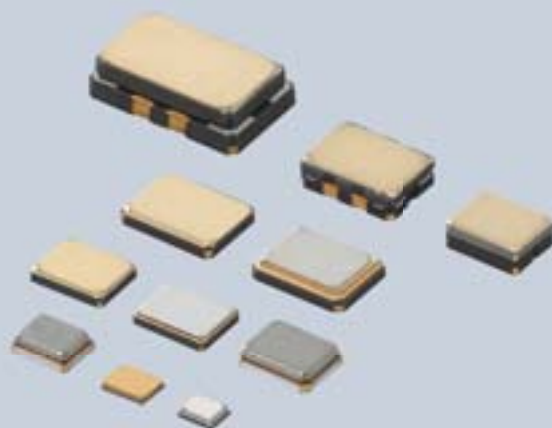


# Crystal Units/Crystal Oscillators





#### **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 web page, "Murata's Approach for EU RoHS" (<http://www.murata.com/en-eu/support/compliance/rohs>).

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Product specifications are as of March 2017.

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

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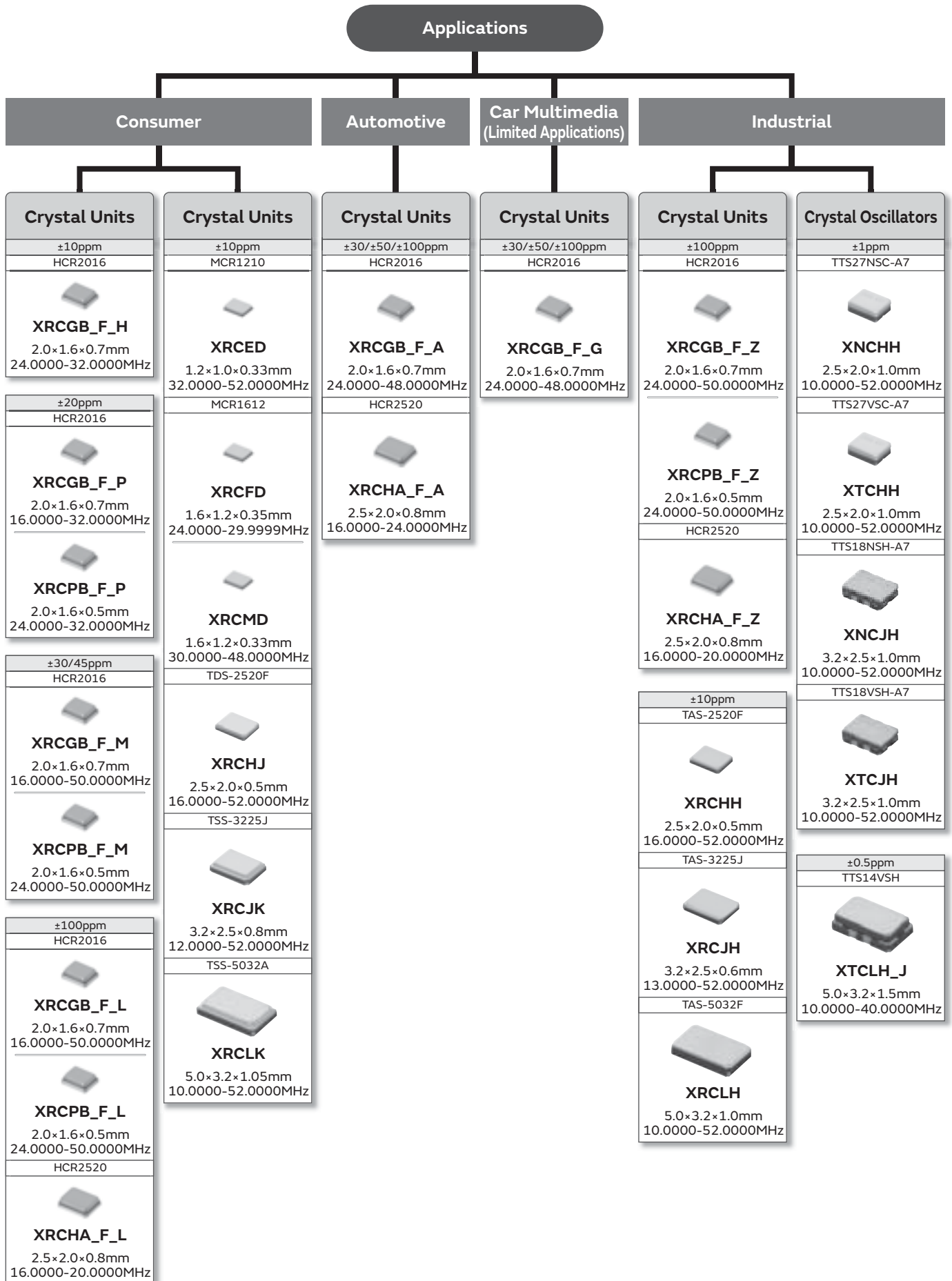
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Please check the MURATA website (<http://www.murata.com/>) if you cannot find a part number in this catalog.

## Selection Guides



## ● Part Numbering

### Crystal Unit

(Part Number)

XR	C	GB	24M000	F	O	L	00	R0
①	②	③	④	⑤	⑥	⑦	⑧	⑨

#### ① Product ID

Product ID	
XR	Crystal Unit

#### ② Lead Style

Code	Lead Style
C/T	SMD

#### ③ Size · Structure

Code	Size · Structure
ED	1210 (STD) Metal Sealing
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* <sup>1</sup>
5	±50ppm
A	±25ppm/±15ppm* <sup>2</sup>
Y	Total* <sup>3</sup> ±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
H/Q	±10ppm to ±15ppm/±10ppm to ±19ppm* <sup>1</sup>
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

RoHS

Lead free

1

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

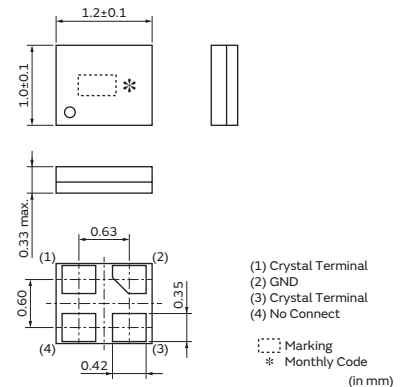
## Features

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).

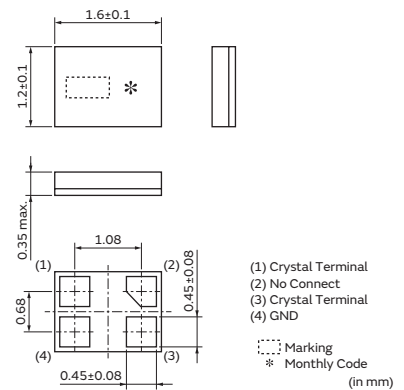
## Applications

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.

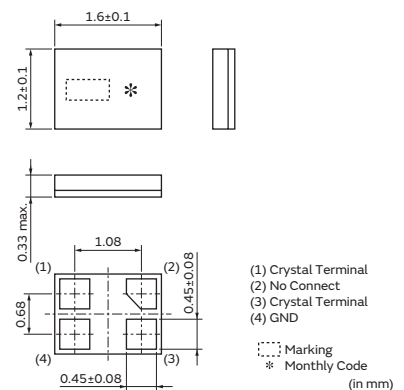
**XRCED  
(MCR1210)**  
32.0000–52.0000MHz



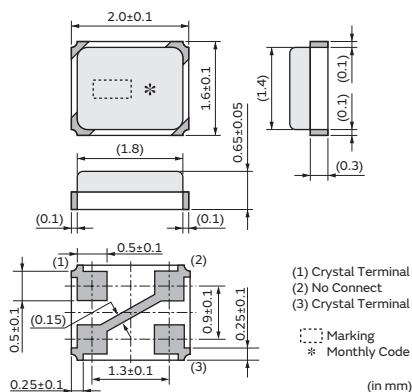
**XRCFD  
(MCR1612)**  
24.0000–29.9999MHz



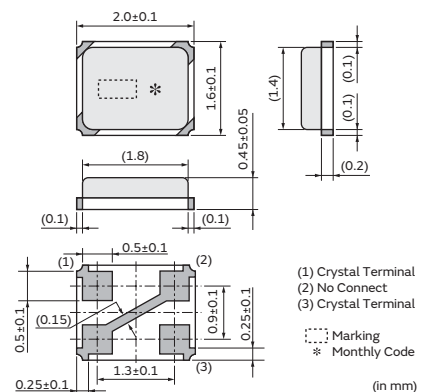
**XRCMD  
(MCR1612)**  
30.0000–48.0000MHz



**XRCGB\_F\_H/P  
(HCR2016)**  
24.0000–32.0000MHz  
**XRCGB\_F\_L/M  
(HCR2016)**  
16.0000–50.0000MHz



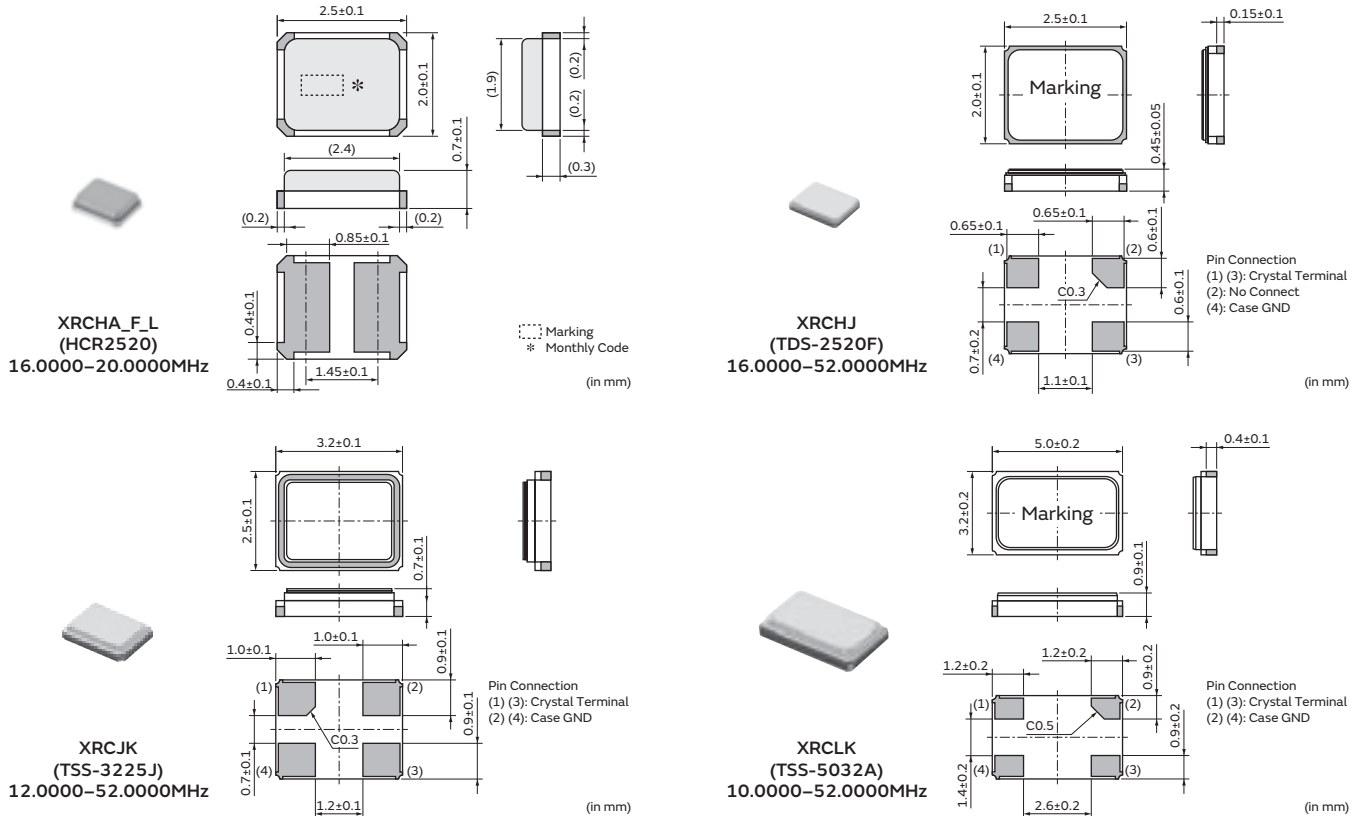
**XRCPB\_F\_P  
(HCR2016)**  
24.0000–32.0000MHz  
**XRCPB\_F\_L/M  
(HCR2016)**  
24.0000–50.0000MHz



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## Series

Series	Type	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)			
XRCED	MCR1210	Metal	32.0000 to 52.0000	±20ppm (Total)			100	-30 to +85			
XRCFD	MCR1612		24.0000 to 29.9999	±10	±10	±1		-20 to +70			
XRCMD			30.0000 to 48.0000					±2	300	-20 to +70	
XRCGB_F_H	HCR2016	Resin	24.0000 to 25.0000			±40 (Total)	±5			300*1	-30 to +85
			26.0000 to 32.0000						±20		±20
XRCGB_F_P			16.0000	±30/±45				±40			
XRCPB_F_P			24.0000 to 32.0000		±100	±50					
XRCGB_F_M			16.0000 to 50.0000						±100		±50
XRCPB_F_M			24.0000 to 50.0000								
XRCGB_F_L			16.0000 to 50.0000				±100		±100		
XRCPB_F_L			24.0000 to 50.0000								
XRCHA_F_L	HCR2520		16.0000 to 20.0000	±100	±100						
XRCHJ	TDS-2520F	Seam	16.0000 to 52.0000	±10	±15	±3	60				
XRCJK	TSS-3225J		12.0000 to 52.0000								
XRCLK	TSS-5032A		10.0000 to 52.0000								

XRCPB series is a low profile type of XRCGB series.

\*1 16MHz: 100μW max.

