CALIBRATION CERTIFICATE

Certificate No. J202607276787A-0001-G2

Client	Servico Nacional de Aprendizagem Industrial		
Contact Inf.	Av. Assis Brasil, 8787 Bairro Sarandi, ZIP CODE 91140-001, Porto Alegre - RS, Brasil		
Description	Automotive Transient Immunity Generator		
Manufacturer	LISUN GROUP		
Model/Type	EMS-ISO7637-P1235-80V100A	Receipt Date	2026-08-01 Y M D
Serial No.	SO20260331A01	Cal. Date	2026-08-01 Y M D
Asset No.	------	Issued Date	2026-08-01 Y M D

Approved by luo wang chu

Inspected by lan si liang

Calibrated by wen bin

(Stamp)

Headquarters Add.:
No.8, Chuangyun Road, Shiqi Town, Panyu District, Guangzhou, Guangdong, China
Add.of the Lab:
No.8, Chuangyun Road, Shiqi Town, Panyu District, Guangzhou, Guangdong, China
Tel.:400-602-0999 Postcode:511450
Website:http:// www.grgtest.com E-mail:grgtest@grgtest.com

Scan
CheckCode：047554

DIRECTIONS OF CALIBRATION

1.The quality system is in accordance with ISO/IEC 17025:2017,the calibration results are traceable to the International System of Units (SI).

2.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.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.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.The traceability date of this instrument is the calibration date on this certificate.

6.Place and environmental conditions of the calibration：

Place: Room 703, Building A4, Huanchuang Enterprise Plaza, Yuelu District, Changsha

Temperature: 21.8℃ Relative Humidity: 56%

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

8.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(电子) 0019-2018 汽车电瞬态传导骚扰模拟器校准规范(C.S. for Road vehicles- Electrical Transient Conduction Disturbance Simulators) 试验电压：±50V 脉冲幅度：±600)V 上升/下降时间：1ns~10ms 脉冲宽度/重复时间：100ns~10s

DIRECTIONS OF CALIBRATION

9. Main Standards of Measurement Used in the Calibration.:

Description	Serial No.	Certificate No./ Due Date	Traceability Institute	Technique Character
attenuator	P1447143474	J202508233324-0008 2026-09-02	广电计量检测集团股份有限公司	46dB@(0.009~400)MHz
attenuator	P1503146968	J202508233324-0009 2026-09-02	广电计量检测集团股份有限公司	54dB@（0.009~400）MHz
digital oscilloscope	C010584	J202603193714-0008 2027-03-31	广电计量检测集团股份有限公司	V: ±1% , t: ±0.01%
Differential probe	20150069	J202604216813-0044 2027-05-11	广电计量检测集团股份有限公司	±2%
Pulse load	ES098000325001等	J202606230486-0155 2027-07-05	广电计量检测集团股份有限公司	±1%

10.Measurement traceability declaration.:

衰减器(P1447143474)→网络分析仪/ Network Analyzer(MY49609241)→检验件（2815A00996）→S参数标准装置（中国计量科学研究院/NIM）;
衰减器(P1503146968)→网络分析仪/ Network Analyzer(MY49609241)→检验件（2815A00996）→S参数标准装置（中国计量科学研究院/NIM）;
数字示波器/digital oscilloscope (C010584)→多功能校准器/multifunction calibrator(6025904)→数字多用表/ Digital multimeter(456175079)→精密交直流同轴分流器/AC/DC coaxial shunt(05155847)→直流电阻副基准装置（中国计量科学研究院/NIM）;
差分探头(20150069)→耐电压测试仪校验仪/Withstanding voltage tester calibrator(072006002)→数字万用表/ Digital multimeter(US36059228)→多产品校准器/Multifunction calibrator(4211501)→多功能标准源校准装置（中国计量科学研究院/NIM）;
脉冲负载（电阻八个）/Pulse load(ES098000325001等)→八位半数字多用表/Multimeter(560479058)→数字多用表/ Digital multimeter(456175079)→精密交直流同轴分流器/AC/DC coaxial shunt(05155847)→直流电阻副基准装置（中国计量科学研究院/NIM）;

校 准 结 果
RESULTS OF CALIBRATION

1、外观以及一般性检查：正常
In view of External and Generality check : Pass

2、测试模式(Test Mode)：

2.1、 Pulse 1（Nominal 12 V System）

测试项目 Items	标称值 Nominal	实测值 Measured	误 差 Error	不确定度 U_{rel} (k=2)	允许误差 MPE	结 论 Conclusion
Us	(V)	(V)	(V)	(%)	(V)	(Pass/Fail)
	-100	-96.0	-4.0	3.5	± 10.0	P
-100V/10Ω	-50	-52.4	2.4	3.5	± 10.0	P
	(ms)	(ms)	(ms)	(%)	(ms)	
Td :空载	2	2.08	-0.08	5.5	± 0.40	P
Td :带载	1.5	1.37	0.13	5.5	± 0.30	P
T2	200	196	4	5.5	± 20	P
	(s)	(s)	(s)	(%)	(s)	
T1	0.5	0.48	0.02	5.5	± 0.05	P
		(μs)		(%)	(μs)	
Tr		0.98	/	5.5	0.50~1.00	P

