

检测报告

编号: CKGEC25001598714_1

日期: 2025 年 12 月 19 日

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客户名称: 四川民承电子有限公司

客户地址: 中国(四川)自由贸易试验区成都双流区西南航空港经济开发区黄甲街道双兴大道 1 号

样品名称: 功率元器件

型号: TO-220F

客户参考信息: TO-126 TO-263 TO-262 TO-251 TO-252 TO-220 TO-220F TO-220HF TO-247
TO-247L TO-277 TO-3PI TO-220C TO-247PLUS TO-263-7 TO-247-4 TO-
264 DFN3*3 DFN5*6 DFN8*8 SOP8 SOT-223 TOLL TOLT

以上样品及信息由客户提供。

此报告替代原来编号为 CKGEC25001598714, 日期为 2025 年 12 月 19 日的报告。

SGS 工作编号: CQP25-014126

样品接收时间: 2025 年 11 月 24 日

检测周期: 2025 年 11 月 24 日 ~ 2025 年 12 月 18 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
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)	见检测结果
铅、汞、镉和六价铬	见检测结果
卤素	见检测结果

通标标准技术服务(重庆)有限公司
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徐雯雯

Amber Xu 徐雯雯
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	A2	CKG25-0015987-0001.C002	银色金属引脚
SN2	A4	CKG25-0015987-0001.C004	黑色本体 (混测)

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

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	单位	MDL	A4
铅 (Pb)	mg/kg	2	5540 [▲]
汞 (Hg)	mg/kg	2	ND
镉 (Cd)	mg/kg	2	ND
六价铬 (Cr(VI))	mg/kg	8	ND
多溴联苯之和 (PBB)	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)	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



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检测项目	单位	MDL	A4
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)	mg/kg	50	ND
邻苯二甲酸丁苄酯 (BBP)	mg/kg	50	ND
邻苯二甲酸二丁酯 (DBP)	mg/kg	50	ND
邻苯二甲酸二异丁酯 (DIBP)	mg/kg	50	ND

备注:

(1) IEC 62321 系列等同于 EN 62321 系列。

(2) 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。

(3) ▲=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(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\(CN\).pdf](https://rohs.sgsonline.com.cn/PDFLinks/zh-cn/RSTS-TP-037%20RoHS%20Exemption%20(CN).pdf)

铅、汞、镉和六价铬

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

检测项目	单位	MDL	A2
铅 (Pb)	mg/kg	2	19
汞 (Hg)	mg/kg	2	ND
镉 (Cd)	mg/kg	2	ND
六价铬 (Cr(VI))▼	µg/cm ²	0.10	ND

备注:

(1) IEC 62321系列等同于 EN 62321系列。

- (2) ▼ =
- 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。

卤素

检测方法: 参考 EN 14582:2016, 采用 IC 进行分析。

检测项目	单位	MDL	A4
氟 (F)	mg/kg	20	ND



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检测项目	单位	MDL	A4
氯 (Cl)	mg/kg	50	ND
溴 (Br)	mg/kg	50	ND
碘 (I)	mg/kg	50	ND

备注:

(1) 样品 A4 基于申请人要求为混合检测。报告中的混合检测结果不代表其中个别单一材质的含量, 该检测数据仅供参考。

(2) 本报告更新了备注。

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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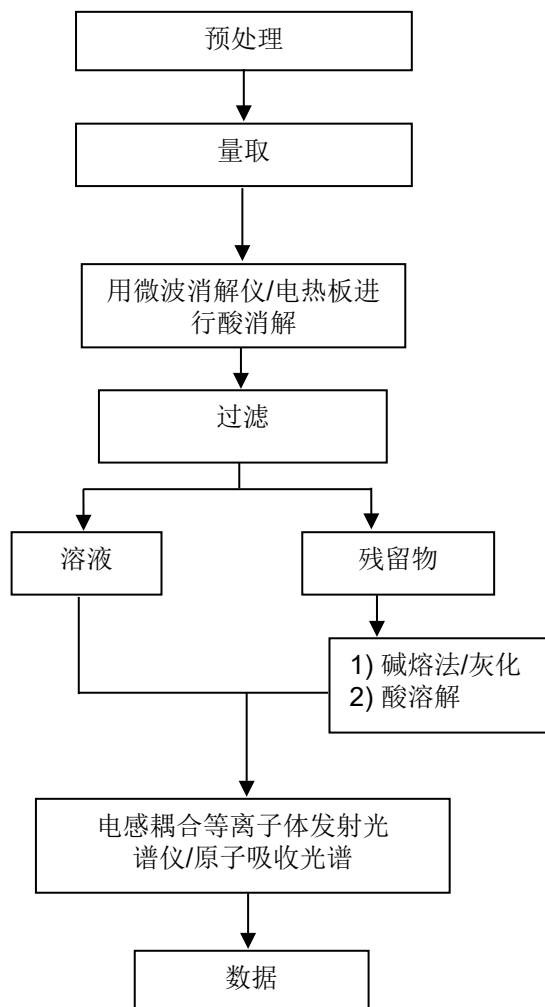
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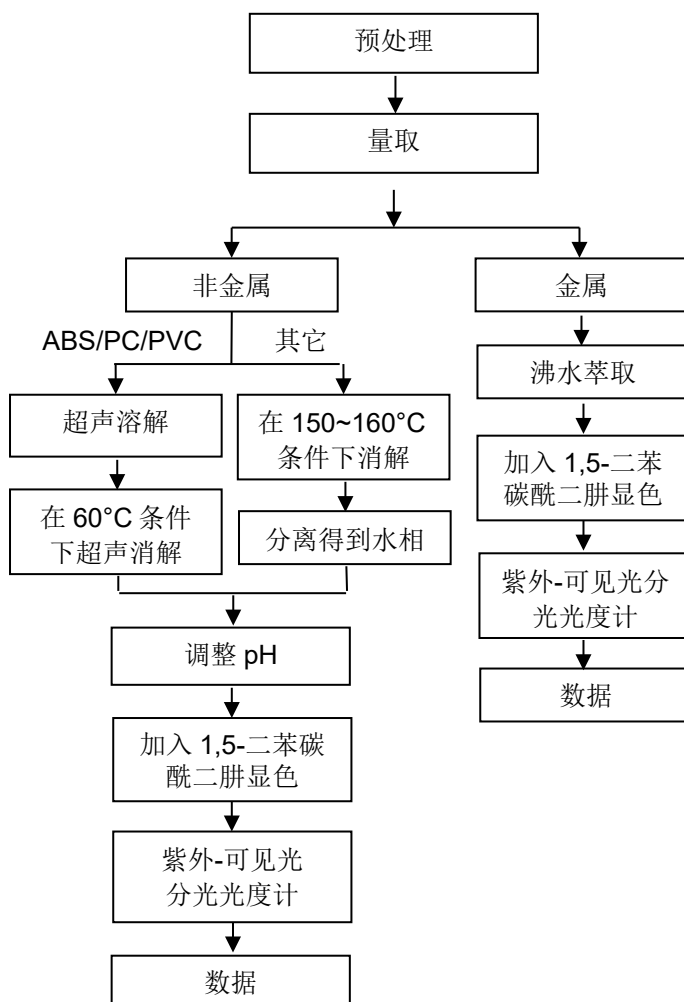
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元素检测流程图

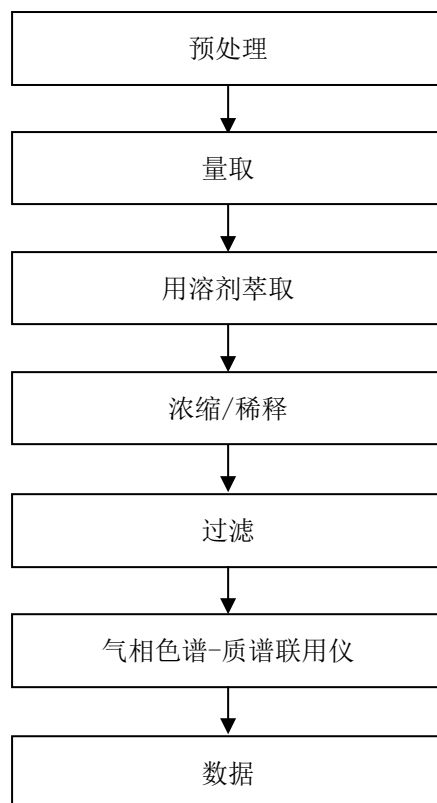
样品按照下述流程被完全消解



六价铬检测流程图



PBB(s)/PBDE(s)/Phthalates 检测流程图



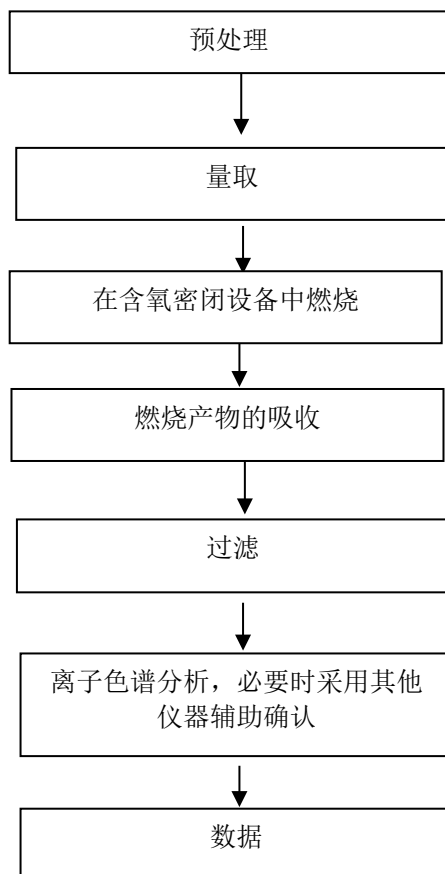
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卤素检测流程图



