

## 测试报告

No. CANEC2124946206

日期: 2022年01月14日 第1页,共14页

浙江里阳半导体有限公司  
浙江省玉环芦浦镇漩门工业区市浙江里阳半导体有限公司

### 本报告取代测试报告CANEC2124946202

以下测试之样品是由申请者所提供及确认: 半导体放电管

SGS工作编号: CP21-070065 - GZ  
样品接收日期: 2021年12月31日  
测试周期: 2021年12月31日 - 2022年01月07日  
测试要求: 根据客户要求测试  
测试方法: 请参见下一页  
测试结果: 请参见下一页

结论: 基于所送样品进行的测试, 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)、邻苯二甲酸丁苄酯(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))的测试结果符合欧盟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

关正孟

Zm guan关正孟  
批准签署人

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## 测试报告

No. CANEC2124946206

日期: 2022年01月14日 第2页,共14页

测试结果:

### 测试样品描述:

样品编号	SGS样品ID	描述
SN1	CAN21-249462.001	银色金属引脚
SN2	CAN21-249462.002	带芯片的铜色金属
SN3	CAN21-249462.003	"半导体放电管"
SN4	CAN21-249462.004	黑色塑料

备注:

- (1) 1 mg/kg = 1 ppm = 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

测试方法: 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.

测试项目	限值	单位	MDL	004
镉 (Cd)	100	mg/kg	2	ND
铅 (Pb)	1,000	mg/kg	2	ND
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



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日期: 2022年01月14日 第3页,共14页

测试项目	限值	单位	MDL	004
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:1258637,25](https://www.cenelec.eu/dyn/www/f?p=104:30:1742232870351101:::FSP_ORG_ID,FSP_LANG_ID:1258637,25)
- (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

测试方法: 参考IEC 62321-4:2013+A1:2017, IEC 62321-5:2013, IEC 62321-7-1:2015, IEC 62321-6:2015 和 IEC 62321-8:2017, 采用 ICP-OES, UV-Vis 和 GC-MS 进行分析。

测试项目	限值	单位	MDL	001	002
镉 (Cd)	100	mg/kg	2	ND	ND
铅 (Pb)	1,000	mg/kg	2	15	46812▲
汞 (Hg)	1,000	mg/kg	2	ND	ND
六价铬(Cr(VI))▼	-	µg/cm <sup>2</sup>	0.10	ND	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



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日期: 2022年01月14日 第4页,共14页

测试项目	限值	单位	MDL	001	002
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)	1000	mg/kg	50		ND
邻苯二甲酸丁苯酯(BBP)	1000	mg/kg	50		ND
邻苯二甲酸二(2-乙基己基)酯(DEHP)	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  
[https://www.cenelec.eu/dyn/www/f?p=104:30:1742232870351101:::FSP\\_ORG\\_ID,FSP\\_LANG\\_ID:1258637,25](https://www.cenelec.eu/dyn/www/f?p=104:30:1742232870351101:::FSP_ORG_ID,FSP_LANG_ID:1258637,25)
- (3) ▼a. 当六价格的浓度高于0.13 µg/cm<sup>2</sup>时, 样品为阳性, 即含有六价格;  
 b. 当六价格的浓度为ND(低于0.10 µg/cm<sup>2</sup>)时, 样品为阴性, 即未检测到六价格;  
 c. 当六价格的浓度介于0.10 µg/cm<sup>2</sup>与0.13 µg/cm<sup>2</sup>之间时, 无法直接判定是否检测到六价格, 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, 样品的六价格测试结果仅能代表测试时样品含六价格的状态。

