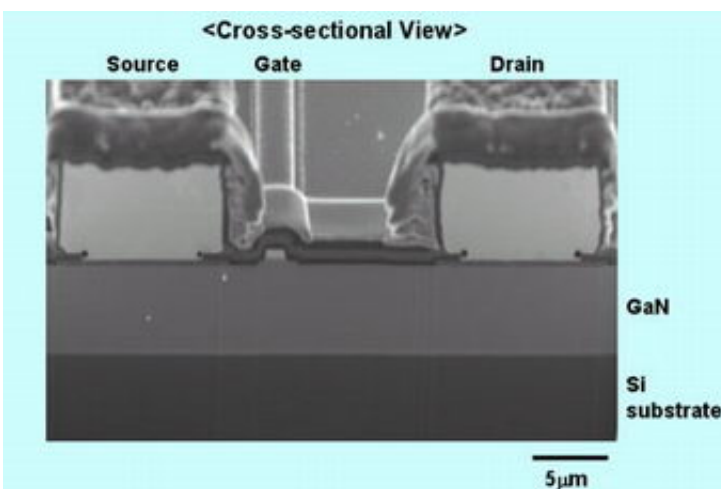


Panasonic Develops New Gallium Nitride Power Transistor with Normally-off Operation

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Normally-Off GaN Power Transistor With Low On-State Resistance. Credit: Panasonic

Panasonic today announced the development of a Gallium Nitride (GaN) power transistor with normally-off operation. This device is the world's first demonstration of the conductivity modulation in GaN as a novel operating principle leading to low on-state resistance. The new GaN transistor enables low-loss and high-voltage power switching devices.

Normally-off operation has been strongly desired for GaN power transistors, however, the reported approaches resulted in high on-state

resistance. In Panasonic's new GaN transistor called “Gate Injection Transistor (GIT)”, the normally-off positive threshold voltage of 1V is achieved by use of a pn-junction gate structure instead of conventional metal gate.

In addition, injection of holes from the p-type gate layer drastically increases the drain current resulting in low specific on-state resistance (R_{onA}) of $2.6\text{m}\Omega\text{cm}^2$. Note that the high breakdown voltage of 640V is obtained on cost-effective silicon substrate.

Panasonic's proprietary GaN power transistor “GIT” is applicable to future high efficiency power switching systems replacing Si-based power devices.

Applications for eighty nine domestic and fifty two international patents have been filed. These research and development results have been presented at International Electron Devices Meeting 2006, held at San Francisco, California, U.S. from December 11 to 13, 2006.

Source: Panasonic

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