

改 定 记 录 (REVISION)

版次 Rev	改定日 Date	项目 Item	改定内容 Description of Revision History	改定者 Designer	确认者 Checked By
01	2018/2/28		初版(New Publication)	Raojun	Zhoujian

地址：湖北省随州市经济开发区深圳工业园泰华科技

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China Science and technology

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Version:2.0 Implement Date:2018/01/01

※ 1. 晶体技术参数指标 Index of Crystal Technical Parameters

- | | |
|---|---|
| 1. 频率 Frequency: | 32.000000MHz |
| 2. 型号 Model : | SX-3225 |
| 3. 振荡模式 Oscillation Mode: | Fundamental(AT) |
| 4. 常温频差 Normal Temperature Frequency Tolerance: | $\pm 10\text{ppm at } 25^{\circ}\text{C} \pm 3^{\circ}\text{C}$ |
| 5. 温度频差 Temperature Frequency Tolerance: | $\pm 10\text{ppm at } -20^{\circ}\text{C} \sim +70^{\circ}\text{C}$ |
| 6. 储存温度范围 Storage Temperature Range: | $-55^{\circ}\text{C} \sim +125^{\circ}\text{C}$ |
| 7. 负载 Load Capacitance (CL) : | 9pF |
| 8. 激励功率 Drive Level: | 100uW/Max |
| 9. 静电容 Shunt Capacitance: | 5.0pF MAX |
| 10. 等效电阻 Equivalent Series Resistance: | 40ΩMax. |
| 11. 绝缘阻抗 Insulation Resistance : | 500MΩ min /DC 200V |
| 12. 年老化率 Aging Rate: | $\pm 3\text{ppm /年(Per Year)}$ |
| 13. 包装方式 Packaging: | 卷包 3000PCS/Reel |
| 14. 备注 Remarks: | 镀膜：溅射式镀膜 Plating: Sputter Coated
微调：离子刻蚀 Adjusting: Ion Etching |
| 15.其他 Other: | |

