

检测报告

编号: EGZ2306150026C00205R

日期: 2023 年 06 月 27 日

第 1 页 共 16 页

委托单位 : 上海庆科信息技术有限公司

地 址 : 上海市普陀区金沙江路 2145 弄 B 幢 9 楼

样品名称 : 嵌入式 Wi-Fi/BLE 模组

型 号 : EMC3090

客户参考信息 : EMC3090-P、EMC3090-E

供 应 商 : 上海庆科信息技术有限公司

接收日期 : 2023 年 06 月 16 日

检测日期 : 2023 年 06 月 16 日~2023 年 06 月 27 日

检测要求 : 根据客户要求, 对送测样品进行欧洲议会及理事会于 2011 年 6 月 8 日决定的关于在电子电器产品中限制使用某些有害物质的指令 2011/65/EU 中附件 II 的修订指令(EU) 2015/863 要求的符合性评估。

检测方法

1. 对客户所提交的样品及其相关材料清单进行检查、评估。
2. a) 参照标准 IEC 62321-2:2021 ed. 2.0, 对客户所提交的样品进行拆分。
b) 参照标准 IEC 62321-1:2013, 对客户所提交的指定图片样品进行测试。
c) 参照标准 IEC 62321-3-1:2013: X 射线荧光扫描筛选测试。
d) 湿化学测试
 - 1) 参照 IEC 62321-5: 2013, 用 ICP-OES 测定铅(Pb)、镉(Cd)的含量。
 - 2) 参照 IEC 62321-4: 2013+A1:2017, 用 ICP-OES 测定汞(Hg)的含量。
 - 3) 参照 IEC 62321-7-1:2015 & IEC 62321-7-2: 2017, 用 UV-VIS 测定六价铬(Cr(VI))的含量。
 - 4) 参照 IEC 62321-6:2015, 用 GC-MS 测定多溴联苯(PBBs)和多溴二苯醚(PBDEs)的含量。
 - 5) 参照 IEC 62321-8:2017, 用 GC-MS 测定邻苯二甲酸二(2-乙基己)酯(DEHP)、邻苯二甲酸二丁酯(DBP)、邻苯二甲酸丁苄酯(BBP)和邻苯二甲酸二异丁酯(DIBP)含量。

测试结果 : 请参见下一页



检测报告

编号: EGZ2306150026C00205R

日期: 2023 年 06 月 27 日

第 2 页 共 16 页

执行测试总结:

所提交样品中均质材料的测试结果符合 RoHS 指令 2011/65/EU 中附件 II 的修订指令(EU) 2015/863 的要求。



谨代表

广州信测标准技术服务股份有限公司

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2023 年 06 月 27 日

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检测报告

编号: EGZ2306150026C00205R

日期: 2023 年 06 月 27 日

第 3 页 共 16 页

1.1 样品清单:

序号	样品编号	样品名称
5	E2306150026-05	嵌入式 Wi-Fi/BLE 模组

1.2 检测样品清单

序号	样品描述
5.1	焊锡-银色金属
5.2	白色标签
5.3	屏蔽罩-银色金属
5.4	SMD Y
5.5	IC
5.6	SMD C
5.7	蓝色 PCB 板
5.8	SMD C
5.9	SMD C
5.10	SMD R
5.11	SMD R
5.12	SMD R
5.13	电感-灰色固体
5.14	电感-铜色金属

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检测报告

编号: EGZ2306150026C00205R

日期: 2023 年 06 月 27 日

第 4 页 共 16 页

2. Pb,Cd,Hg,Cr⁶⁺,PBBs,PBDEs 测试结果

序号	受限物质	EDXRF 结果 ⁽¹⁾	湿化学测试结果 ⁽²⁾ (毫克/千克)	备注 ⁽³⁾
5.1	Cd	BL	---	无
	Pb	BL		
	Hg	BL		
	Cr	BL		
	Br	NA		
5.2	Cd	BL	---	无
	Pb	BL		
	Hg	BL		
	Cr	BL		
	Br	BL		
5.3	Cd	BL	---	无
	Pb	BL		
	Hg	BL		
	Cr	BL		
	Br	NA		
5.4	Cd	BL	---	无
	Pb	BL		
	Hg	BL		
	Cr	BL		
	Br	BL		
5.5	Cd	BL	---	无
	Pb	BL		
	Hg	BL		
	Cr	BL		
	Br	BL		
5.6	Cd	BL	---	无
	Pb	BL		
	Hg	BL		
	Cr	BL		
	Br	BL		

