



# ELECTROSTATIC DISCHARGE (ESD) TESTING REPORT

Applicant/Department: Nations Technologies Inc.	
Product: N32G030C8L7	LOT:
Case NO: S201216071	Quantity: 18 ea
Test Item: Human Body Model (HBM)	Package/Pin Count: LQFP48
Application Date: 2020/12/16	Date Finished: 2020/12/22
Reference: MIL-STD-883K / Method 3015.9	Temperature: 25 ± 5 °C Humidity: 55 ± 5%
Test Instrument: MK2(SN0204336)	Calibration Due Date: 2020/09/02~2021/09/01
Test Voltage: ±4000V	
Failure Criteria: After testing, DUT no longer fulfills requirements of ± 30% voltage drift at ± 1uA reference current and compliance within 10% V+I envelope around REFERENCE I-V curve (pre-zap).	
ESD Testing Result:	Minimum Pass Level = ±4000V

NOTE 1: ESD/latch-up test is employed as one of qualification tests for electronic products. However, the pass / fail results of this test can NOT be taken as go/no-go criteria for IC tape-out and mass production. Before and after ESD/latch-up test(s), complete parametric and functional testing (F/T) are essential for determining pass/fail of the tested products. (References: Page 9, AEC-Q100-003-Rev-E-2003; and Page 15, ESDA-JEDEC JS-001-2017).

NOTE 2: MA-tek sample storage policy is 14 days after the test data delivery. Prolonged storage can be arranged per client's request.

## WE HEREBY CERTIFY THAT:

The test(s) was/were conducted according to test conditions provided by customer. Testing was performed on calibrated and JEDEC-ESDA qualified ESD instruments. The quality and comprehensiveness of this test(s) were delivered by qualified personnel.

Tested by	Reviewed by	Approved by
Joe_Xu	Fly-Fei	Zhen-Zhu



## CERTIFICATE of APPROVAL INDEPENDENT TESTING LABORATORY:

ISO9001:2015 Certificate Registration No. 20001845 QM08, issued by UL DQS Inc.  
IEC/IECQ17025 Certificate No. IECQ-L ULTW 09.0009, approved by Certification Body (CB): UL Registered Firm





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2. 坚持独立检测、独立判断，保持和发展认可的分析检测能力；
3. 坚持公平、公正、对所有客户一视同仁的分析检测服务原则；
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5. 不接受有违分析检测公正性的投资赞助和代理要求，不介入客户之间的市场竞争和利益冲突；
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## 1. TEST SUMMARY

[illegible]

\* DUT failed at the first level of test condition, defined by client.

NOTE: Red color in raw data indicates failed pins, if any.

**2. Pin ASSIGNMENT**

Pin Group	PAD Pins
VDD	1,24,48
VSS	8,23,47
IO	2-7,9-22,25-46



### 3. ESD TEST CONDITIONS

ESD Zap Interval:  $\geq 1\text{ S}$

Zap: 3 pulse.

#### Testing Combinations

All other pins to VSS(+)

All other pins to VSS(-)

All other pins to VDD(+)

All other pins to VDD(-)

IO pins to IO pins(+)

IO pins to IO pins(-)

**4. Raw Data - 2**

HBM All other pins to VSS_+4000 (Unit: V)								
Test Pin Fail Voltage	#1	#2	#3	Test Pin Fail Voltage	#1	#2	#3	
VDD	Pass	Pass	Pass	IO	Pass	Pass	Pass	
VSS	Pass	Pass	Pass					

HBM All other pins to VSS_-4000 (Unit: V)								
Test Pin Fail Voltage	#4	#5	#6	Test Pin Fail Voltage	#4	#5	#6	
VDD	Pass	Pass	Pass	IO	Pass	Pass	Pass	
VSS	Pass	Pass	Pass					

HBM All other pins to VDD_+4000 (Unit: V)								
Test Pin Fail Voltage	#7	#8	#9	Test Pin Fail Voltage	#7	#8	#9	
VDD	Pass	Pass	Pass	IO	Pass	Pass	Pass	
VSS	Pass	Pass	Pass					

