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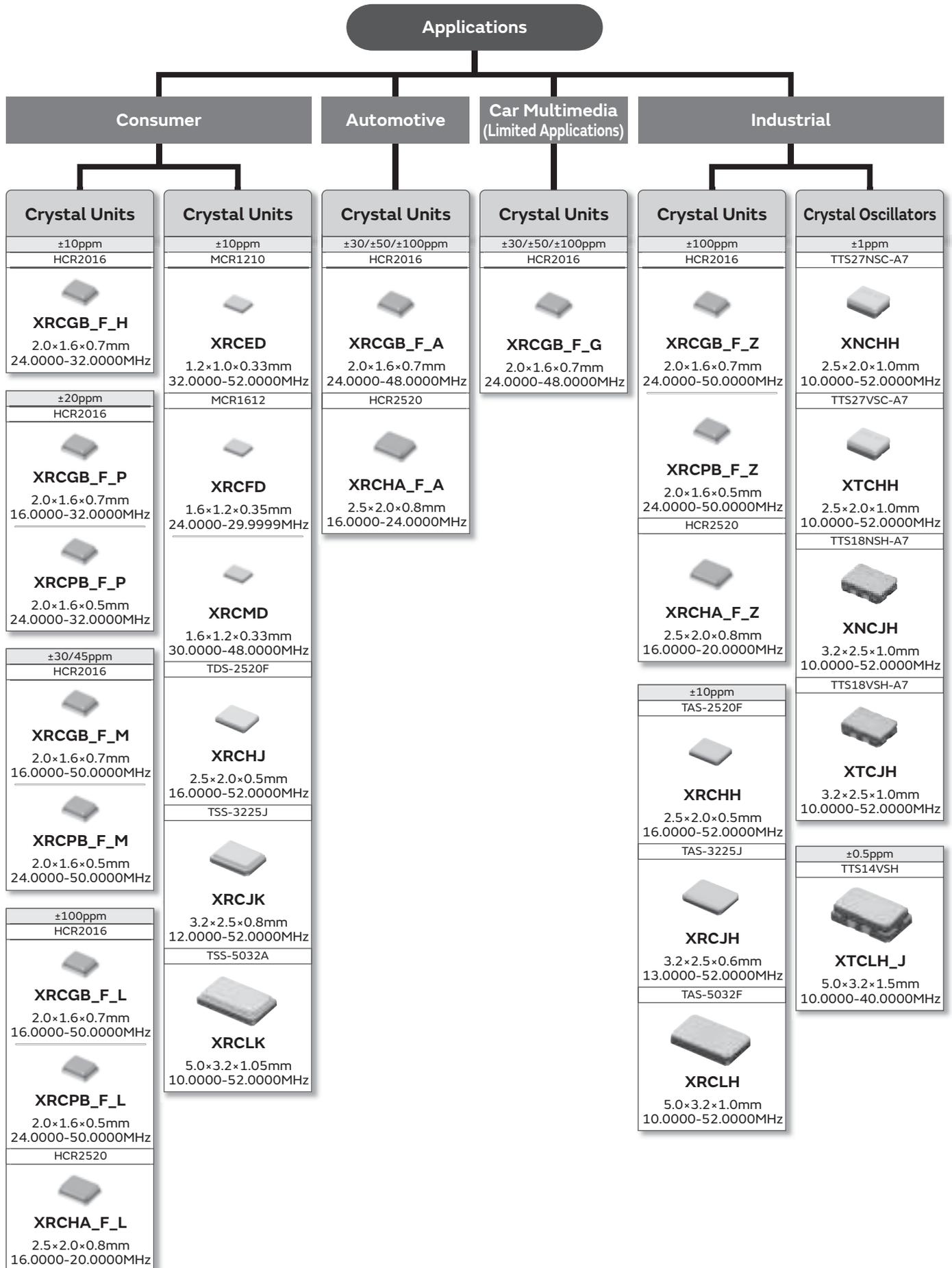
Product specifications are as of March 2017.

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

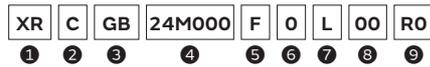
# Selection Guides



● Part Numbering

Crystal Unit

(Part Number)



① Product ID

Product ID	
XR	Crystal Unit

② Lead Style

Code	Lead Style
C/T	SMD

③ Size · Structure

Code	Size · Structure
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*1
5	±50ppm
A	±25ppm/±15ppm*2
Y	Total*3±20ppm

\*1 \*2 When ③ is "HH" or "JK"

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

⑦ Frequency Shift by Temperature

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

\*1 When ③ is "HH" or "JK"

⑧ Individual Specification

Code	
**	Two-digit alphanumerics express Individual Specification.

00: Standard specification type.

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

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

# Crystal 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.

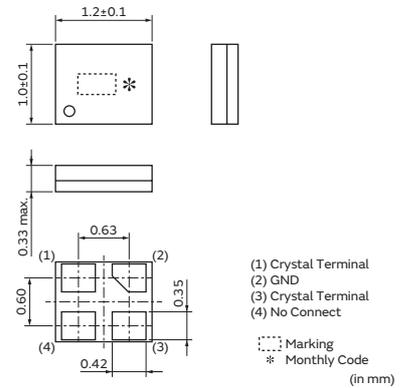
## Features

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).

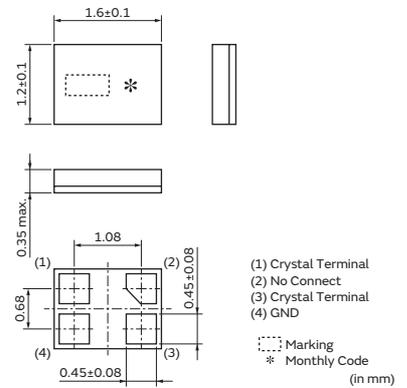
## Applications

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.

