



RFM Integrated Device, Inc.

## PRODUCT SPECIFICATION

Part Number: XTS4202

TSX, 38.4MHz +/-10 +/-12  
-30C to +85C, 7pF

## Features:

- Surface Mount Hermetic Package
- Excellent Reliability Performance
- Good Frequency Perturbation and Stability over temperature
- Ultra Miniature Package
- Moisture Sensitivity Level (MSL) : Level-1



## Description and Applications:

Surface mount 1.6mmx1.2mm crystal unit for use in wireless communications devices, especially for a need of ultra miniature package for mobility.

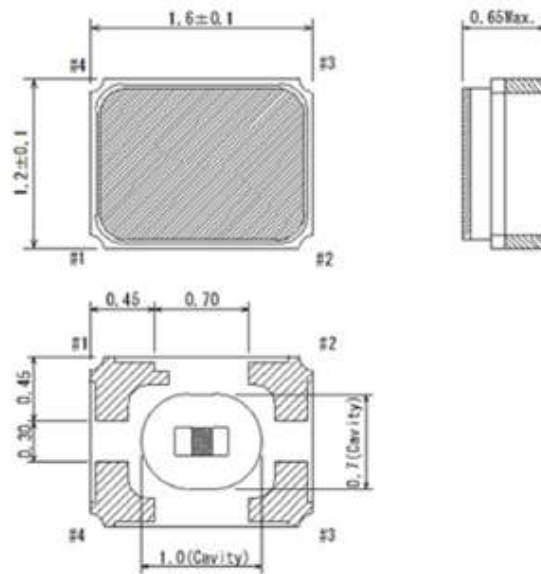
## Electrical Specifications:

<b>XTS4202</b>	<b>Specification</b>
Nominal Frequency	38.400000 MHz
Mode of Oscillation	AT-cut Fundamental
Storage Temperature Range	-40°C to +125°C
Operating Temperature Range	-30°C to +105°C
Frequency Stability over Operating Temperature Range	+/-12 ppm (referred to the value at 29°C for temperature range -30°C to 85°C)
Frequency Make Tolerance (FL)	+/-10 ppm @ 25°C +/- 3°C
Equivalent Series Resistance (ESR)	80 Ω max
Frequency Drift After Reflow	+/- 2 ppm after four times reflow
Aging	+/-0.7 ppm / first year
Motional Capacitance (C1)	1.2 fF min and 3.1fF max
Pulling Sensitivity(TS)	11.5 ppm/pF typ.
Load Capacitance (CL)	7 pF
Insulation Resistance	500 MΩ min
Spurious Mode Series Resistance	1100Ω Min. (@ +/- 1MHz)
Quality Factor	75000 Min.

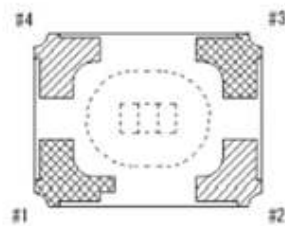
Nominal Drive Level	50 uW typ and 200uW max
Unit Weight	4 +/-0.5mg
<b>Thermistor Characteristics</b>	
Resistance Value(at 25°C)	100KΩ +/- 1%
Beta Constant	4250K +/- 1%
Rated Power(at 25°C)	100mW Max
<b>Specification(Crystal curve fitting)</b>	
Inflection Temperature	+29°C +/- 1.5°C
First-order Curve Fitting Parameter (C <sub>1</sub> )	-0.40 to -0.10 ppm/°C
Second-order Curve Fitting Parameter (C <sub>2</sub> )	- 4.5 to 4.5 x10 <sup>-4</sup> ppm/°C <sup>2</sup>
Third-order Curve Fitting Parameter (C <sub>3</sub> )	8.5 to 11.5 x10 <sup>-5</sup> ppm/°C <sup>3</sup>
Residual frequency stability slope	+/-50 ppb /°C max

