±20  | ±20 (-30 to +85°C)  | ±5                              | 150          | 6                     | 300                   |
| XRCGB_F_P | -    | XRCGB27M000F2P00R0 | 27.0000         | ±20  | ±20 (-30 to +85°C)  | ±5                              | 150          | 6                     | 300                   |
| XRCGB_F_P | -    | XRCGB27M120F2P00R0 | 27.1200         | ±20  | ±20 (-30 to +85°C)  | ±5                              | 150          | 6                     | 300                   |
| XRCGB_F_P | -    | XRCGB27M120F2P10R0 | 27.1200         | ±20  | ±20 (-30 to +85°C)  | ±5                              | 80           | 10                    | 300                   |
| XRCGB_F_P | -    | XRCGB30M000F2P00R0 | 30.0000         | ±20  | ±20 (-30 to +85°C)  | ±5                              | 100          | 6                     | 300                   |
| XRCGB_F_P | -    | XRCGB31M250F2P00R0 | 31.2500         | ±20  | ±20 (-30 to +85°C)  | ±5                              | 100          | 6                     | 300                   |
| XRCGB_F_P | -    | XRCGB32M000F2P00R0 | 32.0000         | ±20  | ±20 (-30 to +85°C)  | ±5                              | 100          | 6                     | 300                   |
| XRCPB_F_P | -    | XRCPB24M000F2P00R0 | 24.0000         | ±20  | ±20 (-30 to +85°C)  | ±5                              | 150          | 6                     | 300                   |

\* Equivalent Series Resistance

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| Series    | Type | Part Number        | Frequency (MHz) | Frequency Tolerance (ppm max.) [at 25°C±3°C] | Frequency Shift by Temperature (ppm max.) [Standard Condition: +25°C] | Frequency Aging (ppm max./Year) | ESR* (Ωmax.) | Load Capacitance (pF) | Drive Level (μW max.) |
|-----------|------|--------------------|-----------------|--|---|---------------------------------|--------------|-----------------------|-----------------------|
| XRCPB_F_P | -    | XRCPB25M000F2P00R0 | 25.0000         | ±20  | ±20 (-30 to +85°C)  | ±5                              | 150          | 6                     | 300                   |
| XRCPB_F_P | -    | XRCPB26M000F2P00R0 | 26.0000         | ±20  | ±20 (-30 to +85°C)  | ±5                              | 150          | 6                     | 300                   |
| XRCPB_F_P | -    | XRCPB27M000F2P00R0 | 27.0000         | ±20  | ±20 (-30 to +85°C)  | ±5                              | 150          | 6                     | 300                   |
| XRCPB_F_P | -    | XRCPB27M120F2P00R0 | 27.1200         | ±20  | ±20 (-30 to +85°C)  | ±5                              | 150          | 6                     | 300                   |
| XRCPB_F_P | -    | XRCPB30M000F2P00R0 | 30.0000         | ±20  | ±20 (-30 to +85°C)  | ±5                              | 100          | 6                     | 300                   |
| XRCPB_F_P | -    | XRCPB31M250F2P00R0 | 31.2500         | ±20  | ±20 (-30 to +85°C)  | ±5                              | 100          | 6                     | 300                   |
| XRCPB_F_P | -    | XRCPB32M000F2P00R0 | 32.0000         | ±20  | ±20 (-30 to +85°C)  | ±5                              | 100          | 6                     | 300                   |
| XRCGB_F_M | -    | XRCGB24M000F3M00R0 | 24.0000         | ±30  | ±40 (-30 to +85°C)  | ±5                              | 150          | 6                     | 300                   |
| XRCGB_F_M | -    | XRCGB24M576F3M00R0 | 24.5760         | ±30  | ±40 (-30 to +85°C)  | ±5                              | 150          | 6                     | 300                   |
| XRCGB_F_M | -    | XRCGB25M000F3M00R0 | 25.0000         | ±30  | ±40 (-30 to +85°C)  | ±5                              | 150          | 6                     | 300                   |
| XRCGB_F_M | -    | XRCGB26M000F3M00R0 | 26.0000         | ±30  | ±40 (-30 to +85°C)  | ±5                              | 150          | 6                     | 300                   |
| XRCGB_F_M | -    | XRCGB27M000F3M00R0 | 27.0000         | ±30  | ±40 (-30 to +85°C)  | ±5                              | 150          | 6                     | 300                   |
| XRCGB_F_M | -    | XRCGB27M120F3M00R0 | 27.1200         | ±30  | ±40 (-30 to +85°C)  | ±5                              | 150          | 6                     | 300                   |
| XRCGB_F_M | -    | XRCGB27M120F3M10R0 | 27.1200         | ±30  | ±40 (-30 to +85°C)  | ±5                              | 80           | 10                    | 300                   |
| XRCGB_F_M | -    | XRCGB30M000F3M00R0 | 30.0000         | ±30  | ±40 (-30 to +85°C)  | ±5                              | 100          | 6                     | 300                   |
| XRCGB_F_M | -    | XRCGB31M250F3M00R0 | 31.2500         | ±30  | ±40 (-30 to +85°C)  | ±5                              | 100          | 6                     | 300                   |
| XRCGB_F_M | -    | XRCGB32M000F3M00R0 | 32.0000         | ±30  | ±40 (-30 to +85°C)  | ±5                              | 100          | 6                     | 300                   |
| XRCGB_F_M | -    | XRCGB33M868F4M00R0 | 33.8688         | ±45  | ±40 (-30 to +85°C)  | ±5                              | 100          | 6                     | 300                   |
| XRCGB_F_M | -    | XRCGB40M000F4M00R0 | 40.0000         | ±45  | ±40 (-30 to +85°C)  | ±5                              | 100          | 6                     | 300                   |
| XRCGB_F_M | -    | XRCGB48M000F4M00R0 | 48.0000         | ±45  | ±40 (-30 to +85°C)  | ±5                              | 100          | 6                     | 300                   |
| XRCPB_F_M | -    | XRCPB24M000F3M00R0 | 24.0000         | ±30  | ±40 (-30 to +85°C)  | ±5                              | 150          | 6                     | 300                   |
| XRCPB_F_M | -    | XRCPB24M576F3M00R0 | 24.5760         | ±30  | ±40 (-30 to +85°C)  | ±5                              | 150          | 6                     | 300                   |
| XRCPB_F_M | -    | XRCPB25M000F3M00R0 | 25.0000         | ±30  | ±40 (-30 to +85°C)  | ±5                              | 150          | 6                     | 300                   |
| XRCPB_F_M | -    | XRCPB26M000F3M00R0 | 26.0000         | ±30  | ±40 (-30 to +85°C)  | ±5                              | 150          | 6                     | 300                   |
| XRCPB_F_M | -    | XRCPB27M000F3M00R0 | 27.0000         | ±30  | ±40 (-30 to +85°C)  | ±5                              | 150          | 6                     | 300                   |
| XRCPB_F_M | -    | XRCPB27M120F3M00R0 | 27.1200         | ±30  | ±40 (-30 to +85°C)  | ±5                              | 150          | 6                     | 300                   |
| XRCPB_F_M | -    | XRCPB30M000F3M00R0 | 30.0000         | ±30  | ±40 (-30 to +85°C)  | ±5                              | 100          | 6                     | 300                   |
| XRCPB_F_M | -    | XRCPB31M250F3M00R0 | 31.2500         | ±30  | ±40 (-30 to +85°C)  | ±5                              | 100          | 6                     | 300                   |
| XRCPB_F_M | -    | XRCPB32M000F3M00R0 | 32.0000         | ±30  | ±40 (-30 to +85°C)  | ±5                              | 100          | 6                     | 300                   |
| XRCPB_F_M | -    | XRCPB33M868F4M00R0 | 33.8688         | ±45  | ±40 (-30 to +85°C)  | ±5                              | 100          | 6                     | 300                   |
| XRCPB_F_M | -    | XRCPB40M000F4M00R0 | 40.0000         | ±45  | ±40 (-30 to +85°C)  | ±5                              | 100          | 6                     | 300                   |
| XRCPB_F_M | -    | XRCPB48M000F4M00R0 | 48.0000         | ±45  | ±40 (-30 to +85°C)  | ±5                              | 100          | 6                     | 300                   |
| XRCGB_F_L | -    | XRCGB24M000F0L00R0 | 24.0000         | ±100   | ±50 (-30 to +85°C)  | ±5                              | 150          | 6                     | 300                   |
| XRCGB_F_L | -    | XRCGB24M576F0L00R0 | 24.5760         | ±100   | ±50 (-30 to +85°C)  | ±5                              | 150          | 6                     | 300                   |
| XRCGB_F_L | -    | XRCGB25M000F0L00R0 | 25.0000         | ±100   | ±50 (-30 to +85°C)  | ±5                              | 150          | 6                     | 300                   |
| XRCGB_F_L | -    | XRCGB26M000F0L00R0 | 26.0000         | ±100   | ±50 (-30 to +85°C)  | ±5                              | 150          | 6                     | 300                   |
| XRCGB_F_L | -    | XRCGB27M000F0L00R0 | 27.0000         | ±100   | ±50 (-30 to +85°C)  | ±5                              | 150          | 6                     | 300                   |
| XRCGB_F_L | -    | XRCGB27M120F0L00R0 | 27.1200         | ±100   | ±50 (-30 to +85°C)  | ±5                              | 150          | 6                     | 300                   |
| XRCGB_F_L | -    | XRCGB30M000F0L00R0 | 30.0000         | ±100   | ±50 (-30 to +85°C)  | ±5                              | 100          | 6                     | 300                   |
| XRCGB_F_L | -    | XRCGB31M250F0L00R0 | 31.2500         | ±100   | ±50 (-30 to +85°C)  | ±5                              | 100          | 6                     | 300                   |
| XRCGB_F_L | -    | XRCGB32M000F0L00R0 | 32.0000         | ±100   | ±50 (-30 to +85°C)  | ±5                              | 100          | 6                     | 300                   |
| XRCGB_F_L | -    | XRCGB33M868F0L00R0 | 33.8688         | ±100   | ±50 (-30 to +85°C)  | ±5                              | 100          | 6                     | 300                   |
| XRCGB_F_L | -    | XRCGB40M000F0L00R0 | 40.0000         | ±100   | ±50 (-30 to +85°C)  | ±5                              | 100          | 6                     | 300                   |
| XRCGB_F_L | -    | XRCGB48M000F0L00R0 | 48.0000         | ±100   | ±50 (-30 to +85°C)  | ±5                              | 100          | 6                     | 300                   |
| XRCPB_F_L | -    | XRCPB24M000F0L00R0 | 24.0000         | ±100   | ±50 (-30 to +85°C)  | ±5                              | 150          | 6                     | 300                   |
| XRCPB_F_L | -    | XRCPB24M576F0L00R0 | 24.5760         | ±100   | ±50 (-30 to +85°C)  | ±5                              | 150          | 6                     | 300                   |
| XRCPB_F_L | -    | XRCPB25M000F0L00R0 | 25.0000         | ±100   | ±50 (-30 to +85°C)  | ±5                              | 150          | 6                     | 300                   |
| XRCPB_F_L | -    | XRCPB26M000F0L00R0 | 26.0000         | ±100   | ±50 (-30 to +85°C)  | ±5                              | 150          | 6                     | 300                   |
| XRCPB_F_L | -    | XRCPB27M000F0L00R0 | 27.0000         | ±100   | ±50 (-30 to +85°C)  | ±5                              | 150          | 6                     | 300                   |
| XRCPB_F_L | -    | XRCPB27M120F0L00R0 | 27.1200         | ±100   | ±50 (-30 to +85°C)  | ±5                              | 150          | 6                     | 300                   |
| XRCPB_F_L | -    | XRCPB30M000F0L00R0 | 30.0000         | ±100   | ±50 (-30 to +85°C)  | ±5                              | 100          | 6                     | 300                   |
| XRCPB_F_L | -    | XRCPB31M250F0L00R0 | 31.2500         | ±100   | ±50 (-30 to +85°C)  | ±5                              | 100          | 6                     | 300                   |
| XRCPB_F_L | -    | XRCPB32M000F0L00R0 | 32.0000         | ±100   | ±50 (-30 to +85°C)  | ±5                              | 100          | 6                     | 300                   |
| XRCPB_F_L | -    | XRCPB33M868F0L00R0 | 33.8688         | ±100   | ±50 (-30 to +85°C)  | ±5                              | 100          | 6                     | 300                   |
| XRCPB_F_L | -    | XRCPB40M000F0L00R0 | 40.0000         | ±100   | ±50 (-30 to +85°C)  | ±5                              | 100          | 6                     | 300                   |
| XRCPB_F_L | -    | XRCPB48M000F0L00R0 | 48.0000         | ±100   | ±50 (-30 to +85°C)  | ±5                              | 100          | 6                     | 300                   |

