Management No.：Z12-G08

PRODUCT SPECIFICATION

Customer： _____

Customer P/N： _____

Product Description： SX-1612 19.200MHz 7pF ±10ppm

TKD P/N： SX16Y019200B71T11G

Product Compliance： ☑Pb-free ☑RoHS 2.0 ☑REACH ☑HF

CUSTOMER'S APPROVAL

(PLEASE RETURN A COPY WITH APPROVAL)

TKD SCIENCE AND TECHNOLOGY CO.,LTD.

Approved	Checked	Prepared by
Xiong Feng	Mei Bin	Liu Man

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Rev.	Revision Description	Date	Prepared by	Checked By
A	Initial Release	2026/9/9	Liu Man	Mei Bin

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1. QUARTZ CRYSTAL UNIT SPECIFICATION

※ Description : Quartz Crystal
※ Product Type : SX-1612
※ Crystal Cut : AT-CUT
※ Test Equipment : S&A 250B
※ Electrical Characteristics :

Item	Parameters	Symbol	Electrical Specifications				Notes
			Min.	Typ.	Max.	Units	
1	Nominal Frequency	F0	19.200000			MHz	
2	Oscillation Mode	-	Fundamental			-	
3	Load Capacitance	CL	7			pF	
4	Frequency Tolerance	-	-10	-	10	ppm	At 25℃±3℃
5	Equivalent Series Resistance	ESR	-	-	100	Ω	
6	Drive Level	DL	-	-	100	μW	
7	Frequency Stability	TC	-12	-	12	ppm	Over the operating temp. range (referenced to 25 °C)
8	Operating Temperature	-	-30	-	85	℃	
9	Storage Temperature	-	-40	-	85	℃	
10	Aging	-	-3	-	3	ppm	Per Year
11	Insulation Resistance	-	500	-	-	MΩ	at 100 V DC
12	Shunt Capacitance	C0	-	-	3	pF	

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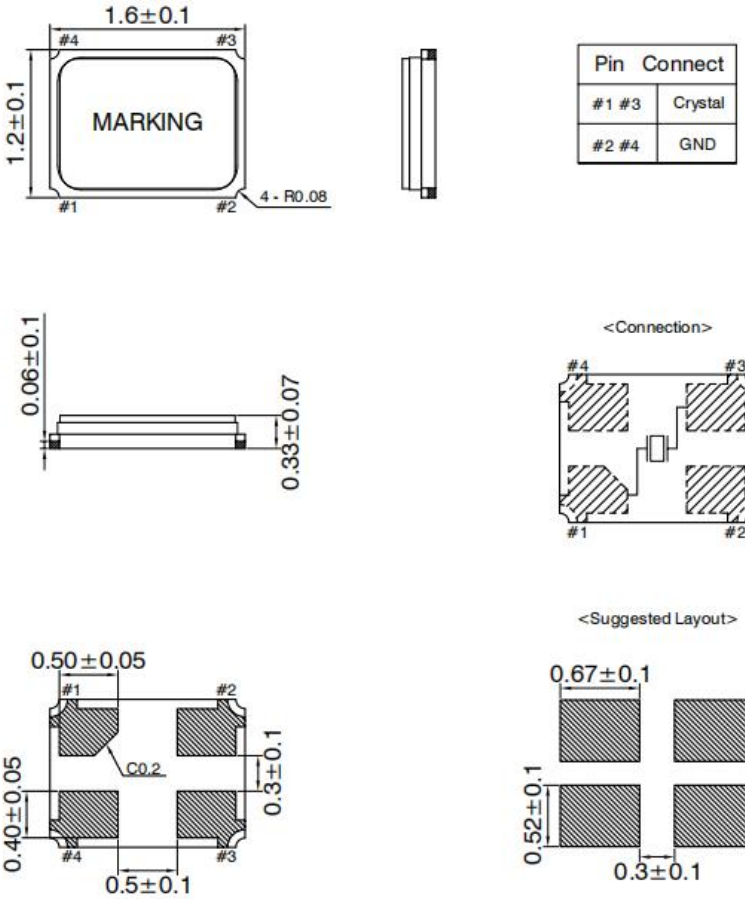
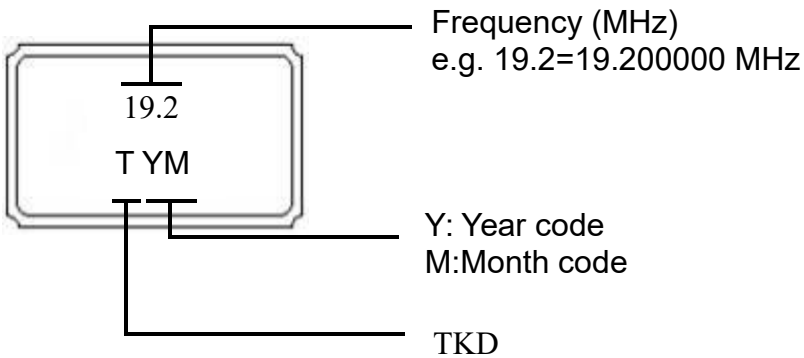
2. DIMENSIONS（Unit:mm）