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检测报告

编号: EGZ2306150026C00205R

日期: 2023 年 06 月 27 日

第 5 页 共 16 页

序号	受限物质	EDXRF 结果 ⁽¹⁾	湿化学测试结果 ⁽²⁾ (毫克/千克)	备注 ⁽³⁾
5.7	Cd	BL	多溴联苯: 未检出 多溴二苯醚: 未检出	无
	Pb	BL		
	Hg	BL		
	Cr	BL		
	Br	X		
5.8	Cd	BL	---	无
	Pb	BL		
	Hg	BL		
	Cr	BL		
	Br	BL		
5.9	Cd	BL	---	无
	Pb	BL		
	Hg	BL		
	Cr	BL		
	Br	BL		
5.10	Cd	BL	---	无
	Pb	BL		
	Hg	BL		
	Cr	BL		
	Br	BL		
5.11	Cd	BL	---	无
	Pb	BL		
	Hg	BL		
	Cr	BL		
	Br	BL		
5.12	Cd	BL	---	无
	Pb	BL		
	Hg	BL		
	Cr	BL		
	Br	BL		

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检测报告

编号: EGZ2306150026C00205R

日期: 2023 年 06 月 27 日

第 6 页 共 16 页

序号	受限物质	EDXRF 结果 ⁽¹⁾	湿化学测试结果 ⁽²⁾ (毫克/千克)	备注 ⁽³⁾
5.13	Cd	BL	六价铬: ND	无
	Pb	BL		
	Hg	BL		
	Cr	X		
	Br	BL		
5.14	Cd	BL	---	无
	Pb	BL		
	Hg	BL		
	Cr	BL		
	Br	NA		

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检测报告

编号: EGZ2306150026C00205R

日期: 2023 年 06 月 27 日

第 7 页 共 16 页

3. 邻苯二甲酸酯(DBP, BBP, DEHP, DIBP)测试结果

序号	受限物质	CAS 号	湿化学测试结果 (%)	方法检测限 (%)	限值 (%)
5.2	DBP	84-74-2	ND	0.003	0.1
	BBP	85-68-7	ND	0.003	0.1
	DEHP	117-81-7	ND	0.003	0.1
	DIBP	84-69-5	ND	0.003	0.1
5.4	DBP	84-74-2	ND	0.003	0.1
	BBP	85-68-7	ND	0.003	0.1
	DEHP	117-81-7	ND	0.003	0.1
	DIBP	84-69-5	ND	0.003	0.1
5.5	DBP	84-74-2	ND	0.003	0.1
	BBP	85-68-7	ND	0.003	0.1
	DEHP	117-81-7	ND	0.003	0.1
	DIBP	84-69-5	ND	0.003	0.1
5.6	DBP	84-74-2	ND	0.003	0.1
	BBP	85-68-7	ND	0.003	0.1
	DEHP	117-81-7	ND	0.003	0.1
	DIBP	84-69-5	ND	0.003	0.1
5.7	DBP	84-74-2	ND	0.003	0.1
	BBP	85-68-7	ND	0.003	0.1
	DEHP	117-81-7	ND	0.003	0.1
	DIBP	84-69-5	ND	0.003	0.1
5.8	DBP	84-74-2	ND	0.003	0.1
	BBP	85-68-7	ND	0.003	0.1
	DEHP	117-81-7	ND	0.003	0.1
	DIBP	84-69-5	ND	0.003	0.1
5.9	DBP	84-74-2	ND	0.003	0.1
	BBP	85-68-7	ND	0.003	0.1
	DEHP	117-81-7	ND	0.003	0.1
	DIBP	84-69-5	ND	0.003	0.1

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检测报告

编号: EGZ2306150026C00205R

日期: 2023 年 06 月 27 日

第 8 页 共 16 页

序号	受限物质	CAS 号	湿化学测试结果 (%)	方法检测限 (%)	限值 (%)
5.10	DBP	84-74-2	ND	0.003	0.1
	BBP	85-68-7	ND	0.003	0.1
	DEHP	117-81-7	ND	0.003	0.1
	DIBP	84-69-5	ND	0.003	0.1
5.11	DBP	84-74-2	ND	0.003	0.1
	BBP	85-68-7	ND	0.003	0.1
	DEHP	117-81-7	ND	0.003	0.1
	DIBP	84-69-5	ND	0.003	0.1
5.12	DBP	84-74-2	ND	0.003	0.1
	BBP	85-68-7	ND	0.003	0.1
	DEHP	117-81-7	ND	0.003	0.1
	DIBP	84-69-5	ND	0.003	0.1
5.13	DBP	84-74-2	ND	0.003	0.1
	BBP	85-68-7	ND	0.003	0.1
	DEHP	117-81-7	ND	0.003	0.1
	DIBP	84-69-5	ND	0.003	0.1

