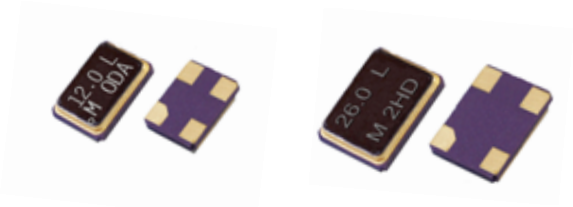
Quartz Crystals

X11	X21	X22	X32	Surface Mount	X11 , X21 , X22 , X32	X32
[1.6 * 1.2 * 0.4 mm]	[2.0 * 1.6 * 0.5 mm]	[2.5 * 2.0 * 0.6 mm]	[3.2 * 2.5 * 0.7 mm]		Fundamental	3rd Overtone

Features

Specifications

- The entire package can be grounded via the top metal lid and the two bottom pads
- Small footprint. Ideal for space constrained applications
- Exhibits extremely low aging with a high shock & vibration resistance



General Specifications

Item / Type	**X11** (1.6 * 1.2 * 0.4 mm)	**X21** (2.0 * 1.6 * 0.5 mm)	**X22** (2.5 * 2.0 * 0.6 mm)	**X32** (3.2 * 2.5 * 0.7 mm)
Frequency Range	24.0 ~ 48.0 MHz (Fund.)	20.0 ~ 54.0 MHz (Fund.)	12.0 ~ 60.0 MHz (Fund.)	8 ~ 54.0 MHz (Fund.)
				40 ~ 125 MHz (3rd Overtone)
Crystal Cut // Load Capacitance	AT - Cut // Series or Parallel (8 to 32 pF) resonance			
Drive Level	10 μ W typical (100μ W max.)			
Frequency Tolerance	± 10 ppm , ± 20 ppm or ± 30 ppm (max.) at 25°C			
Aging	△F / F : ± 3 ppm / year (max.)			
Storage Temperature Range	- 50°C to 105°C			

ESR (Equivalent Series Resistance)

X11	
Frequency Range	E. S. R.
24.0 ~ 29.9 MHz	120 Ω max.
30.0 ~ 36.9 MHz	100 Ω max.
40.0 ~ 48.0 MHz	80 Ω max.

X21	
Frequency Range	E. S. R.
20.0 ~ 23.9 MHz	120 Ω max.
24.0 ~ 29.9 MHz	100 Ω max.
30.0 ~ 37.9 MHz	80 Ω max.
38.0 ~ 54.0 MHz	60 Ω max.

X22	
Frequency Range	E. S. R.
12.0 ~ 15.9 MHz	300 Ω max.
16.0 ~ 29.9 MHz	100 Ω max.
30.0 ~ 60.0 MHz	70 Ω max.

X32		
Frequency Range	E. S. R.	Oscillator Mode
8.0 ~ 9.9 MHz	600 Ω max.	Fund. Mode
10.0 ~ 11.9 MHz	200 Ω max.	
12.0 ~ 29.9 MHz	100 Ω max.	
30.0 ~ 54.0 MHz	60 Ω max.	
40.0 ~ 200.0 MHz	80 Ω max.	3rd Overtone

Frequency stability Vs Operating temperature range

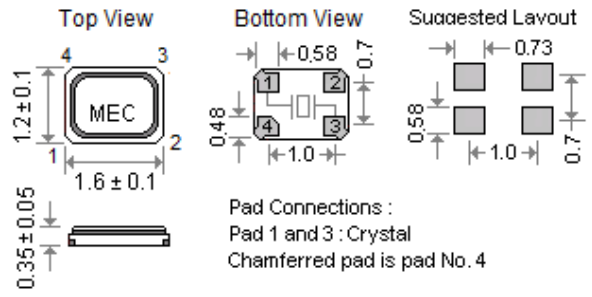
Frequency stability Vs Operating temperature range							
Stability code	Temp. (ºC) \ ppm	± 5	± 10	± 15	± 20	± 25	± 30
X	-10 to 60°C	▲	○	○	○	○	○
Y	-20 to 70°C		○	○	○	○	○
I	-40 to 85°C			○	○	○	○

