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Tgard500 Reliability Report.

Purpose.

Provide reliability data on Tgard500 performance over time when exposed to various environmental conditions.

Material.

- Specimens of Tgard500 cut in circles with 1 in^2 area and placed between two aluminum discs with the same diameter. The clip force of 50psi is applied to the assembly when in the conditioning environment (for thermal resistance test).

- A 20”X10” sheet of Tgard500 (for dielectric breakdown voltage test).

Aging Conditions.

- HAST chamber
  The humidity chamber was set to 85°C and 85 % RH. Material was held in humidity chamber for 1,000 hours.

- Bake at 150 °*C*.
  Standard forced air oven. Unit has automatic controller and was monitored with thermocouple to external Fluke unit. Material was baked at 150 °C for total of 1,000 hours.

- Thermal Shock.
  Temperature in hot section was set to 150 °*C* and the cold section was set to -40°*C*. Material is going through 1,000 cycles (there were 6 cycles in 24 hour period).

Test Method.

- Dielectric Breakdown Voltage Test
  20”X10” sheet of Tgard500 were prepared for the test, and the measurements were taken at 0, 250, 500, 750, 1000 hours (or cycles) and dielectric breakdown voltage was measured using D 149-97.

- Thermal Resistance Test
  Thermal resistance measurements were taken at 0, 250, 500, 750, 1000 hours (or cycles) and thermal resistance was measured at 50 psi using modified D 5470 test method.

Reliability result.

- HAST reliability result

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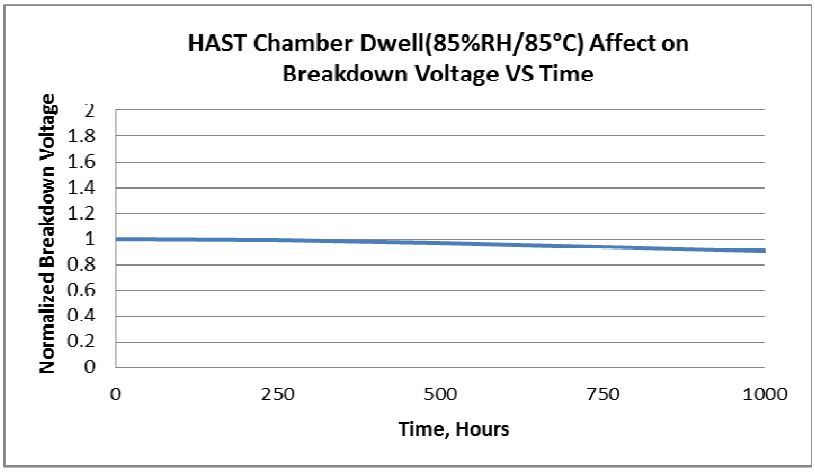
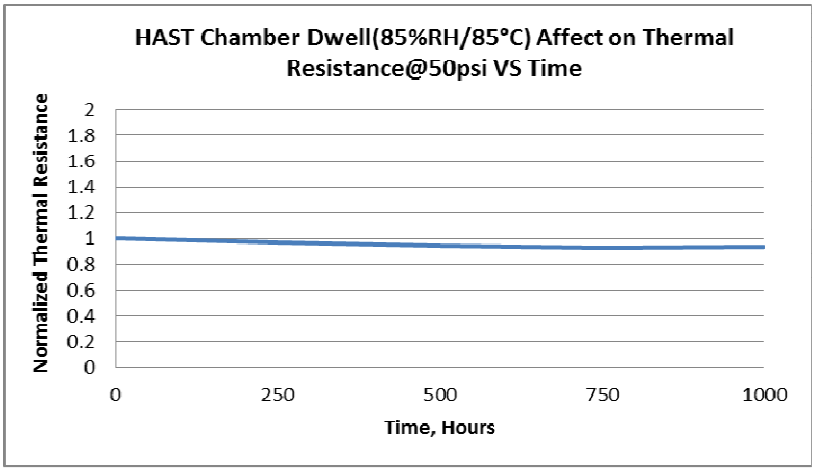
Graph 1