\* Equivalent Series Resistance

Continued on the following page. ↗

Continued from the preceding page. ↘

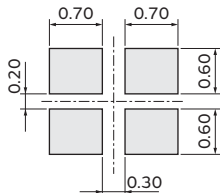
| Series    | Type      | Part Number        | Frequency (MHz) | Frequency Tolerance (ppm max.) [at 25°C±3°C] | Frequency Shift by Temperature (ppm max.) [Standard Condition: +25°C] | Frequency Aging (ppm max./Year) | ESR* (Ωmax.) | Load Capacitance (pF) | Drive Level (μW max.) |
|-----------|-----------|--------------------|-----------------|--|---|---------------------------------|--------------|-----------------------|-----------------------|
| XRCHA_F_L | -         | XRCHA16M000F0L01R0 | 16.0000         | ±100   | ±100 (-30 to +85°C)   | ±5                              | 100          | 8                     | 300                   |
| XRCHA_F_L | -         | XRCHA20M000F0L01R0 | 20.0000         | ±100   | ±100 (-30 to +85°C)   | ±5                              | 80           | 8                     | 300                   |
| XRCHJ     | TDS-2520F | XRCHJ16M000F1QB1P0 | 16.0000         | ±10  | ±15 (-30 to +85°C)  | ±3                              | 100          | 8                     | 60                    |
| XRCHJ     | TDS-2520F | XRCHJ19M200F1QA9P0 | 19.2000         | ±10  | ±15 (-30 to +85°C)  | ±3                              | 100          | 8                     | 60                    |
| XRCHJ     | TDS-2520F | XRCHJ20M000F1QA7P0 | 20.0000         | ±10  | ±15 (-30 to +85°C)  | ±3                              | 80           | 8                     | 60                    |
| XRCHJ     | TDS-2520F | XRCHJ26M000F1QD1P0 | 26.0000         | ±10  | ±15 (-30 to +85°C)  | ±3                              | 80           | 8                     | 60                    |
| XRCHJ     | TDS-2520F | XRCHJ36M000F1QA0P0 | 36.0000         | ±10  | ±15 (-30 to +85°C)  | ±3                              | 80           | 8                     | 60                    |
| XRCHJ     | TDS-2520F | XRCHJ40M000F1QB0P0 | 40.0000         | ±10  | ±15 (-30 to +85°C)  | ±3                              | 80           | 8                     | 60                    |
| XRCHJ     | TDS-2520F | XRCHJ52M000F1QA0P0 | 52.0000         | ±10  | ±15 (-30 to +85°C)  | ±3                              | 80           | 8                     | 60                    |
| XRCJK     | TSS-3225J | XRCJK12M000F1QB4P0 | 12.0000         | ±10  | ±15 (-30 to +85°C)  | ±3                              | 100          | 8                     | 60                    |
| XRCJK     | TSS-3225J | XRCJK13M000F1QA3P0 | 13.0000         | ±10  | ±15 (-30 to +85°C)  | ±3                              | 100          | 8                     | 60                    |
| XRCJK     | TSS-3225J | XRCJK15M360F1QA0P0 | 15.3600         | ±10  | ±15 (-30 to +85°C)  | ±3                              | 80           | 8                     | 60                    |
| XRCJK     | TSS-3225J | XRCJK20M000F1QB3P0 | 20.0000         | ±10  | ±15 (-30 to +85°C)  | ±3                              | 80           | 8                     | 60                    |
| XRCJK     | TSS-3225J | XRCJK24M576F1QA0P0 | 24.5760         | ±10  | ±15 (-30 to +85°C)  | ±3                              | 80           | 8                     | 60                    |
| XRCJK     | TSS-3225J | XRCJK26M000F1QC3P0 | 26.0000         | ±10  | ±15 (-30 to +85°C)  | ±3                              | 80           | 8                     | 60                    |
| XRCJK     | TSS-3225J | XRCJK36M000F1QA0P0 | 36.0000         | ±10  | ±15 (-30 to +85°C)  | ±3                              | 80           | 8                     | 60                    |
| XRCJK     | TSS-3225J | XRCJK40M000F1QA2P0 | 40.0000         | ±10  | ±15 (-30 to +85°C)  | ±3                              | 80           | 8                     | 60                    |
| XRCJK     | TSS-3225J | XRCJK52M000F1QA0P0 | 52.0000         | ±10  | ±15 (-30 to +85°C)  | ±3                              | 80           | 8                     | 60                    |
| XRCLK     | TSS-5032A | XRCLK10M000F1QA8P0 | 10.0000         | ±10  | ±15 (-30 to +85°C)  | ±3                              | 80           | 8                     | 60                    |
| XRCLK     | TSS-5032A | XRCLK12M000F1QA6P0 | 12.0000         | ±10  | ±15 (-30 to +85°C)  | ±3                              | 60           | 8                     | 60                    |
| XRCLK     | TSS-5032A | XRCLK14M745F1QB6P0 | 14.7456         | ±10  | ±15 (-30 to +85°C)  | ±3                              | 60           | 8                     | 60                    |
| XRCLK     | TSS-5032A | XRCLK16M000F1QA7P0 | 16.0000         | ±10  | ±15 (-30 to +85°C)  | ±3                              | 60           | 8                     | 60                    |
| XRCLK     | TSS-5032A | XRCLK21M250F1QA8P0 | 21.2500         | ±10  | ±15 (-30 to +85°C)  | ±3                              | 60           | 8                     | 60                    |
| XRCLK     | TSS-5032A | XRCLK52M000F1QA0P0 | 52.0000         | ±10  | ±15 (-30 to +85°C)  | ±3                              | 60           | 8                     | 60                    |

\* Equivalent Series Resistance

### Standard Land Pattern Dimensions

XRCFD, XRCMD

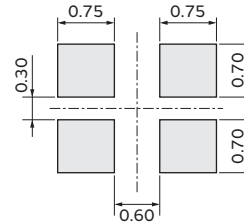
(Recommended Land Pattern)



(in mm)

XRCGB\_F\_P/M/L, XRCPB\_F\_P/M/L

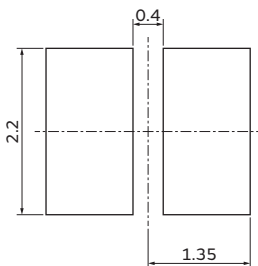
(Recommended Land Pattern)



(in mm)