# Mechanical Dimensions (mm):

## 1) Dimension (Unit : mm)



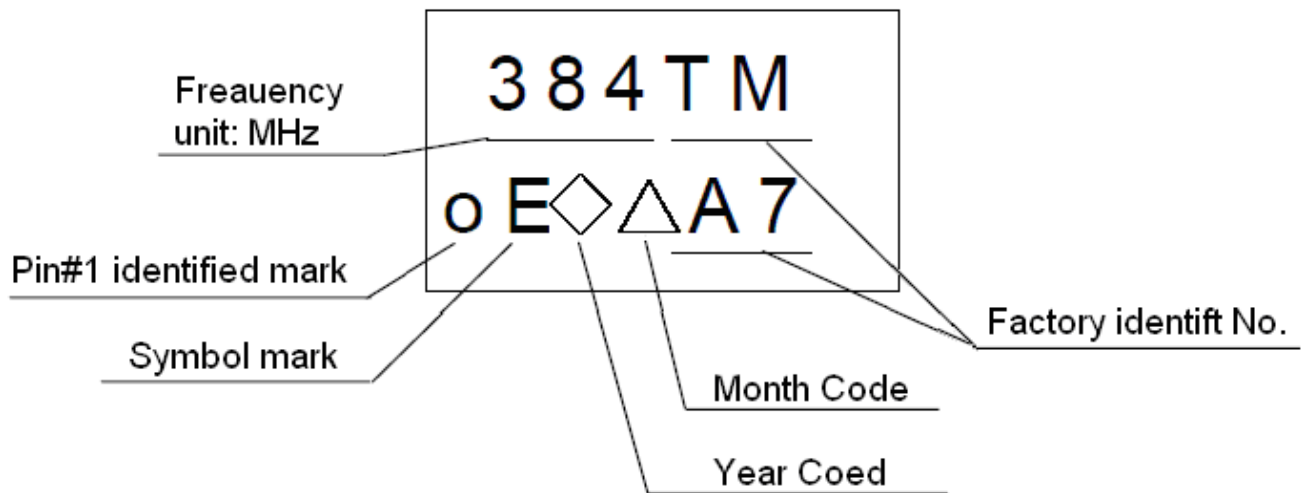
## 2) Circuit



Pin	Connection
1	XTAL
2	GND, thermistor
3	XTAL
4	Thermistor

(Top View)

## Marking:



Nominal frequency omits the figure below the first place of decimals.

Ex) 38.4 MHz..... [384]

### △Month Code Table:

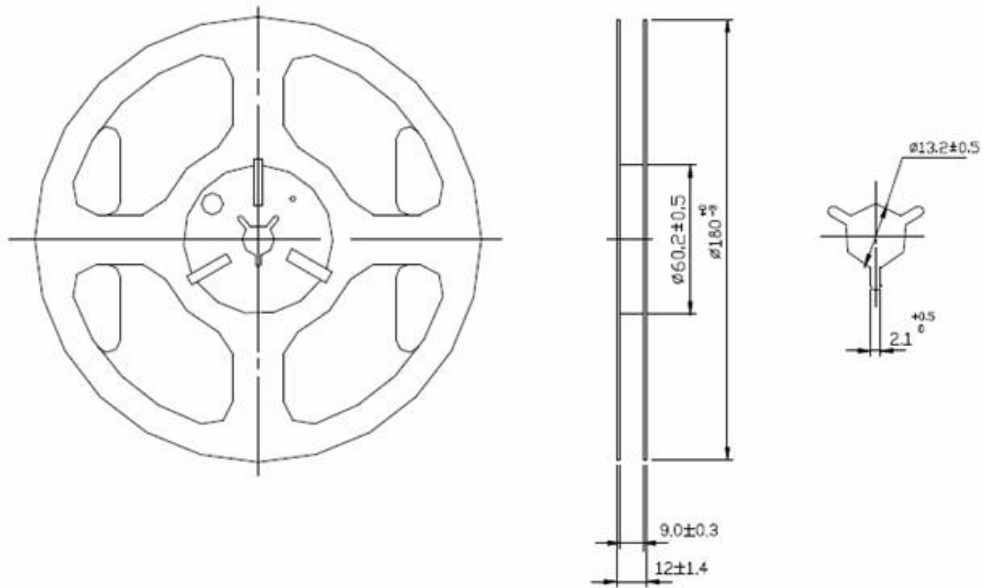
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Month Code	1	2	3	4	5	6	7	8	9	X	Y	Z

