



ELECTROSTATIC DISCHARGE (ESD) TESTING REPORT


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|---|---|
| Applicant/Department: Nations Technologies Inc. | |
| Product: N32G030K6Q7/ N32G030K6Q7-1 | LOT: |
| Case NO: S210319134 | Quantity: 3 ea |
| Test Item: CDM | Package/Pin Count: QFN32 |
| Application Date: 2021/3/19 | Date Finished: 2021/3/30 |
| Reference: ESDA/JEDEC JS-002-2018 | Temperature: 25 ± 5 °C Humidity: 55 ± 5% |
| Test Instrument: Orion(SN1612241) | Calibration Due Date: 2020/08/31~2021/08/30 |
| Test Voltage: ±1000V | |
| Failure Criteria: compliance within 10% V+I envelope around REFERENCE I-V curve (pre-zap) and Customer FunctionTest. | |
| ESD Testing Result: Minimum Pass Level = ±1000V | |

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 |  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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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 | 1,17 |
| VSS | 33 |
| IO | 2-16,18-32 |



3. ESD TEST CONDITIONS

ESD Zap Interval: ≥ 200 ms Zap: 3 pulse.

Testing Combinations

All pins(\pm)

**4. Raw Data - 2**

| CDM All pins Test_±1000 (Unit: V) | | | | | | | | | |
|-----------------------------------|-----|------|------|------|-----------------------|----|------|------|------|
| Test Pin Fail Voltage | | #19 | #20 | #21 | Test Pin Fail Voltage | | #19 | #20 | #21 |
| | VDD | Pass | Pass | Pass | | IO | Pass | Pass | Pass |
| | VSS | Pass | Pass | Pass | | | | | |

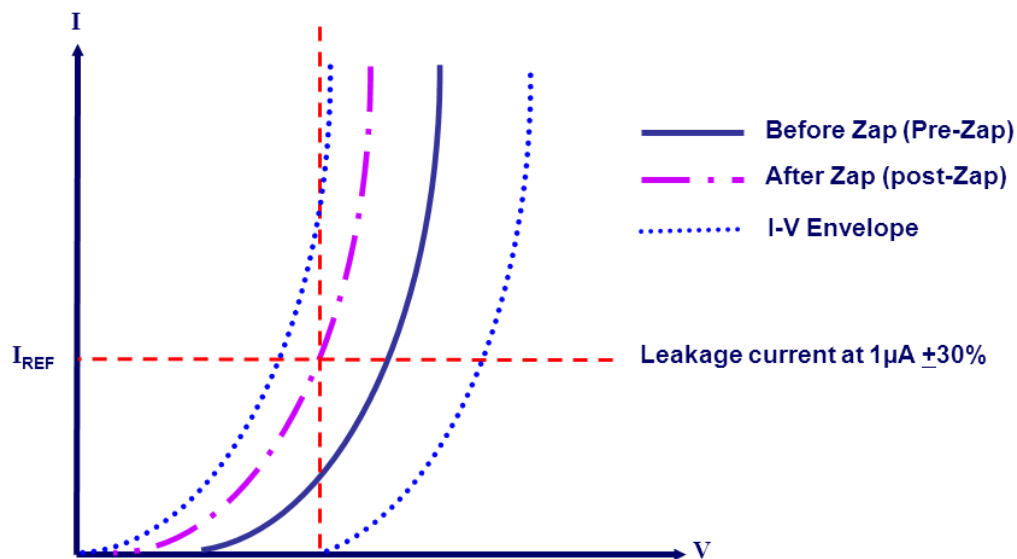
5. APPENDIX-1 (PASS/FAIL CRITERIA)

FAILURE CRITERIA

compliance within 10% V+I envelope around REFERENCE I-V curve (pre-zap) and Customer FunctionTest.

Note

For custom designed ESD testing customers may select variation in I_{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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