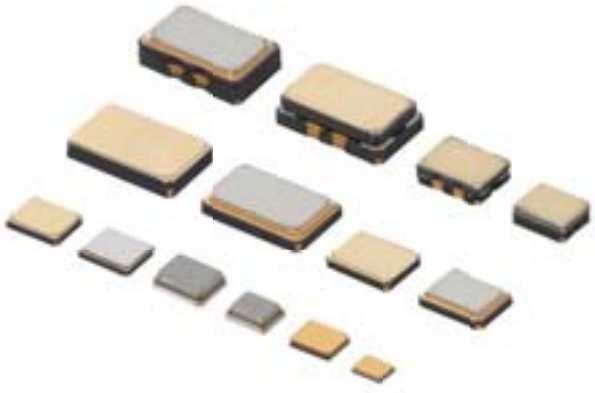
muRata
INNOVATOR IN ELECTRONICS

# 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).

# Contents

Product specifications are as of March 2015.

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

# Selection Guide

## Applications?

### Consumer

#### Crystal Units

**±100ppm**

**2016**

**XRCGB_F_L**
2.0x1.6x0.7mm
24.0000–48.0000MHz



**XRCPB_F_L**
2.0x1.6x0.5mm
24.0000–48.0000MHz

**2520**

**XRCHA_F_L**
2.5x2.0x0.8mm
16.0000–20.0000MHz

**±30/45ppm**

**2016**

**XRCGB_F_M**
2.0x1.6x0.7mm
24.0000–48.0000MHz

**XRCPB_F_M**
2.0x1.6x0.5mm
24.0000–48.0000MHz

**±20ppm**

**2016**

**XRCGB_F_P**
2.0x1.6x0.7mm
24.0000–32.0000MHz

**XRCPB_F_P**
2.0x1.6x0.5mm
24.0000–32.0000MHz

**±10ppm**

**1612**



**XRCFD**
1.6x1.2x0.35mm
24.0000–31.9999MHz



**XRCMD**
1.6x1.2x0.33mm
32.0000–48.0000MHz

**2016**



**XRCGD**
2.0x1.6x0.45mm
26.0000–48.0000MHz

**2520**



**XRCHJ**
2.5x2.0x0.5mm
16.0000–52.0000MHz

**3225**

**XRCJK**
3.2x2.5x0.8mm
12.0000–52.0000MHz

**5032**

**XRCLK**
5.0x3.2x1.05mm
10.0000–52.0000MHz

### Automotive

#### Crystal Units

**±100ppm**

**2016**

**XRCGB_F_A**
2.0x1.6x0.7mm
24.0000–48.0000MHz



**XRCGB_F_G**
2.0x1.6x0.7mm
24.0000–48.0000MHz

**2520**

**XRCHA_F_A**
2.5x2.0x0.8mm
16.0000–24.0000MHz

### Industrial

#### Crystal Units

**±100ppm**

**2016**

**XRCGB_F_Z**
2.0x1.6x0.7mm
24.0000–48.0000MHz



**XRCPB_F_Z**
2.0x1.6x0.5mm
24.0000–48.0000MHz

**2520**

**XRCHA_F_Z**
2.5x2.0x0.8mm
16.0000–20.0000MHz

**±10ppm**

**2520**



**XRCHH**
2.5x2.0x0.5mm
16.0000–52.0000MHz

**3225**

**XRCJH**
3.2x2.5x0.6mm
13.0000–52.0000MHz

**5032**

**XRCLH**
5.0x3.2x1.0mm
10.0000–52.0000MHz

#### Crystal Oscillators

**±1ppm**

**2520**



**XNCHH**
2.5x2.0x1.0mm
10.0000–52.0000MHz



**XTCHH**
2.5x2.0x1.0mm
10.0000–52.0000MHz

**3225**

**XNCJH**
3.2x2.5x1.0mm
10.0000–52.0000MHz

**XTCJH**
3.2x2.5x1.0mm
10.0000–52.0000MHz

**5032**

**XTCLH_E**
5.0x3.2x1.5mm
10.0000–40.0000MHz

**±0.5ppm**

**5032**

**XTCLH_J**
5.0x3.2x1.5mm
10.0000–40.0000MHz

## ● Part Numbering

### Crystal Unit

(Part Number) **XR** **C** **GB** **24M000** **F** **0** **L** **00** **R0**
❶ ❷ ❸ ❹ ❺ ❻ ❼ ❽ ❾

❶Product ID

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

❷Lead Style

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

❸Size · Structure

| Code | Size · Structure |
|---|---|
| **FD** | 1612 (STD) Metal Sealing |
| **MD** | 1612 (Low Profile) Metal Sealing |
| **GD** | 2016 (STD) 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 |

❹Nominal Center Frequency

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

❺Overtone Order

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

❻Frequency Tolerance

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

*1 *2 In the case when ❸ is "HH" or "JK"
*3 Including Initial Torelance+Temperature Characteristics+Aging+Reflow

❼Frequency 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 In the case when ❸ is "HH" or "JK"

❽Individual Specification

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

**00**: Standard specification type.

❾Packaging (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 |
|---|---|---|---|---|---|---|---|---|
| ❶ | ❷ | ❸ | ❹ | ❺ | ❻ | ❼ | ❽ | ❾ |

❶Product ID

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

❷Lead Style

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

❸Size · Structure

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

❹Nominal Center Frequency

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

❺Output Wave

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

❻Frequency Tolerance

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

❼Frequency Shift by Temperature

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

❽Individual Specification

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

❾Packaging (Quantity and Plastic taping reel diameter are expressed by one-digit number in "∗")

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

# for Consumer

## Crystal Units

RoHS Lead free

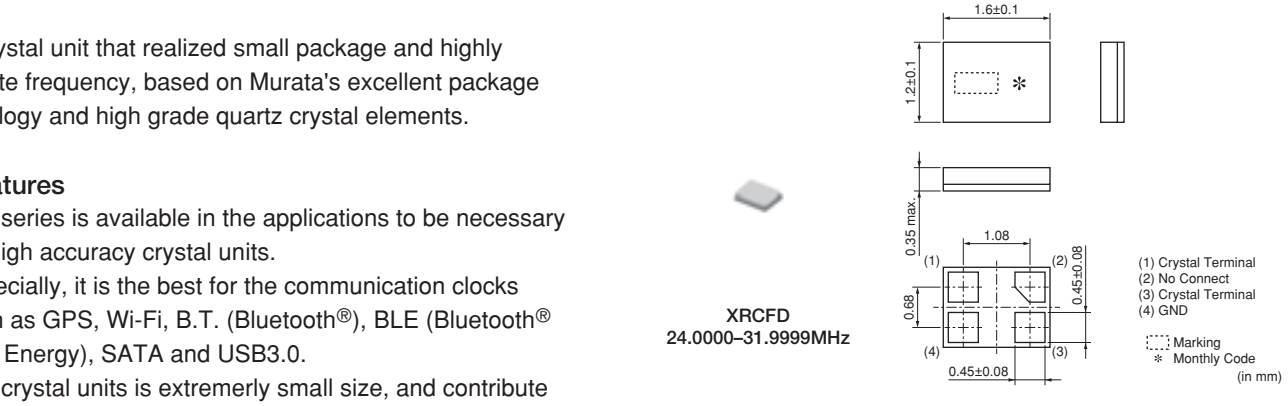
The crystal unit that realized small package and highly accurate frequency, based on Murata's excellent package technology and high grade quartz crystal elements.

### ■ Features

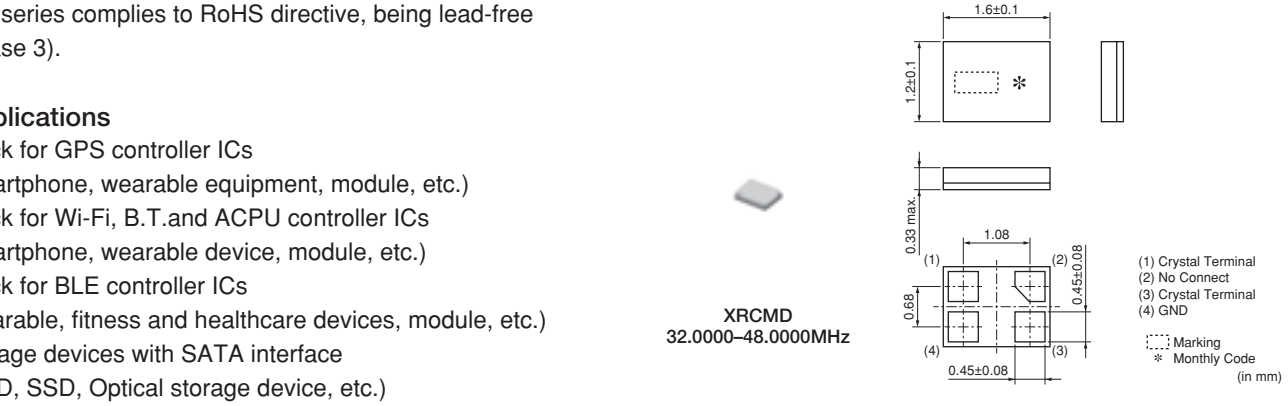
1. The series is available in the applications to be necessary for high accuracy crystal units.
   Especially, it is the best for the communication clocks such as GPS, Wi-Fi, B.T. (Bluetooth®), BLE (Bluetooth® Low Energy), SATA and USB3.0.
2. The crystal units is extremerly small size, and contribute to reduction in mounting area.
3. The series complies to RoHS directive, being lead-free (phase 3).

### ■ Applications

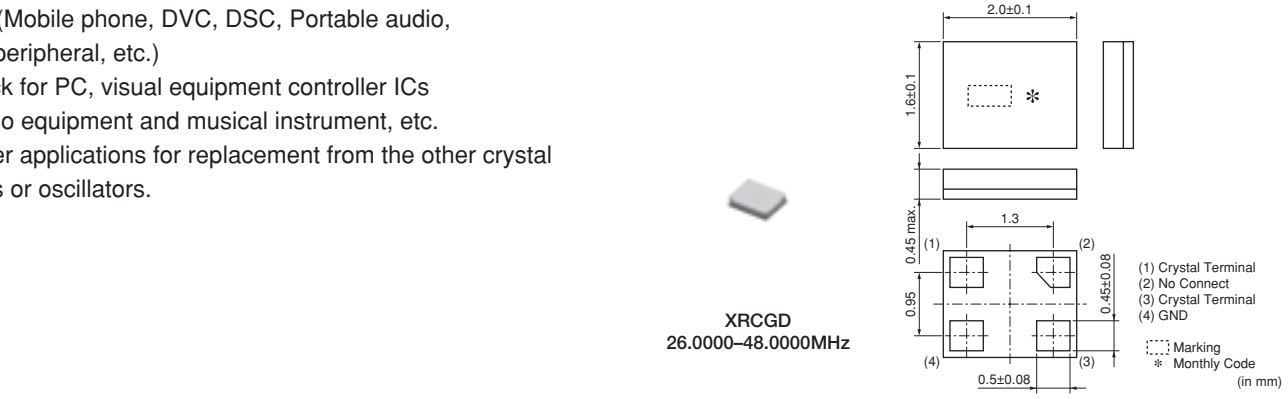
1. Clock for GPS controller ICs
   (smartphone, wearable equipment, module, etc.)
2. Clock for Wi-Fi, B.T.and ACPU controller ICs
   (smartphone, wearable device, module, etc.)
3. Clock for BLE controller ICs
   (wearable, fitness and healthcare devices, module, etc.)
4. Storage devices with SATA interface
   (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 from the other crystal units or oscillators.



