

检测报告

编号: SHAEC24028769414

日期: 2024 年 12 月 30 日

第 1 页, 共 18 页

客户名称: 扬州扬杰电子科技股份有限公司
客户地址: 江苏省扬州市邗江区维扬经济开发区新甘泉西路 68 号

样品名称: 小信号 (含铅)
客户参考信息: 1.锡球; 7.无卤塑封料 2; 26.锡膏/焊片/焊锡丝; 27.铜线; 28.镀金钎铜线; 29.镀钎铜线; 31.框架 (铜铁银); 32.框架 (铜锡银); 33.框架 (铁镍); 34.无卤塑封料 5; 42.框架 (铜银) 1; 44.框架 (铜银) 2

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	A7	SHA24-0287694-0001.C007	灰色固体
SN3	A26	SHA24-0287694-0001.C026	银色金属丝
SN4	A27	SHA24-0287694-0001.C027	铜色金属丝
SN5	A28	SHA24-0287694-0001.C028	银色金属丝
SN6	A29	SHA24-0287694-0001.C029	银色金属丝
SN7	A31	SHA24-0287694-0001.C031	铜色/银色金属
SN8	A32	SHA24-0287694-0001.C032	铜色/银色金属
SN9	A33	SHA24-0287694-0001.C033	银色金属
SN10	A34	SHA24-0287694-0001.C034	灰色固体
SN11	A42	SHA24-0287694-0001.C042	铜色金属
SN12	A44	SHA24-0287694-0001.C044	铜色金属

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	A7	A34
铅 (Pb)	1000	mg/kg	2	ND	ND
汞 (Hg)	1000	mg/kg	2	ND	ND
镉 (Cd)	100	mg/kg	2	ND	ND
六价铬 (Cr(VI))	1000	mg/kg	8	ND	ND
多溴联苯之和 (PBB)	1000	mg/kg	-	ND	ND
一溴联苯 (MonoBB)	-	mg/kg	25	ND	ND



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检测项目	限值	单位	MDL	A7	A34
二溴联苯 (DiBB)	-	mg/kg	25	ND	ND
三溴联苯 (TriBB)	-	mg/kg	25	ND	ND
四溴联苯 (TetraBB)	-	mg/kg	25	ND	ND
五溴联苯 (PentaBB)	-	mg/kg	25	ND	ND
六溴联苯 (HexaBB)	-	mg/kg	25	ND	ND
七溴联苯 (HeptaBB)	-	mg/kg	25	ND	ND
八溴联苯 (OctaBB)	-	mg/kg	25	ND	ND
九溴联苯 (NonaBB)	-	mg/kg	25	ND	ND
十溴联苯 (DecaBB)	-	mg/kg	25	ND	ND
多溴二苯醚之和 (PBDE)	1000	mg/kg	-	ND	ND
一溴二苯醚 (MonoBDE)	-	mg/kg	25	ND	ND
二溴二苯醚 (DiBDE)	-	mg/kg	25	ND	ND
三溴二苯醚 (TriBDE)	-	mg/kg	25	ND	ND
四溴二苯醚 (TetraBDE)	-	mg/kg	25	ND	ND
五溴二苯醚 (PentaBDE)	-	mg/kg	25	ND	ND
六溴二苯醚 (HexaBDE)	-	mg/kg	25	ND	ND
七溴二苯醚 (HeptaBDE)	-	mg/kg	25	ND	ND
八溴二苯醚 (OctaBDE)	-	mg/kg	25	ND	ND
九溴二苯醚 (NonaBDE)	-	mg/kg	25	ND	ND
十溴二苯醚 (DecaBDE)	-	mg/kg	25	ND	ND
邻苯二甲酸二(2-乙基己基)酯 (DEHP)	1000	mg/kg	50	ND	ND
邻苯二甲酸丁苄酯 (BBP)	1000	mg/kg	50	ND	ND
邻苯二甲酸二丁酯 (DBP)	1000	mg/kg	50	ND	ND
邻苯二甲酸二异丁酯 (DIBP)	1000	mg/kg	50	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	A27	A28
铅 (Pb)	1000	mg/kg	2	38	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))▼	-	µg/cm ²	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



