



CHEQUERS ELECTRONIC (CHINA) LIMITED
捷嘉電子(中國)有限公司

**Quartz Crystal Oscillator
Specification**

Part No.: CO12.0000SMM23

<This product is RoHS and REACH compliant>

Part no.	: CO12.0000SMM23	Address	: Room 1101-3, Mongkok Commercial Centre, 16 Argyle St., Mongkok, Kowloon, Hong Kong SAR, China
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Page(s)	: 1 of 6	E-mail	: info@chequers-electronic.com

1. Scope

This specification shall cover the characteristics of the quartz crystal unit CO12.0000SMM23.

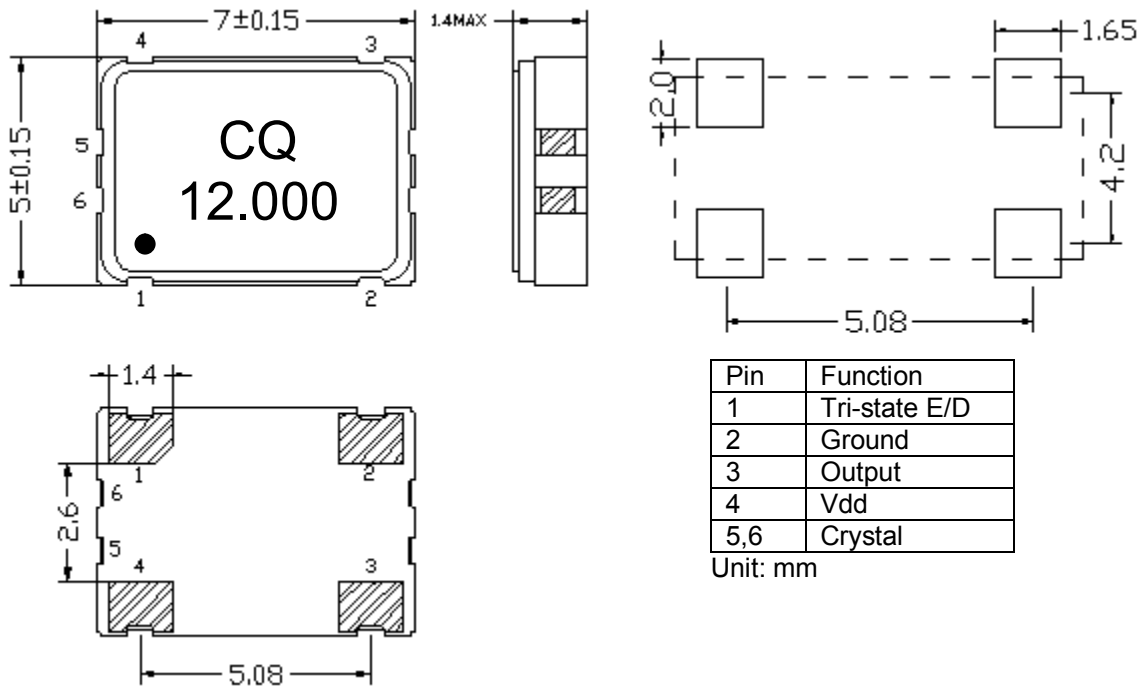
2. Specification no.: -

3. Part no.: CO12.0000SMM23

4. Electrical specification

4-1	Holder type	SMD 7050 (7.0x5.0mm), 4 pads
4-2	Nominal frequency	12.000MHz
4-3	Output	HCMOS
4-4	Tri-state	Enable
4-5	Operating voltage	3.3V±10%
4-6	Operating temperature range	-20°C to +70°C
4-7	Output load condition	15pF
4-8	Frequency stability over operating temperature range	±50ppm max.
4-9	Current consumption	20mA max.
4-10	Duty cycle	40% to 60%
4-11	T-rise	10ns max.
4-12	T-fall	10ns max.
4-13	High output voltage	0.9Vdd min.
4-14	Low output voltage	0.1Vdd max.
4-15	Aging	±5ppm / year
4-16	Remark	Marking: laser marking

