

Micrometer-size GaN Schottky-diodes for mm-wave frequency multipliers

**O. Cojocari, V. Popa, V. V. Ursaki, I. M. Tiginyanu, K. Mutamba,
M. Saglam, H. L. Hartnagel**

<https://doi.org/10.1109/ICIMW.2004.1422084>

Abstract

Small-size Pt/n-GaN Schottky diodes are fabricated using electrochemical technique for anode metallisation. Effects of surface passivation and thermal annealing on the interface quality are studied using PL-measurements and electrical characterisation. DC-characteristics of 5 μ m-diameter anodes result in a cut-off frequency of 390 GHz. The perspectives of GaN-diodes for THz-frequency multipliers are discussed.

References:

- 1.V.V.Ursaki, I.M.Tiginyanu, V.V.Zalamai, S.Hubbard and D. Pavlidis, J. Appl. Phys. 94, 4813 (2003).
- 2.Manuel Rodriguez-Girones Arbolí: Doctoral Thesis, Shaker Verlage, Aachen 2003.
- 3.I.Shalish, L.Kronik, G.Segal, Yoram Shapira, M.Eizenberg, J.Salzman: Appl Phys. Lett. Vol. 77, No.7, 14 August 2000, pp.987-989.
- 4.M.S.Tyagi, in Metal-Semiconductor Schottky Barrier Junctions and Their Applications, edited by B.L.Sharma (Plenum, New York, 1984), p.1.
- 5.S.J.Pearton, C.R.Abernathy, C.B.Vartuli, J.W.Lee, J.D.MacKenzie, R.G.Wilson, R.J.Shul, F.Ren, J.M. Zavada: J. Vac. Sci. Technol. A 14(3), 1996, 831-835.
- 6.H.Choi, S.Chua, A.Raman, J.Pan, AWee: Appl Phys. Lett. Vol. 77, No. 12, 18 September 2000, pp. 1795-1797.
- 7.X.A.Cao, H.Cho, S.J.Pearton, G.T.Dang, A.P.Zhang, F.Ren, R.J.Shul, L.Zhang, R.Nickman J.M. Van Hove: Appl Phys. Lett. Vol.75, No.2, July 1999, pp.232-234.
- 8.L.J.Brillson, T.M.Levin, G.H.Jessen, A.P.Young, C.Tu, Y.Naoi, F.Ponce, Y.Yang, G.J.Lapeyre, J.D.MacKenzie, C.R.Abernathy: Physica B 273-274 (1999) pp.70-74.
- 9.P. Hacke, T. Detchprom, K. Hiramatsu, and N. Sakawi, Appl. Phys. Lett. 63, 2676 (1993).