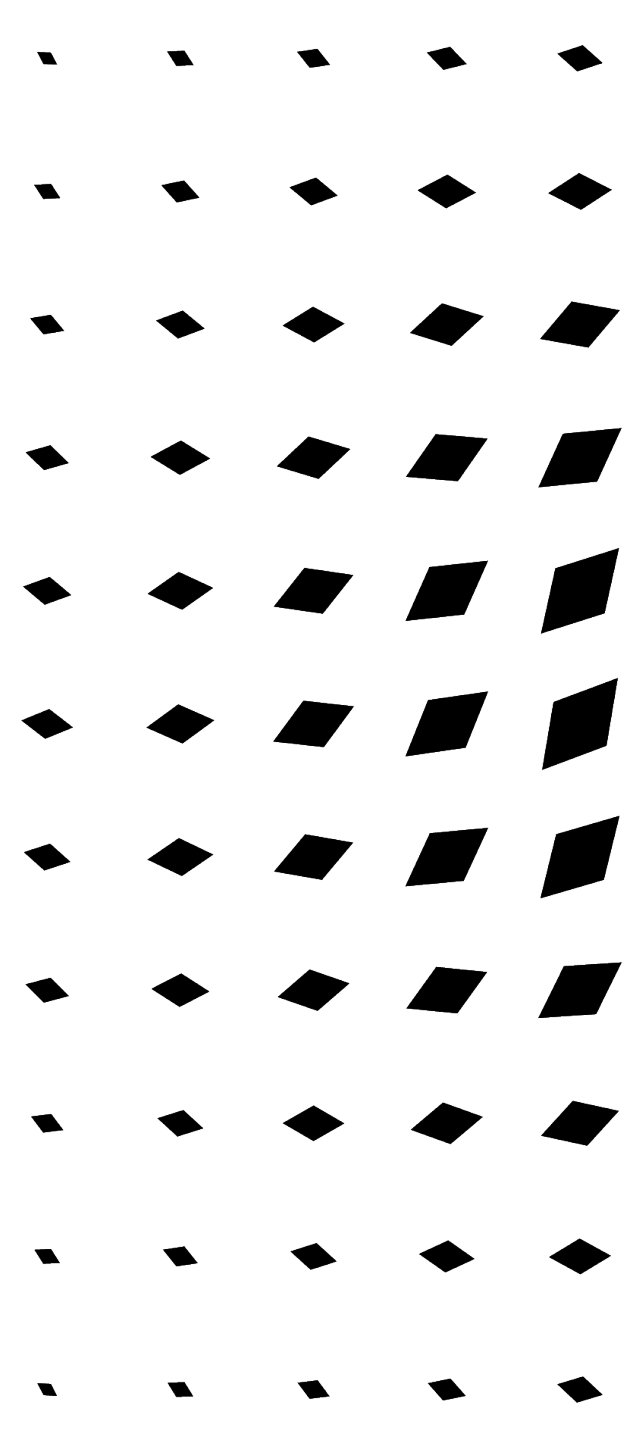


Reliability test of Automotive SiC MOSFET chips



Reliability test of Automotive SiC MOSFET chips

- Reliability tests are conducted by selecting relevant test items for power semiconductor chips based on JEITA standards.
- The tests listed below have a strong correlation with product lifetime and are especially important for automotive applications.
- In addition, qualification tests are performed in accordance with quality requirements and customer specifications.
e.g., AEC-Q101, AQC 324.

(1) High Temperature Reverse Bias (HTRB)

This test evaluates the long-term stability of the drift layer, surface passivation film, and termination structure under high-temperature and high-electric-field conditions. It is used to verify that no excessive leakage current increase or blocking-voltage degradation occurs due to electric-field concentration

Example Test Conditions:

T_j = Maximum rated junction temperature, $V_{GS} = 0\text{ V}$,

$V_{DS} = 85\%$ of the maximum rated drain-source voltage, Test duration = 1,000 h

(2) High Temperature Gate Bias (HTGB)

This test evaluates the integrity of the gate oxide and the stability of the threshold voltage ($V_{GS(th)}$) under high-temperature gate-bias stress conditions. It is used to verify that no gate-oxide degradation, dielectric breakdown, or significant shift in threshold voltage occurs due to electric-field stress.

Example Test Conditions:

PA7-G-260708-*-004 T_j = Maximum rated junction temperature, $V_{DS} = 0\text{ V}$,

$V_{GS} = \pm$ Maximum rated gate voltage, Test duration = 1,000 h

