**DYNAMIC RON AND VTH DEGRADATION UNDER HIGH GATE AND DRAIN BIASES IN E-MODE ALGAN/GAN HEMT**

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The rated gate bias for a Schottky p-GaN gate AlGaN/GaN HEMT is usually between -10 and +7 V due to the reliability at the gate Schottky contact. This study investigates the dynamic on-resistance (DRON) and threshold voltage (VTH) under a double pulse test (DPT) with various gate biases from -10 V to 7 V and OFF-state drain biases from 50 to 400 V. It is found that in addition to the impact on the DRON and VTH from the negative gate bias, a higher positive gate bias is possible to alleviate the degradation. The Keysight PD1500A, a dynamic power device analyzer, performed the DPT on the device. The device is a commercial 650-V AlGaN/GaN HEMT. The DRON was obtained from the 2nd ON-state under various OFF-state biases. If the VGS,OFF is 0 or -2 V, the normalized DRON is within 1.6. But if the VGS,OFF is increased to -6 V, a significant increase in the normalized DRON (> 2) is observed. Based on the data from DPT in the time domain, it is possible to transfer ID- and VGS-time into dynamic ID-VGS during the turn-on to observe the VTH shift. In summary, the VGS (defined at 1 A) from the dynamic ID-VGS under the various VGS,OFF and VGS,ON at VDS,OFF of 400 V, showing a trend of increase of shift at higher VGS,OFF. Therefore, the suitable VGS,OFF is within -2 V to avoid the increased DRON and VTH shift, though the rated VGS is up to -10V.