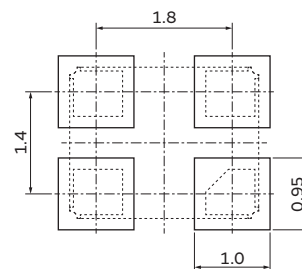
XRCHA\_F\_L

(Recommended Land Pattern)



(in mm)

XRCHJ (TDS-2520F)

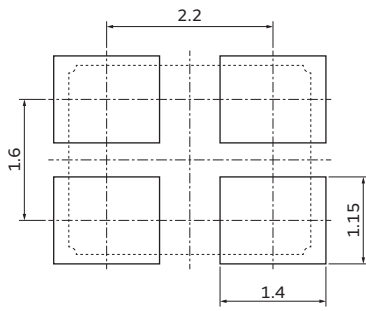


(in mm)

Continued from the preceding page. ↘

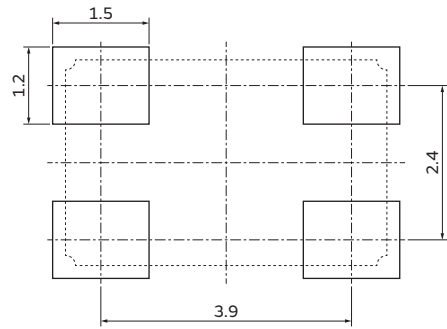
### Standard Land Pattern Dimensions

XRCJK  
(TSS-3225J)



(in mm)

XRCLK  
(TSS-5032A)



(in mm)

## Notice -Crystal Units for Consumer-

1

### Notice (Soldering and Mounting)

#### 1.1. Soldering Condition

##### (1) Reflow

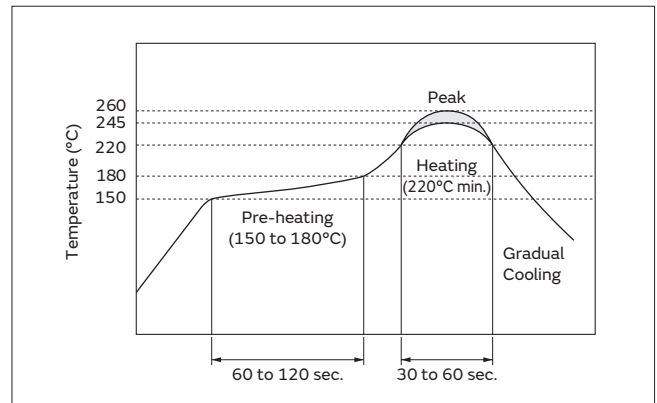
Please mount components on a circuit board by the reflow soldering method.

Flux: Please use rosin based flux; do not use water soluble flux.

Solder: Please use solder (Sn-3.0Ag-0.5Cu) under the following condition.

Standard thickness of soldering paste: 0.10 to 0.15mm

|                  | Condition                         |                |
|------------------|-----------------------------------|----------------|
| Pre-heating      | 150 to 180°C                      | 60 to 120 sec. |
| Heating          | 220°C min.                        | 30 to 60 sec.  |
| Peak Temperature | 245°C min. 260°C max. 5 sec. max. |                |



##### (2) Soldering Iron

If compelled to mount the component by using a soldering iron, please do not directly touch the component with the soldering iron. The component terminals or electrical characteristics may be damaged if excessive thermal stress is applied. Please keep solder away from the metal cap (Lid) portion.

|                               | Condition      |
|-------------------------------|----------------|
| Pre-heating                   | 150°C 60 sec.  |
| Heating of the Soldering Iron | 350°C max.     |
| Watt                          | 30W max.       |
| Shape of the Soldering Iron   | ø3mm max.      |
| Soldering Time                | 5 sec. max.    |
| Solder                        | Sn-3.0Ag-0.5Cu |

#### 1.2. Optimum Solder Amount for Soldering

Please make the solder volume below the height of the substrate. When exceeding the substrate, the damage to the sealing between the metal cap and the substrate may occur.

#### 2. Wash

The component cannot withstand washing.

#### 3. Notice for Mounting

The component is recommended for placement machines employing optical placement capabilities. The component might be damaged by mechanical force depending on placement machine and condition. Make sure that you have evaluated by using placement machines before going into mass production. Do not use placement machines employing mechanical positioning. Please contact Murata for details beforehand.

Continued on the following page. ↗

## Notice -Crystal Units for Consumer-

Continued from the preceding page. ↘

### Notice (Storage and Operating Condition)

#### 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 degrees C

Humidity: 15 to 85% R.H.

#### 2. Expire 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 products may be degraded in solderability and/or rusty. 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/or be degraded in solderability due to the 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 in 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 conditions.

(5) Please do not drop the products to avoid cracking the crystal element.

#### 4. Other

Conformal coating or washing of the component is not acceptable.

Please be sure to consult with our sales representative or engineer prior to using the products.

### Notice (Rating)

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

### Notice (Handling)

1. Irregular or stopped oscillation may occur under unmatched circuit conditions.

Please design your oscillation circuit to get 5 times or more of a negative resistance against the maximum value of the Equivalent Series Resistance, that is specified in order.

2. Be sure to provide an appropriate fail-safe function on your product to prevent secondary damage that may be caused by the abnormal function or the failure of our product.

3. Please do not use these products in the following applications in transportation equipment: vehicles, trains, ships, etc.  
(example: engine control, brake control, steering control, body control.)

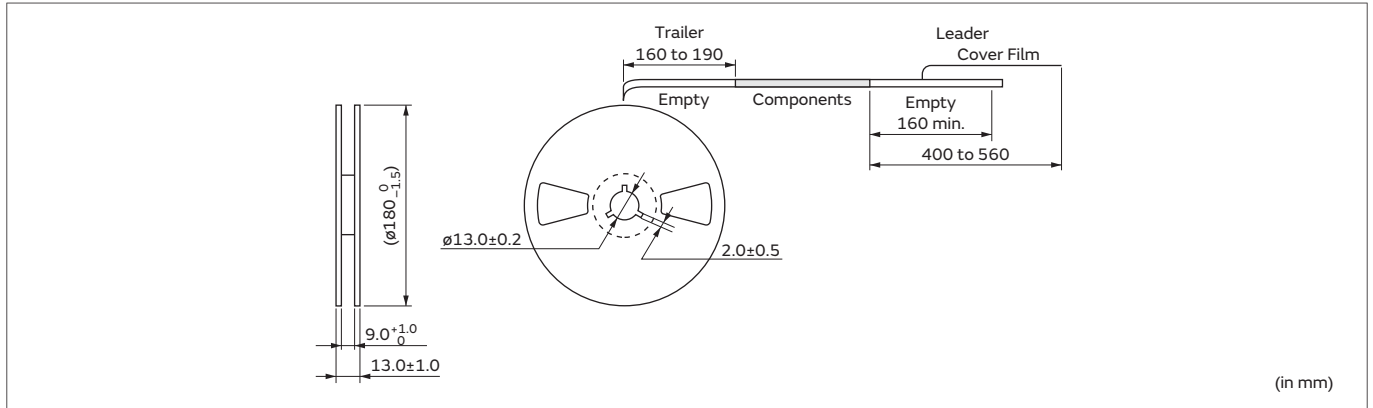
# Packaging -Crystal Units for Consumer-

1

## Minimum Quantity/Dimensions of Reel

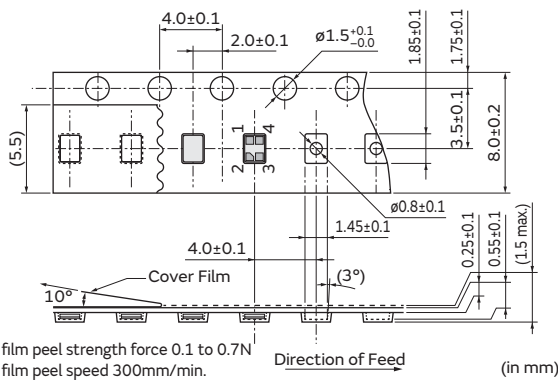
| Plastic Tape $\phi 180\text{mm}$ | Plastic Tape $\phi 330\text{mm}$ |
|----------------------------------|----------------------------------|
| 3,000                            | 9,000                            |

(pcs.)

