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# The effect of neutral beam etching on device isolation in AlGaN/GaN HEMTs

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In this research, we reduced plasma damages on GaN-based high electron mobility transistors (HEMTs) by means of neutral beam (NB) etching. The plasma damages which are induced during dry etching process are one of the causes of decreasing device performances. The NB is almost electrically uncharged and has few UV photons, thus it can reduce plasma damages on the GaN surface. We applied NB etching to the device isolation process, and measured the isolation leakage current under DC and step-stress bias conditions, as well as the breakdown voltages on two-terminal test element arrays. We compared the characteristics with those of samples etched by conventional plasma (PL) etching. The results suggest that the NB etching reduces the leakage current through the deep levels at the etched surface. As a result, the NB samples showed higher breakdown voltages than the PL samples.

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