

# Quartz Crystals

Surface Mount		Thru - Hole type		32.768 KHz	Frequency Tolerance options		
X2012	X3215	T26	T38		± 5 ppm	± 10 ppm	± 20 ppm
[ 2.05 * 1.2 * 0.55 mm ]	[ 3.2 * 1.5 * 0.8 mm ]	[ 2.0ø * 6.0 mm ]	[ 3.0ø * 8.0 mm ]				

## Features

### Specifications

Ultra compact, thin, and light weight tuning fork crystal unit

- Excellent heat resistance and environmental characteristics
- Excellent electrical performance optimum for mobile communications, OA ( office automation ) and AV ( audiovisual ) applications
- RoHS Compliant. Meets the re-flow profiling requirements using lead-free solder



## General Specifications

Frequency Range	32.768 KHz			
Hold type	Surface Mount Type		Thru - Hole Type	
Item / Type	X2012	X3215	T26	T38
Package sizes	[ 2.05 * 1.2 * 0.55 mm ]	[ 3.2 * 1.5 * 0.8 mm ]	[ 2.0ø * 6.0 mm ]	[ 3.0ø * 8.0 mm ]
Shunt Capacitance	1.3 pF ( typ. ) / 1.5 pF ( max. )	1.0 pF ( typ. ) / 1.6 pF ( max. )	1.5 pF ( max. )	0.9 pF ( max. )
Equivalent series resistance	80 KΩ ( max. )		40 KΩ ( max. )	35 KΩ ( max. )
Temperature coefficient	- 0.04 x 10 <sup>-6</sup> / °C <sup>2</sup> ( max. )		- 0.035 x 10 <sup>-6</sup> / °C <sup>2</sup> ( max. )	
Drive Level	0.1 μW ( typ. ) 0.5 μW ( max. )		1.0 μW ( typ. )	
Operating Temperature Range	- 40 °C to 85 °C			
Storage Temperature Range	- 55 °C to 125 °C			
Crystal Cut	XT - Cut			
Load Capacitance	7 pF , 9 pF or 12.5 pF			
Frequency Tolerance	± 5 ppm , ± 10 ppm , ± 20 ppm ( max. ) at 25°C			
Turning POINT	+ 25 °C ± 5 °C			
Insulation resistance	500 MΩ min.			

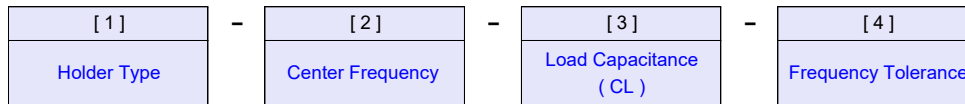
## Outline Dimensions ( Unit : mm )

X2012	X3215
T26	T38

[ X2012 & X3215 & T26 & T38 Crystal ]

Part Number Formats and Product Marking Rules

Part Number Format and Example



Example	( 1 )	X2012	-	32.768K	-	9
	( 2 )	T26	-	32.768K	-	12.5
	( 3 )	X3215	-	32.768K	-	12.5 - 5

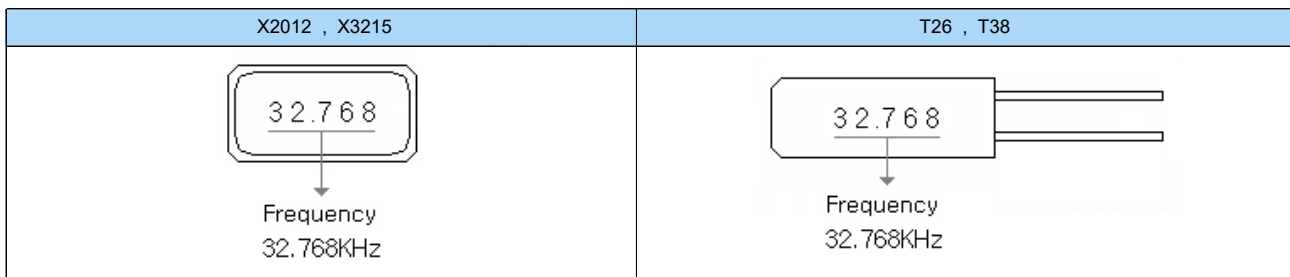
Ex ( 1 ) : X2012 - 32.768K - 9 [ X2015 type , 32.768KHz , 9pF , ± 20ppm ( 25°C ) , - 0.04 x 10<sup>-6</sup> / °C<sup>2</sup> ]

