

Dissertation press release

22 October 2020

## Fabrication of ultra-high power density transistors

<b>Title of the dissertation</b>	Improvements to epitaxial III-N field-effect transistor technology Parannuksia epitaksiseen III-N kanavatransistoriteknologiaan
<b>Contents of the dissertation</b>	<p>The power density of electronic components is one vital parameter that defines the achievable energy efficiency of electrical devices in addition to the level of integration, physical dimensions and scope of possible applications. Developing higher power density components can cut the energy loss in power electronics and increase the capacity of mobile networks.</p> <p>In this dissertation, crystal growth processes and transistor fabrication processes were developed for transistors intended for ultra-high power density applications. The research was focused on developing growth processes for novel semiconductor materials which can be utilized to produce a layer stack suitable for transistor fabrication. Various nanofabrication methods were applied in conjunction with this layer stack to produce transistors. The electrical parameters of these transistors were measured. These results show that the developed semiconductor materials can be used for transistor fabrication and that these types of transistors could be used in ultra-high power density applications</p>
<b>Field of the dissertation</b>	Electronics, Nanofabrication
<b>Doctoral candidate</b>	Jori Lemettinen, M.Sc. (Tech.)
<b>Time of the defence</b>	13 November 2020 at 12:00
<b>Place of the defence</b>	Online defence via Zoom
<b>Opponent</b>	Professor Martin Kuball, University of Bristol, England
<b>Custos</b>	Professor Markku Sopenan, Aalto University School of Electrical Engineering, Department Electronics and Nanoengineering
<b>Electronic dissertation</b>	<a href="http://urn.fi/URN:ISBN:978-952-64-0095-2">http://urn.fi/URN:ISBN:978-952-64-0095-2</a>
<b>Doctoral candidate's contact information</b>	Jori Lemettinen, Department Electronics and Nanoengineering <a href="mailto:jori.lemettinen@aalto.fi">jori.lemettinen@aalto.fi</a>