3. MARKING



Year	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	/	/
Year code	1	2	3	4	5	6	7	8	9	0	/	/
	*The year code repeats every 10 years.											
Month	1	2	3	4	5	6	7	8	9	10	11	12
Month code	A	B	C	D	E	F	G	H	J	K	L	M

Note：Black lettering

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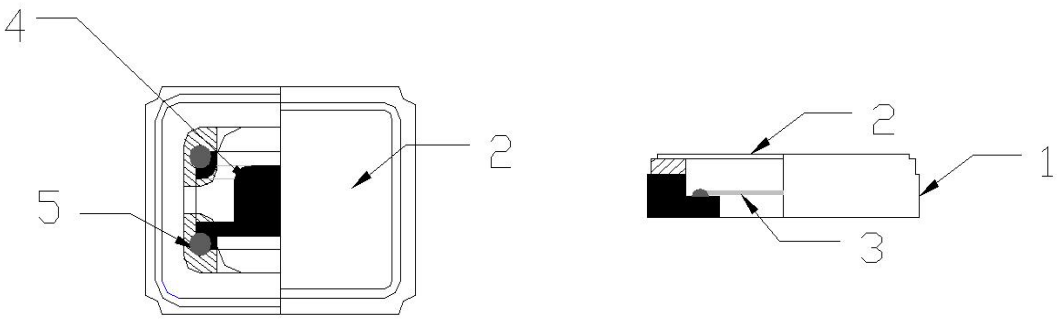
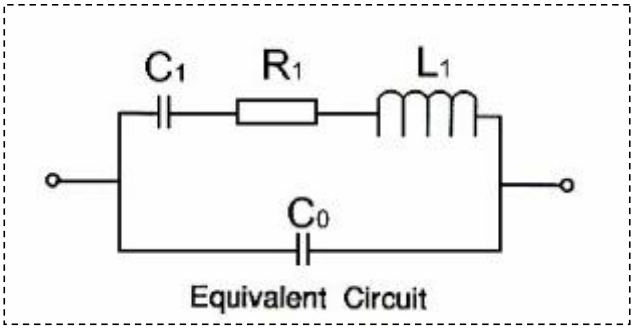
4. INTERNAL STRUCTURE



No.	COMPONENTS	MATERIALS
1	Package	Ceramic (Al_2O_3)
2	Lid	Kovar (Fe-Ni-Co alloy)
3	Crystal blank	SiO_2
4	Electrode	Noble Metal
5	Adhesive	Resin, Ag

