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Reactive high power impulse magnetron sputtering J.T. GUDMUNDSSON, Shanghai Jiao Tong University, F. MAGNUS, Uppsala University, Sweden, T.K. TRYGGVASON, O.B. SVEINSSON, S. OLAFSSON, Science Institute, University of Iceland — Here we discuss reactive high power impulse magnetron sputtering sputtering (HiPIMS) [1] of Ti target in an Ar/N_2 and Ar/O_2 atmosphere. The discharge current waveform is highly dependent on both the pulse repetition frequency and discharge voltage. The discharge current increases with decreasing frequency or voltage. This we attribute to an increase in the secondary electron emission yield during the self-sputtering phase of the pulse, as nitride [2] or oxide [3] forms on the target. We also discuss the growth of TiN films on SiO_2 at temperatures of 22-600 °C. The HiPIMS process produces denser films at lower growth temperature and the surface is much smoother and have a significantly lower resistivity than dc magnetron sputtered films on SiO_2 at all growth temperatures due to reduced grain boundary scattering [4].

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