

Study of Low Noise and High Linearity AlGa_N/Ga_N HEMT with Ti/Al/Ti/W Au-free Ohmic Contact

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Abstract

AlGa_N/Ga_N high-electron-mobility transistors (HEMTs) have become an ideal choice for Ka-band high-frequency amplifiers due to their excellent properties. This study focuses on Ti/Al/Ti/W Au-free ohmic metals and patterned recess etching technology to reduce manufacturing costs while maintaining good device characteristics. The device achieves f_T and f_{max} of 34.5 GHz and 145 GHz, respectively. Besides, minimum noise figure of 1.65 dB and power performance, including maximum power density of 2.93 W/mm, maximum power-added efficiency (PAE) of 23.11%, and linear gain of 9.24 dBm, have been measured at 28 GHz.

Keywords - Ga_N, HEMT, Ohmic contact with W, Low noise.