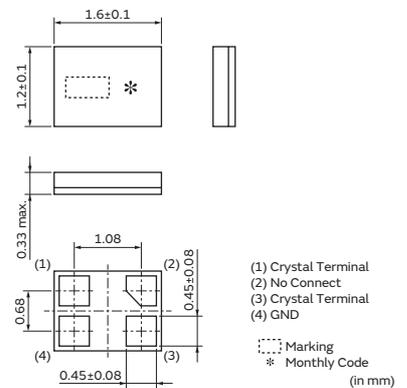
**XRCED**  
**(MCR1210)**  
 32.0000–52.0000MHz



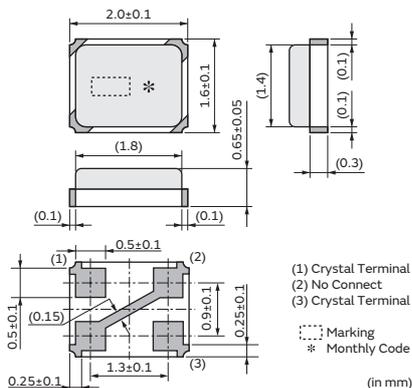
**XRCFD**  
**(MCR1612)**  
 24.0000–29.9999MHz



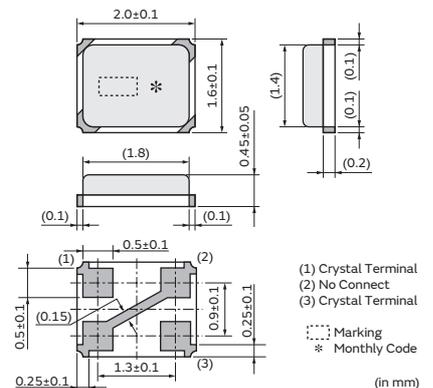
**XRCMD**  
**(MCR1612)**  
 30.0000–48.0000MHz



**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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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

8

<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>

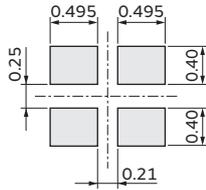
Part Number	Type	Frequency (MHz)	Frequency Tolerance (ppm max.) [at 25°C±3°C]	Frequency Shift by Temperature (ppm max.) [Standard Condition: +25°C]	Frequency Aging (ppm max./Year)	ESR* (Ωmax.)	Load Capacitance (pF)	Drive Level (μW max.)
XRCLK10M000F1QA8P0	TSS-5032A	10.0000	±10	±15 (-30 to +85°C)	±3	80	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**

**XRCED  
 (MCR1210)**

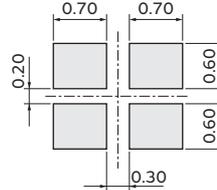
(Recommended Land Pattern)



(in mm)

**XRCFD, XRCMD  
 (MCR1612)**

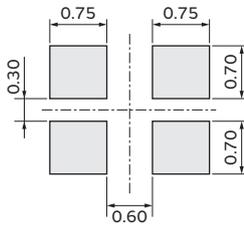
(Recommended Land Pattern)



(in mm)

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

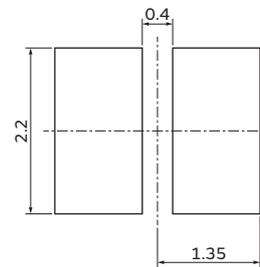
(Recommended Land Pattern)



(in mm)

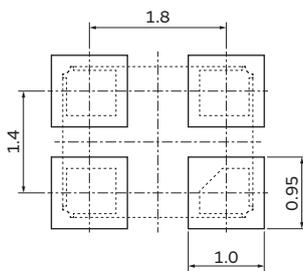
**XRCHA\_F\_L  
 (HCR2520)**

(Recommended Land Pattern)



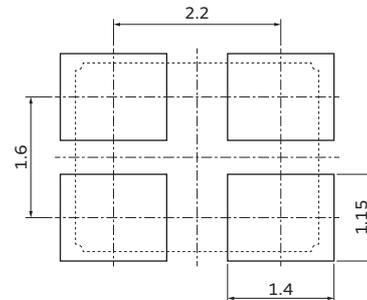
(in mm)

**XRCHJ  
 (TDS-2520F)**



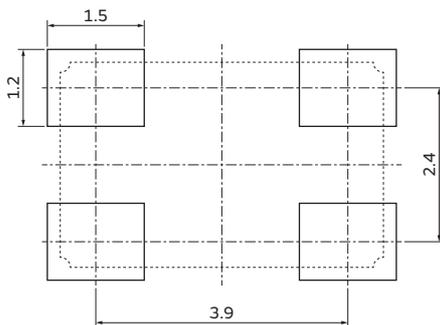
(in mm)

**XRCJK  
 (TSS-3225J)**



(in mm)

**XRCLK  
 (TSS-5032A)**



(in mm)

## Notice -Crystal Units for Consumer-

1

### <XRCE Series>

#### Notice (Soldering and Mounting)

##### 1.1. Soldering Condition

Reflow

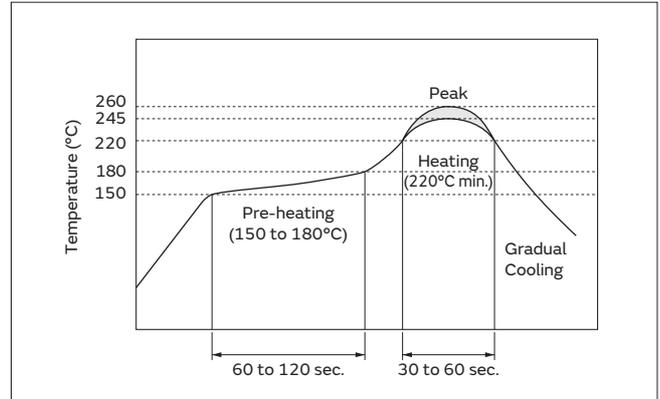
Please mount components on a circuit board by the reflow soldering method.

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

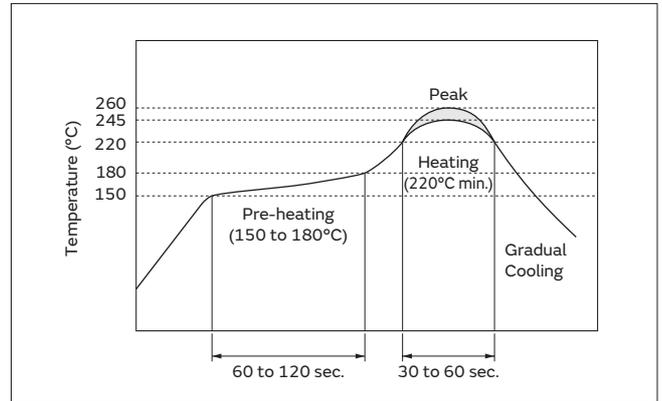
Please mount components on a circuit board by the reflow soldering method.

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

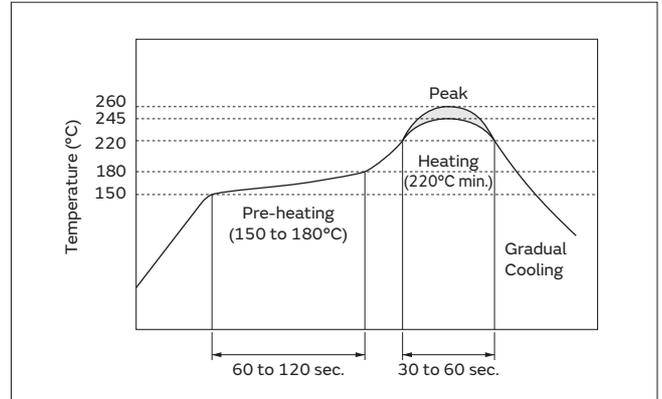
Please mount components on a circuit board by the reflow soldering method.

