釔鋇銅氧高溫超導薄膜雙頻帶濾波器之製作與特性研究

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摘 要

本研究主要利用微小化的開迴路諧振腔，與步階阻抗諧振器之阻抗比來控制第二通帶之位置的特性，使得第二通帶可往高頻或低頻移動，藉此特性設計一種雙頻帶帶通濾波器。此雙頻帶濾波器工作於 2.40~2.48 GHz、5.15~5.35 GHz 等兩個頻段，前者為IEEE 802.11b/g通訊使用之頻段，後者為IEEE 802.11a通訊使用之頻段。我們以RF濺鍍技術在鋁酸鑭 (LaAlO3 , LAO) 基座上成長雙面高溫超導釔鋇銅氧(YBa2Cu3O7-X ,YBCO)薄膜。以IE3D軟體模擬出結果第一中心頻率為 2.42 GHz 插入損失為 -0.01 dB頻寬15 MHz，第二中心頻率為 5.2 GHz 插入損失為 -0.17 dB頻寬6 MHz之雙頻帶通濾波器。我們利用交錯耦合結構，使得斜率更為陡峭，並且在第一頻段附近產生一對傳輸零點。釔鋇銅氧特性中的低插入損耗和高品質因素等特性，我們獲得特性良好之高溫超導濾波器，我們將討論溫度對其特性之影響。

關鍵詞 : 雙頻帶 ; 步階阻抗 ; 濾波器 ; 高溫超導

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