### ◇Year Code Table:

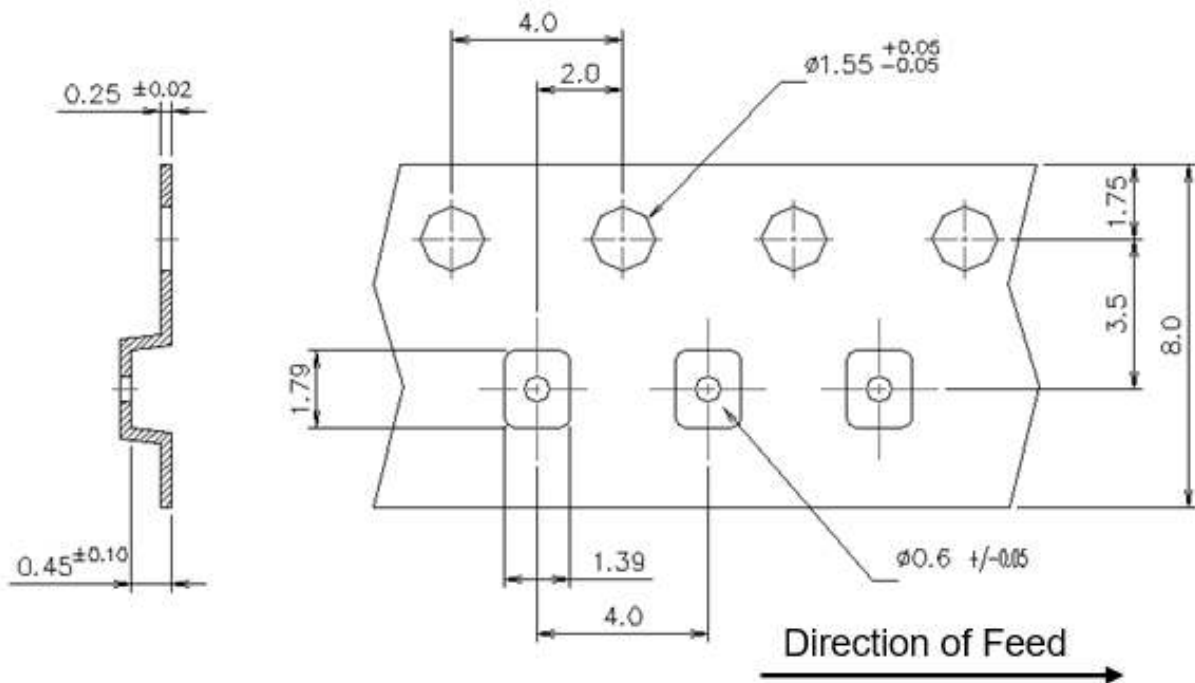
Year	2017	2018	2019	2020	2021
Code	7	8	9	0	1
Year	2022	2023	2024	2025	2026
Code	2	3	4	5	6

