



福建省长兴电子有限公司

CHANGXING ELECTRONICS CO., LTD.

福建省将乐县东门新村3号

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## 石英晶体谐振器产品确认书

Quartz Crystal Resonator Specification For Approval

|                     |                             |
|---------------------|-----------------------------|
| 产品型号:               | Glass5032 2PIN 12.000000MHz |
| Model               |                             |
| 客户名称:               |                             |
| Customer            |                             |
| 客户编号:               |                             |
| Customer's Part No. |                             |
| 长兴编号:               | 9ASC120G0020L               |
| Product No.         |                             |
| 发行日期:               |                             |
| Issue Date          |                             |

承办: 吴丽萍

审核: 林东国

批准: 杨启付

内容:

- 1、Features 特点
- 2、Electrical Specifications 电气参数
- 3、Dimensions 外型尺寸
- 4、Marking 印码
- 5、Reflow Condition 回流焊条件
- 6、Packing 包装 (EIA-481-2)
- 7、Reliability Specifications (可靠性规范)
- 8、Material Composition Declaration (产品物质成分表)

客户 Conclusion:

☐ Conditional Approval ☐ Full Approval ☐ Reject

|                  |  |
|------------------|--|
| 会<br>签<br>意<br>见 |  |
|------------------|--|

APPROVED BY :

ISSUED DATE :

## 5.0x3.2x1.2mm SMD Glass Sealing Crystals / 9A Series

### ■ Features 特点

- . 2 pads SMD glass sealed crystal units.
- . High reliable environmental performance.
- . Tight tolerance and stability parts are available.
- . Designed for automatic mounting and reflow soldering.
- . Reasonable cost and good delivery performance.
- . The best choice of portable PC, PDA, DSC, and USB interface card.
- . Contains Pb in sealing glass exempted by RoHS directive.

### ■ Electrical Specifications 电气参数

#### Standard atmospheric conditions

Unless otherwise specified, the standard range of atmospheric conditions for making measurement and tests are as follow:

Ambient temperatu:  $22 \pm 5^{\circ}\text{C}$

Relative humidity : 40%~70%

If there is any doubt about the results, measurement shall be made within the following limits:

Ambient temperatu:  $22 \pm 1^{\circ}\text{C}$

Relative humidity : 40%~70%

#### Measure equipment

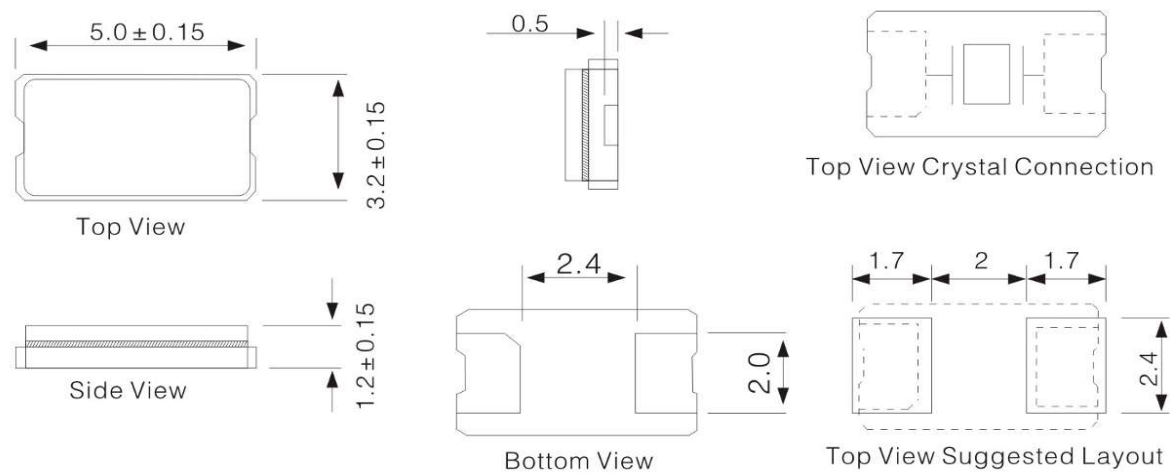
Electrical characteristics measured by HP E5100A or equivalent.

