

DESIGN AND SIMULATION OF DIFFERENT SLOTTED MICROSTRIP PATCH ANTENNA FOR IMPROVED RETURN LOSS

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ABSTRACT: An antenna is a very important part of microwave communication .It helps in both transmitting and receiving information .Microstrip path antenna have attractive features such as small size , low weight, low cost, and low profile. It is easy to design and fabricate. Introduction of different shape of slots are very important for improving the parameters of microstrip patch antenna. Here we are going to discuss very important parameter of antenna i.e. return loss. We are going to the return loss of three different slotted microstrip patch antenna. We are going to design cross circle and square shape slots.

KEYWORDS: Return loss, slots, microstrip antenna

1-INTRODUCTION

The ratio of reflected power from the load to the incident power on that load is known as return loss .It is expressed in dB .

$$\text{Return loss (RL)} = -10 \log_{10} \left[\frac{P_{\text{ref}}}{P_{\text{inc}}} \right]$$

$$= -10 \log |\Gamma_L|^2$$

The return loss thus tells us the percentage of the incident power reflected by load (expressed in decibels).

2- DESIGN AND SIMULATION

We have designed three slotted microstrip patch antenna through HFSS (high frequency structural simulator) . The shape of slots are cross , square and

circle respectively . There graph of return losses of respective antenna after designing is shown below. The antennas are designed at the frequency of 2.4 GHz

