

Tgard TNC-4 Reliability Report

January 2015

Purpose

Provide reliability data on Tgard TNC-4 performance over time when exposed to various environmental conditions.

Sample Preparation.

Aluminum plate surface, and TO220 surface were prepared by rubbing the surface with acetone to remove processing oils. TO-220 were purchased from Fairchild Semiconductor.

Aluminum plates were 45 mil thick and 1 inch x 4 inch square.

Dielectric Breakdown Test

Samples were assembled using a “tack process”. TO components and aluminum plates were preheated to 60 °C. TNC-4 samples were placed between TO components and aluminum plates and pressure of 50 psi was applied on the assembly for 10 seconds. Then the assembly was cured in 160 °C oven for 6 minutes. Test condition was set at 500 V/s ramp.

Torque Test.

Samples were assembled using a “tack process”. TO components and aluminum plates were preheated to 60 °C. TNC-4 samples were placed between TO components and aluminum plates and pressure of 50 psi was applied on the assembly for 10 seconds. Then the assembly was cured in

160 °C oven for 6 minutes.

Thermal Resistance Test.

Samples of TNC-4 were punched as 1in² circles, and then they were cured in an oven at 160 °C for

minutes.

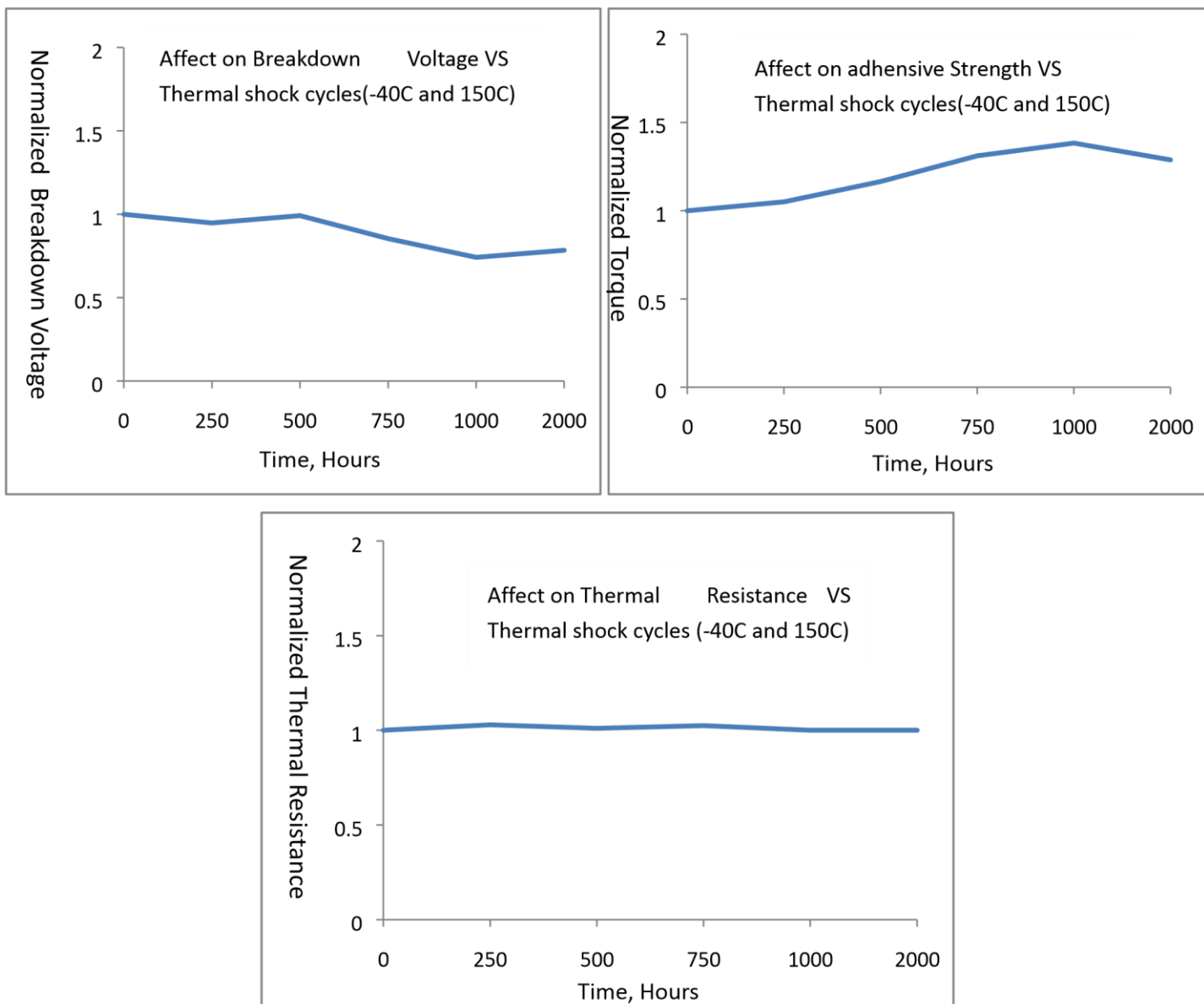
Aging Conditions.