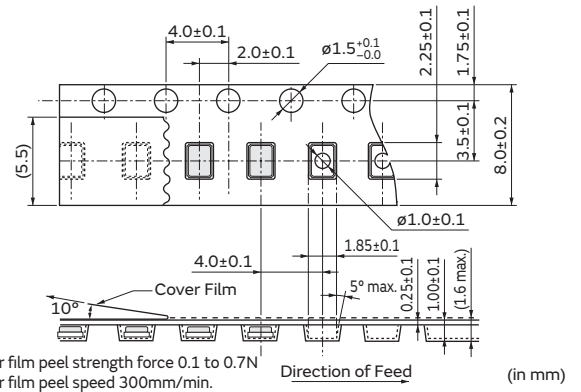


## Dimensions of Taping

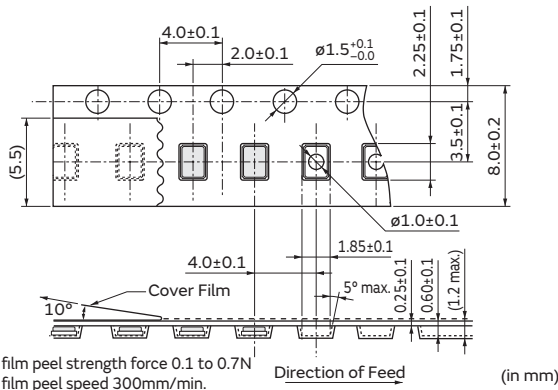
XRCFD, XRCMD



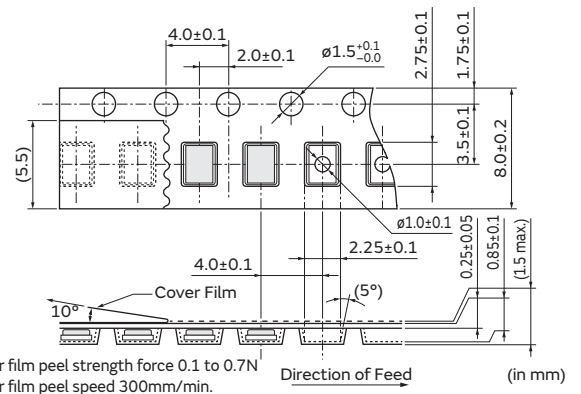
XRCGB\_F\_P/M/L



XRCPB\_F\_P/M/L



XRCHA\_F\_L



## Packaging -Crystal Units for Consumer-

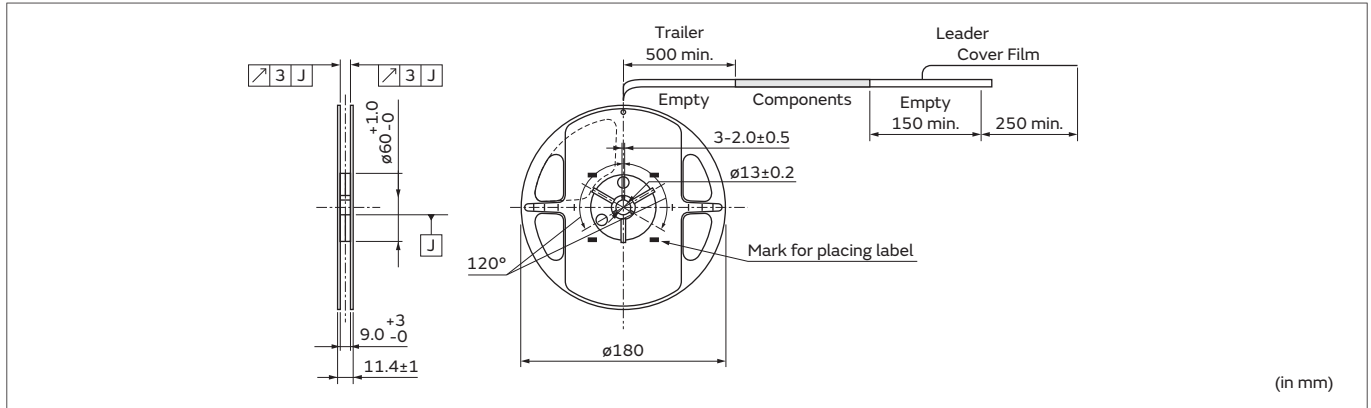
1

### Minimum Quantity/Dimensions of Reel

Plastic Tape  $\phi 180\text{mm}$

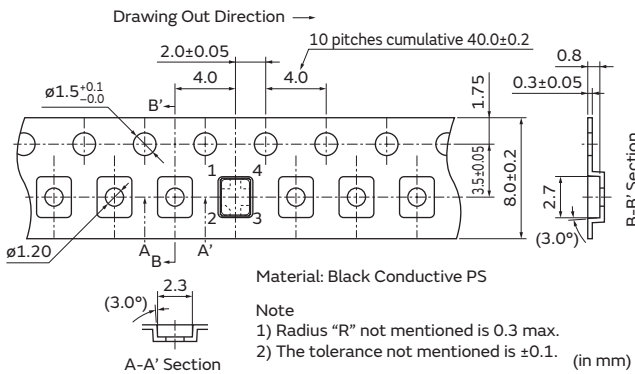
3,000

(pcs.)

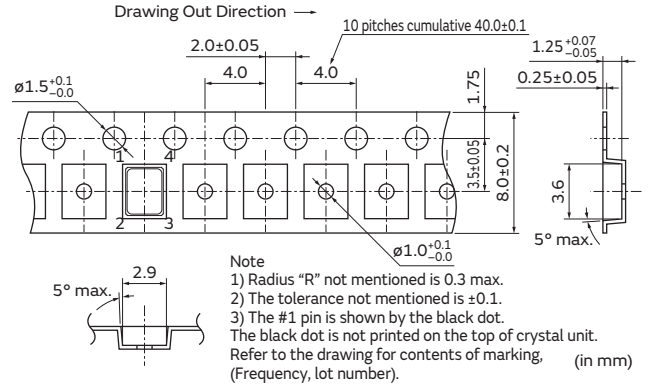


### Dimensions of Taping

**XRCHJ**  
**(TDS-2520F)**



**XRCJK**  
**(TSS-3225J)**





# Packaging -Crystal Units for Consumer-

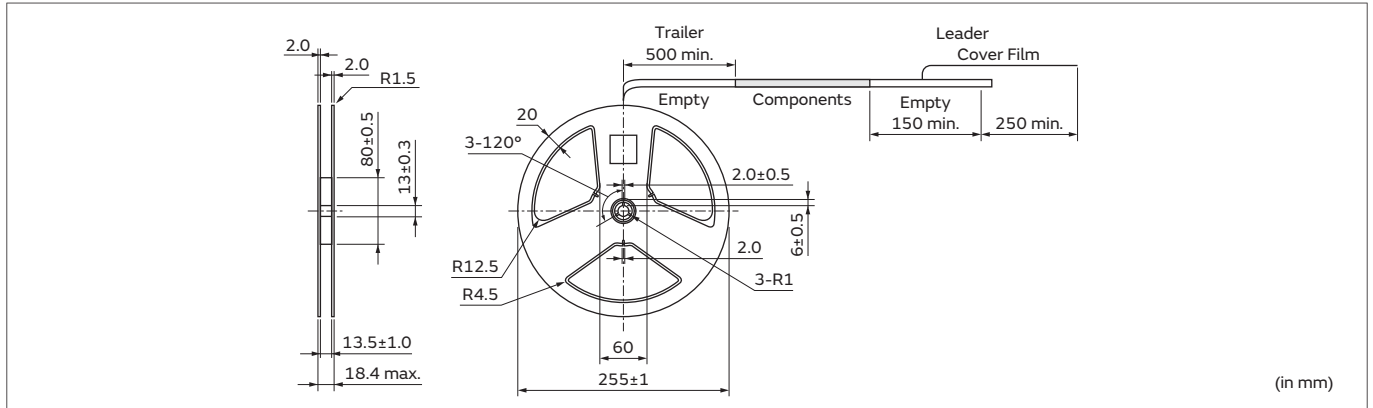
1

## Minimum Quantity/Dimensions of Reel

Plastic Tape  $\phi 255\text{mm}$

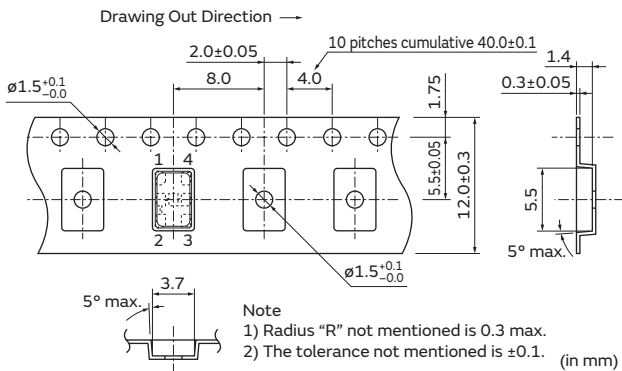
3,000

(pcs.)



## Dimensions of Taping

XRCLK  
 (TSS-5032A)



# Crystal Units

for Automotive



These crystal units for automotive feature a small package and highly accurate frequency, based on Murata's excellent package technology and high grade quartz crystal elements.

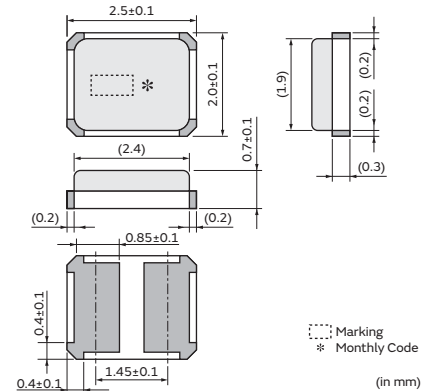
## Features

1. The series has high reliability and is available for a wide temperature range.
2. The crystal units are extremely small, contributing to a reduction in the mounting area.
3. The series complies to RoHS and ELV directives, being lead-free (phase 3).
4. The series complies to AEC-Q200.

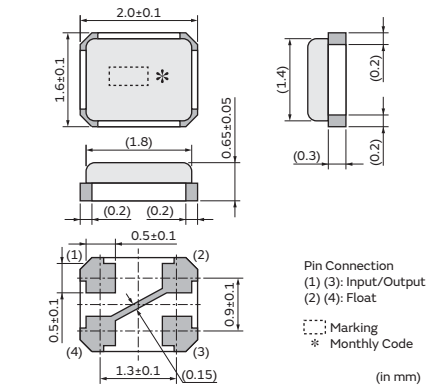
## Applications

1. Power Train (ex. Engine/Transmission management ECU)
2. ADAS (ex. Camera for driver assist, Image processing, Emergency Brake Assist ECU)
3. Chassis, Safety applications, etc.
4. Car multimedia equipment.