Ex ( 2 ) : T26 - 32.768K - 12.5 [ T26 type , 32.768KHz , 12.5pF , ± 20ppm ( 25°C ) , - 0.035 x 10<sup>-6</sup> / °C<sup>2</sup> ]

Ex ( 3 ) : X3215 - 32.768K - 12.5 - 5 [ X3215 type , 32.768KHz , 12.5pF , ± 5ppm ( 25°C ) , - 0.04 x 10<sup>-6</sup> / °C<sup>2</sup> ]

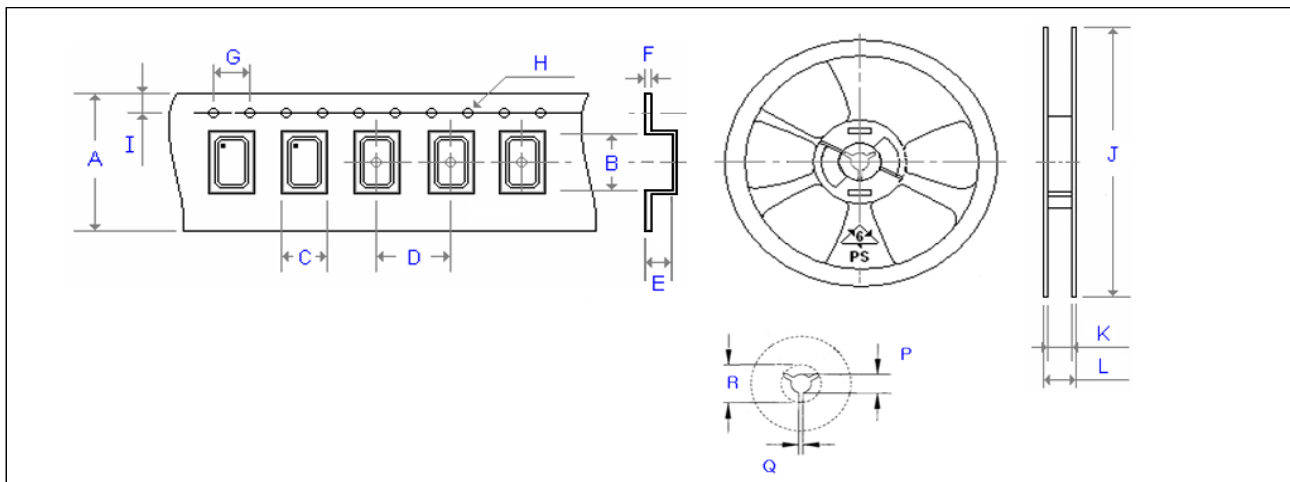
[ 1 ]	Holder Type
[ 2 ]	Center Frequency in KHz : " 32.768K " for 32.768KHz
[ 3 ]	Load Capacitance ( CL ) Typical CL ranges : " 7 " for 7pF , " 9 " for 9pF , " 12.5 " for 12.5pF
[ 4 ]	Frequency Tolerance ( max. ) at 25°C : " Blank " represents ±20ppm ; " 10 " represents ±10ppm ; " 5 " represents ±5ppm

Production Marking Rules



[ X2012 & X3215 ] Emboss Taping and Reel Specifications

Carrier Type Dimensions ( unit : mm ) ±0.3mm



Carrier Type Dimensions ( unit : mm ) ±0.3mm

	A	B	C	D	E	F	G	H	I	pcs / reel
X2012	8.00	2.25	1.45	4.00	0.75	0.25	4.00	∅ 1.50	1.75	3000
X3215	8.00	3.40	1.70	4.00	1.00	0.30	4.00	∅ 1.50	1.75	3000

Reel Dimensions ( unit : mm ) +2.0 / -0.0mm

	J	K	L	P	Q	R	pcs / reel
X2012	180.00	9.00	12.00	13.20	2.10	-	3000
X3215	180.00	13.00	16.00	13.20	2.50	-	3000