5. Dimension, marking, and recommended soldering pattern



Pin	Function
1	Tri-state E/D
2	Ground
3	Output
4	Vdd
5,6	Crystal

Unit: mm

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6. Environmental and mechanical characteristics

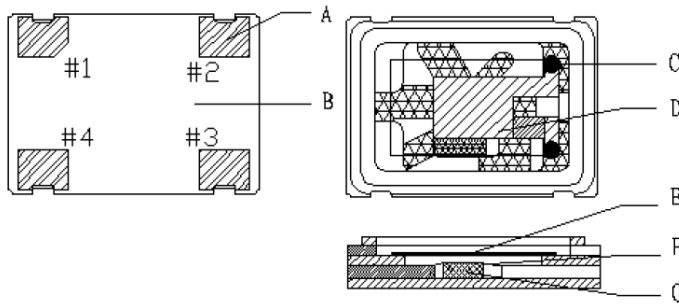
Item	Test type	Condition	Remark
6-1	Vibration resistance	The crystal unit is subject to a vibration (frequency: 0Hz to 500Hz; amplitude: 1.5mm; cycle time: 1 to 2 minutes) for a duration of two hours of each of three mutually perpendicular axes.	$\Delta FL \leq \pm 5 \text{ppm}$ $\Delta RS \leq \pm 5 \Omega$ or $\pm 10\%$ (whichever is larger)
6-2	Drop resistance	The crystal unit is subject to three drops from a height of 100cm on a hard wood floor (thickness: 3cm).	
6-3	Shock resistance	The crystal unit is subject to three shocks (acceleration: 981m/s^2 ; duration of acceleration: 6ms)	
6-4	Heat (damped) resistance	The crystal unit is stored at a temperature of $+40^\circ\text{C} \pm 2^\circ\text{C}$ with a relative humidity of 90% to 95% for a duration of 96 days. After that, the crystal unit is placed in standard atmospheric condition for one hour before measurement.	
6-5	Low temperature resistance	The crystal unit is stored at a temperature of $-40^\circ\text{C} \pm 2^\circ\text{C}$ for a duration of 96 hours. After that, the crystal unit is placed in standard atmospheric condition for one hour before measurement.	
6-6	High temperature resistance 1	The crystal unit is stored at a temperature of $+100^\circ\text{C} \pm 2^\circ\text{C}$ for a duration of 96 hours. After that, the crystal unit is placed in standard atmospheric condition for one hour before measurement.	
6-7	High temperature resistance 2	The crystal unit is stored at a temperature of $+155^\circ\text{C} \pm 2^\circ\text{C}$ for a duration of 2 hours. After that, the crystal unit is placed in standard atmospheric condition for one hour before measurement.	
6-8	Aging	The crystal unit is stored at a temperature of $+85^\circ\text{C} \pm 2^\circ\text{C}$ for a duration of 30 days. After that, the crystal unit is placed in standard atmospheric condition for one hour before measurement.	
6-9	Leakage	The crystal unit is stored a chamber that is filled with helium (0.6 to 0.65MPa) for a duration of 10 minutes	

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6. Environmental and mechanical characteristics (continue from preceding page)

