

检测报告

编号: CANEC2211169004

日期: 2022年06月08日 第1页,共17页

客户名称: 乐鑫信息科技(上海)股份有限公司
客户地址: 中国上海张江高科微电子港碧波路690号2号楼204

样品名称: ESP32 模组
型号: ESP32-S3-WROOM-1
客户参考信息: 见备注
以上样品及信息由客户提供。

SGS工作编号: CP22-029349 - GZ
内部编号: 15955737
样品接收日期: 2022年05月27日
检测周期: 2022年05月27日 - 2022年06月07日
检测要求: 根据客户要求检测
检测方法: 请参见下一页
检测结果: 请参见下一页
结论:

基于所送样品进行的检测, 镉、铅、汞、六价铬、多溴联苯(PBBs)、多溴二苯醚(PBDEs)、邻苯二甲酸酯(如邻苯二甲酸二丁酯(DBP)、邻苯二甲酸丁酯(BBP)、邻苯二甲酸二(2-乙基己基)酯(DEHP)和邻苯二甲酸二异丁酯(DIBP))的检测结果显示符合欧盟RoHS指令2011/65/EU附录II的修正指令(EU) 2015/863的限值要求。

通标标准技术服务有限公司广州分公司
授权签名

鄧莎莎

Sasa Zhi 鄧莎莎
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SGS-CSTC Standards Technical Services Co., Ltd.
Guangzhou Branch Testing Center Chemical Laboratory

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检测报告

编号: CANEC2211169004

日期: 2022年06月08日 第2页,共17页

检测结果:

检测样品描述:

| 样品编号 | SGS样品ID | 描述 |
|------|------------------|---------------------|
| SN1 | CAN22-111690.002 | 黑色 "PCB" |
| SN2 | CAN22-111690.003 | 绿色 "PCB" |
| SN3 | CAN22-111690.004 | 白色 "PCB" |
| SN4 | CAN22-111690.005 | "晶振" |
| SN5 | CAN22-111690.006 | "电感" |
| SN6 | CAN22-111690.007 | "电容" |
| SN7 | CAN22-111690.008 | "二极管" |
| SN8 | CAN22-111690.009 | "电阻" |
| SN9 | CAN22-111690.010 | "RF connector/lpex" |
| SN10 | CAN22-111690.011 | 银色金属 |
| SN11 | CAN22-111690.012 | "XMC" |
| SN12 | CAN22-111690.013 | "芯片" |
| SN13 | CAN22-111690.015 | "ESP32-S3" |
| SN14 | CAN22-111690.016 | "ESP32-PICO-V3" |

备注:

- (1) 1 mg/kg = 0.0001%
- (2) MDL = 方法检测限
- (3) ND = 未检出 (< MDL)
- (4) "-" = 未规定

RoHS指令2011/65/EU附录II的修正指令(EU) 2015/863

检测方法: 参考IEC 62321-4:2013+A1:2017, IEC 62321-5:2013, IEC 62321-7-2:2017, IEC 62321-6:2015 和 IEC 62321-8:2017, 采用 ICP-OES, UV-Vis 和 GC-MS 进行分析.

| 检测项目 | 限值 | 单位 | MDL | 002 | 003 | 004 |
|--------------|-------|-------|-----|-----|-----|-----|
| 镉 (Cd) | 100 | mg/kg | 2 | ND | ND | ND |
| 铅 (Pb) | 1,000 | mg/kg | 2 | 16 | 9 | 10 |
| 汞 (Hg) | 1,000 | mg/kg | 2 | ND | ND | ND |
| 六价铬(Cr(VI)) | 1,000 | mg/kg | 8 | ND | ND | ND |
| 多溴联苯之和(PBBs) | 1,000 | mg/kg | - | ND | ND | ND |
| 一溴联苯 | - | mg/kg | 5 | ND | ND | ND |
| 二溴联苯 | - | mg/kg | 5 | ND | ND | ND |



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| 检测项目 | 限值 | 单位 | MDL | 002 | 003 | 004 |
|-----------------------|-------|-------|-----|-----|-----|-----|
| 三溴联苯 | - | mg/kg | 5 | ND | ND | ND |
| 四溴联苯 | - | mg/kg | 5 | ND | ND | ND |
| 五溴联苯 | - | mg/kg | 5 | ND | ND | ND |
| 六溴联苯 | - | mg/kg | 5 | ND | ND | ND |
| 七溴联苯 | - | mg/kg | 5 | ND | ND | ND |
| 八溴联苯 | - | mg/kg | 5 | ND | ND | ND |
| 九溴联苯 | - | mg/kg | 5 | ND | ND | ND |
| 十溴联苯 | - | mg/kg | 5 | ND | ND | ND |
| 多溴二苯醚之和(PBDEs) | 1,000 | mg/kg | - | ND | ND | ND |
| 一溴二苯醚 | - | mg/kg | 5 | ND | ND | ND |
| 二溴二苯醚 | - | mg/kg | 5 | ND | ND | ND |
| 三溴二苯醚 | - | mg/kg | 5 | ND | ND | ND |
| 四溴二苯醚 | - | mg/kg | 5 | ND | ND | ND |
| 五溴二苯醚 | - | mg/kg | 5 | ND | ND | ND |
| 六溴二苯醚 | - | mg/kg | 5 | ND | ND | ND |
| 七溴二苯醚 | - | mg/kg | 5 | ND | ND | ND |
| 八溴二苯醚 | - | mg/kg | 5 | ND | ND | ND |
| 九溴二苯醚 | - | mg/kg | 5 | ND | ND | ND |
| 十溴二苯醚 | - | mg/kg | 5 | ND | ND | ND |
| 邻苯二甲酸二丁酯 (DBP) | 1,000 | mg/kg | 50 | ND | ND | ND |
| 邻苯二甲酸丁苄酯(BBP) | 1,000 | mg/kg | 50 | ND | ND | ND |
| 邻苯二甲酸二(2-乙基己基)酯(DEHP) | 1,000 | mg/kg | 50 | ND | ND | ND |
| 邻苯二甲酸二异丁酯(DIBP) | 1,000 | mg/kg | 50 | ND | ND | ND |