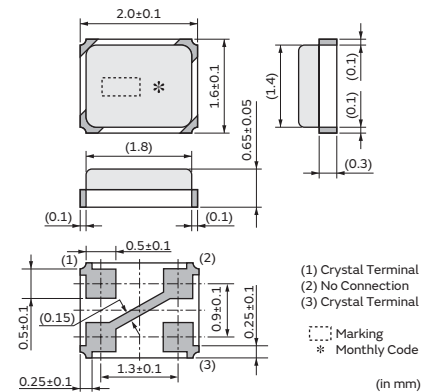
**XRCHA\_F\_A**  
 16.0000–24.0000MHz



**XRCGB\_F\_A**  
 24.0000–48.0000MHz



**XRCGB\_F\_G**  
 24.0000–48.0000MHz



## Series

| Series    | Size | Package | Frequency (MHz)    | Frequency Tolerance (ppm max.) [at 25°C±3°C] | Frequency Shift by Temperature (ppm max.) [Standard Condition: +25°C] | Frequency Aging (ppm max./Year) | Operating Temperature Range (°C) | Applications                       |
|-----------|------|---------|--------------------|--|---|---------------------------------|----------------------------------|------------------------------------|
| XRCHA_F_A | 2520 | Resin   | 16.0000 to 24.0000 | ±100   | ±100  | ±5                              | -40 to +125*                     | ADAS, Power Train, Chassis, Safety |
| XRCGB_F_A | 2016 |         | 24.0000 to 48.0000 | ±30/±50                                      | ±35/±65   | ±2                              | -40 to +125                      | ADAS, Power Train, Chassis, Safety |
| XRCGB_F_G |      |         | ±30/±45/±100       | ±50  | ±5  | -40 to +85                      | Car Multimedia                   |                                    |

\* +150°C is available.

**Part Number List**

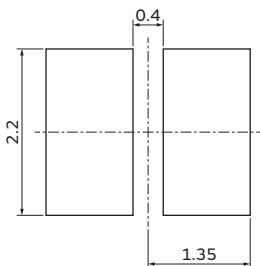
| Series    | Part Number        | Frequency (MHz) | Frequency Tolerance (ppm max.) [at 25°C±3°C] | Frequency Shift by Temperature (ppm max.) [Standard Condition: +25°C] | Frequency Aging (ppm max./Year) | ESR* (Ωmax.) | Load Capacitance (pF) | Drive Level (μW max.) |
|-----------|--------------------|-----------------|--|---|---------------------------------|--------------|-----------------------|-----------------------|
| XRCHA_F_A | XRCHA16M000FOA01R0 | 16.0000         | ±100   | ±100 (-40 to +125°C)  | ±5                              | 100          | 8                     | 300                   |
| XRCHA_F_A | XRCHA16M000FOA11R0 | 16.0000         | ±100   | ±100 (-40 to +125°C)  | ±5                              | 100          | 8                     | 600                   |
| XRCHA_F_A | XRCHA16M000FOA12R0 | 16.0000         | ±100   | ±100 (-40 to +150°C)  | ±5                              | 100          | 8                     | 300                   |
| XRCHA_F_A | XRCHA16M000FOA13R0 | 16.0000         | ±100   | ±100 (-40 to +150°C)  | ±5                              | 100          | 8                     | 600                   |
| XRCHA_F_A | XRCHA20M000FOA01R0 | 20.0000         | ±100   | ±100 (-40 to +125°C)  | ±5                              | 80           | 8                     | 300                   |
| XRCHA_F_A | XRCHA20M000FOA11R0 | 20.0000         | ±100   | ±100 (-40 to +125°C)  | ±5                              | 80           | 8                     | 600                   |
| XRCHA_F_A | XRCHA20M000FOA12R0 | 20.0000         | ±100   | ±100 (-40 to +150°C)  | ±5                              | 80           | 8                     | 300                   |
| XRCHA_F_A | XRCHA20M000FOA13R0 | 20.0000         | ±100   | ±100 (-40 to +150°C)  | ±5                              | 80           | 8                     | 600                   |
| XRCHA_F_A | XRCHA24M000FOA01R0 | 24.0000         | ±100   | ±100 (-40 to +125°C)  | ±5                              | 80           | 8                     | 300                   |
| XRCHA_F_A | XRCHA24M000FOA11R0 | 24.0000         | ±100   | ±100 (-40 to +125°C)  | ±5                              | 80           | 8                     | 600                   |
| XRCHA_F_A | XRCHA24M000FOA12R0 | 24.0000         | ±100   | ±100 (-40 to +150°C)  | ±5                              | 80           | 8                     | 300                   |
| XRCHA_F_A | XRCHA24M000FOA13R0 | 24.0000         | ±100   | ±100 (-40 to +150°C)  | ±5                              | 80           | 8                     | 600                   |
| XRCGB_F_A | XRCGB24M000F3A00R0 | 24.0000         | ±30  | ±35 (-40 to +125°C)   | ±2                              | 120          | 6                     | 300                   |
| XRCGB_F_A | XRCGB25M000F3A00R0 | 25.0000         | ±30  | ±35 (-40 to +125°C)   | ±2                              | 100          | 6                     | 300                   |
| XRCGB_F_A | XRCGB26M000F3A00R0 | 26.0000         | ±30  | ±35 (-40 to +125°C)   | ±2                              | 80           | 6                     | 300                   |
| XRCGB_F_A | XRCGB27M000F3A00R0 | 27.0000         | ±30  | ±35 (-40 to +125°C)   | ±2                              | 80           | 6                     | 300                   |
| XRCGB_F_A | XRCGB27M120F3A00R0 | 27.1200         | ±30  | ±35 (-40 to +125°C)   | ±2                              | 80           | 6                     | 300                   |
| XRCGB_F_A | XRCGB48M000F5A00R0 | 48.0000         | ±50  | ±65 (-40 to +125°C)   | ±2                              | 60           | 6                     | 300                   |
| XRCGB_F_G | XRCGB24M000F0G00R0 | 24.0000         | ±100   | ±50 (-40 to +85°C)  | ±5                              | 150          | 6                     | 300                   |
| XRCGB_F_G | XRCGB24M000F3G00R0 | 24.0000         | ±30  | ±50 (-40 to +85°C)  | ±5                              | 150          | 6                     | 300                   |
| XRCGB_F_G | XRCGB24M576F0G00R0 | 24.5760         | ±100   | ±50 (-40 to +85°C)  | ±5                              | 150          | 6                     | 300                   |
| XRCGB_F_G | XRCGB24M576F3G00R0 | 24.5760         | ±30  | ±50 (-40 to +85°C)  | ±5                              | 150          | 6                     | 300                   |
| XRCGB_F_G | XRCGB25M000F0G00R0 | 25.0000         | ±100   | ±50 (-40 to +85°C)  | ±5                              | 150          | 6                     | 300                   |
| XRCGB_F_G | XRCGB25M000F3G00R0 | 25.0000         | ±30  | ±50 (-40 to +85°C)  | ±5                              | 150          | 6                     | 300                   |
| XRCGB_F_G | XRCGB26M000F0G00R0 | 26.0000         | ±100   | ±50 (-40 to +85°C)  | ±5                              | 150          | 6                     | 300                   |
| XRCGB_F_G | XRCGB26M000F3G00R0 | 26.0000         | ±30  | ±50 (-40 to +85°C)  | ±5                              | 150          | 6                     | 300                   |
| XRCGB_F_G | XRCGB27M000F0G00R0 | 27.0000         | ±100   | ±50 (-40 to +85°C)  | ±5                              | 150          | 6                     | 300                   |
| XRCGB_F_G | XRCGB27M000F3G00R0 | 27.0000         | ±30  | ±50 (-40 to +85°C)  | ±5                              | 150          | 6                     | 300                   |
| XRCGB_F_G | XRCGB27M120F3G00R0 | 27.1200         | ±30  | ±50 (-40 to +85°C)  | ±5                              | 150          | 6                     | 300                   |
| XRCGB_F_G | XRCGB30M000F0G00R0 | 30.0000         | ±100   | ±50 (-40 to +85°C)  | ±5                              | 100          | 6                     | 300                   |
| XRCGB_F_G | XRCGB30M000F3G00R0 | 30.0000         | ±30  | ±50 (-40 to +85°C)  | ±5                              | 100          | 6                     | 300                   |
| XRCGB_F_G | XRCGB33M868F0G00R0 | 33.8688         | ±100   | ±50 (-40 to +85°C)  | ±5                              | 100          | 6                     | 300                   |
| XRCGB_F_G | XRCGB33M868F4G00R0 | 33.8688         | ±45  | ±50 (-40 to +85°C)  | ±5                              | 100          | 6                     | 300                   |
| XRCGB_F_G | XRCGB40M000F0G00R0 | 40.0000         | ±100   | ±50 (-40 to +85°C)  | ±5                              | 100          | 6                     | 300                   |
| XRCGB_F_G | XRCGB40M000F4G00R0 | 40.0000         | ±45  | ±50 (-40 to +85°C)  | ±5                              | 100          | 6                     | 300                   |
| XRCGB_F_G | XRCGB48M000F0G00R0 | 48.0000         | ±100   | ±50 (-40 to +85°C)  | ±5                              | 100          | 6                     | 300                   |
| XRCGB_F_G | XRCGB48M000F4G00R0 | 48.0000         | ±45  | ±50 (-40 to +85°C)  | ±5                              | 100          | 6                     | 300                   |

\* Equivalent Series Resistance

**Standard Land Pattern Dimensions**

XRCHA\_F\_A

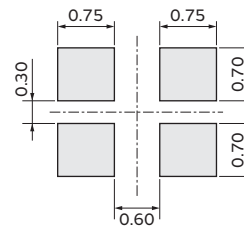
(Recommended Land Pattern)