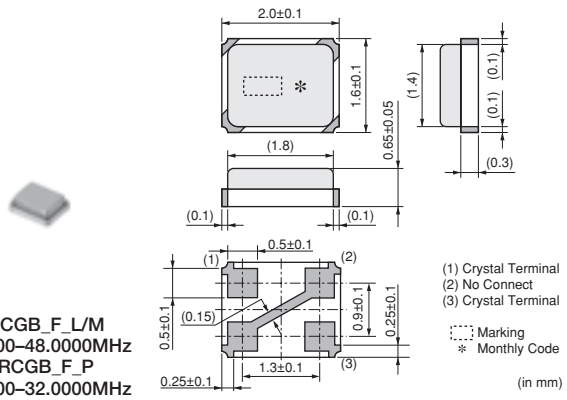

**XRCFD**
**24.0000–31.9999MHz**




**XRCMD**
**32.0000–48.0000MHz**




**XRCGD**
**26.0000–48.0000MHz**




**XRCGB_F_L/M**
**24.0000–48.0000MHz**
**XRCGB_F_P**
**24.0000–32.0000MHz**




**XRCPB_F_L/M**
**24.0000–48.0000MHz**
**XRCPB_F_P**
**24.0000–32.0000MHz**

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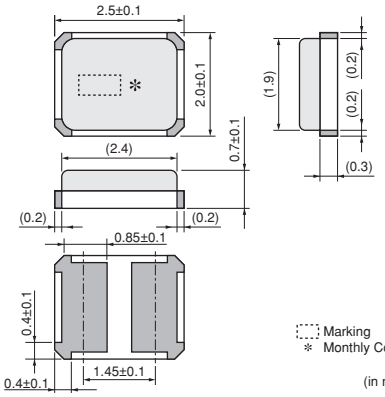
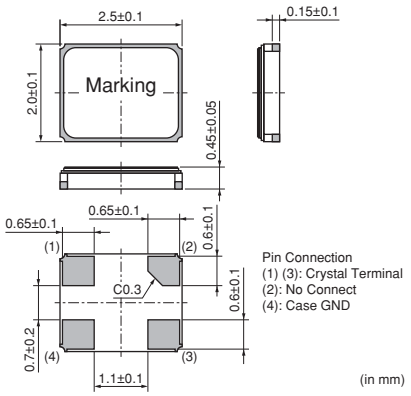
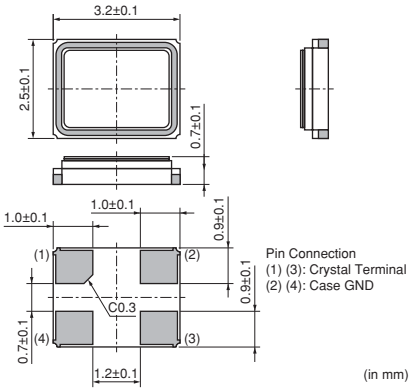
XRCHA_F_L
16.0000–20.0000MHz



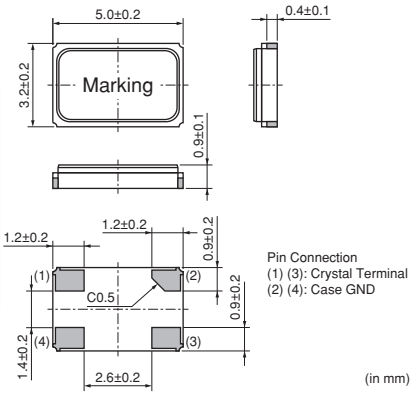

XRCHJ
16.0000–52.0000MHz




XRCJK
12.0000–52.0000MHz




XRCLK
10.0000–52.0000MHz




## ■ 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) | 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 | | | | | |
| **XRCGD** | 2016 | | 26.0000 to 48.0000 | | | | | |
| **XRCGB_F_L** | | Resin | 24.0000 to 48.0000 | ±100 | ±50 | ±5 | 300 | -30 to +85 |
| **XRCPB_F_L** | | | | | | | | |
| **XRCGB_F_M** | | | | ±30/45 | ±40 | | | |
| **XRCPB_F_M** | | | | | | | | |
| **XRCGB_F_P** | | | 24.0000 to 32.0000 | ±20 | ±20 | | | |
| **XRCPB_F_P** | | | | | | | | |
| **XRCHA_F_L** | 2520 | | 16.0000 to 20.0000 | ±100 | ±100 | | | |
| **XRCHJ** | | Seam | 16.0000 to 52.0000 | ±10 | ±15 | ±3 | 30 | |
| **XRCJK** | 3225 | | 12.0000 to 52.0000 | | | | | |
| **XRCLK** | 5032 | | 10.0000 to 52.0000 | | | | | |

XRCPB series is low profile type of XRCGB series.

## ■ 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.) |
|---|---|---|---|---|---|---|---|---|
| **XRCMD** | **XRCMD37M400F1Q01R0** | 37.4000 | ±10 | ±10 (-20 to +70°C) | ±1 | 60 | 8 | 100 |
| **XRCGD** | **XRCGD26M000K1Q01R0** | 26.0000 | ±10 | ±10 (-20 to +70°C) | ±1 | 60 | 8 | 100 |
| **XRCGD** | **XRCGD37M400K1Q01R0** | 37.4000 | ±10 | ±10 (-20 to +70°C) | ±1 | 50 | 8 | 100 |
| **XRCGD** | **XRCGD48M000K1Q01R0** | 48.0000 | ±10 | ±10 (-20 to +70°C) | ±1 | 22 | 8 | 100 |
| **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 |

*: Equivalent Series Resistance

Continued from the preceding page.

| 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.) |
|---|---|---|---|---|---|---|---|---|
| **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 |
| **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_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 |
| **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 |

*: Equivalent Series Resistance

Continued on the following page.

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1

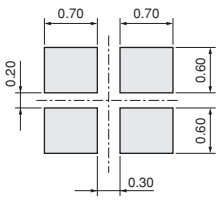
| Series | Part Number | Frequency (MHz) | Frequency Tolerance (ppm max.) [at 25°C±3°C] | Frequency Shift by Temperature (ppm max.) [Standard Condition: +25°C] | Frequency Aging (ppm max./Year) | ESR* (Ωmax.) | Load Capacitance (pF) | Drive Level (μW max.) |
|---|---|---|---|---|---|---|---|---|
| **XRCPB_F_P**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

*: Equivalent Series Resistance

## ■ Standard Land Pattern Dimensions

**XRCFD, XRCMD**

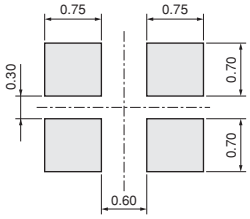
(Recommendable Land Pattern)




(in mm)

**XRCGD**

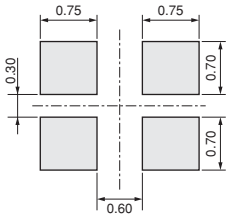
(Recommendable Land Pattern)




(in mm)

**XRCGB_F_L/M/P, XRCPB_F_L/M/P**

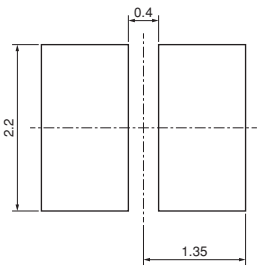
(Recommendable Land Pattern)




(in mm)

**XRCHA_F_L**

(Recommendable Land Pattern)



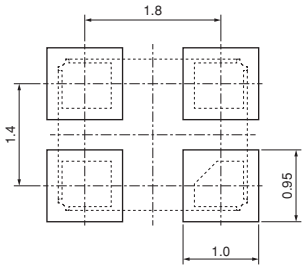

(in mm)

Continued on the following page.

Continued from the preceding page.

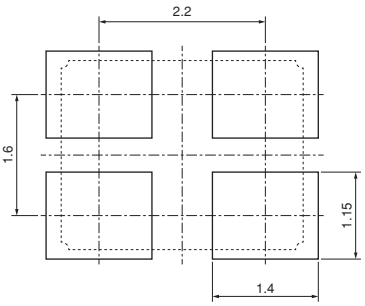
## ■ Standard Land Pattern Dimensions

XRCHJ



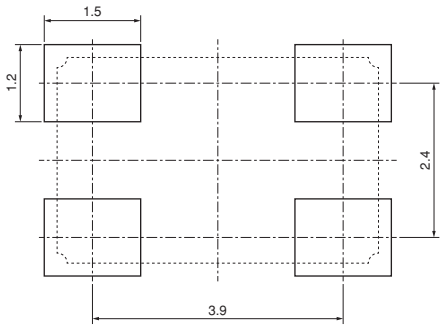

(in mm)

XRCJK




(in mm)

XRCLK




(in mm)

1

# Notice -Crystal Units for Consumer-

## ■ Notice (Soldering and Mounting)

### 1.1. Soldering Condition

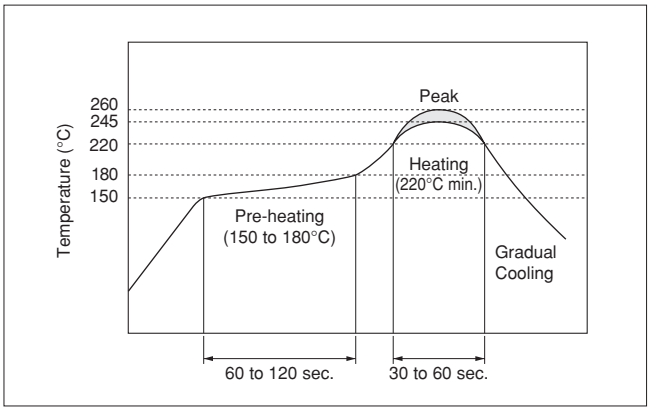
(1) Reflow

Please mount components on a circuit board by the re-flow soldering.

Flux: Please use rosin based flux, but 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 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 off 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 of sealing part between the metal cap and the substrate may occur.

### 2. Wash

The component cannot withstand washing.

### 3. Notice for Mounting

The component is recommended with 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 room where the temperature/humidity is stable. And avoid such 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
   Expire date (Shelf life) of the products is six months after delivery under the conditions of a sealed and an 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 the 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 the 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 the places such as: in a damp heated place, in a place where direct sunlight comes in, in place applying vibrations.
   (4) Please use the products immediately after the package is opened, because the characteristics may be reduced in quality, and/or be degraded in the solderability due to storage under the poor condition.
   (5) Please do not drop the products to avoid cracking of crystal element.
4. Others
   Conformal coating or washing of the component is not acceptable.
   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 stop 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 a second damage that may be caused by the abnormal function or the failure of our product.
3. Please do not use this products in following applications in transportation equipment (vehicles, trains, ships, etc.).
   (example: engine control, brake control, steering control, body control.)

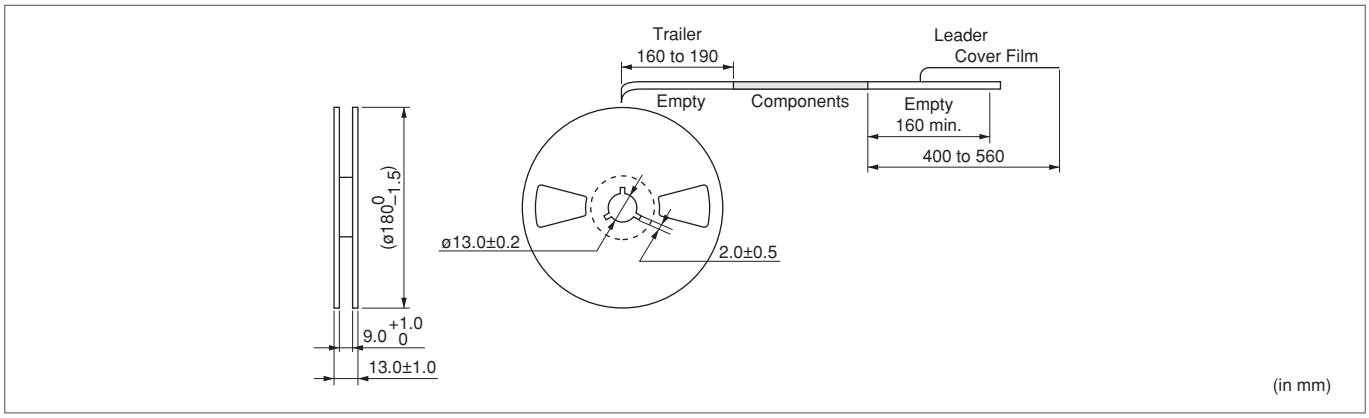
1

# Packaging -Crystal Units for Consumer-

## ■ Minimum Quantity/Dimensions of Reel

| Plastic Tape ø180mm | Plastic Tape ø330mm |
|---|---|
| 3,000 | 9,000 |

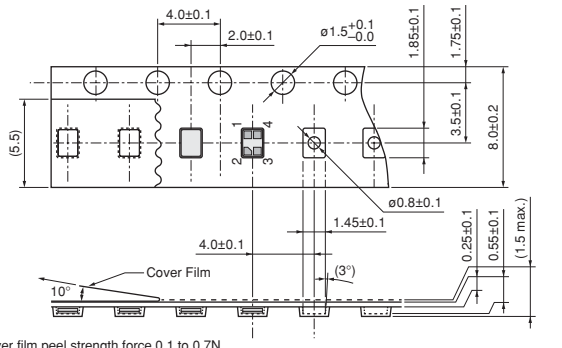
(pcs.)