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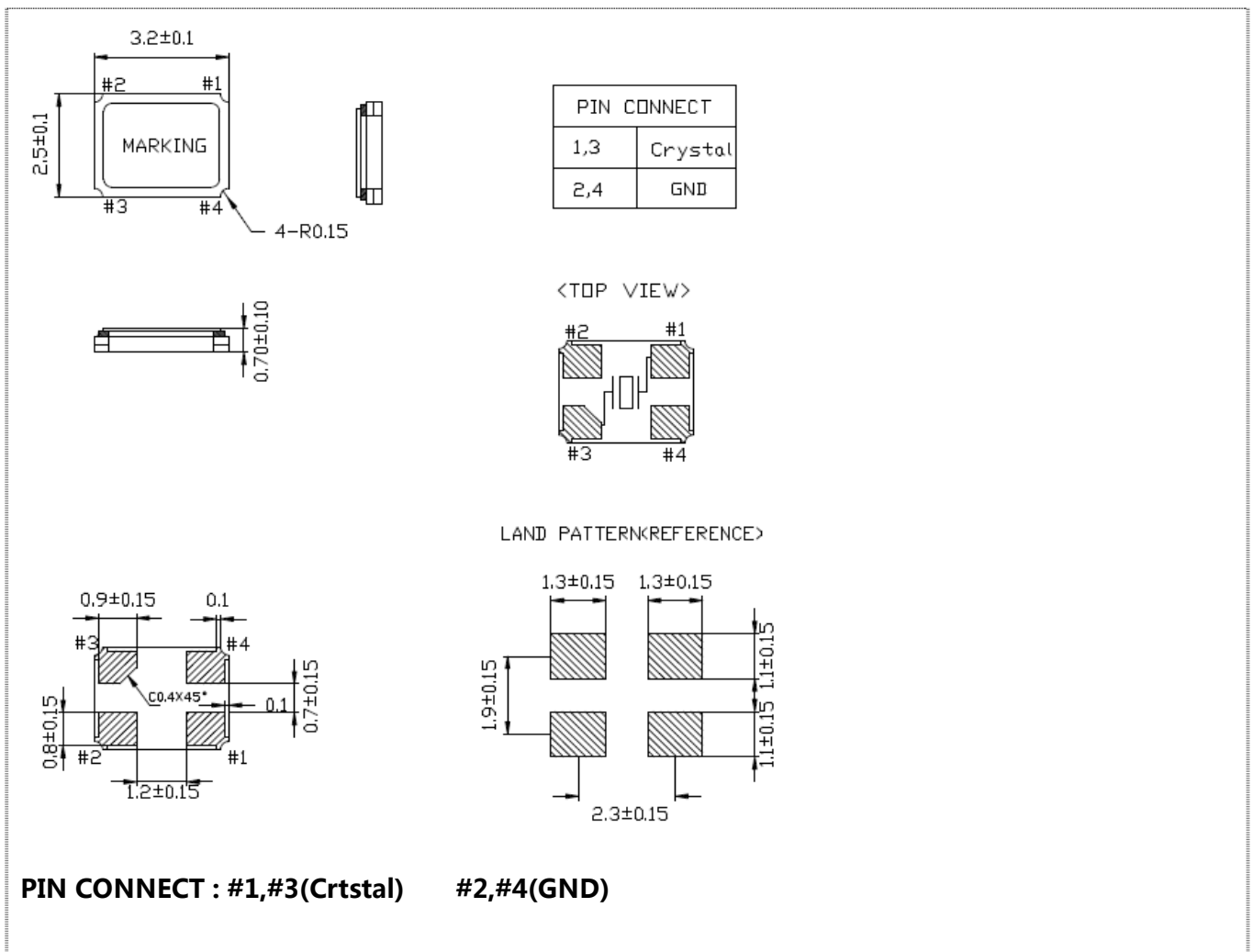
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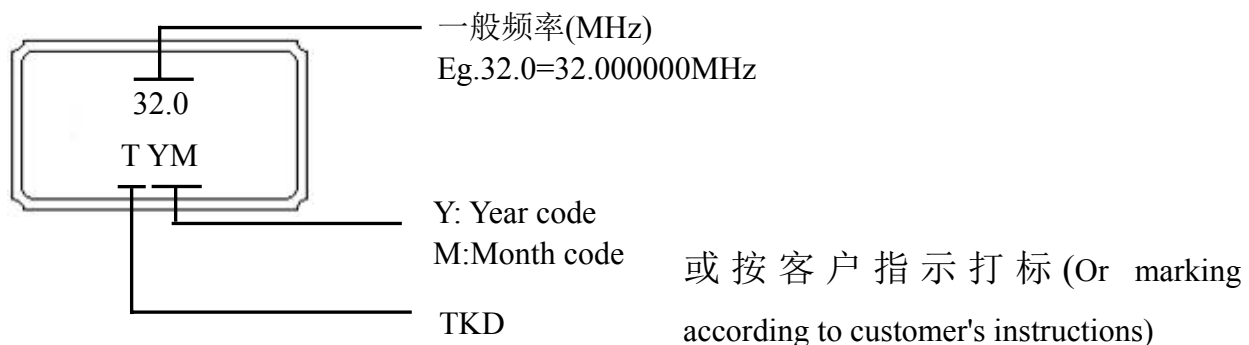
※ 2. 图纸尺寸以及印字说明 Drawing size and Marking Instructions

2.1 图纸尺寸(Dimensions)

Units:mm



2.2 印字说明 Marking(Laser):