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检测报告

编号: EGZ2306150026C00205R

日期: 2023 年 06 月 27 日

第 9 页 共 16 页

备注: (1) ① XRF 结果是初步筛选,如果有不确定结果(如下表中“X”)需要进一步通过 ICP-OES/AAS(针对镉,铅,汞), UV-VIS(针对六价铬)以及 GC/MS(针对多溴联苯,多溴二苯醚)做湿化学分析(单位:毫克/千克)。

② OL = 超出限值, BL = 低于限值, X = 不确定, NA = 不适用。

③ 针对元素的扫描结果-不均一材料的测试值与真实值可能存在差异。

分析元素	聚合物材料	金属材料	电子元件
镉 Cd	$BL \leq (70-3\sigma) < X < (130+3\sigma) \leq OL$	$BL \leq (70-3\sigma) < X < (130+3\sigma) \leq OL$	$LOD < X < (150+3\sigma) \leq OL$
铅 Pb	$BL \leq (700-3\sigma) < X < (1300+3\sigma) \leq OL$	$BL \leq (700-3\sigma) < X < (1300+3\sigma) \leq OL$	$BL \leq (500-3\sigma) < X < (1500+3\sigma) \leq OL$
汞 Hg	$BL \leq (700-3\sigma) < X < (1300+3\sigma) \leq OL$	$BL \leq (700-3\sigma) < X < (1300+3\sigma) \leq OL$	$BL \leq (500-3\sigma) < X < (1500+3\sigma) \leq OL$
溴 Br	$BL \leq (300-3\sigma) < X$	NA	$BL \leq (250-3\sigma) < X$
铬 Cr	$BL \leq (700-3\sigma) < X$	$BL \leq (700-3\sigma) < X$	$BL \leq (500-3\sigma) < X$

(2) ① 毫克/千克 = 0.0001%, ND = 未检测到(小于方法检测限)。

② 湿化学测试中的单位和报告限值。

测试项目	铅	镉	汞	Cr(VI)(非金属)	多溴联苯(单个)	多溴二苯醚(单个)
单位	毫克/千克	毫克/千克	毫克/千克	毫克/千克	毫克/千克	毫克/千克
报告限值	2	2	2	8	5	5

③ 依据 IEC 62321-7-1:2015, 金属样品中 Cr(VI)的结果用阳性/阴性来表示。

- 当六价铬结果为阳性(浓度大于 $0.13\mu\text{g}/\text{cm}^2$), 表示样品表层含有六价铬。
 - 当六价铬结果为阴性(浓度小于 $0.10\mu\text{g}/\text{cm}^2$), 表示样品表层不含有六价铬。
 - 当六价铬结果介于 0.10 及 $0.13\mu\text{g}/\text{cm}^2$ 时, 无法确定涂层是否含有六价铬。
- 由于未知测试样品的储存条件及生产日期, 测试结果仅代替样品在测试期间的状态。