○ : available

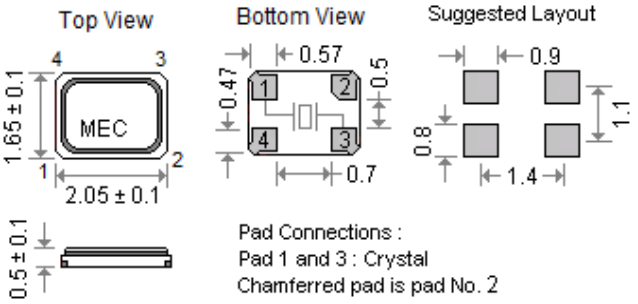
▲ : contact Mercury

Outline Dimensions (Unit : mm)

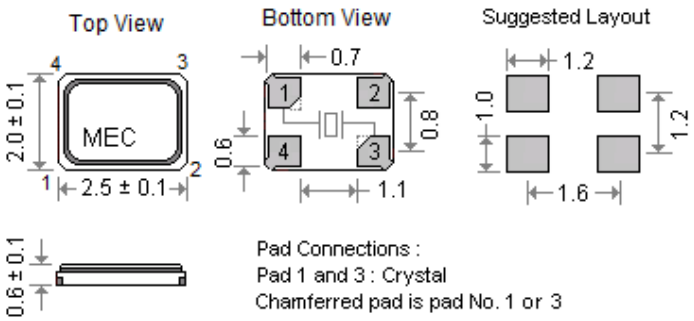
X11



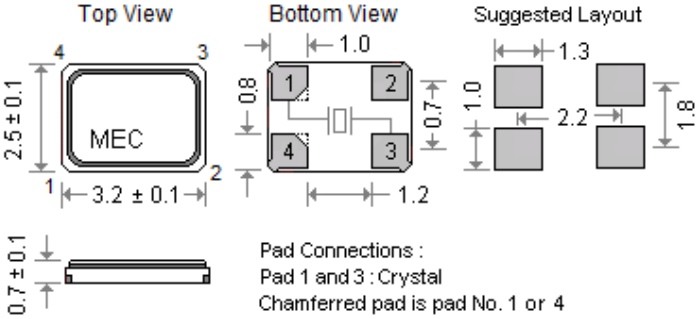
X21



X22



X32



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Part Number Formats and Product Marking Rules

Quartz Crystals

Holder Type

SMD type :	X11	X21	X22	X32	X42	MJ	MF	MQ	M49	ML49	MP5	MP4	MP25	MP24
Dip type :	H49	HUS	HUSL	U1	U5	T38	T26							
Jacket type :	H49MJ	49TMJ	U1MJ	U5MJ	T26MJ									
Gull wing :	H49SM	49TSM	U1SM	U5SM	T26SM									

Part Number Format

	[1] Holder Type	-	[2] Center Freq.	-	[3] CL	-	[4] Freq . Tolerance	/	[5] Freq. Stability	[6] Operating Temp. Range Code	/	[7] Special ESR
Example (1)	H49	-	40.000A3	-	12	-	30	/	30	X		
Example (2)	X32	-	26.000	-	16		30	/	30	X	/	20R
Example (3)	MJ	-	12.000	-	20	-	10	/	10	W		
Example (4)	M49	-	24.000	-	18	-	20	/	30	H	/	15R

Ex (1) : H49 - 40.000A3 - 12 [49/U type , 40.000MHz , AT-cut 3rd overtone , 12pF , ±30ppm (25°C) , ±30ppm (-10°C to 60°C)]

Ex (2) : X32 - 26.000 - 16 / 20R [X32 type , 26.000MHz , 16pF , ±30ppm (25°C) , ±30ppm (-10°C to 60°C) , 20 Ω]