2.2、 Pulse 1（Nominal 24 V System）

测试项目 Items	标称值 Nominal	实测值 Measured	误 差 Error	不确定度 U_{rel} (k=2)	允许误差 MPE	结 论 Conclusion
Us	(V)	(V)	(V)	(%)	(V)	(Pass/Fail)
	-600	-612.0	12.0	3.5	± 60.0	P
-600V/50Ω	-300	-316.0	16.0	3.5	± 60.0	P
	(ms)	(ms)	(ms)	(%)	(ms)	
Td :空载	1	0.95	0.05	5.5	± 0.20	P
Td :带载	1	0.90	0.10	5.5	± 0.20	P
T2	200	195	5	5.5	± 20	P
	(s)	(s)	(s)	(%)	(s)	
T1	0.5	0.48	0.02	5.5	± 0.05	P
		(μs)		(%)	(μs)	
Tr		2.2	/	5.5	1.5~3.0	P

2.3、 Pulse 2a(Nominal 12 V/ 24V system)

测试项目 Test Items	标称值 Nominal	实测值 Measured	误 差 Error	不确定度 U_{rel} (k=2)	允许误差 MPE	结 论 Conclusion
Us	(V)	(V)	(V)	(%)	(V)	(Pass/Fail)
	75	76.0	-1.0	3.5	± 7.5	P
75V/2Ω	37.5	34.4	3.1	3.5	± 7.5	P
	(μs)	(μs)	(μs)	(%)	(μs)	
Td :空载	50	46.8	3.2	5.5	± 10.0	P
Td :带载	12	12.8	-0.8	5.5	± 2.4	P
	(s)	(s)	(s)	(%)	(s)	
T1	0.5	0.49	0.01	5.5	± 0.05	P
		(μs)		(%)	(μs)	
Tr		0.75	/	5.5	0.50~1.00	P

校 准 结 果
RESULTS OF CALIBRATION

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2.4、 Pulse 3a(Nominal 12 V /24V system)

测试项目 Test Items Us	标称值 Nominal (V)	实测值 Measured (V)	误 差 Error (V)	不确定度 U_{rel} (k=2) (%)	允许误差 MPE (V)	结 论 Conclusion (Pass/Fail)
	-200	-212.0	12.0	3.5	± 20.0	P
-200V/50Ω	-100	-93.6	-6.4	3.5	± 20.0	P
	(ns)	(ns)	(ns)	(%)	(ns)	
Td :空载	150	140	10	5.5	± 45	P
Td :带载	150	125	25	5.5	± 45	P
Tr:空载	5	5.6	-0.6	5.5	± 1.5	P
Tr :带载	5	6.0	-1.0	5.5	± 1.5	P

2.5、 Pulse 3b(Nominal 12 V/24V system)

测试项目 Test Items Us	标称值 Nominal (V)	实测值 Measured (V)	误 差 Error (V)	不确定度 U_{rel} (k=2) (%)	允许误差 MPE (V)	结 论 Conclusion (Pass/Fail)
	200	210.0	-10.0	3.5	± 20.0	P
200V/50Ω	100	94.4	5.6	3.5	± 20.0	P
	(ns)	(ns)	(ns)	(%)	(ns)	
Td:空载	150	142	8	5.5	± 45	P
Td :带载	150	136	14	5.5	± 45	P
Tr:空载	5	6.0	-1.0	5.5	± 1.5	P
Tr :带载	5	6.0	-1.0	5.5	± 1.5	P

2.6、 Pulse 5a（Nominal 12 V System）

测试项目 Test Items Us	标称值 Nominal (V)	实测值 Measured (V)	误 差 Error (V)	不确定度 U_{rel} (k=2) (%)	允许误差 MPE (V)	结 论 Conclusion (Pass/Fail)
	100	98.0	2.0	3.5	± 10.0	P
100V/2Ω	50	47.5	2.5	3.5	± 10.0	P
	(ms)	(ms)	(ms)	(%)	(ms)	
Tr		8.6	/	5.5	5.0~10.0	P
Td/空载	400	388	12	5.5	± 80	P
Td/带载	200	195	5	5.5	± 40	P

2.7、 Pulse 5a（Nominal 24 V System）

测试项目 Test Items Us	标称值 Nominal (V)	实测值 Measured (V)	误 差 Error (V)	不确定度 U_{rel} (k=2) (%)	允许误差 MPE (V)	结 论 Conclusion (Pass/Fail)
	200	200.0	0.0	3.5	± 20.0	P
200V/2Ω	100	95.0	5.0	3.5	± 20.0	P
	(ms)	(ms)	(ms)	(%)	(ms)	
Tr		8.7	/	5.5	5.0~10.0	P
Td / 空载	350	344	6	5.5	± 70	P
Td / 带载	175	180	-5	5.5	± 35	P

校 准 结 果
RESULTS OF CALIBRATION

2.8、 Pulse 5b（Nominal 12 V/24V System）

测试项目 Test Items	标称值 Nominal	实测值 Measured	误 差 Error	不确定度 U_{rel} (k=2)	允许误差 MPE	结 论 Conclusion
	(V)	(V)	(V)	(%)	(V)	(Pass/Fail)
Up	100	98.0	2.0	3.5	± 10.0	P
	(ms)	(ms)	(ms)	(%)	(ms)	
Td	400	402	-2	5.5	± 80	P

备注：
Notes：

结论（Conclusion): 所校项目符合技术要求 (The calibrated items meet the technical specifications)

1.本报告给出的扩展不确定度是由合成标准不确定度乘以包含概率约为95%时对应的包含因子k 得到的。

The extended uncertainty given in the report is obtained by multiplying the combined standard uncertainty by the coverage factor k corresponding to the inclusion probability of about 95%。

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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