

校准证书

CALIBRATION CERTIFICATE

证书编号:

Certificate No.



J202310234458-04-0001

第 1 页 共 6 页

Page of

委托方

Client

京东方华灿光电(浙江)有限公司

联络信息

Contact Inf.

浙江省义乌市苏溪镇苏福路233号

仪器名称

Description

半导体专用静电放电发生器(HBM/MM模式)

型号/规格

Model/Type

ESD-883D

制造厂

Manufacturer

LISUN

出厂编号

Serial No.

H8KC3K24015

管理号

Asset No.

接收日期

Receipt Date

2024年09月11日

Y M D

校准日期

Cal. Date

2024年09月11日

Y M D

发布日期

Issued Date

2024年09月11日

Y M D

批准

Approved by

焦一鹏

焦一鹏

审核

Inspected by

蒋骋杰

蒋骋杰

校准

Calibrated by

赵大星

赵大星

证书专用章

(Stamp)

总部地址(Headquarters Add.): 广东省广州市黄埔大道西平云路163号

No.163.Pingyun Rd, West of HuangPu Ave.Guangzhou Guangdong China

实验室地址(Add.of the Lab): 江苏无锡太湖国际科技园菱湖大道200号

No.200,Linghu Road,Taihu ISTEP,Xinwu District,Wuxi,Jiangsu,China

联系电话(Tel.):400-602-0999

邮政编码(Postcode):510656

网站(Website):http://www.grgtest.com

电子邮件(E-mail):grgtest@grgtest.com



扫一扫验真伪

校验码: 349336

校准说明 DIRECTIONS OF CALIBRATION

证书编号: J202310234458-04-0001

第 2 页 共 6 页

Certificate No.

Page of

1.本实验室的质量管理体系符合ISO/IEC 17025:2017标准的要求,校准结果均可溯源至国际单位制(SI)单位。(The quality system is in accordance with ISO/IEC 17025:2017,the calibration results are traceable to the International System of Units (SI).)

2.本结果仅对本次校准样品有效。未经实验室批准,不得部分复制。如有疑问请在15个工作日内反馈。(The result is only valid for the calibrated sample.The certificate shall not be reproduced except in full,without the written approval of our laboratory .please feedback to us within 15 days if you have any question.)

3.本证书编号具有唯一性,后缀若带有“-Gx”的证书为替换证书,自发出后原证书即刻作废。(Each certificate has a unique number. The suffix of "-Gx" will be added to the number as a replacement of the old version. The original certificate will be officially invalid once the new certificate number is issued.)

4.证书中最大允许误差、判定结果仅供参考,其中“P”代表“合格”,“F”代表“不合格”,“N/A”代表“不适用”。使用人员应结合实际测量需求,评估测量不确定度对符合性评定的影响。(MPE & judgement result in the datasheet is only for reference , "P" is "Pass" , "F" is "Fail" and "N/A" is "Not Applicable".Whereas users should evaluate the effects of MU of calibration results on conformance assessment by actual measurement.)

5.校准地点、环境条件(Place and environmental conditions of the calibration):

地点: 无锡计量电子室
Place

温度: 21℃ 相对湿度: 49%
Temperature Relative Humidity

6.建议复校时间间隔: 1年,送校单位也可按实际使用情况自主决定。

Suggested calibration interval is 1 year or it can be altered depending on the actual usage of the user.

7.本次校准的技术依据及CNAS认可范围,超出范围的内容未被认可。详细认可范围请查看CNAS网站证书附件。(Reference document and accredited scope by CNAS for calibration, beyond which isn't accredited. Please see the attachment of certificate on CNAS website for details.)

JJF 1238-2022 集成电路静电放电敏感度测试设备校准规范 (Calibration Specification for Testing Systems of Microcircuits Electro-static Discharge(ESD) Sensitivity) 峰值电流: $\pm(0.03\sim 36)$ A 电压: (1-200) V 上升时间: 10 μ s~50ms 衰减时间: (100~200)ns

校准说明
DIRECTIONS OF CALIBRATION

证书编号: J202310234458-04-0001

第 3 页 共 6 页

Certificate No.