### 卤素

测试方法: 参考EN 14582:2016, 用 IC分析。

测试项目	单位	MDL	003
氟 (F)	mg/kg	50	ND
氯 (Cl)	mg/kg	50	ND
溴 (Br)	mg/kg	50	ND



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## 测试报告

No. CANEC2124946206

日期: 2022年01月14日 第5页,共14页

测试项目	单位	MDL	003
碘 (I)	mg/kg	50	ND

### AfPS GS 2019:01 PAK-多环芳香烃

测试方法: 参考AfPS GS 2019:01 PAK测试, 采用 GC-MS进行分析。

测试项目	CAS NO.	单位	MDL	003
萘 (NAP)	91-20-3	mg/kg	0.1	ND
菲 (PHE)	85-01-8	mg/kg	0.1	ND
蒽 (ANT)	120-12-7	mg/kg	0.1	ND
荧蒽 (FLT)	206-44-0	mg/kg	0.1	ND
芘 (PYR)	129-00-0	mg/kg	0.1	ND
苯并(a)蒽 (BaA)	56-55-3	mg/kg	0.1	ND
蒽 (CHR)	218-01-9	mg/kg	0.1	ND
苯并(b)荧蒽 (BbF)	205-99-2	mg/kg	0.1	ND
苯并(j)荧蒽 (BjF)	205-82-3	mg/kg	0.1	ND
苯并(k)荧蒽 (BkF)	207-08-9	mg/kg	0.1	ND
苯并(a)芘 (BaP)	50-32-8	mg/kg	0.1	ND
苯并(e)芘 (BeP)	192-97-2	mg/kg	0.1	ND
茚并(1,2,3-c,d)芘 (IPY)	193-39-5	mg/kg	0.1	ND
二苯并(a,h)蒽 (DBA)	53-70-3	mg/kg	0.1	ND
苯并(g,h,i)芘(二苯并(a,h)蒽) (BPE)	191-24-2	mg/kg	0.1	ND
4项多环芳香烃总和(菲 (PHE), 芘 (PYR), 蒽 (ANT), 荧蒽 (FLT))	-	mg/kg	-	ND
15项多环芳香烃总和	-	mg/kg	-	ND



**AfPS (德国产品安全委员会):多环芳香烃的要求**

参数 (mg/kg)	1类	2类		3类	
	设计意图为放入口中的材料,或与皮肤长期接触(超过30秒)的材料用于 -2009/48/EC定义的玩具,或 -供3岁以下儿童 <sup>a,b</sup> 使用。	不属于第1类,设计意图或可预见 <sup>d</sup> 与皮肤长期接触(超过30秒)或短期重复接触 <sup>c</sup> 的材料		不属于第1和2类,设计意图或可预见与皮肤短期接触(不超过30秒)材料	
		a.供儿童使用的产品	b.其他产品	a.供儿童使用的产品	b.其他产品
苯并(a)芘 (BaP)	< 0.2	< 0.2	< 0.5	< 0.5	< 1
苯并(e)芘 (BeP)	< 0.2	< 0.2	< 0.5	< 0.5	< 1
苯并(a)蒽 (BaA)	< 0.2	< 0.2	< 0.5	< 0.5	< 1
苯并(b)荧蒽 (BbF)	< 0.2	< 0.2	< 0.5	< 0.5	< 1
苯并(j)荧蒽 (BjF)	< 0.2	< 0.2	< 0.5	< 0.5	< 1
苯并(k)荧蒽 (BkF)	< 0.2	< 0.2	< 0.5	< 0.5	< 1
蒽 (CHR)	< 0.2	< 0.2	< 0.5	< 0.5	< 1
二苯并(a,h)蒽 (DBA)	< 0.2	< 0.2	< 0.5	< 0.5	< 1
苯并(g,h,i)芘(二苯嵌苯) (BPE)	< 0.2	< 0.2	< 0.5	< 0.5	< 1
茚并(1,2,3-c,d)芘 (IPY)	< 0.2	< 0.2	< 0.5	< 0.5	< 1
菲 (PHE), 芘 (PYR), 蒽 (ANT), 荧蒽 (FLT)	< 1 (总和)	< 5 (总和)	< 10 (总和)	< 20 (总和)	< 50 (总和)
萘 (NAP)	< 1	< 2		< 10	
<b>15 PAH之和</b>	<1	< 5	< 10	< 20	< 50

注释:

- <sup>a</sup> 儿童是指法定年龄未满 14 周岁的人。
- <sup>b</sup> 供儿童使用包括儿童的主动接触或被动接触。
- <sup>c</sup> “短期重复接触”的定义摘自 REACH 附录 XVII 第 50 条修正案 (EC) No. 1272/2013)。
- <sup>d</sup> 根据德国产品安全法 (ProdSG) (第一章第 2 条第 28 款) 的定义,“可预见的使用”是指将产品投放市场的人无意但可以合理预见的方式使用产品。

备注:

德国产品安全委员会 (AfPS) 于 2020 年 4 月 10 日发布了关于多环芳香烃 (PAHs) 的新文件 (AfPS GS 2019:01 PAK), 该文件将于 2020 年 7 月 1 日起用于 GS-MARK 认证。

**全氟辛酸(PFOA)及其盐 & 全氟辛烷磺酸 (PFOS)及其衍生物**

测试方法: 参考CEN/TS 15968:2010, 采用LC-MS或LC-MS/MS进行分析。



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日期: 2022年01月14日 第7页,共14页

测试项目	CAS NO.	单位	MDL	003
全氟辛酸 (PFOA)及其盐+	335-67-1	mg/kg	0.010	ND
全氟辛酸磺酸 (PFOS) <sup>^</sup>	1763-23-1	mg/kg	0.010	ND
全氟辛基磺酰胺(PFOSA)	754-91-6	mg/kg	0.010	ND
N-甲基全氟辛酸磺酰胺(MeFOSA)	31506-32-8	mg/kg	0.010	ND
N-乙基全氟辛酸磺酰胺(EtFOSA)	4151-50-2	mg/kg	0.010	ND
2- (N-甲基全氟辛基磺酰胺) 乙醇(MeFOSE)	24448-09-7	mg/kg	0.010	ND
2- (N-乙基全氟辛基磺酰胺) 乙醇(EtFOSE)	1691-99-2	mg/kg	0.010	ND
全氟辛酸磺酸 (PFOS)及其衍生物	-	mg/kg	-	ND

### 备注:

- (1) + PFOA 及其盐包含PFOA-Na (CAS No.: 335-95-5), PFOA-K (CAS No.: 2395-00-8), PFOA-Ag (CAS No.: 335-93-3), PFOA-F (CAS No.: 335-66-0) 和 APFO (CAS No.: 3825-26-1);
- (2) <sup>^</sup> 全氟辛酸磺酸 (PFOS)包含 PFOS-K (CAS No.: 2795-39-3), PFOS-Li (CAS No.: 29457-72-5), PFOS-NH<sub>4</sub> (CAS No.: 29081-56-9), PFOS-NH(OH)<sub>2</sub> (CAS No.: 70225-14-8), PFOS-N(C<sub>2</sub>H<sub>5</sub>)<sub>4</sub> (CAS No.: 56773-42-3), PFOS-DDA (CAS No.:251099-16-8) 和POSF (CAS No.: 307-35-7)