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

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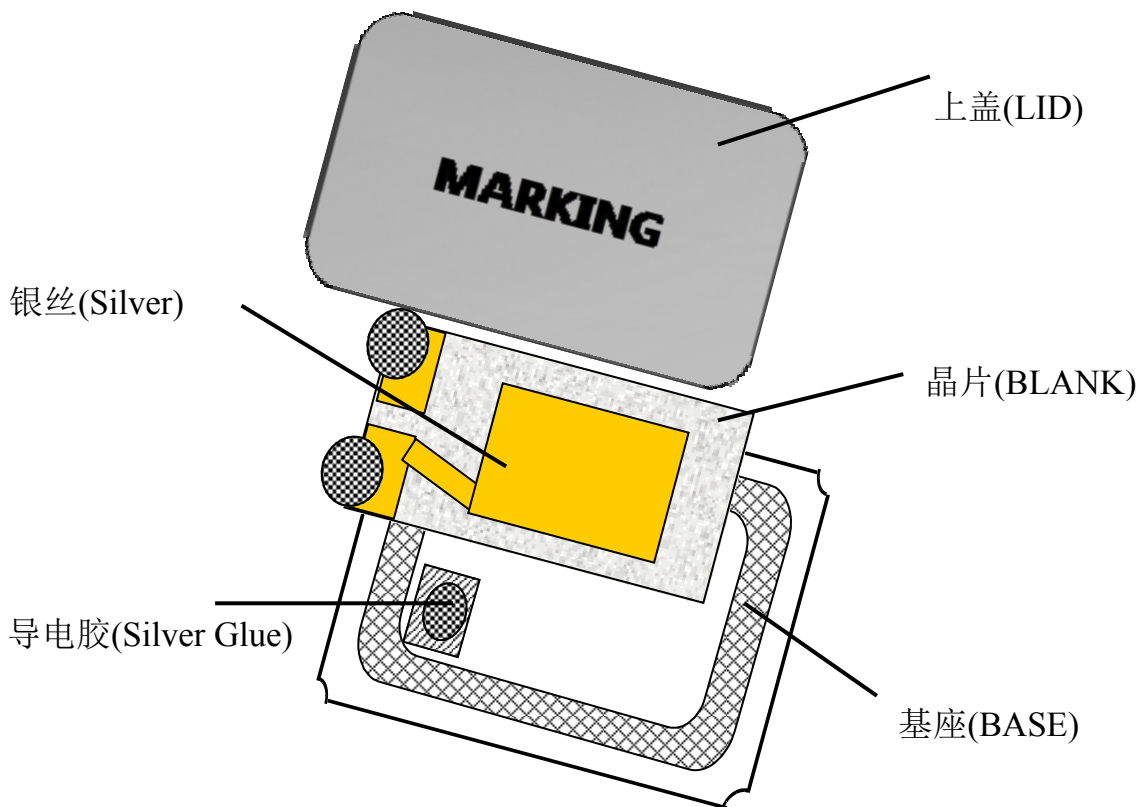
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※ 3. 内部结构以及材料清单 Internal Structure and Material List



序号 No.	部件名称 Part name	主要成份 Substance	部件供应商 Vendor
1	晶片 Blank	二氧化硅 Silicon dioxide	科鑫泰/泰美克 (KXT/TIMEMAKER)
2	基座 Base	陶瓷 Ceramic	CCTC
3	上盖 Lid	银、铜 Ag、Cu	DDYH/NPSJ
4	银层 Silver Electrode	银 Ag	光洋 (SOLAR)
5	导电胶 Silver Glue	树脂、银粉 Resin、silver	藤仓/三健 (FUJIKURA/THREE BOND)

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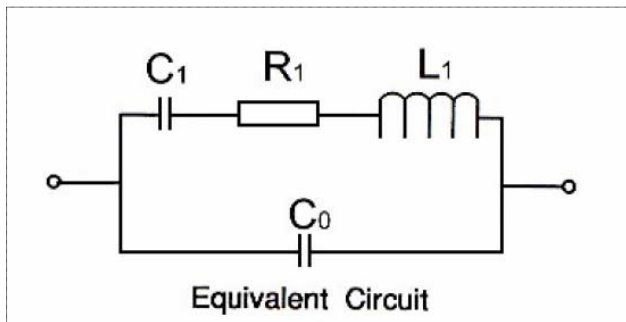
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※ 4. 等效电路原理图 Equivalent Circuit



■注意(Note)

