

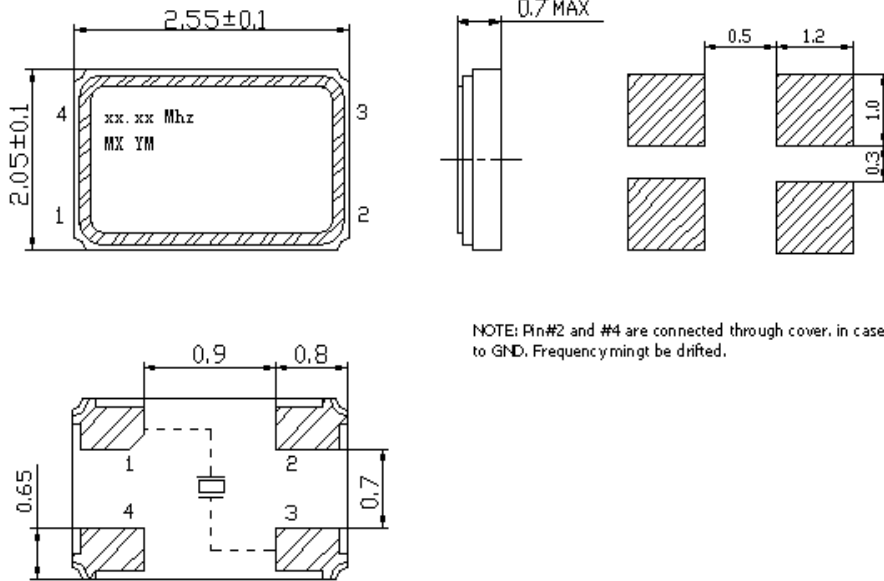
Lianyungang Macrobiz Co., Ltd.  
www.macrobiz.com



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**Specifications of Quartz Crystal**  
**2.5\*2.0SMD XQ22**

**DIMENSION AND MARKING**



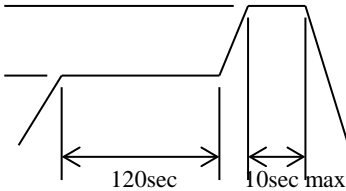
NOTE: Pin#2 and #4 are connected through cover, in case connected to GND, Frequency might be drifted.

**ELECTRICAL SPECIFICATION**

<b>TYPE</b>	: 2.5*2.0 SMD CRYSTAL	
<b>Frequency Range (F0)</b>	: 16Mhz to 60Mhz	
<b>Frequency Tolerance (<math>\Delta F</math>) (at 25 °C)</b>	: $\pm 10$ ppm to $\pm 100$ ppm	
<b>Frequency Drift (Tc)</b>	: $\pm 10$ ppm to $\pm 100$ ppm	
<b>Operating Temperature Range (T0)</b>	: $-10^{\circ}\text{C} \sim +60^{\circ}\text{C}$ or $-40^{\circ}\text{C} \sim +85^{\circ}\text{C}$	
<b>Storage Temperature Range</b>	: $-40^{\circ}\text{C} \sim +85^{\circ}\text{C}$ or $-55^{\circ}\text{C} \sim +125^{\circ}\text{C}$	
<b>Aging ( 25 °C )</b>	: $\pm 3$ ppm or $\pm 5$ ppm Max / first year	
<b>Shunt Capacitance (C0)</b>	: 7pF Max	
<b>Drive Level (DL)</b>	: 10 $\mu$ W Typical	
<b>Insulation Resistance (Ri)</b>	: 500M $\Omega$ Min / 100V $\pm$ 15V D.C.	
<b>Load Capacitance (CL)</b>	: Given by the customer	
<b>Equivalent Series Resistance (ESR) and Mode of Oscillation (Mode)</b>		
<b>Frequency Range (Mhz)</b>	<b>ESR (<math>\Omega</math>)</b>	<b>Mode</b>
16.000-20.000	100 Max	Fundamental
20.000-30.000	80 Max	Fundamental
30.000-40.000	60 Max	Fundamental
40.000-60.000	40 Max	Fundamental

