CQT CHINA QUARTZ TECHNOLOGY	质量管理体系文件标准 Quality Management System Documents standard	Number：TE－05－20 版　次：A/0 Revise No.：00 Page：第 1 页 共 10 页
	标 题：晶片外观检验 blank Appearance Inspection	
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1　适用范围：本标准适用于所有出厂晶片的检验和部分工序检验；出厂检验时应按工艺要求选择，工序检验都按Ⅰ级标准进行。

Scope of application: This standard applies to the inspection of all blanks and some process inspections; During outgoing inspection, selection should be made according to process requirements, and process inspections should be carried out according to Level I standards.

2　说明：本标准共分圆片、方片二种；其中方片是指去除籽晶后的方形晶片，包括厚度片和频率片；圆片是指经过改圆加工后圆形晶片，包括厚度片，频率片，腐蚀片和抛光片等。

Description: This standard is divided into two types: round and square; Among them, square blanks refer to square blanks after removing seed crystals, including thickness blanks and frequency blanks; A wafer refers to a circular blank that has undergone rounding processing, including thickness blanks, frequency blanks, etching blanks, and polishing blanks.

3　名词解释 DEFINITION：

3.1　裂痕：在光线下看起来为明亮的点或线，位于晶片的中心或边缘，贯穿于晶片的两表面，见图 1；

Cracks: bright dots or lines that appear under light, located at the center or edge of the chip, running through both surfaces of the chip, as shown in Figure 1;

3.2　缺口：位于晶片的边缘，而没有贯穿晶片只是在晶片一个表面，见图 2；

Chips: Located at the edge of the chip, without penetrating the chip but only on one surface, as shown in Figure 2;

3.3　缺角：专指方片，位于晶片的四角处，贯穿或未贯穿晶片，见图 3；

Missing corner: Refers specifically to a square chip, located at the four corners of the blank, penetrating or not penetrating the blank, as shown in Figure 3;

3.4　崩边：位于晶片的边缘，并贯穿晶片，见图 4；

Edge collapse: located at the edge of the blank and penetrating through the chip, as shown in Figure 4;

3.5　毛边：位于晶片的边缘，较多连续的缺口或崩角，见图 5；

Burr edge: located at the edge of the blank, with many continuous notches or edges, as shown in Figure 5;

3.6　划痕：直线或折线，位于晶片的表面，见图 6；其中**明显划痕**是指在黑色绒布上和光线下肉眼可看到的划痕；

Scratches: straight or broken lines, located on the surface of the blank, as shown in Figure 6; The obvious scratches refer to those visible to the naked eye on black velvet and under light;

3.7　脏片：在黑色绒布上和光线下可看到的表面附有任何污点的晶片；

Dirty blanks: blanks with any stains visible on the surface of black velvet and under light;

4　检验标准 Inspection standards：

4.1　方片：分Ⅰ和Ⅰa 级

Square blanks: divided into Grade I and Grade Ia

4.1.1　Ⅰ级标准　Grade I sandards：

4.1.1.1 标记：分两种标记，见图 8，①倒角：尺寸 C（见图 8-1）应符合工艺要求，并

能准确地分辩；②油漆：颜色符合工艺要求，并无脱落（见图 8-2）；

Marking: There are two types of markings, as shown in Figure 8. ① Chamfer: Size C (as shown in Figure 8-1) should meet the process requirements and be accurately distinguishable; ② Paint: The color meets the process requirements and there is no peeling (see Figure 8-2);

4.1.1.2 裂痕：无任何裂痕，见图 9；

Cracks: No cracks, as shown in Figure 9;

4.1.1.3 缺口、崩边：深入中心的深度不超过 0.2mm，宽度不超过 0.5mm，在同一边不允许两个或以上的该缺口，见图 10、11；

Notch and edge collapse: The depth deep into the center shall not exceed 0.2mm, and the width shall not exceed 0.5mm. Two or more such notches are not allowed on the same side, as shown in Figures 10 and 11;

4.1.1.4 缺角：深入中心的深度不超过 0.3mm，宽度不超过 0.5mm，但不能造成方向标记混淆，见图 12；

Missing corners: The depth into the center shall not exceed 0.3mm, and the width shall not exceed 0.5mm, but shall not cause confusion in the direction markings, as shown in Figure 12;

