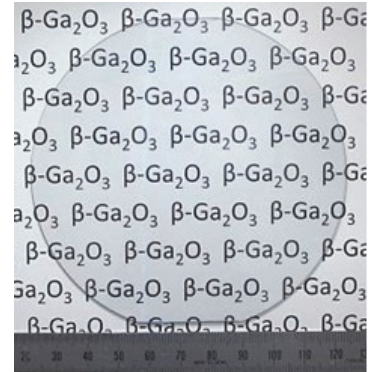


## AGC Invests in Next-generation Power Semiconductor Material Developer

### Novel Crystal Technology

- Joint Development of a Gallium Oxide Wafer Begins -

Tokyo, March 22, 2018—AGC Asahi Glass (AGC), a world-leading manufacturer of glass, chemicals and high-tech materials, has decided to invest in Novel Crystal Technology (Novel Crystal Technology, Inc.; Headquarters: Saitama prefecture, Japan; President: Akito Kuramata), a company engaged in developing a next-generation semiconductor material. This investment will pursue the joint development of gallium oxide wafers for use in next-generation power semiconductors, aiming for commercialization in 2020.



Gallium oxide wafer

Power semiconductors, which are found in a wide range of electric devices such as servers, home appliances, trains, and manufacturing facilities, function to control voltage and current. In step with the ever-expanding popularity of electric vehicles and renewable energy, the demand for such semiconductors is expected to double current demand by 2030\*<sup>1</sup>. The performance expected from power semiconductors rises by the day, and there is a need to shift from the silicon wafer used as today's power semiconductor material, to a material that can be used with high voltages and exhibit less power loss even at higher currents.

Compared to SiC (silicon carbide) and GaN (gallium nitride), both of which are being developed as next-generation power semiconductor materials, gallium oxide has intrinsic characteristics that allow it to be used under higher voltages and currents, and this material has excellent potential for mass production. Gallium oxide is garnering significant attention as a material for next-generation power semiconductors, and as such is expected to mature into a market of around 20 billion Japanese yen by 2030\*<sup>2</sup>.

Recognizing the future potential of gallium oxide wafers, AGC has decided to invest in Novel Crystal Technology, a company engaged in the development and manufacture of this material. AGC is committed to accelerating the practical application of gallium oxide wafers and next-generation power semiconductors by utilizing the company's materials, processing, and mass production expertise built up through years of experience in conjunction with this joint development with Novel Crystal Technology.

Under its **AGC plus** management policy, the AGC Group has made a commitment to positioning electronics-related business as one of its strategic initiatives. AGC intends to continue making aggressive capital investment in semiconductor-related business, which is expected to see significant growth in demand in the coming years, to contribute to further development of the semiconductor industry.

#### Notes

\*1: Refer to - Fuji Keizai "Reality and Future Prospect of next-generation Power Device and Power Electronics Related Apparatus Market 2018"

\*2: AGC estimate

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<Media inquiries>

Kazumi Tamaki, General Manager, Corporate Communications & Investor Relations Division

AGC Asahi Glass

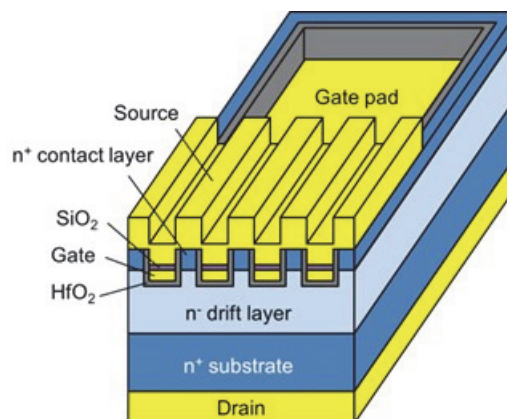
(Contact: Yuki Kitano; Tel: +81-3-3218-5603; E-mail: info-pr@agc.com)

## REFERENCE

### ■ About Novel Crystal Technology Inc. ■

Novel Crystal Technology was established in 2015. Novel Crystal Technology is an accredited company formed through a 'carve-out' venture from the Tamura Corporation and a technology transfer venture from NICT (National Institute of Information and Communications Technology). The company is engaged in the manufacture and development of gallium oxide single crystal substrates and epitaxial films, which are used as power semiconductor materials. In November 2017, Novel Crystal Technology, in collaboration with Tamura Corporation, successfully developed the world's first trench MOS-type power transistor made with gallium oxide epitaxial film. The company is focusing efforts on being a world pioneer in the practical application of gallium oxide based power semiconductors.

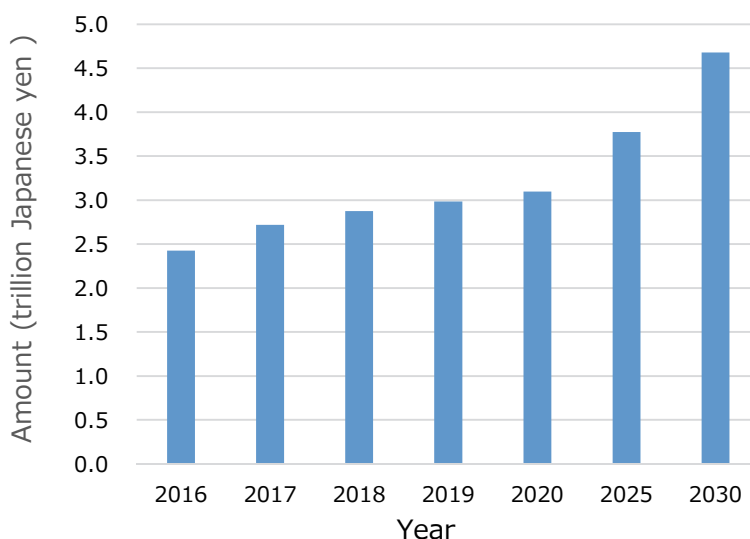
<http://www.novelcrystal.co.jp/index.html>



**Schematic of a gallium oxide trench MOS-type power transistor**

### ■ Power semiconductor market size ■

The market size of power semiconductors is forecast to rapidly expand in the years to come, reaching a market scale of some 3.8 trillion yen by 2025, and 4.7 trillion yen by 2030.



Source - Fuji Keizai "Reality and Future Prospect of next-generation Power Device and Power Electronics Related Apparatus Market 2018"

<Media inquiries>

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