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检测报告

编号: SHAEC24028769414

日期: 2024 年 12 月 30 日

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检测项目	限值	单位	MDL	A1	A27	A28
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	A29	A31	A32
铅 (Pb)	1000	mg/kg	2	ND	9	13
汞 (Hg)	1000	mg/kg	2	ND	ND	ND
镉 (Cd)	100	mg/kg	2	ND	ND	ND
六价铬 (Cr(VI))▼	-	µg/cm ²	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



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检测项目	限值	单位	MDL	A29	A31	A32
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	A33	A42	A44
铅 (Pb)	1000	mg/kg	2	ND	6	ND
汞 (Hg)	1000	mg/kg	2	ND	ND	ND
镉 (Cd)	100	mg/kg	2	ND	ND	ND
六价铬 (Cr(VI))▼	-	µg/cm ²	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
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



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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。

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
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



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检测报告

编号: SHAEC24028769414

日期: 2024 年 12 月 30 日

第 7 页, 共 18 页

检测项目	限值	单位	MDL	A26
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>

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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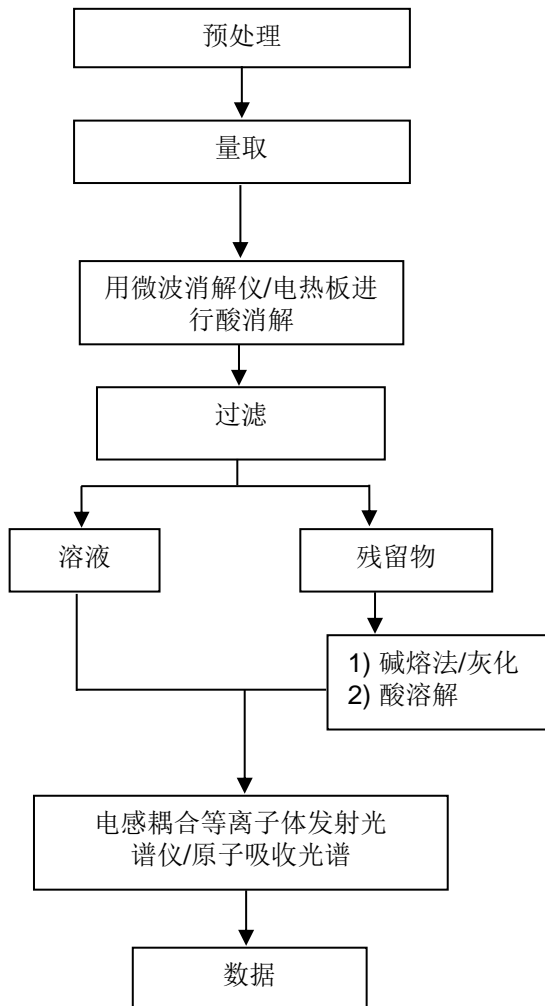
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附件