备注▲: 根据客户提供的声明, 样品002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)。

本报告更新了样品名称。

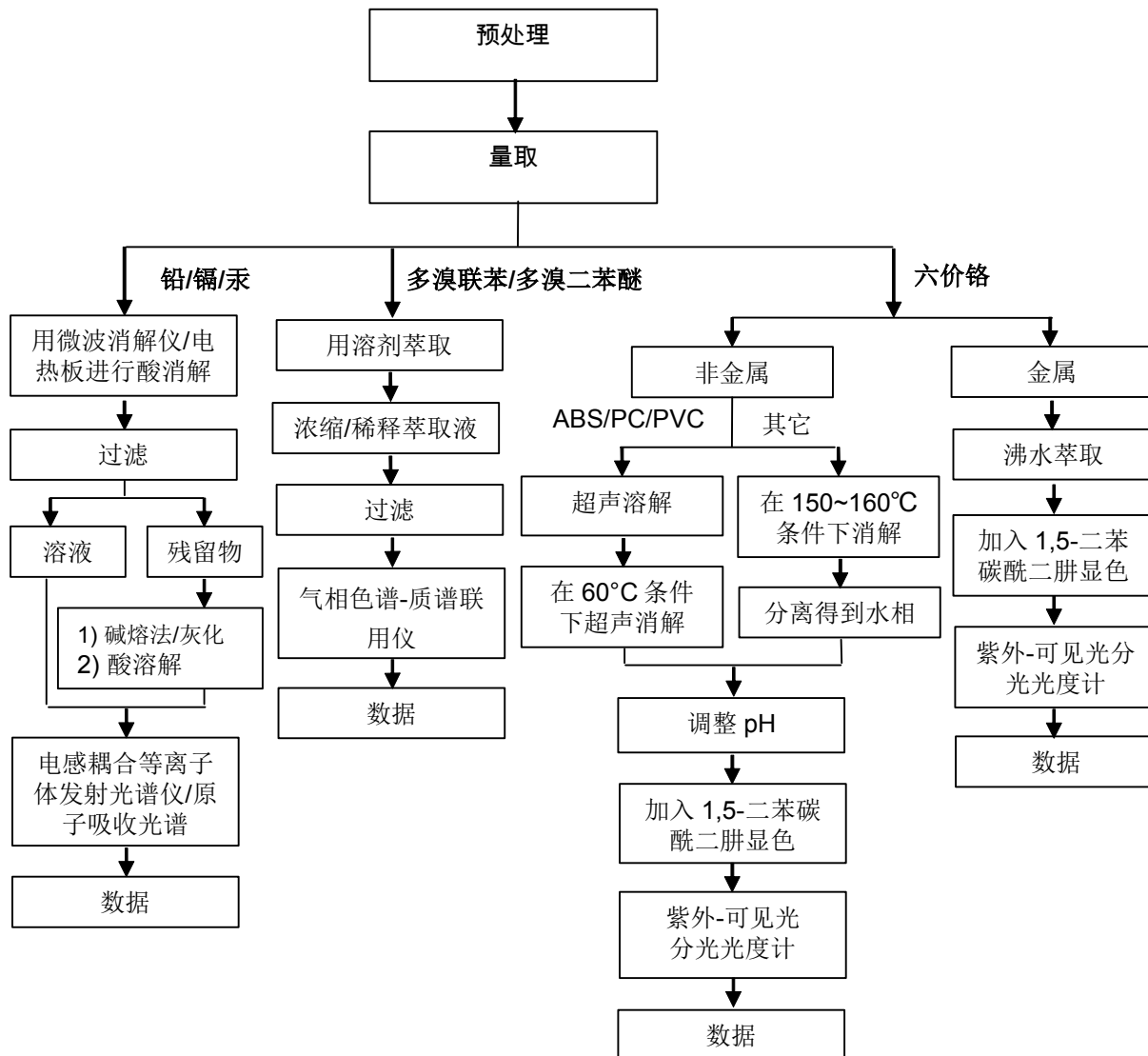
除非另有说明, 此报告结果仅对测试的样品负责。本报告未经本公司书面许可, 不可部分复制。检测报告仅用于客户科研、教学、内部质量控制、产品研发等目的, 仅供内部参考。



