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the nonalloy Ti/Au Metallization Scheme

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Abstract: Metal contact (Ohmic or Schottky) is vital for building different ZnO based IC compatible electronic devices. Literature has seen a tremendous development on metal contacts on this specific semiconductor by using a range of metallization scheme, but in all cases, ZnO film was very thick, highly doped, and deposited on Al₂O₃ substrate, even though this substrate is not appropriate for modern IC technology. For estimation of the specific contact resistance, transmission line method (TLM) has been used predominantly instead of Schottky barrier height (SBH) model, considering thermionic emission (TE) theory. However, SBH model is more realistic and furnishes accurate statistics of the distinct parameters of Ohmic contacts compared to TLM theory, where TLM gives only specific contact resistance. So, we are presenting the electrical properties of Ti/Au nonalloy Ohmic contact developed on 20 nm undoped RF sputtered ZnO thin film on SiO₂/p-Si and SiO₂/n-Si substrates using SBH model considering thermionic emission theory. Further, using X-ray diffraction, photo luminance, and scanning electron microscopy, we were investigated the crystal structure, energy band gap, and surface morphology of the thin film.

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