## Reel Dimensions (mm):

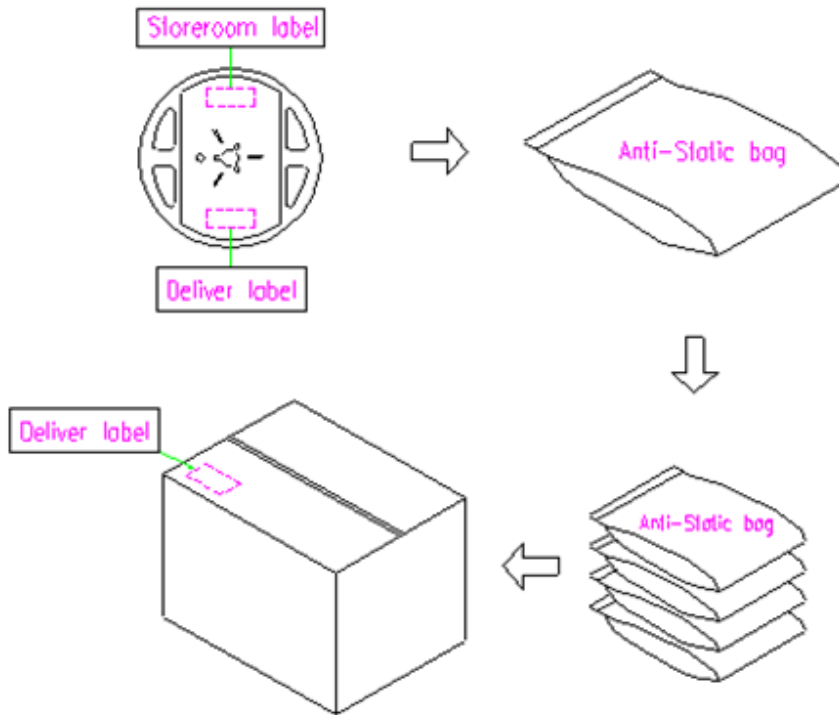
Reel Count: 7" = 3000



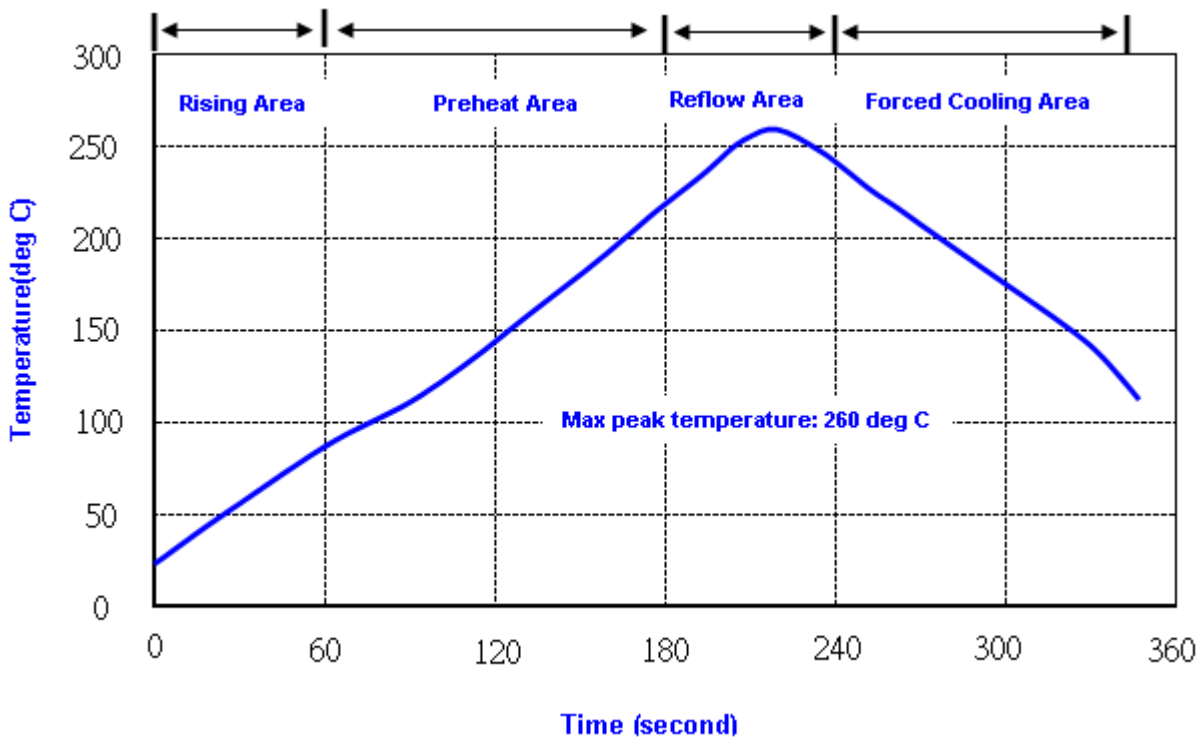
## Tape Dimensions (mm):



## Packing Quantity/Packing:



## Reflow Profile:



- Note:** 1. Max peak temperature: 260 $\pm$ 5 deg C; Time: 10 $\pm$ 2 sec  
2. Temperature: 217 $\pm$ 5 deg C; Time: 90~100 sec

## Reliability Specifications

Test name	Test process / method	Reference standard
<b>Mechanical characteristics</b>		
resistance to Soldering heat (IR reflow)	Temp./ Duration : 260°C /10sec ×2 times Total time : 4min.(IR-reflow)	EIAJED-4701 -300(301)M(II)
Vibration	Total peak amplitude : 1.5mm Vibration frequency : 10 to 55 Hz Sweep period : 1.0 minute Vibration directions : 3 mutually perpendicular Duration : 2 hr / direc.	MIL-STD 202F method 201A
Mechanical Shock	directions : 3 impacts per axis Acceleration : 3000g's, +20/-0 % Duration : 0.3 ms (total 18 shocks) Waveform : Half-sine	MIL-STD 202F method 213C
Solderability	Solder Temperature:265±5°C Duration time: 5±0.5 seconds.	MIL-STD 883G method 2003
<b>Environmental characteristics</b>		
Thermal Shock	Heat cycle conditions -55 °C (30min) ↔ 125 °C (30min) * cycle time : 10 times	MIL-STD 883G method 1010.7
Humidity test	Temperature : 70 ± 2 °C Relative humidity : 90~95% Duration : 96 hours	MIL-STD 202F method 103B
Dry heat ( Aging test )	Temperature 125 ± 2 °C Duration 168 hours	MIL-STD 883G method 1008.2 condition C
PCT test	Pressure: 2.06kg/cm <sup>2</sup> (2.03*10 <sup>5</sup> pa) Temperature 121 ± 2 °C Relative humidity : 100% Duration : 24 hours	EIAJED-4701-3 B-123A