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.

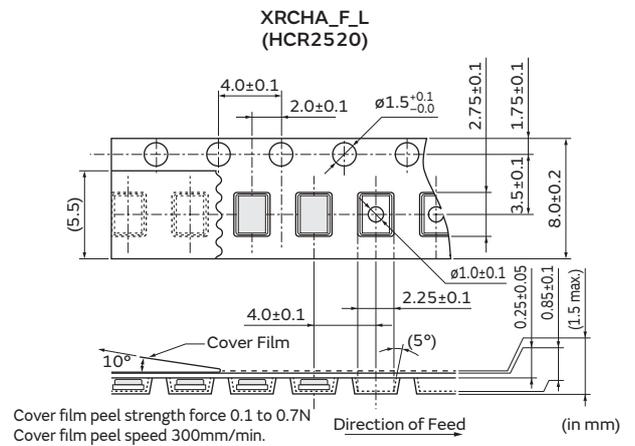
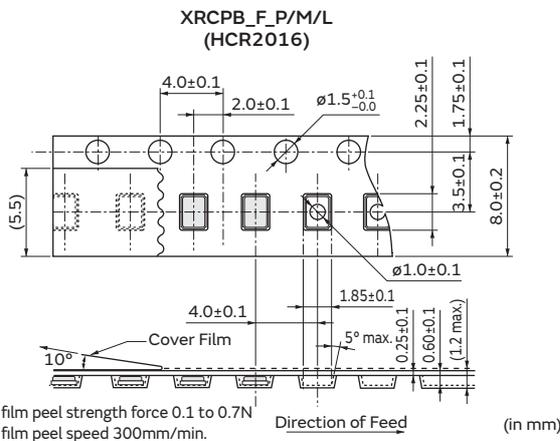
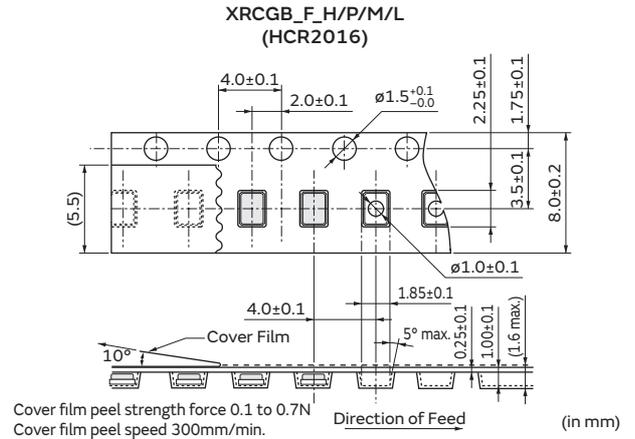
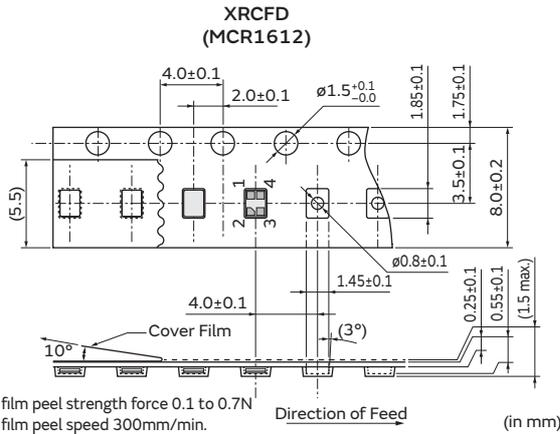
(example: engine control, brake control, steering control, body control.)



## Packaging -Crystal Units for Consumer-

1

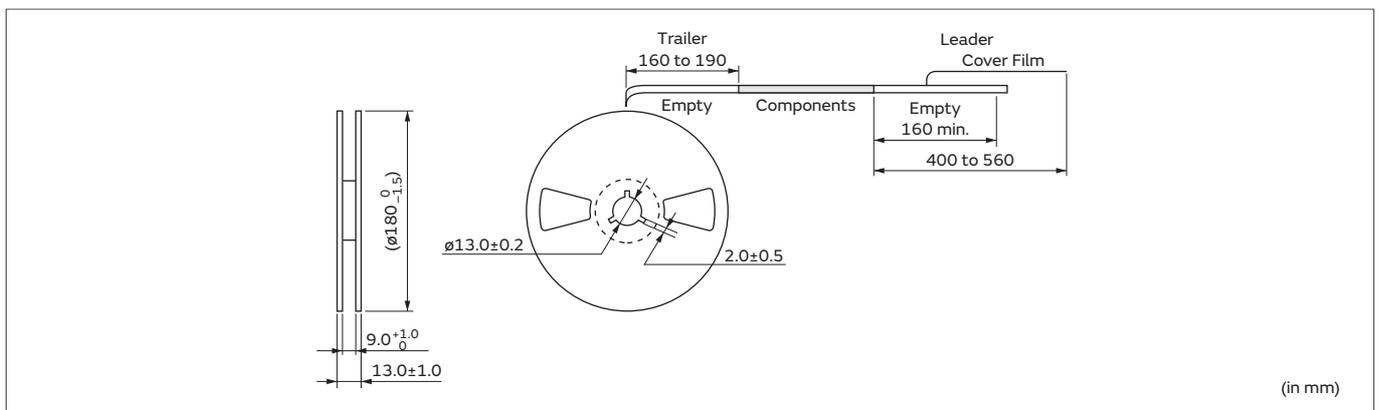
### Dimensions of Taping



### Minimum Quantity/Dimensions of Reel

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

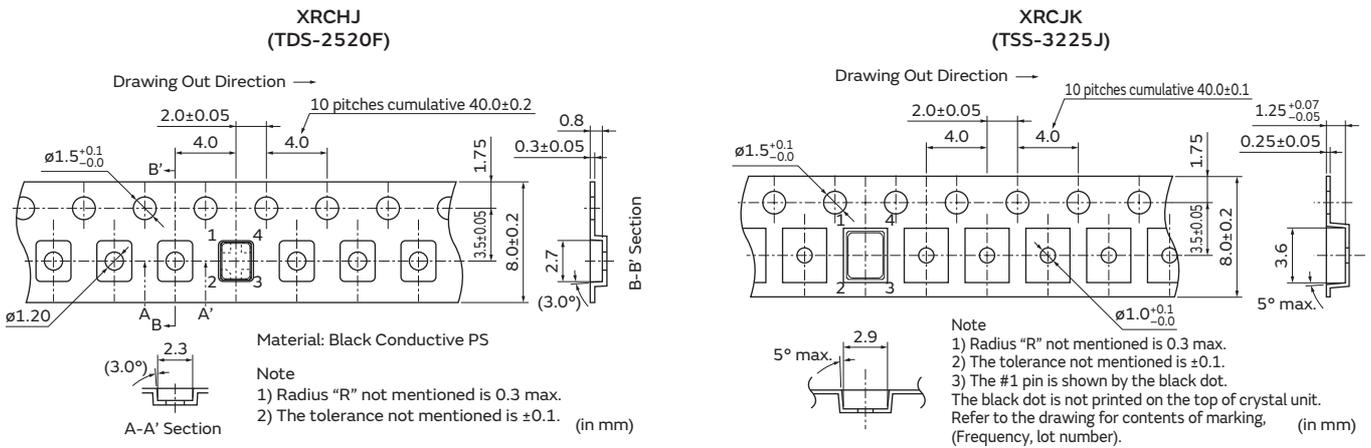
(pcs.)



