TOYODA GOSEI

News Release

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Toyoda Gosei's Quality GaN Substrate Technology Enhances Power Device Performance

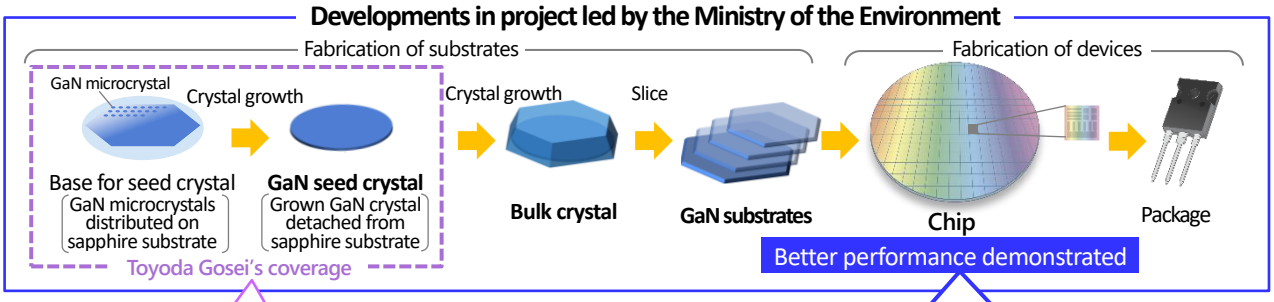
Verified in International Scientific Journal

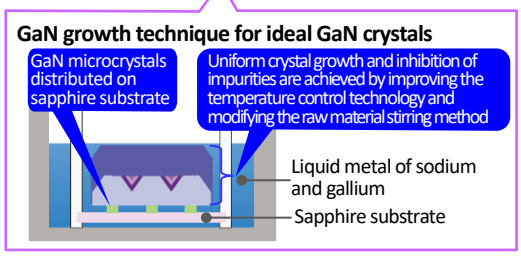
Kiyosu, Japan, January 8, 2025: Toyoda Gosei's technology to enhance GaN substrates has been verified to improve power device performance. An article confirming it was published in *Physica Status Solidi (RRL) – Rapid Research Letters*, an international scientific journal for solid state physics.

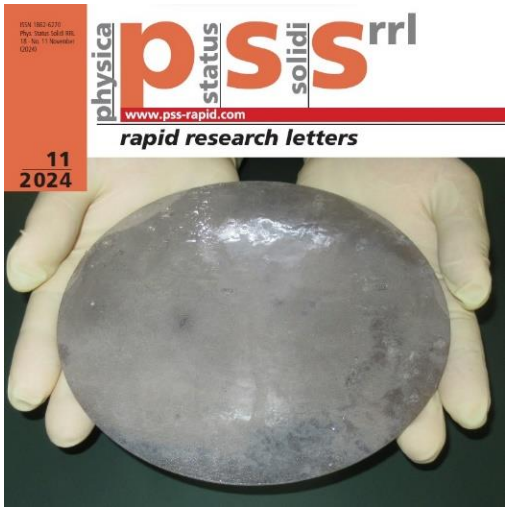
Better power devices are indispensable for CO_2 reduction in society, as they regulate electric power everywhere. Switching material from silicon to gallium nitride enables 90% energy-saving, superior devices, for which mass production of larger quality GaN substrates is requisite.

The Japanese Ministry of the Environment is leading a project[1] for broad application of GaN power devices, for which Toyoda Gosei is providing technology to obtain ideal GaN crystals. One outcome of the project is a demonstrable improvement in power device performance with a GaN substrate fabricated on a GaN seed crystal that Toyoda Gosei jointly developed with Osaka University. Compared to power devices made on commercially-available substrates, power devices using these GaN substrates show higher performance in both power regulation capacity and yield ratio.

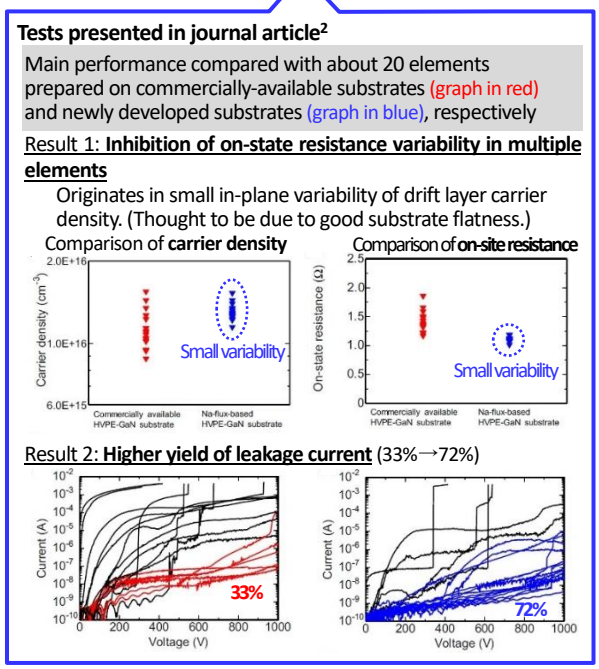
Toyoda Gosei will continue collaborating with government, universities, and other corporations for earlier dissemination of large quality GaN substrates.







Large GaN seed crystal on the inside cover



1 The leading innovation project for a decarbonized society and lifestyles using GaN technology; this is a large project that includes verification of CO_2 reductions from social implementation of applied products based on the development of GaN substrates.

2 Yusuke Mori, et al. 2024. 'Characteristics of Vertical Transistors on a GaN Substrate Fabricated via Na-Flux Method and Enlargement of the Substrate Surpassing 6 Inches'. *physica status solidi (RRL) – Rapid Research Letters*, Volume 18, Issue 11.