

检测报告

编号: SHAEC24028769408

日期: 2024 年 12 月 30 日

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客户名称: 扬州扬杰电子科技股份有限公司
客户地址: 扬州市维扬经济开发区创业园中路 26 号

样品名称: 框架桥
客户参考信息: 1.锡球; 3.无卤塑封料 1; 4.玻钝芯片; 5.肖特基芯片; 8.无卤塑封料 3; 9.无卤塑封料 4; 10.框架/跳线/引线; 11.铝片; 26.锡膏/焊片/焊锡丝; 38.无卤塑封料 8; 39.无卤塑封料 9; 40.无卤塑封料 10; 48.无卤塑封料 13

以上样品及信息由客户提供。

SGS 工作编号: SHP24-040813
样品接收时间: 2024 年 12 月 16 日
检测周期: 2024 年 12 月 16 日 ~ 2024 年 12 月 23 日
检测要求: 根据客户要求检测。
检测方法: 见后续页。
检测结果: 见后续页。

检测要求	结论
欧盟 RoHS 指令 2011/65/EU 附录 II 的修正指令(EU) 2015/863-铅、汞、镉、六价铬、多溴联苯 (PBB)、多溴二苯醚 (PBDE)、邻苯二甲酸二(2-乙基己基)酯 (DEHP)、邻苯二甲酸丁苄酯 (BBP)、邻苯二甲酸二丁酯 (DBP)和邻苯二甲酸二异丁酯 (DIBP)	符合

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罗萍

Carol Luo 罗萍
批准签署人

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检测结果:

检测部件外观描述:

样品序号	样品编号	SGS 样品 ID	样品描述
SN1	A1	SHA24-0287694-0001.C001	银色金属
SN2	A3	SHA24-0287694-0001.C003	灰色固体
SN3	A4	SHA24-0287694-0001.C004	灰色/黑色固体片
SN4	A5	SHA24-0287694-0001.C005	彩色固体片
SN5	A8	SHA24-0287694-0001.C008	灰色固体
SN6	A9	SHA24-0287694-0001.C009	灰色固体
SN7	A10	SHA24-0287694-0001.C010	铜色金属
SN8	A11	SHA24-0287694-0001.C011	银色/白色金属
SN9	A26	SHA24-0287694-0001.C026	银色金属丝
SN10	A38	SHA24-0287694-0001.C038	灰色固体
SN11	A39	SHA24-0287694-0001.C039	灰色固体
SN12	A40	SHA24-0287694-0001.C040	灰色固体
SN13	A48	SHA24-0287694-0001.C048	灰色固体

备注:

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

欧盟 RoHS 指令 2011/65/EU 附录 II 的修正指令(EU) 2015/863-铅、汞、镉、六价铬、多溴联苯 (PBB)、多溴二苯醚 (PBDE)、邻苯二甲酸二(2-乙基己基)酯 (DEHP)、邻苯二甲酸丁苄酯 (BBP)、邻苯二甲酸二丁酯 (DBP)和邻苯二甲酸二异丁酯 (DIBP)

检测方法: 参考 IEC 62321-4:2013+AMD1:2017, IEC 62321-5:2013, IEC 62321-7-2:2017 和 IEC 62321-12:2023, 采用 ICP-OES/AAS, UV-Vis 和 GC-MS 进行分析。

检测项目	限值	单位	MDL	A3	A4	A5
铅 (Pb)	1000	mg/kg	2	ND	21965 [▲]	ND
汞 (Hg)	1000	mg/kg	2	ND	ND	ND
镉 (Cd)	100	mg/kg	2	ND	ND	ND
六价铬 (Cr(VI))	1000	mg/kg	8	ND	ND	ND