元素检测流程图

样品按照下述流程被完全消解



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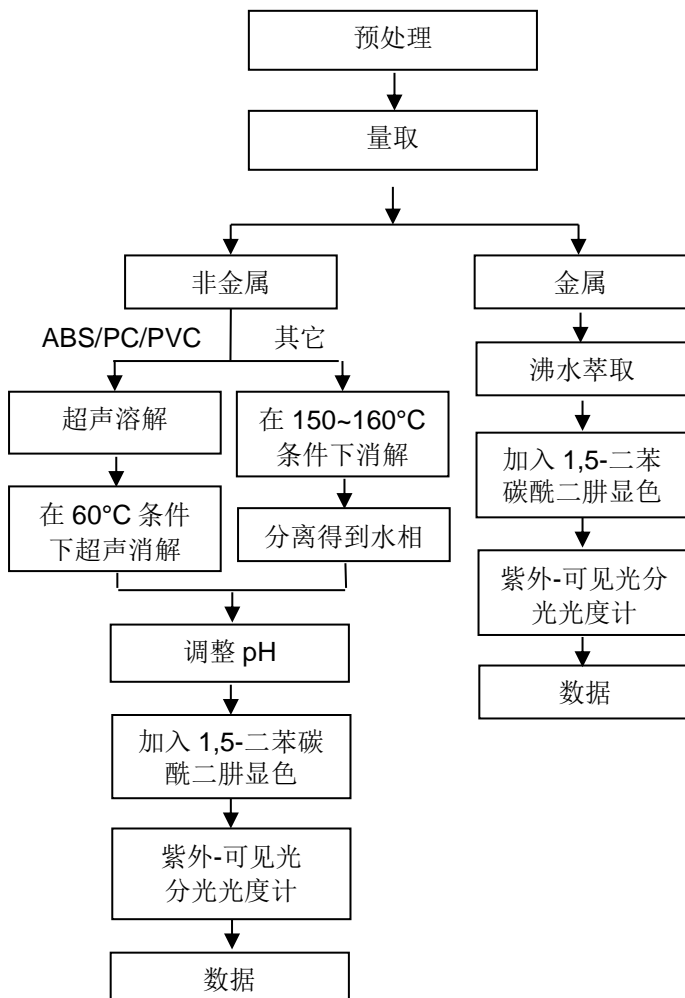
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六价铬检测流程图



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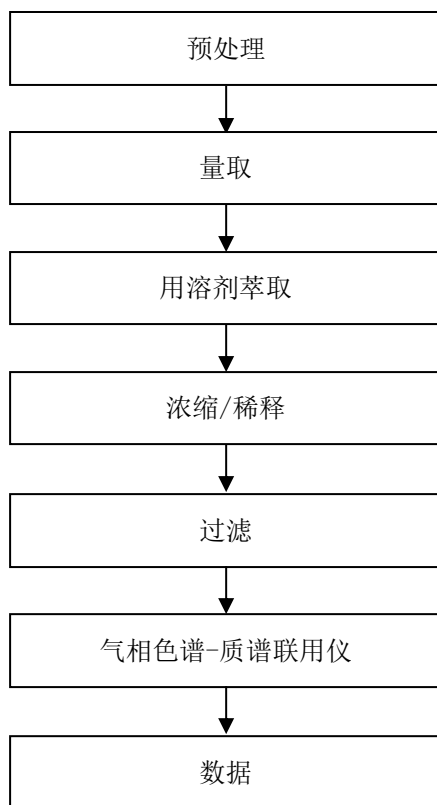
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PBB/PBDE/Phthalates 检测流程图



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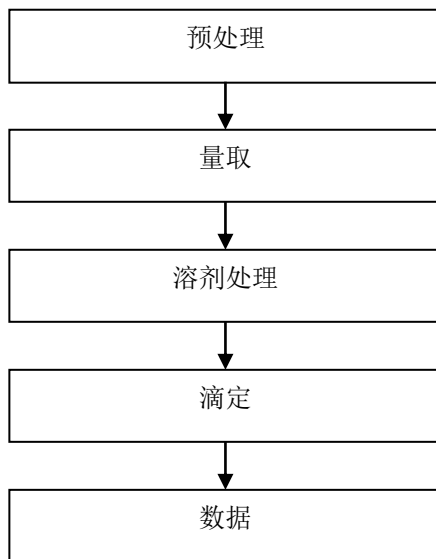
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滴定检测流程图