5. EQUIVALENT CIRCUIT



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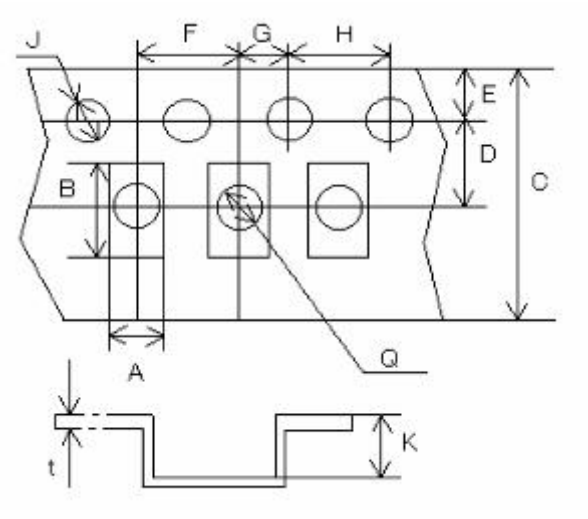
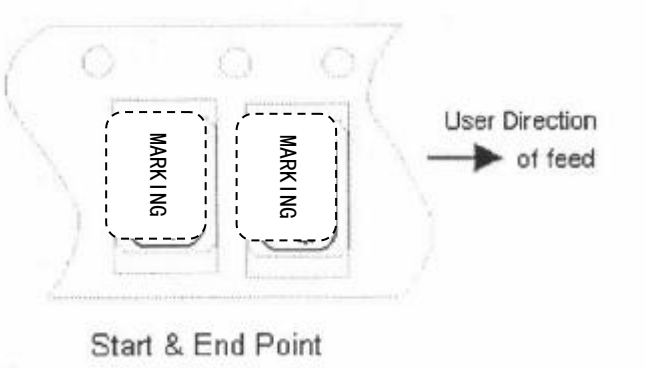
6. PACKAGING (Unit:mm)

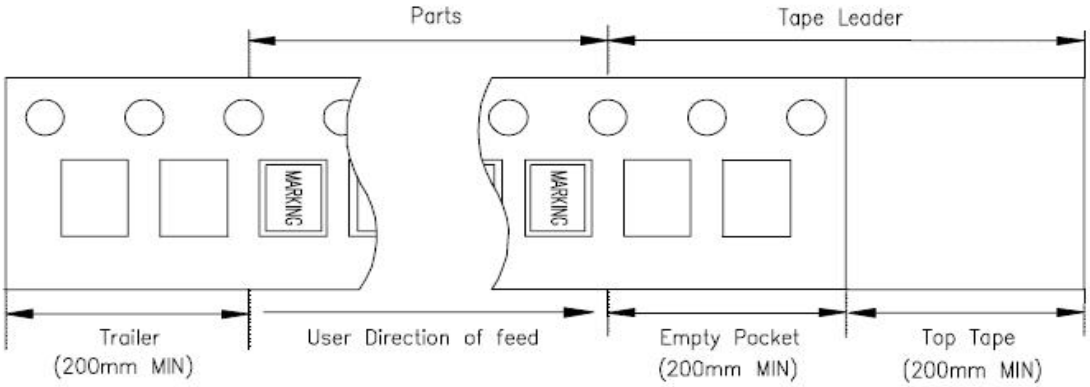
※ CARRIER TAPE



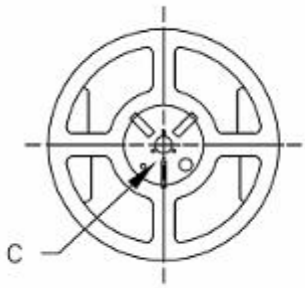


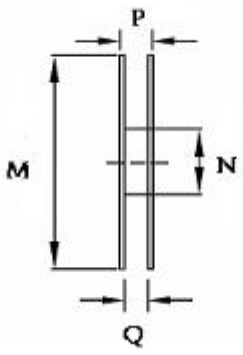
A	B	C	D	E	F	G	H	J	K	t
1.39	1.79	8.0	3.5	1.75	4.0	2.0	4.0	1.55	0.45	0.25

