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Temperature Dependent Dielectric Functions of MBE-grown GaMnAs Thin Films F.C. PEIRIS, Z.J. WEBER, N. MANDEL, T. SCULLY, Kenyon College, X. LIU, J.K. FURDYNA, University of Notre Dame — Spectroscopic ellipsometry was used to measure the dielectric functions of a series of $Ga_{1-x}Mn_xAs$ samples from 20 K to 300 K. Initially, by modeling the ellipsometric data in the transparent region, the film thickness and the index of refraction of $Ga_{1-x}Mn_xAs$ alloys were obtained. Extending the analysis into the absorption region, the dielectric function for the entire spectral range between 0.6 eV and 6.5 eV was determined. Monitoring the temperature dependence of the critical points, corresponding to electronic transitions in the Brillouin zone, we deduced the electron-phonon coupling parameters using Bose-Einstein occupation distributions. In comparison to GaAs, we find that the ternary alloy $Ga_{1-x}Mn_xAs$ shows a slight enhancement in its electron-phonon coupling.

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