**Special Instructions:**  
**Tape and Reel**  
**Rohs Compliant**

**NOTE:**

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RELIABILITY			
NO	ITEM	CONDITIONS	BASIS OF VERDICT
1	DROP	High:100cm;Thickness:3cm;3tims	$\Delta FL \pm 5\text{ppm Max}$ $\Delta RS 5\Omega \text{ Max or } \pm 10\% \text{ Max}$ (whichever is largrer)
2	VIBRATION	Frequency:10~57.7Hz: Amplitude: $\pm 0.75\text{mm}$ Frequency:57.7Hz~500Hz: acceleration rate: $98\text{m/s}^2$ Cycle time:10-500-10Hz: 15min Direction:X, Y, Z Duration: 2 h/direction	$\Delta FL \pm 5\text{ppm Max}$ $\Delta RS 5\Omega \text{ Max or } \pm 10\% \text{ Max}$ (whichever is largrer)
3	TEMPERATURE SHOCK	$-40^\circ\text{C} \pm 2^\circ\text{C}(30\text{min})$ -- $85^\circ\text{C} \pm 2^\circ\text{C}(30\text{min})$ ;For 10 cycles	$\Delta FL \pm 5\text{ppm Max}$ $\Delta RS 5\Omega \text{ Max or } \pm 10\% \text{ Max}$ (whichever is largrer)
4	HUMIDITY	Temp: $40^\circ\text{C} \pm 2^\circ\text{C}$ ;Humidity:90-95%;Times:96h	$\Delta FL \pm 5\text{ppm Max}$ $\Delta RS 5\Omega \text{ Max or } \pm 10\% \text{ Max}$ (whichever is largrer)
5	COLD RESISTANCE	Temp: $-40^\circ\text{C} \pm 2^\circ\text{C}$ ;Times:96h	$\Delta FL \pm 5\text{ppm Max}$ $\Delta RS 5\Omega \text{ Max or } \pm 10\% \text{ Max}$ (whichever is larger)
6	HEAT RESISTANCE 1	Temp: $100^\circ\text{C} \pm 2^\circ\text{C}$ ;Times:96h	$\Delta FL \pm 5\text{ppm Max}$ $\Delta RS 5\Omega \text{ Max or } \pm 10\% \text{ Max}$ (Whichever is larger)
7	HEAT RESISTANCE 2	Temp: $155^\circ\text{C} \pm 2^\circ\text{C}$ ;Times:2h	$\Delta FL \pm 5\text{ppm Max}$ $\Delta RS 5\Omega \text{ Max or } \pm 10\% \text{ Max}$ (whichever is larger)
8	REFLOW	$270^\circ\text{C} \pm 5^\circ\text{C}$ $150^\circ\text{C} \pm 5^\circ\text{C}$  CYCLE TIME: 200sec Max.	$\Delta FL \pm 5\text{ppm Max}$ $\Delta RS 5\Omega \text{ Max or } \pm 10\% \text{ Max}$ (whichever is largrer)
9	SALT SPRAY	Salt density:5%;Temp: $35^\circ\text{C}$ ;Times:96h	$\Delta FL \pm 5\text{ppm Max}$ $\Delta RS 5\Omega \text{ Max or } \pm 10\% \text{ Max}$ (whichever is largrer)
10	AGING	Temp: $85^\circ\text{C}$ ;Times:30days	$\Delta FL \pm 10\text{ppm Max}$ $\Delta RS 5\Omega \text{ or } \pm 10\% \text{ Max}$ (whichever is largrer)
11	LEAKAGE	He(0.6~0.65MPa):10min	$3 \times 10^{-9} \text{Pa} \cdot \text{m}^3/\text{s Max}$
12	SOLDER	Temp: $235^\circ\text{C} \pm 5^\circ\text{C}$	the solder immersion surface 90% Min

