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Title:Carrier-concentration-dependent resonance frequency shim in a metamaterial loaded semiconductor
Authors:Myoga, S. (1); Amemiya, T. (2); Ishikawa, A. (3); Nishiyama, N. (1); Tanaka, T. (3); Arai, S. (1)
Author affiliation:(1) Dept. of Electr. & Electron. Eng., Tokyo Inst. of Technol., Tokyo, Japan; (2) Quantum Nanoelectron. Res. Center, Tokyo Inst. of Technol., Tokyo, Japan; (3) Metamaterial Lab., RIKEN, Wako, Japan
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Abstract:We examined the electromagnetic responses of near-infrared metamaterials consisting of split-ring resonators fabricated on GalnAs semiconductor layers with different doping levels on an InP substrate. The inductance-capacitance (LC) resonances of the split-ring resonators could be controlled entirely from 52 to 63 THz by changing the carrier concentrations from 2.6 × 10^{18} to 2.7 × 10^{19} cm^{-3}. Our results show the feasibility of semiconductor-based tunable metamaterials.
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Chemical indexing:GaInAs/int As/int Ga/int In/int GaInAs/ss As/ss Ga/ss In/ss;InP/int In/int P/int InP/bin In/bin P/bin
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