Item	Test type	Condition	Remark
6-10	Thermal impact resistance	The crystal unit is stored at a temperature of $-40^{\circ}\text{C}\pm 2^{\circ}\text{C}$ for 30 minutes. Then the crystal unit is transferred (transfer time should be less than 30 seconds), and stored at a temperature of $+85^{\circ}\text{C}\pm 2^{\circ}\text{C}$ for 30 minutes. Such cycle should be repeated 10 times. After that, the crystal unit is placed in standard atmospheric condition for one hour before measurement.	$\Delta\text{FL}\leq\pm 5\text{ppm}$ $\Delta\text{RS}\leq\pm 5\Omega$ or $\pm 10\%$ (whichever is larger)
6-11	Resistance to soldering heat	<p><u>Reflow soldering (for HC-49S-SMD and SMD crystal unit only)</u></p> <p style="text-align: center;">Total cycle time: 200 seconds max.</p>	
6-12	Solderability	Terminals of the crystal unit is immersed into a solder bath ($235^{\circ}\text{C}\pm 5^{\circ}\text{C}$) for a duration of 5 seconds \pm 2 seconds	Solder should cover the immersed surface area no less than 90%

7. Material List



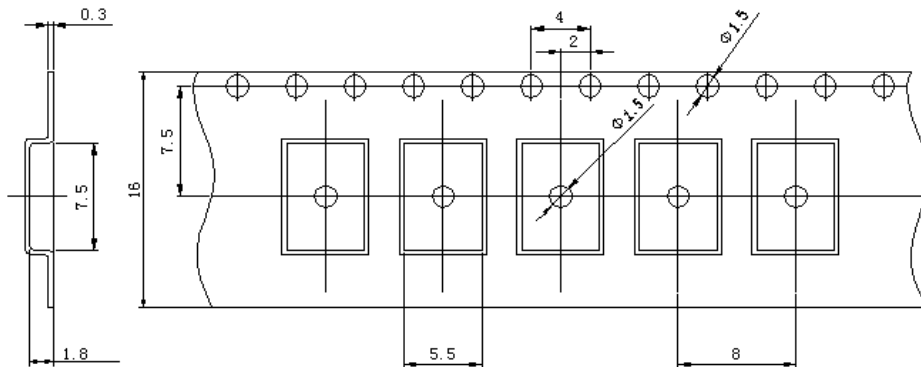
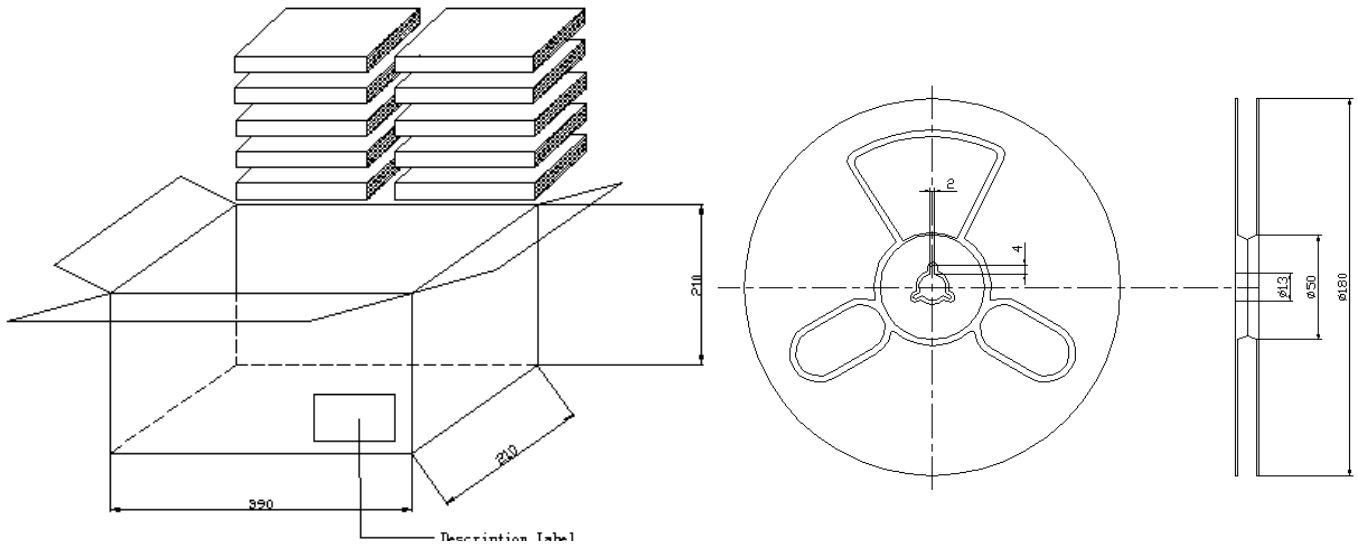
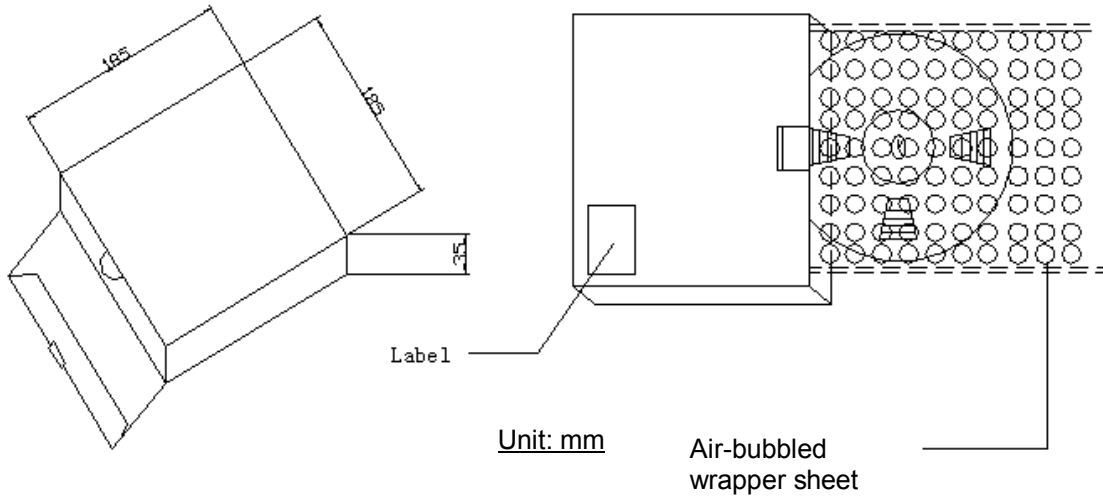
Item	Description	Material
A	Solder pads	Gold plating
B	Package	Ceramic
C	Conductive paste	Epoxy
D	Electrode	Ag
E	Blank	SiO_2
F	IC	Silicon
G	Wire	Au