④ 根据 IEC 62321-3-1:2013 的标准要求, 这列内容代表化学测试结果, 而“---”代表前面 XRF 扫描测试合格后不需要再做化学测试。

(3) 这列内容代表有关材料的豁免声明或者其它必要的批注, 而“无”代表没有批注。

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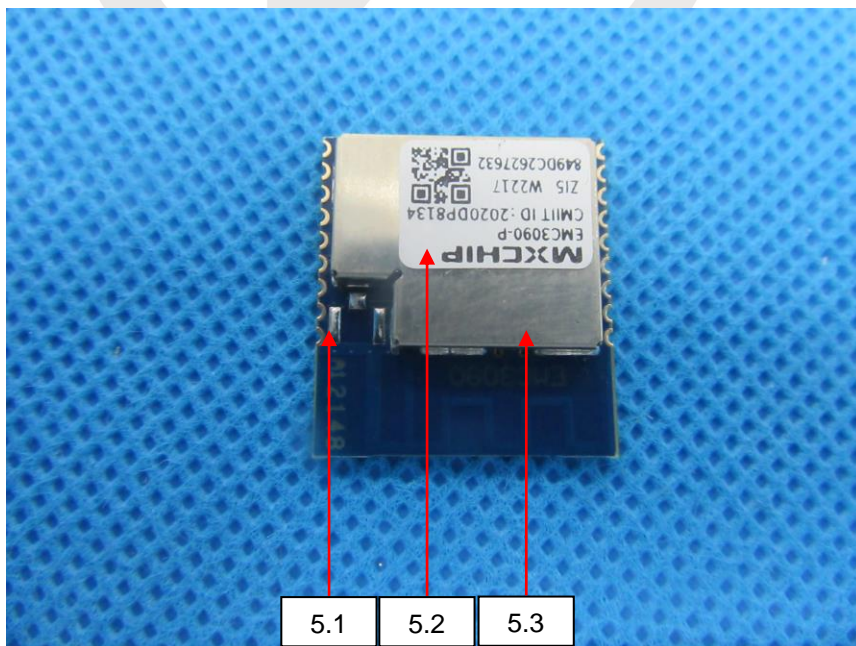
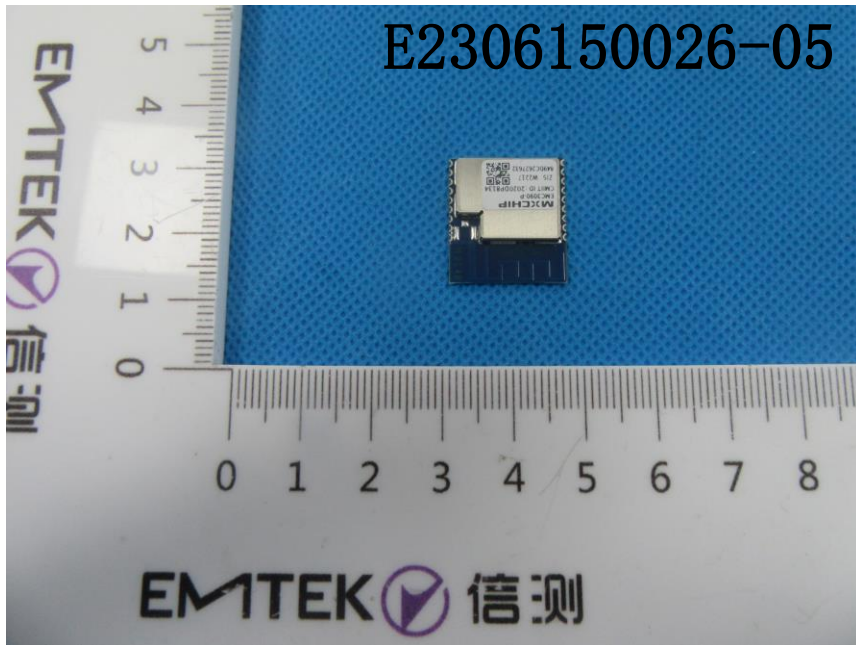
检测报告