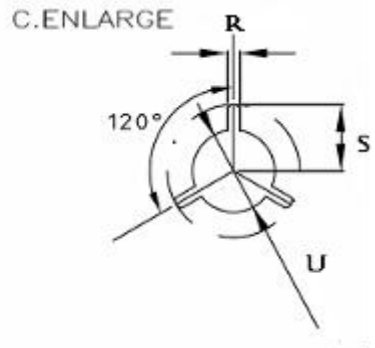
REMARK：



※ Quantity: 3,000 pcs/reel







M	N	P	Q	R	S	U
178.0	60.2	11.5	8.0	2.5	11.0	13.0

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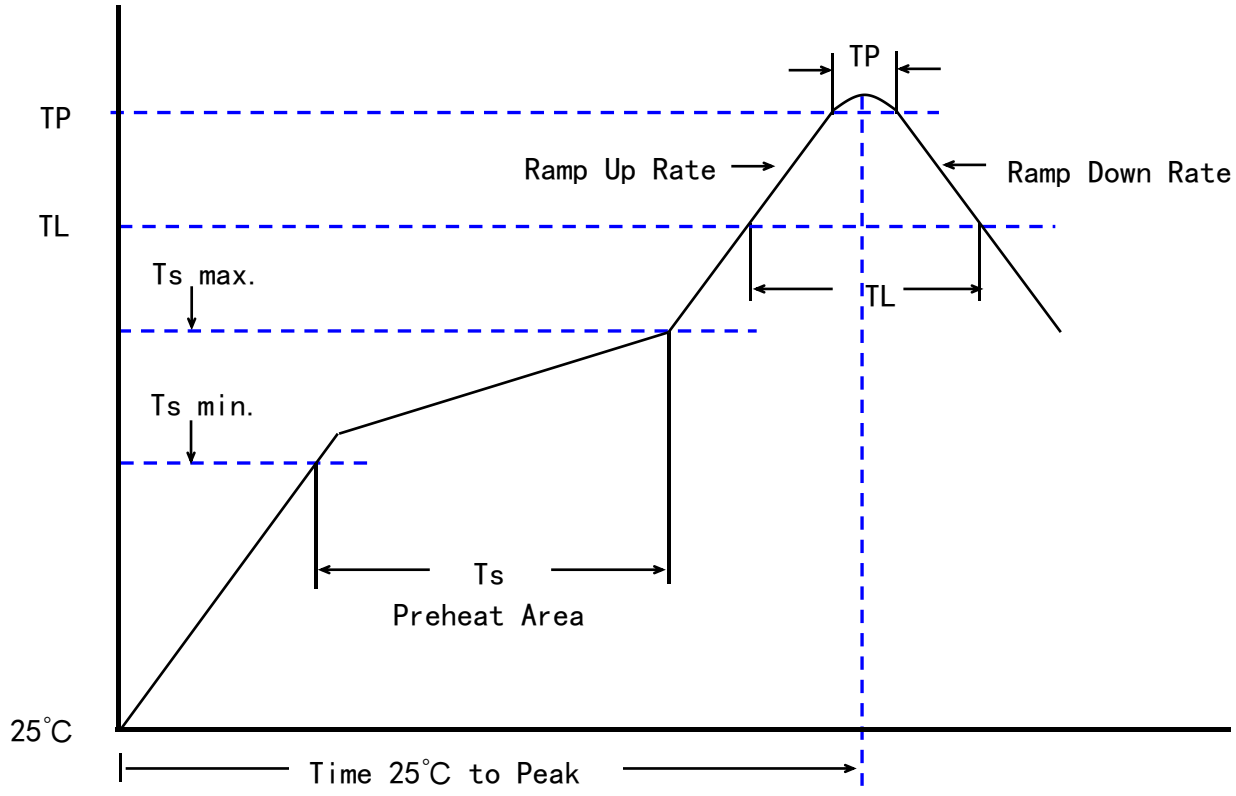
7. REFLOW SOLDERING PROFILE

Reference：JEDEC J-STD-020D	
Profile Parameter	**Pb-Free Assembly**
Preheat/Soak Temperature Min. (Ts min.) Temperature Max. (Ts max.) Time (Ts) from (Ts min. to Ts max.)	 150℃ 200℃ 60-120 seconds
Ramp-up rate (TL to TP)	3℃/second max.
Liquidus temperature (TL) Time maintained above TL	217℃ 60-150 seconds
Peak/Classification Temperature (TP)	260±5℃
Time within 5℃ of actual Peak Temperature (TP)	20~40 seconds
Ramp-down rate (TP to TL)	6℃/second max.
Time from 25 °C to peak temperature	8 minutes max.
Suggest reflow times	3 Times max.



