Analysis and design of the broadband amplifier for miniature EMI probe

莊豐躋、林漢年 ; 許崇宜

E-mail: 9606878@mail.dyu.edu.tw

ABSTRACT

As electronic integrated circuits gradually become the trend, electromagnetic compatibility-related researches gradually focus on integrated circuit as well. However, for the measurement skills of integrated circuit sides, test probe of more miniature size must be developed to measure radiation levels accurately. In addition to the rapid attenuation of noise radiation field with distance, the chip-radiation is relatively weaker than general electronic circuits radiation field because of the small chip size, resulting in a difficulty in detecting level. To solve this problem, this study emphasizes on designing a broadband preamplifier circuit for miniature test probe, raising the measurement sensitivity, amplifying a weak signal and getting a more accurate measurement. This study will design a broadband low noise amplifier for related radiation testing standards bandwidth (30 MHz-1GHz). The active components is transistors (BFP420) from Infineon (Infineon Technologies AG) Company, along with high-frequency circuit design software (Advanced Design System 2004A) and RF circuits based on the principle of impedance matching. In this band, impedance matching using surface-mount device (SMD) lump elements, and the production of all circuits in FR4 printed circuit board, and finally the overall circuit using the network analyzer. spectrum analyzer, noise index analyzer, measurement of its overall circuit parameters, Finally 61967-3,61967-6 according to IEC standards such as IC EMC calibration procedures, be measured with the probe integration and use of the spectrum analyzer to compare test.

Keywords : IC EMC ; miniature probe ; Broadband and Low Noise Amplifier (LNA)

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