(in mm)

XRCGB\_F\_A/G

(Recommended Land Pattern)



(in mm)

## Notice -Crystal Units for Automotive-

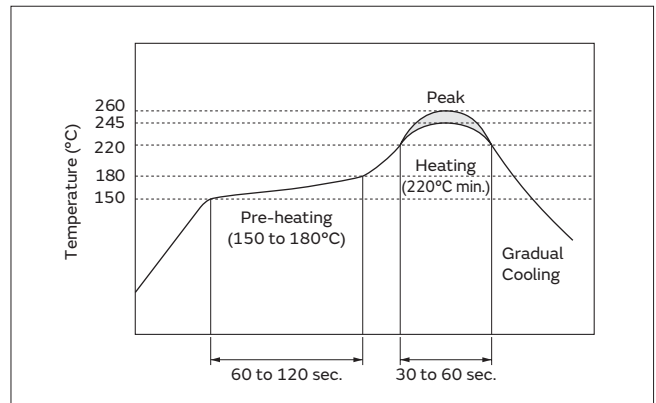
### Notice (Soldering and Mounting)

#### 1.1. Soldering Condition

##### (1) Reflow

Please mount components on a circuit board by the reflow soldering method.  
 Flux: Please use rosin based flux; do not use water soluble flux.  
 Solder: Please use solder (Sn-3.0Ag-0.5Cu) under the following condition.  
 Standard thickness of soldering paste: 0.10 to 0.15mm

|                  | Condition                         |                |
|------------------|-----------------------------------|----------------|
| Pre-heating      | 150 to 180°C                      | 60 to 120 sec. |
| Heating          | 220°C min.                        | 30 to 60 sec.  |
| Peak Temperature | 245°C min. 260°C max. 5 sec. max. |                |



##### (2) Soldering Iron

If compelled to mount the component by using a soldering iron, please do not directly touch the component with the soldering iron. The component terminals or electrical characteristics may be damaged if excessive thermal stress is applied.

|                               | Condition      |
|-------------------------------|----------------|
| Pre-heating                   | 150°C 60 sec.  |
| Heating of the Soldering Iron | 350°C max.     |
| Watt                          | 30W max.       |
| Shape of the Soldering Iron   | ø3mm max.      |
| Soldering Time                | 5 sec. max.    |
| Solder                        | Sn-3.0Ag-0.5Cu |

#### 1.2. Optimum Solder Amount for Soldering

Please make the solder volume below the height of the substrate. When exceeding the substrate, damage to the sealing part between the metal cap and the substrate may occur.

#### 1.3. Other

Do not reuse components once mounted onto a circuit board.

#### 2. Wash

The component cannot withstand washing.

#### 3. Notice for Mounting

The component is recommended for placement machines employing optical placement capabilities. The component might be damaged by mechanical force depending on placement machine and condition. Make sure that you have evaluated by using placement machines before going into mass production. Do not use placement machines employing mechanical positioning. Please contact Murata for details beforehand.

Continued on the following page. ↗

## Notice -Crystal Units for Automotive-

Continued from the preceding page. ↘

### Notice (Storage and Operating Condition)

#### 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 degrees C

Humidity: 15 to 85% R.H.

#### 2. Expire 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 products may be degraded in solderability and/or rusty. 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/or be degraded in solderability due to the 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 in 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 conditions.

(5) Please do not drop the products to avoid cracking the crystal element.

#### 4. Other

Conformal coating or washing of the component is not acceptable because it is not hermetically sealed. Please be sure to consult with our sales representative or engineer whenever and prior to using the products.

### Notice (Rating)

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

### Notice (Handling)

1. Irregular or stopped oscillation may occur under unmatched circuit conditions.

Please design your oscillation circuit to get 5 times or more of a negative resistance against the maximum value of the Equivalent Series Resistance, that is specified in order.

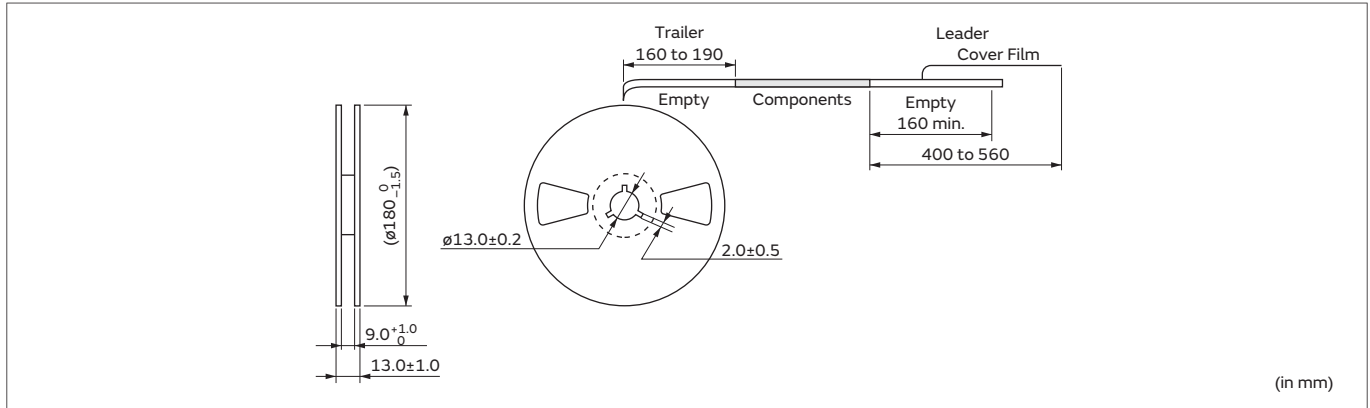
2. Be sure to provide an appropriate fail-safe function on your product to prevent secondary damage that may be caused by the abnormal function or the failure of our product.

## Packaging -Crystal Units for Automotive-

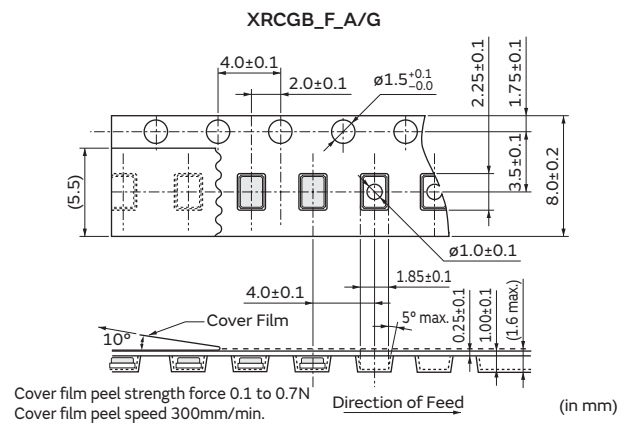
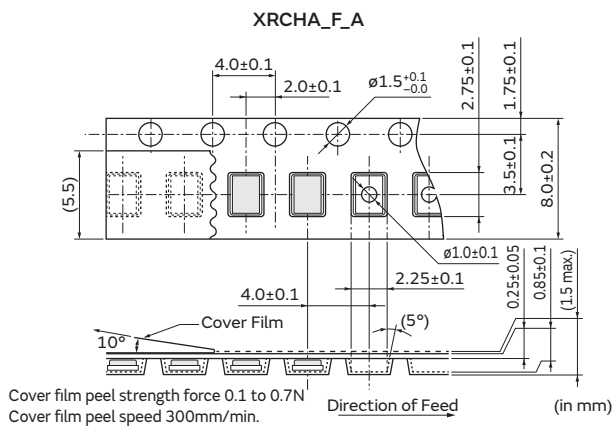
### Minimum Quantity/Dimensions of Reel

| Plastic Tape $\phi 180\text{mm}$ | Plastic Tape $\phi 330\text{mm}$ |
|----------------------------------|----------------------------------|
| 3,000                            | 9,000                            |

(pcs.)



### Dimensions of Taping



# Crystal Units

for Industrial



These crystal units feature a small package and highly accurate frequency. Based on Murata's excellent package technology and high grade quartz crystal elements, achieving small size and high accuracy crystal units.

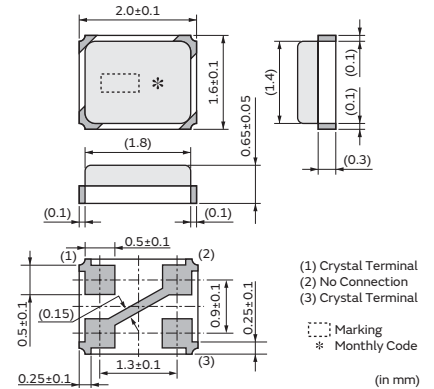
## Features

1. The series is available in the applications to be necessary for high accuracy crystal units.
2. The crystal units are extremely small, contributing to a reduction in the mounting area.
3. The series complies to RoHS directive, being lead-free (phase 3).

