

Improvements in GaN semiconductor technologies

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GaN HEMTs are widely used in power amplifier applications, due to their superior properties, such as wide band gap, high critical field, high electron mobility, low intrinsic carrier density and high electron mobility. However, device self-heating is still the main challenge with the existing technology and limits devices from achieving theoretical power levels of 40 W/mm.

Various ways of reducing the channel temperature within these devices have been investigated. A method of planar distributed gates have been shown to reduce the temperature peaks within the device by 30°C by introducing inactive, heat absorbing areas within the device channel/gate regions. It's been done by plasma treatment thus keeping the device mesa planar which lead to low gate leakage currents.

Planar distributed gate devices show improved performance due to the efficient heat dissipation in the device channel demonstrating that this technology has a huge potential for high power applications.

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