1. 一般的清洗剂或超声波清洗方法可用于清洗我们的产品。
1.General cleaning solutions or ultrasonic cleaning method may be used to clean our products.
然而，在某些情况下，超声波清洗机可能在我们
However, under certain circumstances, ultrasonic cleaning machine could generate resonance at the
的产品振荡频率上产生共振现象，从而使晶体制品的电
oscillation frequency of our products and thus deteriorate the electrical characteristics in devices, and
气特性劣化，甚至损坏晶体制品的整体结构。因此，建
even damage the overall structure of devices. Therefore, verification test is recommended before
议在清洗前进行验证试验。
cleaning.

2. 避免超声波焊接安装和处理，这种方法有可能在晶
2.Avoid mounting and processing by Ultrasonic welding this method has a possibility of an excessive
体内部产生过度的振动，并成为特性劣化和不振荡的原
vibration spreading inside the crystal products and becoming the cause of characteristic deterioration and
因。
not oscillating.

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※ 5. 可靠性试验 Reliability Test

序号 NO.	试验项目 Test Item	试验条件 Condition of Test	标准要求 Performance Requirements
1	跌落 Drop	从75cm位置高度,自由跌落在木板上,连续3次 [Form 75cm height 3 times on 3cm hard wooden floor]	试验前后,频率变化不超过±5ppm,电阻变化不超过±15% (1).Frequency Change:±5ppm (2).Resistance:±15%
2	振动 Vibration	振动频率(Frequency) : 10~55 Hz 全振幅(Amplitude) : 1.5mm±15% 时间(Period) : 每个方位三面(X、Y、Z)各振动2小时[3 direction (x, y, z) each for 2 hrs]	试验前后,频率变化不超过±5ppm,电阻变化不超过±15% (1).Frequency Change:±5ppm (2).Resistance:±15%
3	冷热冲击 Temperature Cycle	晶体放入试验箱中, 高低温循环100次[The crystal is put into the test box, and the high and low temperature cycle is 100 times] 低温为-40±3°C保持30分钟,高温85±2°C保持保持30分钟,高、低温每3分钟变换一次[The low temperature is kept at -40±3°C for 30 minutes, and the high temperature is maintained at 85±2°C for 30 minutes, and the high and low temperature are changed every 3 minutes.] 	试验前后,频率变化不超过±5ppm,电阻变化不超过±15% (1).Frequency Change:±5ppm (2).Resistance:±15%
4	气密性(大漏) Sealing (Gross Leak)	气密检测机(Sealing Check Equipment) 试验压力(Test Pressure):0.2 Mpa	漏率标准(leak rate) : ≤1×10 ⁻⁴ Pa.m ³ /s
5	气密性(细漏) Sealing (Fine leak)	氦气气压标准 : 5~5.5 kgf / cm ² , 氦气加压时间 : 2 小时 [Helium bombing 5~5.5 kgf / cm ² for 2 hours.]	漏率标准(leak rate) : ≤1×10 ⁻⁹ Pa.m ³ /s