编号: EGZ2306150026C00205R

日期: 2023 年 06 月 27 日

第 10 页 共 16 页

4. 样品照片



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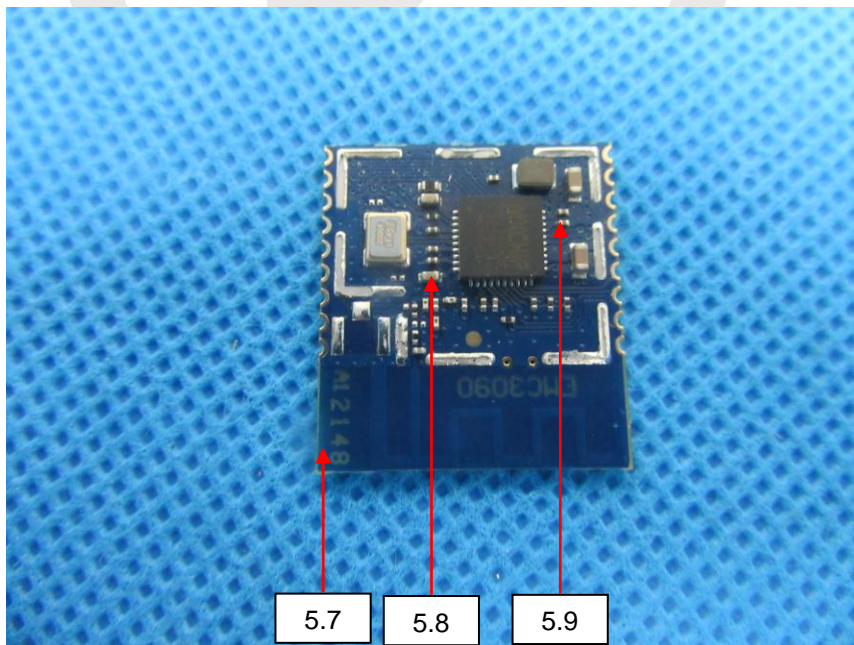
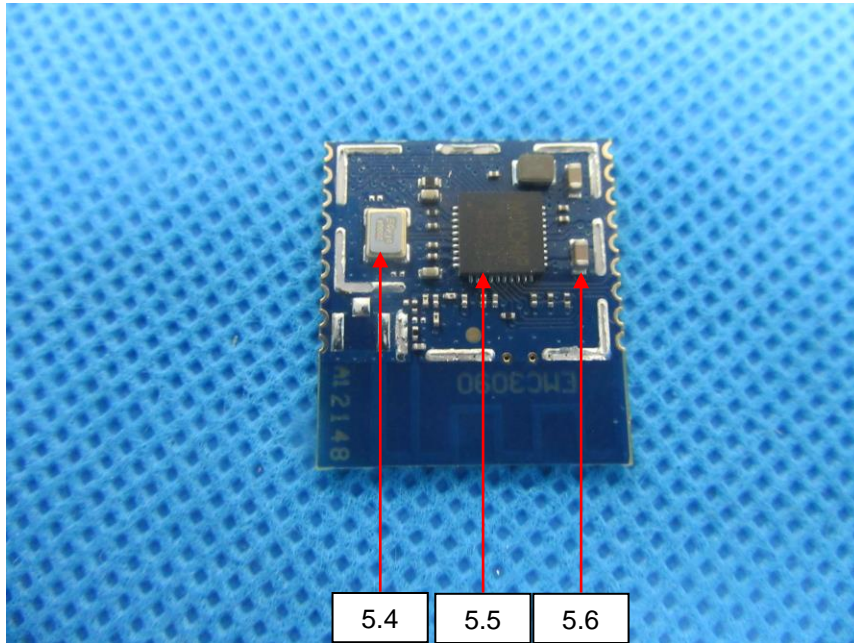


检测报告

编号: EGZ2306150026C00205R

日期: 2023 年 06 月 27 日

第 11 页 共 16 页



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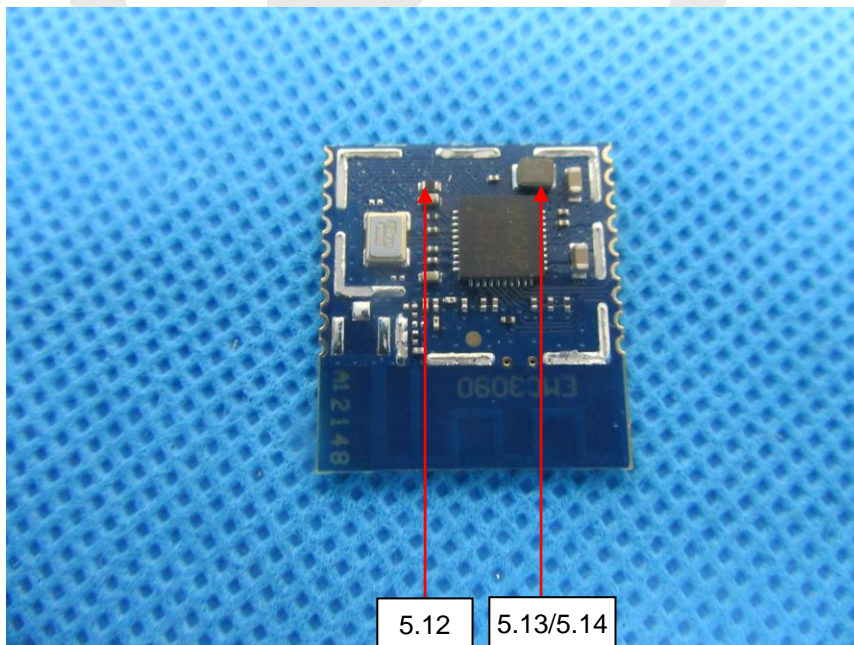
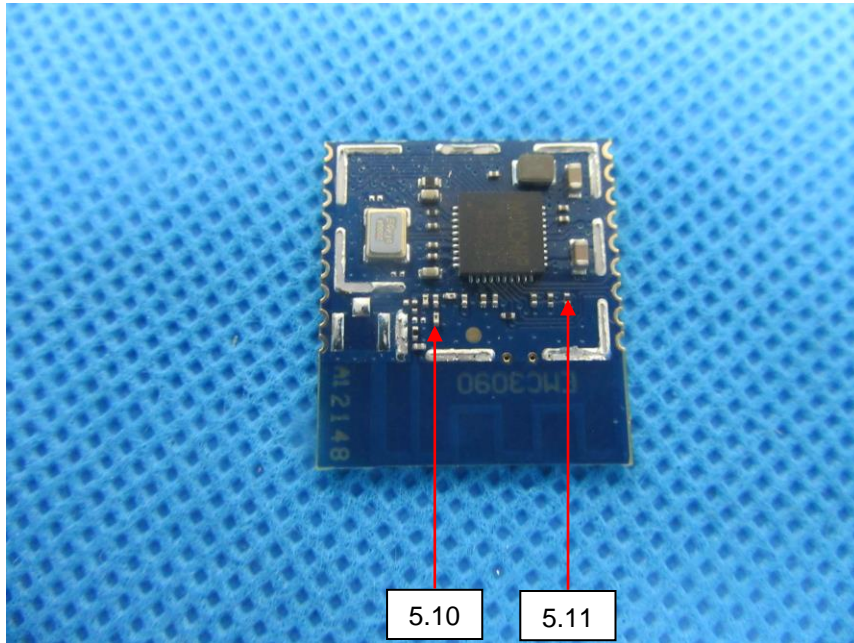


