## **Supplemental Information:**



Figure 1: a) Layer structure of the implanted sample. b) IV measurements of alloyed contacts display linear, canonical ohmic behavior. c) TLM extraction of contact resistance gives  $R_c$  of 0.16  $\Omega$ -mm and sheet resistance of 242  $\Omega/_{\Box}$ .



Figure 2: a) Layer structure of non-alloyed contacts to MOCVD grown n+ Ga<sub>2</sub>O<sub>3</sub>. b) IV measurements display leaky-Schottky behavior. c) TLM extraction of  $R_c$  at 50 mA applied current. The extracted  $R_c$  is 0.31  $\Omega$ -mm, and the  $R_{sh}$  is 55  $\Omega/\Box$ .



Figure 3: a) Layer structure of alloyed contacts to MOCVD grown n+ on n- Ga<sub>2</sub>O<sub>3</sub>. b) IV measurements show canonical ohmic behavior with current saturation due to thermal effects and source choke. c) Spatially non-uniform contacts make extraction of R<sub>c</sub> by TLM methods impossible.

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