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8. RELIABILITY SPECIFICATION

Reference: JIS C 6701			
NO.	ITEM	CONDITIONS	Criteria
1	High Temperature	Samples shall be stored at 125±2℃ for 1000±12h. Electrical parameters shall be measured by 250B within 24h after conditioning for more than 2h at room temperature(25±2℃). If the customer's required temperature range exceeds the standard range, the test shall be conducted under the customer-specified conditions.	B, C
2	Low Temperature	Samples shall be stored at -40 ± 2℃ for 500 ±12h. Electrical parameters shall be measured using an S&A 250B within 24h after conditioning for more than 2h at room temperature(25±2℃). If the customer's required temperature range exceeds the standard range, the test shall be conducted under the customer-specified conditions.	A, C
3	High Temperature & Humidity	Stored at 85±2℃ and humidity 85% for 1000±12h. The characteristic parameters of 250B must be tested in 24h after conditioning for more than 2h at room temperature(25±2℃).	B, C, D
4	Temperature Shock	The crystal unit should undergo 100 temperature shocks, and then be left to stand at room temperature (25±2℃) for at least 2 hours and tested at 250B within 24 hours. The conditions for each temperature shock are as follows: 1. Last for 2~3 minutes at a temperature of -40+0/-6 ℃ 2. Last for 30±3 minutes at a temperature of 25 ℃±2℃ 3. Last for 30±3 minutes at a temperature of 125+4/-0 ℃ 4. Last for 2~3 minutes at a temperature of 25 ℃±2℃	A, C
5	Solderability	The lead is immersed in a 245±5℃ solder bath within 2±0.6 seconds.	G

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6	Fine Leak	Helium bombing 5.0~5.5 Kgf/cm²,for 2 hours.	F
7	Resistance to Soldering Heat	3 reflows,the maximum temperature & time is 260℃±5℃, 15±5 seconds. The characteristic parameters of 250B must be tested in 24h after conditioning for more than 4h at room temperature(25±2℃).	A, C
8	Free Fall	Fall freely from a height of 150cm three times onto a cement slab.	A, C
9	Vibration	Frequency Range：10~55Hz Amplitude (total excursion)：The scanning frequency is 0.75oct/min, and the peak acceleration is 5g. Sweep time：3 direction(x, y, z) each for 2 hours.	A, C
10	Mechanical Shock	100g,6ms, half sine shock pulse, 6 axis*3 times	A, C

SPECIFICATIONS		
A	Frequency change permitted.	ΔF ≤ 5 ppm
B	Frequency change permitted.	ΔF ≤ 10 ppm
C	Equivalent series resistance change permitted.	ΔCI ≤ 5 Ω or 15 % of initial value, whichever is larger
D	Insulation resistance	>500 MΩ
E	Pressure gap less than	$< 1 \times 10^{-4}$ Pa·m³/s
F	Leak rate less than	$< 1 \times 10^{-9}$ Pa·m³/s
G	A new uniform coating of solder shall cover a minimum 95% of the surface	

Remark:

※ Each test item shall be performed on separate samples.

※ Measurement condition:Electrical parameters shall be measured using S&A 250B or equivalent tester.

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Notes:

1. Ultrasonic cleaning

General cleaning solutions or ultrasonic cleaning method may be used to clean our products. However, under certain circumstances, ultrasonic cleaning machine could generate resonance at the oscillation frequency of our products and thus deteriorate the electrical characteristics in devices, and even damage the overall structure of devices. Therefore, verification test is recommended before cleaning.

2. Ultrasonic welding

Avoid mounting and processing by ultrasonic welding. This method has a possibility of excessive vibration spreading inside the crystal products and becoming the cause of characteristic deterioration and non-oscillation.

3. Storage Conditions

Storage Temperature is only for the product itself. The storage temperature range for packing material is 5℃~40℃.

4. Prohibited Environments

This product shall not be used in toxic, harmful, or corrosive environments such as mercury, chlorine, sulfur, acid-base environments etc.

5. Application scenario description

TKD products are designed specifically for general and specific electronic applications. Without confirmation, they shall not be used in critical areas beyond expectations, such as space technology, vehicle control, military weapon development, etc., to avoid significant risks to safety, health, property, or society. These products are intended solely for designated applications.There is no additional guarantee for special-purpose applications. If you need products for specific purposes, please consult TKD sales representatives in advance.

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