Page of

8. 本次校准使用的主要测量标准(Main Standards of Measurement Used in the Calibration.):

名称 Description	编号 Serial No.	证书号/有效期 Certificate No./ Due Date	溯源机构 Traceability Institute	技术特征 Technique Character
示波器	C070546	J202310091266-0015 2024-10-24	广电计量检测集团股份有限公司	直流增益:±1.5%;时基:±5ppm; 频带宽度: 2GHz
电流探头	794036	J202309042044-0056 2024-10-06	广电计量检测集团股份有限公司	带宽:25 kHz~1GHz;准确度:±3%
电流探头	794037	J202309042044-0057 2024-10-06	广电计量检测集团股份有限公司	带宽:1.2 kHz~200MHz;准确度:±3%
衰减器 Attenuator	23040412	J202403055441-0036 2025-03-18	广电计量检测集团股份有限公司	0.009MHz-3000MHz

9. 计量溯源性声明(Measurement traceability declaration.):

衰减器/Attenuator(23040412)→网络分析仪/Network Analyzer(MY49609241)→频率计/Frequency Counter(66C04014)→铷原子频率标准/Rubidium Atomic Frequency Standards(051101)→铯原子频率标准/Cesium atomic frequency standard(US49353151))(广东省计量科学研究院);

校准结果

RESULTS OF CALIBRATION

证书编号: J202310234458-04-0001

第 4 页 共 6

Certificate No.

Page of

1、外观以及一般性检查: 正常

In view of External and Generality check : Pass

HBM模式

2、峰值电流校准

Calibration of Peak Current

测试电压 Test Voltage (kV)	实测值 Measured (A)	不确定度 $U_{rel}(k=2)$ (%)	允许值 Limit (A)	结论 Conclusio (Pass/Fai)
0.5	0.333	4.0	0.30 ~ 0.36	P
1	0.68	4.0	0.60 ~ 0.74	P
2	1.28	4.0	1.20 ~ 1.46	P
4	2.50	4.0	2.40 ~ 2.94	P
8	4.94	4.0	4.80 ~ 5.86	P
-0.5	-0.334	4.0	-0.30 ~ -0.36	P
-1	-0.72	4.0	-0.60 ~ -0.74	P
-2	-1.38	4.0	-1.20 ~ -1.46	P
-4	-2.73	4.0	-2.40 ~ -2.94	P
-8	-5.26	4.0	-4.80 ~ -5.86	P

3、放电电流上升时间的校准

Calibration of Discharge Current Rise Time

测试电压 Test Voltage (kV)	实测值 Measured (ns)	不确定度 $U_{rel}(k=2)$ (%)	允许值 Limit (ns)	结论 Conclusio (Pass/Fai)
0.5	5.4	5.2	2.0 ~ 10.0	P
1	5.2	5.2	2.0 ~ 10.0	P
2	5.4	5.2	2.0 ~ 10.0	P
4	5.2	5.2	2.0 ~ 10.0	P
8	5.0	5.2	2.0 ~ 10.0	P
-0.5	5.6	5.2	2.0 ~ 10.0	P
-1	5.0	5.2	2.0 ~ 10.0	P
-2	4.8	5.2	2.0 ~ 10.0	P
-4	5.0	5.2	2.0 ~ 10.0	P
-8	4.8	5.2	2.0 ~ 10.0	P

4、衰减时间的校准

Calibration of Decay Times

测试电压 Test Voltage (kV)	标称值 Nominal (ns)	实测值 Measured (ns)	不确定度 $U_{rel}(k=2)$ (%)	允许值 Limit (ns)	结论 Conclusio (Pass/Fai)
0.5	150	163	5.2	130 ~ 170	P
1	150	147	5.2	130 ~ 170	P
2	150	149	5.2	130 ~ 170	P
4	150	150	5.2	130 ~ 170	P
8	150	138	5.2	130 ~ 170	P
-0.5	150	136	5.2	130 ~ 170	P
-1	150	136	5.2	130 ~ 170	P
-2	150	135	5.2	130 ~ 170	P
-4	150	136	5.2	130 ~ 170	P
-8	150	133	5.2	130 ~ 170	P

校准结果

RESULTS OF CALIBRATION

证书编号: J202310234458-04-0001

第 5 页 共 6

Certificate No.