## Part Number List

<XRCED/XRCFD/XRCMD>

Part Number	Type	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.)
XRCED37M400FXQ52R0	MCR1210	37.4000	±20ppm (Total)(-30 to +85°C)			60	6	100
XRCFD26M000FYQ01R0	MCR1612	26.0000	±20ppm (Total)(-30 to +85°C)			150	8	100
XRCMD32M000FXP50R0	MCR1612	32.0000	±30ppm (Total)(-30 to +85°C)			100	6	100
XRCMD37M400F1Q01R0	MCR1612	37.4000	±10	±10(-20 to +70°C)	±1	60	8	100
XRCMD38M400FXQ56R0	MCR1612	38.4000	±20ppm (Total)(-30 to +85°C)			60	10	100
XRCMD40M000FXQ57R0	MCR1612	40.0000	±20ppm (Total)(-30 to +85°C)			60	10	100

\* Equivalent Series Resistance

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Part Number	Type	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.)
<b>XRCMD48M000FXQ58R0</b>	<b>MCR1612</b>	48.0000	±20ppm (Total)(-30 to +85°C)		±1	40	7	100

\* Equivalent Series Resistance

## <XRCGB\_F\_H>

Part Number	Type	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.)
<b>XRCGB24M000F1H00R0</b>	<b>HCR2016</b>	24.0000	±10	±10 (-20 to +70°C)	±2	80	6	300
<b>XRCGB25M000F1H00R0</b>	<b>HCR2016</b>	25.0000	±10	±10 (-20 to +70°C)	±2	80	6	300
<b>XRCGB26M000F1H00R0</b>	<b>HCR2016</b>	26.0000	±10	±10 (-30 to +85°C)	±2	60	6	300
<b>XRCGB32M000F1H00R0</b>	<b>HCR2016</b>	32.0000	±10	±10 (-30 to +85°C)	±2	60	6	300

\* Equivalent Series Resistance

## <XRCGB\_F\_P/XRCPB\_F\_P>

Part Number	Type	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.)
<b>XRCGB16M000FXN01R0</b>	<b>HCR2016</b>	16.0000	±40ppm (Total)(-30 to +85°C)		±5	200	8	100
<b>XRCGB24M000F2P00R0</b>	<b>HCR2016</b>	24.0000	±20	±20 (-30 to +85°C)	±5	150	6	300
<b>XRCGB25M000F2P00R0</b>	<b>HCR2016</b>	25.0000	±20	±20 (-30 to +85°C)	±5	150	6	300
<b>XRCGB26M000F2P00R0</b>	<b>HCR2016</b>	26.0000	±20	±20 (-30 to +85°C)	±5	150	6	300
<b>XRCGB27M000F2P00R0</b>	<b>HCR2016</b>	27.0000	±20	±20 (-30 to +85°C)	±5	150	6	300
<b>XRCGB27M120F2P00R0</b>	<b>HCR2016</b>	27.1200	±20	±20 (-30 to +85°C)	±5	150	6	300
<b>XRCGB30M000F2P00R0</b>	<b>HCR2016</b>	30.0000	±20	±20 (-30 to +85°C)	±5	100	6	300
<b>XRCGB31M250F2P00R0</b>	<b>HCR2016</b>	31.2500	±20	±20 (-30 to +85°C)	±5	100	6	300
<b>XRCGB32M000F2P00R0</b>	<b>HCR2016</b>	32.0000	±20	±20 (-30 to +85°C)	±5	100	6	300
<b>XRCPB24M000F2P00R0</b>	<b>HCR2016</b>	24.0000	±20	±20 (-30 to +85°C)	±5	150	6	300
<b>XRCPB25M000F2P00R0</b>	<b>HCR2016</b>	25.0000	±20	±20 (-30 to +85°C)	±5	150	6	300
<b>XRCPB26M000F2P00R0</b>	<b>HCR2016</b>	26.0000	±20	±20 (-30 to +85°C)	±5	150	6	300
<b>XRCPB27M000F2P00R0</b>	<b>HCR2016</b>	27.0000	±20	±20 (-30 to +85°C)	±5	150	6	300
<b>XRCPB27M120F2P00R0</b>	<b>HCR2016</b>	27.1200	±20	±20 (-30 to +85°C)	±5	150	6	300
<b>XRCPB30M000F2P00R0</b>	<b>HCR2016</b>	30.0000	±20	±20 (-30 to +85°C)	±5	100	6	300
<b>XRCPB31M250F2P00R0</b>	<b>HCR2016</b>	31.2500	±20	±20 (-30 to +85°C)	±5	100	6	300
<b>XRCPB32M000F2P00R0</b>	<b>HCR2016</b>	32.0000	±20	±20 (-30 to +85°C)	±5	100	6	300

\* Equivalent Series Resistance

## <XRCGB\_F\_M/XRCPB\_F\_M>

Part Number	Type	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.)
<b>XRCGB24M000F3M00R0</b>	<b>HCR2016</b>	24.0000	±30	±40 (-30 to +85°C)	±5	150	6	300
<b>XRCGB24M576F3M00R0</b>	<b>HCR2016</b>	24.5760	±30	±40 (-30 to +85°C)	±5	150	6	300
<b>XRCGB25M000F3M00R0</b>	<b>HCR2016</b>	25.0000	±30	±40 (-30 to +85°C)	±5	150	6	300
<b>XRCGB26M000F3M00R0</b>	<b>HCR2016</b>	26.0000	±30	±40 (-30 to +85°C)	±5	150	6	300
<b>XRCGB27M000F3M00R0</b>	<b>HCR2016</b>	27.0000	±30	±40 (-30 to +85°C)	±5	150	6	300
<b>XRCGB27M120F3M00R0</b>	<b>HCR2016</b>	27.1200	±30	±40 (-30 to +85°C)	±5	150	6	300
<b>XRCGB30M000F3M00R0</b>	<b>HCR2016</b>	30.0000	±30	±40 (-30 to +85°C)	±5	100	6	300
<b>XRCGB31M250F3M00R0</b>	<b>HCR2016</b>	31.2500	±30	±40 (-30 to +85°C)	±5	100	6	300
<b>XRCGB32M000F3M00R0</b>	<b>HCR2016</b>	32.0000	±30	±40 (-30 to +85°C)	±5	100	6	300
<b>XRCGB33M868F4M00R0</b>	<b>HCR2016</b>	33.8688	±45	±40 (-30 to +85°C)	±5	100	6	300
<b>XRCGB40M000F4M00R0</b>	<b>HCR2016</b>	40.0000	±45	±40 (-30 to +85°C)	±5	100	6	300
<b>XRCGB48M000F4M00R0</b>	<b>HCR2016</b>	48.0000	±45	±40 (-30 to +85°C)	±5	100	6	300
<b>XRCGB50M000F4M00R0</b>	<b>HCR2016</b>	50.0000	±45	±40 (-30 to +85°C)	±5	65	6	300
<b>XRCPB24M000F3M00R0</b>	<b>HCR2016</b>	24.0000	±30	±40 (-30 to +85°C)	±5	150	6	300
<b>XRCPB24M576F3M00R0</b>	<b>HCR2016</b>	24.5760	±30	±40 (-30 to +85°C)	±5	150	6	300
<b>XRCPB25M000F3M00R0</b>	<b>HCR2016</b>	25.0000	±30	±40 (-30 to +85°C)	±5	150	6	300

\* Equivalent Series Resistance

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Part Number	Type	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.)
XRCPB26M000F3M00R0	HCR2016	26.0000	±30	±40 (-30 to +85°C)	±5	150	6	300
XRCPB27M000F3M00R0	HCR2016	27.0000	±30	±40 (-30 to +85°C)	±5	150	6	300
XRCPB27M120F3M00R0	HCR2016	27.1200	±30	±40 (-30 to +85°C)	±5	150	6	300
XRCPB30M000F3M00R0	HCR2016	30.0000	±30	±40 (-30 to +85°C)	±5	100	6	300
XRCPB31M250F3M00R0	HCR2016	31.2500	±30	±40 (-30 to +85°C)	±5	100	6	300
XRCPB32M000F3M00R0	HCR2016	32.0000	±30	±40 (-30 to +85°C)	±5	100	6	300
XRCPB33M868F4M00R0	HCR2016	33.8688	±45	±40 (-30 to +85°C)	±5	100	6	300
XRCPB40M000F4M00R0	HCR2016	40.0000	±45	±40 (-30 to +85°C)	±5	100	6	300
XRCPB48M000F4M00R0	HCR2016	48.0000	±45	±40 (-30 to +85°C)	±5	100	6	300
XRCPB50M000F4M00R0	HCR2016	50.0000	±45	±40 (-30 to +85°C)	±5	65	6	300

\* Equivalent Series Resistance

## <XRCGB\_F\_L/XRCPB\_F\_L>

Part Number	Type	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.)
XRCGB24M000F0L00R0	HCR2016	24.0000	±100	±50 (-30 to +85°C)	±5	150	6	300
XRCGB24M576F0L00R0	HCR2016	24.5760	±100	±50 (-30 to +85°C)	±5	150	6	300
XRCGB25M000F0L00R0	HCR2016	25.0000	±100	±50 (-30 to +85°C)	±5	150	6	300
XRCGB26M000F0L00R0	HCR2016	26.0000	±100	±50 (-30 to +85°C)	±5	150	6	300
XRCGB27M000F0L00R0	HCR2016	27.0000	±100	±50 (-30 to +85°C)	±5	150	6	300
XRCGB27M120F0L00R0	HCR2016	27.1200	±100	±50 (-30 to +85°C)	±5	150	6	300
XRCGB30M000F0L00R0	HCR2016	30.0000	±100	±50 (-30 to +85°C)	±5	100	6	300
XRCGB31M250F0L00R0	HCR2016	31.2500	±100	±50 (-30 to +85°C)	±5	100	6	300
XRCGB32M000F0L00R0	HCR2016	32.0000	±100	±50 (-30 to +85°C)	±5	100	6	300
XRCGB33M868F0L00R0	HCR2016	33.8688	±100	±50 (-30 to +85°C)	±5	100	6	300
XRCGB40M000F0L00R0	HCR2016	40.0000	±100	±50 (-30 to +85°C)	±5	100	6	300
XRCGB48M000F0L00R0	HCR2016	48.0000	±100	±50 (-30 to +85°C)	±5	100	6	300
XRCGB50M000F0L00R0	HCR2016	50.0000	±100	±50 (-30 to +85°C)	±5	100	6	300
XRCPB24M000F0L00R0	HCR2016	24.0000	±100	±50 (-30 to +85°C)	±5	150	6	300
XRCPB24M576F0L00R0	HCR2016	24.5760	±100	±50 (-30 to +85°C)	±5	150	6	300
XRCPB25M000F0L00R0	HCR2016	25.0000	±100	±50 (-30 to +85°C)	±5	150	6	300
XRCPB26M000F0L00R0	HCR2016	26.0000	±100	±50 (-30 to +85°C)	±5	150	6	300
XRCPB27M000F0L00R0	HCR2016	27.0000	±100	±50 (-30 to +85°C)	±5	150	6	300
XRCPB27M120F0L00R0	HCR2016	27.1200	±100	±50 (-30 to +85°C)	±5	150	6	300
XRCPB30M000F0L00R0	HCR2016	30.0000	±100	±50 (-30 to +85°C)	±5	100	6	300
XRCPB31M250F0L00R0	HCR2016	31.2500	±100	±50 (-30 to +85°C)	±5	100	6	300
XRCPB32M000F0L00R0	HCR2016	32.0000	±100	±50 (-30 to +85°C)	±5	100	6	300
XRCPB33M868F0L00R0	HCR2016	33.8688	±100	±50 (-30 to +85°C)	±5	100	6	300
XRCPB40M000F0L00R0	HCR2016	40.0000	±100	±50 (-30 to +85°C)	±5	100	6	300
XRCPB48M000F0L00R0	HCR2016	48.0000	±100	±50 (-30 to +85°C)	±5	100	6	300
XRCPB50M000F0L00R0	HCR2016	50.0000	±100	±50 (-30 to +85°C)	±5	100	6	300

\* Equivalent Series Resistance

## <XRCHA\_F\_L>

Part Number	Type	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.)
XRCHA16M000F0L01R0	HCR2520	16.0000	±100	±100 (-30 to +85°C)	±5	100	8	300
XRCHA20M000F0L01R0	HCR2520	20.0000	±100	±100 (-30 to +85°C)	±5	80	8	300

\* Equivalent Series Resistance

## <XRCHJ>

Part Number	Type	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.)
XRCHJ16M000F1QB1P0	TDS-2520F	16.0000	±10	±15 (-30 to +85°C)	±3	100	8	60
XRCHJ19M200F1QA9P0	TDS-2520F	19.2000	±10	±15 (-30 to +85°C)	±3	100	8	60
XRCHJ20M000F1QA7P0	TDS-2520F	20.0000	±10	±15 (-30 to +85°C)	±3	80	8	60
XRCHJ26M000F1QD1P0	TDS-2520F	26.0000	±10	±15 (-30 to +85°C)	±3	80	8	60
XRCHJ36M000F1QA0P0	TDS-2520F	36.0000	±10	±15 (-30 to +85°C)	±3	80	8	60
XRCHJ40M000F1QB0P0	TDS-2520F	40.0000	±10	±15 (-30 to +85°C)	±3	80	8	60
XRCHJ52M000F1QA0P0	TDS-2520F	52.0000	±10	±15 (-30 to +85°C)	±3	80	8	60

\* Equivalent Series Resistance

## <XRCJK>

Part Number	Type	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.)
XRCJK12M000F1QB4P0	TSS-3225J	12.0000	±10	±15 (-30 to +85°C)	±3	100	8	60
XRCJK13M000F1QA3P0	TSS-3225J	13.0000	±10	±15 (-30 to +85°C)	±3	100	8	60
XRCJK15M360F1QA0P0	TSS-3225J	15.3600	±10	±15 (-30 to +85°C)	±3	80	8	60
XRCJK20M000F1QB3P0	TSS-3225J	20.0000	±10	±15 (-30 to +85°C)	±3	80	8	60
XRCJK24M576F1QA0P0	TSS-3225J	24.5760	±10	±15 (-30 to +85°C)	±3	80	8	60
XRCJK26M000F1QC3P0	TSS-3225J	26.0000	±10	±15 (-30 to +85°C)	±3	80	8	60
XRCJK36M000F1QA0P0	TSS-3225J	36.0000	±10	±15 (-30 to +85°C)	±3	80	8	60
XRCJK40M000F1QA2P0	TSS-3225J	40.0000	±10	±15 (-30 to +85°C)	±3	80	8	60
XRCJK52M000F1QA0P0	TSS-3225J	52.0000	±10	±15 (-30 to +85°C)	±3	80	8	60