附件

## Pb/Cd/Hg/Cr<sup>6+</sup>/PBBs/PBDEs 测试流程图

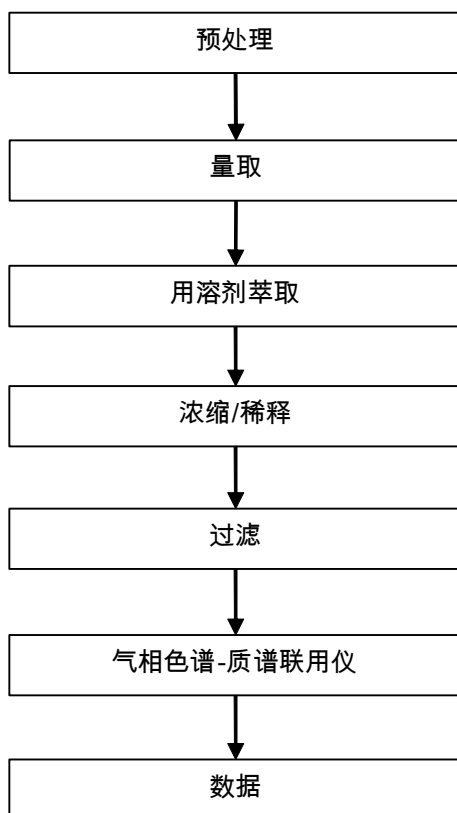
1) 样品按照下述流程被完全消解（六价铬和多溴联苯/多溴二苯醚测试除外）。





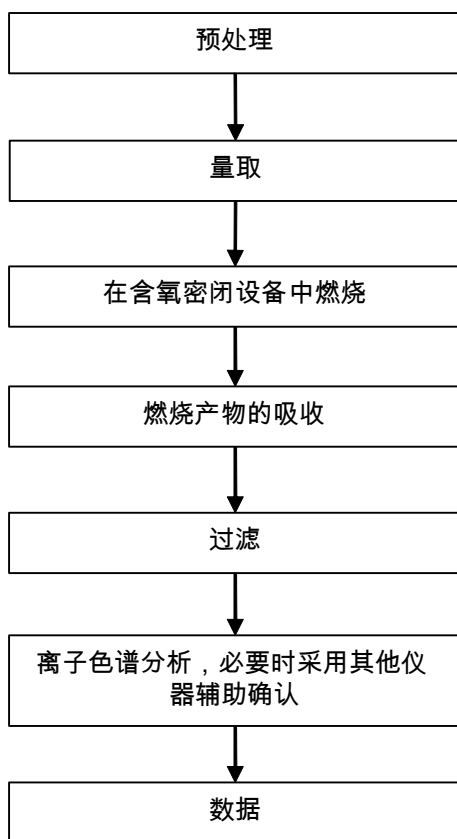
附件

### Phthalates 测试流程图



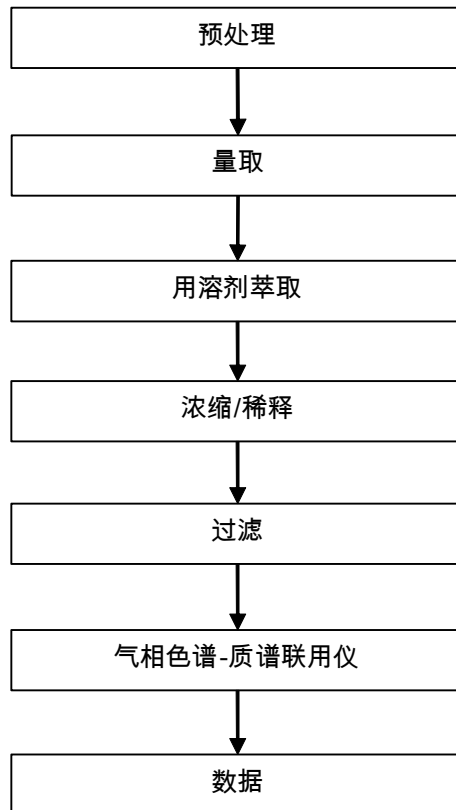
附件