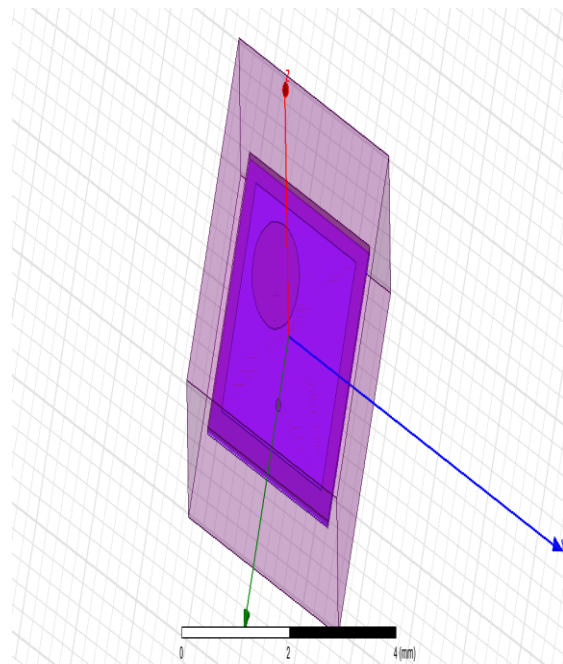


figure 1(a): circular slot microstrip patch antenna

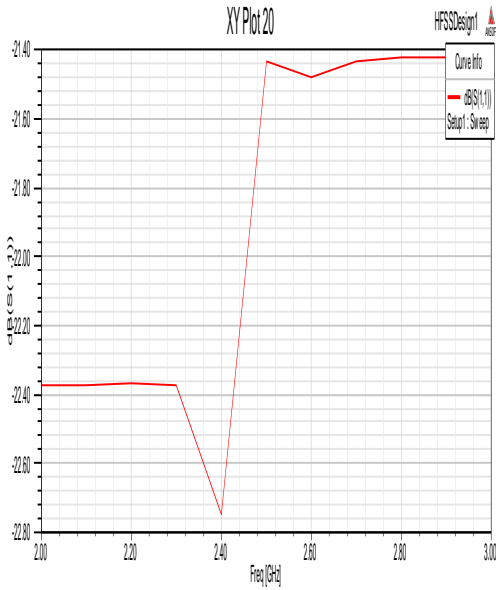


figure 1(b): return loss of circular slot MPA

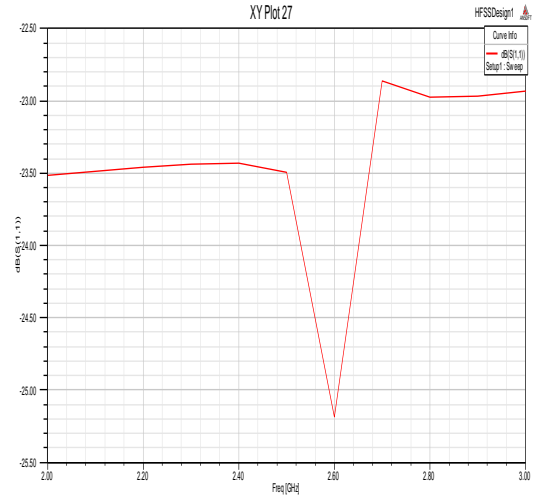


figure2(b):return loss of square slot MPA

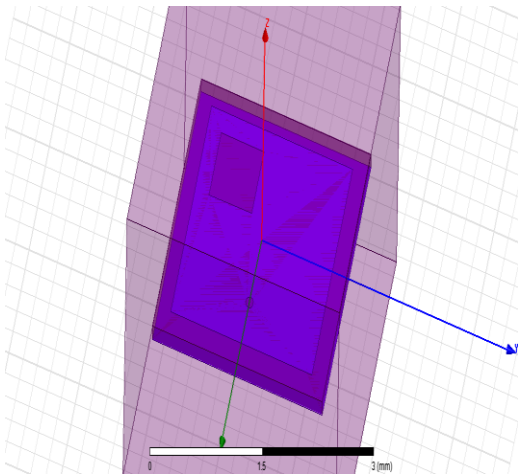


figure 2(a): square slot microstrip patch antenna

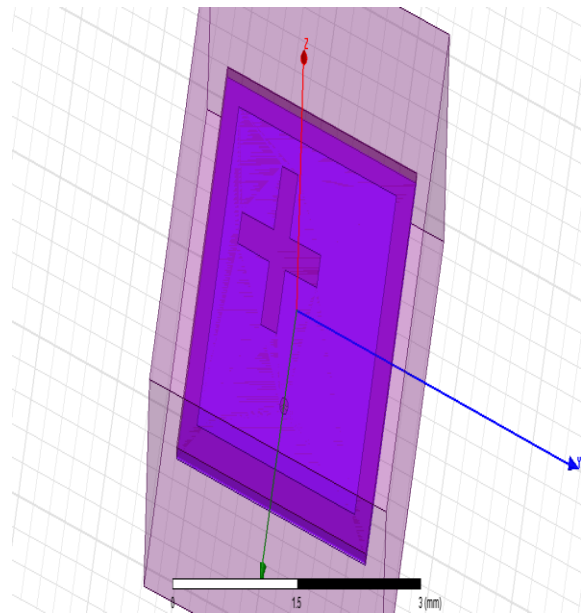


figure3(a):cross slot microstrip patch antenna

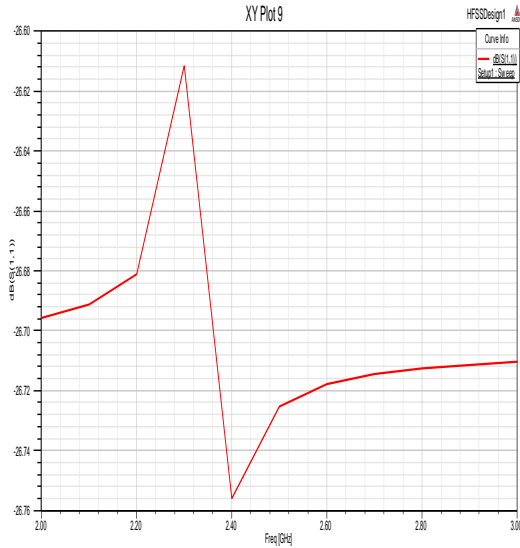


figure3(b):return loss of cross slot MPA

3- CAMPARISION OF RETURN LOSSES OF ABOVE ANTENNAS

SLOT SHAPE	RETURN LOSS
CIRCULAR SHAPE SLOT	-22.75 dB
SQUARE SHAPE SLOT	-25.20 dB
CROSS SHAPE SLOT	-28.76 dB

4- CONCLUSION

We have designed and simulated different slotted microstrip patch antenna. We have seen return losses of these antennas. By comparing the return losses cross shape slot antenna have best return loss among all the three antennas after that square shape slot and then circular shape slot. We can improve the return losses to more extent by trying it with more shape of slots and changing the dimensions of antennas.

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