\* Equivalent Series Resistance

## <XRCLK>

Part Number	Type	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.)
XRCLK10M000F1QA8P0	TSS-5032A	10.0000	±10	±15 (-30 to +85°C)	±3	80	8	60
XRCLK12M000F1QA6P0	TSS-5032A	12.0000	±10	±15 (-30 to +85°C)	±3	60	8	60
XRCLK14M745F1QB6P0	TSS-5032A	14.7456	±10	±15 (-30 to +85°C)	±3	60	8	60
XRCLK16M000F1QA7P0	TSS-5032A	16.0000	±10	±15 (-30 to +85°C)	±3	60	8	60
XRCLK21M250F1QA8P0	TSS-5032A	21.2500	±10	±15 (-30 to +85°C)	±3	60	8	60
XRCLK52M000F1QA0P0	TSS-5032A	52.0000	±10	±15 (-30 to +85°C)	±3	60	8	60

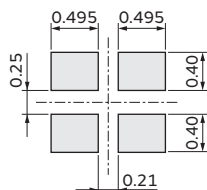
\* Equivalent Series Resistance

## Standard Land Pattern Dimensions

1

**XRCD**  
**(MCR1210)**

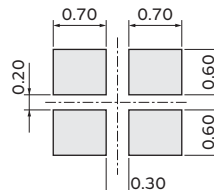
(Recommended Land Pattern)



(in mm)

**XRCFD, XRCMD**  
**(MCR1612)**

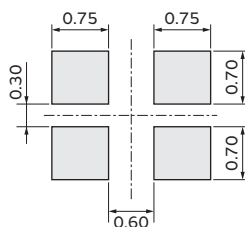
(Recommended Land Pattern)



(in mm)

**XRCGB\_F\_H/P/M/L, XRCPB\_F\_P/M/L**  
**(HCR2016)**

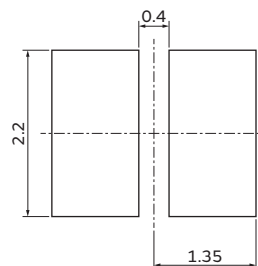
(Recommended Land Pattern)



(in mm)

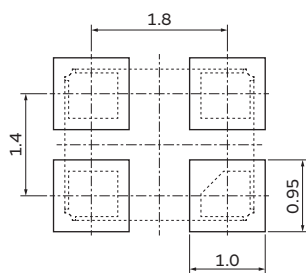
**XRCHA\_F\_L**  
**(HCR2520)**

(Recommended Land Pattern)



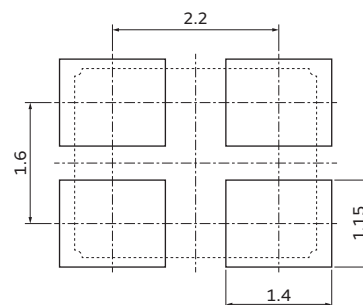
(in mm)

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



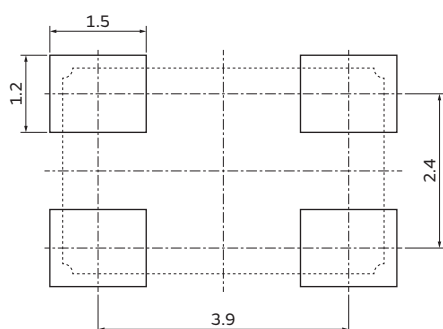
(in mm)

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



(in mm)

**XRCLK**  
**(TSS-5032A)**



(in mm)

## Notice -Crystal Units for Consumer-

1

### <XRCED Series>

#### Notice (Soldering and Mounting)

##### 1.1. Soldering Condition

###### Reflow

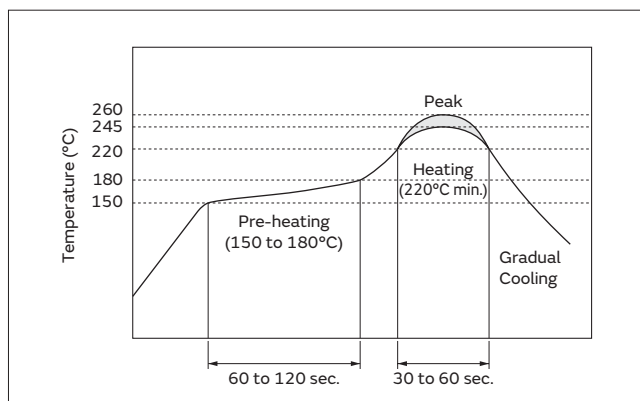
Please mount components on a circuit board by the reflow soldering method.

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.	10 sec. max.



##### 1.2. Optimum Solder Amount for Soldering

Please keep 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. 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.

#### 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

Expiration date (shelf life) of the products is 6 months after delivery under the conditions of an unopened package. Please use the products within 6 months after delivery. If you store the products for a long time (more than 6 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 the places under direct sunlight, heat and 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.

#### Notice (Rating)

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

Continued on the following page. ↗

## Notice -Crystal Units for Consumer-

1

Continued from the preceding page. ↘

### Notice (Handling)

1. Please confirm the circuit conditions on your set, because irregular or stop oscillation may occur under unmatched circuit conditions.
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 these products in the following applications in transportation equipment: vehicles, trains, ships, etc.  
(example: engine control, brake control, steering control, body control.)

### <XRCFD, XRCMD Series>

#### Notice (Soldering and Mounting)

##### 1.1. Soldering Condition

Reflow

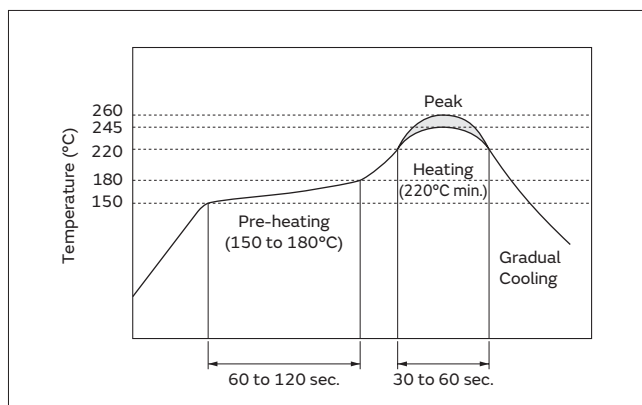
Please mount components on a circuit board by the reflow soldering method.

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.	



##### 1.2. Optimum Solder Amount for Soldering

Please keep 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. 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

Expiration date (shelf life) of the products is 6 months after delivery under the conditions of an unopened package. Please use the products within 6 months after delivery. If you store the products for a long time (more than 6 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 the places under direct sunlight, heat and 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.

### Notice (Rating)

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

### Notice (Handling)

1. Please confirm circuit the conditions on your set, because irregular or stop oscillation may occur under unmatched circuit conditions.
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 these products in the following applications in transportation equipment: vehicles, trains, ships, etc.  
(example: engine control, brake control, steering control, body control.)



## Notice -Crystal Units for Consumer-

1

### <XRCGB\_F\_H/P/M/L, XRCPB\_F\_P/M/L, XRCHA\_F\_L, XRCHJ, XRCJK, XRCLK Series>

#### Notice (Soldering and Mounting)

##### 1.1. Soldering Condition

###### (1) Reflow

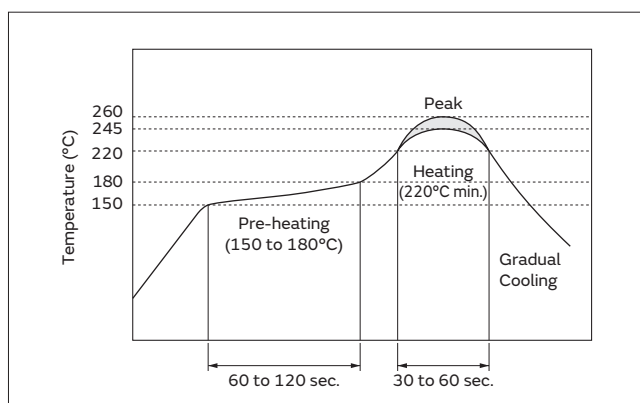
Please mount components on a circuit board by the reflow soldering method.

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 keep 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

Expiration date (shelf life) of the products is 6 months after delivery under the conditions of an unopened package. Please use the products within 6 months after delivery. If you store the products for a long time (more than 6 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 the places under direct sunlight, heat and 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. Please confirm circuit the conditions on your set, because irregular or stop oscillation may occur under unmatched circuit conditions.

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.

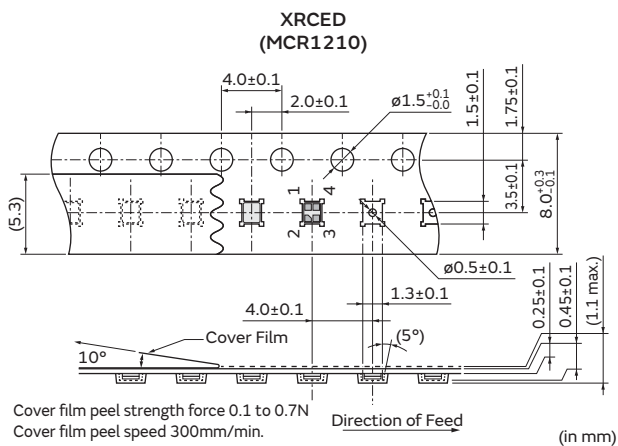
3. Please do not use these products in the following applications in transportation equipment: vehicles, trains, ships, etc.

(example: engine control, brake control, steering control, body control.)

## Packaging -Crystal Units for Consumer-

1

### Dimensions of Taping

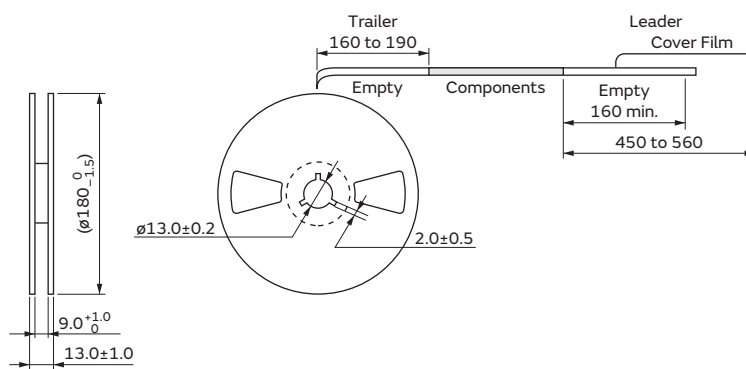


### Minimum Quantity/Dimensions of Reel

Plastic Tape ø180mm

3,000

(pcs.)