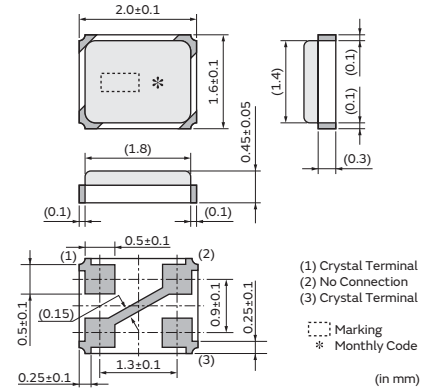
## Applications

1. Clock for PLC, Inverter, Servo Amp, Servo Motor, etc. controller ICs
2. Clock for LCD, Programmable display and Visual equipment controller ICs
3. Storage devices with SATA interface (Server, HDD, SSD, Optical storage device, etc.)
4. Clock for USB (Ultra-Speed and High-speed) controller ICs (Mobile phone, DVC, DSC, Portable audio, PC peripheral, etc.)
5. Other applications for replacement of other crystal units or oscillators

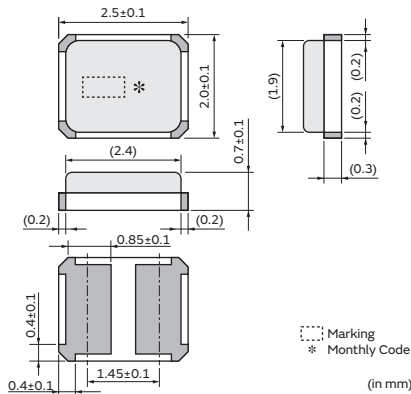
XRCGB\_F\_Z  
24.0000-48.0000MHz



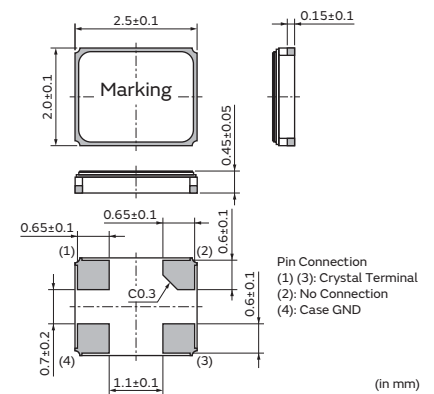
XRCPB\_F\_Z  
24.0000-48.0000MHz



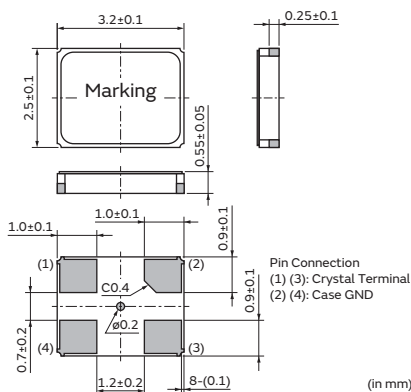
XRCHA\_F\_Z  
16.0000-20.0000MHz



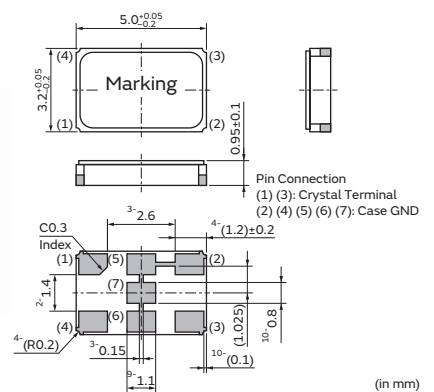
XRCHH  
(TAS-2520F)  
16.0000-52.0000MHz



XRCJH  
(TAS-3225J)  
13.0000-52.0000MHz



XRCLH  
(TAS-5032F)  
10.0000-52.0000MHz



3

**Series**

| Series    | Type      | Size | Package            | Frequency (MHz)    | Frequency Tolerance (ppm max.) [at 25°C±3°C] | Frequency Shift by Temperature (ppm max.) [Standard Condition: +25°C] | Frequency Aging (ppm max./Year) | Drive Level (µW max.) | Operating Temperature Range (°C) |
|-----------|-----------|------|--------------------|--------------------|--|---|---------------------------------|-----------------------|----------------------------------|
| XRCGB_F_Z | -         | 2016 | Resin              | 24.0000 to 48.0000 | ±100   | ±100  | ±5                              | 300                   | -40 to +105                      |
| XRCPB_F_Z |           |      |                    | 16.0000 to 20.0000 |  |   |                                 |                       |                                  |
| XRCHA_F_Z |           | 2520 | 16.0000 to 52.0000 |                    |  |   |                                 |                       |                                  |
| XRCHH     | TAS-2520F | 3225 | Metal              | 13.0000 to 52.0000 | ±10  | ±15   | ±1(±3/5Years)                   | 60                    | -30 to +85                       |
| XRCJH     | TAS-3225J |      |                    | 10.0000 to 52.0000 |  |   |                                 |                       |                                  |
| XRCLH     | TAS-5032F |      |                    | 5032               |  |   |                                 |                       |                                  |

XRCPB series is a low profile type of XRCGB series.

**Part Number List**

| Series    | Type      | Part Number        | Frequency (MHz) | Frequency Tolerance (ppm max.) [at 25°C±3°C] | Frequency Shift by Temperature (ppm max.) [Standard Condition: +25°C] | Frequency Aging (ppm max./Year) | ESR* (Ωmax.) | Load Capacitance (pF) | Drive Level (µW max.) |
|-----------|-----------|--------------------|-----------------|--|---|---------------------------------|--------------|-----------------------|-----------------------|
| XRCGB_F_Z | -         | XRCGB24M000F0Z00R0 | 24.0000         | ±100   | ±100 (-40 to +105°C)  | ±5                              | 150          | 6                     | 300                   |
| XRCGB_F_Z | -         | XRCGB24M576F0Z00R0 | 24.5760         | ±100   | ±100 (-40 to +105°C)  | ±5                              | 150          | 6                     | 300                   |
| XRCGB_F_Z | -         | XRCGB25M000F0Z00R0 | 25.0000         | ±100   | ±100 (-40 to +105°C)  | ±5                              | 150          | 6                     | 300                   |
| XRCGB_F_Z | -         | XRCGB26M000F0Z00R0 | 26.0000         | ±100   | ±100 (-40 to +105°C)  | ±5                              | 150          | 6                     | 300                   |
| XRCGB_F_Z | -         | XRCGB27M000F0Z00R0 | 27.0000         | ±100   | ±100 (-40 to +105°C)  | ±5                              | 150          | 6                     | 300                   |
| XRCGB_F_Z | -         | XRCGB27M120F0Z00R0 | 27.1200         | ±100   | ±100 (-40 to +105°C)  | ±5                              | 150          | 6                     | 300                   |
| XRCGB_F_Z | -         | XRCGB30M000F0Z00R0 | 30.0000         | ±100   | ±100 (-40 to +105°C)  | ±5                              | 100          | 6                     | 300                   |
| XRCGB_F_Z | -         | XRCGB31M250F0Z00R0 | 31.2500         | ±100   | ±100 (-40 to +105°C)  | ±5                              | 100          | 6                     | 300                   |
| XRCGB_F_Z | -         | XRCGB32M000F0Z00R0 | 32.0000         | ±100   | ±100 (-40 to +105°C)  | ±5                              | 100          | 6                     | 300                   |
| XRCGB_F_Z | -         | XRCGB33M868F0Z00R0 | 33.8688         | ±100   | ±100 (-40 to +105°C)  | ±5                              | 100          | 6                     | 300                   |
| XRCGB_F_Z | -         | XRCGB40M000F0Z00R0 | 40.0000         | ±100   | ±100 (-40 to +105°C)  | ±5                              | 100          | 6                     | 300                   |
| XRCGB_F_Z | -         | XRCGB48M000F0Z00R0 | 48.0000         | ±100   | ±100 (-40 to +105°C)  | ±5                              | 100          | 6                     | 300                   |
| XRCPB_F_Z | -         | XRCPB24M000F0Z00R0 | 24.0000         | ±100   | ±100 (-40 to +105°C)  | ±5                              | 150          | 6                     | 300                   |
| XRCPB_F_Z | -         | XRCPB24M576F0Z00R0 | 24.5760         | ±100   | ±100 (-40 to +105°C)  | ±5                              | 150          | 6                     | 300                   |
| XRCPB_F_Z | -         | XRCPB25M000F0Z00R0 | 25.0000         | ±100   | ±100 (-40 to +105°C)  | ±5                              | 150          | 6                     | 300                   |
| XRCPB_F_Z | -         | XRCPB26M000F0Z00R0 | 26.0000         | ±100   | ±100 (-40 to +105°C)  | ±5                              | 150          | 6                     | 300                   |
| XRCPB_F_Z | -         | XRCPB27M000F0Z00R0 | 27.0000         | ±100   | ±100 (-40 to +105°C)  | ±5                              | 150          | 6                     | 300                   |
| XRCPB_F_Z | -         | XRCPB27M120F0Z00R0 | 27.1200         | ±100   | ±100 (-40 to +105°C)  | ±5                              | 150          | 6                     | 300                   |
| XRCPB_F_Z | -         | XRCPB30M000F0Z00R0 | 30.0000         | ±100   | ±100 (-40 to +105°C)  | ±5                              | 100          | 6                     | 300                   |
| XRCPB_F_Z | -         | XRCPB31M250F0Z00R0 | 31.2500         | ±100   | ±100 (-40 to +105°C)  | ±5                              | 100          | 6                     | 300                   |
| XRCPB_F_Z | -         | XRCPB32M000F0Z00R0 | 32.0000         | ±100   | ±100 (-40 to +105°C)  | ±5                              | 100          | 6                     | 300                   |
| XRCPB_F_Z | -         | XRCPB33M868F0Z00R0 | 33.8688         | ±100   | ±100 (-40 to +105°C)  | ±5                              | 100          | 6                     | 300                   |
| XRCPB_F_Z | -         | XRCPB40M000F0Z00R0 | 40.0000         | ±100   | ±100 (-40 to +105°C)  | ±5                              | 100          | 6                     | 300                   |
| XRCPB_F_Z | -         | XRCPB48M000F0Z00R0 | 48.0000         | ±100   | ±100 (-40 to +105°C)  | ±5                              | 100          | 6                     | 300                   |
| XRCHA_F_Z | -         | XRCHA16M000F0Z01R0 | 16.0000         | ±100   | ±100 (-40 to +105°C)  | ±5                              | 100          | 8                     | 300                   |
| XRCHA_F_Z | -         | XRCHA20M000F0Z01R0 | 20.0000         | ±100   | ±100 (-40 to +105°C)  | ±5                              | 80           | 8                     | 300                   |
| XRCHH     | TAS-2520F | XRCHH16M000F1QB7P0 | 16.0000         | ±10  | ±15 (-30 to +85°C)  | ±1 (±3/5Years)                  | 80           | 8                     | 60                    |
| XRCHH     | TAS-2520F | XRCHH20M000F1QB1P0 | 20.0000         | ±10  | ±15 (-30 to +85°C)  | ±1 (±3/5Years)                  | 60           | 8                     | 60                    |
| XRCHH     | TAS-2520F | XRCHH26M000F1QD8P0 | 26.0000         | ±10  | ±15 (-30 to +85°C)  | ±1 (±3/5Years)                  | 60           | 8                     | 60                    |
| XRCHH     | TAS-2520F | XRCHH36M000F1QA3P0 | 36.0000         | ±10  | ±15 (-30 to +85°C)  | ±1 (±3/5Years)                  | 60           | 8                     | 60                    |
| XRCHH     | TAS-2520F | XRCHH40M000F1QB3P0 | 40.0000         | ±10  | ±15 (-30 to +85°C)  | ±1 (±3/5Years)                  | 60           | 8                     | 60                    |
| XRCHH     | TAS-2520F | XRCHH52M000F1QA2P0 | 52.0000         | ±10  | ±15 (-30 to +85°C)  | ±1 (±3/5Years)                  | 60           | 8                     | 60                    |
| XRCJH     | TAS-3225J | XRCJH13M000F1QA0P0 | 13.0000         | ±10  | ±15 (-30 to +85°C)  | ±1 (±3/5Years)                  | 80           | 8                     | 60                    |
| XRCJH     | TAS-3225J | XRCJH16M000F1QB5P0 | 16.0000         | ±10  | ±15 (-30 to +85°C)  | ±1 (±3/5Years)                  | 80           | 8                     | 60                    |
| XRCJH     | TAS-3225J | XRCJH20M000F1QB3P0 | 20.0000         | ±10  | ±15 (-30 to +85°C)  | ±1 (±3/5Years)                  | 60           | 8                     | 60                    |
| XRCJH     | TAS-3225J | XRCJH26M000F1QC1P0 | 26.0000         | ±10  | ±15 (-30 to +85°C)  | ±1 (±3/5Years)                  | 60           | 8                     | 60                    |
| XRCJH     | TAS-3225J | XRCJH36M000F1QA1P0 | 36.0000         | ±10  | ±15 (-30 to +85°C)  | ±1 (±3/5Years)                  | 60           | 8                     | 60                    |
| XRCJH     | TAS-3225J | XRCJH40M000F1QB2P0 | 40.0000         | ±10  | ±15 (-30 to +85°C)  | ±1 (±3/5Years)                  | 60           | 8                     | 60                    |
| XRCJH     | TAS-3225J | XRCJH52M000F1QA1P0 | 52.0000         | ±10  | ±15 (-30 to +85°C)  | ±1 (±3/5Years)                  | 60           | 8                     | 60                    |
| XRCLH     | TAS-5032F | XRCLH10M000F1QA4P0 | 10.0000         | ±10  | ±15 (-30 to +85°C)  | ±1 (±3/5Years)                  | 60           | 8                     | 60                    |
| XRCLH     | TAS-5032F | XRCLH12M000F1QA0P0 | 12.0000         | ±10  | ±15 (-30 to +85°C)  | ±1 (±3/5Years)                  | 60           | 8                     | 60                    |
| XRCLH     | TAS-5032F | XRCLH14M745F1QA0P0 | 14.7456         | ±10  | ±15 (-30 to +85°C)  | ±1 (±3/5Years)                  | 40           | 8                     | 60                    |
| XRCLH     | TAS-5032F | XRCLH16M000F1QA2P0 | 16.0000         | ±10  | ±15 (-30 to +85°C)  | ±1 (±3/5Years)                  | 40           | 8                     | 60                    |
| XRCLH     | TAS-5032F | XRCLH21M250F1QA0P0 | 21.2500         | ±10  | ±15 (-30 to +85°C)  | ±1 (±3/5Years)                  | 40           | 8                     | 60                    |
| XRCLH     | TAS-5032F | XRCLH52M000F1QA1P0 | 52.0000         | ±10  | ±15 (-30 to +85°C)  | ±1 (±3/5Years)                  | 40           | 8                     | 60                    |