(in mm)

## ■ Dimensions of Taping

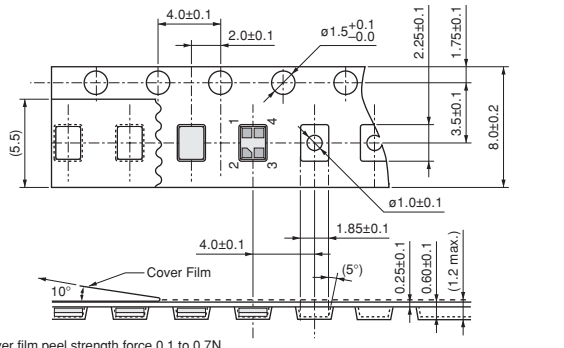
### XRCFD, XRCMD




The cover film peel strength force 0.1 to 0.7N
The cover film peel speed 300mm/min.

(in mm)

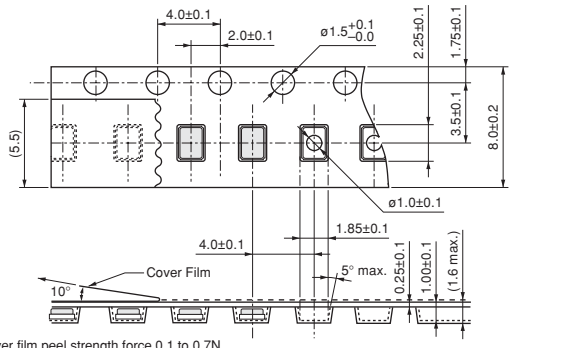
### XRCGD




The cover film peel strength force 0.1 to 0.7N
The cover film peel speed 300mm/min.

(in mm)

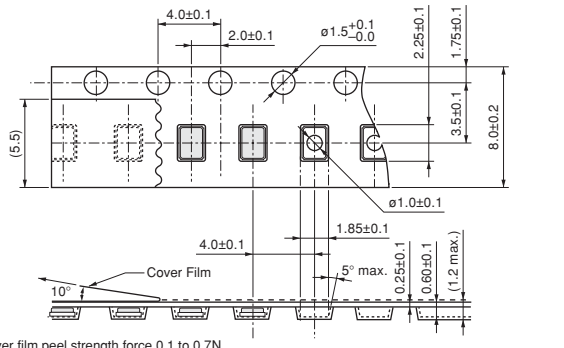
### XRCGB_F_L/M/P




The cover film peel strength force 0.1 to 0.7N
The cover film peel speed 300mm/min.

(in mm)

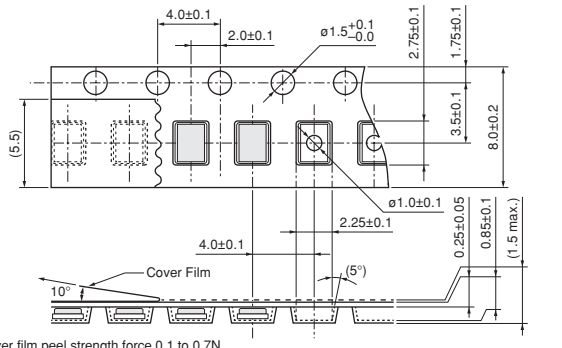
### XRCPB_F_L/M/P




The cover film peel strength force 0.1 to 0.7N
The cover film peel speed 300mm/min.

(in mm)

### XRCHA_F_L



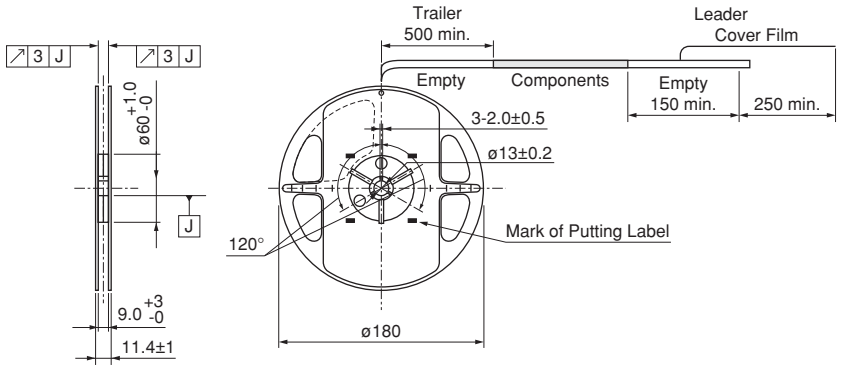

The cover film peel strength force 0.1 to 0.7N
The cover film peel speed 300mm/min.

(in mm)

## ■ Minimum Quantity/Dimensions of Reel

| Plastic Tape ø180mm |
|---|
| 3,000 |

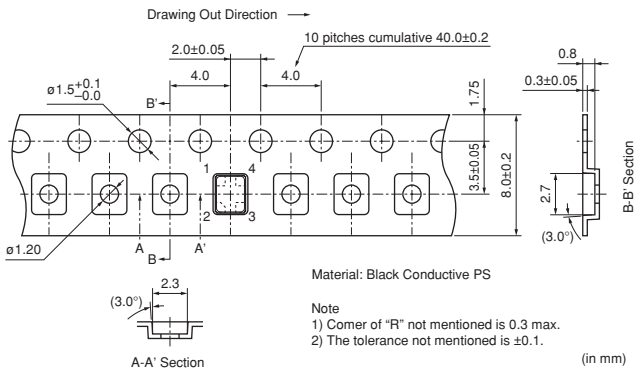
(pcs.)




(in mm)

## ■ Dimensions of Taping

### XRCHJ

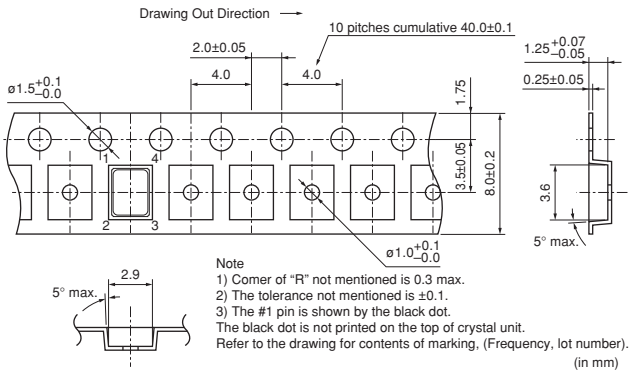



Material: Black Conductive PS

Note
1) Comer of "R" not mentioned is 0.3 max.
2) The tolerance not mentioned is ±0.1.

(in mm)

### XRCJK




Note
1) Comer of "R" not mentioned is 0.3 max.
2) The tolerance not mentioned is ±0.1.
3) The #1 pin is shown by the black dot.
The black dot is not printed on the top of crystal unit.
Refer to the drawing for contents of marking, (Frequency, lot number).

(in mm)

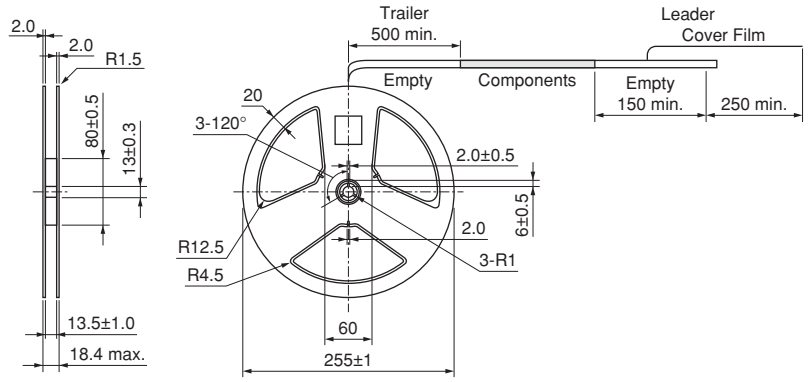
1

# Packaging -Crystal Units for Consumer-

## ■ Minimum Quantity/Dimensions of Reel

| Plastic Tape ø255mm |
|---|
| 3,000 |

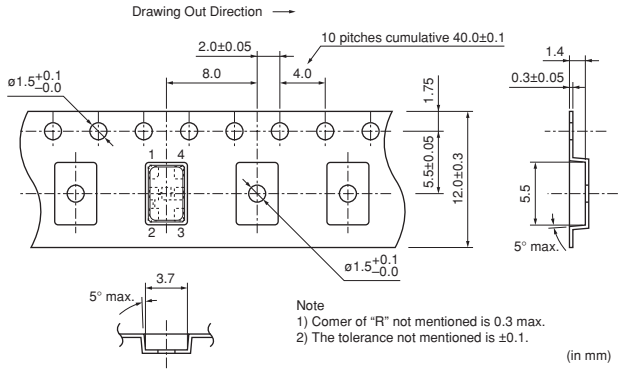
(pcs.)




(in mm)

## ■ Dimensions of Taping

**XRCLK**




Note
1) Comer of "R" not mentioned is 0.3 max.
2) The tolerance not mentioned is ±0.1.

(in mm)

# for Automotive

## Crystal Units

AEC-Q200 RoHS Lead free



The crystal unit for automotive that realized small package and highly accurate frequency, based on Murata's excellent package technology and high grade quartz crystal elements.

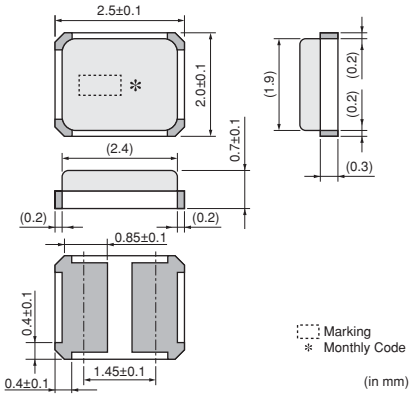
### ■ Features

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

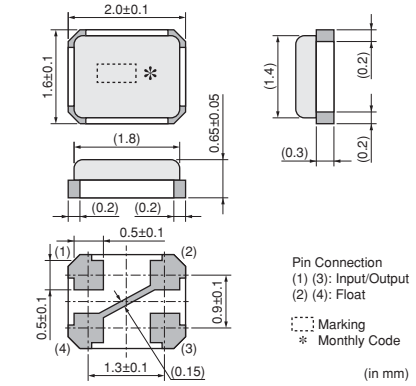
### ■ Applications

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

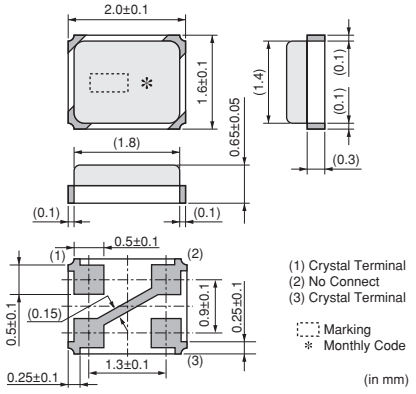
**XRCHA_F_A**
**16.0000–24.0000MHz**




**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** | | | | ±50 | ±50 | ±5 | -40 to +85 | Car Multimedia |

*: +150°C is available.