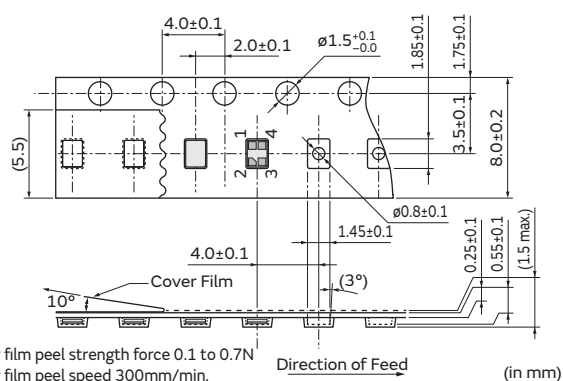


## Packaging -Crystal Units for Consumer-

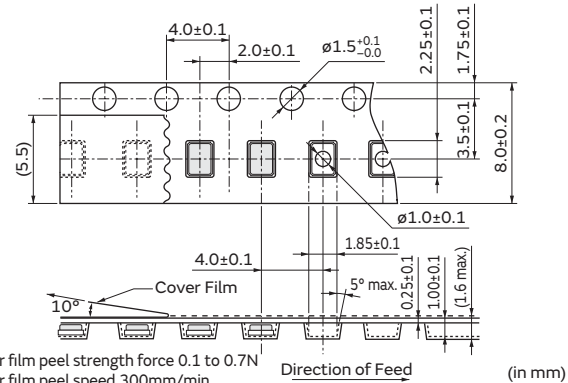
1

### Dimensions of Taping

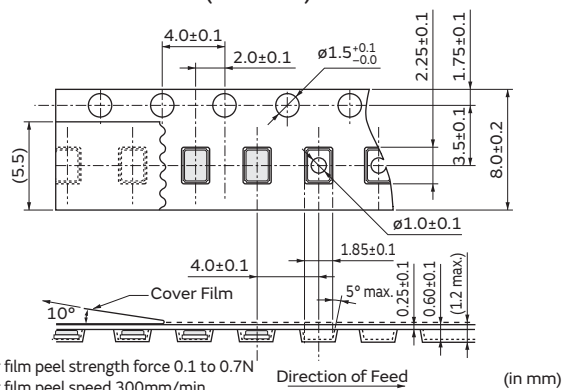
**XRCFD  
(MCR1612)**



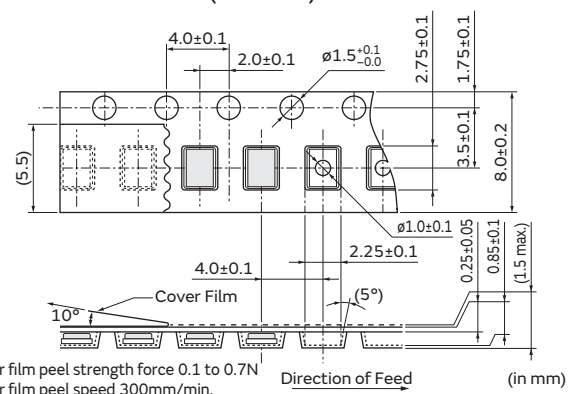
**XRCGB\_F\_H/P/M/L  
(HCR2016)**



**XRCPB\_F\_P/M/L  
(HCR2016)**



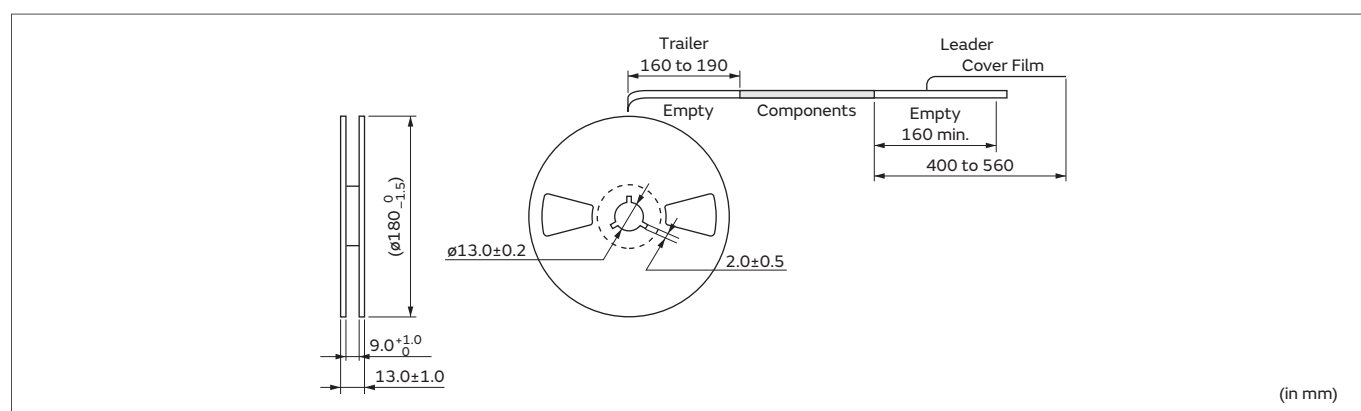
**XRCHA\_F\_L  
(HCR2520)**



### Minimum Quantity/Dimensions of Reel

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

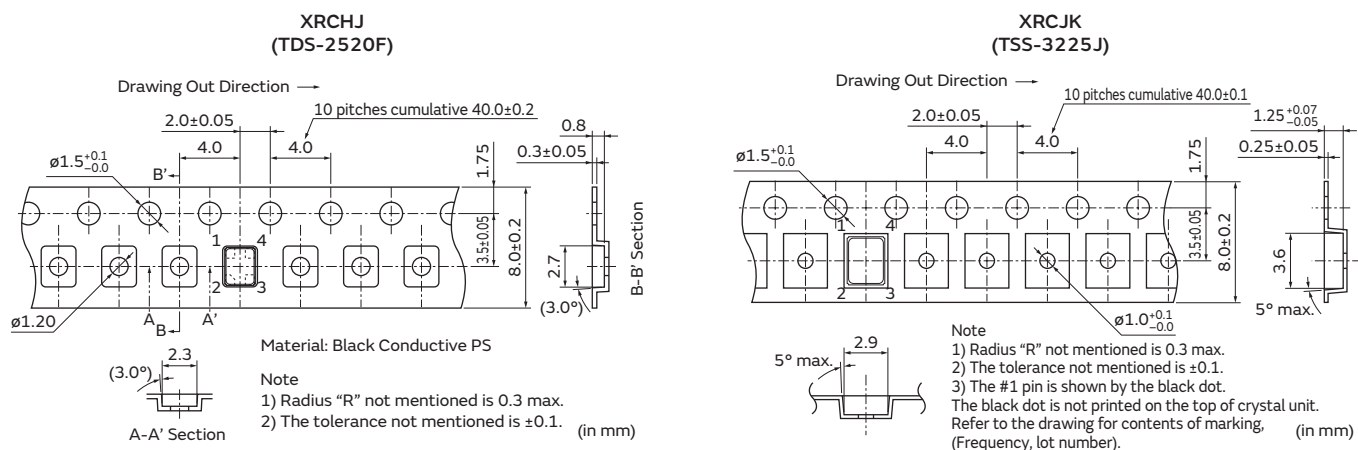
(pcs.)



## Packaging -Crystal Units for Consumer-

1

### Dimensions of Taping

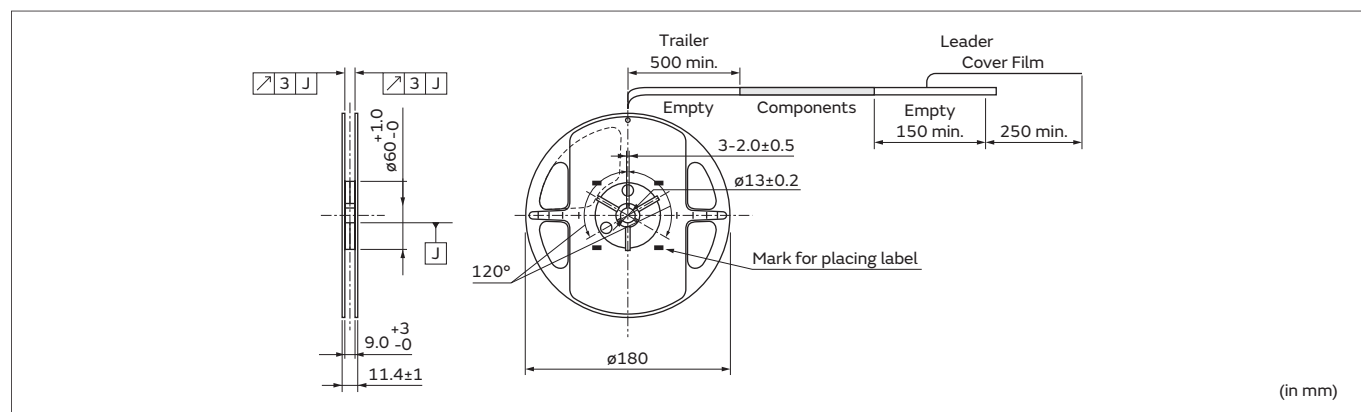


### Minimum Quantity/Dimensions of Reel

Plastic Tape ø180mm

3,000

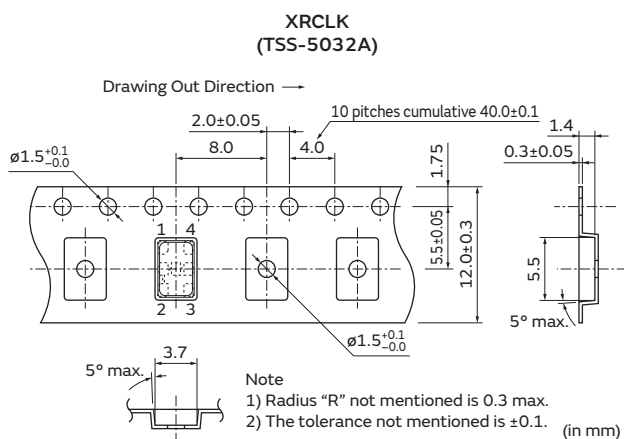
(pcs.)



## Packaging -Crystal Units for Consumer-

1

### Dimensions of Taping

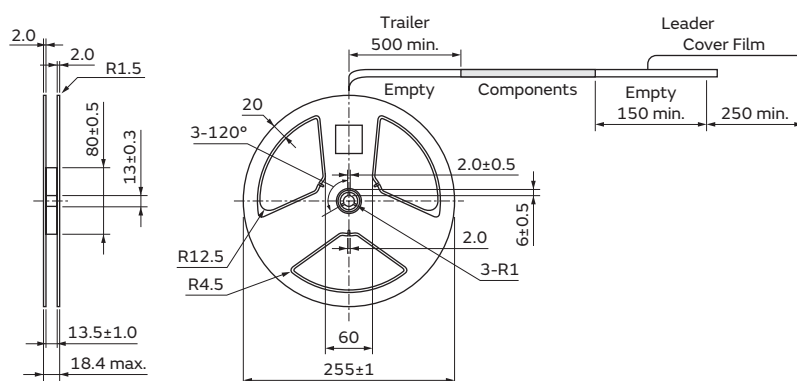


### Minimum Quantity/Dimensions of Reel

Plastic Tape ø255mm

3,000

(pcs.)



# Crystal Units

for Automotive



2

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.

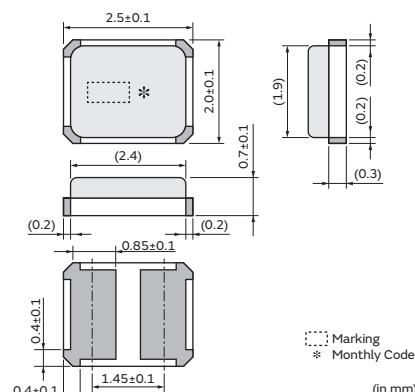
## Features

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.

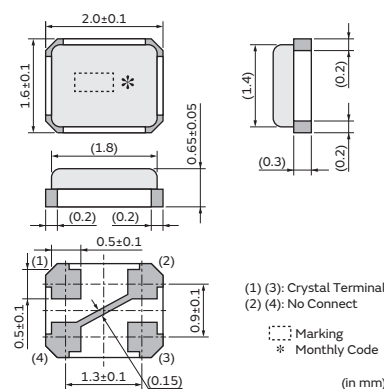
## Applications

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.

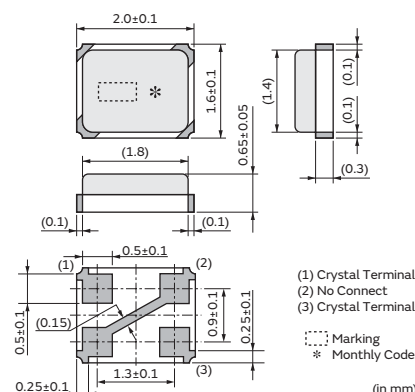
XRCHA\_F\_A  
(HCR2520)  
16.0000–24.0000MHz



XRCGB\_F\_A  
(HCR2016)  
24.0000–48.0000MHz



XRCGB\_F\_G  
(HCR2016)  
24.0000–48.0000MHz



## Series

Series	Type	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	HCR2520	Resin	16.0000 to 24.0000	±100	±100	±5	-40 to +125*	ADAS, Power Train, Chassis, Safety
XRCGB_F_A	HCR2016		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

### <XRCHA\_F\_A (For Automotive)>

Part Number	Type	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.)
XRCHA16M000F0A01R0	HCR2520	16.0000	±100	±100 (-40 to +125°C)	±5	100	8	300
XRCHA16M000F0A11R0	HCR2520	16.0000	±100	±100 (-40 to +125°C)	±5	100	8	600
XRCHA16M000F0A12R0	HCR2520	16.0000	±100	±100 (-40 to +150°C)	±5	100	8	300
XRCHA16M000F0A13R0	HCR2520	16.0000	±100	±100 (-40 to +150°C)	±5	100	8	600
XRCHA20M000F0A01R0	HCR2520	20.0000	±100	±100 (-40 to +125°C)	±5	80	8	300
XRCHA20M000F0A11R0	HCR2520	20.0000	±100	±100 (-40 to +125°C)	±5	80	8	600
XRCHA20M000F0A12R0	HCR2520	20.0000	±100	±100 (-40 to +150°C)	±5	80	8	300
XRCHA20M000F0A13R0	HCR2520	20.0000	±100	±100 (-40 to +150°C)	±5	80	8	600
XRCHA24M000F0A01R0	HCR2520	24.0000	±100	±100 (-40 to +125°C)	±5	80	8	300
XRCHA24M000F0A11R0	HCR2520	24.0000	±100	±100 (-40 to +125°C)	±5	80	8	600
XRCHA24M000F0A12R0	HCR2520	24.0000	±100	±100 (-40 to +150°C)	±5	80	8	300
XRCHA24M000F0A13R0	HCR2520	24.0000	±100	±100 (-40 to +150°C)	±5	80	8	600

\* Equivalent Series Resistance

### <XRCGB\_F\_A (For Automotive)>

Part Number	Type	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.)
XRCGB24M000F3A00R0	HCR2016	24.0000	±30	±35 (-40 to +125°C)	±2	120	6	300
XRCGB25M000F3A00R0	HCR2016	25.0000	±30	±35 (-40 to +125°C)	±2	100	6	300
XRCGB26M000F3A00R0	HCR2016	26.0000	±30	±35 (-40 to +125°C)	±2	80	6	300
XRCGB27M000F3A00R0	HCR2016	27.0000	±30	±35 (-40 to +125°C)	±2	80	6	300
XRCGB27M120F3A00R0	HCR2016	27.1200	±30	±35 (-40 to +125°C)	±2	80	6	300
XRCGB48M000F5A00R0	HCR2016	48.0000	±50	±65 (-40 to +125°C)	±2	60	6	300