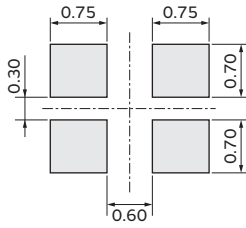
\* Equivalent Series Resistance



## Standard Land Pattern Dimensions

XRCGB\_F\_Z, XRCPB\_F\_Z

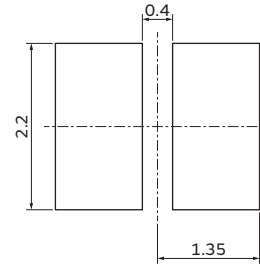
(Recommended Land Pattern)



(in mm)

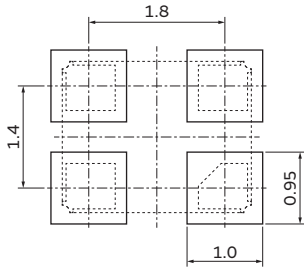
XRCHA\_F\_Z

(Recommended Land Pattern)



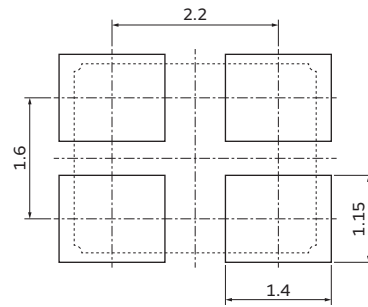
(in mm)

XRCHH  
 (TAS-2520F)



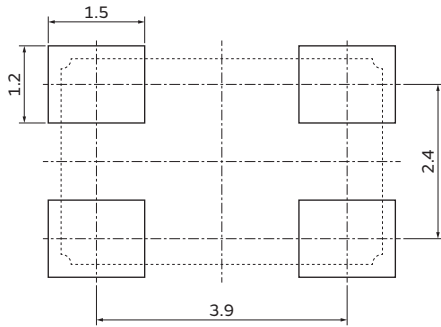
(in mm)

XRCJH  
 (TAS-3225J)



(in mm)

XRCLH  
 (TAS-5032F)



Avoid putting signal lines under the product except referenced land pattern.

(in mm)

## Notice -Crystal Units for Industrial-

### Notice (Soldering and Mounting)

#### 1.1. Soldering Condition

##### (1) Reflow

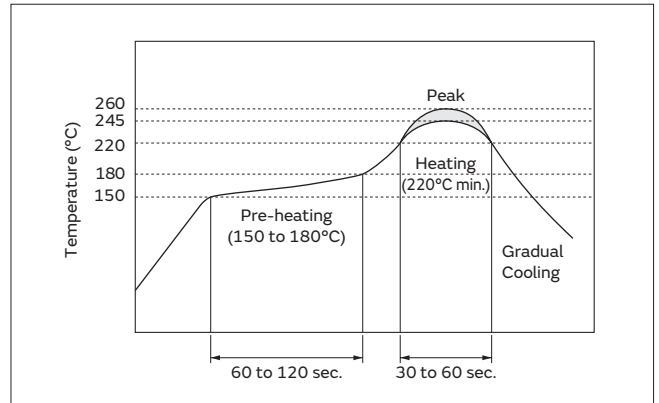
Please mount components on a circuit board by the reflow soldering method.

Flux: Please use rosin based flux; do not use water soluble flux.

Solder: Please use solder (Sn-3.0Ag-0.5Cu) under the following condition.

Standard thickness of soldering paste: 0.10 to 0.15mm

|                  | Condition                         |                |
|------------------|-----------------------------------|----------------|
| Pre-heating      | 150 to 180°C                      | 60 to 120 sec. |
| Heating          | 220°C min.                        | 30 to 60 sec.  |
| Peak Temperature | 245°C min. 260°C max. 5 sec. max. |                |



##### (2) Soldering Iron

If compelled to mount the component by using a soldering iron, please do not directly touch the component with the soldering iron. The component terminals or electrical characteristics may be damaged if excessive thermal stress is applied. Please keep solder away from the metal cap (Lid) portion.

|                               | Condition      |
|-------------------------------|----------------|
| Pre-heating                   | 150°C 60 sec.  |
| Heating of the Soldering Iron | 350°C max.     |
| Watt                          | 30W max.       |
| Shape of the Soldering Iron   | ø3mm max.      |
| Soldering Time                | 5 sec. max.    |
| Solder                        | Sn-3.0Ag-0.5Cu |

#### 1.2. Optimum Solder Amount for Soldering

Please make the solder volume below the height of the substrate. When exceeding the substrate, the damage to the sealing between the metal cap and the substrate may occur.

#### 2. Wash

The component cannot withstand washing.

#### 3. Notice for Mounting

The component is recommended for placement machines employing optical placement capabilities. The component might be damaged by mechanical force depending on placement machine and condition. Make sure that you have evaluated by using placement machines before going into mass production. Do not use placement machines employing mechanical positioning. Please contact Murata for details beforehand.

Continued on the following page. ↗