| 检测项目 | 限值 | 单位 | MDL | 005 | 006 | 007 |
|--------------|-------|-------|-----|-----|-----|-----|
| 镉 (Cd) | 100 | mg/kg | 2 | ND | ND | ND |
| 铅 (Pb) | 1,000 | mg/kg | 2 | 7 | 8 | ND |
| 汞 (Hg) | 1,000 | mg/kg | 2 | ND | ND | ND |
| 六价铬(Cr(VI)) | 1,000 | mg/kg | 8 | ND | ND | ND |
| 多溴联苯之和(PBBs) | 1,000 | mg/kg | - | ND | ND | ND |
| 一溴联苯 | - | mg/kg | 5 | ND | ND | ND |
| 二溴联苯 | - | mg/kg | 5 | ND | ND | ND |
| 三溴联苯 | - | mg/kg | 5 | ND | ND | ND |
| 四溴联苯 | - | mg/kg | 5 | ND | ND | ND |
| 五溴联苯 | - | mg/kg | 5 | ND | ND | ND |
| 六溴联苯 | - | mg/kg | 5 | ND | ND | ND |
| 七溴联苯 | - | mg/kg | 5 | ND | ND | ND |
| 八溴联苯 | - | mg/kg | 5 | ND | ND | ND |
| 九溴联苯 | - | mg/kg | 5 | ND | ND | ND |



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| 检测项目 | 限值 | 单位 | MDL | 005 | 006 | 007 |
|-----------------------|-------|-------|-----|-----|-----|-----|
| 十溴联苯 | - | mg/kg | 5 | ND | ND | ND |
| 多溴二苯醚之和(PBDEs) | 1,000 | mg/kg | - | ND | ND | ND |
| 一溴二苯醚 | - | mg/kg | 5 | ND | ND | ND |
| 二溴二苯醚 | - | mg/kg | 5 | ND | ND | ND |
| 三溴二苯醚 | - | mg/kg | 5 | ND | ND | ND |
| 四溴二苯醚 | - | mg/kg | 5 | ND | ND | ND |
| 五溴二苯醚 | - | mg/kg | 5 | ND | ND | ND |
| 六溴二苯醚 | - | mg/kg | 5 | ND | ND | ND |
| 七溴二苯醚 | - | mg/kg | 5 | ND | ND | ND |
| 八溴二苯醚 | - | mg/kg | 5 | ND | ND | ND |
| 九溴二苯醚 | - | mg/kg | 5 | ND | ND | ND |
| 十溴二苯醚 | - | mg/kg | 5 | ND | ND | ND |
| 邻苯二甲酸二丁酯 (DBP) | 1,000 | mg/kg | 50 | ND | ND | ND |
| 邻苯二甲酸丁苄酯(BBP) | 1,000 | mg/kg | 50 | ND | ND | ND |
| 邻苯二甲酸二(2-乙基己基)酯(DEHP) | 1,000 | mg/kg | 50 | ND | ND | ND |
| 邻苯二甲酸二异丁酯(DIBP) | 1,000 | mg/kg | 50 | ND | ND | ND |

| 检测项目 | 限值 | 单位 | MDL | 008 | 009 | 010 |
|----------------|-------|-------|-----|-----|-----|-----|
| 镉 (Cd) | 100 | mg/kg | 2 | ND | ND | ND |
| 铅 (Pb) | 1,000 | mg/kg | 2 | ND | ND | 12 |
| 汞 (Hg) | 1,000 | mg/kg | 2 | ND | ND | ND |
| 六价铬(Cr(VI)) | 1,000 | mg/kg | 8 | ND | ND | ND |
| 多溴联苯之和(PBBs) | 1,000 | mg/kg | - | ND | ND | ND |
| 一溴联苯 | - | mg/kg | 5 | ND | ND | ND |
| 二溴联苯 | - | mg/kg | 5 | ND | ND | ND |
| 三溴联苯 | - | mg/kg | 5 | ND | ND | ND |
| 四溴联苯 | - | mg/kg | 5 | ND | ND | ND |
| 五溴联苯 | - | mg/kg | 5 | ND | ND | ND |
| 六溴联苯 | - | mg/kg | 5 | ND | ND | ND |
| 七溴联苯 | - | mg/kg | 5 | ND | ND | ND |
| 八溴联苯 | - | mg/kg | 5 | ND | ND | ND |
| 九溴联苯 | - | mg/kg | 5 | ND | ND | ND |
| 十溴联苯 | - | mg/kg | 5 | ND | ND | ND |
| 多溴二苯醚之和(PBDEs) | 1,000 | mg/kg | - | ND | ND | ND |
| 一溴二苯醚 | - | mg/kg | 5 | ND | ND | ND |
| 二溴二苯醚 | - | mg/kg | 5 | ND | ND | ND |
| 三溴二苯醚 | - | mg/kg | 5 | ND | ND | ND |
| 四溴二苯醚 | - | mg/kg | 5 | ND | ND | ND |
| 五溴二苯醚 | - | mg/kg | 5 | ND | ND | ND |