#### Crystal cutting type

The crystal is using AT CUT (thickness shear mode).

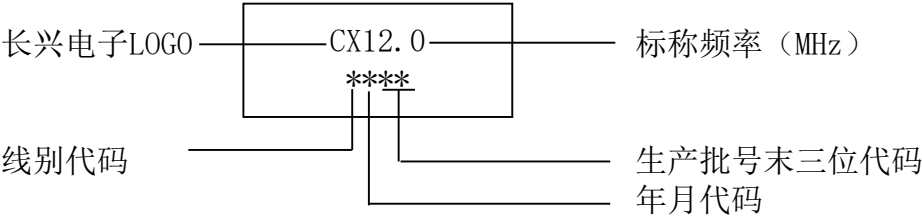
|    | Parameters                | Electrical Spec. | UNITS              | Notes                                                                                                                                |
|----|---------------------------|------------------|--------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| 1  | Nominal Frequency         | 12.000000        | MHz                | -                                                                                                                                    |
| 2  | Oscillation Mode          | Fund             | -                  | -                                                                                                                                    |
| 3  | Load Capacitance          | 20               | pF                 | -                                                                                                                                    |
| 4  | Frequency Tolerance       | $\pm 10$         | ppm                | at $25^{\circ}\text{C} \pm 3^{\circ}\text{C}$                                                                                        |
| 5  | Frequency Tolerance       | $\pm 30$         | ppm                | Over Operating Temp. Range                                                                                                           |
| 6  | Operating Temperature     | $-40 \sim +85$   | $^{\circ}\text{C}$ | -                                                                                                                                    |
| 7  | Aging                     |                  | ppm                | 1st Year                                                                                                                             |
| 8  | Drive Level               | 100              | uW                 | -                                                                                                                                    |
| 9  | Effective Resistance Rr   | 40 Max.          | $\Omega$           | -                                                                                                                                    |
| 10 | Shunt Capacitance C0      | 5 Max.           | pF                 | -                                                                                                                                    |
| 11 | Motional Capacitance C1   | -                | fF                 | -                                                                                                                                    |
| 12 | Pulling Sensitivity TS    | -                | ppm/pF             | -                                                                                                                                    |
| 13 | Spurious Response         | -3.0             | dB                 | -1000~+5000 ppm 125 步                                                                                                                |
| 14 | Insulation Resistance     | 500 Min.         | M $\Omega$         | at DC 100V                                                                                                                           |
| 15 | Storage Temperature Range | $-55 \sim +125$  | $^{\circ}\text{C}$ | -                                                                                                                                    |
| 16 | RLD2                      | 40 Max.          | $\Omega$           | 0.01~30 $\mu\text{W}$ /15 steps<br>30~100 $\mu\text{W}$ /5 steps<br>100~30 $\mu\text{W}$ /5 steps<br>30~0.01 $\mu\text{W}$ /15 steps |
| 17 | FDDL                      | 10 Max.          | ppm                |                                                                                                                                      |
| 18 | DLD2                      | 10 Max.          | $\Omega$           |                                                                                                                                      |
| 19 | FDDLH                     | 5 Max.           | ppm                |                                                                                                                                      |
| 20 | DLDH2                     | 5 Max.           | $\Omega$           |                                                                                                                                      |
| 21 | DLDF                      | -                | $\Omega$           |                                                                                                                                      |
| 22 | DLD2 (低)                  | -                | $\Omega$           | 0.01~30 $\mu\text{W}$ /15 steps                                                                                                      |
| 23 | Others                    | -                | -                  | -                                                                                                                                    |