\* Equivalent Series Resistance

### <XRCGB\_F\_G (For Car Multimedia)>

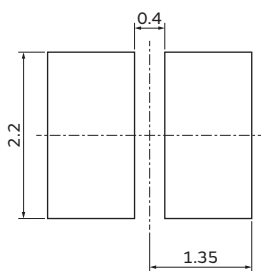
Part Number	Type	Frequency (MHz)	Frequency Tolerance (ppm max.) [at 25°C±3°C]	Frequency Shift by Temperature (ppm max.) [Standard Condition: +25°C]	Frequency Aging (ppm max./Year)	ESR* (Ωmax.)	Load Capacitance (pF)	Drive Level (μW max.)
XRCGB24M000F0G00R0	HCR2016	24.0000	±100	±50 (-40 to +85°C)	±5	150	6	300
XRCGB24M000F3G00R0	HCR2016	24.0000	±30	±50 (-40 to +85°C)	±5	150	6	300
XRCGB24M576F0G00R0	HCR2016	24.5760	±100	±50 (-40 to +85°C)	±5	150	6	300
XRCGB24M576F3G00R0	HCR2016	24.5760	±30	±50 (-40 to +85°C)	±5	150	6	300
XRCGB25M000F0G00R0	HCR2016	25.0000	±100	±50 (-40 to +85°C)	±5	150	6	300
XRCGB25M000F3G00R0	HCR2016	25.0000	±30	±50 (-40 to +85°C)	±5	150	6	300
XRCGB26M000F0G00R0	HCR2016	26.0000	±100	±50 (-40 to +85°C)	±5	150	6	300
XRCGB26M000F3G00R0	HCR2016	26.0000	±30	±50 (-40 to +85°C)	±5	150	6	300
XRCGB27M000F0G00R0	HCR2016	27.0000	±100	±50 (-40 to +85°C)	±5	150	6	300
XRCGB27M000F3G00R0	HCR2016	27.0000	±30	±50 (-40 to +85°C)	±5	150	6	300
XRCGB27M120F3G00R0	HCR2016	27.1200	±30	±50 (-40 to +85°C)	±5	150	6	300
XRCGB30M000F0G00R0	HCR2016	30.0000	±100	±50 (-40 to +85°C)	±5	100	6	300
XRCGB30M000F3G00R0	HCR2016	30.0000	±30	±50 (-40 to +85°C)	±5	100	6	300
XRCGB33M868F0G00R0	HCR2016	33.8688	±100	±50 (-40 to +85°C)	±5	100	6	300
XRCGB33M868F4G00R0	HCR2016	33.8688	±45	±50 (-40 to +85°C)	±5	100	6	300
XRCGB40M000F0G00R0	HCR2016	40.0000	±100	±50 (-40 to +85°C)	±5	100	6	300
XRCGB40M000F4G00R0	HCR2016	40.0000	±45	±50 (-40 to +85°C)	±5	100	6	300
XRCGB48M000F0G00R0	HCR2016	48.0000	±100	±50 (-40 to +85°C)	±5	100	6	300
XRCGB48M000F4G00R0	HCR2016	48.0000	±45	±50 (-40 to +85°C)	±5	100	6	300

\* Equivalent Series Resistance

## Standard Land Pattern Dimensions

XRCHA\_F\_A  
 (HCR2520)

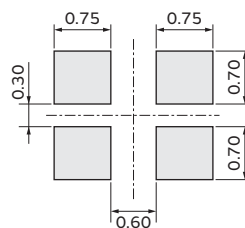
(Recommended Land Pattern)



(in mm)

XRCGB\_F\_A/G  
 (HCR2016)

(Recommended Land Pattern)



(in mm)



## Notice -Crystal Units for Automotive-

### Notice (Soldering and Mounting)

#### 1.1. Soldering Condition

##### (1) Reflow

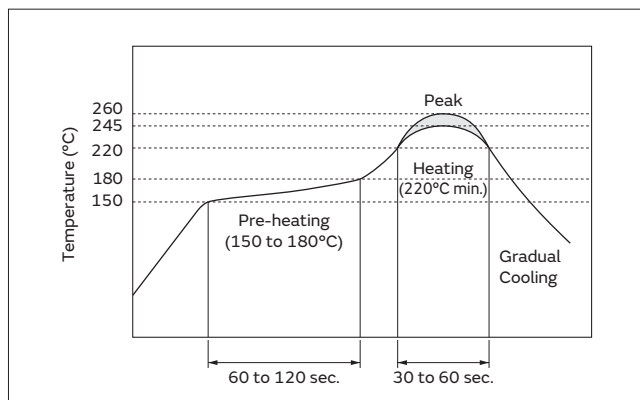
Please mount components on a circuit board by the reflow soldering method.

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 keep the solder volume below the height of the substrate. When exceeding the substrate, 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 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

Expiration date (shelf life) of the products is 6 months after delivery under the conditions of an unopened package. Please use the products within 6 months after delivery. If you store the products for a long time (more than 6 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 the places under direct sunlight, heat and 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)

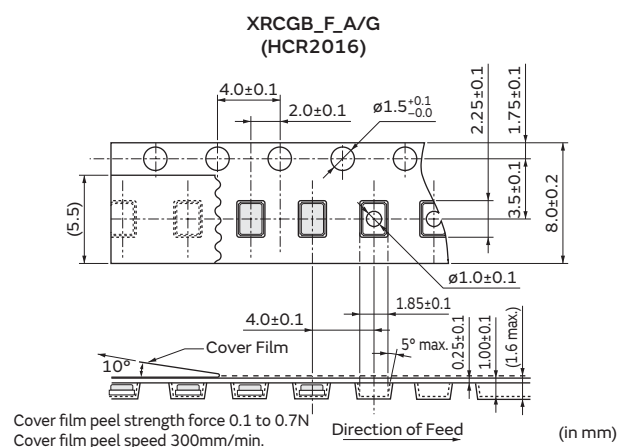
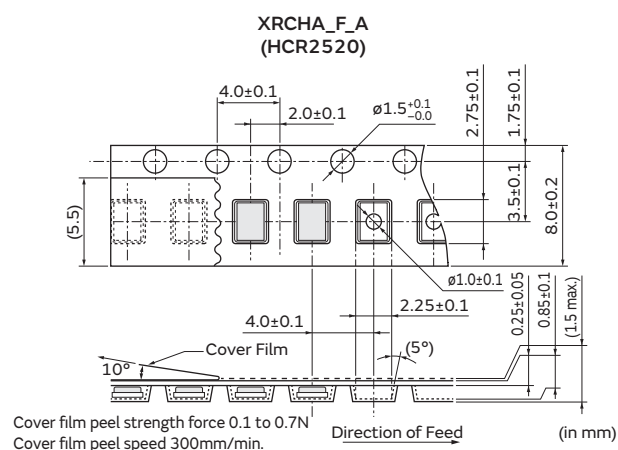
1. Irregular or stopped oscillation may occur under unmatched circuit conditions.

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 a second damage that may be caused by the abnormal function or the failure of our product.

## Packaging -Crystal Units for Automotive-

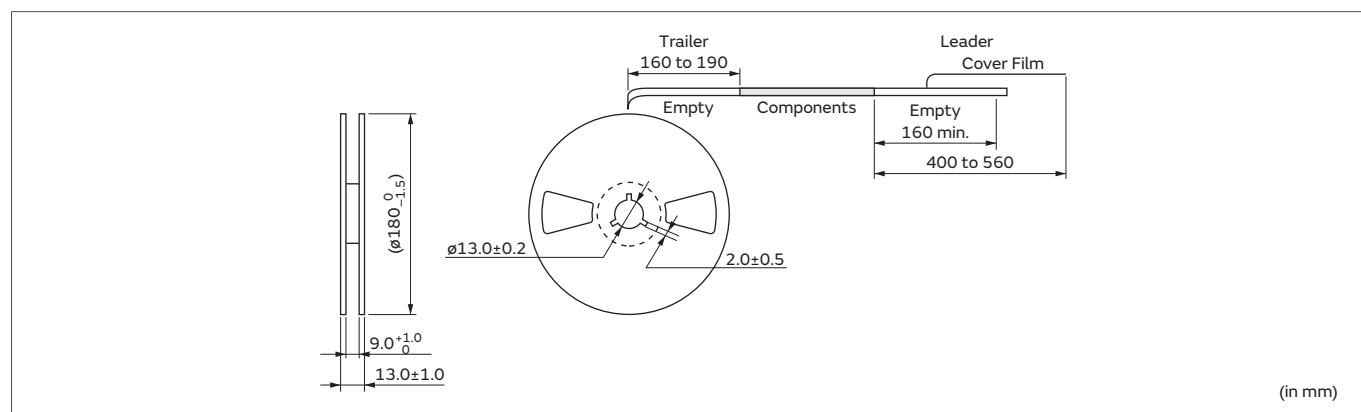
### Dimensions of Taping



### Minimum Quantity/Dimensions of Reel

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

(pcs.)



# 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.

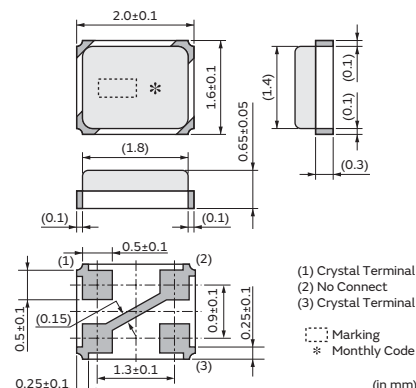
## Features

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).

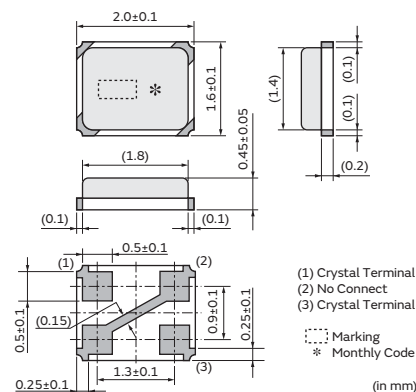
## Applications

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

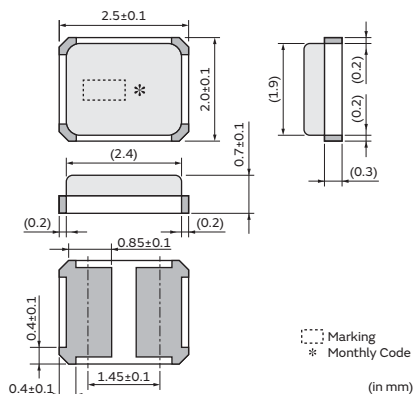
**XRCGB\_F\_Z**  
(HCR2016)  
24.0000–50.0000MHz



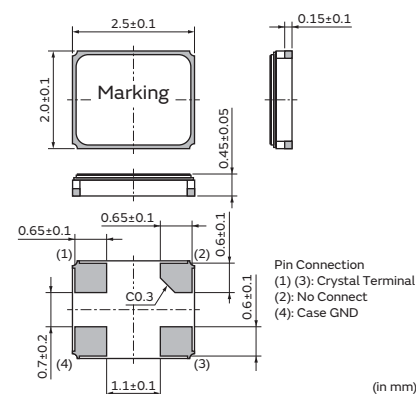
**XRCPB\_F\_Z**  
(HCR2016)  
24.0000–50.0000MHz



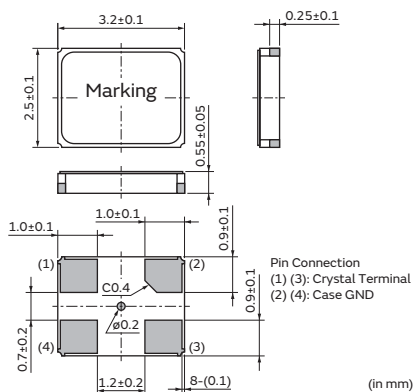
**XRCHA\_F\_Z**  
(HCR2520)  
16.0000–20.0000MHz



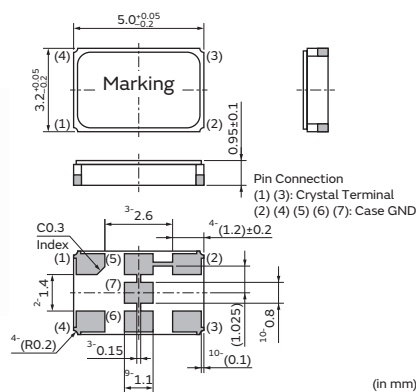
**XRCHH**  
(TAS-2520F)  
16.0000–52.0000MHz



**XRCJH**  
(TAS-3225J)  
13.0000–52.0000MHz



**XRCLH**  
(TAS-5032F)  
10.0000–52.0000MHz



## Series

Series	Type	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	HCR2016	Resin	24.0000 to 50.0000	±100	±100	±5	300	-40 to +105
XRCPB_F_Z			16.0000 to 20.0000					
XRCHA_F_Z	HCR2520	Metal	16.0000 to 52.0000	±10	±15	±1 (±3/5Years)	60	-30 to +85
XRCHH	TAS-2520F		13.0000 to 52.0000					
XRCJH	TAS-3225J		10.0000 to 52.0000					
XRCLH	TAS-5032F							

XRCPB series is a low profile type of XRCGB series.