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检测项目	限值	单位	MDL	A3	A4	A5
多溴联苯之和 (PBB)	1000	mg/kg	-	ND	ND	ND
一溴联苯 (MonoBB)	-	mg/kg	25	ND	ND	ND
二溴联苯 (DiBB)	-	mg/kg	25	ND	ND	ND
三溴联苯 (TriBB)	-	mg/kg	25	ND	ND	ND
四溴联苯 (TetraBB)	-	mg/kg	25	ND	ND	ND
五溴联苯 (PentaBB)	-	mg/kg	25	ND	ND	ND
六溴联苯 (HexaBB)	-	mg/kg	25	ND	ND	ND
七溴联苯 (HeptaBB)	-	mg/kg	25	ND	ND	ND
八溴联苯 (OctaBB)	-	mg/kg	25	ND	ND	ND
九溴联苯 (NonaBB)	-	mg/kg	25	ND	ND	ND
十溴联苯 (DecaBB)	-	mg/kg	25	ND	ND	ND
多溴二苯醚之和 (PBDE)	1000	mg/kg	-	ND	ND	ND
一溴二苯醚 (MonoBDE)	-	mg/kg	25	ND	ND	ND
二溴二苯醚 (DiBDE)	-	mg/kg	25	ND	ND	ND
三溴二苯醚 (TriBDE)	-	mg/kg	25	ND	ND	ND
四溴二苯醚 (TetraBDE)	-	mg/kg	25	ND	ND	ND
五溴二苯醚 (PentaBDE)	-	mg/kg	25	ND	ND	ND
六溴二苯醚 (HexaBDE)	-	mg/kg	25	ND	ND	ND
七溴二苯醚 (HeptaBDE)	-	mg/kg	25	ND	ND	ND
八溴二苯醚 (OctaBDE)	-	mg/kg	25	ND	ND	ND
九溴二苯醚 (NonaBDE)	-	mg/kg	25	ND	ND	ND
十溴二苯醚 (DecaBDE)	-	mg/kg	25	ND	ND	ND
邻苯二甲酸二(2-乙基己基)酯 (DEHP)	1000	mg/kg	50	ND	ND	ND
邻苯二甲酸丁苄酯 (BBP)	1000	mg/kg	50	ND	ND	ND
邻苯二甲酸二丁酯 (DBP)	1000	mg/kg	50	ND	ND	ND
邻苯二甲酸二异丁酯 (DIBP)	1000	mg/kg	50	ND	ND	ND

检测项目	限值	单位	MDL	A8	A9	A38
铅 (Pb)	1000	mg/kg	2	ND	ND	ND
汞 (Hg)	1000	mg/kg	2	ND	ND	ND
镉 (Cd)	100	mg/kg	2	ND	ND	ND
六价铬 (Cr(VI))	1000	mg/kg	8	ND	ND	ND
多溴联苯之和 (PBB)	1000	mg/kg	-	ND	ND	ND
一溴联苯 (MonoBB)	-	mg/kg	25	ND	ND	ND
二溴联苯 (DiBB)	-	mg/kg	25	ND	ND	ND
三溴联苯 (TriBB)	-	mg/kg	25	ND	ND	ND
四溴联苯 (TetraBB)	-	mg/kg	25	ND	ND	ND
五溴联苯 (PentaBB)	-	mg/kg	25	ND	ND	ND
六溴联苯 (HexaBB)	-	mg/kg	25	ND	ND	ND
七溴联苯 (HeptaBB)	-	mg/kg	25	ND	ND	ND
八溴联苯 (OctaBB)	-	mg/kg	25	ND	ND	ND
九溴联苯 (NonaBB)	-	mg/kg	25	ND	ND	ND
十溴联苯 (DecaBB)	-	mg/kg	25	ND	ND	ND