■ Dimensions外型尺寸



Units:mm

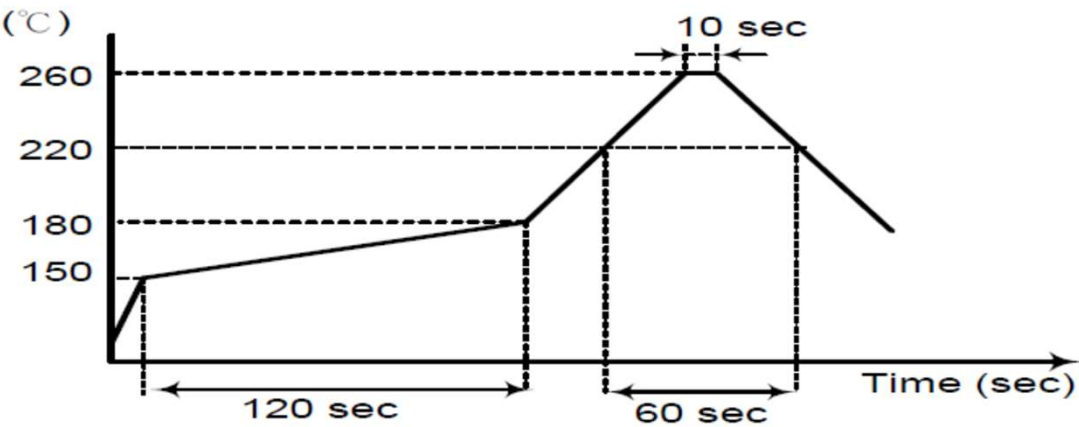
■ Marking印码



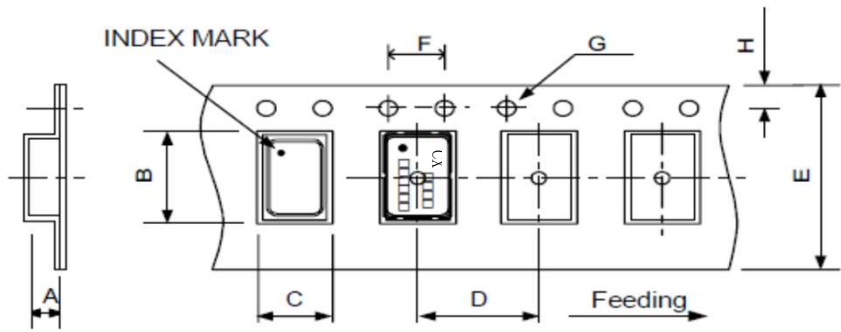
年月代码（四年一个周期）：

| 月份   |      | 一月 | 二月 | 三月 | 四月 | 五月 | 六月 | 七月 | 八月 | 九月 | 十月 | 十一月 | 十二月 |
|------|------|----|----|----|----|----|----|----|----|----|----|-----|-----|
| 年份   |      |    |    |    |    |    |    |    |    |    |    |     |     |
| 2015 | 2019 | a  | b  | c  | d  | e  | f  | g  | h  | j  | k  | l   | m   |
| 2016 | 2020 | n  | p  | q  | r  | s  | t  | u  | v  | w  | x  | y   | z   |
| 2017 | 2021 | A  | B  | C  | D  | E  | F  | G  | H  | J  | K  | L   | M   |
| 2018 | 2022 | N  | P  | Q  | R  | S  | T  | U  | V  | W  | X  | Y   | Z   |

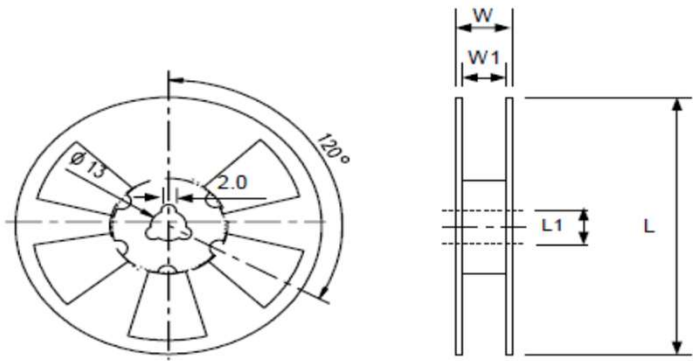
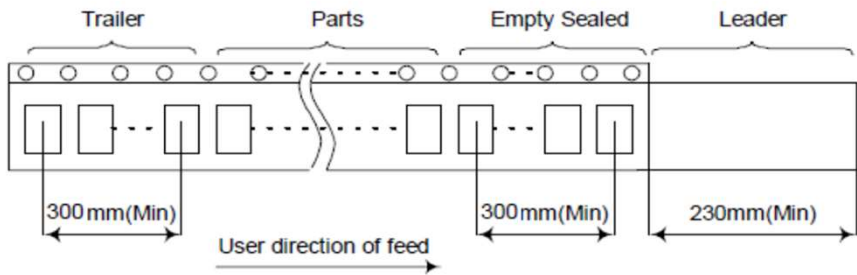
■ Reflow Condition回流焊条件



