

校准证书
CALIBRATION CERTIFICATE

证书编号:

Certificate No.



J202607246643A-0001

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of

委托方

Client

Pragmatic Semiconductor Limited

联络信息

Contact Inf.

400 Cambridge Science Park, Milton Road, Cambridge, United Kingdom, CB4 0WH

仪器名称

Description

ESD SIMULATORS FOR IC TESTING

制造厂

Manufacturer

LISUN

型号/规格

Model/Type

ESD-883D

接收日期

Receipt Date

2026年07月24日

Y M D

出厂编号

Serial No.

HMC26019

校准日期

Cal. Date

2026年07月24日

Y M D

管理号

Asset No.

发布日期

Issued Date

2026年07月27日

Y M D

批准

Approved by

葛振杰

葛振杰

审核

Inspected by

邢永军

邢永军

校准

Calibrated by

黄克伟

黄克伟

证书专用章

(Stamp)

总部地址(Headquarters Add.): 广东省广州市番禺区石碁镇创运路8号

No.8, Chuangyun Road, Shiqi Town, Panyu District, Guangzhou, Guangdong, China

实验室地址(Add.of the Lab): 上海市嘉定区叶城路1612号

No. 1612, Yecheng Road, Jiading District, Shanghai

联系电话(Tel.):400-602-0999

邮政编码(Postcode):511450

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: 842443

校准说明 DIRECTIONS OF CALIBRATION

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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,修改后的证书以客户端内容为准。(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.The modified certificate shall be based on the client content.)

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.该仪器的溯源日期为本证书的“校准日期”。(The traceability date of this instrument is the calibration date on this certificate.)

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

地点: 客户三楼实验室
Place

温度: (21.5~21.7) °C
Temperature

相对湿度: (57~59) %
Relative Humidity

7.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.

8.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: $\pm(0.03\sim36)$ A; 放电电流: (0.05~5)A 上升时间: 2ns~50ms; 持续时间: (100~200)ns 放电电压: (1~100)V

校准说明
DIRECTIONS OF CALIBRATION

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

名称	编号	证书号/有效期	溯源机构	技术特征
Description	Serial No.	Certificate No./ Due Date	Traceability Institute	Technique Character
数字温湿度计 Digital temperature and humidity meter	831914	J202507301116-04- 0013 2026-08-28	广电计量检测集 团股份有限公司	温度Temperature:MPE:±2.0 ℃, 湿度Humidity:MPE:± 5%RH ~±7%RH
差分探头 Differential probe	C032025	2025F32-10- 6206741001 2026-11-09	上海市计量测试 技术研究院有限 公司	±2%
电流探头 current probe	910822	XDdj2025-04889 2026-10-22	中国计量科学研 究院	带宽:1.2kHz~200MHz;MPE:± 3%
示波器 oscilloscope	MY65220102	J202507084156- 0001 2026-08-13	广电计量检测集 团股份有限公司	1.直流增益: 1mV/DIV- 5V/DIV, MPE: ±0.20mV~± 1.0V; 2.时基: ±0.0003%3.带 宽:6GHz, MPE: ≥-3.0dB4.

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

数字温湿度计/Digital temperature and humidity meter(831914)→冷镜式精密露点仪/Chilled-mirror dew-point hygrometer(003B22)→高精度冷镜露点仪/High precision cold mirror dew point meter (19-0116)→标准铂电阻温度计 /Standard platinum resistance thermometer (广东省计量科学研究院);
示波器/oscilloscope(MY65220102)→快沿信号发生器/Fast Signal Generator(MY56200114)→取样示波器 Sampling oscilloscope(北京无线电测量研究所/ChinaMTA);