## Halogen 测试流程图



附件

### PAHs 测试流程图

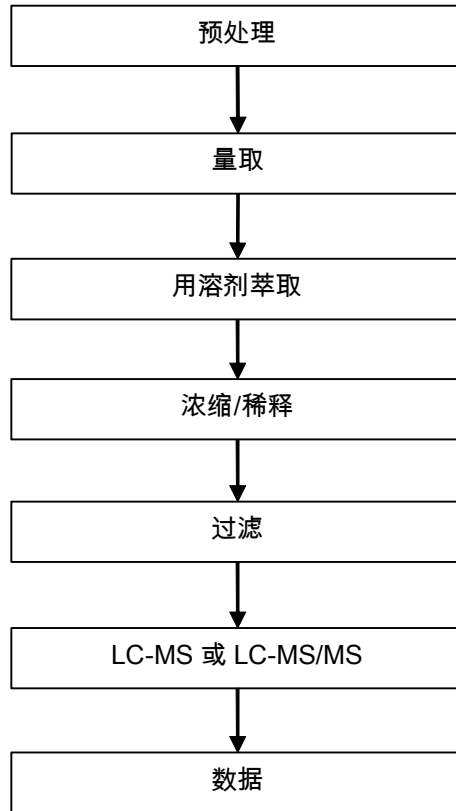


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附件

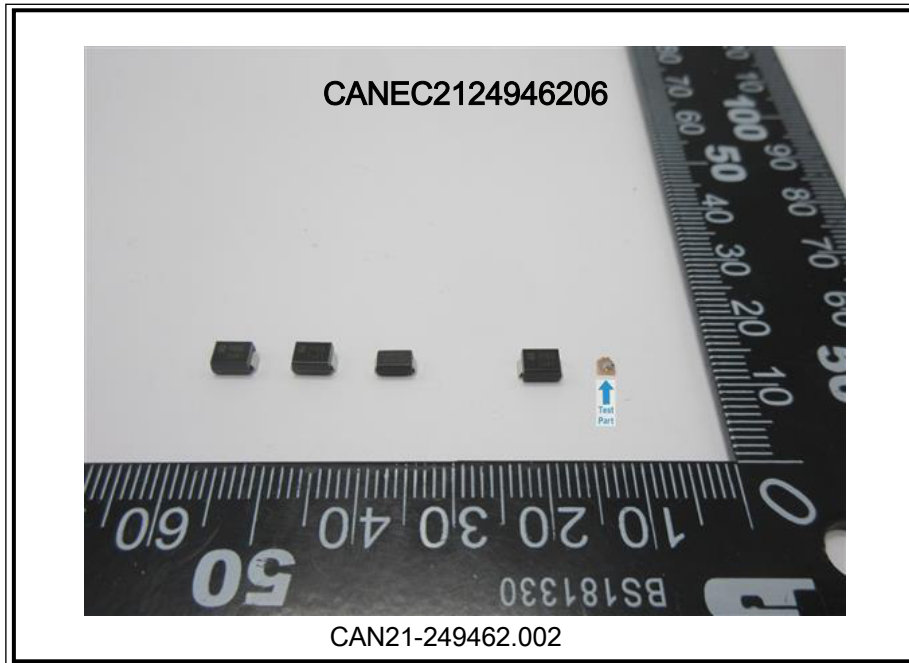
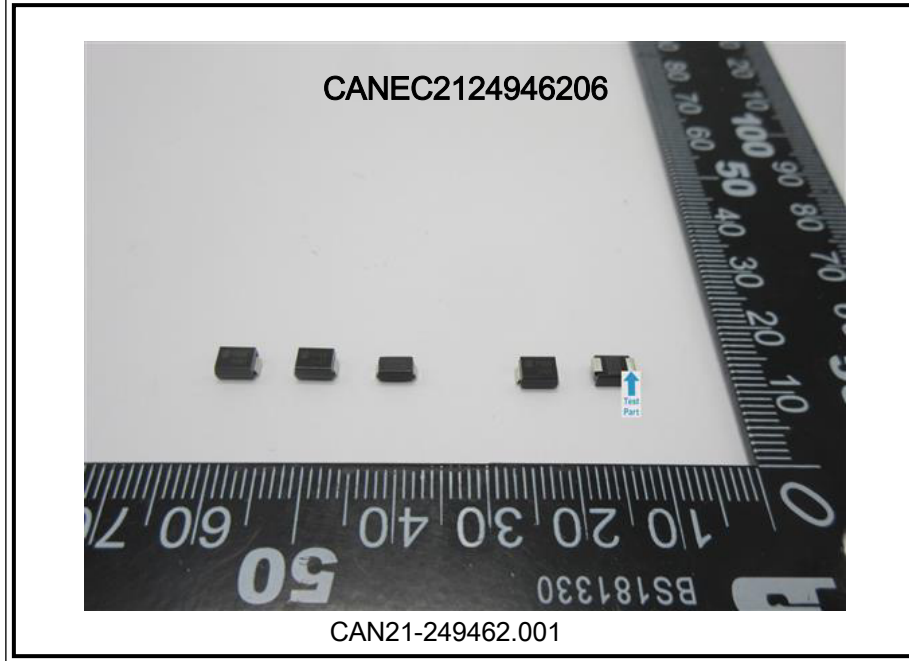
### PFOA / PFOS 测试流程图

