

GaN quality & reliability: Q&A's Nexperia Power Live 2021

1. Q: Will you share the test results with JEDEC Committee JC-70?

A: Yes, once results are available, we will publish them for broad audience reach and share them with WBG forums. Please do visit <https://www.nexperia.com/products/gan-fets> for regular updates.

2. Q: What other tests does Nexperia perform on top of AECQ101 & JESD47?

A: There are series of tests as highlighted in the presentation, such as Dynamic HTRB, H3TRB, mechanical stress tests, H3TRB beyond 100 V, which are on top of AEC Q101/JESD47. There will be tests to fail like high voltage off-state stress and DC/AC farm testing to gain further insights into the product.

3. Q: During Nexperia's extended qualification testing are both the silicon and the GaN of the Cascode structure tested, or is only the GaN stressed?

A: Most of the tests have Cascode structure to simulate the actual application results and scenarios. We also test HEMT and Silicon FET individually to screen the weaker device and gain information on robustness.

4. Q: How are you able to tell that your early failure screening procedure gets rid of all the defective parts?

A: Functional tests are performed before and after screening tests to help us analyse the effectiveness of screening tests. We also run life tests to find out confidence in our screening method. The current data shows good confidence in our screening method.

5. Q: What are the challenges and requirements in selecting mold compound for GaN FETs?

A: The key is looking for mold compound that provides zero delamination, meets high voltage dielectric strength requirements, and is compatible with the package and manufacturing process.

6. Q: You say IOL is used for qualifications, why not active power cycling test which fits well for switching devices?

A: We are adding power cycling to product qualifications, mid-2022 we will share results of power cycling on our products. We are already running power cycling for the test to fail, and these results will be published in Q1 2022. Please do visit <https://www.nexperia.com/products/gan-fets> for regular updates.

7. Q: Will you provide data from test to fail for every product?

A: Data will be provided for all structurally different products; these tests take a lot of time and resources. Therefore, we do want to apply structural similarity and be efficient in our approach.

8. Q: Will there be any board level reliability tests on the SMD products?

A: Yes, we have put together a comprehensive board-level reliability test plan, and our CCPAK is going through all the tests. We will release the results of our tests upon completion. Please do visit <https://www.nexperia.com/products/gan-fets> for regular updates.

9. Q: Products are 100% tested, are the wafers fully tested, if yes, any hot tests?

A: Yes, our GaN HEMT and Silicon FETs are 100% wafer tested, which gives us confidence going into final product manufacturing.