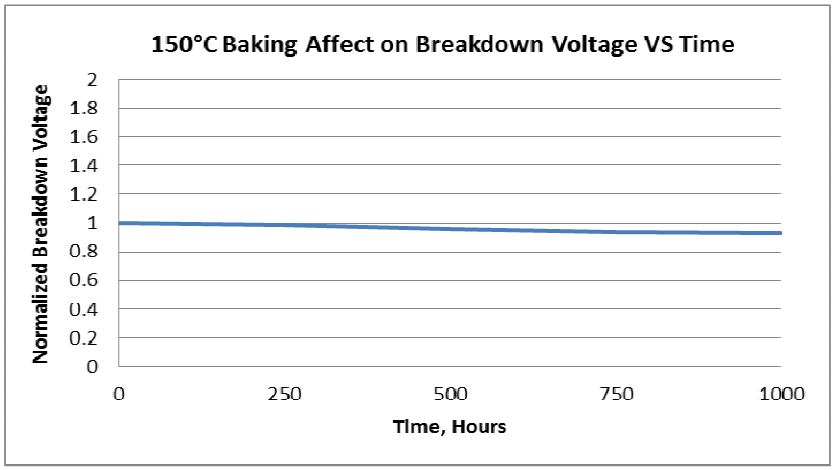
Graph 2



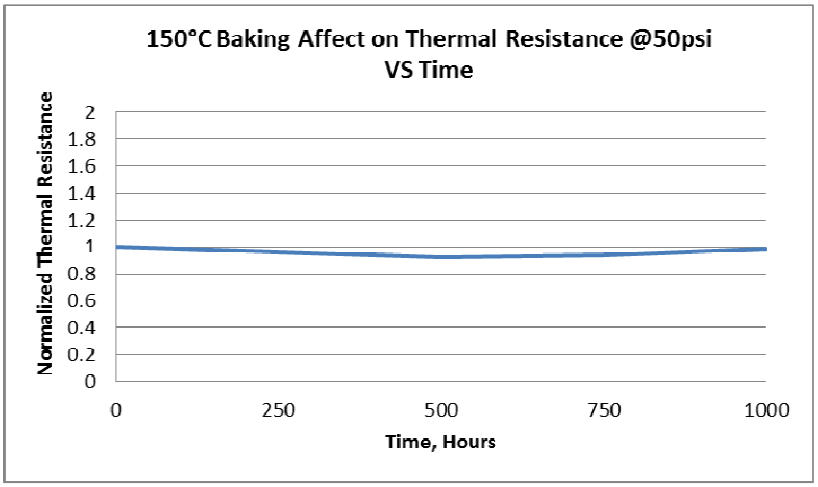
Graph1, 2 show the results of HAST chamber aging effect, the dielectric properties of Tgard500 were not obviously affected by the exposure to 85 % relative humidity and 85 ℃ after 1000 hours, and the thermal resistance at 50psi was stable with time increase, and it was slightly reduced within 10% range at 50 psi and then eventually stabilizes as time of exposure increases.

- Bake at 150^0C reliability result

Graph 3



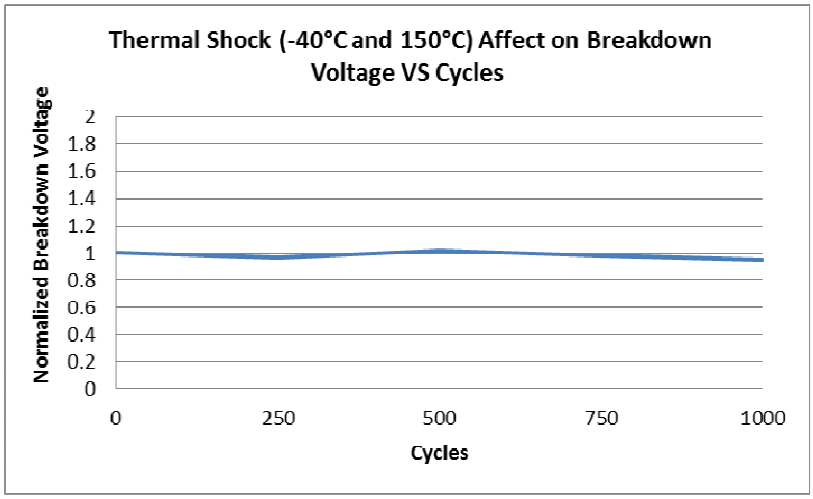
Graph 4



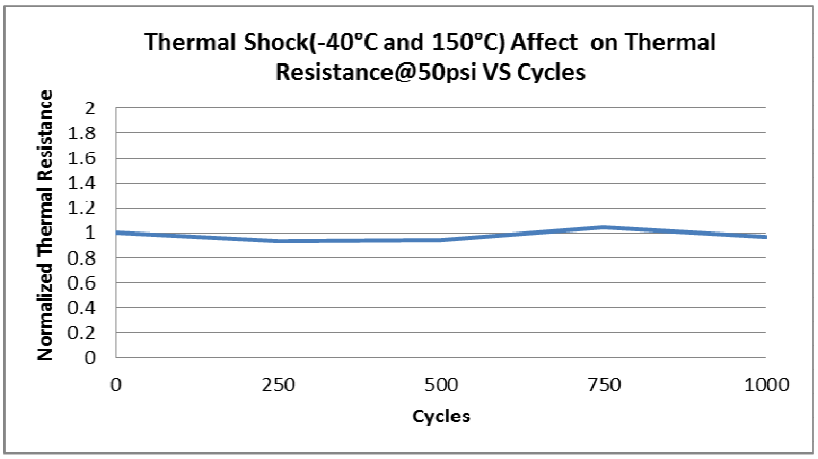
Graph3&4 showed that dielectric properties and thermal resistance at 50psi were stable during the 150 ℃ baking testing and maintained its thermal, and dielectric qualities.

- Thermal Shock reliability result

Graph 5



Graph 6



Graph5&6 indicate that Tgard500 maintains its thermal, and dielectric qualities after exposure to 1000 thermal shock cycles between -40 ℃ and + 150 ℃.

Conclusion.

The results above indicate that dielectric strength and thermal resistance were stable and not obviously influenced when exposed to various environmental conditions.

2014-8
Tianjin, China