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检测项目	限值	单位	MDL	A8	A9	A38
多溴二苯醚之和 (PBDE)	1000	mg/kg	-	ND	ND	ND
一溴二苯醚 (MonoBDE)	-	mg/kg	25	ND	ND	ND
二溴二苯醚 (DiBDE)	-	mg/kg	25	ND	ND	ND
三溴二苯醚 (TriBDE)	-	mg/kg	25	ND	ND	ND
四溴二苯醚 (TetraBDE)	-	mg/kg	25	ND	ND	ND
五溴二苯醚 (PentaBDE)	-	mg/kg	25	ND	ND	ND
六溴二苯醚 (HexaBDE)	-	mg/kg	25	ND	ND	ND
七溴二苯醚 (HeptaBDE)	-	mg/kg	25	ND	ND	ND
八溴二苯醚 (OctaBDE)	-	mg/kg	25	ND	ND	ND
九溴二苯醚 (NonaBDE)	-	mg/kg	25	ND	ND	ND
十溴二苯醚 (DecaBDE)	-	mg/kg	25	ND	ND	ND
邻苯二甲酸二(2-乙基己基)酯 (DEHP)	1000	mg/kg	50	ND	ND	ND
邻苯二甲酸丁苄酯 (BBP)	1000	mg/kg	50	ND	ND	ND
邻苯二甲酸二丁酯 (DBP)	1000	mg/kg	50	ND	ND	ND
邻苯二甲酸二异丁酯 (DIBP)	1000	mg/kg	50	ND	ND	ND

检测项目	限值	单位	MDL	A39	A40	A48
铅 (Pb)	1000	mg/kg	2	ND	ND	ND
汞 (Hg)	1000	mg/kg	2	ND	ND	ND
镉 (Cd)	100	mg/kg	2	ND	ND	ND
六价铬 (Cr(VI))	1000	mg/kg	8	ND	ND	ND
多溴联苯之和 (PBB)	1000	mg/kg	-	ND	ND	ND
一溴联苯 (MonoBB)	-	mg/kg	25	ND	ND	ND
二溴联苯 (DiBB)	-	mg/kg	25	ND	ND	ND
三溴联苯 (TriBB)	-	mg/kg	25	ND	ND	ND
四溴联苯 (TetraBB)	-	mg/kg	25	ND	ND	ND
五溴联苯 (PentaBB)	-	mg/kg	25	ND	ND	ND
六溴联苯 (HexaBB)	-	mg/kg	25	ND	ND	ND
七溴联苯 (HeptaBB)	-	mg/kg	25	ND	ND	ND
八溴联苯 (OctaBB)	-	mg/kg	25	ND	ND	ND
九溴联苯 (NonaBB)	-	mg/kg	25	ND	ND	ND
十溴联苯 (DecaBB)	-	mg/kg	25	ND	ND	ND
多溴二苯醚之和 (PBDE)	1000	mg/kg	-	ND	ND	ND
一溴二苯醚 (MonoBDE)	-	mg/kg	25	ND	ND	ND
二溴二苯醚 (DiBDE)	-	mg/kg	25	ND	ND	ND
三溴二苯醚 (TriBDE)	-	mg/kg	25	ND	ND	ND
四溴二苯醚 (TetraBDE)	-	mg/kg	25	ND	ND	ND
五溴二苯醚 (PentaBDE)	-	mg/kg	25	ND	ND	ND
六溴二苯醚 (HexaBDE)	-	mg/kg	25	ND	ND	ND
七溴二苯醚 (HeptaBDE)	-	mg/kg	25	ND	ND	ND
八溴二苯醚 (OctaBDE)	-	mg/kg	25	ND	ND	ND
九溴二苯醚 (NonaBDE)	-	mg/kg	25	ND	ND	ND
十溴二苯醚 (DecaBDE)	-	mg/kg	25	ND	ND	ND



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检测报告

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日期: 2024 年 12 月 30 日

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检测项目	限值	单位	MDL	A39	A40	A48
邻苯二甲酸二(2-乙基己基)酯 (DEHP)	1000	mg/kg	50	ND	ND	ND
邻苯二甲酸丁苄酯 (BBP)	1000	mg/kg	50	ND	ND	ND
邻苯二甲酸二丁酯 (DBP)	1000	mg/kg	50	ND	ND	ND
邻苯二甲酸二异丁酯 (DIBP)	1000	mg/kg	50	ND	ND	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。
(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。