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检测报告

编号: CANEC2211169004

日期: 2022年06月08日 第5页,共17页

| 检测项目 | 限值 | 单位 | MDL | 008 | 009 | 010 |
|-----------------------|-------|-------|-----|-----|-----|-----|
| 六溴二苯醚 | - | mg/kg | 5 | ND | ND | ND |
| 七溴二苯醚 | - | mg/kg | 5 | ND | ND | ND |
| 八溴二苯醚 | - | mg/kg | 5 | ND | ND | ND |
| 九溴二苯醚 | - | mg/kg | 5 | ND | ND | ND |
| 十溴二苯醚 | - | mg/kg | 5 | ND | ND | ND |
| 邻苯二甲酸二丁酯 (DBP) | 1,000 | mg/kg | 50 | ND | ND | ND |
| 邻苯二甲酸丁苯酯(BBP) | 1,000 | mg/kg | 50 | ND | ND | ND |
| 邻苯二甲酸二(2-乙基己基)酯(DEHP) | 1,000 | mg/kg | 50 | ND | ND | ND |
| 邻苯二甲酸二异丁酯(DIBP) | 1,000 | mg/kg | 50 | ND | ND | ND |

| 检测项目 | 限值 | 单位 | MDL | 012 | 013 | 015 |
|----------------|-------|-------|-----|-----|-----|-----|
| 镉 (Cd) | 100 | mg/kg | 2 | ND | ND | ND |
| 铅 (Pb) | 1,000 | mg/kg | 2 | ND | ND | ND |
| 汞 (Hg) | 1,000 | mg/kg | 2 | ND | ND | ND |
| 六价铬(Cr(VI)) | 1,000 | mg/kg | 8 | ND | ND | ND |
| 多溴联苯之和(PBBs) | 1,000 | mg/kg | - | ND | ND | ND |
| 一溴联苯 | - | mg/kg | 5 | ND | ND | ND |
| 二溴联苯 | - | mg/kg | 5 | ND | ND | ND |
| 三溴联苯 | - | mg/kg | 5 | ND | ND | ND |
| 四溴联苯 | - | mg/kg | 5 | ND | ND | ND |
| 五溴联苯 | - | mg/kg | 5 | ND | ND | ND |
| 六溴联苯 | - | mg/kg | 5 | ND | ND | ND |
| 七溴联苯 | - | mg/kg | 5 | ND | ND | ND |
| 八溴联苯 | - | mg/kg | 5 | ND | ND | ND |
| 九溴联苯 | - | mg/kg | 5 | ND | ND | ND |
| 十溴联苯 | - | mg/kg | 5 | ND | ND | ND |
| 多溴二苯醚之和(PBDEs) | 1,000 | mg/kg | - | ND | ND | ND |
| 一溴二苯醚 | - | mg/kg | 5 | ND | ND | ND |
| 二溴二苯醚 | - | mg/kg | 5 | ND | ND | ND |
| 三溴二苯醚 | - | mg/kg | 5 | ND | ND | ND |
| 四溴二苯醚 | - | mg/kg | 5 | ND | ND | ND |
| 五溴二苯醚 | - | mg/kg | 5 | ND | ND | ND |
| 六溴二苯醚 | - | mg/kg | 5 | ND | ND | ND |
| 七溴二苯醚 | - | mg/kg | 5 | ND | ND | ND |
| 八溴二苯醚 | - | mg/kg | 5 | ND | ND | ND |
| 九溴二苯醚 | - | mg/kg | 5 | ND | ND | ND |
| 十溴二苯醚 | - | mg/kg | 5 | ND | ND | ND |
| 邻苯二甲酸二丁酯 (DBP) | 1,000 | mg/kg | 50 | ND | ND | ND |
| 邻苯二甲酸丁苯酯(BBP) | 1,000 | mg/kg | 50 | ND | ND | ND |



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| 检测项目 | 限值 | 单位 | MDL | 012 | 013 | 015 |
|-----------------------|-------|-------|-----|-----|-----|-----|
| 邻苯二甲酸二(2-乙基己基)酯(DEHP) | 1,000 | mg/kg | 50 | ND | ND | ND |
| 邻苯二甲酸二异丁酯(DIBP) | 1,000 | mg/kg | 50 | ND | ND | ND |

| 检测项目 | 限值 | 单位 | MDL | 016 |
|-----------------------|-------|-------|-----|-----|
| 镉 (Cd) | 100 | mg/kg | 2 | ND |
| 铅 (Pb) | 1,000 | mg/kg | 2 | 19 |
| 汞 (Hg) | 1,000 | mg/kg | 2 | ND |
| 六价铬(Cr(VI)) | 1,000 | mg/kg | 8 | ND |
| 多溴联苯之和(PBBs) | 1,000 | mg/kg | - | ND |
| 一溴联苯 | - | mg/kg | 5 | ND |
| 二溴联苯 | - | mg/kg | 5 | ND |
| 三溴联苯 | - | mg/kg | 5 | ND |
| 四溴联苯 | - | mg/kg | 5 | ND |
| 五溴联苯 | - | mg/kg | 5 | ND |
| 六溴联苯 | - | mg/kg | 5 | ND |
| 七溴联苯 | - | mg/kg | 5 | ND |
| 八溴联苯 | - | mg/kg | 5 | ND |
| 九溴联苯 | - | mg/kg | 5 | ND |
| 十溴联苯 | - | mg/kg | 5 | ND |
| 多溴二苯醚之和(PBDEs) | 1,000 | mg/kg | - | ND |
| 一溴二苯醚 | - | mg/kg | 5 | ND |
| 二溴二苯醚 | - | mg/kg | 5 | ND |
| 三溴二苯醚 | - | mg/kg | 5 | ND |
| 四溴二苯醚 | - | mg/kg | 5 | ND |
| 五溴二苯醚 | - | mg/kg | 5 | ND |
| 六溴二苯醚 | - | mg/kg | 5 | ND |
| 七溴二苯醚 | - | mg/kg | 5 | ND |
| 八溴二苯醚 | - | mg/kg | 5 | ND |
| 九溴二苯醚 | - | mg/kg | 5 | ND |
| 十溴二苯醚 | - | mg/kg | 5 | ND |
| 邻苯二甲酸二丁酯 (DBP) | 1,000 | mg/kg | 50 | ND |
| 邻苯二甲酸丁苄酯(BBP) | 1,000 | mg/kg | 50 | ND |
| 邻苯二甲酸二(2-乙基己基)酯(DEHP) | 1,000 | mg/kg | 50 | ND |
| 邻苯二甲酸二异丁酯(DIBP) | 1,000 | mg/kg | 50 | ND |