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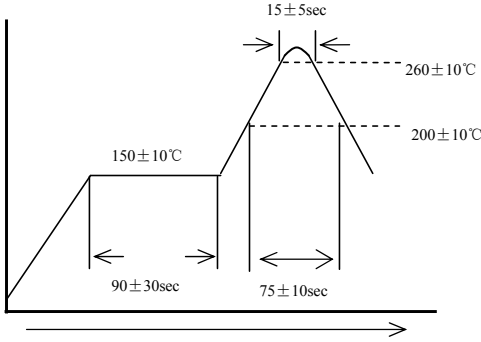
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6	耐焊接热 Resistance to soldering heat	波峰温度(Peak Temp) : $260^{\circ}\text{C} \pm 10^{\circ}\text{C}$ 时间(Time) : $15\text{s} \pm 5\text{sec}$ 	试验前后,频率变化不超过 $\pm 5\text{ppm}$,电阻变化不超过 $\pm 15\%$ (1).Frequency Change: $\pm 5\text{ppm}$ (2).Resistance: $\pm 15\%$
7	沾锡试验 Solder bility	温度(Temperature) : $260^{\circ}\text{C} \pm 10^{\circ}\text{C}$ 浸泡时间(Soaking Time) : $3\text{s} \pm 1\text{sec}$	引脚沾锡后覆盖面积达90%以上[A new uniform coating of solder shall cover min mun 95% of the surface being immersed.]
8	高温高湿 High Temp. & Humidity	温度(Temperature) : $60^{\circ}\text{C} \pm 2^{\circ}\text{C}$ 湿度(Humidity) : 90%~95% 保持时间(Hold time): 500 hours	1. 试验前后,频率变化不超过 $\pm 5\text{ppm}$,电阻变化不超过 $\pm 15\%$ (1).Frequency Change: $\pm 5\text{ppm}$ (2).Resistance: $\pm 15\%$ 2. 制品表面不可生锈[No rust on the surface of the product.]
9	高温试验 High Temperature Storage	高温温度(Temperature) : $85^{\circ}\text{C} \pm 2^{\circ}\text{C}$ 时间(Hold time): 500 hours	试验前后,频率变化不超过 $\pm 5\text{ppm}$,电阻变化不超过 $\pm 15\%$ (1).Frequency Change: $\pm 5\text{ppm}$ (2).Resistance: $\pm 15\%$
10	低温试验 Low Temperature Storage	低温温度(Temperature) : $-40^{\circ}\text{C} \pm 2^{\circ}\text{C}$ 时间(Hold time): 500 hours	试验前后,频率变化不超过 $\pm 5\text{ppm}$,电阻变化不超过 $\pm 15\%$ (1).Frequency Change: $\pm 5\text{ppm}$ (2).Resistance: $\pm 15\%$
11	盐雾 Salt Mist	盐雾浓度 (Salt mist concentration) : 5% 温度(Temperature) : 25°C 时间(Hold time):36 hours	制品表面不可生锈 [No rust on the surface of the product.]

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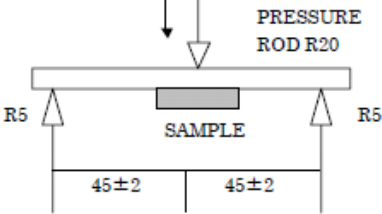
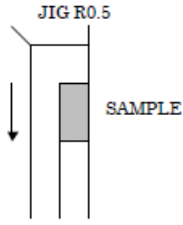
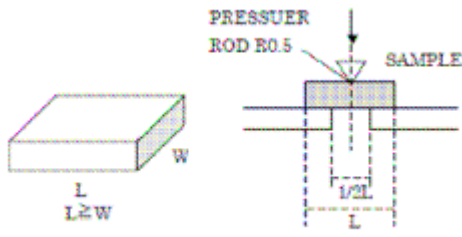
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12	折板弯曲试验 Terminal Strength	高度(Height) : 3mm 时间(Time) : 5sec 速度(Speed) : 0.5mm/sec 	试验前后,频率变化不超过±5ppm,电阻变化不超过±15% 1).Frequency Change:±5ppm (2).Resistance:±15%
13	折板推力试验 Sticking Tendency	荷重(Load) : 10N 时间(Hold time) : 10sec 治具(Tool) : R0.5(制品侧边位置[Side position of product]) 	试验前后,频率变化不超过±5ppm,电阻变化不超过±15% 1).Frequency Change:±5ppm (2).Resistance:±15%
14	本体荷重试验 Element Assembly Strength	荷重(Load) : 10N 时间(Hold time) : 10 sec 治具(Tool) : R0.5(制品中心位置 [Center position of product]) 	试验前后,频率变化不超过±5ppm,电阻变化不超过±15% 1).Frequency Change:±5ppm (2).Resistance:±15%