# Packaging -Crystal Units for Consumer-

1

## Dimensions of Taping

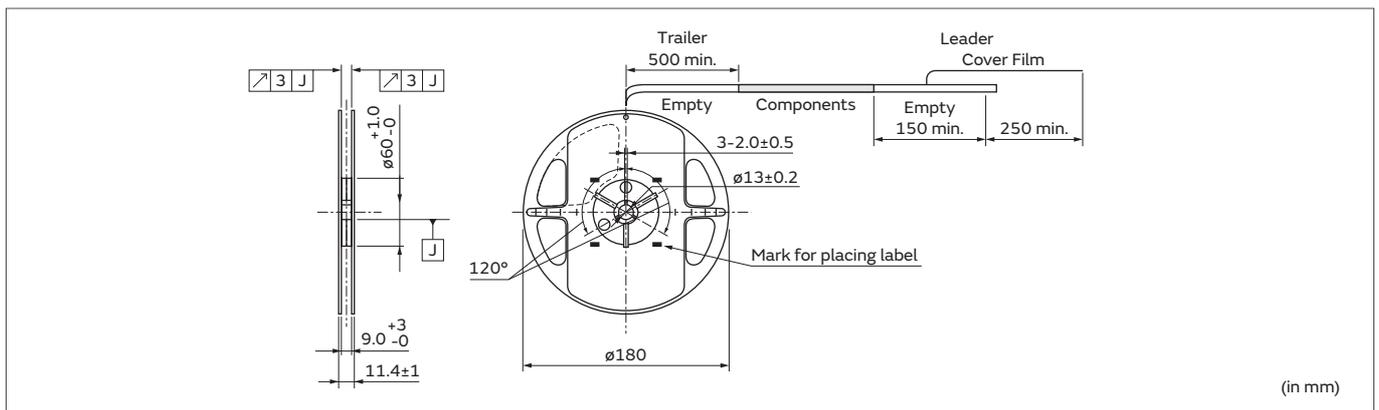


## Minimum Quantity/Dimensions of Reel

Plastic Tape ø180mm

3,000

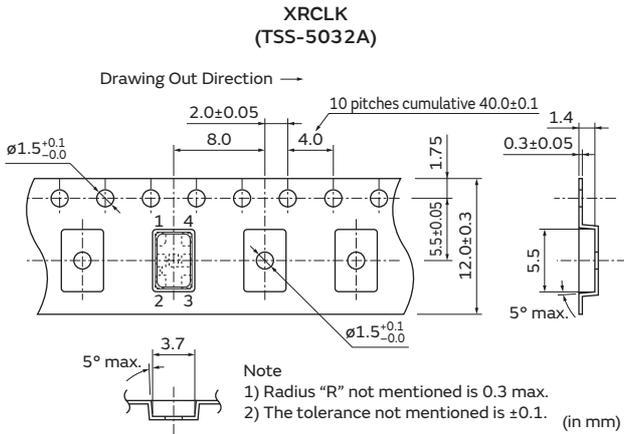
(pcs.)



## Packaging -Crystal Units for Consumer-

1

### Dimensions of Taping

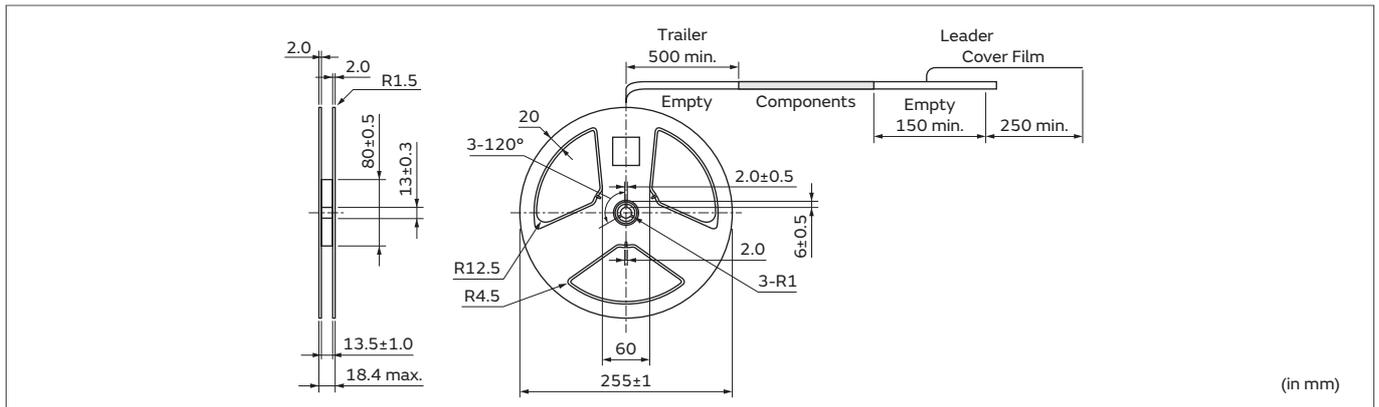


### Minimum Quantity/Dimensions of Reel

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.

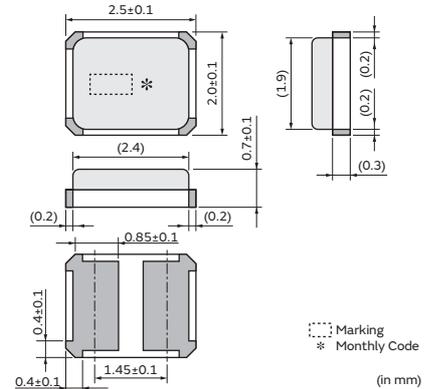
## Features

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.

