

البحث رقم (1)

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Title

Dielectric Resonator Antenna Mounted on Cylindrical Ground Plane for Handheld RFID Reader at 5.8 GHz

S. H. Zainud-Deen¹, H. A. Malhat², N. A. El-Shalaby³, and K. H. Awadalla⁴

¹24Faculty of Electronic Engineering, Menoufia University, Egypt.

³Faculty of Engineering, Kafer Elshekh University, Egypt.

E.mail: 1anssaber@yahoo.com,

3noha1511ahm@yahoo.com,

4kamal_awadalla@hotmail.com

,er_honida1@yahoo.com*corresponding author, E-mail:

Abstract

Dielectric resonator antenna (DRA) mounted on cylindrical ground plane is investigated for handheld RFID reader applications at 5.8 GHz. The simplicity of the structure makes it practical in terms of cost, space, and ease of fabrication. The radiation characteristics of the antenna in free space and in the presence of a proposed compact reader device model and human hand are calculated. The antenna is circularly polarized and exhibits peak gain of 7.62 dB at 5.8 GHz with high front to back ratio of 15.5 dB. Using the same reader device model, a sequentially feeding 2×2 DRA array mounted on the same cylindrical ground plane is used for RFID reader antenna at 5.8 GHz. The array introduces high gain of 9.36 dB at 5.8 GHz with high front to back ratio of 10.48 dB. The 2×2 DRA array elements exhibit circular polarization over a frequency band of 1.1 GHz. The axial ratio is 1.1 dB at 5.8 GHz. The proposed reader model is simple and has a small size compared with that in the case of planar ground plane. The results are calculated using the finite element method (FEM) and compared with that calculated using the finite integral technique (FIT).

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البحث رقم (2)

Title

NOVEL CHIPLESS TAG WITH ELECTROMAGNETIC CODE

S.H. Zainud-Deen¹, M. Abo El-Hassan, H.A. Malhet² and K.H. Awadalla
Faculty of Electronic Eng., Menoufia University, Egypt
lanssaber@yahoo.com, 2er_honida1@yahoo.com

Keywords:

Radio Frequency Identification, chipless tag, curved surface.

Abstract:

This paper presents a new radio frequency identification (RFID) chipless tag operating in the frequency span 4-7 GHz. The tag consists of triangle microstrip filter. The bits are encoded into the spectrum hence the tag has a unique spectral signature. The tag is less sensitive to tag orientation and has smaller size. A 6-bit chipless tag is designed. The simple opening of the triangle sides shifts the resonant frequency of the triangle resonator to an insignificant frequency, which is not used in the band. The curvature effects on the characteristics of the filter are analysed. The chipless tag is designed for advanced traffic and vehicle regulation, alarm and navigation. The finite-element method and the finiteintegration technique are used to investigate the characteristics of the filter.

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البحث رقم (3)

Title

PERFORATED CONVEX AND CONCAVE TRANSMITARRAYS

S.H. Zainud-Deen¹, S.M. Gaber², H.A. Malhet¹, M. Ibrahim³, and K.H. Awadalla¹
1Faculty of Electronic Eng., Menoufia University, Egypt, er_honidal@yahoo.com
2Egyptian Russian University, Egypt, shaymaa.gaber@yahoo.com
3MUST University, 6 oct., Egypt, mourad_said1@hotmail.com

Keywords:

perforated dielectric material, Transmitarray, satellite applications.

Abstract:

In this paper, the radiation characteristics of curvature transmitarray is investigated. Concave and convex transmitarrays are designed and analysed using the finite integral technique. Centre and offset beams transmitarrays are considered for satellite applications at 10 GHz. Perforated technique is used to construct the concave and convex transmitarray from a single dielectric sheet. A 13x13 unit cell element is designed to operate at 10GHz for each concave and convex transmitarray. The radiation characteristics of the concave and convex transmitarray with different focal to diameter ratio and different subtended angles are investigated and compared with that of the planar transmitarray.

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البحث رقم (4)

Title

PLASMA REFLECTARRAYS

S.H. Zainud-Deen¹, H.A. Malhet¹, S.M. Gaber², M. Ibrahim³, and K.H. Awadalla¹
¹Faculty of Electronic Eng., Menoufia University, Egypt, er_honida1@yahoo.com
²Egyptian Russian University, Egypt, shaymaa.gaber@yahoo.com
³MUST University, 6 oct., Egypt, mourad_said1@hotmail.com

Keywords:

Plasma antenna, Reflectarray, satellite applications.

Abstract:

This paper investigates the design of four different configurations of plasma reflectarrays. The results provide insight into different radiation characteristics of plasma reflectarrays. The proposed unit cell consists of cubic glass box filled with Argon gas energized with applied AC voltage. The reflectarray reflection coefficients phase variation is achieved by varying the plasma frequency of the energized gas. Four plasma reflectarrays for satellite applications at 12 GHz are proposed (centre-feed centre-beam, centre-feed offset-beam, offset-feed centre-beam, and finally offset-feed offset-beam). The finite integration technique is used to analyze the plasma reflectarray.

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البحث رقم (5)

Title

Reflectarrays Mounted on or embedded in Cylindrical or Spherical Surfaces

S.H. Zainud-Deen¹, N.A. El-Shalaby², S.M. Gaber³ H.A. Malhet¹, and K.H. Awadalla¹.

¹Faculty of Electronic Eng., Menoufia University, Egypt.

²Kafer El-Sheikh University, Egypt, ³Egyptian Russian University, Egypt.

Keywords:

Reflectarray, Dielectric Resonator.

Abstract:

In this paper, reflectarrays mounted on or embedded in cylindrical or spherical surfaces are designed, analyzed, and simulated at 11.5 GHz for satellite applications. The effect of the cylindrical or spherical surfaces curvature with different subtended angles on the radiation characteristics of the designed reflectarrays are investigated and compared with that of planar reflectarray. Full-wave analysis using the finite integration technique (FIT) is applied. The impedance matching bandwidth is greater than 3 GHz. The results are validated by comparing with that calculated by transmission line method (TLM).

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