HBM All other pins to VDD_-4000 (Unit: V)								
Test Pin Fail Voltage	#10	#11	#12	Test Pin Fail Voltage	#10	#11	#12	
VDD	Pass	Pass	Pass	IO	Pass	Pass	Pass	
VSS	Pass	Pass	Pass					

HBM IO pins to IO pins_+4000 (Unit: V)								
Test Pin Fail Voltage	#13	#14	#15	Test Pin Fail Voltage	#13	#14	#15	
VDD	Pass	Pass	Pass	IO	Pass	Pass	Pass	
VSS	Pass	Pass	Pass					

HBM IO pins to IO pins_-4000 (Unit: V)								
Test Pin Fail Voltage	#16	#17	#18	Test Pin Fail Voltage	#16	#17	#18	
VDD	Pass	Pass	Pass	IO	Pass	Pass	Pass	
VSS	Pass	Pass	Pass					

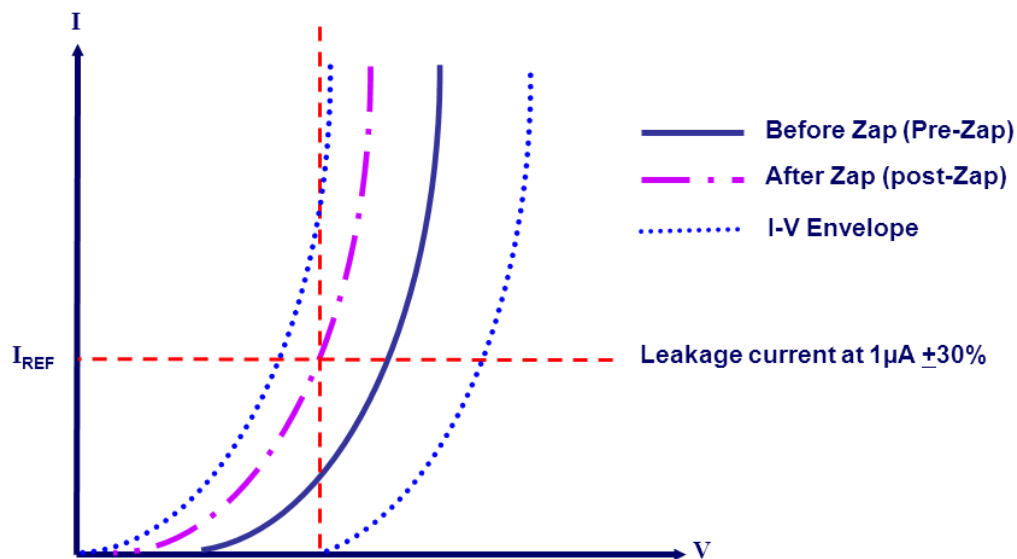
## 5. APPENDIX-1 (PASS/FAIL CRITERIA)

### FAILURE CRITERIA

After testing, DUT no longer fulfills requirements of  $\pm 30\%$  voltage drift at  $\pm 1\mu\text{A}$  reference current and compliance within 10% V+I envelope around REFERENCE I-V curve (pre-zap).

### Note

For custom designed ESD testing customers may select variation in  $I_{\text{dd}}$ , and leakage current as criteria to determine pass/fail results of ESD testing.