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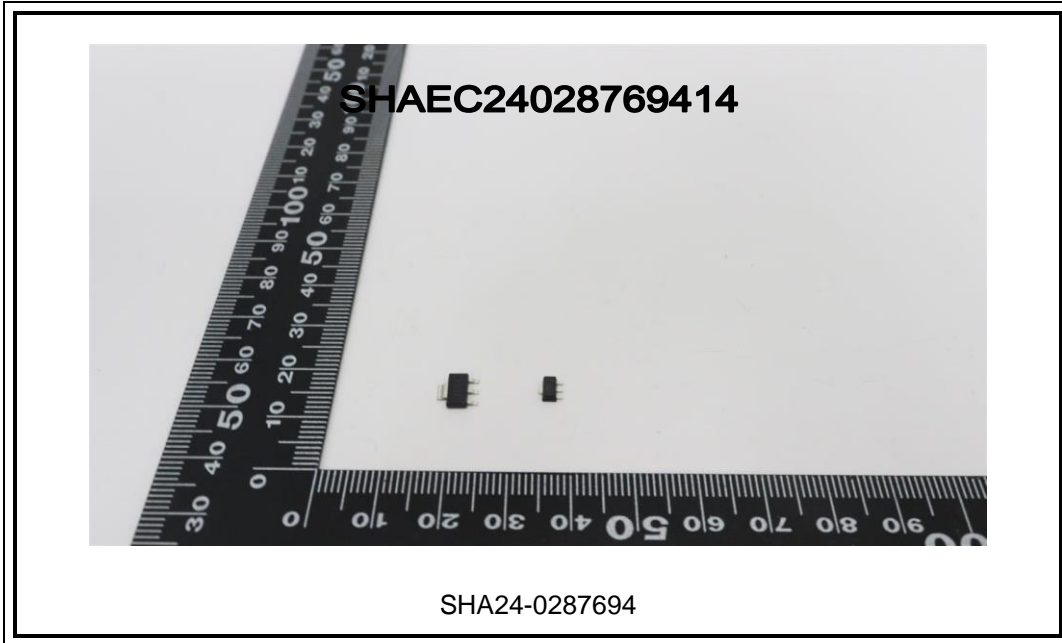
检测报告