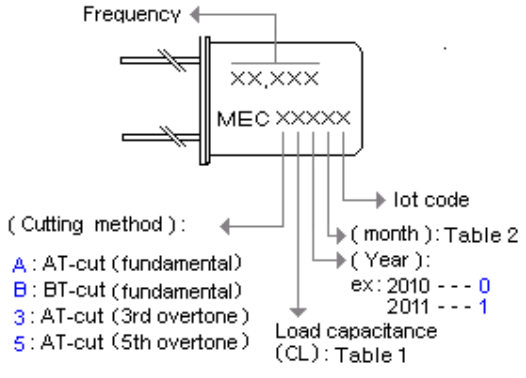
Ex (3) : MJ - 12.000 - 20 - 10 / 10 W [MJ type , 12.000MHz , 20pF , ±10ppm (25°C) , ±10ppm (0°C to 50°C)]

Ex (4) : M49 - 24.000 - 18 - 20 / 30 Y4 [M49 type , 24.000MHz , 18pF , ±20ppm (25°C) , ±30ppm (-30°C to 85°C) , 15 Ω]

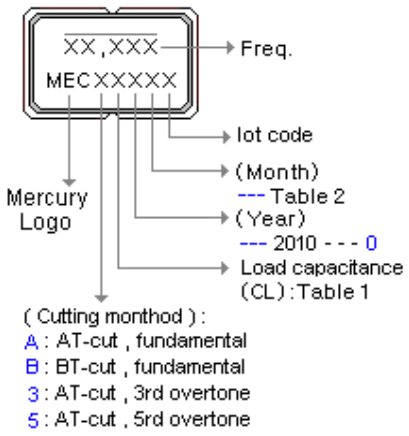
[1]	Holder Type											
[2]	Center frequency . Please add " A3 , A5 or B " after the " Freq. in MHz " for the quartz cut other options .											
	Blank : AT-cut fund. mode ; A3 : AT-cut 3rd overtone ; A5 : AT-cut 5th overtone ; B : BT-cut fund. mode											
[3]	Load Capacitance (CL) : series (spec. code is " S ") or											
	Parallel (If parallel , please specify CL value , typical CL ranges from 8 to 32 pF)											
	Available Options " V " = Vinyl sleeve around holder , " K " = 3rd lead at bottom center , " R " = On reel											
	" G " = 3rd lead at top center , " I " = Teflon insulator at bottom											
[4]	Calibration tolerance value : freq. tolerance value (at 25°C) , industrial temp. range											
[5]	Frequency Stability , industrial temp. range											
[6]	Temp. Range	W	0°C ~ +50°C	X	-10°C ~ +60°C	Y	-20°C ~ +70°C	F	-30°C ~ +70°C	G	-10°C ~ +80°C	
		H	-30°C ~ +85°C	I	-40°C ~ +85°C	J	-40°C ~ +90°C	K	-40°C ~ +105°C	M	-55°C ~ +105°C	
	Options	N	-55°C ~ +125°C	Z	Customized							
[7]	If non-standard please enter the desired ESR (Equivalent Series Resistance) after " / " , for example " 20R " : 20Ω											

Production Marking Rules

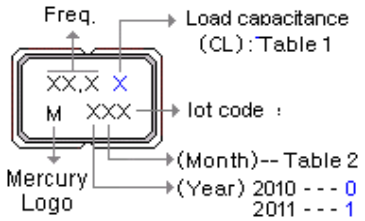
General X'tal package type marking rules



MQ , MF , MJ , X42 marking rules



X22 , X32 marking rules



X21 marking rules

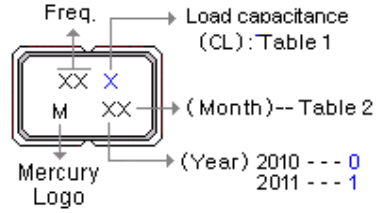


Table 1																												
CL	< 10	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	>34	Series
Code	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	a	b

Table 2													
Month	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Code	A	B	C	D	E	F	G	H	I	J	K	L

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