Latch-up TESTING REPORT

Applicant/Department:	Nations Technologies Inc.		
Product:	N32G030C8L7	**LOT:**	
Case NO:	S210319134	**Quantity:**	9 ea
Test Item:	Latch-up (LU)	**Package/Pin Count:**	LQFP48
Application Date:	2021/3/19	**Date Finished:**	2021/3/30
Reference:	JESD78E	**Temperature:**	85 ± 5 °C **Humidity:** 55 ± 5%
Test Instrument:	MK2(SN0204336)	**Calibration Due Date:**	2020/09/02~2021/09/01
Test Voltage:	1.5*VDDmax		
Failure Criteria:			
If absolute Inom is ⩽ 25 mA,then absolute Inom + 10 mA is used Or If absolute Inom is >25mA, then > 1.4X absolute Inom is used			

Trigger Current:	±100mA	**Minimum Pass Level = ±**	±100mA
Trigger Voltage:	/	**Minimum Pass Level = ±**	/
Vsupply Over Voltage:	1.5*VDDmax	**Minimum Pass Level = ±**	+7.5V

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 the test(s) were delivered by qualified personnel.

Tested by	Reviewed by	Approved by
Joe_Xu	Fly_Fei	Steven_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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TABLE OF CONTENTS

1. TEST SUMMARY

IT CLASS: II

NOTE:

Class I - Latch-up testing performed at room temperature.

Class II - Latch-up testing performed at maximum ambient rated temperature for the device.

Level: A

Level A - The failure criteria as defined in JEDEC.

Level B - Special failure criteria. Supplier shall provide definition of failure criteria used.

Trigger Model	Test Pin	Sample	Passing Current or Voltage
+IT	+IT_IO_85C	3	Pass(+100mA)
-IT	-IT_IO_85C	3	Pass(-100mA)
Vsupply Over voltage test	OV_VDD_85C	3	Pass(+7.5V)

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

Positive Current Trigger
Negative Current Trigger
Over Voltage Supply Test

VDD= 5V Clamp= 200mA
GND= 0V

Vclamp= +7.5V/-2.5V (IO5V pins)

4. Raw Data - 2

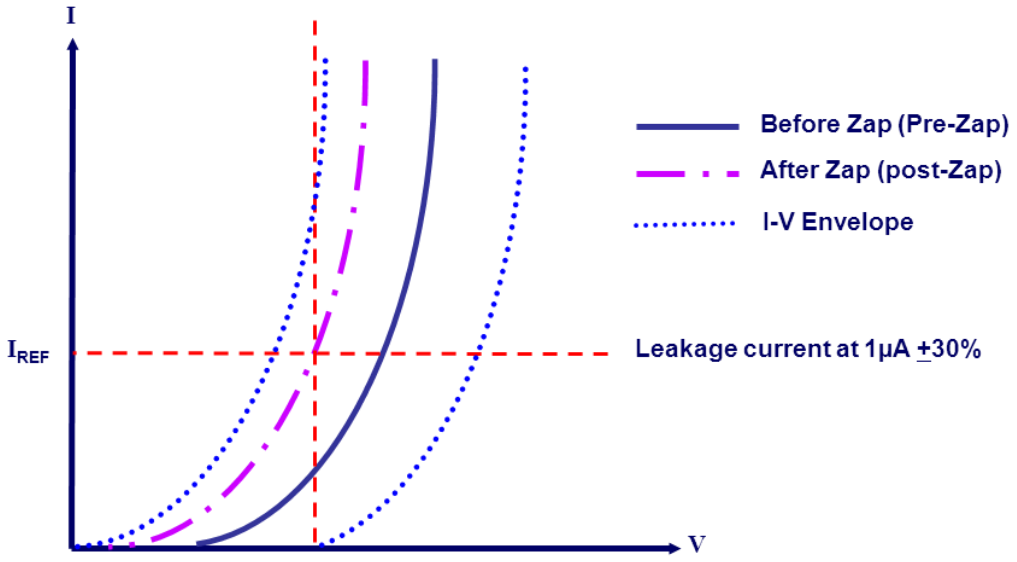
Positive Current Trigger_+100 (Unit:mA) 85C								
Test Pin Fail Current		#1	#2	#3	Test Pin Fail Current		#1	#2	#3
	VDD	/	/	/		IO	Pass	Pass	Pass
	VSS	/	/	/					

Negative Current Trigger_-100 (Unit:mA) 85C								
Test Pin Fail Current		#4	#5	#6	Test Pin Fail Current		#4	#5	#6
	VDD	/	/	/		IO	Pass	Pass	Pass
	VSS	/	/	/					