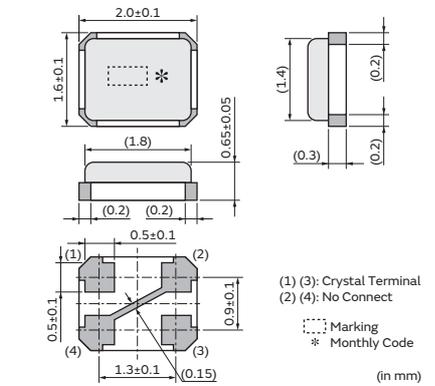
## Applications

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.

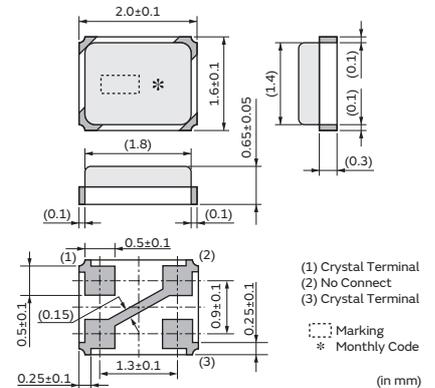
XRCHA\_F\_A  
 (HCR2520)  
 16.0000-24.0000MHz



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.

20

## 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.)
XRCHA16M000FOA01R0	HCR2520	16.0000	±100	±100 (-40 to +125°C)	±5	100	8	300
XRCHA16M000FOA11R0	HCR2520	16.0000	±100	±100 (-40 to +125°C)	±5	100	8	600
XRCHA16M000FOA12R0	HCR2520	16.0000	±100	±100 (-40 to +150°C)	±5	100	8	300
XRCHA16M000FOA13R0	HCR2520	16.0000	±100	±100 (-40 to +150°C)	±5	100	8	600
XRCHA20M000FOA01R0	HCR2520	20.0000	±100	±100 (-40 to +125°C)	±5	80	8	300
XRCHA20M000FOA11R0	HCR2520	20.0000	±100	±100 (-40 to +125°C)	±5	80	8	600
XRCHA20M000FOA12R0	HCR2520	20.0000	±100	±100 (-40 to +150°C)	±5	80	8	300
XRCHA20M000FOA13R0	HCR2520	20.0000	±100	±100 (-40 to +150°C)	±5	80	8	600
XRCHA24M000FOA01R0	HCR2520	24.0000	±100	±100 (-40 to +125°C)	±5	80	8	300
XRCHA24M000FOA11R0	HCR2520	24.0000	±100	±100 (-40 to +125°C)	±5	80	8	600
XRCHA24M000FOA12R0	HCR2520	24.0000	±100	±100 (-40 to +150°C)	±5	80	8	300
XRCHA24M000FOA13R0	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.)
XRCGB24M000FOG00R0	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
XRCGB24M576FOG00R0	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
XRCGB25M000FOG00R0	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
XRCGB26M000FOG00R0	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
XRCGB27M000FOG00R0	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
XRCGB30M000FOG00R0	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
XRCGB33M868FOG00R0	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
XRCGB40M000FOG00R0	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
XRCGB48M000FOG00R0	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

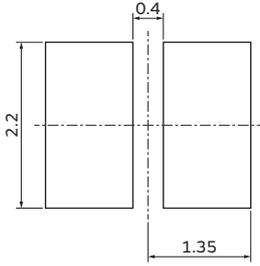
\* Equivalent Series Resistance

## Standard Land Pattern Dimensions

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XRCHA\_F\_A  
(HCR2520)

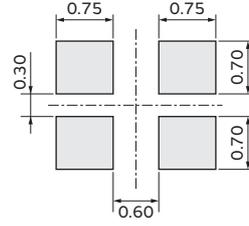
(Recommended Land Pattern)



(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

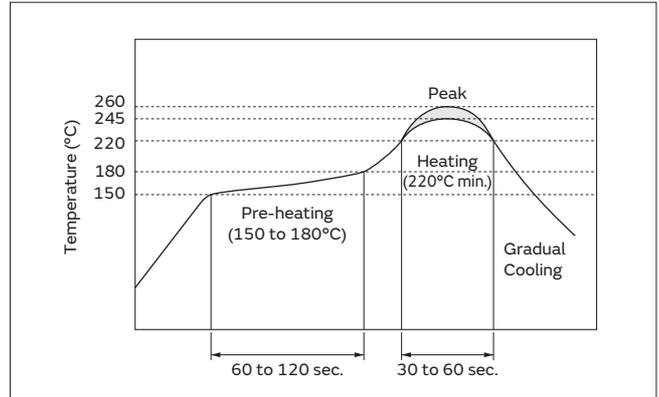
Please mount components on a circuit board by the reflow soldering method.

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)

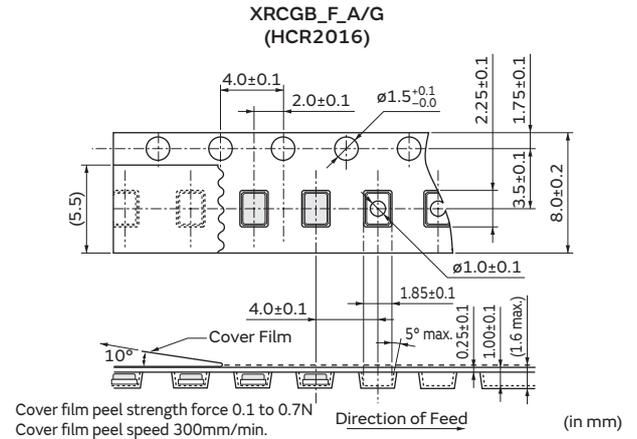
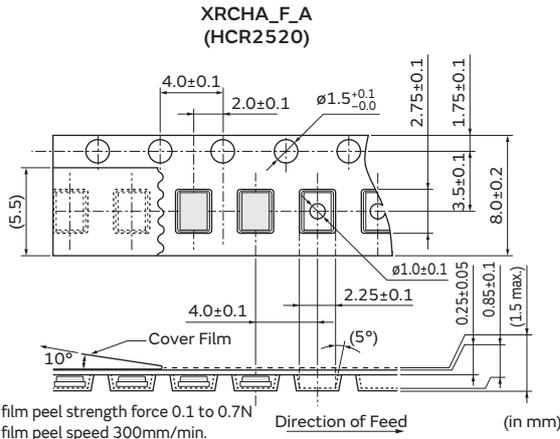
1. Irregular or stopped oscillation may occur under unmatched circuit conditions.