检测报告

编号: EGZ2306150026C00205R

日期: 2023 年 06 月 27 日

第 12 页 共 16 页



报告结束

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检测报告

编号: EGZ2306150026C00205R

日期: 2023 年 06 月 27 日

第 13 页 共 16 页

附录

限制物质清单

限制物质及其在均质材料中的最大允许浓度 (以重量计):

铅 (0.1%)	DEHP (0.1%)
汞 (0.1%)	BBP (0.1%)
镉 (0.01%)	DBP (0.1%)
六价铬 (0.1%)	DIBP (0.1%)
多溴联苯 (0.1%)	
多溴二苯醚 (0.1%)	

豁免清单

序号

- 1 单端(紧凑型)荧光灯中的汞含量不超过(每盏):
 - 1(a) 普通照明用<30W: 2.5 毫克/灯
 - 1(b) 普通照明用≥30W 且< 50W: 3.5 毫克/灯
 - 1(c) 普通照明用≥50W 且< 150 W: 5 毫克/灯
 - 1(d) 普通照明用≥150 W: 15 毫克/灯
 - 1(e) 普通照明用, 环状或方形结构, 管径 ≤17 毫米: 7 毫克/灯
 - 1(f) 特殊用途: 5 毫克/灯
 - 1(g) 用于一般照明用途, 功率<30W、寿命≥20000 小时: 3.5 毫克/灯
- 2(a) 普通照明用的双端线型荧光灯中的汞含量不超过(每盏):
 - 2(a)(1) 正常寿命的三基色荧光灯, 管径< 9 毫米(例如 T2): 4 毫克/灯
 - 2(a)(2) 正常寿命的三基色荧光灯, 管径≥9 毫米且≤17 毫米(例如 T5): 3 毫克/灯
 - 2(a)(3) 正常寿命的三基色荧光灯, 管径> 17 毫米且≤28 毫米(例如 T8): 3.5 毫克/灯
 - 2(a)(4) 正常寿命的三基色荧光灯, 管径> 28 毫米(例如 T12): 3.5 毫克/灯
 - 2(a)(5) 长寿命(≥2 万 5 千小时)的三基色荧光灯: 5 毫克/灯
 - 2(b) 其它荧光灯中的汞含量不超过(每盏):
 - 2(b)(2) 非线型卤磷酸盐灯(各种管径): 15 毫克
 - 2(b)(3) 管径> 17 毫米的非线型三基色荧光灯(例如 T9): 15 毫克/灯
 - 2(b)(4) 其它普通照明用灯和特殊用灯(例如感应灯): 15 毫克/灯
- 3 特殊用途的冷阴极荧光灯及外部电极荧光灯(CCFL 和 EEFL)中的汞含量不超过(每盏):
 - 3(a) 短型(长度≤500 毫米): 3.5 毫克/灯
 - 3(b) 中型(长度> 500 毫米且≤1500 毫米): 5 毫克/灯
 - 3(c) 长型(长度> 1500 毫米): 13 毫克/灯
- 4(a) 其它低压放电灯中的汞(每盏): 15 毫克/灯
- 4(b) 普通照明用的高压钠(蒸气)灯, 其显色指数 $R_a > 60$ 的, 其汞含量不超过(每盏):
 - 4(b)- I 功率≤155W: 30 毫克/灯
 - 4(b)- II 155W < 功率 ≤405 W: 40 毫克/灯
 - 4(b)-III 功率> 405 W: 40 毫克/灯
- 4(c) 其它普通照明用的高压钠(蒸气)灯中的汞含量不超过(每盏):
 - 4(c)- I 功率≤155 W: 25 毫克/灯
 - 4(c)- II 155 W < 功率 ≤405 W: 30 毫克/灯
 - 4(c)-III 功率> 405 W: 40 毫克/灯
- 4(d) 高压汞(蒸气)灯(HPMV)中的汞
- 4(e) 金属卤化物灯(MH)中的汞