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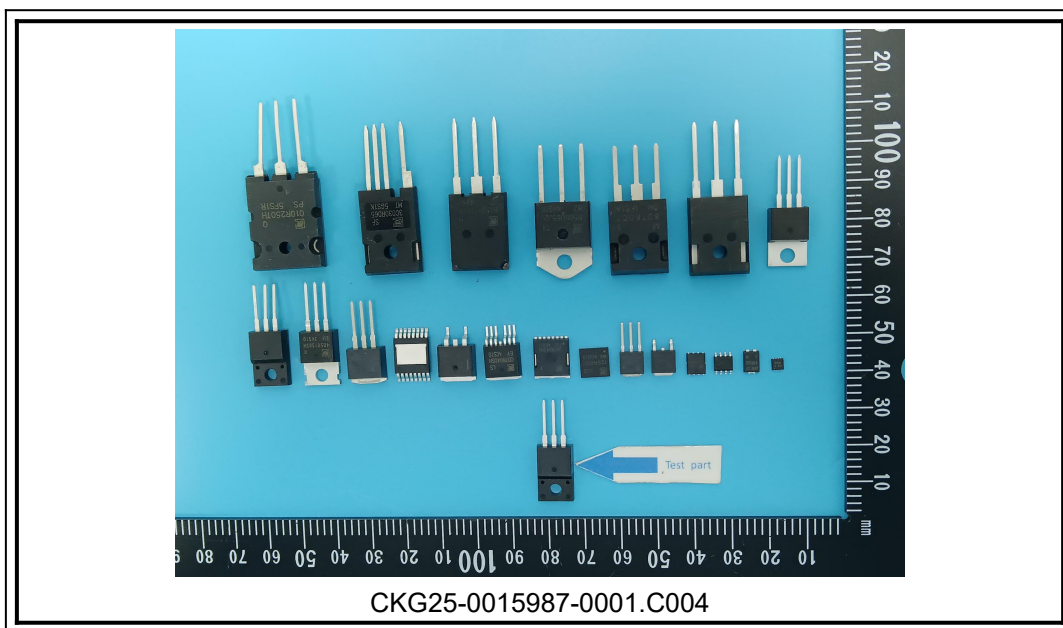
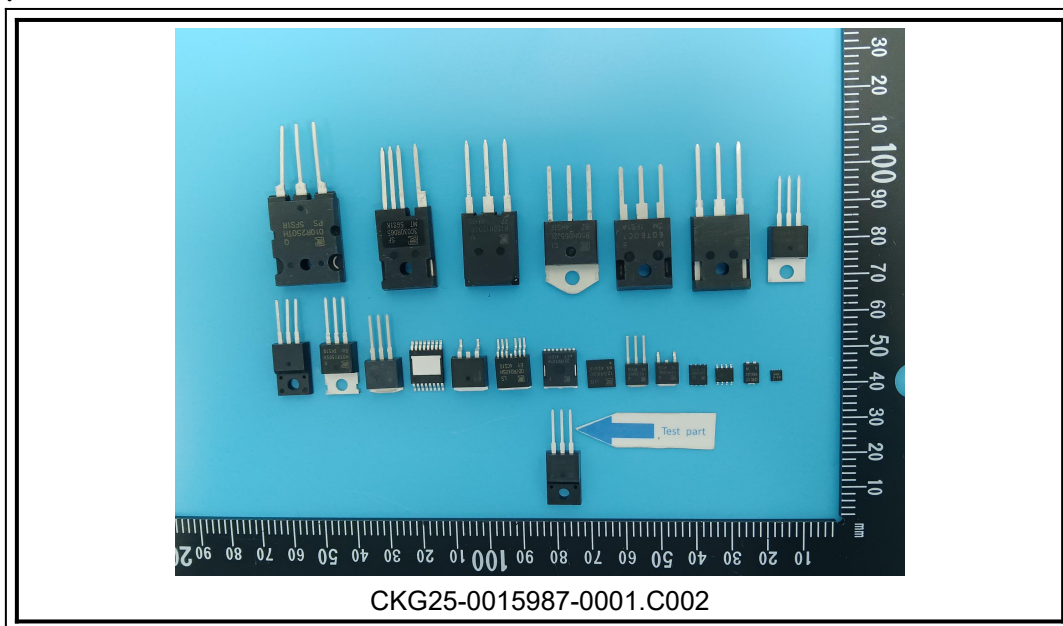
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