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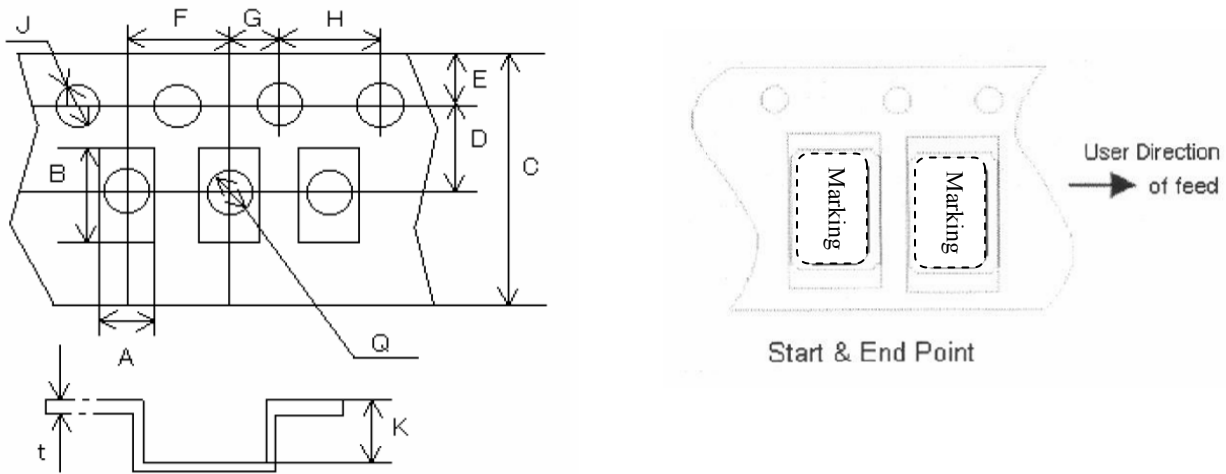
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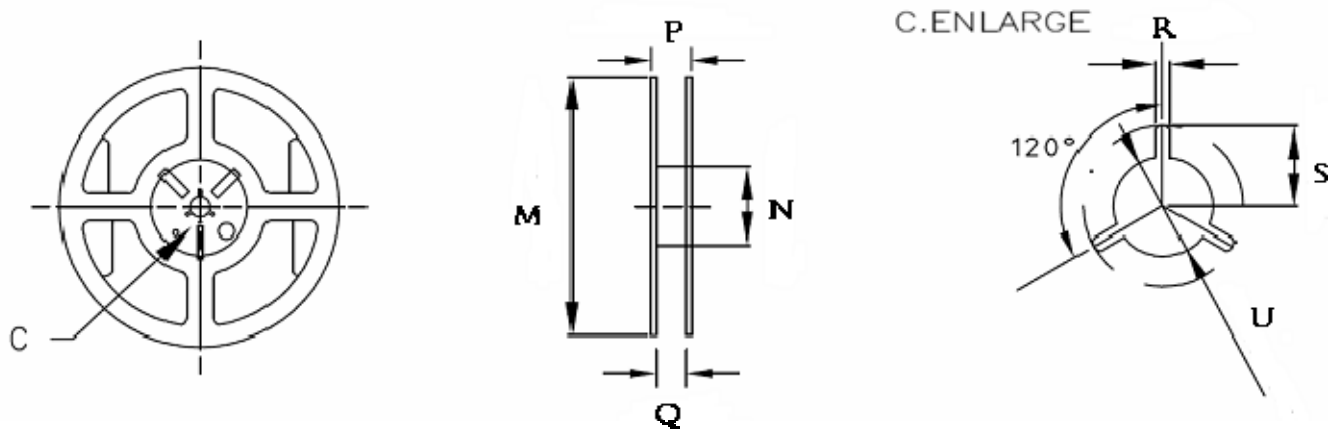
※ 6. 包装方式 Packing Description

6.1 带子尺寸[CARRIER TYPE] (unit:mm)



A	B	C	D	E	F	G	H	J	K	t
2.7	3.4	8.0	3.5	1.75	4.0	2.0	4.0	1.55	1.4	0.25

6.2 卷盘尺寸[REEL] (unit:mm)



