

## Feature

The 32.768kHz liming fork crystal unit is the most widely used frequency control product. liming's tuning-fork-type crystals have low power consumption ideal for portable application. Their different package sizes provide the customers more choices for time management. liming N's tuning-fork-type crystals are cost effective real time clock products.

## Specifications

Nominal Frequency	32.768000 kHz
Mode of Vibration	Fundamental
Storage Temp. Range (T <sub>STR</sub> )	-55°C ~+125 °C
Turnover Temperature (TM)	25±5 °C
Temperature Coefficient (β)	-(0.03±0.01) ppm/°C <sup>2</sup>
Frequency vs. Temperature (Δf / fM)	β x (T-TM) <sup>2</sup> ppm
Series Resistance (R1)	65~90 KΩ Max.
Level of Drive (DL)	0.1±0.01 uW Typ, 0.5 uW Max.
Aging (first year) (Δf / f0)	±3 ppm Max.
Quality Factor (Q)	30000~60000 Typ.
Shunt Capacitance (C0)	3~7 pF Max.
Load Capacitance (CL)	6, 7, 9, 12.5 pF (Please contact us)
Frequency Tolerance(f_tol)	±20 ppm @ 25±5 °C
Insulation Resistance	500 MΩ Min. @ DC 100±15 V

Specifications subject to change without notice

### Frequency Stability Vs. Temperature Range

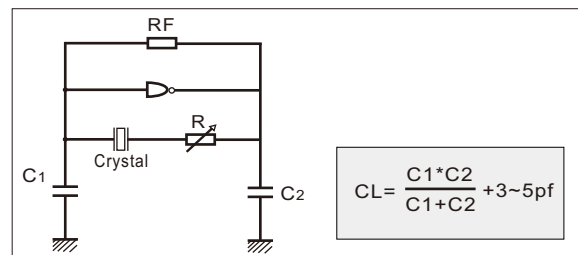
Temp.(°C)	Ppm	±5	±10	±15
-10 ~ +60		+	✓	✓
-20 ~ +70		×	✓	✓
-40 ~ +85		×	×	+

Temp.(°C)	Ppm	±15	±20	±30	±50
-40 ~ +105		+	✓	✓	✓
-40 ~ +125		×	×	+	✓

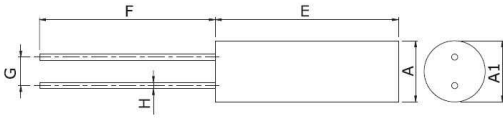
✓ Available + Conditional × Not Available

### Oscillation Circuit of Fundamental Mode





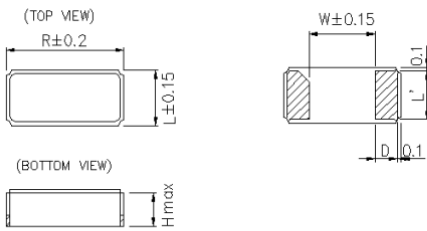
## 38/26/14 Series



TYPE	A	A'	E	F	G	H
3*8	3.0	3.1max	8.0max	10±1	0.8±0.2	∅0.32±0.07
2*6	2.0	2.1max	6.0max	5.0min	0.7±0.2	∅0.28±0.05
1*4	1.0	1.2max	4.6max	5.7min	0.3±0.05	∅0.18±0.03

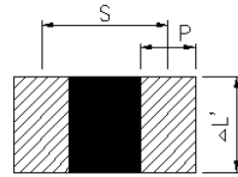
UNIT:mm

## 3215Series



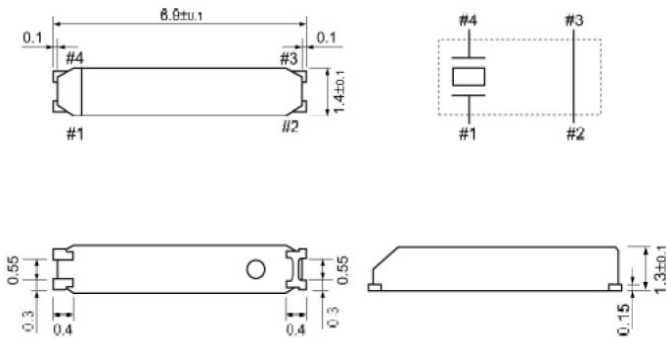
Model	R	L	H	W	L'	D	S	P	ΔL'
4115	4.1	1.5	0.9	2.7	1.3	0.6	3.4	1.1	1.8
3215	3.2	1.5	0.9	1.7	1.3	0.6	2.5	1.1	1.8
2012	2.0	1.2	0.6	0.8	1.0	0.5	1.4	0.6	1.1

Internal connection

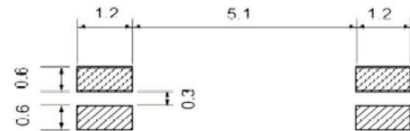


Do not design any patterns on shaded area  
Recommended soldering pattern

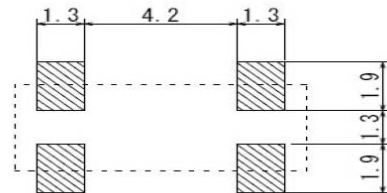
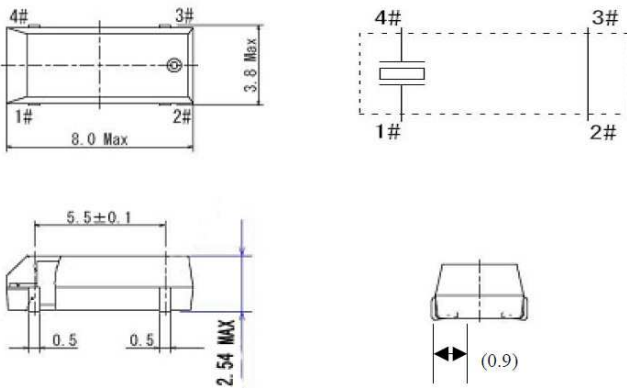
## MC146Series



\* Do not connect to external with #2 and #3



## MC406Series





## Model Numbering Guide – Crystal Units

### Available options

①	②	③	④		⑤						
Type	package (mm)	Frequency range	Load Capacitance (pF)	Freq. Tol. @25°C (ppm)	Freq. Stability (ppm)	Temp. Range(°C)	Special Requirement	Oscillator Mode	Appearance	Lead Free	Dash
1612	1.6x1.2	3.00~100.00MHZ	6	±5	±5	A:-20~+70 B:-40~+85 J:-40~+105	For Automotive Spurious DLD No Special Pullability Several	AT Fundamental AT 3 <sup>rd</sup> Overtone	Normal	RoHs Compliant	-
2016	2.0x1.6		7	±10	±10						
2520	2.5x2.0		8	±15	±15						
3225	3.2x2.5		9	±20	±20						
5032	5.0x3.2 (4Pads)		10	±25	±25						
6035	6.0x3.5		12	±30	±30						
3225	3.2x2.5		15	±40	±40						
5032	5.0x3.2 (2Pads)		16	±50	±50						
8045	8.0x4.5		18	±100	±100						
49S	11.1x4.68		20	±150	±150						
49MD	13.0x4.85		22		±150 above						
			25								
		30									
		32									

产品编号:  -  -  -  -

① 型号    ② 频率    ③ 负载电容    ④ 频率稳定度 (X10<sup>-6</sup>, +25°C)    ⑤ 温度

范例: 3225-12.00-20-20-20/A

①    ②    ③    ④    ⑤