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检测报告

编号: EGZ2306150026C00205R

日期: 2023 年 06 月 27 日

第 14 页 共 16 页

附录

豁免清单 (续)

- 4(f) 本附录中未提及的, 其它特殊用途的放电灯中的汞
- 4(g) 用于标志、装饰、建筑、专业照明和灯光艺术的手工制作发光放电管 (HLDTs) 中的汞, 其汞含量限值为:
- (a) 用于室外和温度低于 20℃ 的室内时, 20mg/电极对+0.3mg/cm \times 灯管长度, 但不超过 80mg
- (b) 用于其他室内环境时, 15mg/电极对+0.24mg/cm \times 灯管长度, 但不超过 80mg
- 5(a) 阴极射线管的玻璃中的铅
- 5(b) 荧光管的玻璃中的铅含量不超过 0.2%.
- 6(a) 铅作为合金元素, 在加工用途的钢和镀锌钢中的含量不超过 0.35%
- 6(b) 铝合金中的铅含量不超过 0.4%
- 6(c) 铜合金中的铅含量不超过 4%
- 7(a) 高熔点型焊料中的铅(也就是铅基合金, 其铅含量超过 85%)
- 7(b) 用于服务器、存储器和存储阵列系统中的焊料中的铅, 用于为交换、信号发送、传输的网络基础设备中及电信网络管理设施中的焊料中的铅。
- 7(c)- I 除介电陶瓷电容器外, 其它电子电气元件中玻璃或陶瓷中的铅(例如压电电子装置), 或玻璃或陶瓷复合材料中的铅
- 7(c)- II 额定电压不低于交流电 125 伏特或直流电 250 伏特的介电陶瓷电容器中的铅
- 7(c)-III 额定电压小于交流电 125 伏特或直流电 250 伏特的介电陶瓷电容器中的铅
- 7(c)-IV 以锆钛酸铅 (PZT) 为基础的介电陶瓷介电陶瓷材料的电容器的铅, 该电容器为集成电路或分立半导体的组成部分
- 8(a) 单触球型热熔断器中的镉及镉的化合物
- 8(b) 电触点中的镉及镉的化合物
- 9 六价铬用于吸收式电冰箱中碳钢冷却系统中的防腐剂, 其重量不超过冷却液的 0.75%。
- 9(b) 用于冷暖空调设备(HVACR)的制冷压缩机中的轴承壳及衬套中的铅
- 11(a) C-press 顺应针连接器系统中的铅
- 11(b) 除 C-press 之外的顺应针连接器系统中的铅
- 12 热导模组 C-ring 涂层中的铅
- 13(a) 光学应用的白色玻璃中的铅
- 13(b) 滤光玻璃及用于当做反射率标准片的玻璃中的镉和铅
- 14 微处理器的引脚与封装体连接所使用的铅含量占 80%~85%的含两种以上元素的焊料中的铅
- 15 集成电路倒装芯片封装中半导体芯片及载体之间形成可靠连接所用焊料中的铅
- 17 用于专业复印设备的高强度放电灯(HID)中, 作为发光剂的卤化铅
- 18(b) 放电灯, 用于仿日晒灯, 其中含有磷, 如 BSP(BaSi2O5:Pb), 则放电灯中的荧光粉, 其铅作为触媒剂, 铅含量占重量的 1%或以下。
- 21 应用于如硼硅酸盐玻璃及碱石灰玻璃瓷釉的印刷油墨中的铅和镉。
- 23 在细距零部件的表面处理中的铅, 但不包括螺距在 0.65 毫米及以下的连接器。
- 24 通孔盘状和平面阵列陶瓷多层电容器的焊料中的铅。
- 25 用于结构部件的表面传导式电子发射显示器(SED)中的氧化铅, 特别是密封玻璃料和玻璃环中。
- 29 69/493/EEC 指令中附录 I 中(第 1, 2, 3, 4 类)定义的水晶玻璃中的铅。
- 30 声压在 100 分贝以上的大功率扬声器中, 与音圈转换器连接电导体之电机/机械焊料中的镉合金。
- 31 无汞平板荧光灯(例如用于液晶显示器、设计或工业照明)中的焊料材料中的铅。
- 32 氩及氪雷射管中, 使用于窗口结构的密封玻璃中的氧化铅。
- 33 用于焊接电力变压器中直径 100 微米及以下细铜线所用焊料中的铅。
- 34 金属陶瓷质微调电位器中的铅。
- 37 以硼酸锌玻璃体为基体的高压二极管的电镀层中的铅。
- 38 用氧化铍连接铝制成的厚膜浆料中的镉和氧化镉。
- 39(a) 用于固态照明或显示系统中的彩色转换 II-VI 族发光二极管(每平方毫米发光区域的镉含量小于 10 微克)内所含的镉。