Page of

5、IpR 峰值电流的校准(500Ω)

Calibration of IPR current

测试电压 Test Voltage (V)	实测值 Measured (A)	不确定度 $U_{rel}(k=2)$ (%)	允许值 Limit (A)	结论 Conclusio (Pass/Fai
1000	0.424	4.0	0.375 ~ 0.550	P
-1000	-0.463	4.0	-0.375 ~ -0.550	P
4000	1.64	4.0	1.50 ~ 2.20	P
-4000	-1.63	4.0	-1.50 ~ -2.20	P

6、放电电流上升时间的校准(500Ω)

Calibration of Discharge Current Rise Time

测试电压 Test Voltage (V)	实测值 Measured (ns)	不确定度 $U_{rel}(k=2)$ (%)	允许值 Limit (ns)	结论 Conclusio (Pass/Fai
1000	9.6	5.2	5.0 ~ 25.0	P
-1000	9.4	5.2	5.0 ~ 25.0	P
4000	9	5.2	5.0 ~ 25.0	P
-4000	9.3	5.2	5.0 ~ 25.0	P

MM模式

7、峰值电流的校准

Calibration of Ipeak for Short Current

测试电压 Test Voltage (V)	实测值 Measured (A)	不确定度 $U_{rel}(k=2)$ (%)	允许值 Limit (A)	结论 Conclusio (Pass/Fai
100	1.64	4.0	1.58 ~ 1.93	P
200	3.50	4.0	3.15 ~ 3.85	P
400	7.36	4.0	6.30 ~ 7.70	P
800	15.08	4.0	12.60 ~ 15.40	P
-100	-1.79	4.0	-1.58 ~ -1.93	P
-200	-3.57	4.0	-3.15 ~ -3.85	P
-400	-7.45	4.0	-6.30 ~ -7.70	P
-800	-15.20	4.0	-12.60 ~ -15.40	P

8、短路电流第二峰值与第一峰值比

Ratio of the second peak to the first peak of short-circuit current

测试电压 Test Voltage (V)	实测值 Measured (%)	不确定度 $U_{rel}(k=2)$ (%)	允许值 Limit (%)	结论 Conclusio (Pass/Fai
100	73.17	4.0	67.0 ~ 90.0	P
200	68.00	4.0	67.0 ~ 90.0	P
400	70.79	4.0	67.0 ~ 90.0	P
800	71.88	4.0	67.0 ~ 90.0	P
-100	73.18	4.0	67.0 ~ 90.0	P
-200	68.35	4.0	67.0 ~ 90.0	P
-400	69.53	4.0	67.0 ~ 90.0	P
-800	71.58	4.0	67.0 ~ 90.0	P

校准结果
RESULTS OF CALIBRATION

证书编号: J202310234458-04-0001

第 6 页 共 6

Certificate No.

Page of

9、谐振频率

Resonant frequency

测试电压 Test Voltage (V)	实测值 Measured (MHz)	不确定度 $U_{rel}(k=2)$ (%)	允许值 Limit (MHz)	结论 Conclusio (Pass/Fai
100	13.8	5.2	11.0 ~ 16.0	P
200	13.9	5.2	11.0 ~ 16.0	P
400	13.9	5.2	11.0 ~ 16.0	P
800	14.0	5.2	11.0 ~ 16.0	P
-100	13.6	5.2	11.0 ~ 16.0	P
-200	13.9	5.2	11.0 ~ 16.0	P
-400	14.0	5.2	11.0 ~ 16.0	P
-800	13.9	5.2	11.0 ~ 16.0	P

10、I100电流的校准(500Ω, 100ns)

Calibration of I₁₀₀ current

测试电压 Test Voltage (V)	实测值 Measured (A)	不确定度 $U_{rel}(k=2)$ (%)	允许值 Limit (A)	结论 Conclusio (Pass/Fai
400	0.247	4.0	0.232 ~ 0.348	P
-400	-0.235	4.0	-0.348 ~ -0.232	P

11、I_{PR}峰值电流的校准(500Ω)

Calibration of I_{PR} current

测试电压 Test Voltage (V)	实测值 Measured (A)	不确定度 $U_{rel}(k=2)$ (%)	允许值 Limit (A)	结论 Conclusio (Pass/Fai
400	1.13	4.0	0.00 ~ 1.31	P
-400	-1.14	4.0	-1.31 ~ 0.00	P

备注:

Notes:

结论(Conclusion): 所校项目符合技术要求

1.本报告中的扩展不确定度是由标准不确定度乘以包含概率约为95%时的包含因子 k 。

The expanded uncertainty is given in the report by the standard uncertainty multiplied by the probability of about 95% when the factor k .

2.依据(Reference document)

JJF 1059.1-2012 测量不确定度评定与表示

(JJF 1059.1-2012 Evaluation and Expression of Uncertainty in Measurement)

(以下空白)

(The below is blank)