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-

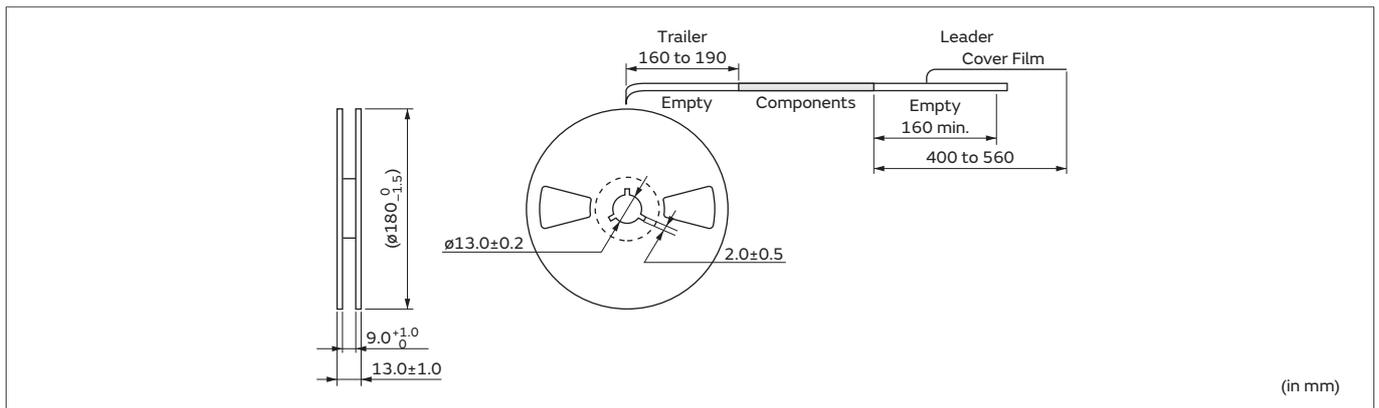
### Dimensions of Taping



### Minimum Quantity/Dimensions of Reel

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

(pcs.)





## 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		16.0000 to 20.0000					
XRCHH	TAS-2520F	Metal	16.0000 to 52.0000	±10	±15	±1 (±3/5Years)	60	-30 to +85
XRCJH	TAS-3225J		13.0000 to 52.0000					
XRCLH	TAS-5032F		10.0000 to 52.0000					

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.)
XRCGB24M000FOZ00R0	HCR2016	24.0000	±100	±100 (-40 to +105°C)	±5	150	6	300
XRCGB24M576FOZ00R0	HCR2016	24.5760	±100	±100 (-40 to +100°C)	±5	150	6	300
XRCGB25M000FOZ00R0	HCR2016	25.0000	±100	±100 (-40 to +105°C)	±5	150	6	300
XRCGB26M000FOZ00R0	HCR2016	26.0000	±100	±100 (-40 to +105°C)	±5	150	6	300
XRCGB27M000FOZ00R0	HCR2016	27.0000	±100	±100 (-40 to +105°C)	±5	150	6	300
XRCGB27M120FOZ00R0	HCR2016	27.1200	±100	±100 (-40 to +105°C)	±5	150	6	300
XRCGB30M000FOZ00R0	HCR2016	30.0000	±100	±100 (-40 to +105°C)	±5	100	6	300
XRCGB31M250FOZ00R0	HCR2016	31.2500	±100	±100 (-40 to +105°C)	±5	100	6	300
XRCGB32M000FOZ00R0	HCR2016	32.0000	±100	±100 (-40 to +105°C)	±5	100	6	300
XRCGB33M868FOZ00R0	HCR2016	33.8688	±100	±100 (-40 to +100°C)	±5	100	6	300
XRCGB40M000FOZ00R0	HCR2016	40.0000	±100	±100 (-40 to +100°C)	±5	100	6	300
XRCGB48M000FOZ00R0	HCR2016	48.0000	±100	±100 (-40 to +105°C)	±5	100	6	300
XRCPB24M000FOZ00R0	HCR2016	24.0000	±100	±100 (-40 to +105°C)	±5	150	6	300
XRCPB24M576FOZ00R0	HCR2016	24.5760	±100	±100 (-40 to +100°C)	±5	150	6	300
XRCPB25M000FOZ00R0	HCR2016	25.0000	±100	±100 (-40 to +105°C)	±5	150	6	300
XRCPB26M000FOZ00R0	HCR2016	26.0000	±100	±100 (-40 to +105°C)	±5	150	6	300
XRCPB27M000FOZ00R0	HCR2016	27.0000	±100	±100 (-40 to +105°C)	±5	150	6	300
XRCPB27M120FOZ00R0	HCR2016	27.1200	±100	±100 (-40 to +105°C)	±5	150	6	300
XRCPB30M000FOZ00R0	HCR2016	30.0000	±100	±100 (-40 to +105°C)	±5	100	6	300
XRCPB31M250FOZ00R0	HCR2016	31.2500	±100	±100 (-40 to +105°C)	±5	100	6	300
XRCPB32M000FOZ00R0	HCR2016	32.0000	±100	±100 (-40 to +105°C)	±5	100	6	300
XRCPB33M868FOZ00R0	HCR2016	33.8688	±100	±100 (-40 to +100°C)	±5	100	6	300
XRCPB40M000FOZ00R0	HCR2016	40.0000	±100	±100 (-40 to +100°C)	±5	100	6	300
XRCPB48M000FOZ00R0	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.)
XRCHA16M000FOZ01R0	HCR2520	16.0000	±100	±100 (-40 to +105°C)	±5	100	8	300
XRCHA20M000FOZ01R0	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. ↗

⚠Note • Please read rating and ⚠CAUTION (for storage, operating, rating, soldering, mounting and handling) in this catalog to prevent smoking and/or burning, etc.  
 • This catalog has only typical specifications. Therefore, please approve our product specifications or transact the approval sheet for product specifications before ordering.

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.)
XRCHH36M000F1QA3P0	TAS-2520F	36.0000	±10	±15 (-30 to +85°C)	±1 (±3/5Years)	60	8	60
XRCHH40M000F1QB3P0	TAS-2520F	40.0000	±10	±15 (-30 to +85°C)	±1 (±3/5Years)	60	8	60
XRCHH52M000F1QA2P0	TAS-2520F	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.)
XRCJH13M000F1QA0P0	TAS-3225J	13.0000	±10	±15 (-30 to +85°C)	±1 (±3/5Years)	80	8	60
XRCJH16M000F1QB5P0	TAS-3225J	16.0000	±10	±15 (-30 to +85°C)	±1 (±3/5Years)	80	8	60
XRCJH20M000F1QB3P0	TAS-3225J	20.0000	±10	±15 (-30 to +85°C)	±1 (±3/5Years)	60	8	60
XRCJH26M000F1QC1P0	TAS-3225J	26.0000	±10	±15 (-30 to +85°C)	±1 (±3/5Years)	60	8	60
XRCJH36M000F1QA1P0	TAS-3225J	36.0000	±10	±15 (-30 to +85°C)	±1 (±3/5Years)	60	8	60
XRCJH40M000F1QB2P0	TAS-3225J	40.0000	±10	±15 (-30 to +85°C)	±1 (±3/5Years)	60	8	60
XRCJH52M000F1QA1P0	TAS-3225J	52.0000	±10	±15 (-30 to +85°C)	±1 (±3/5Years)	60	8	60