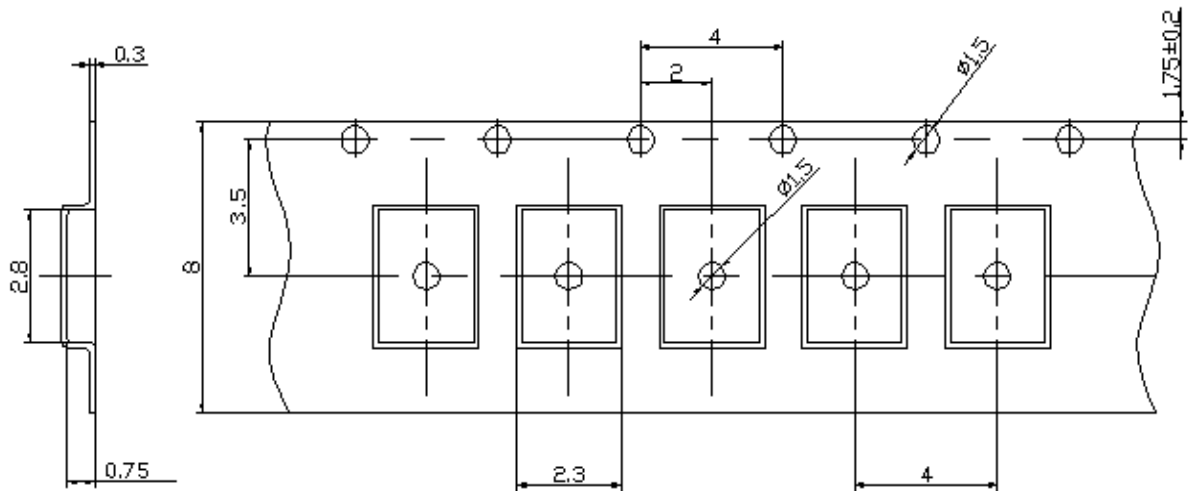
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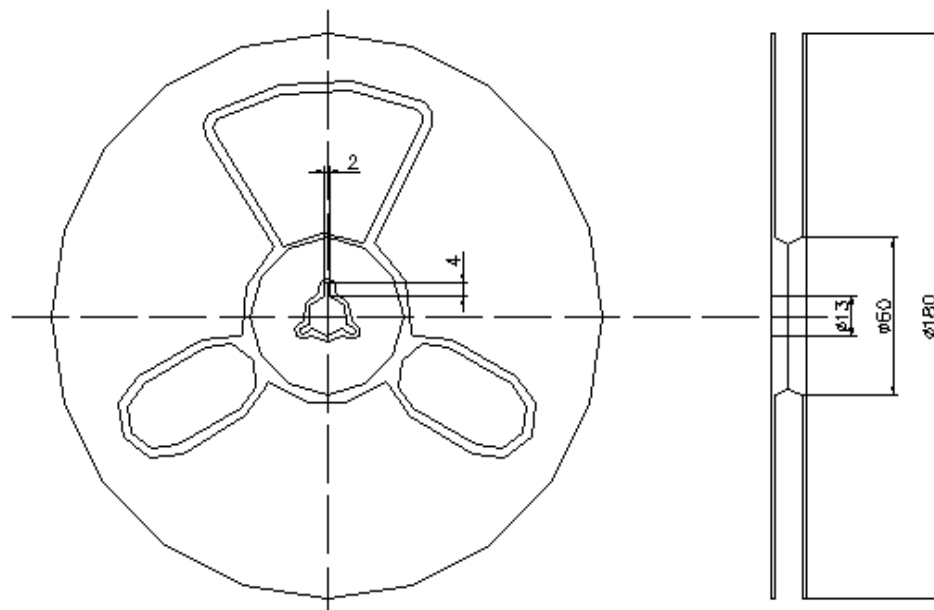
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Crystal 2.5\*2.0SMD XQ22