## ■ Part Number List

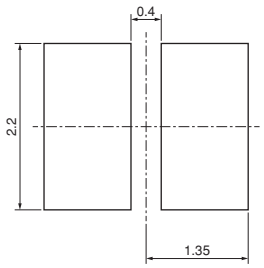
| Series | Part Number | Frequency (MHz) | Frequency Tolerance (ppm max.) [at 25°C±3°C] | Frequency Shift by Temperature (ppm max.) [Standard Condition: +25°C] | Frequency Aging (ppm max./Year) | ESR* (Ωmax.) | Load Capacitance (pF) | Drive Level (μW max.) |
|---|---|---|---|---|---|---|---|---|
| **XRCHA_F_A** | **XRCHA16M000F0A01R0** | 16.0000 | ±100 | ±100 (-40 to +125°C) | ±5 | 100 | 8 | 300 |
| **XRCHA_F_A** | **XRCHA16M000F0A11R0** | 16.0000 | ±100 | ±100 (-40 to +125°C) | ±5 | 100 | 8 | 600 |
| **XRCHA_F_A** | **XRCHA16M000F0A12R0** | 16.0000 | ±100 | ±100 (-40 to +150°C) | ±5 | 100 | 8 | 300 |
| **XRCHA_F_A** | **XRCHA16M000F0A13R0** | 16.0000 | ±100 | ±100 (-40 to +150°C) | ±5 | 100 | 8 | 600 |
| **XRCHA_F_A** | **XRCHA20M000F0A01R0** | 20.0000 | ±100 | ±100 (-40 to +150°C) | ±5 | 80 | 8 | 300 |
| **XRCHA_F_A** | **XRCHA20M000F0A11R0** | 20.0000 | ±100 | ±100 (-40 to +125°C) | ±5 | 80 | 8 | 600 |
| **XRCHA_F_A** | **XRCHA20M000F0A12R0** | 20.0000 | ±100 | ±100 (-40 to +150°C) | ±5 | 80 | 8 | 300 |
| **XRCHA_F_A** | **XRCHA20M000F0A13R0** | 20.0000 | ±100 | ±100 (-40 to +150°C) | ±5 | 80 | 8 | 600 |
| **XRCHA_F_A** | **XRCHA24M000F0A01R0** | 24.0000 | ±100 | ±100 (-40 to +125°C) | ±5 | 80 | 8 | 300 |
| **XRCHA_F_A** | **XRCHA24M000F0A11R0** | 24.0000 | ±100 | ±100 (-40 to +125°C) | ±5 | 80 | 8 | 600 |
| **XRCHA_F_A** | **XRCHA24M000F0A12R0** | 24.0000 | ±100 | ±100 (-40 to +150°C) | ±5 | 80 | 8 | 300 |
| **XRCHA_F_A** | **XRCHA24M000F0A13R0** | 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** | **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_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 | 100 | 6 | 300 |
| **XRCGB_F_G** | **XRCGB25M000F3G00R0** | 25.0000 | ±30 | ±50 (-40 to +85°C) | ±5 | 100 | 6 | 300 |
| **XRCGB_F_G** | **XRCGB26M000F0G00R0** | 26.0000 | ±100 | ±50 (-40 to +85°C) | ±5 | 100 | 6 | 300 |
| **XRCGB_F_G** | **XRCGB26M000F3G00R0** | 26.0000 | ±30 | ±50 (-40 to +85°C) | ±5 | 100 | 6 | 300 |
| **XRCGB_F_G** | **XRCGB27M000F0G00R0** | 27.0000 | ±100 | ±50 (-40 to +85°C) | ±5 | 100 | 6 | 300 |
| **XRCGB_F_G** | **XRCGB27M000F3G00R0** | 27.0000 | ±30 | ±50 (-40 to +85°C) | ±5 | 100 | 6 | 300 |
| **XRCGB_F_G** | **XRCGB27M120F3G00R0** | 27.1200 | ±30 | ±50 (-40 to +85°C) | ±5 | 100 | 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**

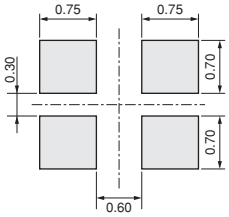
(Recommendable Land Pattern)




(in mm)

**XRCGB_F_A/G**

(Recommendable Land Pattern)




(in mm)

# Notice -Crystal Units for Automotive-



## ■ Notice (Soldering and Mounting)

### 1.1. Soldering Condition

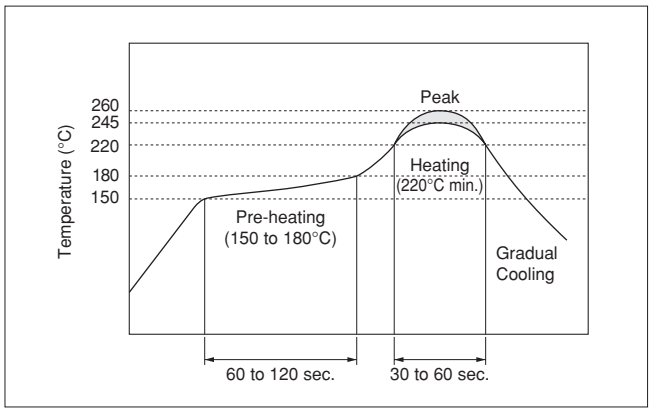
(1) Reflow

Please mount components on a circuit board by the re-flow soldering.

Flux: Please use rosin based flux, but 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 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, the damage of sealing part between the metal cap and the substrate may occur.

### 1.3. Others

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 with 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 room where the temperature/humidity is stable. And avoid such 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
   Expire date (Shelf life) of the products is six months after delivery under the conditions of a sealed and an 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 the 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 the 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 the places such as: in a damp heated place, in a place where direct sunlight comes in, in place applying vibrations.
   (4) Please use the products immediately after the package is opened, because the characteristics may be reduced in quality, and/or be degraded in the solderability due to storage under the poor condition.
   (5) Please do not drop the products to avoid cracking of crystal element.
4. Others
   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 stop 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 a second damage that may be caused by the abnormal function or the failure of our product.

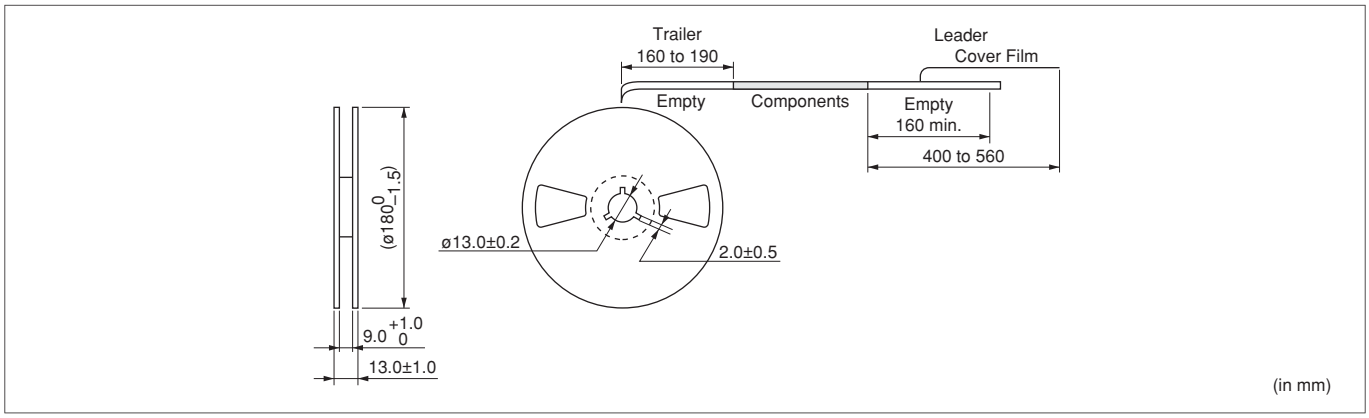
# Packaging -Crystal Units for Automotive-



## ■ Minimum Quantity/Dimensions of Reel

| Plastic Tape ø180mm | Plastic Tape ø330mm |
|---|---|
| 3,000 | 9,000 |

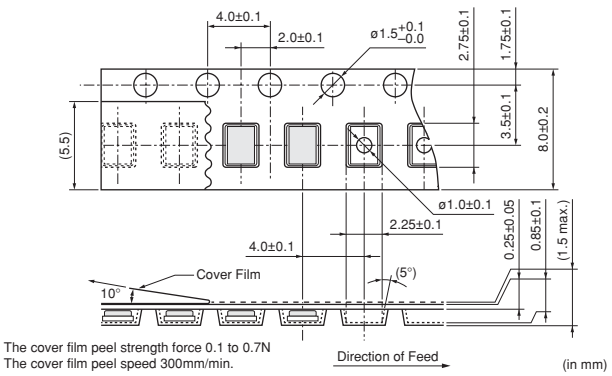
(pcs.)




(in mm)

## ■ Dimensions of Taping

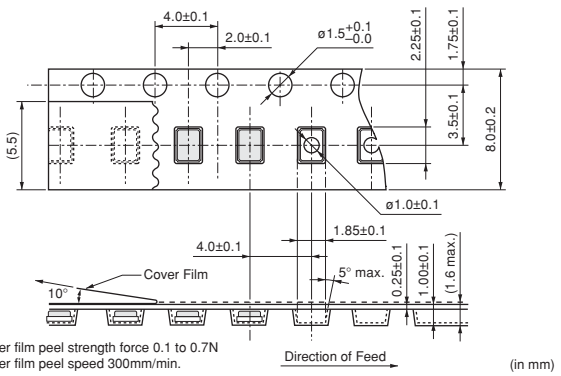
XRCHA_F_A




The cover film peel strength force 0.1 to 0.7N
The cover film peel speed 300mm/min.

(in mm)

XRCGB_F_A/G




The cover film peel strength force 0.1 to 0.7N
The cover film peel speed 300mm/min.

(in mm)

# for Industrial

## Crystal Units

RoHS Lead free

The crystal unit that realized 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.



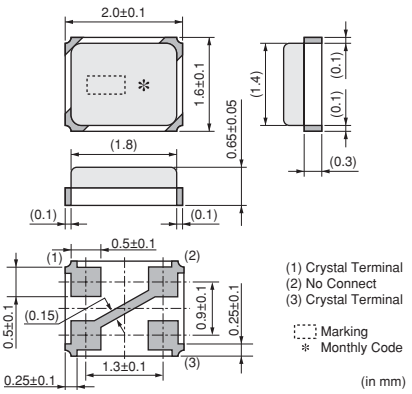
### ■ Features

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

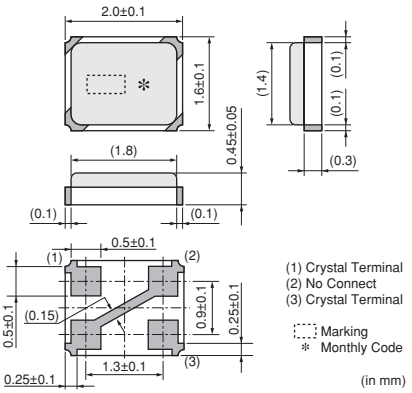
### ■ Applications

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 from the other crystal units or oscillators

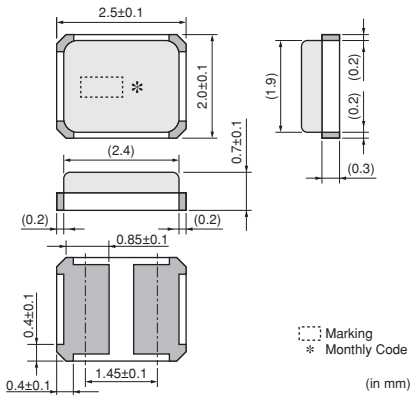
**XRCGB_F_Z**
**24.0000–48.0000MHz**



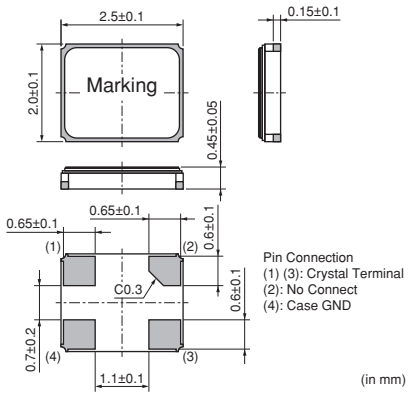

**XRCPB_F_Z**
**24.0000–48.0000MHz**



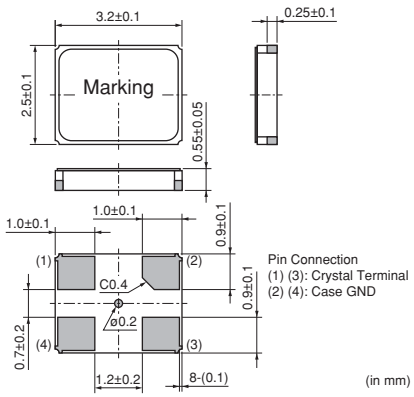

**XRCHA_F_Z**
**16.0000–20.0000MHz**



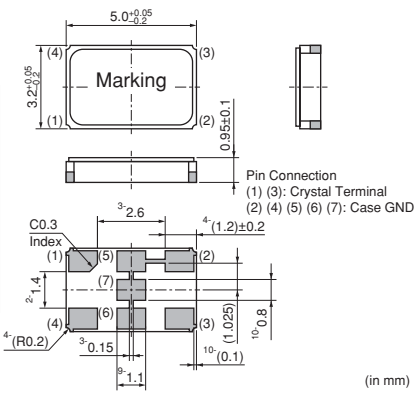

**XRCHH**
**16.0000–52.0000MHz**




**XRCJH**
**13.0000–52.0000MHz**




**XRCLH**
**10.0000–52.0000MHz**



## ■ 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) | 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 | | | | | | | | |
| XRCHA_F_Z | 2520 | | 16.0000 to 20.0000 | | | | | |
| XRCHH | | Metal | 16.0000 to 52.0000 | ±10 | ±15 | ±1 (±3/5Years) | 30 | -30 to +85 |
| XRCJH | 3225 | | 13.0000 to 52.0000 | | | | | |
| XRCLH | 5032 | | 10.0000 to 52.0000 | | | | | |

XRCPB series is low profile type of XRCGB series.