■ Packing包装 (EIA-481-2)



| DIMENSIONS | A        | B        | C        | D        | E        | F        | G         | H        |
|------------|----------|----------|----------|----------|----------|----------|-----------|----------|
| UNIT : mm  | 1.45±0.1 | 5.40±0.1 | 3.60±0.1 | 8.00±0.1 | 12.0±0.2 | 4.00±0.1 | 1.55±0.05 | 1.75±0.1 |



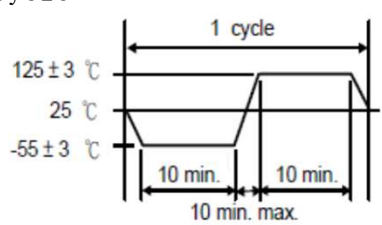
| DIMENSIONS | L       | L1     | W        | W1       | Standard Reel Quantity     |
|------------|---------|--------|----------|----------|----------------------------|
| UNIT : mm  | 180±1.0 | 13±0.5 | 16.5±0.2 | 12.0+1.0 | 1,000 pcs per reel (WHITE) |

■ Reliability Specifications (可靠性规范)

1. Mechanical Endurance (机械耐久性)

| No. | Test Item        | Test Methods                                                                                                                                            | REF. DOC     |
|-----|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| 1.1 | Drop Test        | 75 cm height, 3 times on concrete floor .                                                                                                               | JIS C6701    |
| 1.2 | Mechanical Shock | Device are shocked to half sine wave ( 1000 G ) three mutually perpendicular axes each 3 times. 0.5m sec. duration time                                 | MIL-STD-202F |
| 1.3 | Vibration        | Frequency range 10 ~2000 Hz<br>Amplitude 1.52 mm/20G<br>Sweep time 20 minute<br>Perpendicular axes each test time 4 hours<br>(Total test time 12 hours) | MIL-STD-883E |
| 1.4 | Gross Leak       | Standard Sample For Automatic Gross Leak Detector, Test Pressure: 2Kg / cm <sup>2</sup>                                                                 | MIL-STD-883E |
| 1.5 | Fine Leak        | Helium Bombing 4.5 Kgf / cm <sup>2</sup> for 2 hr                                                                                                       |              |
| 1.6 | Solderability    | Temperature 260 °C ± 5°C<br>Immersing depth 0.5 mm minimum<br>Immersion time 5 ± 1 seconds<br>Flux Rosin resin methyl alcohol solvent ( 1 : 4 )         | MIL-STD-883E |

2. Environmental Endurance (环境耐久性)

| No. | Test Item                    | Test Methods                                                                                                                                                                                                                                                                                                                                                                                                           | REF. DOC     |
|-----|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| 2.1 | Resistance To Soldering Heat | Pre-heat temperature 125 °C<br>Pre-heat time 60 ~ 120 sec.<br>Test temperature 260 ± 5 °C<br>Test time 10 ± 1 sec.                                                                                                                                                                                                                                                                                                     | MIL-STD-202F |
| 2.2 | High Temp. Storage           | + 125 °C ± 3 °C for 1000 ± 12 hours                                                                                                                                                                                                                                                                                                                                                                                    | MIL-STD-883E |
| 2.3 | Low Temp. Storage            | - 40 °C ± 3 °C for 1000 ± 12 hours                                                                                                                                                                                                                                                                                                                                                                                     |              |
| 2.4 | Thermal Shock                | Total 100 cycles of the following temperature cycle<br> <p>The diagram shows a temperature cycle with three levels: 125 ± 3 °C, 25 °C, and -55 ± 3 °C. The cycle consists of a 10 min. dwell at 125 °C, a 10 min. dwell at -55 °C, and a 10 min. max. dwell at 25 °C. The total duration of one cycle is indicated as 1 cycle.</p> | MIL-STD-883E |
| 2.5 | High Temp&Humidity           | 85°C ± 3°C , RH 85% , 1000Hrs                                                                                                                                                                                                                                                                                                                                                                                          | JIS C5023    |