检测方法: 参考 IEC 62321-4:2013+AMD1:2017, IEC 62321-5:2013, IEC 62321-7-1:2015 和 IEC 62321-12:2023, 采用 ICP-OES/AAS, UV-Vis 和 GC-MS 进行分析。

检测项目	限值	单位	MDL	A1	A10	A11
铅 (Pb)	1000	mg/kg	2	38	7	10
汞 (Hg)	1000	mg/kg	2	ND	ND	ND
镉 (Cd)	100	mg/kg	2	ND	ND	ND
六价铬 (Cr(VI))▼	-	µg/cm²	0.10	ND	ND	ND
多溴联苯之和 (PBB)	1000	mg/kg	-	ND	ND	ND
一溴联苯 (MonoBB)	-	mg/kg	25	ND	ND	ND
二溴联苯 (DiBB)	-	mg/kg	25	ND	ND	ND
三溴联苯 (TriBB)	-	mg/kg	25	ND	ND	ND
四溴联苯 (TetraBB)	-	mg/kg	25	ND	ND	ND
五溴联苯 (PentaBB)	-	mg/kg	25	ND	ND	ND
六溴联苯 (HexaBB)	-	mg/kg	25	ND	ND	ND
七溴联苯 (HeptaBB)	-	mg/kg	25	ND	ND	ND
八溴联苯 (OctaBB)	-	mg/kg	25	ND	ND	ND
九溴联苯 (NonaBB)	-	mg/kg	25	ND	ND	ND
十溴联苯 (DecaBB)	-	mg/kg	25	ND	ND	ND
多溴二苯醚之和 (PBDE)	1000	mg/kg	-	ND	ND	ND
一溴二苯醚 (MonoBDE)	-	mg/kg	25	ND	ND	ND
二溴二苯醚 (DiBDE)	-	mg/kg	25	ND	ND	ND
三溴二苯醚 (TriBDE)	-	mg/kg	25	ND	ND	ND
四溴二苯醚 (TetraBDE)	-	mg/kg	25	ND	ND	ND
五溴二苯醚 (PentaBDE)	-	mg/kg	25	ND	ND	ND
六溴二苯醚 (HexaBDE)	-	mg/kg	25	ND	ND	ND
七溴二苯醚 (HeptaBDE)	-	mg/kg	25	ND	ND	ND
八溴二苯醚 (OctaBDE)	-	mg/kg	25	ND	ND	ND
九溴二苯醚 (NonaBDE)	-	mg/kg	25	ND	ND	ND
十溴二苯醚 (DecaBDE)	-	mg/kg	25	ND	ND	ND
邻苯二甲酸二(2-乙基己基)酯 (DEHP)	1000	mg/kg	50	ND	ND	ND
邻苯二甲酸丁苄酯 (BBP)	1000	mg/kg	50	ND	ND	ND



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检测报告

编号: SHAEC24028769408

日期: 2024 年 12 月 30 日

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检测项目	限值	单位	MDL	A1	A10	A11
邻苯二甲酸二丁酯 (DBP)	1000	mg/kg	50	ND	ND	ND
邻苯二甲酸二异丁酯 (DIBP)	1000	mg/kg	50	ND	ND	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。

- (3) ▼ =
- 当六价铬的浓度高于 $0.13 \mu\text{g}/\text{cm}^2$ 时, 样品为阳性, 即含有六价铬;
 - 当六价铬的浓度为ND (低于 $0.10 \mu\text{g}/\text{cm}^2$) 时, 样品为阴性, 即未检测到六价铬;
 - 当六价铬的浓度介于 $0.10 \mu\text{g}/\text{cm}^2$ 与 $0.13 \mu\text{g}/\text{cm}^2$ 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。