## ■ Part Number List

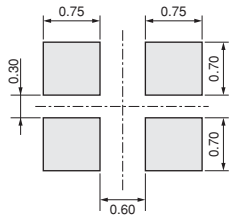
| Series | Part Number | Frequency (MHz) | Frequency Tolerance (ppm max.) [at 25°C±3°C] | Frequency Shift by Temperature (ppm max.) [Standard Condition: +25°C] | Frequency Aging (ppm max./Year) | ESR* (Ωmax.) | Load Capacitance (pF) | Drive Level (μW max.) |
|---|---|---|---|---|---|---|---|---|
| XRCGB_F_Z | 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 | XRCHH16M000F1QB7P0 | 16.0000 | ±10 | ±15 (-30 to +85°C) | ±1 (±3/5Years) | 80 | 8 | 30 |
| XRCHH | XRCHH20M000F1QB1P0 | 20.0000 | ±10 | ±15 (-30 to +85°C) | ±1 (±3/5Years) | 60 | 8 | 30 |
| XRCHH | XRCHH26M000F1QD8P0 | 26.0000 | ±10 | ±15 (-30 to +85°C) | ±1 (±3/5Years) | 60 | 8 | 30 |
| XRCHH | XRCHH36M000F1QA3P0 | 36.0000 | ±10 | ±15 (-30 to +85°C) | ±1 (±3/5Years) | 60 | 8 | 30 |
| XRCHH | XRCHH40M000F1QB3P0 | 40.0000 | ±10 | ±15 (-30 to +85°C) | ±1 (±3/5Years) | 60 | 8 | 30 |
| XRCHH | XRCHH52M000F1QA2P0 | 52.0000 | ±10 | ±15 (-30 to +85°C) | ±1 (±3/5Years) | 60 | 8 | 30 |
| XRCJH | XRCJH13M000F1QA0P0 | 13.0000 | ±10 | ±15 (-30 to +85°C) | ±1 (±3/5Years) | 80 | 8 | 30 |
| XRCJH | XRCJH16M000F1QB5P0 | 16.0000 | ±10 | ±15 (-30 to +85°C) | ±1 (±3/5Years) | 80 | 8 | 30 |
| XRCJH | XRCJH20M000F1QB3P0 | 20.0000 | ±10 | ±15 (-30 to +85°C) | ±1 (±3/5Years) | 60 | 8 | 30 |
| XRCJH | XRCJH26M000F1QC1P0 | 26.0000 | ±10 | ±15 (-30 to +85°C) | ±1 (±3/5Years) | 60 | 8 | 30 |
| XRCJH | XRCJH36M000F1QA1P0 | 36.0000 | ±10 | ±15 (-30 to +85°C) | ±1 (±3/5Years) | 60 | 8 | 30 |
| XRCJH | XRCJH40M000F1QB2P0 | 40.0000 | ±10 | ±15 (-30 to +85°C) | ±1 (±3/5Years) | 60 | 8 | 30 |
| XRCJH | XRCJH52M000F1QA1P0 | 52.0000 | ±10 | ±15 (-30 to +85°C) | ±1 (±3/5Years) | 60 | 8 | 30 |
| XRCLH | XRCLH10M000F1QA4P0 | 10.0000 | ±10 | ±15 (-30 to +85°C) | ±1 (±3/5Years) | 60 | 8 | 30 |
| XRCLH | XRCLH12M000F1QA0P0 | 12.0000 | ±10 | ±15 (-30 to +85°C) | ±1 (±3/5Years) | 60 | 8 | 30 |
| XRCLH | XRCLH14M745F1QA0P0 | 14.7456 | ±10 | ±15 (-30 to +85°C) | ±1 (±3/5Years) | 40 | 8 | 30 |
| XRCLH | XRCLH16M000F1QA2P0 | 16.0000 | ±10 | ±15 (-30 to +85°C) | ±1 (±3/5Years) | 40 | 8 | 30 |
| XRCLH | XRCLH21M250F1QA0P0 | 21.2500 | ±10 | ±15 (-30 to +85°C) | ±1 (±3/5Years) | 40 | 8 | 30 |
| XRCLH | XRCLH52M000F1QA1P0 | 52.0000 | ±10 | ±15 (-30 to +85°C) | ±1 (±3/5Years) | 40 | 8 | 30 |

*: Equivalent Series Resistance

## ■ Standard Land Pattern Dimensions

### XRCGB_F_Z, XRCPB_F_Z

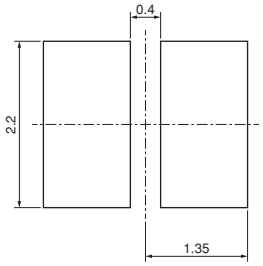
(Recommendable Land Pattern)




(in mm)

### XRCHA_F_Z

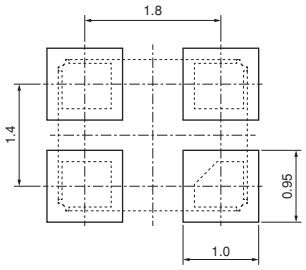
(Recommendable Land Pattern)




(in mm)

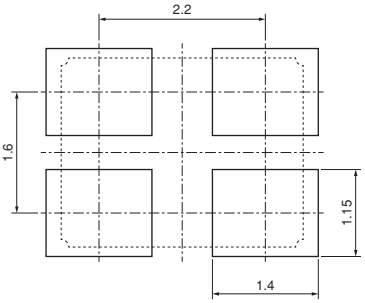
3

### XRCHH



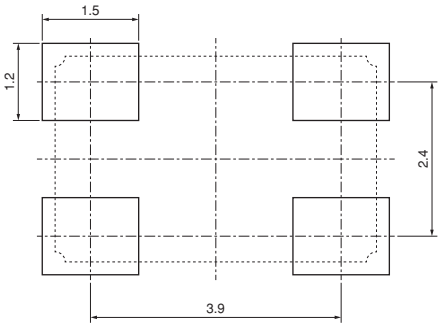

(in mm)

### XRCJH




(in mm)

### XRCLH




Avoid to put on signal lines under the product except refference land pattern.

(in mm)

# Notice -Crystal Units for Industrial-

## ■ Notice (Soldering and Mounting)

### 1.1. Soldering Condition

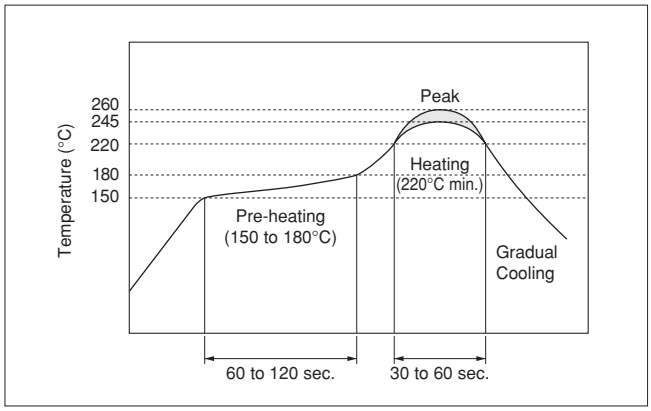
(1) Reflow

Please mount components on a circuit board by the re-flow soldering.

Flux: Please use rosin based flux, but 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 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 off 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 of sealing part between the metal cap and the substrate may occur.

### 2. Wash

The component cannot withstand washing.

### 3. Notice for Mounting

The component is recommended with 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 Industrial-

Continued from the preceding page.

## ■ Notice (Storage and Operating Condition)

1. Product Storage Condition
   Please store the products in room where the temperature/humidity is stable. And avoid such 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
   Expire date (Shelf life) of the products is six months after delivery under the conditions of a sealed and an 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 the 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 the 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 the places such as: in a damp heated place, in a place where direct sunlight comes in, in place applying vibrations.
   (4) Please use the products immediately after the package is opened, because the characteristics may be reduced in quality, and/or be degraded in the solderability due to storage under the poor condition.
   (5) Please do not drop the products to avoid cracking of crystal element.
4. Others
   Conformal coating or washing of the component is not acceptable.
   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)

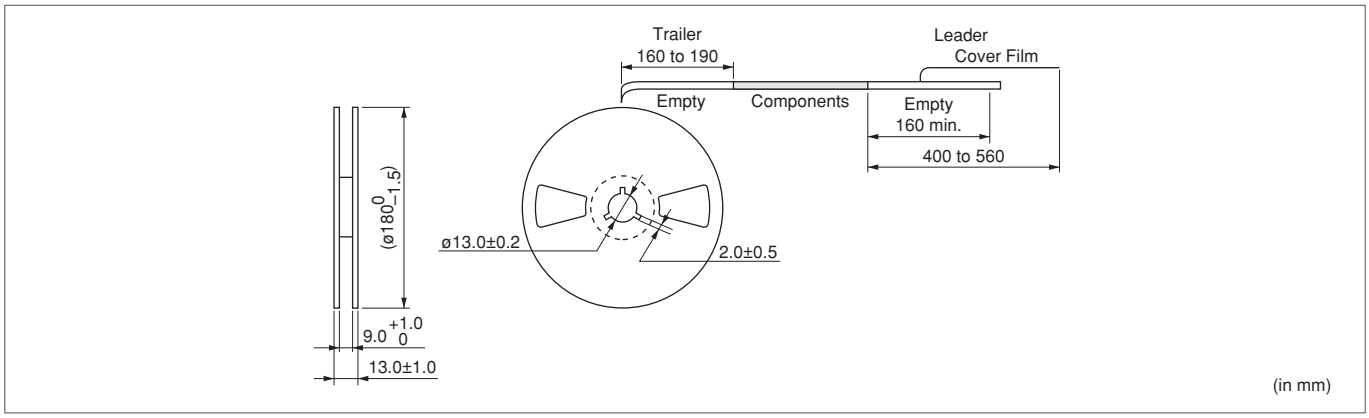
1. Irregular or stop oscillation may occur under unmatched circuit conditions.
   Please design your oscillation circuit to get 5 times or more of a negative resistance against the maximum value of the Equivalent Series Resistance, that is specified in order.
2. Be sure to provide an appropriate fail-safe function on your product to prevent a second damage that may be caused by the abnormal function or the failure of our product.
3. Please do not use this products in following applications in transportation equipment (vehicles, trains, ships, etc.).
   (example: engine control, brake control, steering control, body control.)

# Packaging -Crystal Units for Industrial-

## ■ Minimum Quantity/Dimensions of Reel

| Plastic Tape ø180mm | Plastic Tape ø330mm |
|---|---|
| 3,000 | 9,000 |

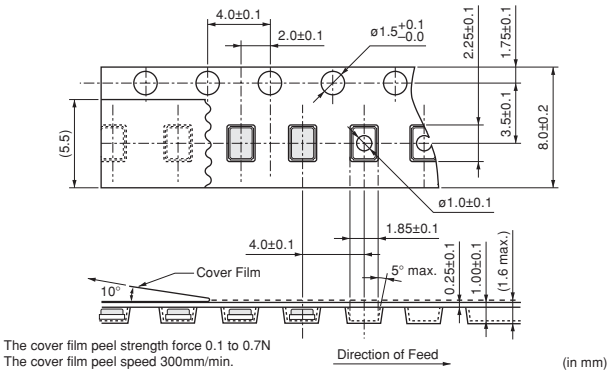
(pcs.)