## Part Number List

### <XRCGB\_F\_Z/XRCPB\_F\_Z>

Part Number	Type	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.)
XRCGB24M000F0Z00R0	HCR2016	24.0000	±100	±100 (-40 to +105°C)	±5	150	6	300
XRCGB24M576F0Z00R0	HCR2016	24.5760	±100	±100 (-40 to +100°C)	±5	150	6	300
XRCGB25M000F0Z00R0	HCR2016	25.0000	±100	±100 (-40 to +105°C)	±5	150	6	300
XRCGB26M000F0Z00R0	HCR2016	26.0000	±100	±100 (-40 to +105°C)	±5	150	6	300
XRCGB27M000F0Z00R0	HCR2016	27.0000	±100	±100 (-40 to +105°C)	±5	150	6	300
XRCGB27M120F0Z00R0	HCR2016	27.1200	±100	±100 (-40 to +105°C)	±5	150	6	300
XRCGB30M000F0Z00R0	HCR2016	30.0000	±100	±100 (-40 to +105°C)	±5	100	6	300
XRCGB31M250F0Z00R0	HCR2016	31.2500	±100	±100 (-40 to +105°C)	±5	100	6	300
XRCGB32M000F0Z00R0	HCR2016	32.0000	±100	±100 (-40 to +105°C)	±5	100	6	300
XRCGB33M868F0Z00R0	HCR2016	33.8688	±100	±100 (-40 to +100°C)	±5	100	6	300
XRCGB40M000F0Z00R0	HCR2016	40.0000	±100	±100 (-40 to +100°C)	±5	100	6	300
XRCGB48M000F0Z00R0	HCR2016	48.0000	±100	±100 (-40 to +105°C)	±5	100	6	300
XRCPB24M000F0Z00R0	HCR2016	24.0000	±100	±100 (-40 to +105°C)	±5	150	6	300
XRCPB24M576F0Z00R0	HCR2016	24.5760	±100	±100 (-40 to +100°C)	±5	150	6	300
XRCPB25M000F0Z00R0	HCR2016	25.0000	±100	±100 (-40 to +105°C)	±5	150	6	300
XRCPB26M000F0Z00R0	HCR2016	26.0000	±100	±100 (-40 to +105°C)	±5	150	6	300
XRCPB27M000F0Z00R0	HCR2016	27.0000	±100	±100 (-40 to +105°C)	±5	150	6	300
XRCPB27M120F0Z00R0	HCR2016	27.1200	±100	±100 (-40 to +105°C)	±5	150	6	300
XRCPB30M000F0Z00R0	HCR2016	30.0000	±100	±100 (-40 to +105°C)	±5	100	6	300
XRCPB31M250F0Z00R0	HCR2016	31.2500	±100	±100 (-40 to +105°C)	±5	100	6	300
XRCPB32M000F0Z00R0	HCR2016	32.0000	±100	±100 (-40 to +105°C)	±5	100	6	300
XRCPB33M868F0Z00R0	HCR2016	33.8688	±100	±100 (-40 to +100°C)	±5	100	6	300
XRCPB40M000F0Z00R0	HCR2016	40.0000	±100	±100 (-40 to +100°C)	±5	100	6	300
XRCPB48M000F0Z00R0	HCR2016	48.0000	±100	±100 (-40 to +105°C)	±5	100	6	300

\* Equivalent Series Resistance

### <XRCHA\_F\_Z>

Part Number	Type	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.)
XRCHA16M000F0Z01R0	HCR2520	16.0000	±100	±100 (-40 to +105°C)	±5	100	8	300
XRCHA20M000F0Z01R0	HCR2520	20.0000	±100	±100 (-40 to +105°C)	±5	80	8	300

\* Equivalent Series Resistance

### <XRCHH>

Part Number	Type	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.)
XRCHH16M000F1QB7P0	TAS-2520F	16.0000	±10	±15 (-30 to +85°C)	±1 (±3/5Years)	80	8	60
XRCHH20M000F1QB1P0	TAS-2520F	20.0000	±10	±15 (-30 to +85°C)	±1 (±3/5Years)	60	8	60
XRCHH26M000F1QD8P0	TAS-2520F	26.0000	±10	±15 (-30 to +85°C)	±1 (±3/5Years)	60	8	60

\* Equivalent Series Resistance

Continued on the following page. ↗

Continued from the preceding page. ↘

Part Number	Type	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.)
<b>XRCHH36M000F1QA3P0</b>	<b>TAS-2520F</b>	36.0000	±10	±15 (-30 to +85°C)	±1 (±3/5Years)	60	8	60
<b>XRCHH40M000F1QB3P0</b>	<b>TAS-2520F</b>	40.0000	±10	±15 (-30 to +85°C)	±1 (±3/5Years)	60	8	60
<b>XRCHH52M000F1QA2P0</b>	<b>TAS-2520F</b>	52.0000	±10	±15 (-30 to +85°C)	±1 (±3/5Years)	60	8	60

\* Equivalent Series Resistance

### <XRCJH>

Part Number	Type	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.)
<b>XRCJH13M000F1QA0P0</b>	<b>TAS-3225J</b>	13.0000	±10	±15 (-30 to +85°C)	±1 (±3/5Years)	80	8	60
<b>XRCJH16M000F1QB5P0</b>	<b>TAS-3225J</b>	16.0000	±10	±15 (-30 to +85°C)	±1 (±3/5Years)	80	8	60
<b>XRCJH20M000F1QB3P0</b>	<b>TAS-3225J</b>	20.0000	±10	±15 (-30 to +85°C)	±1 (±3/5Years)	60	8	60
<b>XRCJH26M000F1QC1P0</b>	<b>TAS-3225J</b>	26.0000	±10	±15 (-30 to +85°C)	±1 (±3/5Years)	60	8	60
<b>XRCJH36M000F1QA1P0</b>	<b>TAS-3225J</b>	36.0000	±10	±15 (-30 to +85°C)	±1 (±3/5Years)	60	8	60
<b>XRCJH40M000F1QB2P0</b>	<b>TAS-3225J</b>	40.0000	±10	±15 (-30 to +85°C)	±1 (±3/5Years)	60	8	60
<b>XRCJH52M000F1QA1P0</b>	<b>TAS-3225J</b>	52.0000	±10	±15 (-30 to +85°C)	±1 (±3/5Years)	60	8	60

\* Equivalent Series Resistance

### <XRCLH>

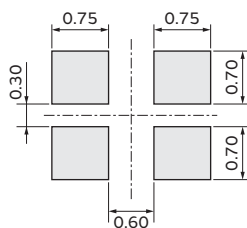
Part Number	Type	Frequency (MHz)	Frequency Tolerance (ppm max.) [at 25°C±3°C]	Frequency Shift by Temperature (ppm max.) [Standard Condition: +25°C]	Frequency Aging (ppm max./Year)	ESR* (Ωmax.)	Load Capacitance (pF)	Drive Level (μW max.)
<b>XRCLH10M000F1QA4P0</b>	<b>TAS-5032F</b>	10.0000	±10	±15 (-30 to +85°C)	±1 (±3/5Years)	60	8	60
<b>XRCLH12M000F1QA0P0</b>	<b>TAS-5032F</b>	12.0000	±10	±15 (-30 to +85°C)	±1 (±3/5Years)	60	8	60
<b>XRCLH14M745F1QA0P0</b>	<b>TAS-5032F</b>	14.7456	±10	±15 (-30 to +85°C)	±1 (±3/5Years)	40	8	60
<b>XRCLH16M000F1QA2P0</b>	<b>TAS-5032F</b>	16.0000	±10	±15 (-30 to +85°C)	±1 (±3/5Years)	40	8	60
<b>XRCLH21M250F1QA0P0</b>	<b>TAS-5032F</b>	21.2500	±10	±15 (-30 to +85°C)	±1 (±3/5Years)	40	8	60
<b>XRCLH52M000F1QA1P0</b>	<b>TAS-5032F</b>	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**  
(HCR2016)

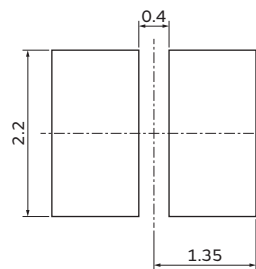
(Recommended Land Pattern)



(in mm)

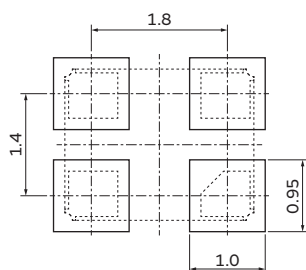
**XRCHA\_F\_Z**  
(HCR2520)

(Recommended Land Pattern)



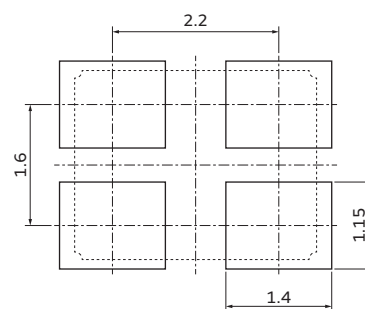
(in mm)

**XRCHH**  
(TAS-2520F)



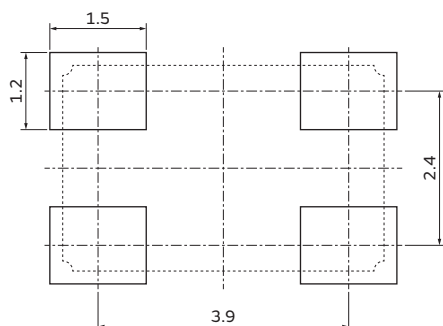
(in mm)

**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

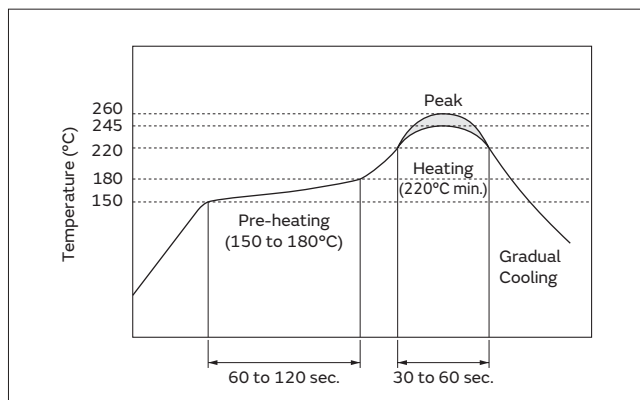
Please mount components on a circuit board by the reflow soldering method.

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 keep 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

Expiration date (shelf life) of the products is 6 months after delivery under the conditions of an unopened package. Please use the products within 6 months after delivery. If you store the products for a long time (more than 6 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 the places under direct sunlight, heat and 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.

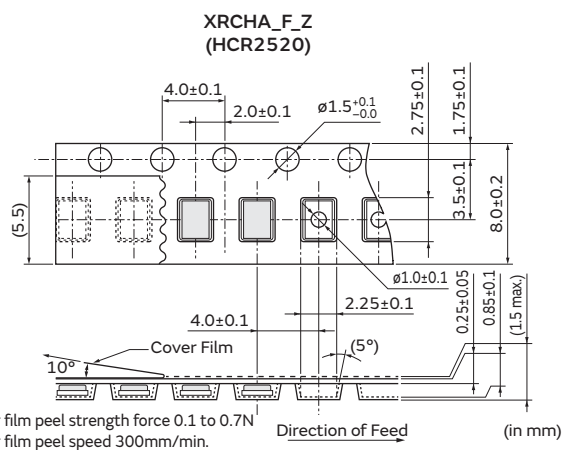
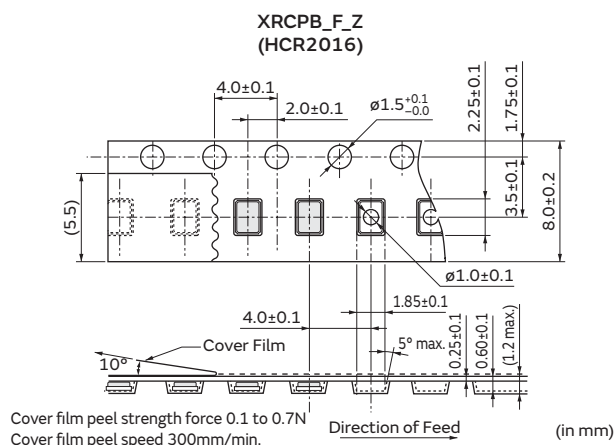
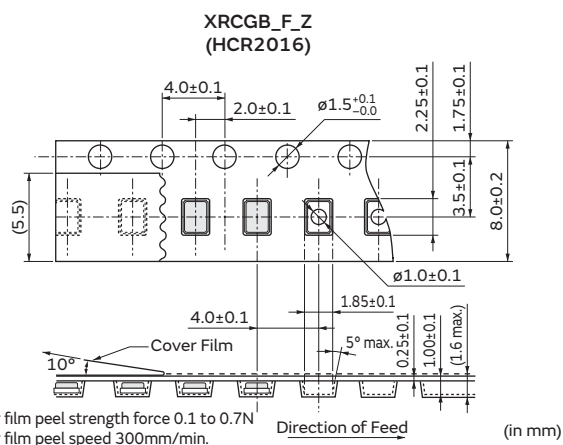
### Notice (Handling)

1. Please confirm circuit the conditions on your set, because irregular or stop oscillation may occur under unmatched circuit conditions.
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 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 Industrial-

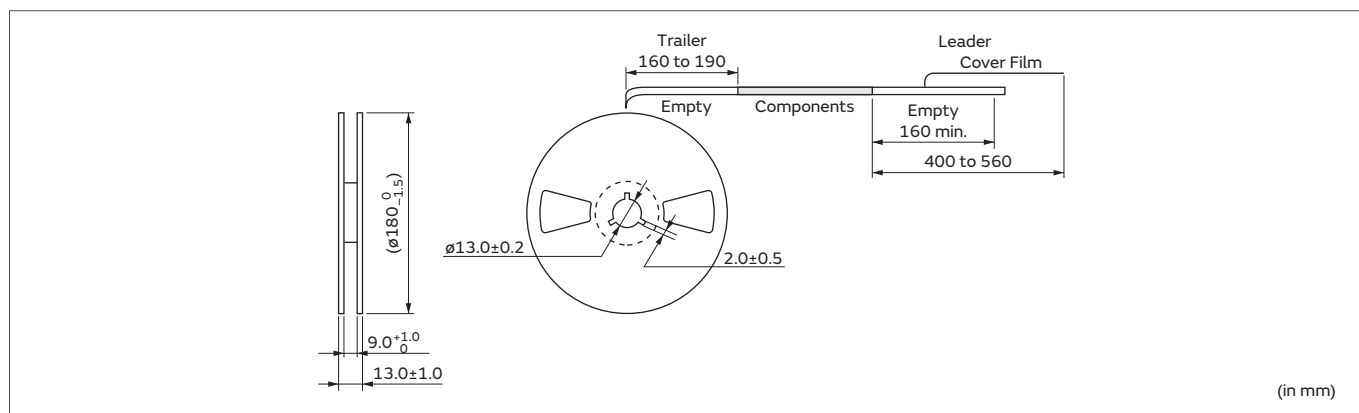
### Dimensions of Taping



### Minimum Quantity/Dimensions of Reel

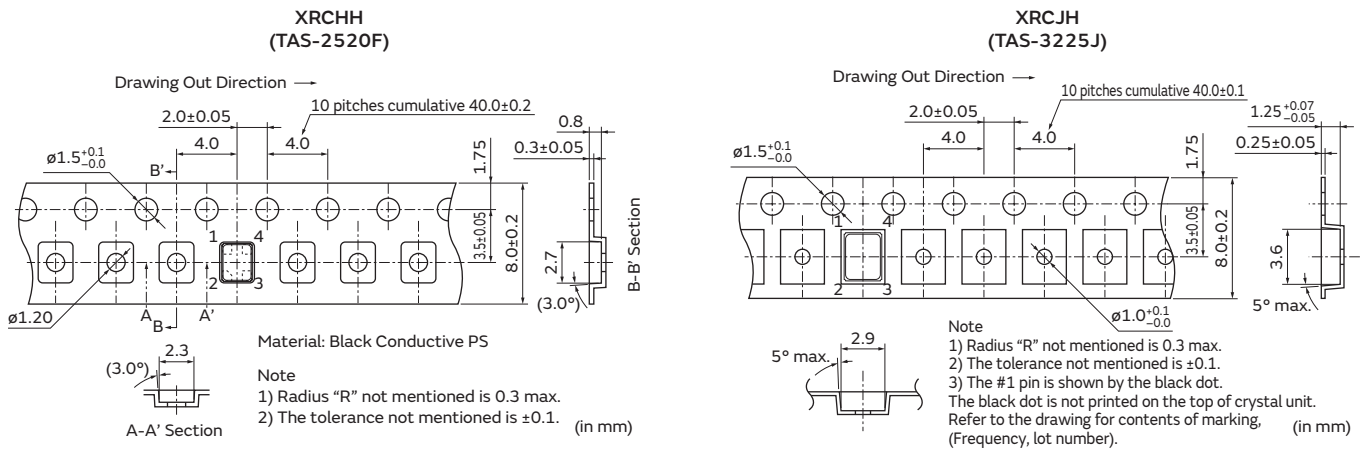
Plastic Tape ø180mm	Plastic Tape ø330mm
3,000	9,000

(pcs.)