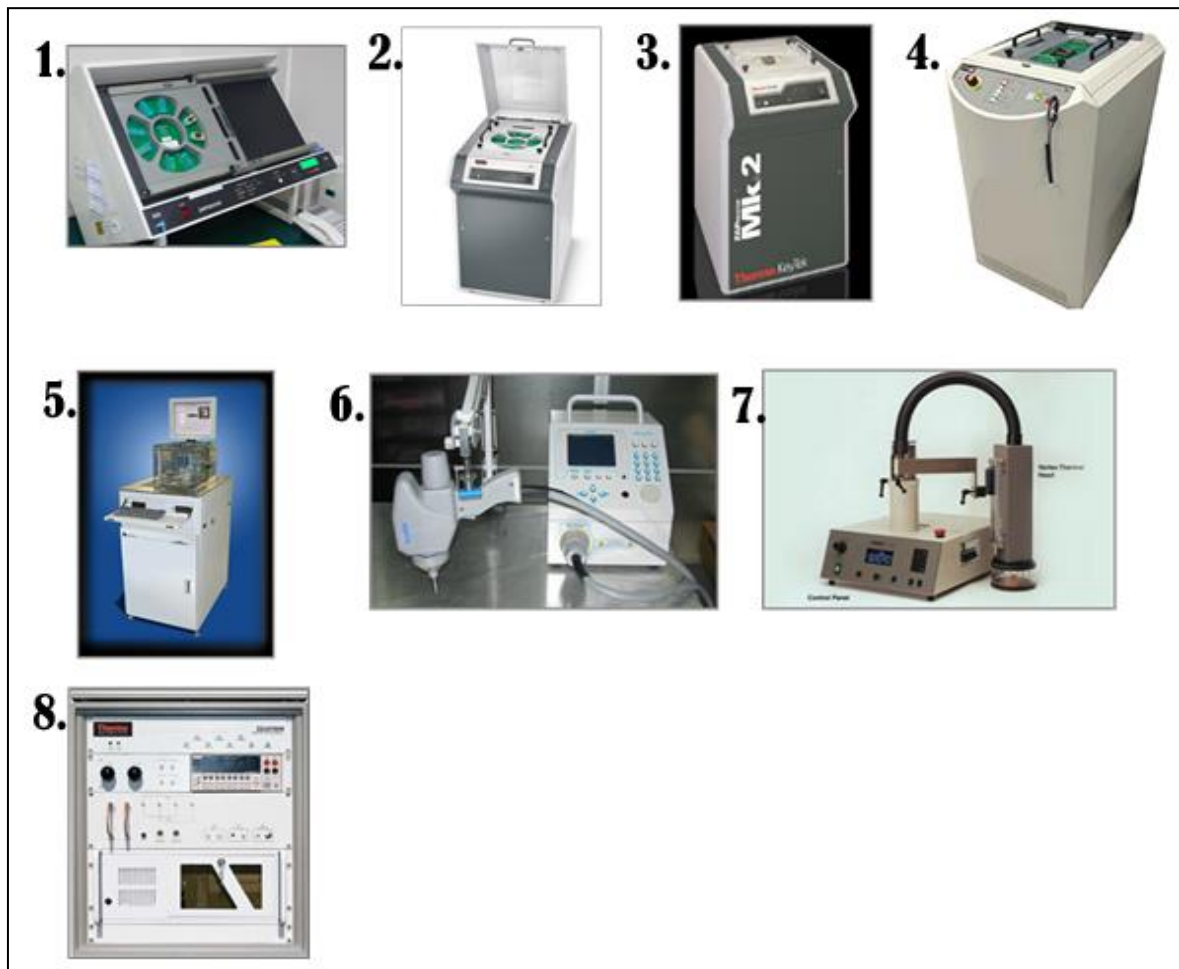
Pass/Fail Criteria:

Variation of Leakage Current and I-V Shift in Pre-Zap and Post-Zap curves



## 6. APPENDIX-2 (ESD INSTRUMENTATION AT MA-TEK)

No.	Test Tools	Vendors	System Specification
1	Zapmaster	Thermo Keytek	256 Pin Count, ESD Pulse 50 V to 8 KV
2	MK1	Thermo Scientific	256 Pin Count, ESD Pulse 10 V to 8 KV
3	MK2	Thermo Keytek	768 Pin Count, ESD Pulse 10 V to 8 KV
4	MK4	Thermo Scientific	2304 Pin Count, ESD Pulse 10 V to 8 KV
5	CDM Tester	Oryx Orion	100 V to 2 KV
6	ESD Gun	Noiseken	Voltage = 1 KV to 30 KV
7	High Temp. Test Module	Thermonics	Maximum temperature = 150°C.
8	TLP Tester	Thermo Scientific	Voltage = 1 V to 2 KV, Current = 10 nA to 40 A





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