

CRYSTAL SEPECIFICATION

Customer : _____

Customer P/N : _____

Part Name : SM3-27.120M-15-10

Product Description : SMD3.2*2.5-27.120M-15PF-10PPM RoHS

Issue Date : 2023.06.19

CUSTOMER'S APPROVAL

(PLEASE RETURN A COPY WITH APPROVAL)

APPROVED	DESIGNER
	Peter

TKK Crystal Industrial (Hong Kong) Co., Limited

Room 1311, Block B, Senyagu, Line 3 City Apartments, Heao,Henggang, Longgang District, Shenzhen
City, China. post: 518115

REV.	Description of Revision History	Date	Designer	Checked By
A	New revision	2023-06-19		

CRYSTAL SEPECIFICATION

1. Description: Quartz Crystal
2. Nominal Frequency: 27.120MHz
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	-20		70	°C	
Storage Temperature Range	Tstg	-40		85	°C	
Load Capacitance	CL		15		pF	
Drive Level	DL		10	100	μw	

[2]Frequency Stability:

Item	Symbol	MIN.	TYP.	MAX.	Unit	Condition
Tolerance	dF/Fo	-10		10	ppm	Refer to Center Frequency@25±3°C
Stability Over Temperature	dF/F25	-10		10	ppm	Refer to Operating Temperature
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

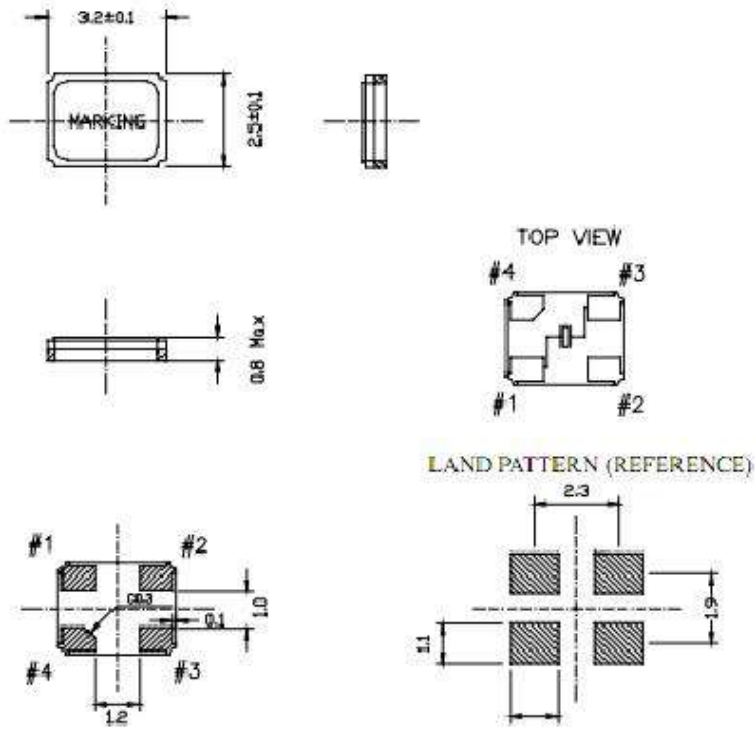
[3]Electrical Performance:

Item	Symbol	MIN.	TYP.	MAX.	Unit	Condition
Equivalent Series Resistance	ESR			40	Ω	@Series
Shunt Capacitance	C0			3	pF	
Insulation Resistance	IR	500			MΩ	@DC 100 Volt
Drive level Dependency: Maximum resistance minus minimum resistance	DLD2			8	Ω	1~200μw 20 point

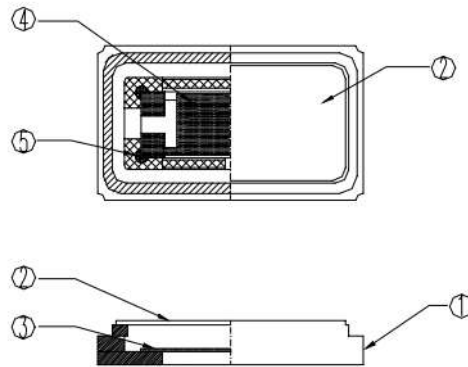
7. Marking:Laser

<p>*MARKING : Y ->YEAR M ->MONTH T : YEAR : 1 2 3 4 5 6 7 8 9 0 MONTH: 1 2 3 4 5 6 7 8 9 10 11 12 CODE : A B C D E F G H J K L M</p>	<div style="border: 1px solid black; width: 100px; height: 50px; margin: auto;"> TTK10.000 </div>
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8. Outline drawing (unit: mm)