Material Composition Declaration  
材 料 成 份 表

1.PRODUCTION NAME : Glass 5032

2.PRODUCTION WEIGHT(mg) : 52.850

| 编号<br>No.                                    | 构成部件<br>Name of Part | 部件材质名<br>Material Name | 材质质量<br>Material Mass(mg) | 材质质量百分比<br>Mat er i al mass ( % ) | 构成之元素名称<br>Constituent name                      | CAS编号<br>CAS No. | 元素百分比<br>Material Analysis(%) |
|----------------------------------------------|----------------------|------------------------|---------------------------|-----------------------------------|--------------------------------------------------|------------------|-------------------------------|
| 1                                            | 基座<br>Base           | 陶瓷<br>Ceramics         | 25.446                    | 48.15%                            | Al <sub>2</sub> O <sub>3</sub><br>Aluminum oxide | 1344-28-1        | 92.41%                        |
|                                              |                      |                        |                           |                                   | SiO <sub>2</sub><br>Silicon oxide                | 14808-60-7       | 4.30%                         |
|                                              |                      |                        |                           |                                   | Cr <sub>2</sub> O <sub>3</sub><br>Chromium Oxide | 1308-38-9        | 1.51%                         |
|                                              |                      |                        |                           |                                   | MgO<br>Magnesium Oxide                           | 1309-48-4        | 0.69%                         |
|                                              |                      |                        |                           |                                   | CaO<br>Cclcium oxide                             | 1305-78-8        | 1.09%                         |
|                                              |                      | 金属化<br>(Metal)         | 2.142                     | 4.05%                             | W<br>Tungsten                                    | 7440-33-7        | 100.00%                       |
|                                              |                      | 镀层<br>(Plating)        | 0.412                     | 0.78%                             | Au<br>Gold                                       | 7440-57-5        | 17.69%                        |
| Ni<br>Nickel                                 | 7440-02-0            |                        |                           |                                   | 82.31%                                           |                  |                               |
| 2                                            | 外壳<br>Cover          | 陶瓷<br>Ceramic          | 15.248                    | 28.85%                            | Al <sub>2</sub> O <sub>3</sub><br>Aluminum oxide | 1344-28-1        | 84.12%                        |
|                                              |                      |                        |                           |                                   | MnO2<br>Manganese oxide                          | 1313-13-9        | 2.87%                         |
|                                              |                      |                        |                           |                                   | SiO <sub>2</sub><br>Silicon oxide                | 14808-60-7       | 2.87%                         |
|                                              |                      |                        |                           |                                   | TiO2<br>Titanium oxide                           | 13463-67-7       | 5.22%                         |
|                                              |                      |                        |                           |                                   | Cr <sub>2</sub> O <sub>3</sub><br>Chromium oxide | 1308-38-9        | 1.91%                         |
|                                              |                      |                        |                           |                                   | Fe2O3<br>Iron oxide                              | 1309-37-1        | 2.06%                         |
|                                              |                      |                        |                           |                                   | MgO<br>Magnesium oxide                           | 1309-48-4        | 0.48%                         |
