

應用於手持式數位視訊廣播之非對稱共面波導饋入型單極天線

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摘要

本論文的目的在於設計並製造應用於手持式數位廣播通訊(digital video broadcasting-handheld, DVB-H)的小型天線。諸如：筆記型電腦、行動電話、與汽車行動通訊等，均需要小型天線。因為需要小型化，所以相對於波長小很多的尺寸以及寬頻的需求極具挑戰性。在本論文中設計了一個以共面波導饋入的印刷電路板形式的單極天線，包含了一個P形狀的天線以及L形狀的接地面。利用不同長度的非對稱接地面，除了單極天線的四分之一波長共振頻段外，可以激發出一個新的輻射頻率(0.75波長)。此外，共面波導饋入的型式，非常適合製作在短小輕便、價格低廉的單晶微波積體電路(monolithic microwave integrated circuits, MMICs)上。藉由模擬軟體HFSS先求出輻射場型、反射損耗、或其他天線參數，我們可以初步設計符合此需求的天線。此天線操作頻率為 439-937 MHz，反射損耗皆在 -6dB以下，此頻段包含了 DVB-H 之頻段 (470-862 MHz)。這個天線的場型在操作頻段內接近全向性。

關鍵詞：數位廣播通訊、印刷電路板形式的單極天線、共面波導

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ABBREVIATIONS	
CENELEC	European Committee for Electro-technical Standardization
COFDM	Coded Orthogonal Frequency Division Multiplexing
CPW	Coplanar Waveguide
DTV	Digital Television
DVB	Digital Video Broadcasting
DVB-C	Digital Video Broadcasting Cable
DVB-H	Digital Video Broadcasting Handheld
DVB-S	Digital Video Broadcasting Satellite
DVB-T	Digital Video Broadcasting Terrestrial
ETSI	European Telecommunications Standards Institute
FEC	Forward error correction
GSM	Global System for Mobile Communications
MMIC	Monolithic Microwave Integrated Circuit
MPE	Multi-Protocol Encapsulation
MPEG-2	Moving Picture Experts Group-2
MPEG-4	Moving Picture Experts Group-4
OFDM	Orthogonal Frequency Division Multiplexing
PIFA	Planar Inverted-F Antenna
QAM	Quadrature amplitude modulation
QPSK	Quadrature Phase-shift keying
SFN	Single-frequency network
SNR	Signal to noise ratio
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