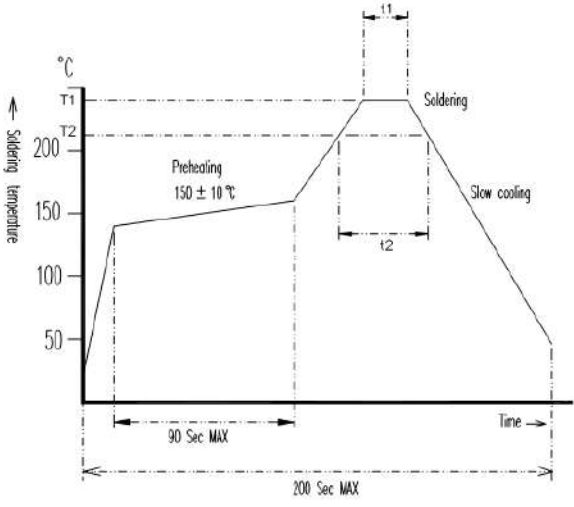
Structure Illustration



PART NAME	MATERIAL	PART NAME	MATERIAL
1. BASE	CERAMIC	4. ELECTRODE	Metal
2. LID	Co	5. ADHESMES	SILVER GLUE
3. BLANK	QUARTZ		

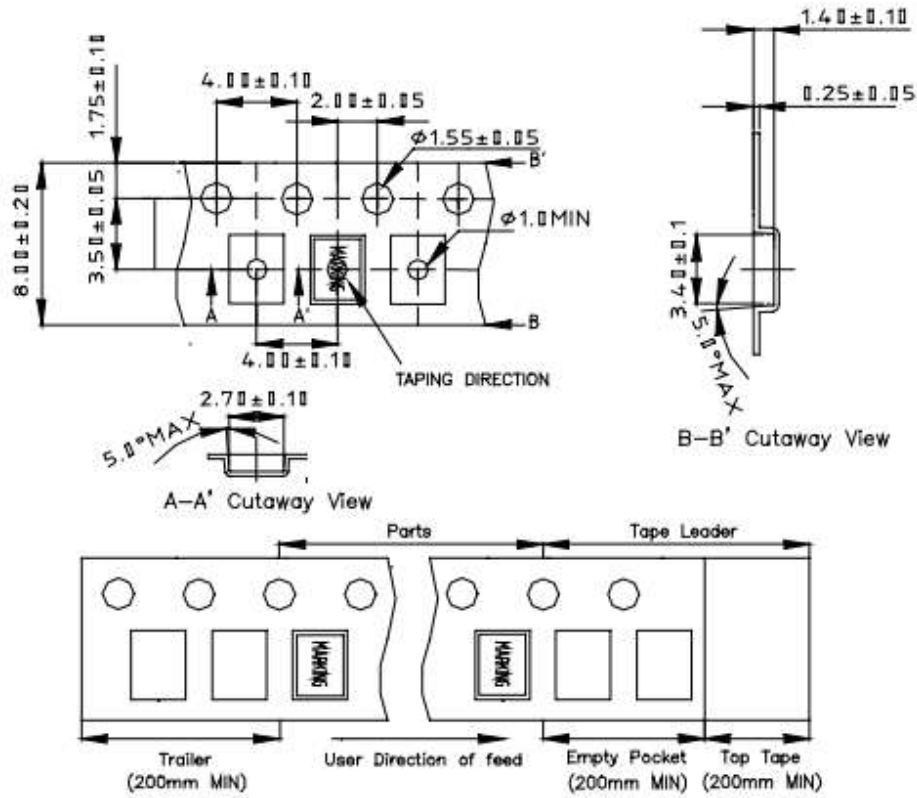
9. Reliability Specification

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 260±5°C solder bath within 2±0.5 seconds.	A new uniform coating of solder shall cover minimum 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 transverse 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 100cm height 3 times on 3cm hard wooden floor	(1). Frequency Change: ±5ppm (2). Resistance: ±15%															
Shock	Peak acceleration: 981m/s ² 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% to 95% 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 1789 1062 2085"> <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	 <table border="1" data-bbox="406 929 1045 985"> <thead> <tr> <th>Application\temperature</th> <th>Time</th> <th>T1 / t1</th> <th>T2 / t2</th> </tr> </thead> <tbody> <tr> <td>Lead Free</td> <td></td> <td>260±5°C / 10 Sec Max</td> <td>225Min / 60 Sec Max</td> </tr> </tbody> </table> <p>Reflow soldering cure see the chart.</p>	Application\temperature	Time	T1 / t1	T2 / t2	Lead Free		260±5°C / 10 Sec Max	225Min / 60 Sec Max	Refer to verdict specification
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Lead Free		260±5°C / 10 Sec Max	225Min / 60 Sec Max							

10. Packing Description

1. CARRIER TYPE



2. REEL : 3000 PCS

