



CHEQUERS ELECTRONIC (CHINA) LIMITED

捷嘉電子(中國)有限公司

APPROVAL SHEET

Manufacturer: Chequers Electronic (China) Limited		Customer: Eppendorf	
Part no.	C53S(2)MM216060-18.432M	Customer part no.	E0688CQU00430
Part name	Quartz crystal unit	Spec. no.	-
Total page (Includes this page)	8	Issued date	15 th May 2014

This product is compliant to:



RoHS
Directive 2002/95/EC






REACH (15 SVHCs)
Regulation (EC) No. 1907/2006



For customer use

Approved by

For internal use only

Prepared by	Checked by	Approved by
		

Part no.	:	C53S(2)MM216060-18.432M
Printed on	:	15-May-14
Prepared by	:	Frankie
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Page(s)	:	8

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Quartz Crystal Unit Specification

Part No.: C53S(2)MM216060-18.432M

<This product is RoHS and REACH compliant>

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1. Scope

This specification shall cover the characteristics of the quartz crystal unit C53S(2)MM216060-18.432M

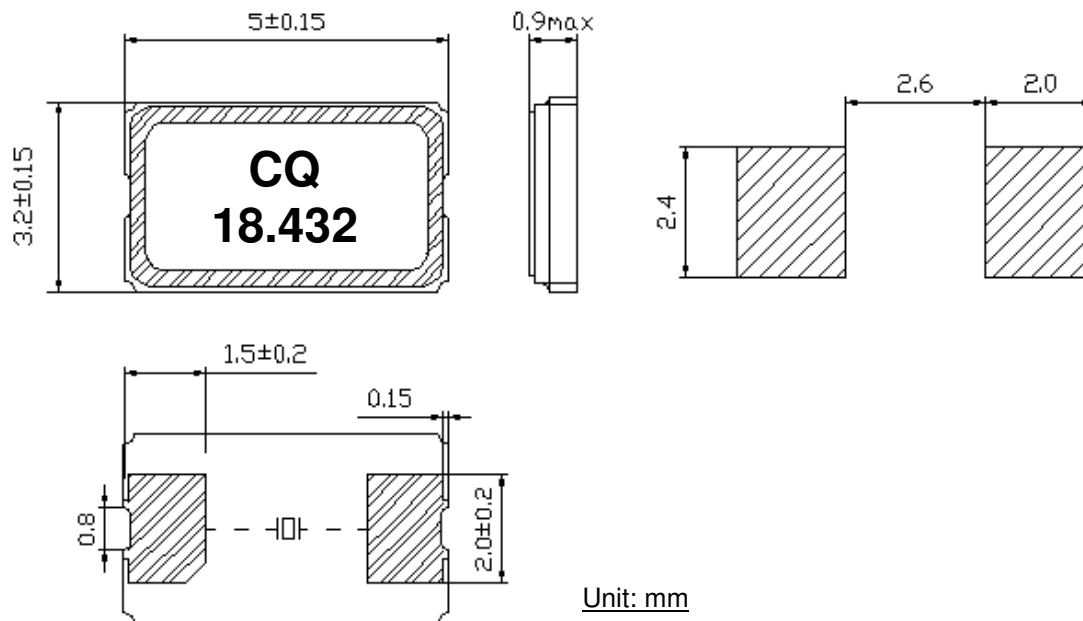
2. Specification no.: -

3. Part no.: C53S(2)MM216060-18.432M

4. Electrical specification

4-1	Nominal frequency (Fo)	18.432 MHz
4-2	Mode of oscillation	Fundamental, AT-cut
4-3	Tolerance (25°C)	±50ppm
4-4	Frequency stability over operating temperature range	±50ppm
4-5	Drive level	100μW
4-6	Loading capacitance	16pF
4-7	Equivalent resistance	60Ω max.
4-8	Insulation resistance	500MΩ min. (D.C. 100V)
4-9	Shunt capacitance	7pF max.
4-10	Aging (25°C)	±5ppm / year max.
4-11	Operating temperature range	-20°C to +70°C
4-12	Storage temperature range	-40°C to +85°C
4-13	Test equipment	KH1200 PI Network

5. Dimension and recommended soldering pattern



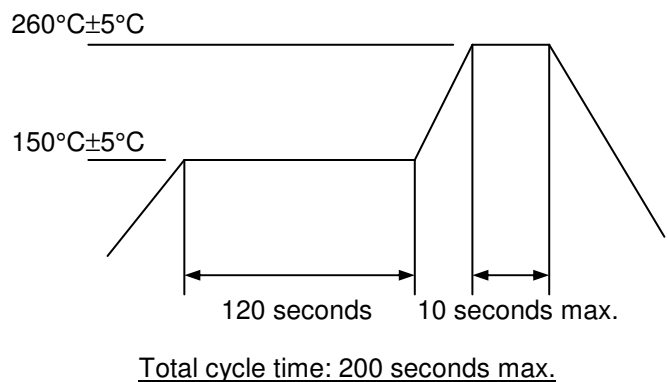
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6. Environmental and mechanical characteristics