4.1.1.5 毛边：深入中心的深度不超过 0.1mm，宽度不超过 1mm，见图 13；

Burr edge: The depth of penetration into the center shall not exceed 0.1mm, and the width shall not exceed 1mm, as shown in Figure 13;

4.1.1.6 划痕：不允许存在划痕；

Scratches: Scratches are not allowed;

4.1.1.7 脏片：不允许存在油污等脏物；

Dirty patches: No oil stains or other dirt are allowed

4.1.2 Ⅰa 级标准 Grade Ia standards：

4.1.2.1 标记：分两种标记，见图 8，①倒角：尺寸 C（见图 8-1）应符合工艺要求，并能准确地分辩；②油漆：颜色符合工艺要求，并无脱落（见图 8-2）；

Marking: There are two types of markings, as shown in Figure 8. ① Chamfer: Size C (as shown in Figure 8-1) should meet the process requirements and be accurately distinguishable; ② Paint: The color meets the process requirements and there is no peeling (see Figure 8-2);

4.1.2.2 裂痕：无任何裂痕，见图 9；

Cracks: No cracks, as shown in Figure 9;

4.1.2.3 缺口：深入中心的深度不超过 0.1mm，宽度不超过 0.2mm，见图 14；

Notch: The depth into the center shall not exceed 0.1mm, and the width shall not exceed 0.2mm, as shown in Figure 14;

4.1.2.4 缺角：深入中心的深度不超过 0.15mm，宽度不超过 0.3mm，但不能造成方向标记混淆，见图 15；

Missing corners: The depth into the center shall not exceed 0.15mm, and the width shall not exceed 0.3mm, but shall not cause confusion in the direction markings, as shown in Figure 15;

4.1.2.5 毛边：深入中心的深度不超过 0.05mm，宽度不超过 0.5mm，见图 20、21；

Burr edge: The depth deep into the center shall not exceed 0.05mm, and the width shall not exceed 0.5mm, as shown in Figures 20 and 21;

4.1.2.6 划痕：不允许存在划痕；

Scratches: Scratches are not allowed;

4.1.2.7 脏片：不允许存在手指印、水印和污点等脏物；

Dirty blanks: No dirt such as fingerprints, watermarks, or stains are allowed;

4.2 圆片：分Ⅰ和Ⅰa 级 round blanks: divided into Grade I and Grade Ia

4.2.1 Ⅰ级标准 Grade I sandards：

4.2.1.1 裂痕：无任何裂痕

Cracks: No cracks;；

4.2.1.2 缺口：深入中心的深度不超过 0.2mm，宽度不超过 0.4mm；

Notch: The depth into the center shall not exceed 0.2mm, and the width shall not exceed 0.4mm;

4.2.1.3 崩边：深入中心的深度不超过 0.2mm，宽度不超过 0.4mm，60°范围内 1 个，最多可有 5 个；

Edge collapse: The depth deep into the center shall not exceed 0.2mm, the width shall not exceed 0.4mm, and there shall be one within a 60° range, up to a maximum of five;

4.2.1.4 毛边：深入中心的深度不超过 0.10mm，宽度不超过 0.5mm；

Burr edge: The depth deep into the center shall not exceed 0.10mm, and the width shall not exceed 0.5mm;

4.2.1.5 划痕：不允许存在划痕；

Scratches: Scratches are not allowed;

4.2.1.6 脏片：不允许存在手指印、水印和污点等脏物；

Dirty blanks: No dirt such as fingerprints, watermarks, or stains are allowed;

4.2.2 Ⅰa 级标准 Grade Ia standards：

4.2.2.1 裂痕：无任何裂痕；

Cracks: No cracks;

4.2.2.2 缺口：深入中心的深度不超过 0.15mm，宽度不超过 0.2mm，60°范围内 1 个，最多可有 5 个；

Notch: The depth into the center shall not exceed 0.15mm, the width shall not exceed 0.2mm, and there shall be one within a 60° range, with a maximum of five;

4.2.2.3 崩边：深入中心的深度不超过 0.15mm，宽度不超过 0.2mm；

Edge collapse: The depth deep into the center shall not exceed 0.15mm, and the width shall not exceed 0.2mm;

4.2.2.4 毛边：无毛边；
Burrs: No burrs;
4.2.2.5 划痕：不允许存在划痕，对于非腐蚀晶片和抛光晶片应在腐蚀后检查；
Scratches: Scratches are not allowed. Non corrosive and polished chips should be inspected after corrosion;
4.2.2.6 脏片：不允许存在手指印、水印和污点等脏物；
Dirty films: No dirt such as fingerprints, watermarks, or stains are allowed;