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检测报告

编号: EGZ2306150026C00205R

日期: 2023 年 06 月 27 日

第 15 页 共 16 页

附录

豁免清单 (续)

- 39(b) 用于显示照明应用中的下转换镉基半导体量子点中的镉 (每方毫米显示屏区域的镉含量小于 $0.2\mu\text{g}$)。
- 41 由于技术原因必须直接安装在手持式内燃机的曲轴箱或气缸 (*指令 97/68/EC 中的类别 SH: 1、SH: 2、SH: 3) 内的点火模块和其他电子电气引擎控制系统, 其电子电气元件所含焊料和最终涂层、印刷电路板的最终涂层中的铅



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检测报告

编号: EGZ2306150026C00205R

日期: 2023 年 06 月 27 日

第 16 页 共 16 页

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6. 其它声明请查阅报告页脚及书面报告末页。
For other statements, please refer to the footer of the report.

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签发测试报告条款 Conditions of Issuance of Test Reports

1. 广州信测标准技术服务有限公司（以下简称[本公司]）为提供符合下述条款的测试和报告，而接受有关样品和货品。本公司基于下述条款提供服务，下述条款为本公司与申请服务的个人、企业或公司（以下简称[客户]）的协议。
All samples and goods are accepted by the EMTEK(Guangzhou) Co., Ltd. (the "Company") solely for testing and reporting in accordance with the following terms and conditions. The company provides its services on the basis that such terms and conditions constitute express agreement between the Company and any person, firm or company requesting its services (the "Clients").
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In the event of the improper use of the report as determined by the Company, the Company reserves the right to withdraw it, and to adopt any other additional remedies which may be appropriate.
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Samples submitted for testing are accepted on the understanding that the Report issued cannot form the basis of, or be the instrument for, any legal action against the Company.
6. 如因使用本公司中心任何报告内的资料，或任何传播信息所描述与之有关的测试或研究导致的任何损失或损害，本公司概不负责。
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8. 该测试报告的支持数据和信息本公司保存 10 年。个别评审机构有特别要求的，检测数据和报告的保存期可依情况变动。一旦超过上述提交的保存期限，数据和信息将被处理掉。任何情况下，本公司不必提供任何被处理的过期数据或信息。即使本公司事先被告知可能会发生相关的损害，本公司在任何情况下也不必承担任何损害，包括（但不限于）补偿性赔偿、利润损失、数据遗失、或任何形式的特殊损害、附带损害、间接损害、从属损害或任何违反约定、违反承诺、侵权（包括疏忽）、产品责任或其他原因的惩罚性损害。
Subject to the variable length of retention time for test data and report stored hereinto as otherwise specifically required by individual accreditation authorities, the Company will only keep the supporting test data and information of the test report for a period of ten years. The data and information will be disposed of after the aforementioned retention period has elapsed. Under no circumstances shall we provide any data and information which has been disposed of after retention period. Under no circumstances shall we be liable for damage of any kind, including (but not limited to) compensatory damages, lost profits, lost data, or any form of special, incidental, indirect, consequential or punitive damages of any kind, whether based on breach of contract of warranty, tort (including negligence), product liability or otherwise, even if we are informed in advance of the possibility of such damages.

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