备注:

(1)最大允许极限值引用自RoHS指令(EU) 2015/863。

(2) IEC 62321 系列等同于 EN 62321 系列

https://www.cenelec.eu/dyn/www/f?p=104:30:1742232870351101:::FSP_ORG_ID,FSP_LANG_ID:12586



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检测报告

编号: CANEC2211169004

日期: 2022年06月08日 第7页,共17页

37,25

(3) 2021年7月22号开始, DEHP, BBP, DBP 和 DIBP的限制适用于医疗器械, 包括体外医疗器械, 监控仪表, 包括工业监测和控制仪器。

RoHS指令2011/65/EU附录II的修正指令(EU) 2015/863

检测方法: 参考IEC 62321-4:2013+A1:2017, IEC62321-5:2013, IEC 62321-7-1:2015, 采用 ICP-OES 和 UV-Vis 进行分析。

| 检测项目 | 限值 | 单位 | MDL | 011 |
|--------------|-------|--------------------|------|-----|
| 镉 (Cd) | 100 | mg/kg | 2 | ND |
| 铅 (Pb) | 1,000 | mg/kg | 2 | 33 |
| 汞 (Hg) | 1,000 | mg/kg | 2 | ND |
| 六价铬(Cr(VI))▼ | - | µg/cm ² | 0.10 | ND |

备注:

(1) 最大允许极限值引用自RoHS指令(EU) 2015/863。

(2) IEC 62321 系列等同于 EN 62321 系列

https://www.cenelec.eu/dyn/www/f?p=104:30:1742232870351101:::FSP_ORG_ID,FSP_LANG_ID:1258637,25

(3) ▼=a. 当六价铬的浓度高于0.13 µg/cm²时, 样品为阳性, 即含有六价铬;

b. 当六价铬的浓度为ND(低于0.10 µg/cm²)时, 样品为阴性, 即未检测到六价铬;

c. 当六价铬的浓度介于0.10 µg/cm²与0.13 µg/cm²之间时, 无法直接判定是否检测到六价铬, 因不同个体的样品表面差异可能会影响测定结果;

由于未获知样品的存储条件和生产日期, 样品的六价铬检测结果仅能代表检测时样品含六价铬的状态。

除非另有说明, 参照ILAC-G8:09/2019, 使用简单接受 ($w=0$) 的二元判定规则进行符合性判定。

除非另有说明, 此报告结果仅对检测的样品负责。本报告未经本公司书面许可, 不可部分复制。

检测报告仅用于客户科研、教学、内部质量控制、产品研发等目的, 仅供内部参考。



检测报告

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备注:

ESP32-WROVER, ESP32-WROVER-I, ESP32-WROOM-32D(ESP-WROOM-32D), ESP32-WROOM-32U, ESP32-WROOM-32DC, ESP32-WROOM-32UC, ESP32-SOLO-1, ESP32-SOLO-1C, ESP32-WROOM-32 (ESP-WROOM-32), ESP32-WROVER-B, ESP32-WROVER-IB, ESP32-WROVER-E, ESP32-WROVER-IE, ESP32-WROOM-32E, ESP32-WROOM-32UE, ESP32-WROOM-32SE, ESP-GR(XD), ESP32-GR, RIGEL (W1261889/W1261888), ESP32-DU1906, ESP32-DU1906-U, ESP32-JY-CAM, ESP32-WATG-32D, ESP32-SIG1711P8, ESP-SIG1711P8, ESP-SIG149, ESP32-SIG149, ESP32-for-Haier, ESP32-MINI-PICO-02, ESP32-MINI-PICO-02U, ESP32-S2-MINI-1, ESP32-S2-MINI-1U, ESP32-WROOM32-EF, EK057, ESP32-C3-MINI-1, ESP32-C3-MINI-1U, ESP32-C3-WROOM-02, ESP32-C3-WROOM-02U, ESP32-S3-WROOM-1, ESP32-S3-WROOM-1U, ESP32-S2-WROOM, ESP32-S2-WROOM-I, ESP32-S2-WROVER, ESP32-S2-WROVER-I, ESP32-S2-SOLO, ESP32-S2-SOLO-U, ESP32-PICO-V3-ZERO, W11261889_P, ESP32-SIG1711P8, ESP32-SIG149, ESP32-S3-MINI-1, ESP32-S3-MINI-1U, ESP32-S3-WROOM-2, ESP32-S3-WROOM-2U, ESP32-S2-SOLO-2, ESP32-S2-SOLO-2U, ESP32-S2-MINI-2, ESP32-S2-MINI-2U, ESP8685-WROOM-01, ESP8685-WROOM-03, ESP8685-WROOM-04, ESP8685-WROOM-5, ESP8685-WROOM-06, ESP8685-WROOM-07, ESP8684-MINI-1, ESP8684-MINI-1U, ESP8684-WROOM-01, ESP8684-WROOM-03, ESP8684-WROOM-04, ESP8684-WROOM-05, ESP8684-WROOM-06, ESP8684-WROOM-07, ESP32-WROOM-DA, ESP32-MINI-1, ESP32-MINI-1U, ESP32-C3F5V1, ESP32-Galanz21, ESP32-C3-WIZ2012, ESP32-C3-WIZ149, ESP32-C3-SOLO-1, EK058, ESP32-C3-WROOM-02D, ESP32-C3-WROOM-02UD, ESP32-C2-WROOM-02, ESP32-C2-WROOM-02U