5 抽样标准 Sampling standards:

按照各级标准，缺陷超差的允许数为
According to standards at all levels, the allowable number of defects exceeding the tolerance is

5.1 标记：按 GB2828.1-2003 抽样标准一般水平Ⅱ（加严），AQL=0.4 进行；
Marking: According to GB2828.1-2003 sampling standard general level II (stricter), AQL=0.4;
5.2 裂痕：0 片；
Cracks: 0 pieces;
5.3 缺口：按 GB2828.1-2003 抽样标准一般水平Ⅱ（加严），AQL=0.4 进行；
Gap: According to GB2828.1-2003 sampling standard general level II (stricter), AQL=0.4;
5.4 崩边：按 GB2828.1-2003 抽样标准一般水平Ⅱ（加严），AQL=0.4 进行；
Edge collapse: According to GB2828.1-2003 sampling standard general level II (stricter), AQL=0.4;
5.5 毛边：按 GB2828.1-2003 抽样标准一般水平Ⅱ（加严），AQL=0.4 进行；
Burr edge: According to GB2828.1-2003 sampling standard general level II (stricter), AQL=0.4;
5.6 划痕：0 片
Scratches: 0 pieces
5.7 脏片：按 GB2828.1-2003 抽样标准一般水平Ⅱ（加严），AQL=0.4 进行；
Dirty films: According to the sampling standard GB2828.1-2003, general level II (stricter), AQL=0.4;