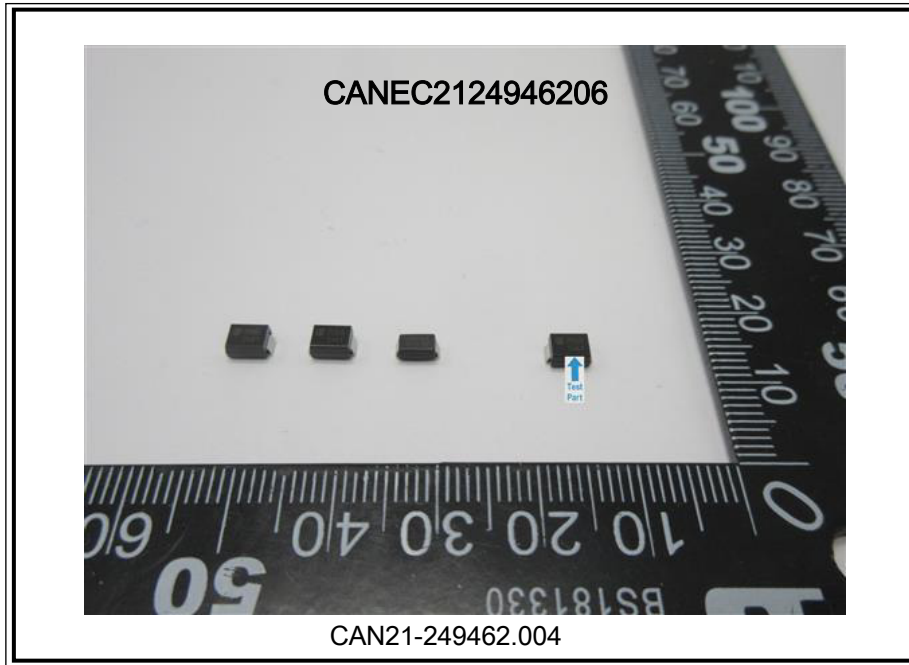
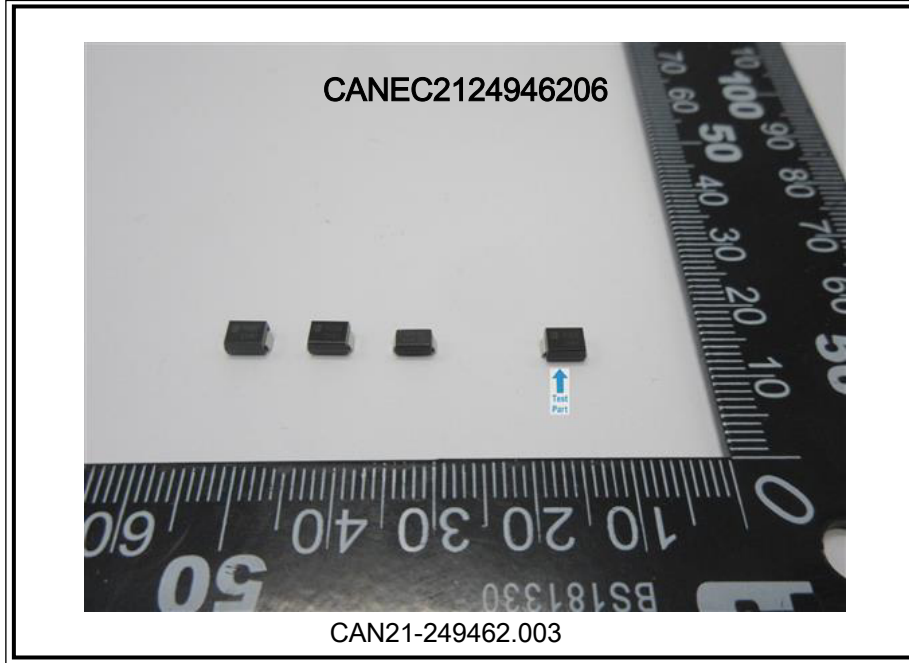


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