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8. Packing*

Package	Dimension LxWxH (cm)	Quantity (pcs)	Weight
Quartz crystal unit	-	1	~ 0.1g
Plastic reel	∅18.0	1000	~ 190.0g
Inner box	18.5 x 18.5 x 3.5	1 Plastic reel = 1000	~ 290.0g
Outer carton box	39.0 x 21.0 x 21.0	10 Inner boxes = 10000	~ 3.90kg

*Please note that the above packing material and dimension given are for reference only. The actual packing material and dimension may vary depending on the actual quantity to be delivered.



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9. Note

9-1 Please contact our sales representatives or engineers before using the products specified in this specification sheet for the following equipment, which require high reliability, and if such equipment fails, which might damage to a third party's life, body or property.

- | | |
|--|--|
| (i) Aerospace equipment | (ii) Medical equipment |
| (iii) Power plant equipment | (iv) Transportation equipment |
| (v) Traffic control equipment | (vi) Disaster control / prevention equipment |
| (vii) Undersea navigational equipment | (viii) Data-processing equipment |
| (ix) or equipment that requires similar complexity and / or reliability of above equipment | |

9-2 Product specifications in this specification sheet are as of the date that is printed on. They are subject to change or discontinue without prior notice. Please check with our sales representative or engineers for details.

9-3 When using our products, please do not exceed the requirements and conditions specified in this specification sheet.

9-4 Should there be any doubt when using our products, please consult our sales representative or engineers before using our products.

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