## Packaging -Crystal Units for Industrial-

### Dimensions of Taping

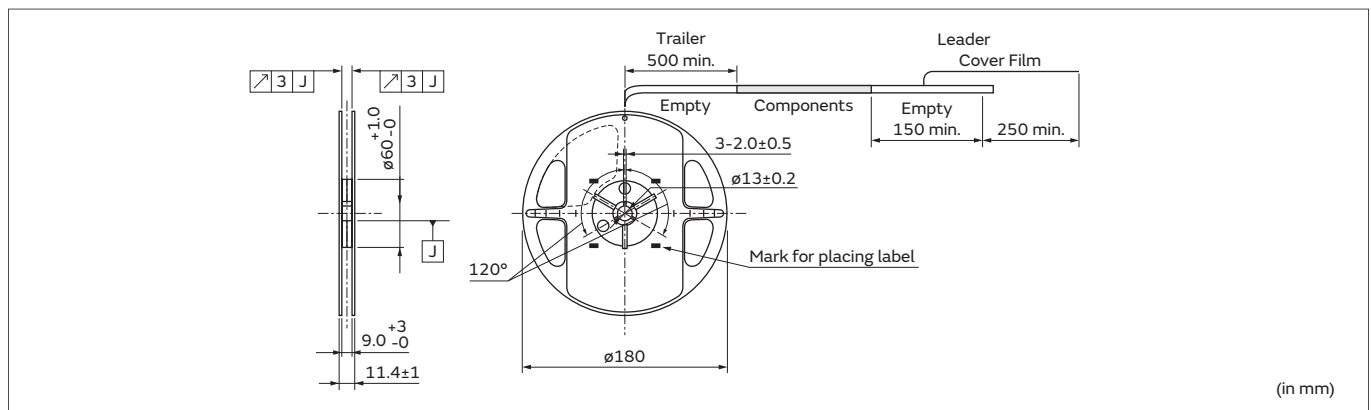


### Minimum Quantity/Dimensions of Reel

Plastic Tape ø180mm

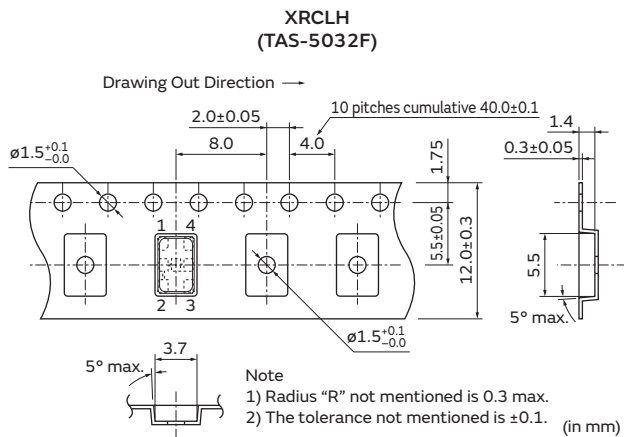
3,000

(pcs.)



## Packaging -Crystal Units for Industrial-

### Dimensions of Taping

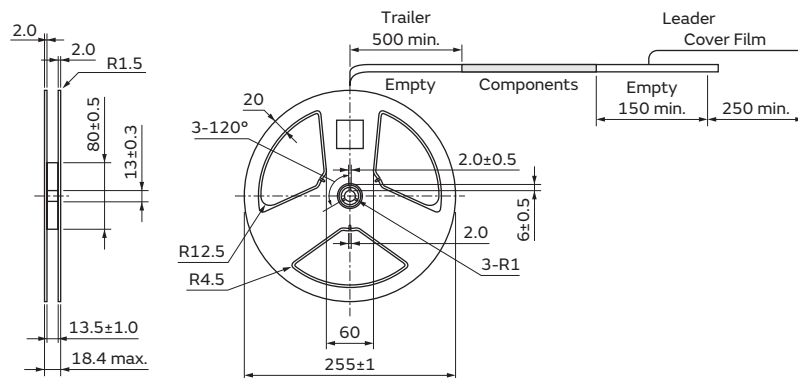


### Minimum Quantity/Dimensions of Reel

Plastic Tape ø255mm

3,000

(pcs.)



# Crystal Oscillators

for Industrial



We offer a varied 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 fostered by our long experience and expertise.

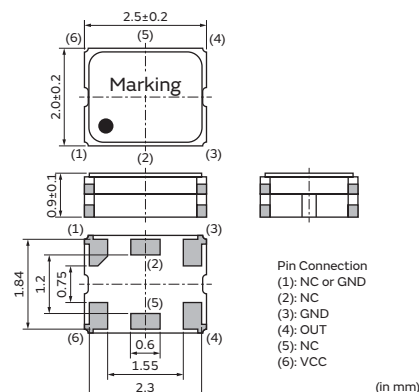
## Features

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).

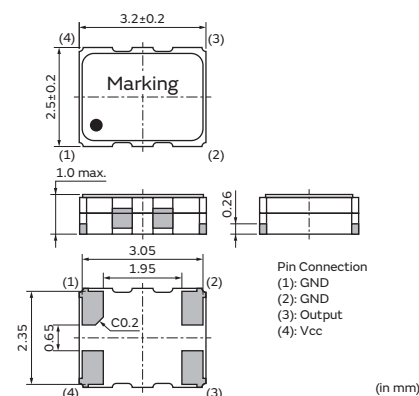
## Applications

1. Business radios
2. GPS (GNSS) systems
3. Small cells
4. Wireless devices

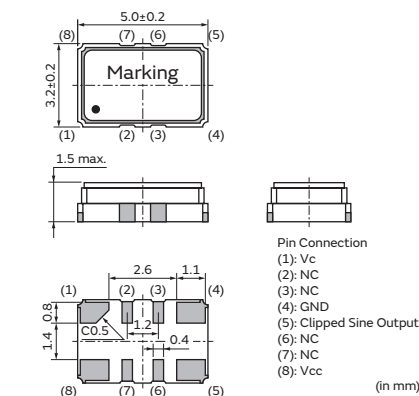
**XNCHH**  
(TTS27NSC-A7)  
10.0000–52.0000MHz  
**XTCHH**  
(TTS27VSC-A7)  
10.0000–52.0000MHz



**XNCJH**  
(TTS18NSH-A7)  
10.0000–52.0000MHz  
**XTCJH**  
(TTS18VSH-A7)  
10.0000–52.0000MHz



**XTCLH\_J**  
(TTS14VSH)  
10.0000–40.0000MHz



## 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)	Operating Temperature Range (°C)	Supply Voltage (Vcc)	VC Function
XNCHH	TTS27NSC-A7	2520	Metal	10.0000 to 52.0000	±1.0	±0.5	±1.0	-30 to +85°C	+3.0±5%	—
XTCHH	TTS27VSC-A7									○
XNCJH	TTS18NSH-A7	3225								—
XTCJH	TTS18VSH-A7									○
XTCLH_J	TTS14VSH	5032		10.0000 to 40.0000	±0.5	±0.2	±0.5	-40 to +85°C		

## Part Number List

### <XNCHH>

Part Number	Type	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)
XNCHH10M000TJEA2P0	TTS27NSC-A7	10.0000	±1.0	±0.5 (-30 to +85°C)	±1.0	2	-
XNCHH15M300TJEA0P0	TTS27NSC-A7	15.3000	±1.0	±0.5 (-30 to +85°C)	±1.0	2	-
XNCHH16M368TJEA4P0	TTS27NSC-A7	16.3680	±1.0	±0.5 (-30 to +85°C)	±1.0	2	-
XNCHH16M800TJEA3P0	TTS27NSC-A7	16.8000	±1.0	±0.5 (-30 to +85°C)	±1.0	2	-
XNCHH19M200TJEC1P0	TTS27NSC-A7	19.2000	±1.0	±0.5 (-30 to +85°C)	±1.0	2	-
XNCHH26M000TJEE5P0	TTS27NSC-A7	26.0000	±1.0	±0.5 (-30 to +85°C)	±1.0	2	-
XNCHH28M800TJEA1P0	TTS27NSC-A7	28.8000	±1.0	±0.5 (-30 to +85°C)	±1.0	2	-
XNCHH32M000TJEB5P0	TTS27NSC-A7	32.0000	±1.0	±0.5 (-30 to +85°C)	±1.0	2	-
XNCHH38M400TJEB3P0	TTS27NSC-A7	38.4000	±1.0	±0.5 (-30 to +85°C)	±1.0	2	-
XNCHH52M000TJEA1P0	TTS27NSC-A7	52.0000	±1.0	±0.5 (-30 to +85°C)	±1.0	2	-

### <XTCHH>

Part Number	Type	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)
XTCHH10M000TJEA3P0	TTS27VSC-A7	10.0000	±1.0	±0.5 (-30 to +85°C)	±1.0	2	±5 min. to ±15 max.
XTCHH15M300TJEA2P0	TTS27VSC-A7	15.3000	±1.0	±0.5 (-30 to +85°C)	±1.0	2	±5 min. to ±15 max.
XTCHH16M800TJEA2P0	TTS27VSC-A7	16.8000	±1.0	±0.5 (-30 to +85°C)	±1.0	2	±5 min. to ±15 max.
XTCHH19M200TJEB4P0	TTS27VSC-A7	19.2000	±1.0	±0.5 (-30 to +85°C)	±1.0	2	±5 min. to ±15 max.
XTCHH20M950TJEA0P0	TTS27VSC-A7	20.9500	±1.0	±0.5 (-30 to +85°C)	±1.0	2	±5 min. to ±15 max.
XTCHH21M250TJEA0P0	TTS27VSC-A7	21.2500	±1.0	±0.5 (-30 to +85°C)	±1.0	2	±5 min. to ±15 max.
XTCHH26M000TJEB1P0	TTS27VSC-A7	26.0000	±1.0	±0.5 (-30 to +85°C)	±1.0	2	±5 min. to ±15 max.
XTCHH28M800TJEA0P0	TTS27VSC-A7	28.8000	±1.0	±0.5 (-30 to +85°C)	±1.0	2	±5 min. to ±15 max.
XTCHH38M400TJEA1P0	TTS27VSC-A7	38.4000	±1.0	±0.5 (-30 to +85°C)	±1.0	2	±5 min. to ±15 max.
XTCHH52M000TJEA1P0	TTS27VSC-A7	52.0000	±1.0	±0.5 (-30 to +85°C)	±1.0	2	±5 min. to ±15 max.

### <XNCJH>

Part Number	Type	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)
XNCJH10M000TJEA8P0	TTS18NSH-A7	10.0000	±1.0	±0.5 (-30 to +85°C)	±1.0	2	-
XNCJH15M300TJEA0P0	TTS18NSH-A7	15.3000	±1.0	±0.5 (-30 to +85°C)	±1.0	2	-
XNCJH16M800TJEA1P0	TTS18NSH-A7	16.8000	±1.0	±0.5 (-30 to +85°C)	±1.0	2	-
XNCJH19M200TJEA5P0	TTS18NSH-A7	19.2000	±1.0	±0.5 (-30 to +85°C)	±1.0	2	-
XNCJH26M000TJEB4P0	TTS18NSH-A7	26.0000	±1.0	±0.5 (-30 to +85°C)	±1.0	2	-
XNCJH28M800TJEA1P0	TTS18NSH-A7	28.8000	±1.0	±0.5 (-30 to +85°C)	±1.0	2	-
XNCJH38M400TJEA3P0	TTS18NSH-A7	38.4000	±1.0	±0.5 (-30 to +85°C)	±1.0	2	-
XNCJH52M000TJEA0P0	TTS18NSH-A7	52.0000	±1.0	±0.5 (-30 to +85°C)	±1.0	2	-

### <XTCJH>

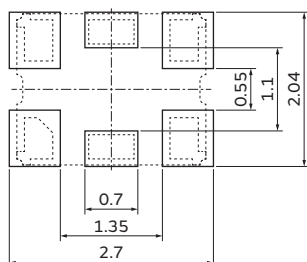
Part Number	Type	Frequency (MHz)	Frequency Tolerance (ppm max.) [at 25°C±3°C]	Frequency Shift by Temperature (ppm max.) [Standard Condition: +25°C]	Frequency Aging (ppm max./Year)	Current Consumption (mA max.)	Frequency Controlled Range (ppm)
XTCJH10M000TJEB0P0	TTS18VSH-A7	10.0000	±1.0	±0.5 (-30 to +85°C)	±1.0	2	±5 min. to ±15 max.
XTCJH15M300TJEA3P0	TTS18VSH-A7	15.3000	±1.0	±0.5 (-30 to +85°C)	±1.0	2	±5 min. to ±15 max.
XTCJH16M800TJEB0P0	TTS18VSH-A7	16.8000	±1.0	±0.5 (-30 to +85°C)	±1.0	2	±5 min. to ±15 max.
XTCJH19M200TJEB6P0	TTS18VSH-A7	19.2000	±1.0	±0.5 (-30 to +85°C)	±1.0	2	±5 min. to ±15 max.
XTCJH26M000TJEB4P0	TTS18VSH-A7	26.0000	±1.0	±0.5 (-30 to +85°C)	±1.0	2	±5 min. to ±15 max.
XTCJH28M800TJEA0P0	TTS18VSH-A7	28.8000	±1.0	±0.5 (-30 to +85°C)	±1.0	2	±5 min. to ±15 max.
XTCJH38M400TJEA3P0	TTS18VSH-A7	38.4000	±1.0	±0.5 (-30 to +85°C)	±1.0	2	±5 min. to ±15 max.
XTCJH52M000TJEA5P0	TTS18VSH-A7	52.0000	±1.0	±0.5 (-30 to +85°C)	±1.0	2	±5 min. to ±15 max.