检测方法: 参考滴定法, IEC 62321-4:2013+AMD1:2017, IEC 62321-5:2013, IEC 62321-7-1:2015 和 IEC 62321-12:2023, 采用 ICP-OES/AAS, UV-Vis 和 GC-MS 进行分析。

检测项目	限值	单位	MDL	A26
铅(Pb)	0.1	%	-	92.5 [▲]
汞(Hg)	1000	mg/kg	2	ND
镉(Cd)	100	mg/kg	2	ND
六价铬 (Cr(VI)) ▼	-	$\mu\text{g}/\text{cm}^2$	0.10	ND
多溴联苯之和 (PBB)	1000	mg/kg	-	ND
一溴联苯 (MonoBB)	-	mg/kg	25	ND
二溴联苯 (DiBB)	-	mg/kg	25	ND
三溴联苯 (TriBB)	-	mg/kg	25	ND
四溴联苯 (TetraBB)	-	mg/kg	25	ND
五溴联苯 (PentaBB)	-	mg/kg	25	ND
六溴联苯 (HexaBB)	-	mg/kg	25	ND
七溴联苯 (HeptaBB)	-	mg/kg	25	ND
八溴联苯 (OctaBB)	-	mg/kg	25	ND
九溴联苯 (NonaBB)	-	mg/kg	25	ND
十溴联苯 (DecaBB)	-	mg/kg	25	ND
多溴二苯醚之和 (PBDE)	1000	mg/kg	-	ND
一溴二苯醚 (MonoBDE)	-	mg/kg	25	ND
二溴二苯醚 (DiBDE)	-	mg/kg	25	ND
三溴二苯醚 (TriBDE)	-	mg/kg	25	ND
四溴二苯醚 (TetraBDE)	-	mg/kg	25	ND
五溴二苯醚 (PentaBDE)	-	mg/kg	25	ND
六溴二苯醚 (HexaBDE)	-	mg/kg	25	ND
七溴二苯醚 (HeptaBDE)	-	mg/kg	25	ND
八溴二苯醚 (OctaBDE)	-	mg/kg	25	ND
九溴二苯醚 (NonaBDE)	-	mg/kg	25	ND



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检测报告

编号: SHAEC24028769408

日期: 2024 年 12 月 30 日

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检测项目	限值	单位	MDL	A26
十溴二苯醚 (DecaBDE)	-	mg/kg	25	ND
邻苯二甲酸二(2-乙基己基)酯 (DEHP)	1000	mg/kg	50	ND
邻苯二甲酸丁苄酯 (BBP)	1000	mg/kg	50	ND
邻苯二甲酸二丁酯 (DBP)	1000	mg/kg	50	ND
邻苯二甲酸二异丁酯 (DIBP)	1000	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。

(3) ▼ = a. 当六价铬的浓度高于 $0.13 \mu\text{g}/\text{cm}^2$ 时, 样品为阳性, 即含有六价铬。b. 当六价铬的浓度为 ND (低于 $0.10 \mu\text{g}/\text{cm}^2$) 时, 样品为阴性, 即未检测到六价铬。c. 当六价铬的浓度介于 $0.10 \mu\text{g}/\text{cm}^2$ 与 $0.13 \mu\text{g}/\text{cm}^2$ 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。

▲ 根据客户提供的声明, 编号 A26 中的铅 (Pb) 被欧盟 RoHS 指令 2011/65/EU 豁免, 相应豁免条文 (请以英文原文为准) [ANNEX III 7(a)]: 高熔点型焊料中的铅 (即铅含量等于或大于 85% 的铅基合金焊料)。

更多豁免相关信息, 可以从以下链接获取:

<https://rohs.sgsonline.com.cn/PDFLinks/zh-cn/RSTS-TP-037%20RoHS%20Exemption%20%28CN%29.pdf>