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

注[P.S] : 3000PCS/Reel

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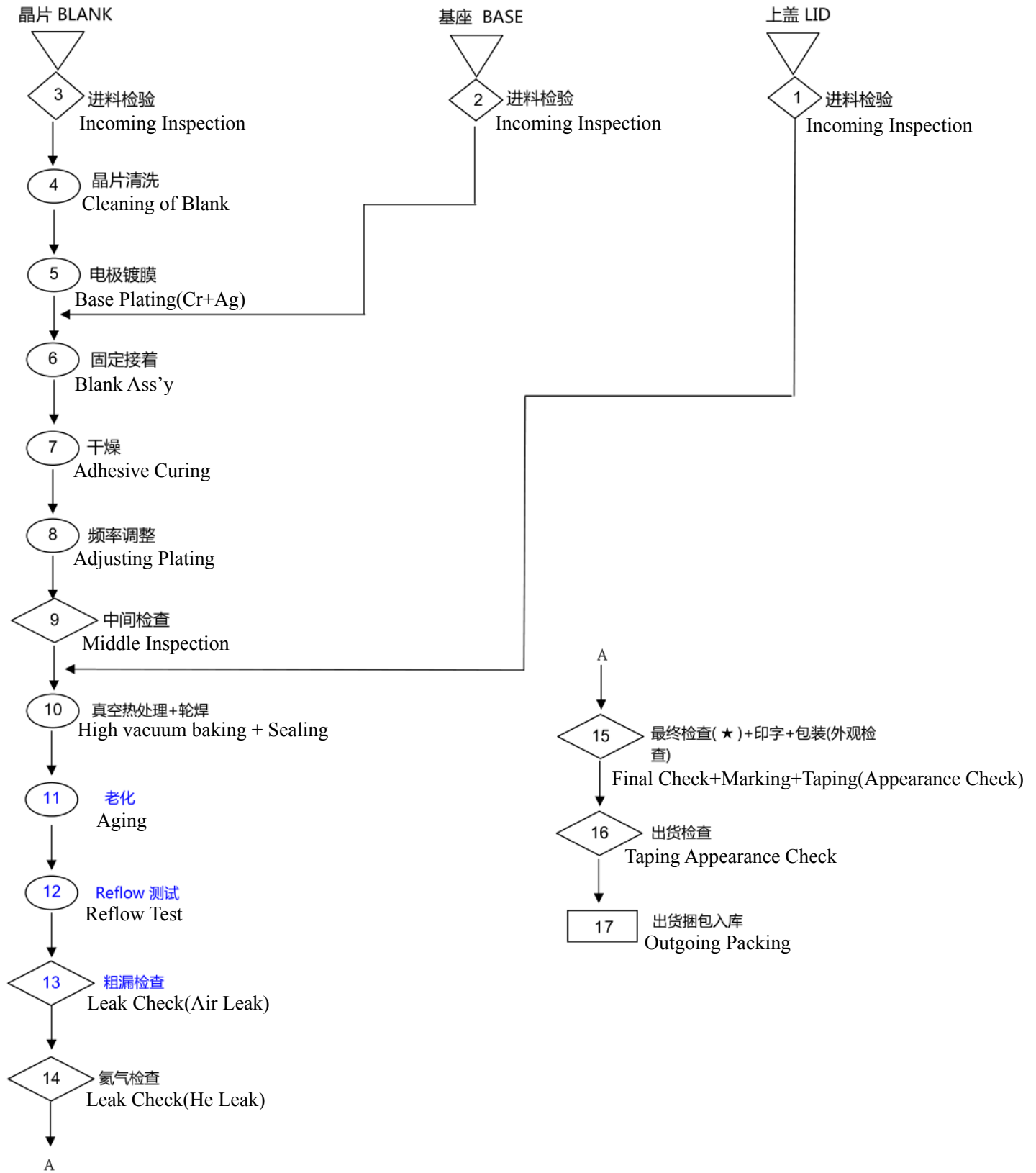
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※ 7. 工艺流程图 Process Flow Chart