编号: SHAEC24028769414

日期: 2024 年 12 月 30 日

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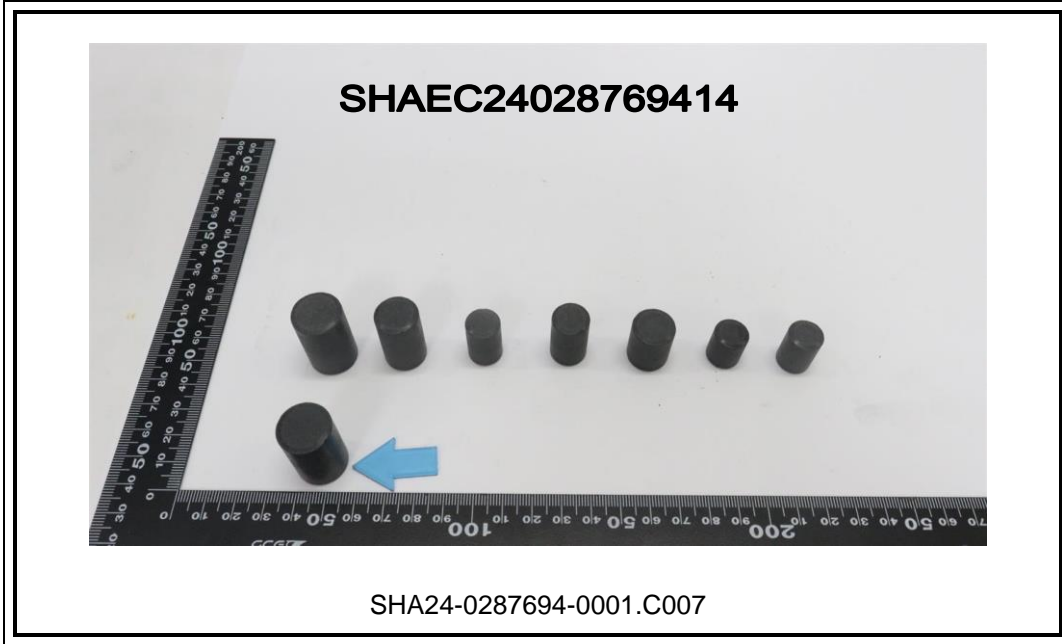
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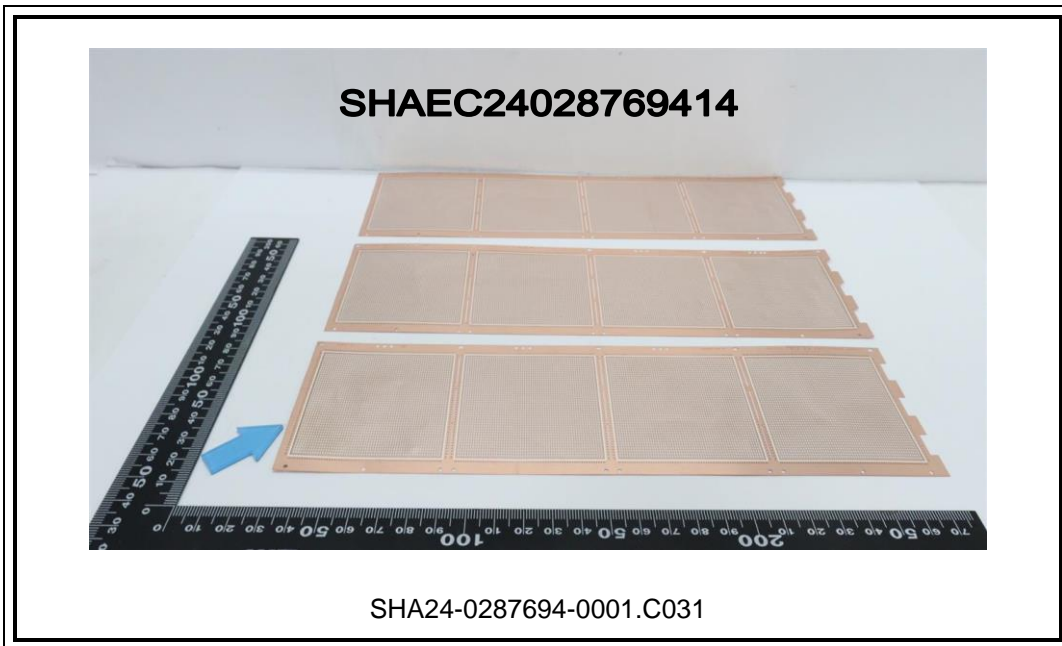