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### Tape

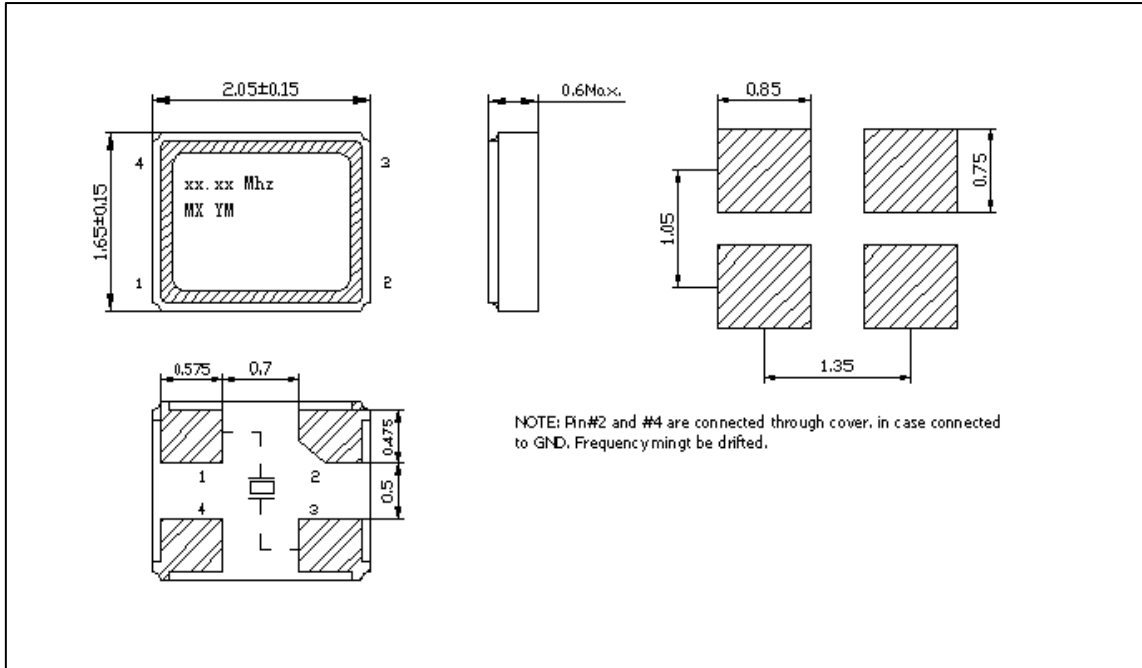


### Reel





**DIMENSION AND MARKING**



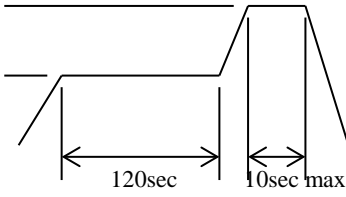
NOTE: Pin#2 and #4 are connected through cover, in case connected to GND. Frequency might be drifted.

**ELECTRICAL SPECIFICATION**

TYPE	: 2.0*1.6 SMD CRYSTAL	
Frequency Range (F0)	: 24Mhz to 60Mhz	
Frequency Tolerance ( $\Delta F$ ) (at 25 °C)	: $\pm 10$ ppm to $\pm 100$ ppm	
Frequency Drift (Tc)	: $\pm 10$ ppm to $\pm 100$ ppm	
Operating Temperature Range (T0)	: -10°C ~ +60°C or -40°C ~ +85°C	
Storage Temperature Range	: -40°C ~ +85°C or -55°C ~ +125°C	
Aging ( 25 °C )	: $\pm 3$ ppm or $\pm 5$ ppm Max / first year	
Shunt Capacitance (C0)	: 7pF Max	
Drive Level (DL)	: 10 $\mu$ W Typical	
Insulation Resistance (Ri)	: 500M $\Omega$ Min / 100V $\pm$ 15V D.C.	
Load Capacitance (CL)	: Given by the customer	
<b>Equivalent Series Resistance (ESR) and Mode of Oscillation (Mode)</b>		
Frequency Range (Mhz)	ESR ( $\Omega$ )	Mode
24.000-26.000	80 Max	Fundamental
26.000-40.000	60 Max	Fundamental
40.000-60.000	50 Max	Fundamental

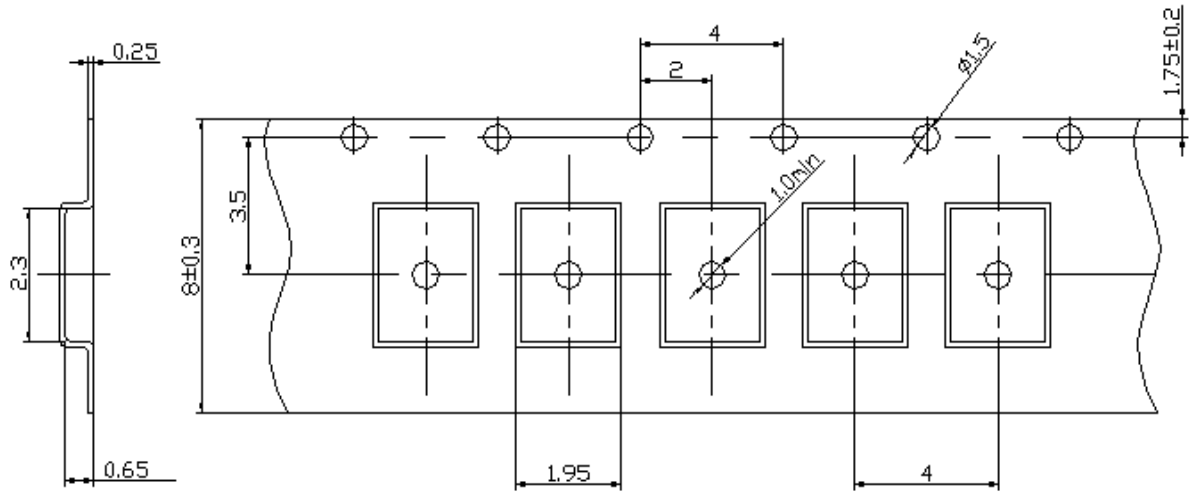
Special Instructions:  
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Rohs Compliant