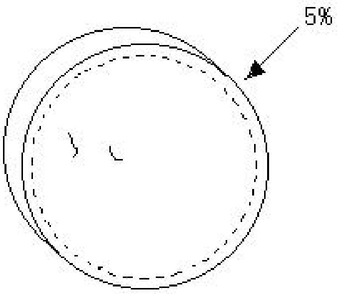


图1：震裂 Cracks

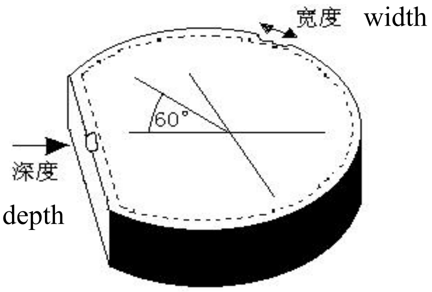


图2：缺口 Chips

width

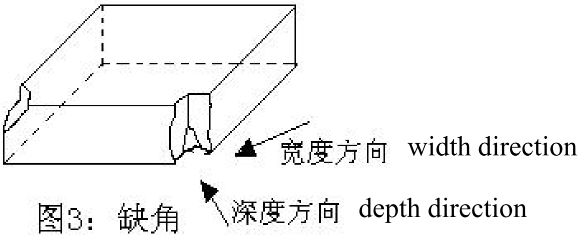


图3：缺角
Missing corner

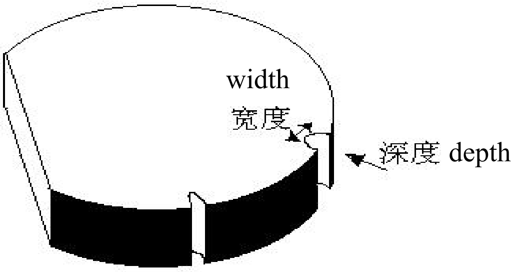


图4：崩边 Edge collapse

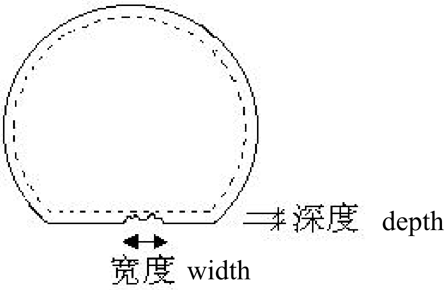


图5：毛边 Burrs

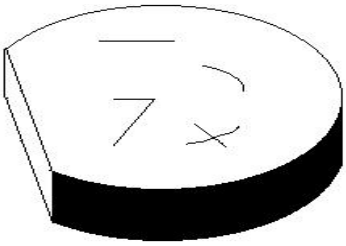


图6：划痕 Scratches

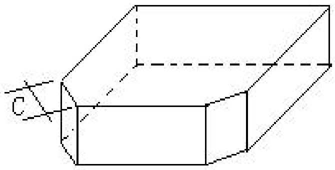


图8-1：倒角标记
Chamfer marking

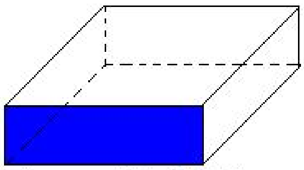


图8-2：油漆标记
Paint marking

图9 裂痕 （Ⅰ级和Ⅰa级标准） **不合格**
Cracks (Grade I & Grade Ia standards) **unqualified**

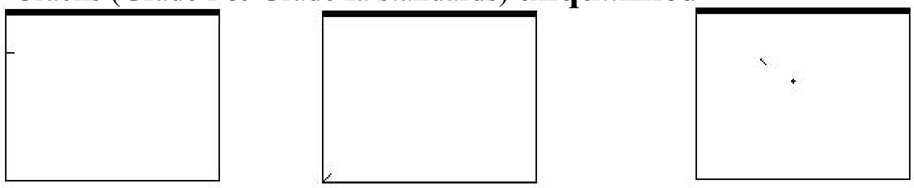


图9-1 边缘存在裂隙 图9-2 四角存在裂隙 图9-3 晶片中心存在裂隙或震点
Figure 9-1 shows cracks at the edges Figure 9-2 shows cracks at the corners
Figure 9-3 shows cracks at the center of the blank

图10 缺口、崩角 （Ⅰ级标准） **合格**

Figure 10 Notch and edge collapse (Grade I standards) Qualified

图10-1 深度≤0. 2mm且宽度≤0. 5mm的缺角或崩边一个

图10-2 深度≤0. 2mm且宽度≤0. 5mm的缺角或崩边每边最多一个

Figure 10-1 depth <=0.2mm and width <=0.5mm notch & edge collapse

Figure 10-2 with one extra depth <=0.2mm and width <=0.5mm notch & edge collapse

Figure 11 Notch and edge collapse (Grade I standards) unqualified

图11 缺口、崩边（Ⅰ级标准）**不合格**

图11-1 深度>0. 20mm或者宽度>0. 50mm

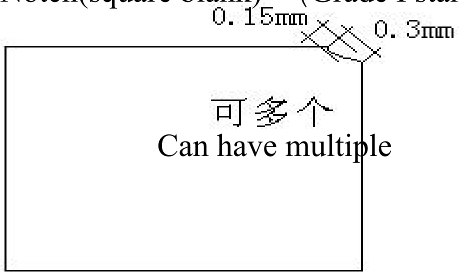
图11-2 深度≤0. 20mm且宽度≤0. 5mm，但个数>4个

Figure 11-1 depth <=0.2mm and width >0.5mm

Figure 11-2 with 4 depth <=0.2mm and width <=0.5mm notch & edge collapse

图12 缺角（方片）（Ⅰ级标准） **合格**

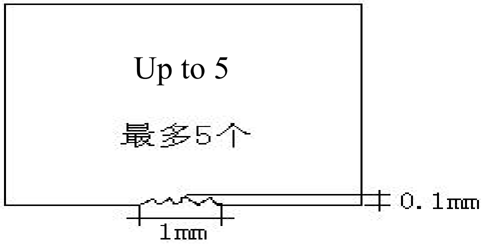
Figure 12 Notch(square blank) (Grade I standards) Qualified



崩边或缺口：深度<0.2mm，宽度<0.4mm 1 个，**合格**

Collapse or notch: 1 piece with a depth of<0.2mm and a width of<0.4mm, qualified

图13 毛边（I 级标准）**合格**
Figure 13 Burr edge (Grade I standards) Qualified



1.4mm one qualified
1.4mm 1 个合格

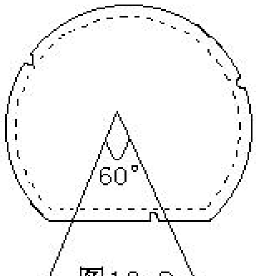


图10-2

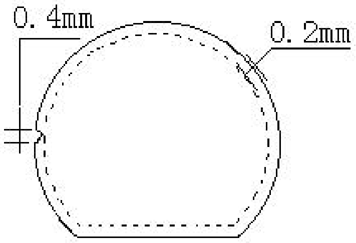


图10-1

崩边或缺口：深度<0.2mm，宽度<0.4mm ,60 ˚ 范围内一个，最多 5 个，**合格**

Collapse or notch: depth<0.2mm, width<0.4mm, one within a 60 ˚ range, up to 5, qualified

