Printed Inverted L Antenna on Dielectric Substrate Excited by Microstrip Line

Mitsuo Taguchi Takanobu Taniguchi
(Graduate School of Engineering, Nagasaki University)

1. Abstract

The authors have proposed the unbalanced fed ultra low profile inverted L antenna [1]. In this paper, the printed inverted L antenna on dielectric substrate excited by microstrip line is proposed. In the numerical analysis, the electromagnetic simulator WIPL-D based on the Method of Moments is used.

2. Analytical model

Figure 1 shows the structure of the proposed antenna. The inverted L antenna is printed on the upper surface of two-layer dielectric substrate. The microstrip line is printed on the rear surface of lower dielectric substrate. The inverted L antenna is excited by the slot on the conducting plane between two dielectric layers. The design frequency is 24 GHz.

3. Results and discussion

Figure 2 shows the S11 characteristics of proposed antenna. The S11 less than -10 dB is satisfied at the frequencies from 23.9 GHz to 24.04 GHz.

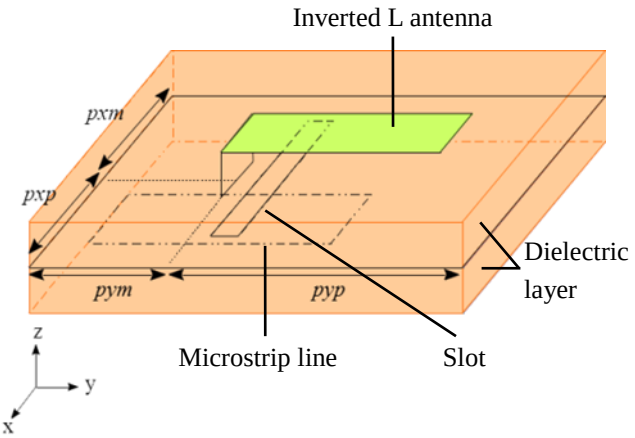
Figure 3 shows the directivity. The directivity at 24 GHz becomes 4.76 dBi.

4. Conclusion

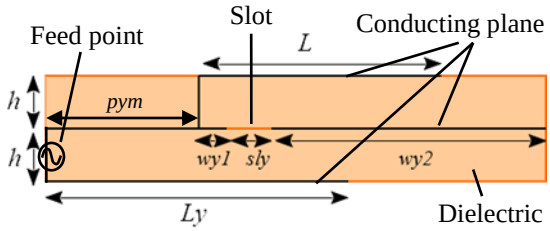
The inverted L antenna printed on the upper surface of two-layer dielectric substrate is proposed. The inverted L antenna is excited by the slot on the conducting plane between two dielectric layers.

References

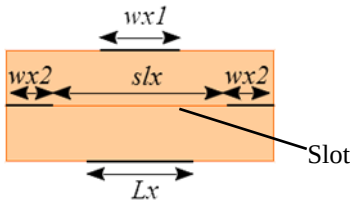
[1] T. Yamashita, M. Taguchi, Proc. of ISAP 2009, pp.361-364, 2009.



(a) Bird's-eye view



(b) A cross section (yz-plane, x=0)



(c) A cross section (xz-plane, y=wy1)

Figure 1 analytical model
pxp=pxm=1.5mm, pyp=4mm, pym=2mm, h=0.218mm, L=1.8mm, wy1=0.05mm, sly=0.25mm, wy2=3.7mm Ly=4.7mm, Lx=0.66mm wx1=0.6mm, slx=1mm, wx2=1mm

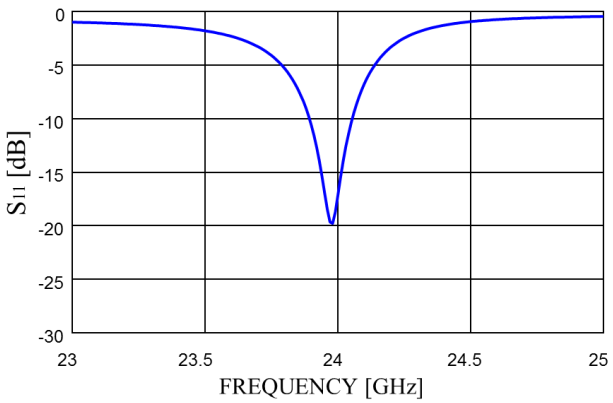


Figure 2 S_{11} characteristics.

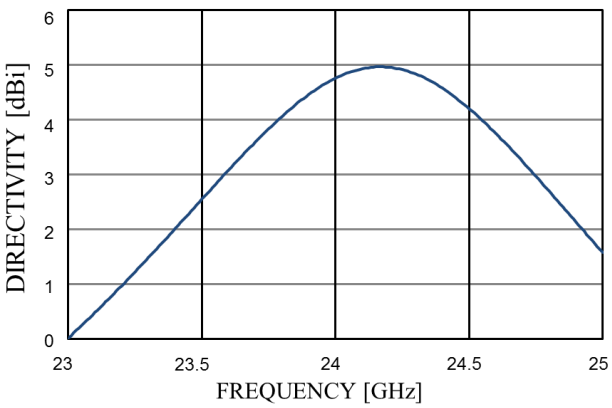


Figure 3 Directivity.