●研究論文

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UWB用広帯域不平衡ダイポールアンテナの小型化の提案と検討

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Proposal and Investigation of Miniaturizing Unbalanced Dipole Antenna for Ultra Wideband Radio

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概要　本稿では，過去に提案したUWB用半円台形不平衡ダイポールアンテナの小型化を目的に，扇形と台形のペアの放射素子を有する不平衡ダイポールアンテナを提案し，電磁界解析およびアンテナ試作によって放射素子形状の検討および特性確認を行った。その結果，アンテナ各部の寸法を，扇形放射素子の半径12mm，台形放射素子の上底12mm，下底20mm，高さ22mm，扇形と台形放射素子の間隔0.4mm，放射素子導体厚1.6mmとした試作アンテナにおいて，3.0〜15GHzでVSWR≦2.0，比帯域幅133%を実現し，原形の半円台形不平衡ダイポールアンテナと比べて面積比で60%の小型サイズでありながら，同等以上のVSWR特性を有する良好なアンテナが得られた。

Abstract

In this paper, a half-sized unbalanced dipole antenna with fan-shaped and trapezoidal radiators is proposed. In addition, the VSWR, input impedance characteristics, and radiation patterns of the proposed antenna were investigated. It was found that the antenna has a maximum bandwidth when the radius of the fan-shaped element is 12mm, the length of the upper base is 12mm, the length of the lower base is 20mm, the height of the trapezoidal element is 22mm, the distance between the fan-shaped and trapezoidal elements is 0.4mm, and the thickness of the antenna elements is 1.6mm. In spite of the radiator area being 60% that of an unbalanced dipole antenna with semicircular and trapezoidal radiators, VSWR characteristics less than 2.0 and a relative bandwidth of 133% over the frequency band of 3.0 to 15GHz were obtained.

***Key Words*:** *Ultra Wideband, Broadband Antenna, Planar Antenna, Electromagnetic Field Analysis, Miniaturization*