多頻段手機天線之設計與特性分析

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摘 要

本研究主要是設計可實用於手機的內藏式平面倒Ｆ型天線(PIFA)與單極天線(Monopole)，並分析比較平面倒F型天線與單極天線之模擬與實驗結果。 本論文中分別設計並製作了三支可運用於手機的內藏式天線，天線的結構是採用共振條件為的平面倒F型天線及單極天線，其中平面倒F型天線是利用銅箔、鋁箔與低價位的FR4基板來進行設計，此結構的天線具有價位低、尺寸小、重量輕、製作簡單、低姿態（Low profile）等優點，而單極天線則具有結構簡單、可操作阻抗頻寬較寬，並且其輻射場型具有水平面上為全向性輻射等特點。 本文中的三支天線分別依據個別的需求去進行設計，二支平面倒F型天線引用了兩個概念去設計，首先是引用了寄生共振以增加天線的阻抗頻寬來產生新的共振頻段，第二則是利用折疊天線的方式來縮小天線的尺寸並藉由產生寄生電容、電感效應來降低共振頻率；而單極天線的設計則藉由不同的分支單極天線來產生多頻段的共振，同時為了能產生低頻共振路徑且不增加天線的尺寸，將一分支單極天線彎曲並藉由耦合的方式來增加其頻寬，並藉由改變天線與接地面之距離來調整高頻之阻抗頻寬，使天線達到多頻段與多模式應用的特性。

關鍵詞 : 平面倒F型天線;折疊天線;分支單極天線

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