校准结果

RESULTS OF CALIBRATION

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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 Conclusi (Pass/Fai
0.5	0.342	4.0	0.30 ~ 0.36	P
1	0.68	4.0	0.60 ~ 0.74	P
2	1.22	4.0	1.20 ~ 1.46	P
4	2.43	4.0	2.40 ~ 2.94	P
8	4.88	4.0	4.80 ~ 5.86	P
-0.5	-0.312	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	-2.45	4.0	-2.40 ~ -2.94	P
-8	-5.02	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 Conclusi (Pass/Fai
0.5	5.1	5.2	2.0 ~ 10.0	P
1	5.2	5.2	2.0 ~ 10.0	P
2	5.1	5.2	2.0 ~ 10.0	P
4	5.1	5.2	2.0 ~ 10.0	P
8	5.0	5.2	2.0 ~ 10.0	P
-0.5	5.2	5.2	2.0 ~ 10.0	P
-1	5.0	5.2	2.0 ~ 10.0	P
-2	4.9	5.2	2.0 ~ 10.0	P
-4	5.0	5.2	2.0 ~ 10.0	P
-8	5.2	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 Conclusi (Pass/Fai
0.5	150	165	5.2	130 ~ 170	P
1	150	161	5.2	130 ~ 170	P
2	150	155	5.2	130 ~ 170	P
4	150	152	5.2	130 ~ 170	P
8	150	144	5.2	130 ~ 170	P
-0.5	150	141	5.2	130 ~ 170	P
-1	150	138	5.2	130 ~ 170	P
-2	150	135	5.2	130 ~ 170	P
-4	150	133	5.2	130 ~ 170	P
-8	150	131	5.2	130 ~ 170	P

校 准 结 果
RESULTS OF CALIBRATION

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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 Conclusi (Pass/Fai
1000	0.382	4.0	0.375 ~ 0.550	P
-1000	-0.386	4.0	-0.375 ~ -0.550	P
4000	1.55	4.0	1.50 ~ 2.20	P
-4000	-1.58	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 Conclusi (Pass/Fai
1000	7.8	5.2	5.0 ~ 25.0	P
-1000	7.4	5.2	5.0 ~ 25.0	P
4000	7.8	5.2	5.0 ~ 25.0	P
-4000	7.6	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 Conclusi (Pass/Fai
100	1.61	4.0	1.58 ~ 1.93	P
200	3.22	4.0	3.15 ~ 3.85	P
400	6.36	4.0	6.30 ~ 7.70	P
800	13.08	4.0	12.60 ~ 15.40	P
-100	-1.64	4.0	-1.58 ~ -1.93	P
-200	-3.25	4.0	-3.15 ~ -3.85	P
-400	-6.45	4.0	-6.30 ~ -7.70	P
-800	-13.20	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 Conclusi (Pass/Fai
100	74.53	4.0	67.0 ~ 90.0	P
200	73.91	4.0	67.0 ~ 90.0	P
400	81.92	4.0	67.0 ~ 90.0	P
800	82.87	4.0	67.0 ~ 90.0	P
-100	79.88	4.0	67.0 ~ 90.0	P
-200	75.08	4.0	67.0 ~ 90.0	P
-400	80.31	4.0	67.0 ~ 90.0	P
-800	82.42	4.0	67.0 ~ 90.0	P

校 准 结 果
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9、谐振频率

Resonant frequency

测试电压 Test Voltage	实测值 Measured	不确定度 $U_{rel}(k=2)$	允许值 Limit	结 论 Conclusio
(V)	(MHz)	(%)	(MHz)	(Pass/Fai
100	11.3	5.2	11.0 ~ 16.0	P
200	11.5	5.2	11.0 ~ 16.0	P
400	11.6	5.2	11.0 ~ 16.0	P
800	12.2	5.2	11.0 ~ 16.0	P
-100	12.3	5.2	11.0 ~ 16.0	P
-200	12.4	5.2	11.0 ~ 16.0	P
-400	12.6	5.2	11.0 ~ 16.0	P
-800	12.7	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	实测值 Measured	不确定度 $U_{rel}(k=2)$	允许值 Limit	结 论 Conclusio
(V)	(A)	(%)	(A)	(Pass/Fai
400	0.244	4.0	0.232 ~ 0.348	P
-400	-0.238	4.0	-0.348 ~ -0.232	P

11、IpR 峰值电流的校准(500Ω)

Calibration of I_{PR} current

测试电压 Test Voltage	实测值 Measured	不确定度 $U_{rel}(k=2)$	允许值 Limit	结 论 Conclusio
(V)	(A)	(%)	(A)	(Pass/Fai
400	1.22	4.0	0.00 ~ 1.31	P
-400	-1.21	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)

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