|                                              |                      |                        |                           |                                   | Co <sub>3</sub> O <sub>4</sub><br>Cobalt oxide   | 1308-06-1        | 0.48%                         |
|                                              |                      | 玻璃胶<br>Glass           | 7.702                     | 14.57%                            | PbO<br>Lead oxide                                | 1317-36-8        | 57.29%                        |
|                                              |                      |                        |                           |                                   | PbF <sub>2</sub><br>Lead fluorid                 | 7783-46-2        | 19.29%                        |
|                                              |                      |                        |                           |                                   | Bi <sub>2</sub> O <sub>3</sub><br>Bismuth oxide  | 1304-76-3        | 5.30%                         |
|                                              |                      |                        |                           |                                   | Nb <sub>2</sub> O <sub>5</sub><br>Niobium oxide  | 1313-96-8        | 4.30%                         |
|                                              |                      |                        |                           |                                   | B <sub>2</sub> O <sub>3</sub><br>Boron oxide     | 1303-86-2        | 2.30%                         |
|                                              |                      |                        |                           |                                   | ZnO<br>Zinc oxide                                | 1314-13-2        | 2.30%                         |
|                                              |                      |                        |                           |                                   | CuO<br>Copper oxide                              | 1317-38-0        | 1.30%                         |
|                                              |                      |                        |                           |                                   | CaO<br>Cclcium oxide                             | 1305-78-8        | 0.30%                         |
|                                              |                      |                        |                           |                                   | TiO <sub>2</sub><br>Titanium oxide               | 13463-67-7       | 5.30%                         |
| Fe <sub>2</sub> O <sub>3</sub><br>Iron oxide | 1309-37-1            | 2.30%                  |                           |                                   |                                                  |                  |                               |
| 3                                            | 黏合剂<br>Adhesive      | 金属<br>Metal            | 0.340                     | 0.64%                             | Ag<br>Silver                                     | 7440-22-4        | 75.00%                        |
|                                              |                      | 聚合物<br>Polymer         |                           |                                   | 晶态二氧化硅                                           | —                | 5.00%                         |
|                                              |                      |                        |                           |                                   | 石油溶剂<br>Petroleum solvent                        | —                | 5.00%                         |
|                                              |                      |                        |                           |                                   | 有机硅树脂<br>Silicone resin                          | —                | 15.00%                        |
| 4                                            | Blank                | 晶片<br>Quartz           | 1.500                     | 2.84%                             | SiO2<br>Silicon oxide                            | 14808-60-7       | 100.00%                       |
| 5                                            | Electrode            | 电极<br>Electrode        | 0.06                      | 0.11%                             | Cr<br>Chromium                                   | 7440-47-3        | 5.56%                         |
|                                              |                      |                        |                           |                                   | Ag<br>silver                                     | 7440-22-4        | 94.44%                        |