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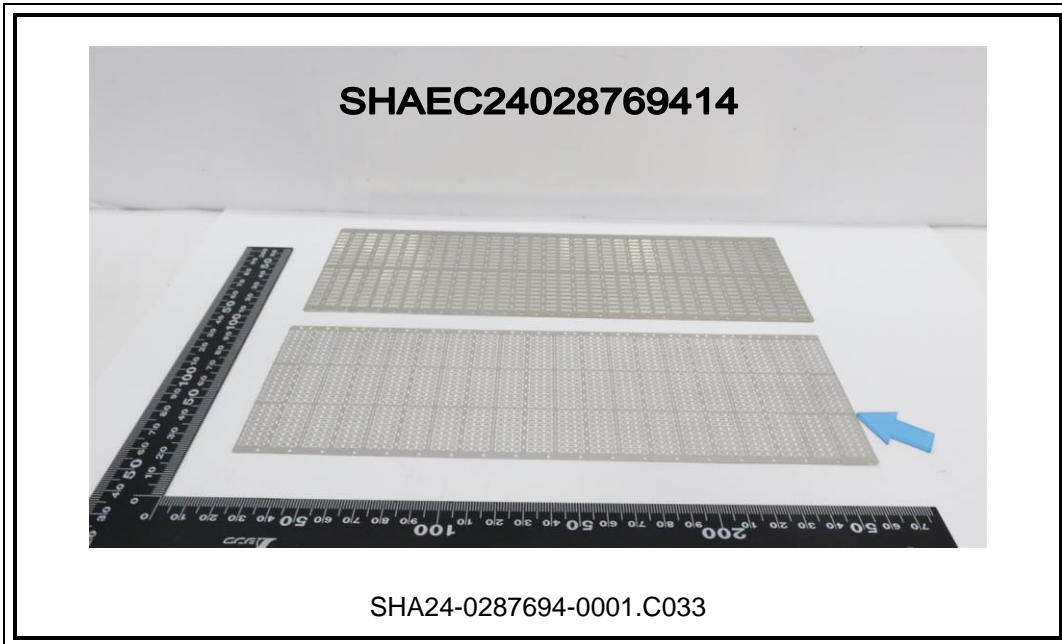
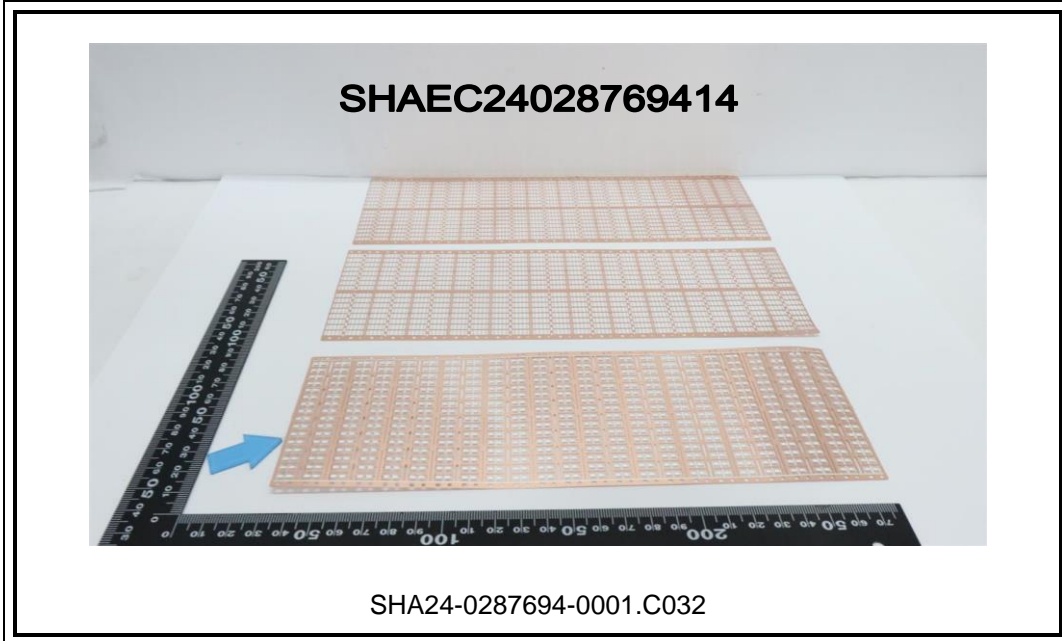
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