





REV.	Description of Revision History	Date	Designer	Checked By
A	New revision	<u>2018-12-28</u>	<u>Sutingting</u>	<u>DaiWei</u>



## CRYSTAL SPECIFICATION

1. Description: Quartz Crystal
2. Nominal Frequency: 12.000000MHz
3. Oscillation Mode: Fundamental
4. Cutting Mode: AT cut
5. Measurement Instrument: S&A 250B(Measured FL)
6. Electrical Characteristics:

### [1]Operation Conditions:

Item	Symbol	MIN.	TYP.	MAX.	Unit	Condition
Operating Temperature Range	Topt	-40		85	°C	
Storage Temperature Range	Tstg	-55		105	°C	
Load Capacitance	CL		20		pF	
Drive Level	DL	0.1		100	uW	

### [2]Frequency Stability:

Item	Symbol	MIN.	TYP.	MAX.	Unit	Condition
Tolerance	dF/Fo	-20		20	ppm	Refer to Center Frequency@25±3°C
Stability Over Temperature	dF/F25	-30		30	ppm	Refer to Operating Temperature @-40~+85°C
Aging	dF/F25	-3		3	ppm	Per Year

dF/Fo:Frequency Deviation Refer to Center Frequency

dF/F25:Frequency Deviation Refer to 25°C Frequency

### [3]Electrical Performance:

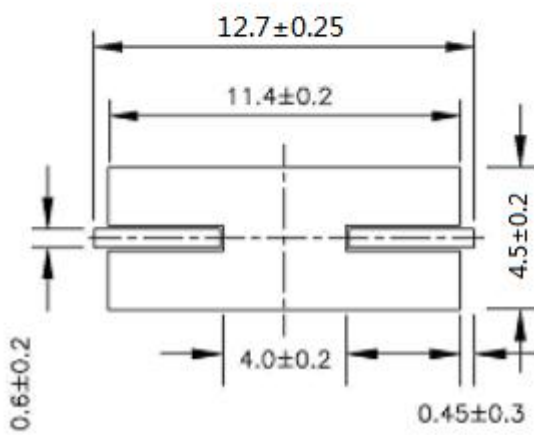
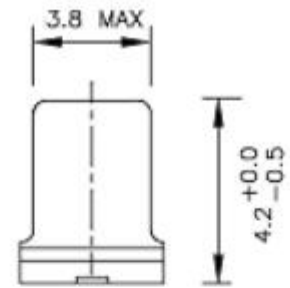
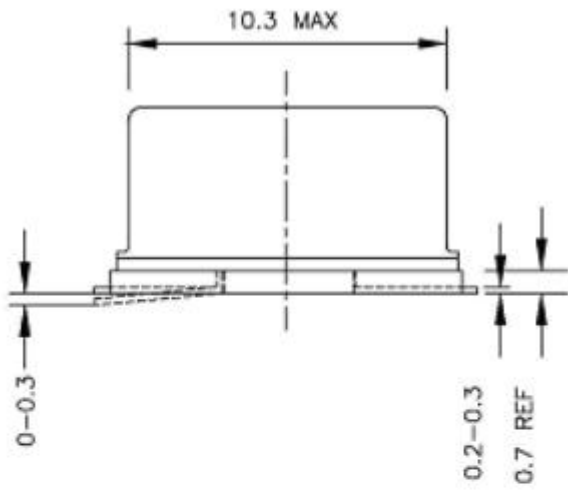
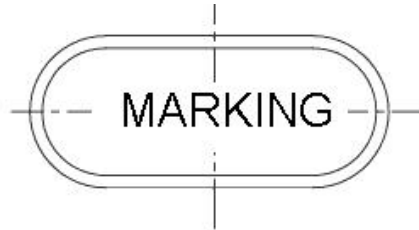
Item	Symbol	MIN.	TYP.	MAX.	Unit	Condition
Equivalent Series Resistance	ESR			40	Ω	@Series
Shunt Capacitance	C0			7	pF	
Insulation Resistance	IR	500			MΩ	@DC 100 Volt