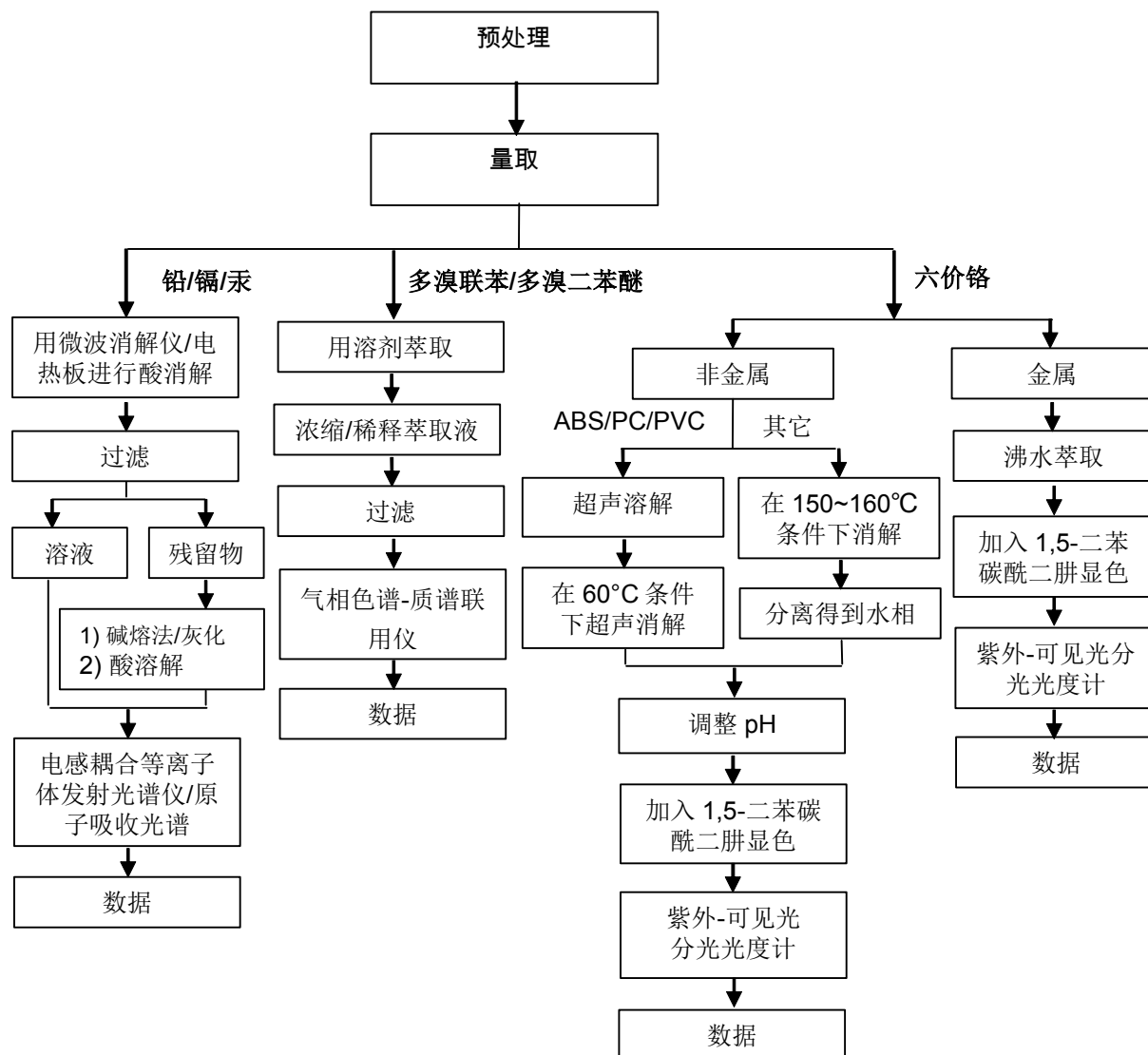
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附件