NOTE:

Lianyungang Macrobizes Co., Ltd. www.macrobizes.com		Specifications of Quartz Crystal 2.0*1.6SMD XQ21	
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RELIABILITY			
NO	ITEM	CONDITIONS	BASIS OF VERDICT
1	DROP	High:100cm;Thickness:3cm;3tims	$\Delta FL \pm 5\text{ppm Max}$ $\Delta RS 5\Omega \text{ Max or } \pm 10\% \text{ Max}$ (whichever is largrer)
2	VIBRATION	Frequency:10~57.7Hz: Amplitude: $\pm 0.75\text{mm}$ Frequency:57.7Hz~500Hz: acceleration rate: $98\text{m/s}^2$ Cycle time:10-500-10Hz: 15min Direction:X, Y, Z Duration: 2 h/direction	$\Delta FL \pm 5\text{ppm Max}$ $\Delta RS 5\Omega \text{ Max or } \pm 10\% \text{ Max}$ (whichever is largrer)
3	TEMPERATURE SHOCK	$-40^\circ\text{C} \pm 2^\circ\text{C}(30\text{min})$ -- $85^\circ\text{C} \pm 2^\circ\text{C}(30\text{min})$ ;For 10 cycles	$\Delta FL \pm 5\text{ppm Max}$ $\Delta RS 5\Omega \text{ Max or } \pm 10\% \text{ Max}$ (whichever is largrer)
4	HUMIDITY	Temp: $40^\circ\text{C} \pm 2^\circ\text{C}$ ;Humidity:90-95%;Times:96h	$\Delta FL \pm 5\text{ppm Max}$ $\Delta RS 5\Omega \text{ Max or } \pm 10\% \text{ Max}$ (whichever is largrer)
5	COLD RESISTANCE	Temp: $-40^\circ\text{C} \pm 2^\circ\text{C}$ ;Times:96h	$\Delta FL \pm 5\text{ppm Max}$ $\Delta RS 5\Omega \text{ Max or } \pm 10\% \text{ Max}$ (whichever is larger)
6	HEAT RESISTANCE 1	Temp: $100^\circ\text{C} \pm 2^\circ\text{C}$ ;Times:96h	$\Delta FL \pm 5\text{ppm Max}$ $\Delta RS 5\Omega \text{ Max or } \pm 10\% \text{ Max}$ (Whichever is larger)
7	HEAT RESISTANCE 2	Temp: $155^\circ\text{C} \pm 2^\circ\text{C}$ ;Times:2h	$\Delta FL \pm 5\text{ppm Max}$ $\Delta RS 5\Omega \text{ Max or } \pm 10\% \text{ Max}$ (whichever is larger)
8	REFLOW	$270^\circ\text{C} \pm 5^\circ\text{C}$ $150^\circ\text{C} \pm 5^\circ\text{C}$  CYCLE TIME: 200sec Max.	$\Delta FL \pm 5\text{ppm Max}$ $\Delta RS 5\Omega \text{ Max or } \pm 10\% \text{ Max}$ (whichever is largrer)
9	SALT SPRAY	Salt density:5%;Temp: $35^\circ\text{C}$ ;Times:96h	$\Delta FL \pm 5\text{ppm Max}$ $\Delta RS 5\Omega \text{ Max or } \pm 10\% \text{ Max}$ (whichever is largrer)
10	AGING	Temp: $85^\circ\text{C}$ ;Times:30days	$\Delta FL \pm 10\text{ppm Max}$ $\Delta RS 5\Omega \text{ or } \pm 10\% \text{ Max}$ (whichever is largrer)
11	LEAKAGE	He(0.6~0.65MPa):10min	$3 \times 10^{-9} \text{Pa} \cdot \text{m}^3/\text{s Max}$
12	SOLDER	Temp: $235^\circ\text{C} \pm 5^\circ\text{C}$	the solder immersion surface 90% Min



Tape



Reel