Material Composition Declaration  
材 料 成 份 表

1.PRODUCTION NAME : Glass 5032

2.PRODUCTION WEIGHT(mg) : 52.850

| 编号<br>No.      | 构成部件<br>Name of Part      | 部件材质名<br>Material Name | 材质质量<br>Material Mass(mg) | 材质质量百分比<br>Mat er i al mass ( % ) | 构成之元素名称<br>Constituent name                      | CAS编号<br>CAS No. | 元素百分比<br>Material Analysis(%) |
|----------------|---------------------------|------------------------|---------------------------|-----------------------------------|--------------------------------------------------|------------------|-------------------------------|
| 1              | 基座<br>Base                | 陶瓷<br>Ceramics         | 25.446                    | 48.15%                            | Al <sub>2</sub> O <sub>3</sub><br>Aluminum oxide | 1344-28-1        | 92.41%                        |
|                |                           |                        |                           |                                   | SiO <sub>2</sub><br>Silicon oxide                | 14808-60-7       | 4.30%                         |
|                |                           |                        |                           |                                   | Cr <sub>2</sub> O <sub>3</sub><br>Chromium Oxide | 1308-38-9        | 1.51%                         |
|                |                           |                        |                           |                                   | MgO<br>Magnesium Oxide                           | 1309-48-4        | 0.69%                         |
|                |                           |                        |                           |                                   | CaO<br>Cclcium oxide                             | 1305-78-8        | 1.09%                         |
|                |                           | 金属化<br>(Metal)         | 2.142                     | 4.05%                             | W<br>Tungsten                                    | 7440-33-7        | 100.00%                       |
|                |                           | 镀层<br>(Plating)        | 0.412                     | 0.78%                             | Au<br>Gold                                       | 7440-57-5        | 17.69%                        |
| Ni<br>Nickel   | 7440-02-0                 |                        |                           |                                   | 82.31%                                           |                  |                               |
| 2              | 外壳<br>Cover               | 陶瓷<br>Ceramic          | 15.248                    | 28.85%                            | Al <sub>2</sub> O <sub>3</sub><br>Aluminum oxide | 1344-28-1        | 84.12%                        |
|                |                           |                        |                           |                                   | MnO2<br>Manganese oxide                          | 1313-13-9        | 2.87%                         |
|                |                           |                        |                           |                                   | SiO <sub>2</sub><br>Silicon oxide                | 14808-60-7       | 2.87%                         |
|                |                           |                        |                           |                                   | TiO2<br>Titanium oxide                           | 13463-67-7       | 5.22%                         |
|                |                           |                        |                           |                                   | Cr <sub>2</sub> O <sub>3</sub><br>Chromium oxide | 1308-38-9        | 1.91%                         |
|                |                           |                        |                           |                                   | Fe2O3<br>Iron oxide                              | 1309-37-1        | 2.06%                         |
|                |                           |                        |                           |                                   | MgO<br>Magnesium oxide                           | 1309-48-4        | 0.48%                         |
|                |                           |                        |                           |                                   | Co <sub>3</sub> O <sub>4</sub><br>Cobalt oxide   | 1308-06-1        | 0.48%                         |
|                |                           | 玻璃胶<br>Glass           | 7.702                     | 14.57%                            | PbO<br>Lead oxide                                | 1317-36-8        | 57.29%                        |
|                |                           |                        |                           |                                   | PbF <sub>2</sub><br>Lead fluorid                 | 7783-46-2        | 19.29%                        |
|                |                           |                        |                           |                                   | Bi <sub>2</sub> O <sub>3</sub><br>Bismuth oxide  | 1304-76-3        | 5.30%                         |
|                |                           |                        |                           |                                   | Nb <sub>2</sub> O <sub>5</sub><br>Niobium oxide  | 1313-96-8        | 4.30%                         |
|                |                           |                        |                           |                                   | B <sub>2</sub> O <sub>3</sub><br>Boron oxide     | 1303-86-2        | 2.30%                         |
|                |                           |                        |                           |                                   | ZnO<br>Zinc oxide                                | 1314-13-2        | 2.30%                         |
|                |                           |                        |                           |                                   | CuO<br>Copper oxide                              | 1317-38-0        | 1.30%                         |
|                |                           |                        |                           |                                   | CaO<br>Cclcium oxide                             | 1305-78-8        | 0.30%                         |
|                |                           |                        |                           |                                   | TiO <sub>2</sub><br>Titanium oxide               | 13463-67-7       | 5.30%                         |
|                |                           |                        |                           |                                   | Fe <sub>2</sub> O <sub>3</sub><br>Iron oxide     | 1309-37-1        | 2.30%                         |
|                |                           |                        |                           |                                   | 3                                                | 黏合剂<br>Adhesive  | 金属<br>Metal                   |
| 聚合物<br>Polymer | 晶态二氧化硅                    | —                      | 5.00%                     |                                   |                                                  |                  |                               |
|                | 石油溶剂<br>Petroleum solvent | —                      | 5.00%                     |                                   |                                                  |                  |                               |
|                | 有机硅树脂<br>Silicone resin   | —                      | 15.00%                    |                                   |                                                  |                  |                               |
| 4              | Blank                     | 晶片<br>Quartz           | 1.500                     | 2.84%                             | SiO2<br>Silicon oxide                            | 14808-60-7       | 100.00%                       |
| 5              | Electrode                 | 电极<br>Electrode        | 0.06                      | 0.11%                             | Cr<br>Chromium                                   | 7440-47-3        | 5.56%                         |
|                |                           |                        |                           |                                   | Ag<br>silver                                     | 7440-22-4        | 94.44%                        |