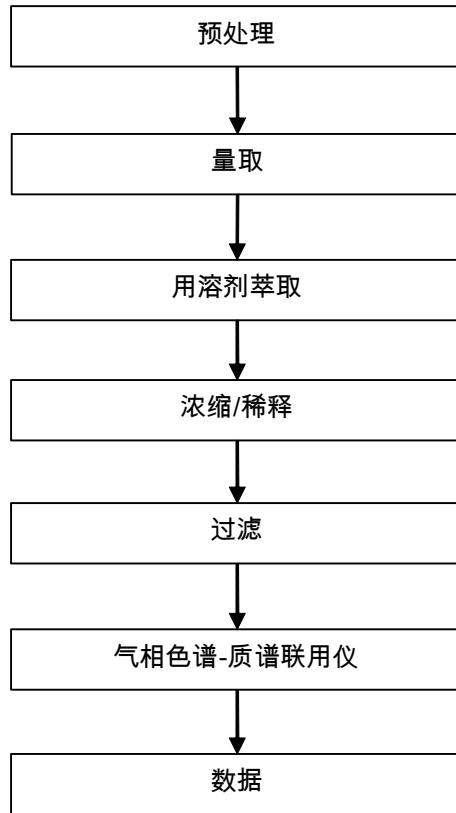
Pb/Cd/Hg/Cr⁶⁺/PBBs/PBDEs 检测流程图

1) 样品按照下述流程被完全消解（六价铬和多溴联苯/多溴二苯醚检测除外）。



附件

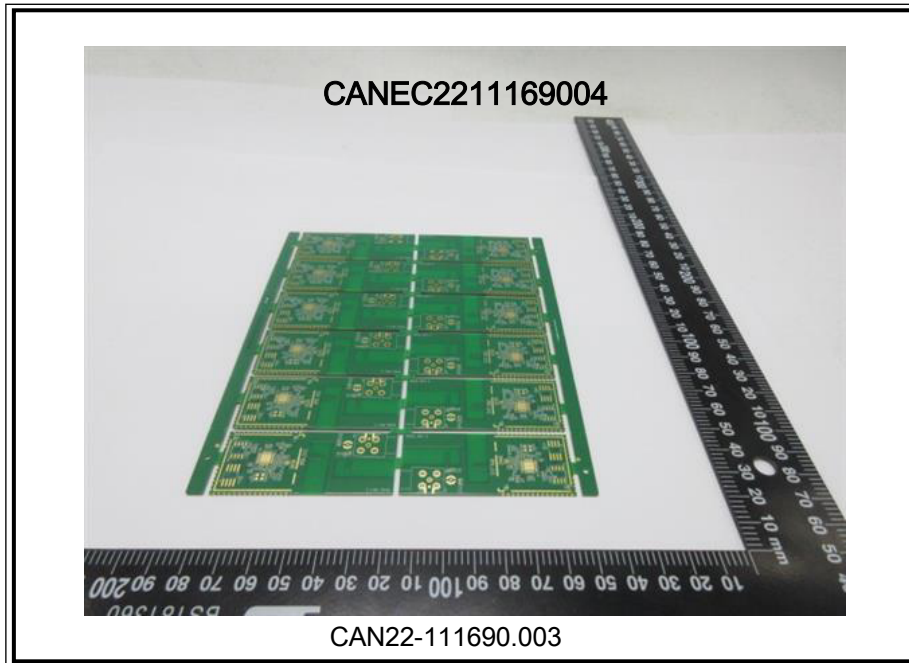
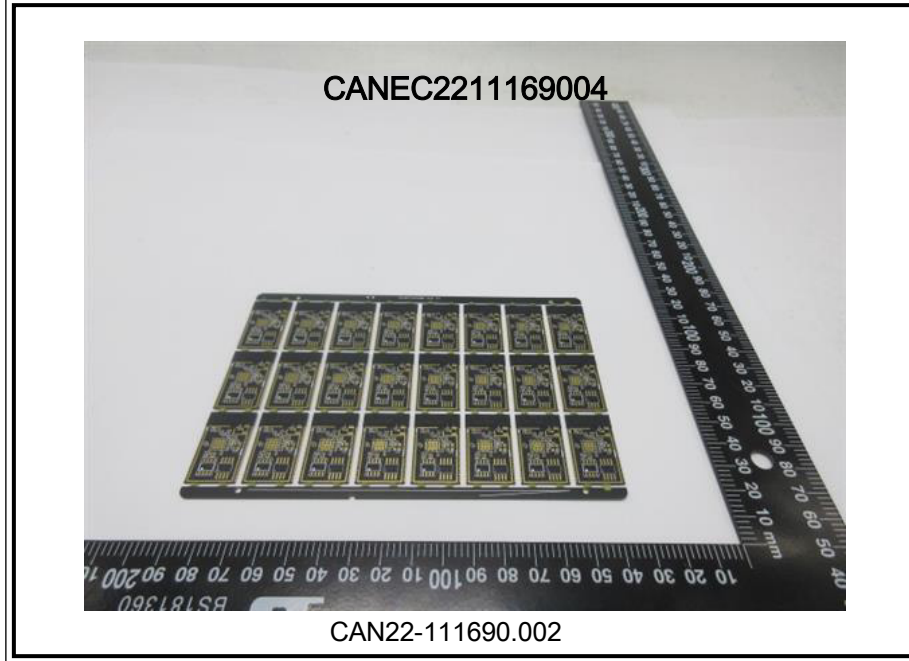
Phthalates 检测流程图