\* Equivalent Series Resistance

### <XRCLH>

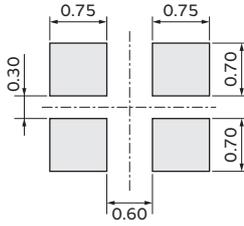
Part Number	Type	Frequency (MHz)	Frequency Tolerance (ppm max.) [at 25°C±3°C]	Frequency Shift by Temperature (ppm max.) [Standard Condition: +25°C]	Frequency Aging (ppm max./Year)	ESR* (Ωmax.)	Load Capacitance (pF)	Drive Level (μW max.)
XRCLH10M000F1QA4P0	TAS-5032F	10.0000	±10	±15 (-30 to +85°C)	±1 (±3/5Years)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

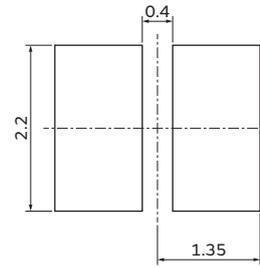
(Recommended Land Pattern)



(in mm)

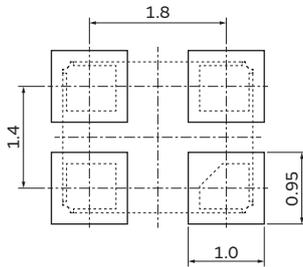
**XRCHA\_F\_Z**  
**(HCR2520)**

(Recommended Land Pattern)



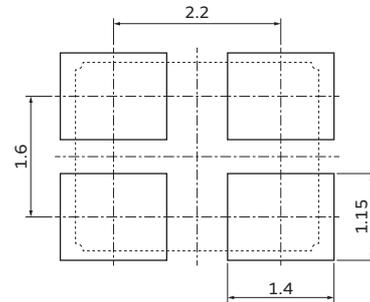
(in mm)

**XRCHH**  
**(TAS-2520F)**



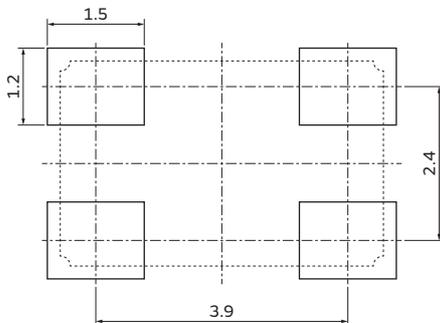
(in mm)

**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

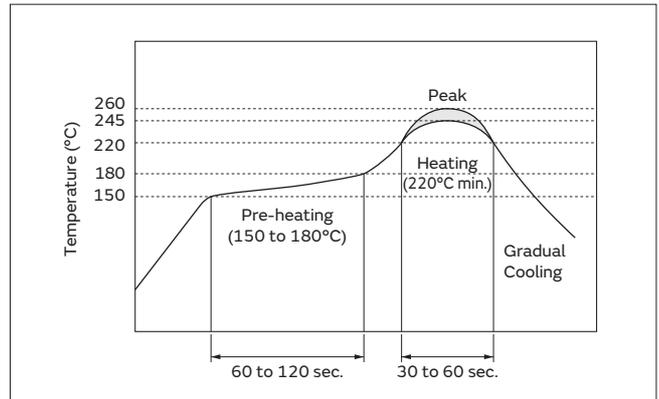
Please mount components on a circuit board by the reflow soldering method.

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.

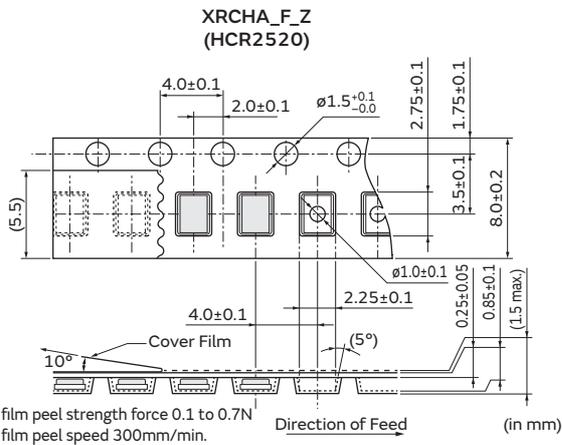
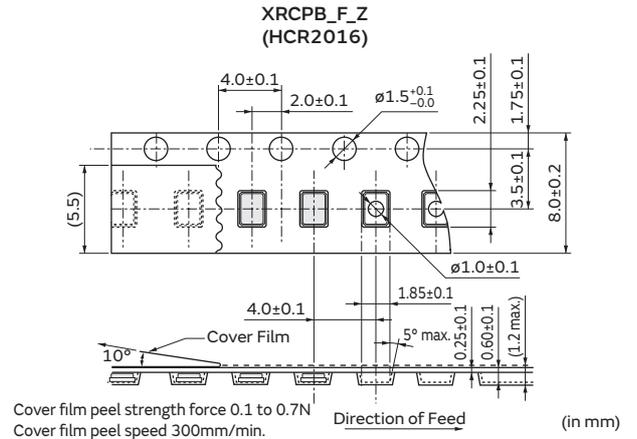
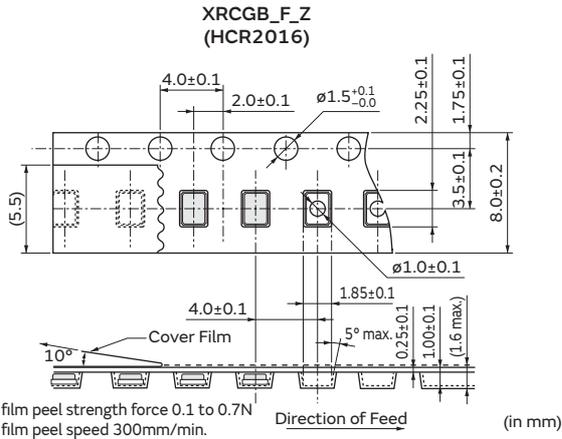
2. Be sure to provide an appropriate fail-safe function on your product to prevent a second damage that may be caused by the abnormal function or the failure of our product.