▲ 根据客户提供的声明, 编号 A4 中的铅 (Pb) 被欧盟 RoHS 指令 2011/65/EU 豁免, 相应豁免条文 (请以英文原文为准) [ANNEX III 7(c)-II]: 电子电气元件中玻璃或陶瓷材料 (电容中陶瓷介质除外) 所含的铅, 如压电设备、玻璃或陶瓷基复合元件。

更多豁免相关信息, 可以从以下链接获取:

<https://rohs.sgsonline.com.cn/PDFLinks/zh-cn/RSTS-TP-037%20RoHS%20Exemption%20%28CN%29.pdf>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。



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检测报告

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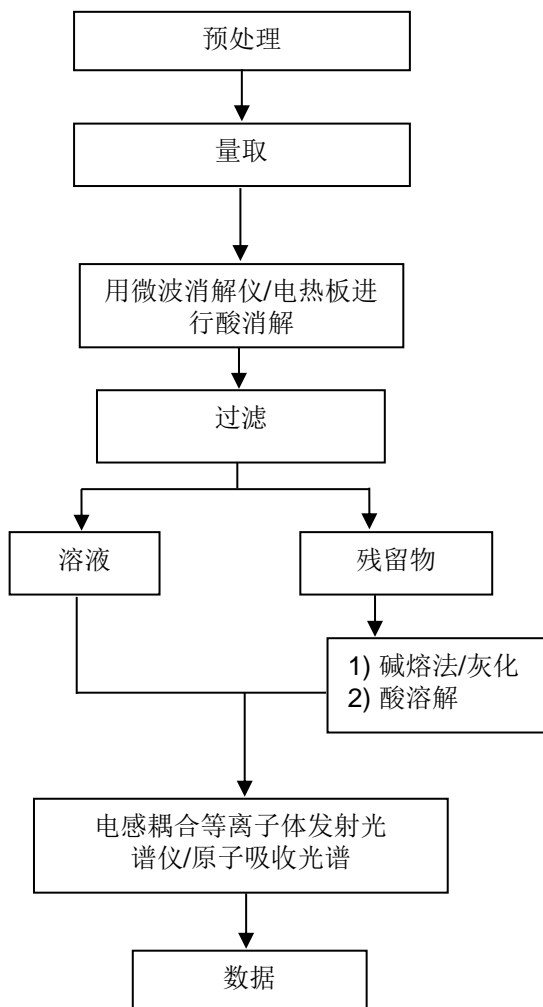
日期: 2024 年 12 月 30 日

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附件

元素检测流程图

样品按照下述流程被完全消解



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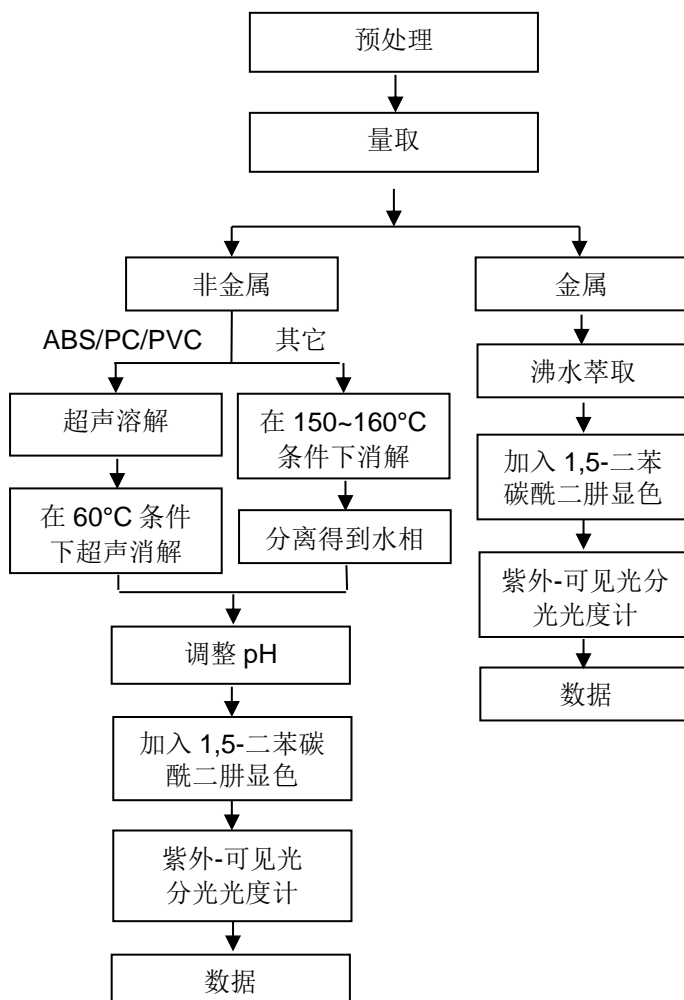
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六价铬检测流程图



