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High frequency magnetic properties of patterned FeCoSiB multilayer thin films on silicon substrate W.B. ZHU, L. ZHANG, H.Y. ZHENG, X. WANG, M. LI, M. BI, J.L. XIE, L.J. DENG, School of Microelectronics and Solid-State Electronics, University of Electronic Science and Technology of China, Chengdu 610054, China, NATIONAL ENGINEERING RESEARCH CENTER OF ELECTROMAGNETIC RADIATION CONTROL MATERIALS, CHENGDU, CHINA TEAM, STATE KEY LABORATORY OF ELECTRONIC THIN FILMS AND INTEGRATED DEVICES, UESTC, CHENGDU, CHINA TEAM — Soft magnetic thin film with high saturation magnetization and high permeability, has been intensively studied in the several decades. In recent years, many research efforts have been placed on the controlling of resonance frequency (f_r). One of the useful ways to tuning the resonance frequency (f_r) is by patterning the magnetic thin film into periodic structure. In this article, FeCoSiB (patterned)/SiO₂/FeCoSiB multilayer was fabricated with the bottom layer patterned into periodical strip. In frequency-dependent permeability spectra measurement, f_r was increased with the increase of bottom layer thickness (T_1 , range from 50nm to 250nm) and the full width at half maximum (FWHM) reached the maximum value of 2.7GHz at $T_1 = 50$ nm. Two resonance peaks of complex permeability spectrum were observed when $T_1 = 100$ nm. In this bottom layer thickness, further changing upper layer thickness (T_2 , range from 100nm to 300nm) haven't changed so much to the main peak position. We believed that the difference of anisotropy for different magnetic layers contribute to the coexistence of double resonance.

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