- Thermal Shock. Temperature in hot section was set to 150 °C and the cold section was set to -40 °C. There were 24 cycles per day.
- HAST chamber- The chamber was set at 85 °C and 85 % RH.
- Bake at 150 °C. Standard forced air oven. Unit has automatic controller and was monitored with thermocouple to external Fluke unit.

Page 1 of 3

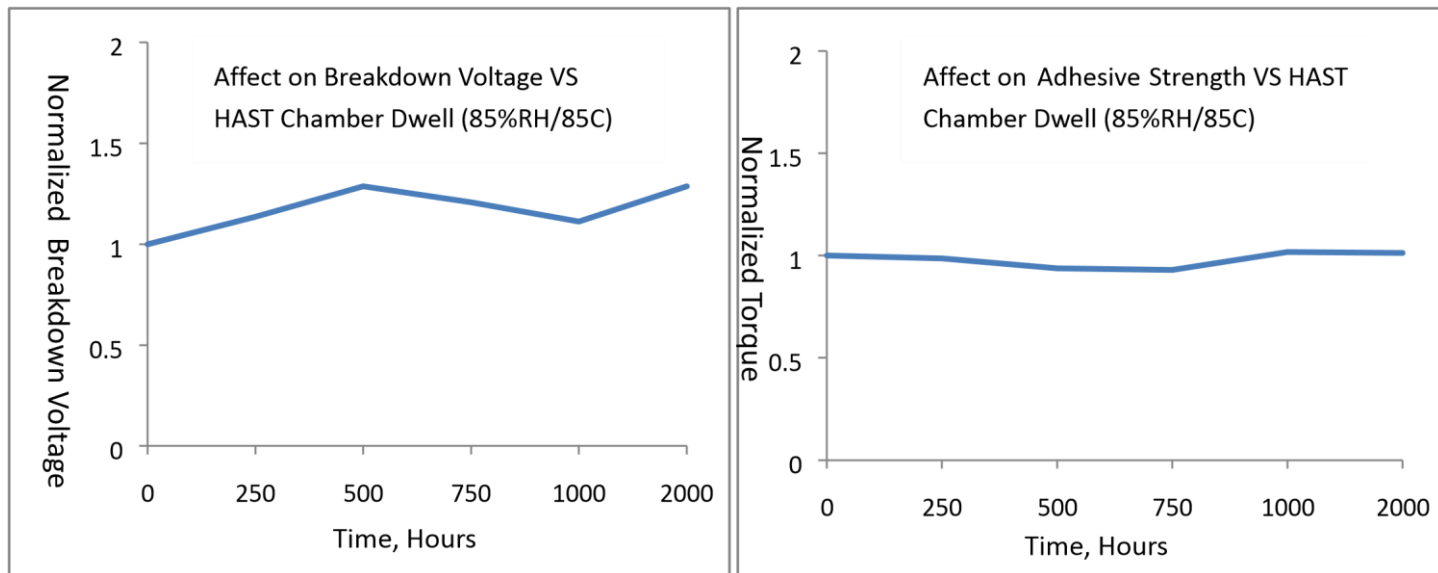
Thermal Shock Chamber Results

Following graphs indicate that TNC-4 maintains its thermal, adhesive, and dielectric qualities after exposure to 2000 thermal shock cycles between -40 °C and + 150 °C.

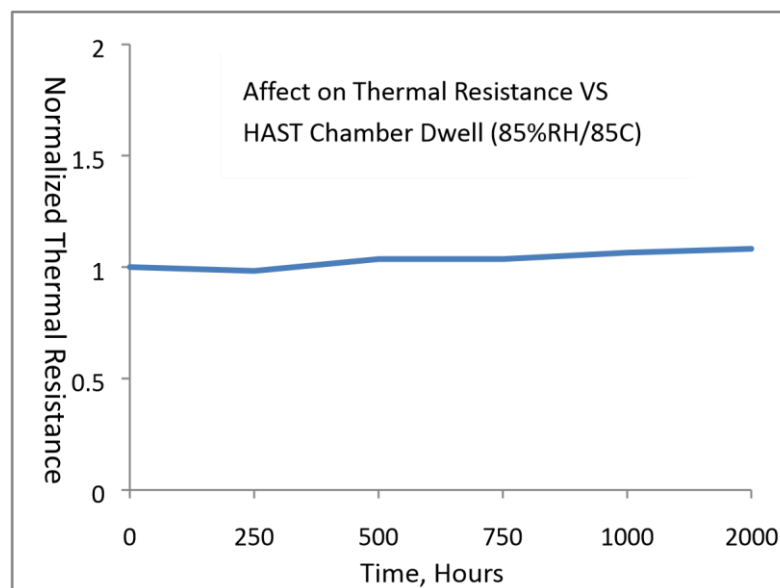


HAST Chamber Aging results

Following graphs show the results of hast chamber aging effect. The thermal, dielectric, and adhesive properties of TNC-4 were not affected by the exposure to 85 % relative humidity and 85 °C of 2000 hours.