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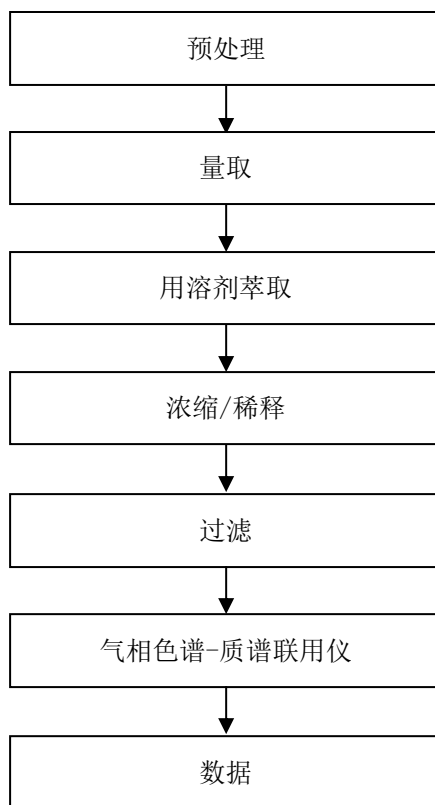
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PBB/PBDE/Phthalates 检测流程图



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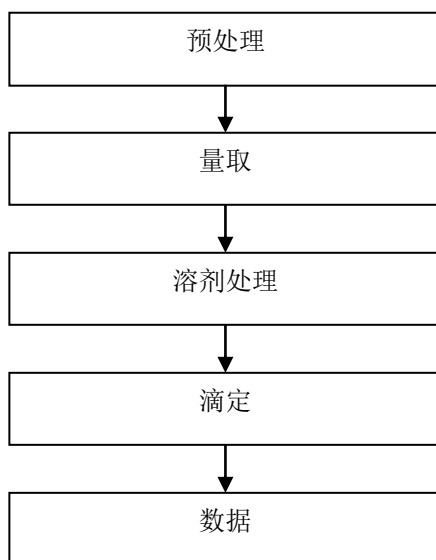
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滴定检测流程图



检测报告

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样品照片:

