Uniform Spacing UWB Antenna Array for Grating Lobe Reduction

鄭凱元、張道治

E-mail: 9511023@mail.dyu.edu.tw

ABSTRACT

The uniformly spaced UWB antenna array will solve the problem of the grating lobe when the space of the conventional antenna array exceeds more than of a wavelength. In this paper, an alternative uniform spacing UWB antenna array which composes of UWB CPW-fed bow-tie slot antennas, UWB cable line (ULA-316) and muti-stage microstrip UWB power dividers are achieved. For measurement, the impulse time domain measurement system is used. As the impulse signal is presented into the uniformly spaced UWB antenna array with wider bandwidth and linear good phase, the received waveform demonstrates less distorted signal. By taking FFT into frequently field type, as well as summation of each frequency, then the suppressed grating lobe and the UWB radiation pattern are obtained.

Keywords : Uniform spacing UWB antenna array ; Grating lobe ; Impulse time domain measurement system

Table of Contents

REFERENCES

1] W. Sorgel, C. Sturm and W. Wiesbeck, “ Impulse Responses of Linear UWB Antenna Arrays and the Application to Beam Steering ”, ultra-wideband, 2005 IEEE International Conference, 275-280, 5-8 sept, 2005 [2] Constantine A.Balanis, “ ANTENNA THEORY ANALYSIS AND DESIGN ”, 1997, by John Wiley & Sons, Inc.

[3] R. N. Simons, “ Coplanar Waveguide Circuits, Components, and Systems ”, New York: John Wiley & Sons, Inc, 2001.

[4] C. H. Yang, “ Design of CPW-Fed Slot Antenna ”, Master Thesis, National Taiwan University, Taipei, 2000.

[5] J. W. Niu S. S. Zhong, ” A Broadband CPW-Fed Bow-Tie Slot Antenna ”, IEEE Antennas and Propagation Socity International Symposium, 4483-4486 vol.4, 20-25 June 2004.

[6] K. Y. Yazdandoost, R. K, ” Bow-Tie Antenna For Communication Frequency ”, IEEE Antennas and Propagation Society International Symposium, 2520-2523 vol.3, 20-23 June 2004.

[7] K. K, A. H, T. S, ” Double-Sided Printed Bow-Tie Antenna for UWB Communications ”, IEEE Antennas and Wireless Propagation Letters, vol.3, 2004.

[8] J. L, C. C. Chiau, X. Chen, C. G. Parini, “ Study of a Printed Circular Disc Monopole Antenna for UWB Systems ”, IEEE Transactions on Antennas and Propagation, vol.53, NO.11, November 2005.

[9] DAVID M.POZAR. MICROWAVE ENGINEERING, Second edition, by JOHN WILEY & SONS.
[10] M. K, K.Y, I. O, T. K, “ A Design of Muti-Stage, Multi-Way Microstrip Power Dividers with Broadband Properties ”, 2004 IEEE MTT-S Digest, 69-72, vol.1, 6-11 June 2004.
[11] X. H. Wu, A. A. Kishk, Z. N. Chen, “ A Linear Antenna Array for UWB Applications ”, IEEE Antennas and Propagation Socity International Symposium, 594-597, vol.1A, 3-8 July 2005.
[12] T. G. Ma, S. K. Jeng, “ Planar Miniature Tapered-Slot-Fed Annular Slot Antennas for Ultrawide-Band Radios ”, IEEE Transactions on Antennas and Propagation, vol.53, NO.3, March 2005.