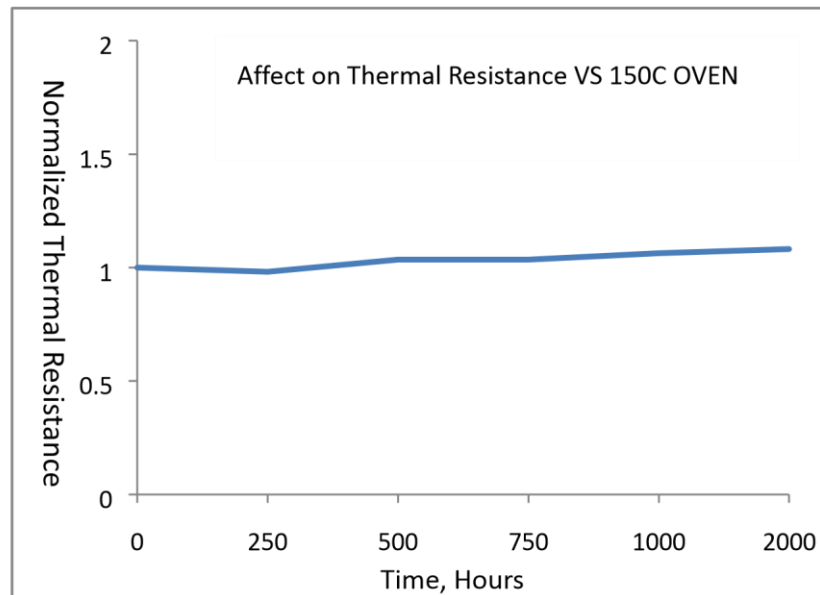
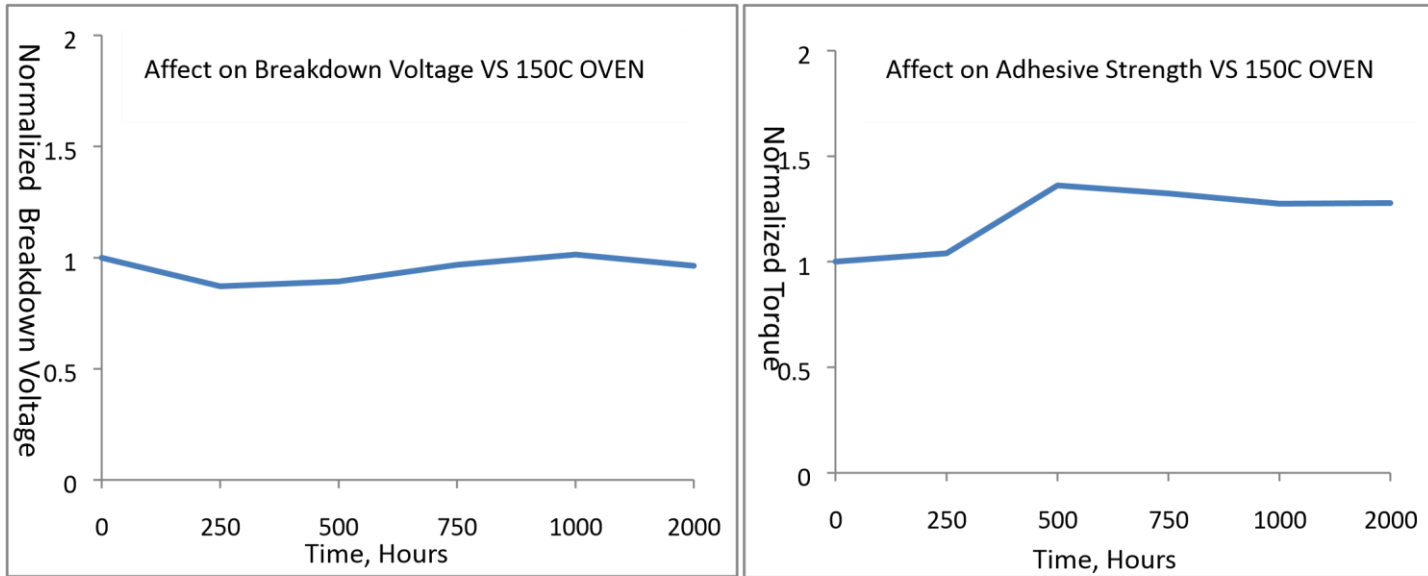


Page 2 of 3



Oven baking at 150 °C results.

Oven exposure to 150 °C did not affect the thermal, dielectric, and adhesive properties of TNC-4 materials.



Rev	Summary of Change	Author	Approval Date
版本	變更內容	作者	審核日期
A	New release	Richard Jiao	5/8/2018