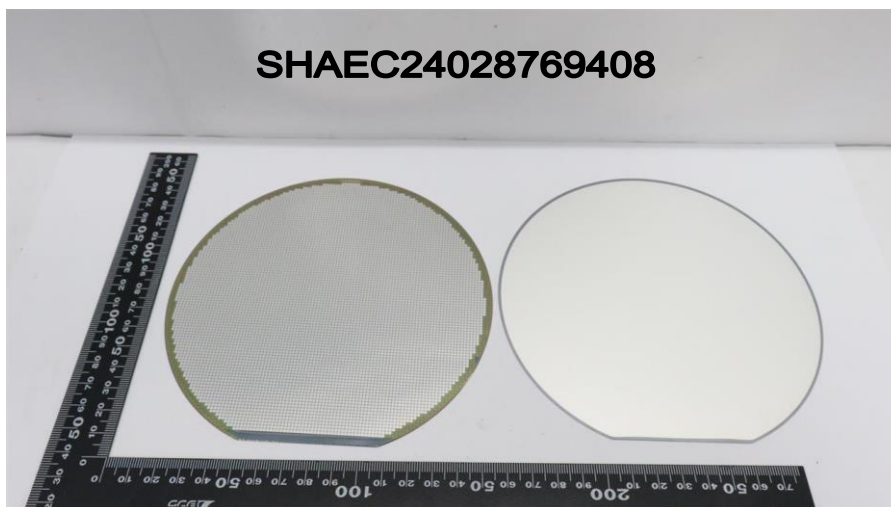




SHA24-0287694-0001.C003



SHA24-0287694-0001.C004



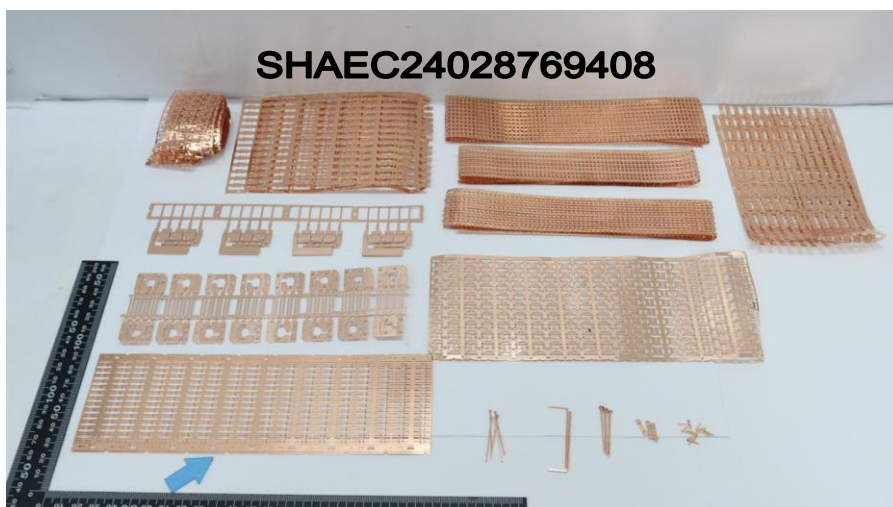
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SHA24-0287694-0001.C009



SHA24-0287694-0001.C010

检测报告

编号: SHAEC24028769408

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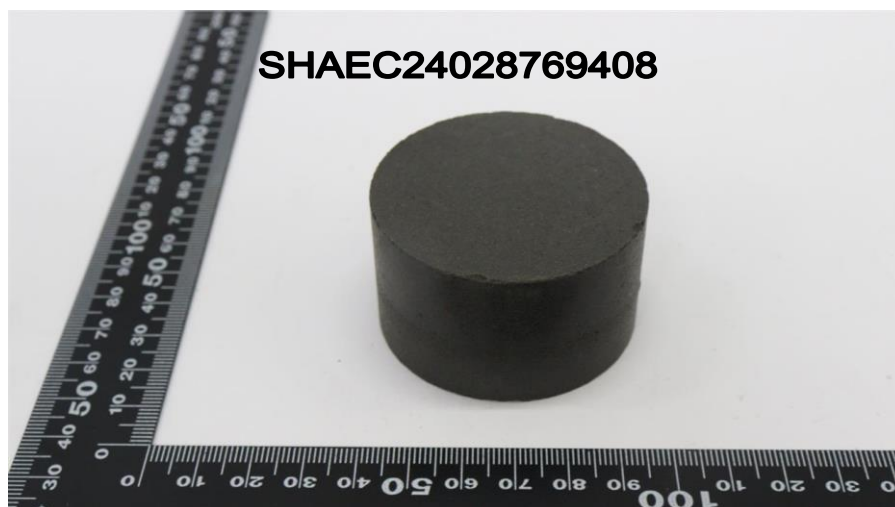
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