(in mm)

## ■ Dimensions of Taping

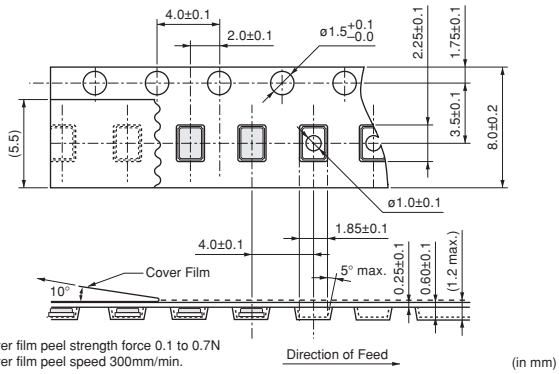
### XRCGB_F_Z




The cover film peel strength force 0.1 to 0.7N
The cover film peel speed 300mm/min.

(in mm)

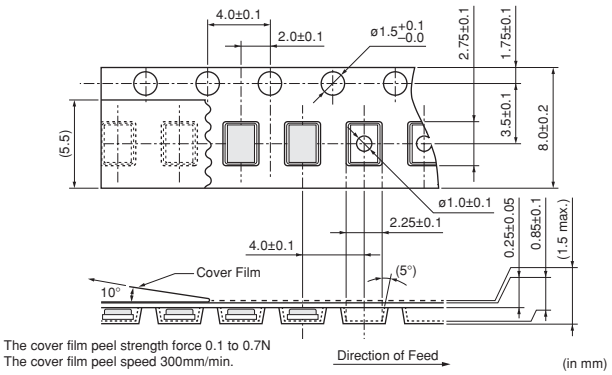
### XRCPB_F_Z




The cover film peel strength force 0.1 to 0.7N
The cover film peel speed 300mm/min.

(in mm)

### XRCHA_F_Z




The cover film peel strength force 0.1 to 0.7N
The cover film peel speed 300mm/min.

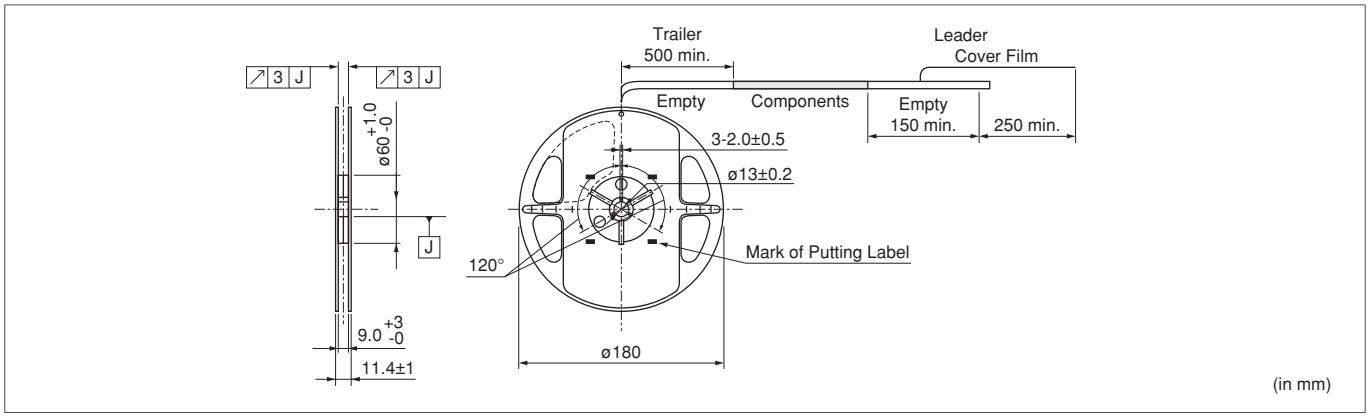
(in mm)

# Packaging -Crystal Units for Industrial-

## ■ Minimum Quantity/Dimensions of Reel

| Plastic Tape ø180mm |
|---|
| 3,000 |

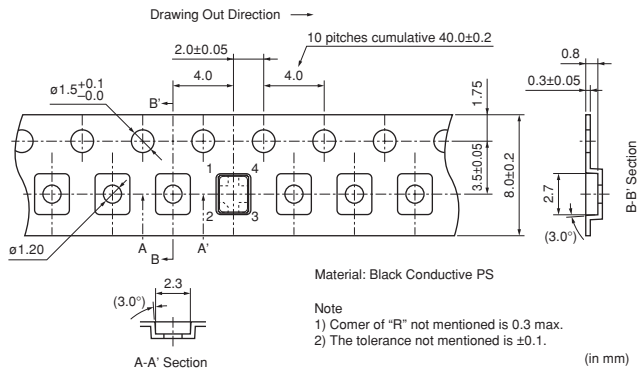
(pcs.)




(in mm)

## ■ Dimensions of Taping

### XRCHH

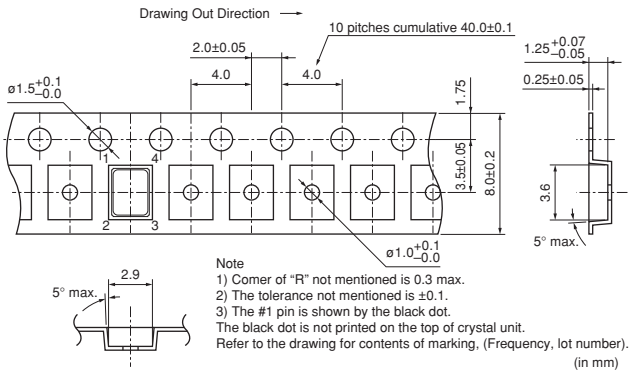



Material: Black Conductive PS

Note
1) Comer of "R" not mentioned is 0.3 max.
2) The tolerance not mentioned is ±0.1.

(in mm)

### XRCJH




Note
1) Comer of "R" not mentioned is 0.3 max.
2) The tolerance not mentioned is ±0.1.
3) The #1 pin is shown by the black dot.
The black dot is not printed on the top of crystal unit.
Refer to the drawing for contents of marking, (Frequency, lot number).

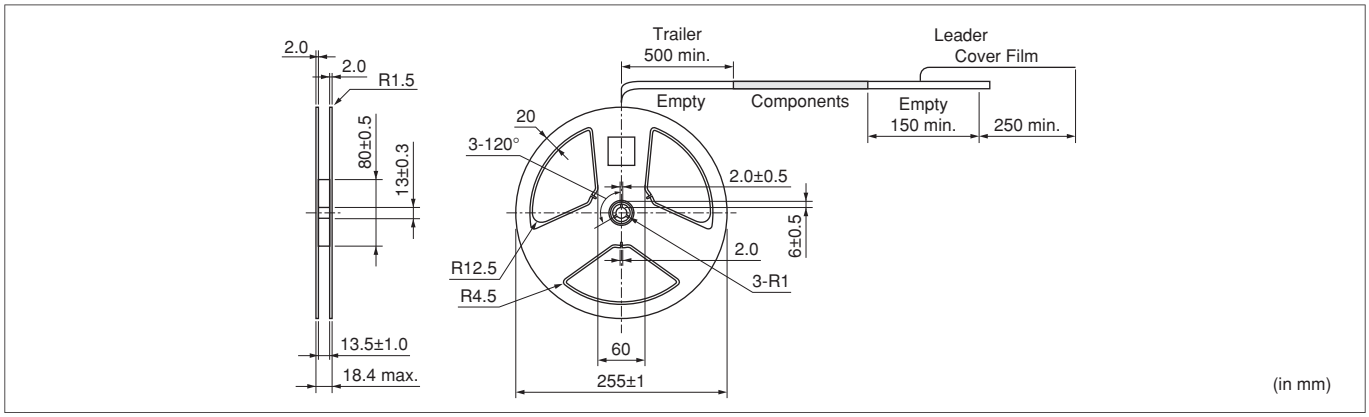
(in mm)

# Packaging -Crystal Units for Industrial-

## ■ Minimum Quantity/Dimensions of Reel

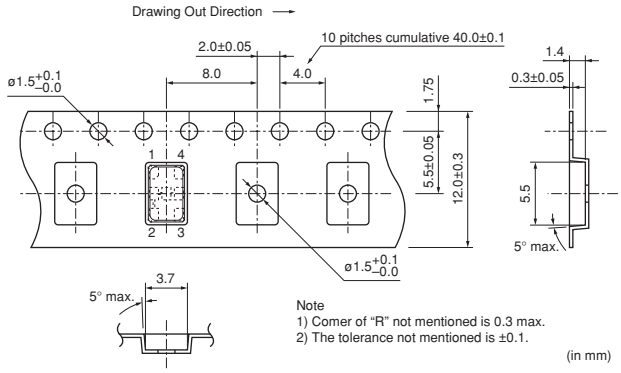
| Plastic Tape ø255mm |
|---|
| 3,000 |

(pcs.)




## ■ Dimensions of Taping

**XRCLH**




Note
1) Comer of "R" not mentioned is 0.3 max.
2) The tolerance not mentioned is ±0.1.

(in mm)

# for Industrial

## Crystal Oscillators

RoHS Lead free

We offer various lineup of TCXO (Temperature compensated crystal oscillator)/VC-TCXO (Voltage-controlled temperature-compensated crystal oscillator) based on highly reliable crystal units, superior temperature compensation and adjusting method which is fostered by our long experience and activity.

### ■ Features

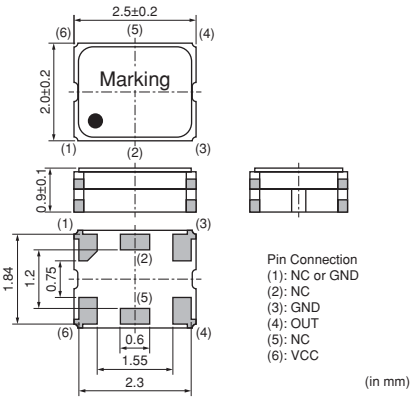
1. Excellent frequency stability over temperature
2. Low profile
3. Low supply voltage
4. SMD type (Reflow soldering available)
5. The series complies to RoHS directive, being lead-free (phase 3).

### ■ Applications

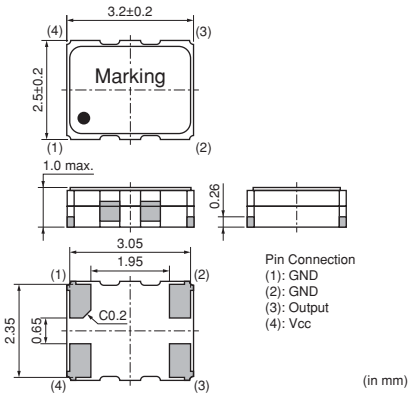
1. Business Radio
2. GPS (GNSS) system
3. Small cells
4. Wireless devices



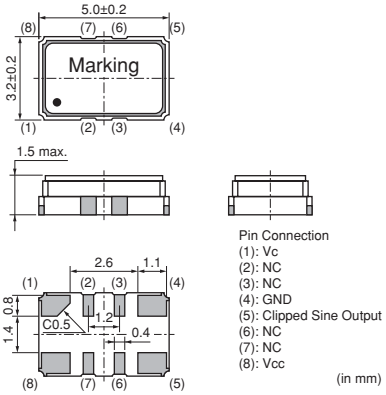
XNCHH, XTCHH
10.0000–52.0000MHz



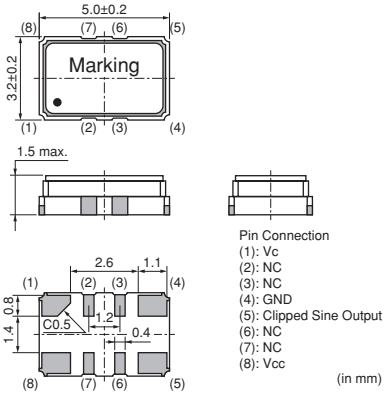

XNCJH, XTCJH
10.0000–52.0000MHz




XTCLH_E
10.0000–40.0000MHz




XTCLH_J
10.0000–40.0000MHz




### ■ Series

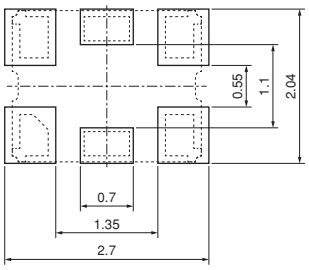
| Series | Size | Package | Frequency (MHz) | Frequency Tolerance (ppm max.) [at 25°C±3°C] | Frequency Shift by Temperature (ppm max.) [Standard Condition: +25°C] | Frequency Aging (ppm max./Year) | Operating Temperature Range (°C) | Supply Voltage (Vp-p) | VC Function |
|---|---|---|---|---|---|---|---|---|---|
| XNCHH | 2520 | Metal | 10.0000 to 52.0000 | ±1.0 | ±0.5 | ±1.0 | -30 to +85 | +3.0±5% | — |
| XTCHH | | | | | | | | | ○ |
| XNCJH | 3225 | | | | | | | | — |
| XTCJH | | | | | | | | | ○ |
| XTCLH_E | 5032 | | 10.0000 to 40.0000 | | | | | | |
| XTCLH_J | | | | ±0.5 | ±0.2 | ±0.5 | -40 to +85 | | |