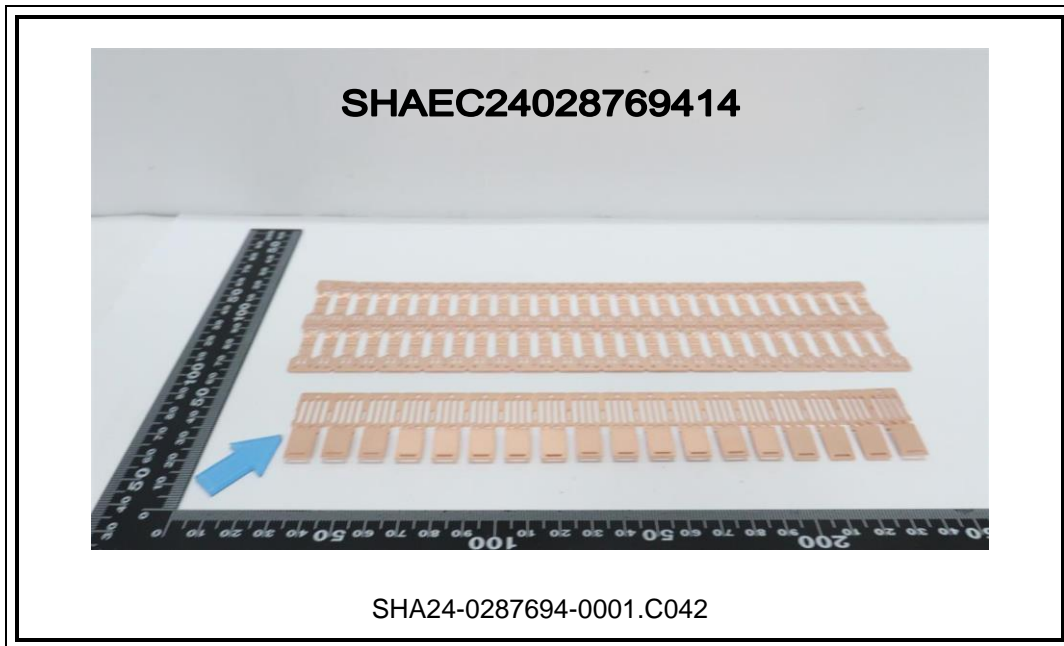
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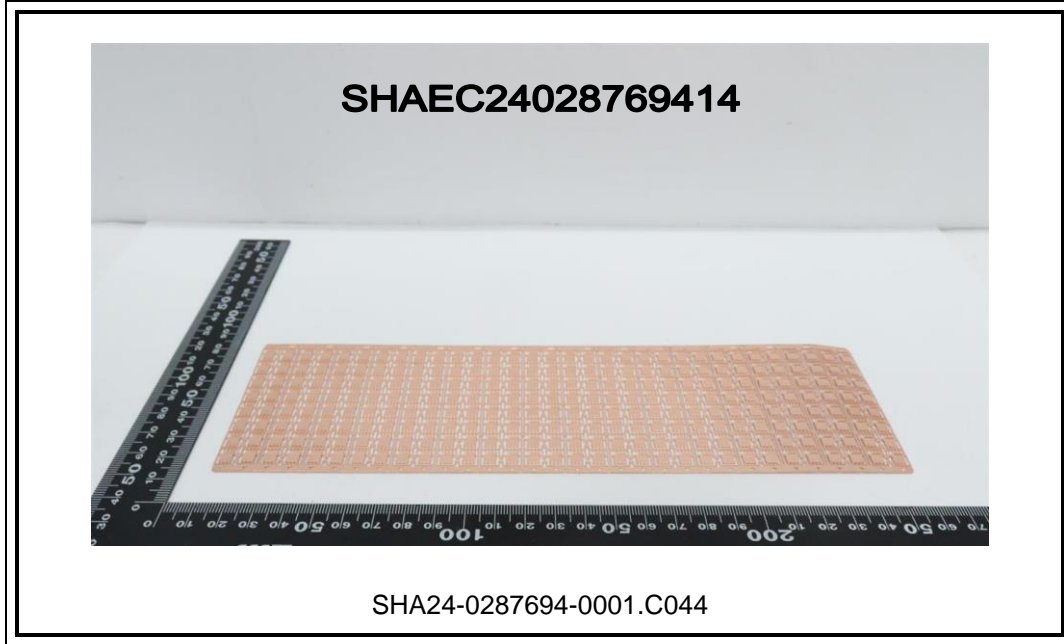
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