Vsupply Over voltage test_+7.5 (Unit:V) 85C								
Test Pin Fail Voltage		#7	#8	#9	Test Pin Fail Voltage			
	VDD	Pass	Pass	Pass				

5. APPENDIX-1 (PASS/FAIL CRITERIA)

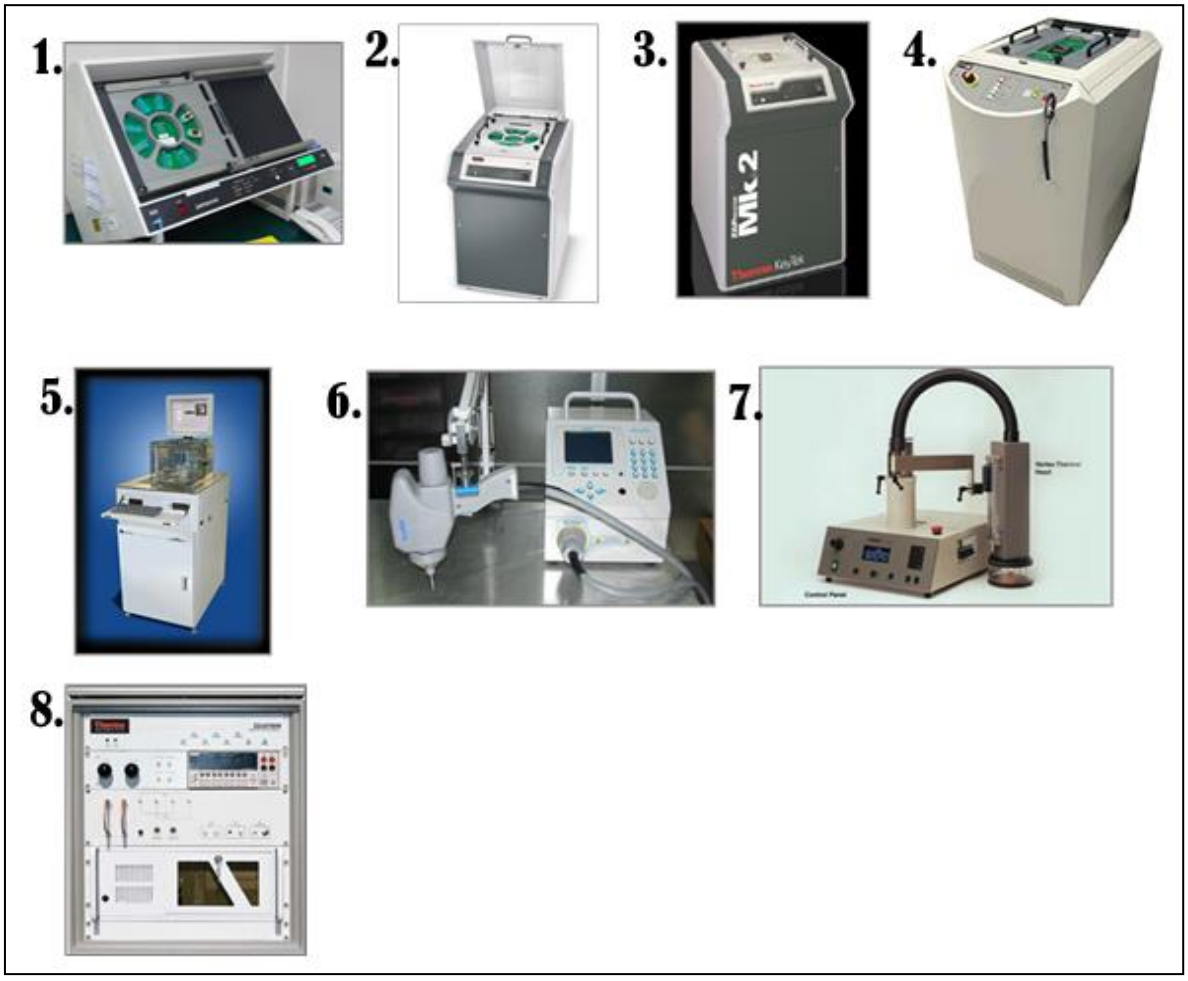
FAILURE CRITERIA	**If absolute Inom is ⩽25 mA,then absolute Inom + 10 mA is used Or If absolute Inom is > 25 mA, then > 1.4X absolute Inom is used.**
Note	**For custom designed ESD testing customers may select variation in Idd, and leakage current as criteria to determine pass/fail results of ESD testing.**



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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