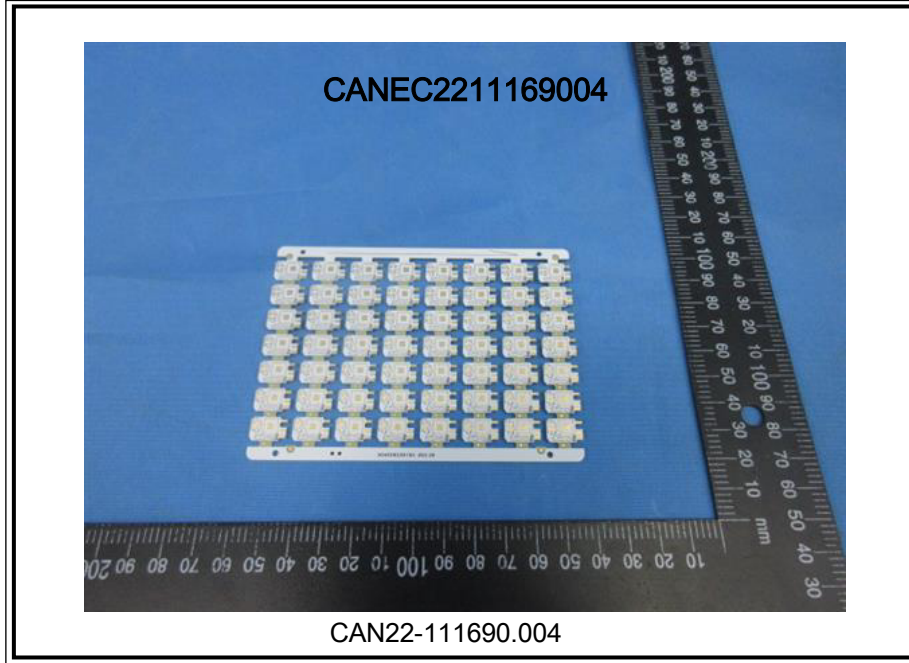


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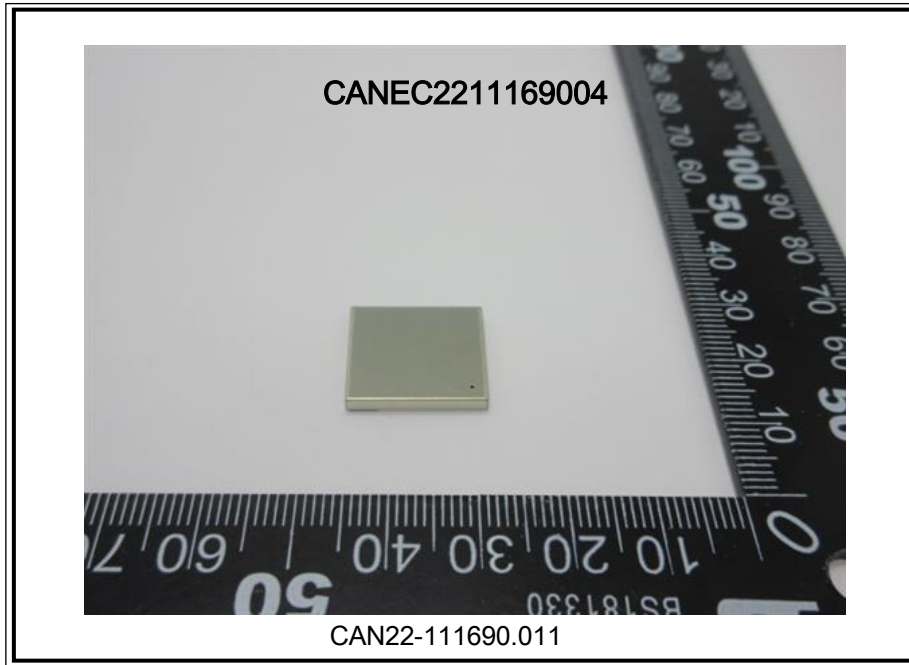
样品照片:

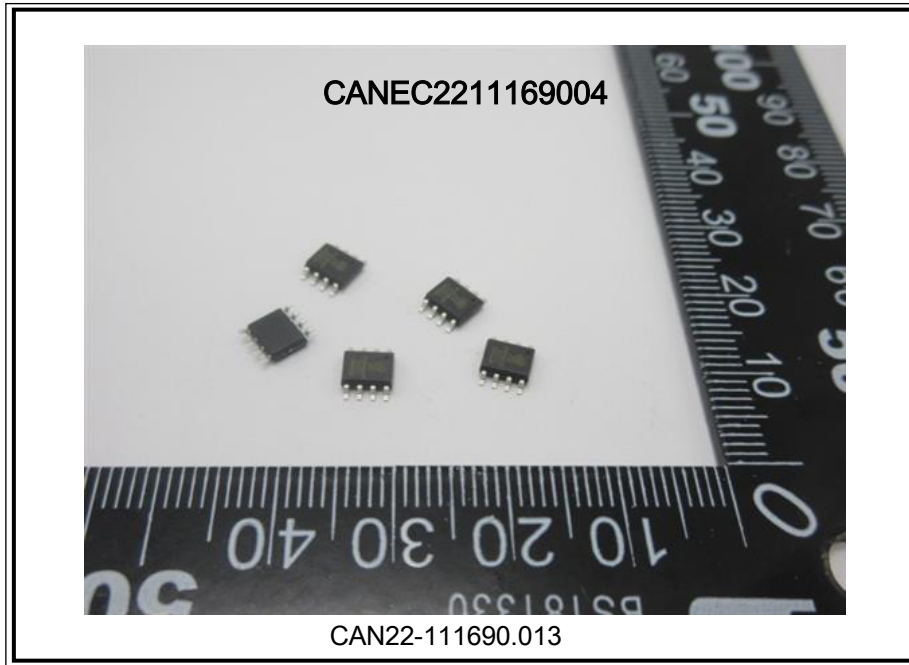
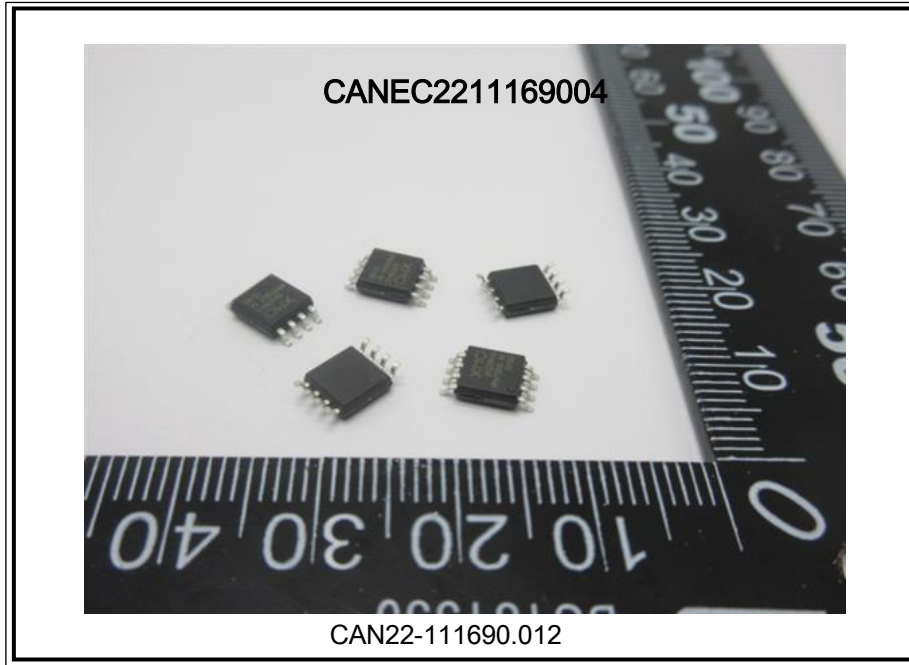