## ■ 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) | Current Consumption (mA max.) | Frequency Controlled Range (ppm) |
|---|---|---|---|---|---|---|---|
| **XNCHH** | **XNCHH10M000TJEA2P0** | 10.0000 | ±1.0 | ±0.5 (-30 to +85°C) | ±1.0 | 2 | – |
| **XNCHH** | **XNCHH15M300TJEA0P0** | 15.3000 | ±1.0 | ±0.5 (-30 to +85°C) | ±1.0 | 2 | – |
| **XNCHH** | **XNCHH16M368TJEA4P0** | 16.3680 | ±1.0 | ±0.5 (-30 to +85°C) | ±1.0 | 2 | – |
| **XNCHH** | **XNCHH16M800TJEA3P0** | 16.8000 | ±1.0 | ±0.5 (-30 to +85°C) | ±1.0 | 2 | – |
| **XNCHH** | **XNCHH19M200TJEC1P0** | 19.2000 | ±1.0 | ±0.5 (-30 to +85°C) | ±1.0 | 2 | – |
| **XNCHH** | **XNCHH26M000TJEE5P0** | 26.0000 | ±1.0 | ±0.5 (-30 to +85°C) | ±1.0 | 2 | – |
| **XNCHH** | **XNCHH28M800TJEA1P0** | 28.8000 | ±1.0 | ±0.5 (-30 to +85°C) | ±1.0 | 2 | – |
| **XNCHH** | **XNCHH32M000TJEB5P0** | 32.0000 | ±1.0 | ±0.5 (-30 to +85°C) | ±1.0 | 2 | – |
| **XNCHH** | **XNCHH38M400TJEB3P0** | 38.4000 | ±1.0 | ±0.5 (-30 to +85°C) | ±1.0 | 2 | – |
| **XNCHH** | **XNCHH52M000TJEA1P0** | 52.0000 | ±1.0 | ±0.5 (-30 to +85°C) | ±1.0 | 2 | – |
| **XTCHH** | **XTCHH10M000TJEA3P0** | 10.0000 | ±1.0 | ±0.5 (-30 to +85°C) | ±1.0 | 2 | ±5min. to ±15max. |
| **XTCHH** | **XTCHH15M300TJEA2P0** | 15.3000 | ±1.0 | ±0.5 (-30 to +85°C) | ±1.0 | 2 | ±5min. to ±15max. |
| **XTCHH** | **XTCHH16M800TJEA2P0** | 16.8000 | ±1.0 | ±0.5 (-30 to +85°C) | ±1.0 | 2 | ±5min. to ±15max. |
| **XTCHH** | **XTCHH19M200TJEB4P0** | 19.2000 | ±1.0 | ±0.5 (-30 to +85°C) | ±1.0 | 2 | ±5min. to ±15max. |
| **XTCHH** | **XTCHH20M950TJEA0P0** | 20.9500 | ±1.0 | ±0.5 (-30 to +85°C) | ±1.0 | 2 | ±5min. to ±15max. |
| **XTCHH** | **XTCHH21M250TJEA0P0** | 21.2500 | ±1.0 | ±0.5 (-30 to +85°C) | ±1.0 | 2 | ±5min. to ±15max. |
| **XTCHH** | **XTCHH26M000TJEB1P0** | 26.0000 | ±1.0 | ±0.5 (-30 to +85°C) | ±1.0 | 2 | ±5min. to ±15max. |
| **XTCHH** | **XTCHH28M800TJEA0P0** | 28.8000 | ±1.0 | ±0.5 (-30 to +85°C) | ±1.0 | 2 | ±5min. to ±15max. |
| **XTCHH** | **XTCHH38M400TJEA1P0** | 38.4000 | ±1.0 | ±0.5 (-30 to +85°C) | ±1.0 | 2 | ±5min. to ±15max. |
| **XTCHH** | **XTCHH52M000TJEA1P0** | 52.0000 | ±1.0 | ±0.5 (-30 to +85°C) | ±1.0 | 2 | ±5min. to ±15max. |
| **XNCJH** | **XNCJH10M000TJEA8P0** | 10.0000 | ±1.0 | ±0.5 (-30 to +85°C) | ±1.0 | 2 | – |
| **XNCJH** | **XNCJH15M300TJEA0P0** | 15.3000 | ±1.0 | ±0.5 (-30 to +85°C) | ±1.0 | 2 | – |
| **XNCJH** | **XNCJH16M800TJEA1P0** | 16.8000 | ±1.0 | ±0.5 (-30 to +85°C) | ±1.0 | 2 | – |
| **XNCJH** | **XNCJH19M200TJEA5P0** | 19.2000 | ±1.0 | ±0.5 (-30 to +85°C) | ±1.0 | 2 | – |
| **XNCJH** | **XNCJH26M000TJEB4P0** | 26.0000 | ±1.0 | ±0.5 (-30 to +85°C) | ±1.0 | 2 | – |
| **XNCJH** | **XNCJH28M800TJEA1P0** | 28.8000 | ±1.0 | ±0.5 (-30 to +85°C) | ±1.0 | 2 | – |
| **XNCJH** | **XNCJH38M400TJEA3P0** | 38.4000 | ±1.0 | ±0.5 (-30 to +85°C) | ±1.0 | 2 | – |
| **XNCJH** | **XNCJH52M000TJEA0P0** | 52.0000 | ±1.0 | ±0.5 (-30 to +85°C) | ±1.0 | 2 | – |
| **XTCJH** | **XTCJH10M000TJEB0P0** | 10.0000 | ±1.0 | ±0.5 (-30 to +85°C) | ±1.0 | 2 | ±5min. to ±15max. |
| **XTCJH** | **XTCJH15M300TJEA3P0** | 15.3000 | ±1.0 | ±0.5 (-30 to +85°C) | ±1.0 | 2 | ±5min. to ±15max. |
| **XTCJH** | **XTCJH16M800TJEB0P0** | 16.8000 | ±1.0 | ±0.5 (-30 to +85°C) | ±1.0 | 2 | ±5min. to ±15max. |
| **XTCJH** | **XTCJH19M200TJEB6P0** | 19.2000 | ±1.0 | ±0.5 (-30 to +85°C) | ±1.0 | 2 | ±5min. to ±15max. |
| **XTCJH** | **XTCJH26M000TJEB4P0** | 26.0000 | ±1.0 | ±0.5 (-30 to +85°C) | ±1.0 | 2 | ±5min. to ±15max. |
| **XTCJH** | **XTCJH28M800TJEA0P0** | 28.8000 | ±1.0 | ±0.5 (-30 to +85°C) | ±1.0 | 2 | ±5min. to ±15max. |
| **XTCJH** | **XTCJH38M400TJEA3P0** | 38.4000 | ±1.0 | ±0.5 (-30 to +85°C) | ±1.0 | 2 | ±5min. to ±15max. |
| **XTCJH** | **XTCJH52M000TJEA5P0** | 52.0000 | ±1.0 | ±0.5 (-30 to +85°C) | ±1.0 | 2 | ±5min. to ±15max. |
| **XTCLH_E** | **XTCLH10M000TJEB4P0** | 10.0000 | ±1.0 | ±0.5 (-30 to +85°C) | ±1.0 | 2 | ±3min. to ±15max. |
| **XTCLH_E** | **XTCLH13M000TJEA3P0** | 13.0000 | ±1.0 | ±0.5 (-30 to +85°C) | ±1.0 | 2 | ±3min. to ±15max. |
| **XTCLH_E** | **XTCLH16M800TJED2P0** | 16.8000 | ±1.0 | ±0.5 (-30 to +85°C) | ±1.0 | 2 | ±3min. to ±15max. |
| **XTCLH_E** | **XTCLH19M200TJEC4P0** | 19.2000 | ±1.0 | ±0.5 (-30 to +85°C) | ±1.0 | 2 | ±3min. to ±15max. |
| **XTCLH_E** | **XTCLH20M000TJEB7P0** | 20.0000 | ±1.0 | ±0.5 (-30 to +85°C) | ±1.0 | 2 | ±3min. to ±15max. |
| **XTCLH_E** | **XTCLH21M250TJEA0P0** | 21.2500 | ±1.0 | ±0.5 (-30 to +85°C) | ±1.0 | 2 | ±3min. to ±15max. |
| **XTCLH_E** | **XTCLH26M000TJEA7P0** | 26.0000 | ±1.0 | ±0.5 (-30 to +85°C) | ±1.0 | 2 | ±3min. to ±15max. |
| **XTCLH_E** | **XTCLH38M400TJEA0P0** | 38.4000 | ±1.0 | ±0.5 (-30 to +85°C) | ±1.0 | 2 | ±3min. to ±15max. |
| **XTCLH_E** | **XTCLH40M000TJEB0P0** | 40.0000 | ±1.0 | ±0.5 (-30 to +85°C) | ±1.0 | 2 | ±3min. to ±15max. |
| **XTCLH_J** | **XTCLH19M200TJJC3P0** | 19.2000 | ±0.5 | ±0.2 (-40 to +85°C) | ±0.5 | 3 | ±3min. to ±6max. |
| **XTCLH_J** | **XTCLH25M000TJJA5P0** | 25.0000 | ±0.5 | ±0.2 (-40 to +85°C) | ±0.5 | 3 | ±3min. to ±6max. |
| **XTCLH_J** | **XTCLH26M000TJJA6P0** | 26.0000 | ±0.5 | ±0.2 (-40 to +85°C) | ±0.5 | 3 | ±3min. to ±6max. |

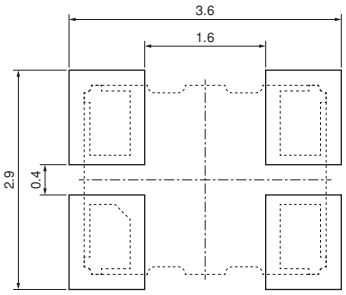
## ■ Standard Land Pattern Dimensions

### XNCHH, XTCHH



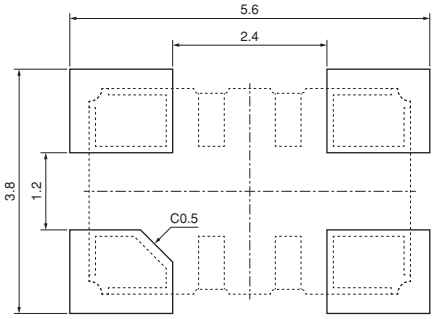

(in mm)

### XNCJH, XTCJH




(in mm)

### XTCLH_E/J




(in mm)

4

# Notice -Crystal Oscillators for Industrial-

## ■ Notice (Soldering and Mounting)

### 1.1. Soldering Condition

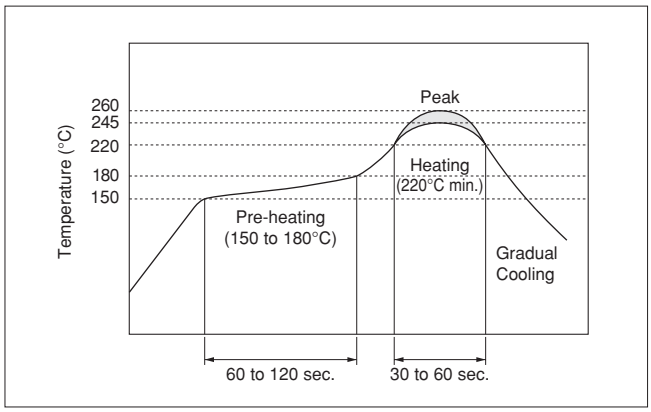
(1) Reflow

Please mount components on a circuit board by the re-flow soldering.