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※ 8.样品参数测试数据 Sample Parameter Test Data

Reference Fr:32000000

(Using Measured FL)

Power: 100.00 uW Into 20.0 ohms

PL: 0.00 ohms CL: 9.00 pF

Crystal	First Failure	FR Hz	FL ppm	RR Ohms	RLD2 Ohms	DLD2 Ohms	FDDL ppm	C0 pF	C1 fF	C0/C1	TS ppm/pF	L mH	Q k	FL Hz
High Limit			10.00	40.00	36.00	10.00	5.00	3.00		650.00				
Low Limit			-10.00											
1	PASS	31,993,357.41	-2.27	4.71	4.64	0.35	0.24	1.23	4.20	293.73	20.04	5.90	251.48	31,999,977.36
2	PASS	31,993,229.56	-5.05	5.08	5.00	0.30	0.13	1.22	4.22	289.54	20.18	5.87	232.06	31,999,888.31
3	PASS	31,993,383.16	-0.12	6.49	6.80	0.48	1.42	1.23	4.22	292.33	20.14	5.87	181.72	32,000,046.06
4	PASS	31,993,242.91	-5.42	5.03	4.91	0.35	0.66	1.24	4.21	293.69	20.09	5.88	235.13	31,999,876.65
5	PASS	31,993,303.97	-4.87	5.78	5.80	0.32	0.61	1.25	4.19	297.54	19.96	5.90	205.32	31,999,894.22
6	PASS	31,993,385.39	-2.93	4.79	4.71	0.32	0.55	1.22	4.16	293.22	19.93	5.94	249.24	31,999,956.29
7	PASS	31,993,455.74	-3.70	6.19	6.11	0.34	0.69	1.24	4.11	300.74	19.63	6.01	195.45	31,999,931.65
8	PASS	31,993,161.44	-5.08	4.99	4.88	0.34	0.10	1.23	4.26	288.75	20.35	5.81	234.11	31,999,887.52
9	PASS	31,993,398.12	-3.15	4.77	4.69	0.33	0.58	1.24	4.16	298.23	19.85	5.94	250.52	31,999,949.29
10	PASS	31,993,285.03	-4.15	5.53	5.44	0.37	0.25	1.23	4.21	292.34	20.11	5.88	213.76	31,999,917.08
11	PASS	31,993,231.80	-1.78	6.03	6.41	0.57	1.33	1.23	4.27	286.92	20.44	5.79	192.93	31,999,992.99
12	PASS	31,993,370.00	-2.32	5.05	4.95	0.32	0.47	1.23	4.19	294.17	20.02	5.90	234.70	31,999,975.72
13	PASS	31,993,225.27	-4.25	4.89	4.80	0.33	0.88	1.23	4.23	290.52	20.23	5.85	240.48	31,999,914.15
14	PASS	31,993,117.59	-5.32	5.44	5.35	0.38	0.61	1.24	4.28	288.49	20.45	5.78	213.62	31,999,879.92
15	PASS	31,993,319.66	-3.84	5.08	4.99	0.36	0.52	1.23	4.19	294.04	20.02	5.90	233.62	31,999,927.07
16	PASS	31,993,316.70	-3.17	5.85	5.79	0.34	0.44	1.23	4.21	293.56	20.07	5.88	202.25	31,999,948.64
17	PASS	31,993,194.34	-4.61	5.75	5.66	0.36	0.11	1.23	4.26	289.80	20.32	5.82	203.44	31,999,902.33
18	PASS	31,993,334.74	-0.53	5.82	5.76	0.34	0.67	1.23	4.24	290.65	20.26	5.83	201.57	32,000,032.93
19	PASS	31,993,312.01	-5.86	4.88	4.78	0.33	0.57	1.24	4.16	298.64	19.82	5.95	244.94	31,999,862.56
20	PASS	31,993,237.00	-5.53	7.19	7.19	0.38	0.47	1.22	4.21	290.79	20.14	5.88	164.36	31,999,872.95

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