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Abstract:Bandpass filters are reported based on double-stacked metamaterial layers separated by an air gap for operation at terahertz frequencies. Several stacking configurations were investigated designed for a ∼0.5 THz center frequency. The filters exhibited improved spectral transmission properties when compared with conventional ones based on single metamaterial layers. 3 dB bandwidth of ∼78 GHz and sidelobe suppression ratio > 16 dB were determined when symmetric or asymmetric double layers were stacked. We demonstrate that superior frequency selectivity can be achieved when metamaterial layers with different unit cells are used. Good agreement was found between measured and simulated transmission response. © 2012 Optical Society of America.
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