Characterization of Titanium Nitride film for High Power Applications

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Abstract: In this paper, Titanium Nitride (TiN) thin film is deposited at room temperature and optimized for high power RF MEMS applications. Being hard, Titanium Nitride is used at contact area. The contact material should have low resistance and high hardness. TiN thin films were deposited by DC Magnetron reactive sputtering using a four inch high purity titanium target in nitrogen (N_2) environment. X-ray diffraction (XRD) analysis is used for verification of TiN film. The effect of various N_2 pressure on resistivity and hardness of deposited TiN thin film was investigated. Resistivity of the film decreases with N_2 percentage and hardness increases with N_2 pressure.

Keywords: Titanium Nitride, DC magnetron reactive sputtering, X-ray diffraction (XRD), Sheet resistivity.