Suppression of Common-Mode Noise by Using U-Shaped Defected Ground Structure

藍元浚、吳俊德

E-mail: 9707885@mail.dyu.edu.tw

ABSTRACT

In high speed digital system, the employment of differential signal may alleviate EMI and improve signal integrity. But asymmetric structure excites common mode noise to effect signal quality critically in transmission line. This thesis proposes a structure for suppressing common mode noise due to asymmetric structure or unbalanced input source of differential transmission lines by using defected ground structure. Firstly, the influence of defected ground structure on differential lines during the coupling frequency range is investigated. Secondly, utilize the defected ground structure to suppress the common mode noise and improve the signal integrity of high speed digital system. Finally, use eye diagram and mixed-mode S parameter to verify the proposed structure by simulation and measurement. Those results demonstrated that the proposed structure do block the common mode signal with little influence on differential mode.

Keywords : differential transmission lines ; common mode noise ; signal integrity ; defected ground structure

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