### 7. Marking:Laser

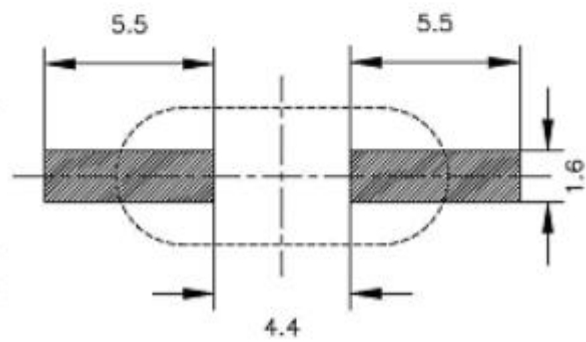
TKD:Company Logo  
12.000:Nominal Frequency

TKD12.000

8. Outline drawing (unit: mm)



LAND PATTERN (REFERENCE)



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9. Reliability Specification

Test Item	Condition of test	Performance Requirements															
Tensile Strength Termination	The unit's lead wire should withstand a tensile force applied to the termination in the direction of its draw-out axis of up to 1000g maintained as is for 10±2s	There should be no abnormalities detected on the unit															
Solder ability	The lead is immersed in a 235±5°C solder bath within 2±0.5 seconds.	A new uniform coating of solder shall cover min mun 95% of the surface being immersed.															
Vibration	Endurance condition by a frequency sweep shall be made. The entire frequency range from 10HZ to 50HZ and return to 10HZ, shall be transverseb in 1min. Amplitude(total excursion):1.5mm this motion shall be applied for a period of 2h each of 3 mutually perpendicular axes(a total of 6h)	(1).Frequency Change:±5ppm (2).Resistance:±15%															
Drop	Form 70cm height 3 times on 3cm hard wooden floor	(1).Frequency Change:±5ppm (2).Resistance:±15%															
Shock	Peak acceleration:981m/s <sup>2</sup> duration of the pulse :6ms three successive shocks shall be applied in both direction of 3 mutually perpendicular axes(a total of 18 shocks)	(1).Frequency Change:±5ppm (2).Resistance:±15%															
Damp heat	The unit shall be stored at a temperature of 40±2°C with relative humidity of 90%to95% for 48h, then it shall be subjected to standard atmospheric conditions for 1 ~ 2h after which measurement shall be made.	(1).Frequency Change:±5ppm (2).Resistance:±15%															
Dry heat	The unit shall be stored at a temperature of 100°C±5°C for 24h, then it shall be subjected to standard atmospheric conditions for 1~2h after which measurement shall be made.	(1).Frequency Change:±5ppm (2).Resistance:±15%															
Cold	The unit shall be stored at a temperature of -40°C±5°C for 48h, then it shall be subjected to standard atmospheric conditions for 1~2h after which measurement shall be made.	(1).Frequency Change:±5ppm (2).Resistance:±15%															
Aging	The unit shall be stored at a temperature of 85°C±5°C for 7d then it shall be subjected to standard atmospheric conditions for 1~2h after which measurement shall be made.	Refer to verdict specification															
Temperature cycling	The unit shall be subjected to 5 successive change of temperature cycles, each as show in table below, then it shall be subjected to standard atmospheric conditions for 1 ~ 2h after which measurement shall be made <table border="1" data-bbox="400 1794 1062 2087"> <thead> <tr> <th></th> <th>Temperature</th> <th>Duration</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>-40°C±3°C</td> <td>30min</td> </tr> <tr> <td>2</td> <td>Standard atmospheric conditions</td> <td>Within 30s</td> </tr> <tr> <td>3</td> <td>100°C±3°C</td> <td>30min</td> </tr> <tr> <td>4</td> <td>Standard atmospheric conditions</td> <td>Within 30s</td> </tr> </tbody> </table>		Temperature	Duration	1	-40°C±3°C	30min	2	Standard atmospheric conditions	Within 30s	3	100°C±3°C	30min	4	Standard atmospheric conditions	Within 30s	Refer to verdict specification
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1	-40°C±3°C	30min															
2	Standard atmospheric conditions	Within 30s															
3	100°C±3°C	30min															
4	Standard atmospheric conditions	Within 30s															

Test Item	Condition of test	Performance Requirements
Sealing	The crystal filter unit shall be immersed in a industry alcohol for 5±0.5 minutes then 25±3°C 1~2 Hr before testing	Insulation Resistance>500MΩ
Resistance to soldering heat	 <p>Reflow soldering cure see the chart. Soldering iron method: Bit temperature: 350°C±10°C Application time of soldering iron:5s Max</p>	Refer to verdict specification



12. Schematic diagram of packaging