Flux: Please use rosin based flux, but 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 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, the damage of sealing part between the metal cap and the substrate may occur.

### 2. Wash

The component cannot withstand washing.

### 3. Notice for Mounting

The component is recommended with 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 Oscillators for Industrial-

Continued from the preceding page.

## ■ Notice (Storage and Operating Condition)

1. Product Storage Condition
   Please store the products in room where the temperature/humidity is stable. And avoid such 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
   Expire date (Shelf life) of the products is six months after delivery under the conditions of a sealed and an 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 the 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 the 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 the places such as: in a damp heated place, in a place where direct sunlight comes in, in place applying vibrations.
   (4) Please use the products immediately after the package is opened, because the characteristics may be reduced in quality, and/or be degraded in the solderability due to storage under the poor condition.
   (5) Please do not drop the products to avoid cracking of crystal element.
4. Others
   Conformal coating or washing of the component is not acceptable.
   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)

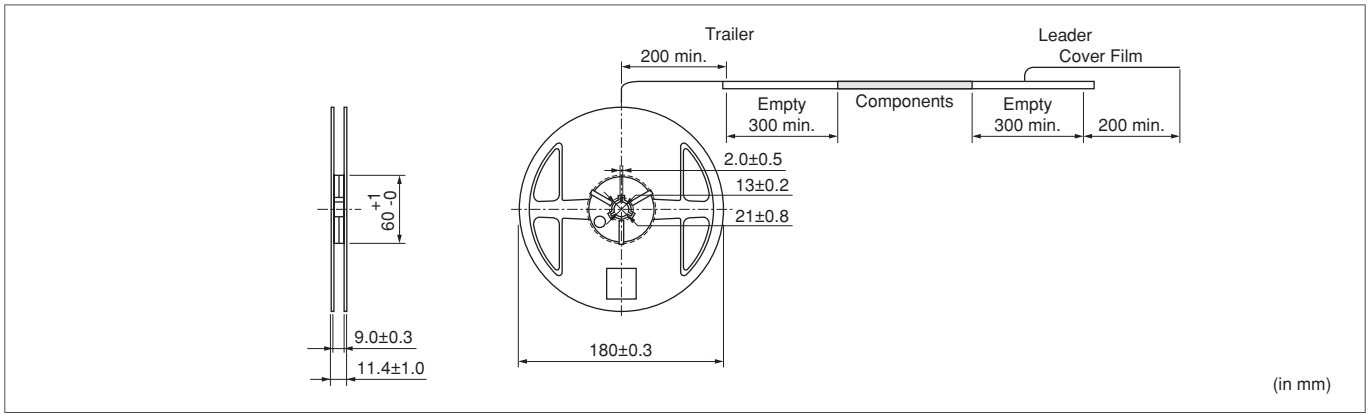
1. Be sure to provide an appropriate fail-safe function on your product to prevent a second damage that may be caused by the abnormal function or the failure of our product.
2. Please do not use this products in following applications in transportation equipment (vehicles, trains, ships, etc.).
   (example: engine control, brake control, steering control, body control.)

# Packaging -Crystal Oscillators for Industrial-

## ■ Minimum Quantity/Dimensions of Reel

| Plastic Tape ø180mm |
|---|
| 3,000 |

(pcs.)

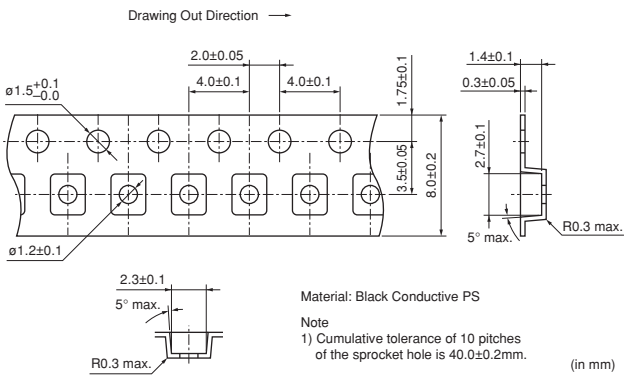



(in mm)

4

## ■ Dimensions of Taping

### XNCHH, XTCHH

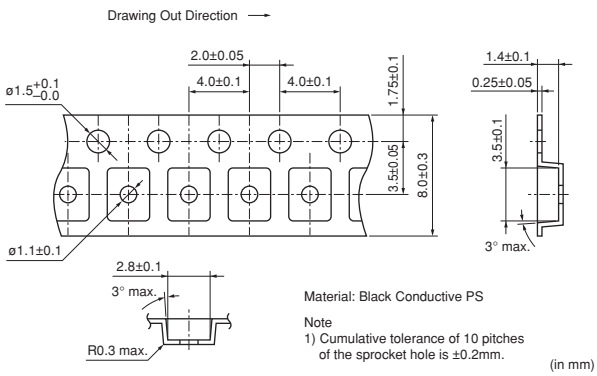



Material: Black Conductive PS

Note
1) Cumulative tolerance of 10 pitches of the sprocket hole is 40.0±0.2mm.

(in mm)

### XNCJH, XTCJH




Material: Black Conductive PS

Note
1) Cumulative tolerance of 10 pitches of the sprocket hole is ±0.2mm.

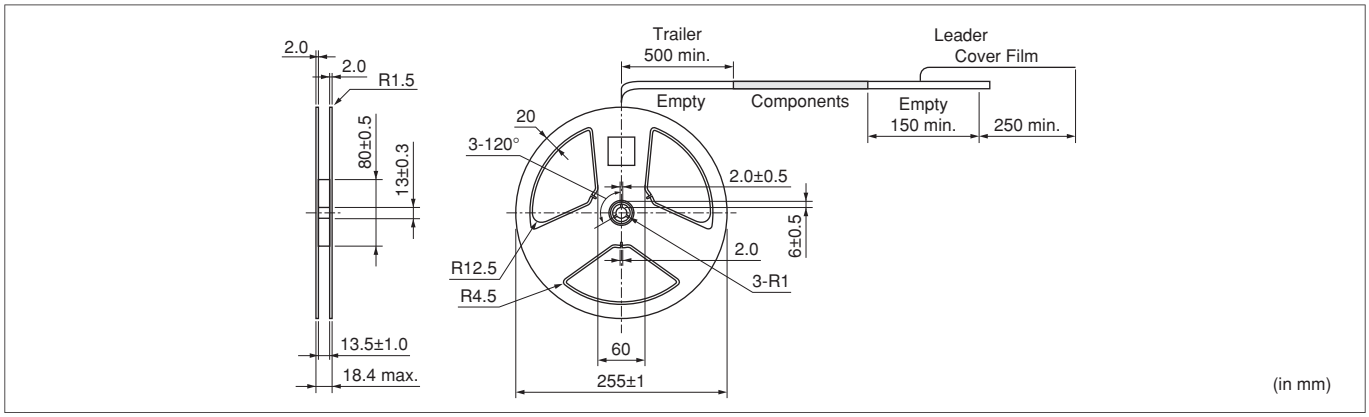
(in mm)

# Packaging -Crystal Oscillators for Industrial-

## ■ Minimum Quantity/Dimensions of Reel

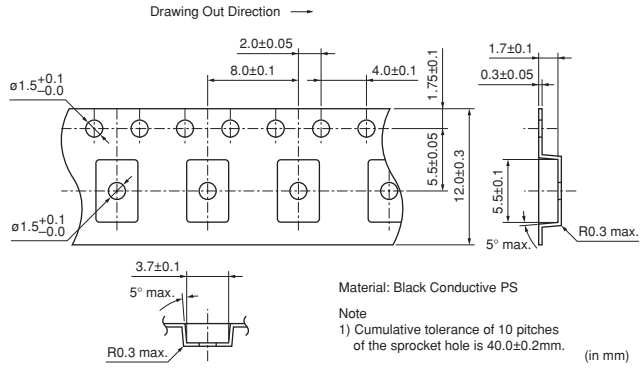
| Plastic Tape ø255mm |
|---|
| 3,000 |

(pcs.)




## ■ Dimensions of Taping

XTCLH_E/J




Material: Black Conductive PS

Note
1) Cumulative tolerance of 10 pitches of the sprocket hole is 40.0±0.2mm.

(in mm)

# Measuring Circuit of Crystal Units

## ■ Measuring Circuit

**1. Frequency Measuring Method**

The load resonance frequency (Lower frequency of the two given when the electrical impedance of the component becomes resistant near its resonance point) measured by network analyzer (Agilent E5100A or the equivalent) and the circuit in Figure 1. DUT is shown in Figure 2, and the value of Cs is referred to the load capacitance value in specifications.

**2. Equivalent Series Resistance**

The equivalent series resistance (R1) is measured by network analyzer (Agilent E5100A or equivalent) and the circuit in Figure 1. DUT is shown in Figure 3.

**3. Measuring Condition**

Standard conditions for the measurement shall be +25±3°C temperature and the humidity of 45 to 85%R.H.

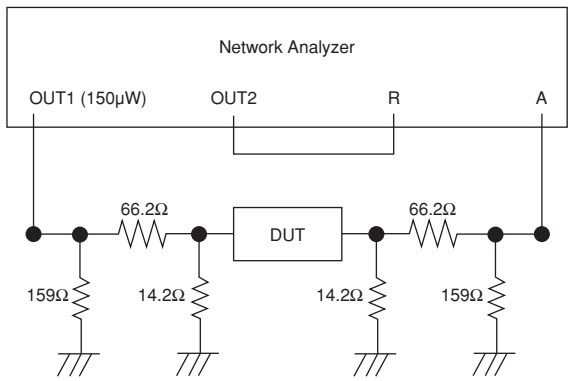



Figure 1 Frequency Measuring Circuit


Figure 2 DUT (Device Under Test)

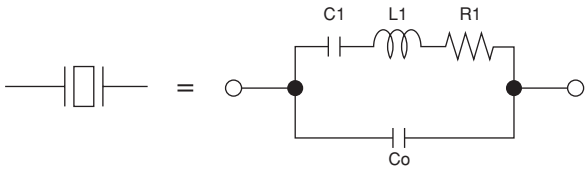



Figure 3 DUT (Device Under Test)

Cat. No. P79E-7

# Global Locations

For details please visit www.murata.com

## ⚠Note

**1 Export Control**

*For customers outside Japan:*

No Murata products should be used or sold, through any channels, for use in the design, development, production, utilization, maintenance or operation of, or otherwise contribution to (1) any weapons (Weapons of Mass Destruction [nuclear, chemical or biological weapons or missiles] or conventional weapons) or (2) goods or systems specially designed or intended for military end-use or utilization by military end-users.

*For customers in Japan:*

For products which are controlled items subject to the "Foreign Exchange and Foreign Trade Law" of Japan, the export license specified by the law is required for export.

**2** Please contact our sales representatives or product engineers before using the products in this catalog for the applications listed below, which require especially high reliability for the prevention of defects which might directly damage a third party's life, body or property, or when one of our products is intended for use in applications other than those specified in this catalog.

1. *Aircraft equipment*
2. *Aerospace equipment*
3. *Undersea equipment*
4. *Power plant equipment*
5. *Medical equipment*
6. *Transportation equipment (vehicles, trains, ships, etc.)*
7. *Traffic signal equipment*
8. *Disaster prevention / crime prevention equipment*
9. *Data-processing equipment*
10. *Application of similar complexity and/or reliability requirements to the applications listed above*

**3** Product specifications in this catalog are as of March 2015. They are subject to change or our products in it may be discontinued without advance notice. Please check with our sales representatives or product engineers before ordering. If there are any questions, please contact our sales representatives or product engineers.

**4** Please read rating and ⚠CAUTION (for storage, operating, rating, soldering, mounting and handling) in this catalog to prevent smoking and/or burning, etc.

**5** This catalog has only typical specifications. Therefore, please approve our product specifications or transact the approval sheet for product specifications before ordering.

**6** Please note that unless otherwise specified, we shall assume no responsibility whatsoever for any conflict or dispute that may occur in connection with the effect of our and/or a third party's intellectual property rights and other related rights in consideration of your use of our products and/or information described or contained in our catalogs. In this connection, no representation shall be made to the effect that any third parties are authorized to use the rights mentioned above under licenses without our consent.

**7** No ozone depleting substances (ODS) under the Montreal Protocol are used in our manufacturing process.

**Murata Manufacturing Co., Ltd.**

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