

**INVESTIGATION ON THE EFFECT OF PHYSICAL
PARAMETERS OF TERAHERTZ DIPOLE
PHOTOCONDUCTIVE ANTENNA TO THEIR
PERFORMANCE**

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ABSTRACT

The effect of the physical parameters to the resonant frequency of the terahertz (THz) dipole photoconductive antenna (PCA) is investigated. The analysis had been done by varying some of the parameters of the dipole PCA. The parameters are substrate thickness, substrate height, substrate length, copper thickness, dipole length, gap length and dipole width. Each parameter is varied for at least 10 samples using the data obtained from the parameter sweep simulation result. The variation is done from the reference dipole PCA that resonate at 1THz. Their relationship had been analyzed in graphical method and briefly discussed. Simulations have been carried out using Computer Simulation Technology (CST) and the results are plotted using MATLAB. From the analysis of the parameter sweep, the substrate thickness and dipole length give effect to the resonant frequency with uncertain way. Whereas, the relationship between the dipole width and resonant frequency is inversely proportional which the resonant frequency get lower as the dipole width increased. However, increasing the gap length and the copper thickness had given rise to the resonant frequency. For substrate height and substrate length, both give approximately the same effect to the resonant frequency which is increase and then decrease gradually as the dimension of both parameters get bigger. This study concludes that the physical parameters affect the resonant frequency of the dipole PCA.

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