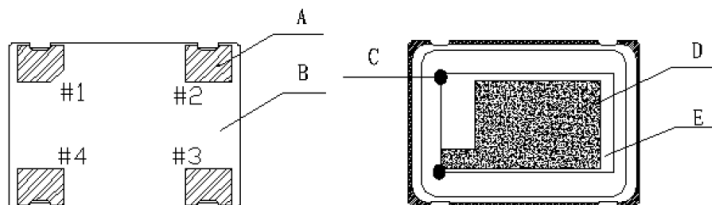
Item	Test type	Condition	Remark
6-1	Vibration resistance	The crystal unit is subject to a vibration (frequency: 0Hz to 500Hz; amplitude: 1.5mm; cycle time: 1 to 2 minutes) for a duration of two hours of each of three mutually perpendicular axes.	$\Delta FL \leq \pm 5 \text{ ppm}$ $\Delta RS \leq \pm 5 \Omega$ 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: 981 m/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	$\leq 3 \times 10^{-8} \text{ mbar.l/s}$

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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



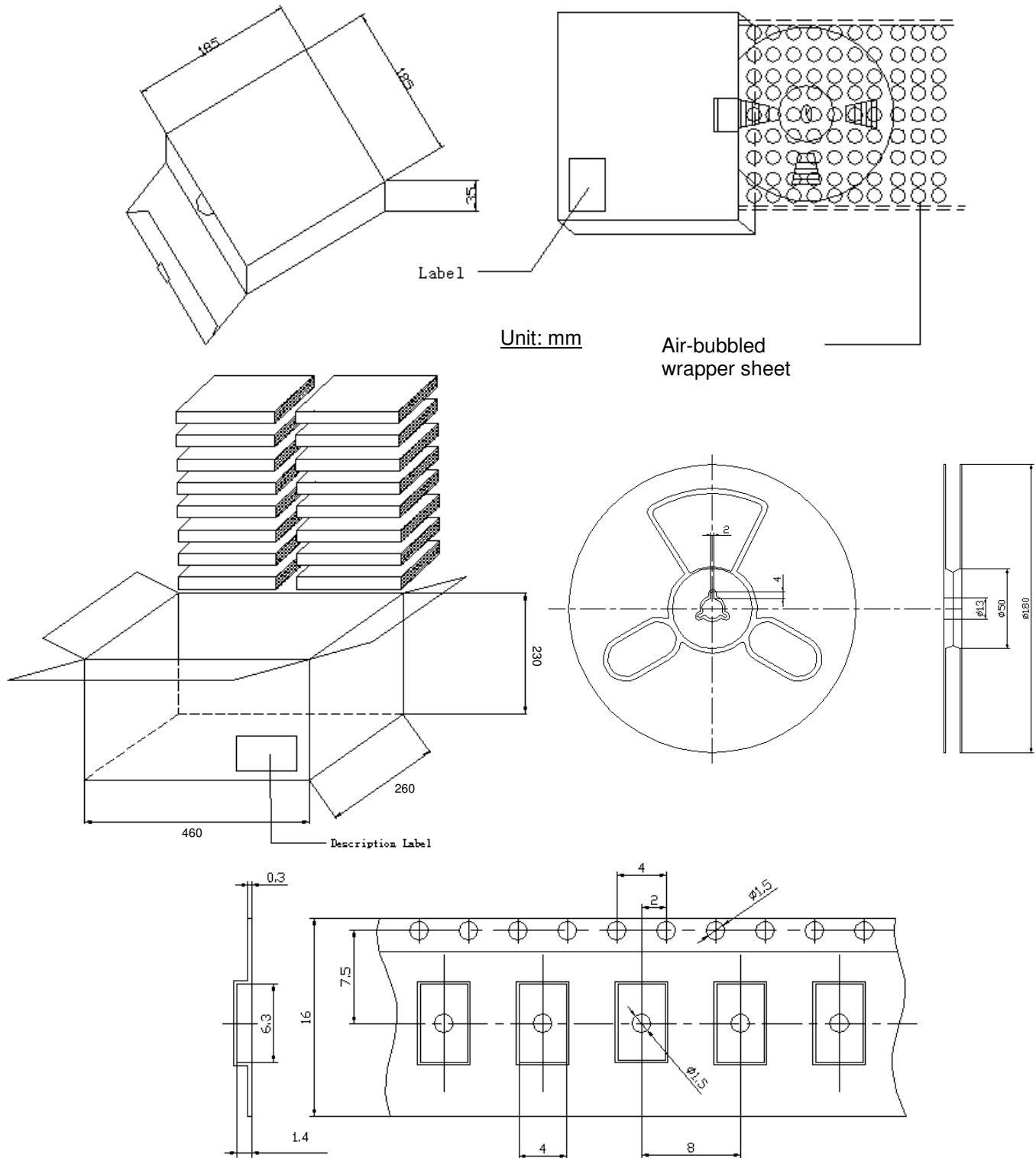
Item	Description	Material
A	Solder pads	Gold plating
B	Package	Ceramic
C	Conductive paste	Epoxy
D	Electrode	Ag
E	Blank	SiO ₂

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8. Packing information*

Package	Dimension LxWxH (cm)	Quantity (pcs)	Weight
Quartz crystal unit	-	1	~ 0.2g
Plastic reel	Ø18.0	1000	~ 220.0g
Inner box	18.5 x 18.5 x 3.5	1 Plastic reel = 1000	~ 275.0g
Outer carton box	46.0 x 26.0 x 23.0	16 Inner boxes = 16000	~ 6.00kg

*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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Unit: mm

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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