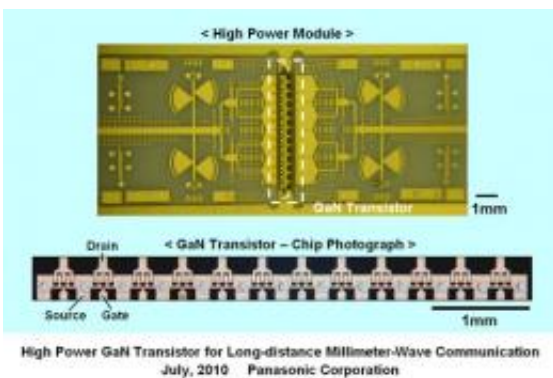


Panasonic Develops High Power Gallium Nitride Transistor for Long-distance Millimeter-Wave Communication

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Panasonic today announced the development of a high power Gallium Nitride (GaN) transistor for long-distance communication at millimeter-wave frequencies. A 25GHz wireless transceiver is fabricated using the GaN transistor. The device exhibits maximum output power of 10.7W at 25GHz enabling communication over 84km in theory.

The high power GaN transistor is fabricated on silicon (Si) substrate which is suited for mass production taking advantages of the large diameter. A novel epitaxial structure on Si improves the crystal quality resulting in high drain current of 1.1A/mm with the high carrier concentration.

A metal-insulator-semiconductor (MIS) gate structure with crystalline SiN film used as a gate [insulator](#) greatly increases the gate [breakdown voltage](#) and thus high drain voltage of 55V can be applied for the device. The Panasonic's proprietary GaN device with high current and high breakdown voltage enables high power operation of 10.7W at 25GHz which is the highest power reported by GaN [transistors](#) on Si at the frequency. The device also exhibits the world highest [power density](#) of 2.4W/mm at 60GHz among reported GaN transistors.

The fabricated transceiver utilizes orthogonal frequency division multiplexing (OFDM) which is suited for high capacity data communication. The averaged output power of 2W out of the 10W from the GaN transistor can achieve 84km communication in theory. The high power GaN transistor enables far longer distance than that by conventional GaAs transistors. The presented GaN transistor is very promising for future millimeter-wave long-distance communication systems with high speed and high data capacity.

Applications for 18 domestic and 3 overseas patents have been filed.

Source: Panasonic

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