## <XTCLH\_J>

Part Number	Type	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)
XTCLH19M200TJJC3P0	TTS14VSH	19.2000	±0.5	±0.2(-40 to +85°C)	±0.5	3	±3 min. to ±6 max.
XTCLH25M000TJJA5P0	TTS14VSH	25.0000	±0.5	±0.2(-40 to +85°C)	±0.5	3	±3 min. to ±6 max.
XTCLH26M000TJJA6P0	TTS14VSH	26.0000	±0.5	±0.2(-40 to +85°C)	±0.5	3	±3 min. to ±6 max.

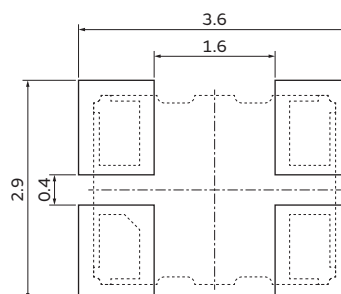
## Standard Land Pattern Dimensions

XNCHH (TTS27NSC-A7)  
XTCHH (TTS27VSC-A7)



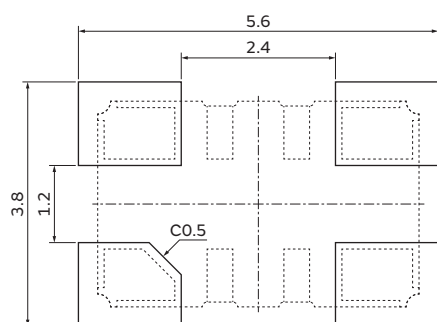
(in mm)

XNCJH (TTS18NSH-A7)  
XTCJH (TTS18VSH-A7)



(in mm)

XTCLH\_J (TTS14VSH)



(in mm)

## Notice -Crystal Oscillators for Industrial-

### Notice (Soldering and Mounting)

#### 1.1. Soldering Condition

##### (1) Reflow

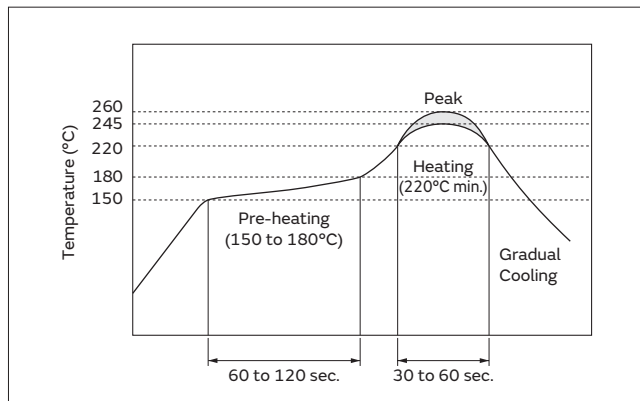
Please mount components on a circuit board by the reflow soldering method.

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.

	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 keep the solder volume below the height of the substrate. When exceeding the substrate, 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 a 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

Expiration date (shelf life) of the products is 6 months after delivery under the conditions of an unopened package. Please use the products within 6 months after delivery. If you store the products for a long time (more than 6 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 the solderability due to 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 under direct sunlight, heat and 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 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 these products in the following

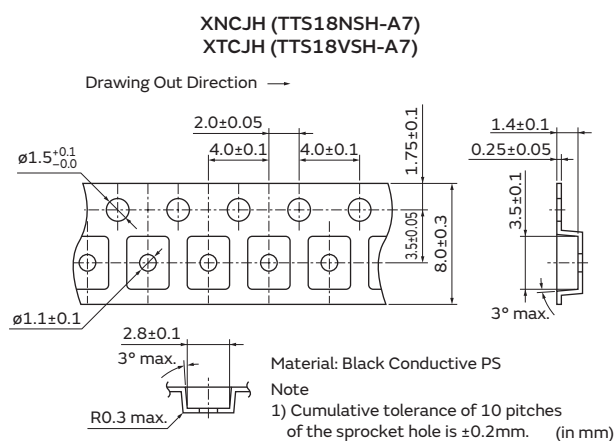
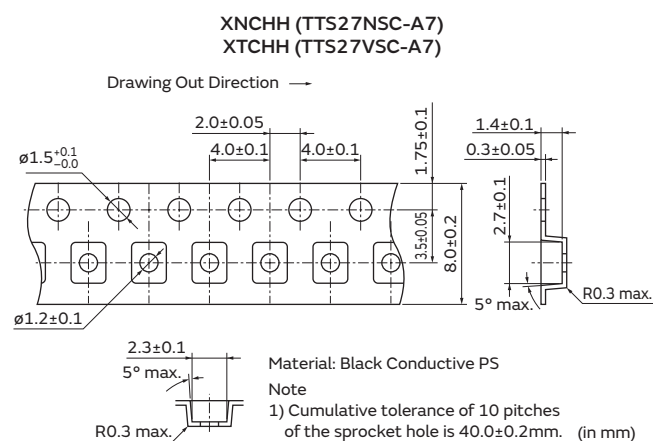
applications in transportation equipment

(vehicles, trains, ships, etc.).

(example: engine control, brake control, steering control, body control.)

## Packaging -Crystal Oscillators for Industrial-

### Dimensions of Taping

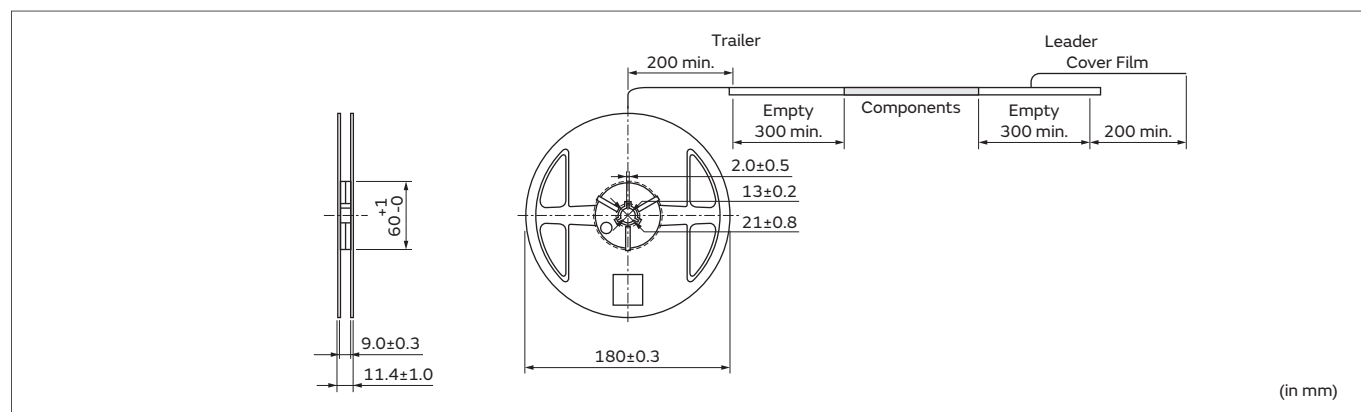


### Minimum Quantity/Dimensions of Reel

Plastic Tape ø180mm

3,000

(pcs.)



## 41

## Measuring Circuit of Crystal Units

### Measuring Circuit

#### 1. Frequency Measuring Method

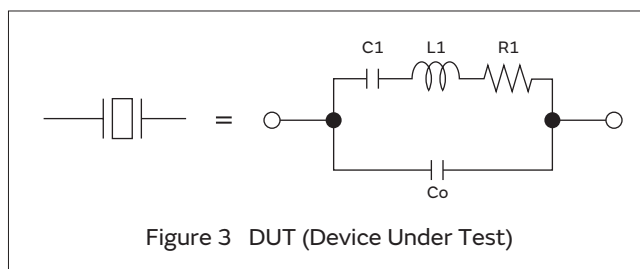
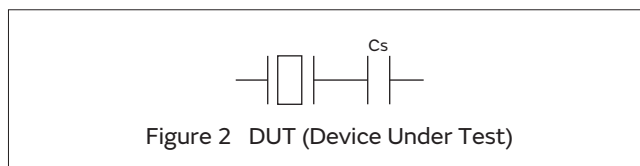
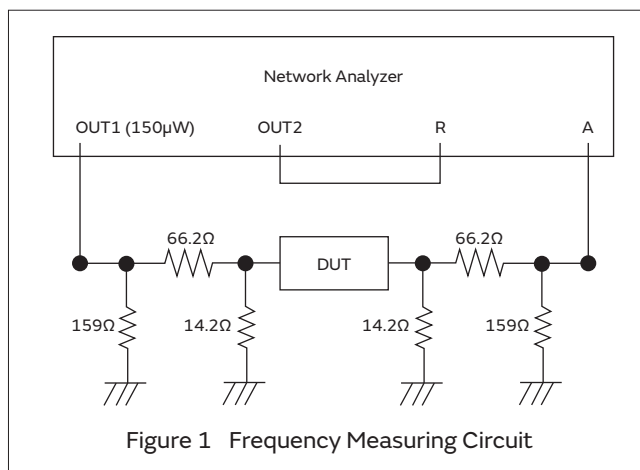
The load resonance frequency (Lower frequency of the two given when the electrical impedance of the component becomes resistant near its resonance point) is measured by network analyzer (KEYSIGHT E5100A or the equivalent) and the circuit in Figure 1. DUT is shown in Figure 2, and the value of  $C_s$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

#### 2. Equivalent Series Resistance

The equivalent series resistance ( $R_1$ ) is measured by network analyzer (KEYSIGHT E5100A or equivalent) and the circuit in Figure 1. DUT is shown in Figure 3.

#### 3. Measuring Condition

Standard conditions for measurement shall be  $+25\pm3^\circ\text{C}$  temperature and humidity of 45 to 85%R.H.



# Global Locations

For details please visit [www.murata.com](http://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 2017. 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.

[www.murata.com](http://www.murata.com)

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INNOVATOR IN ELECTRONICS

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[XTL1015](#) [XTL1016](#) [XTL1017](#) [XTL1018](#) [XTL1019](#) [XTL1020](#) [XTL1021](#) [XTL1022](#) [XTL1023](#) [XTL1024](#) [XTL1025](#)  
[XTL1026](#) [XRCGB24M000F0L00R0](#) [XRCGB25M000F0L00R0](#) [XRCGB25M000F3M00R0](#) [XRCGB27M000F0L00R0](#)  
[XRCGB27M000F3M00R0](#) [XRCGB27M120F3M00R0](#) [XRCGB30M000F0L00R0](#) [XRCGB30M000F3M00R0](#)  
[XRCGB33M868F0L00R0](#) [XRCGB40M000F0L00R0](#) [XRCGB40M000F4M00R0](#) [XRCGB27M120F3M10R0](#)  
[XRCGB26M000F0L00R0](#) [XRCGB26M000F3M00R0](#) [XRCGB24M000F3N00R0](#) [XRCGB24M000FAN00R0](#)  
[XRCGB25M000F3N00R0](#) [XRCGB25M000FAN00R0](#) [XRCGB26M000F3N00R0](#) [XRCGB26M000FAN00R0](#)  
[XRCGB27M000F3N00R0](#) [XRCGB27M000FAN00R0](#) [XRCGB30M000F3N00R0](#) [XRCGB30M000FAN00R0](#)  
[XRCGB32M000F2P00R0](#) [XRCGB26M000F2P00R0](#) [XRCGB27M000F2P00R0](#) [XRCGB24M000F2P00R0](#)  
[XRCGB25M000F2P00R0](#) [XRCGB27M120F2P00R0](#) [XRCGB30M000F2P00R0](#) [XRCGB31M250F2P00R0](#)  
[XRCGB24M000F0G00R0](#) [XRCGB32M000FAN00R0](#) [XRCGB30M000F0G00R0](#) [XRCGB27M000F3G00R0](#)  
[XRCGB26M000F3G00R0](#) [XRCGB33M868F4M00R0](#) [XRCGB27M000F0G00R0](#) [XRCGB25M000F0G00R0](#)  
[XRCGB24M576F0G00R0](#) [XRCGB25M000F3G00R0](#) [XRCGB33M868F4G00R0](#) [XRCGB33M868F0G00R0](#)  
[XRCGB24M000F3G00R0](#) [XRCGB30M000F3G00R0](#) [XRCGB24M576F3G00R0](#) [XRCGB26M000F0G00R0](#)  
[XRCGB32M000F3N00R0](#) [PAH-48/8.5-D48NB1-C](#) [XRCGB48M000F4M12R0](#) [XRCGB32M000F2P26R0](#)  
[XRCGB32M000FAP11R0](#) [XRCGB32M000F2N13R0](#) [XRCGB27M120F2P10R0](#) [XRCGB25M000F3M04R0](#)  
[XRCGB24M000F1H02R0](#) [XRCGB25M000F1H01R0](#) [XRCGB25M000F1H02R0](#) [XRCGB25M000F1H03R0](#)  
[XRCGB24M000F1H01R0](#) [XRCGB24M000F1H03R0](#)