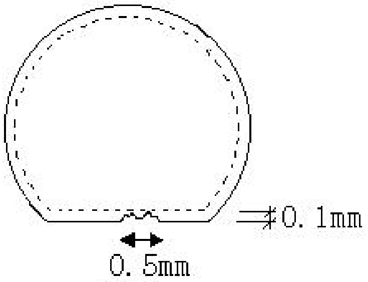


图11

毛边：深度<0.1mm，宽度<0.5mm ,最多 1 个，**合格**

Burr edge: depth<0.1mm, width<0.5mm, maximum of 1, qualified

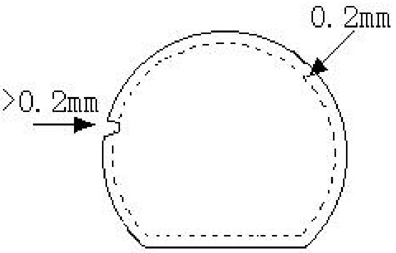


图12

缺角、崩边：深度>0.2mm，**不合格**

Missing corners and broken edges: depth>0.2mm, unqualified

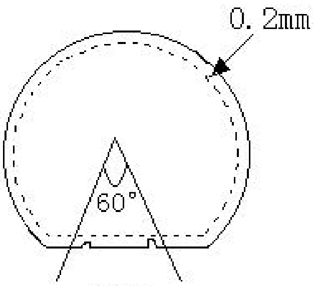


图13

缺角、崩边：60°范围内大于 1 个，**不合格**

Missing corners and edge collapse: more than one within a 60 ° range, unqualified

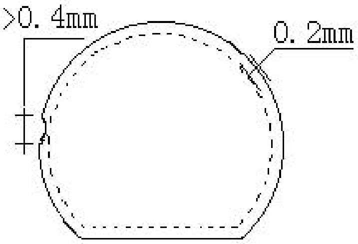


图14

缺角、崩边：宽度>0.4mm，**不合格**

Missing corners and broken edges: width>0.4mm, unqualified

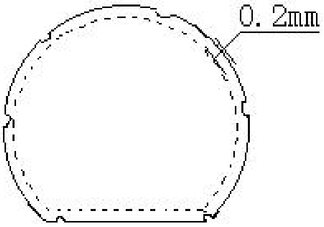


图15

缺角、崩边：数目大于 5 个，**不合格**

Missing corners and broken edges: if the number is greater than 5, it is unqualified

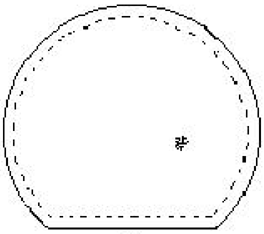


图16

清洁度：晶片表面有水印，油污和手指等，**不合格**

Cleanliness: The surface of the blank has watermarks, oil stains, and fingers, which are unqualified

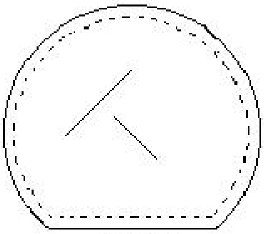


图17

划痕：晶片表面有肉眼可见的划痕，**不合格**

Scratches: Visible scratches on the surface of the blanks, unqualified

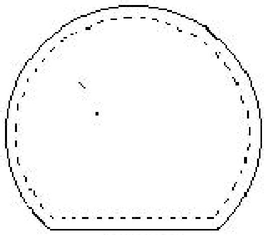


图18

震裂：晶片存在裂隙或震点，**不合格**

Shaking: The chip has cracks or vibration points, which are unqualified

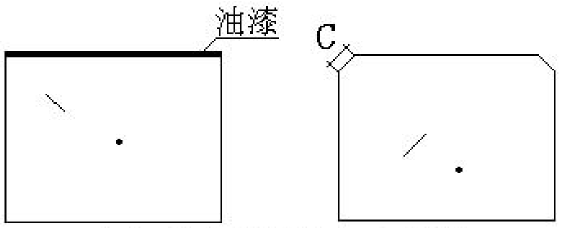


图9 方片Ⅰ级及Ⅰa级标准

裂痕：晶片存在裂隙或震点，**不合格**

Cracks: The chip has cracks or vibration points, which are unqualified