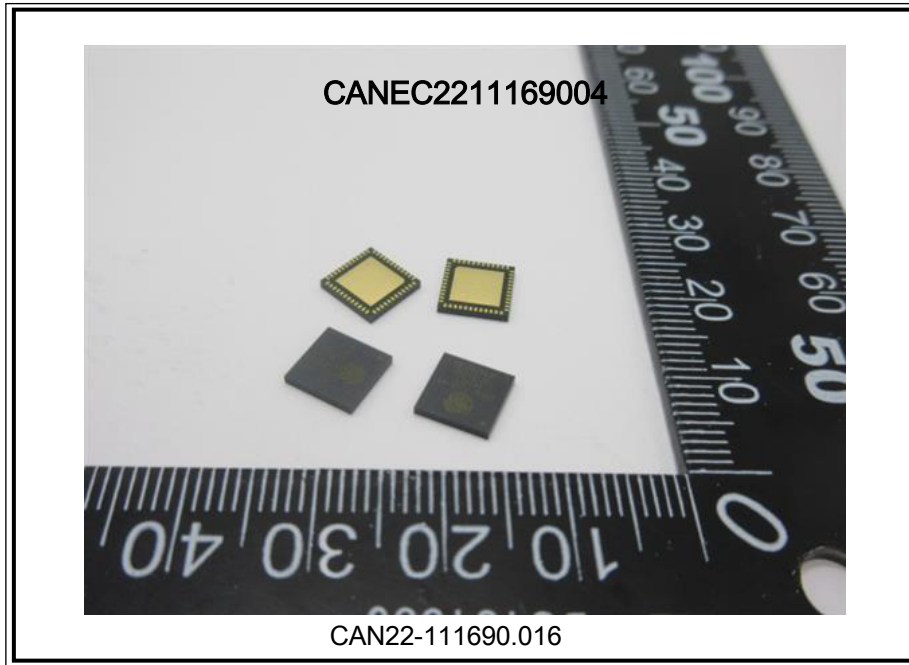
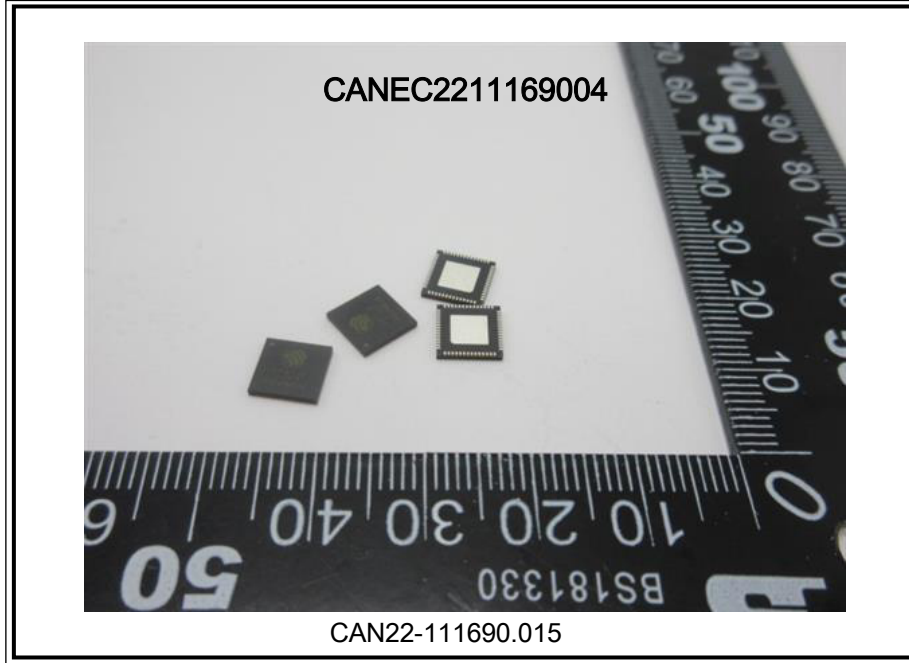












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