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-

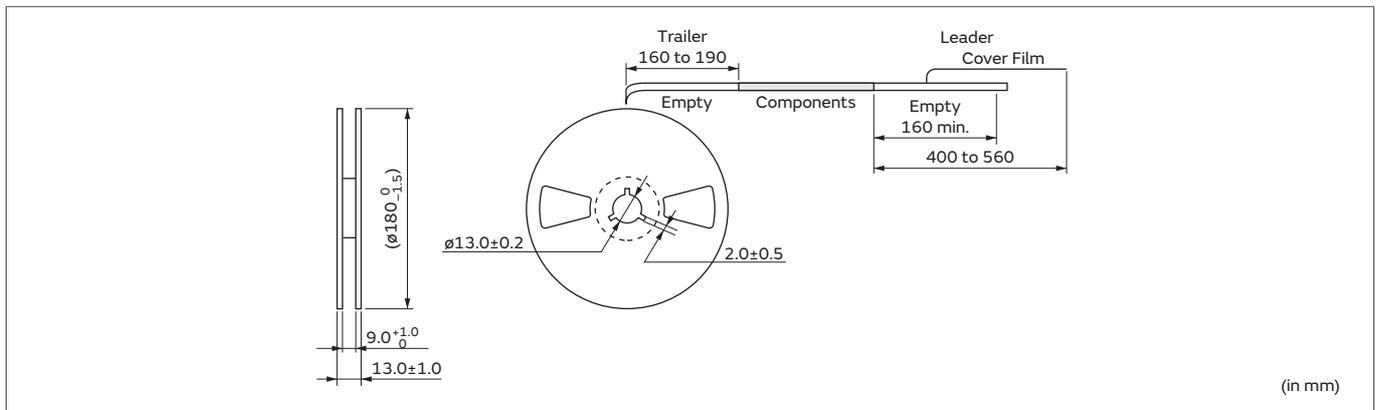
## Dimensions of Taping



## Minimum Quantity/Dimensions of Reel

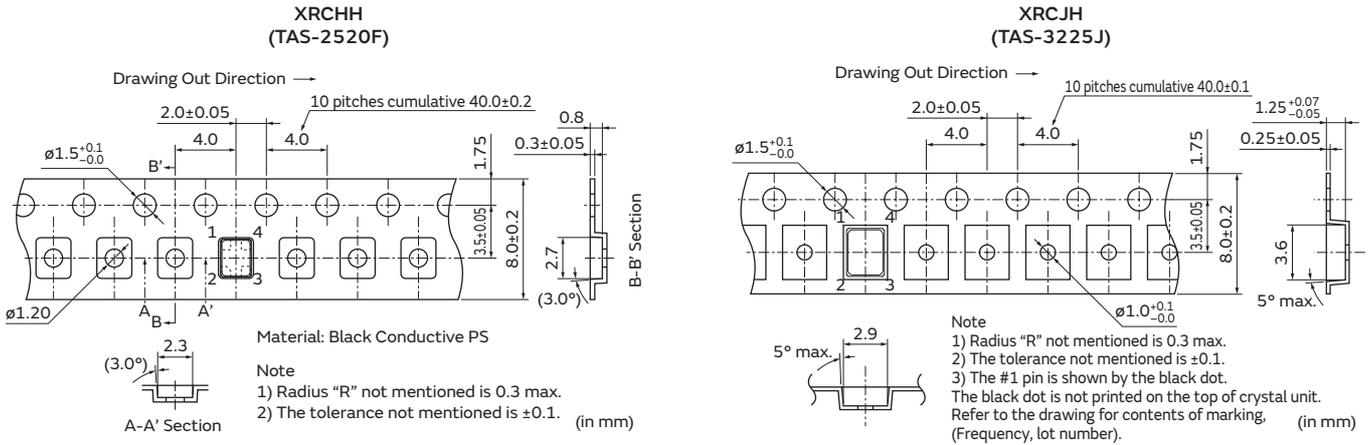
Plastic Tape $\phi 180$ mm	Plastic Tape $\phi 330$ mm
3,000	9,000

(pcs.)



## Packaging -Crystal Units for Industrial-

### Dimensions of Taping

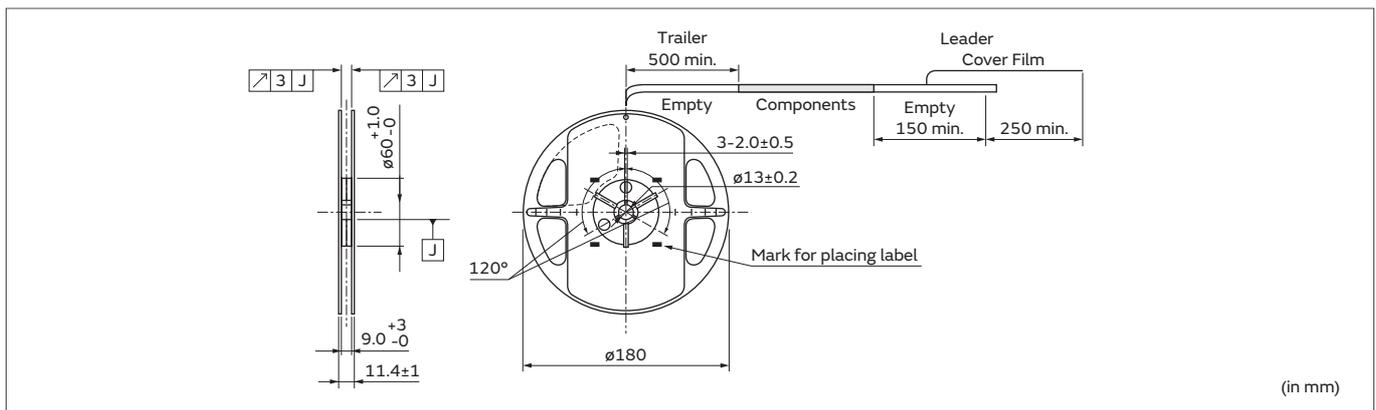


### Minimum Quantity/Dimensions of Reel

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

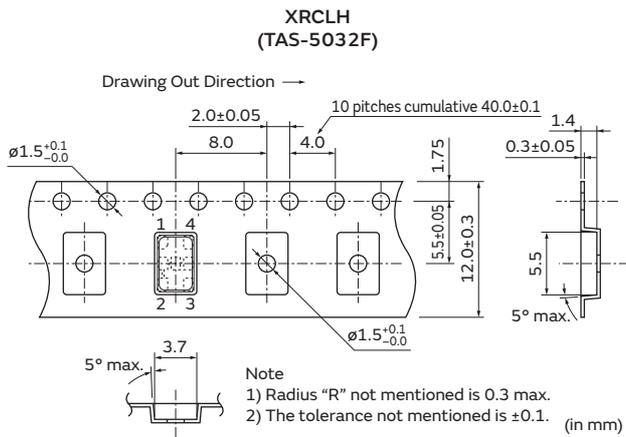
3,000

(pcs.)



## Packaging -Crystal Units for Industrial-

### Dimensions of Taping



### Minimum Quantity/Dimensions of Reel

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

3,000

(pcs.)

