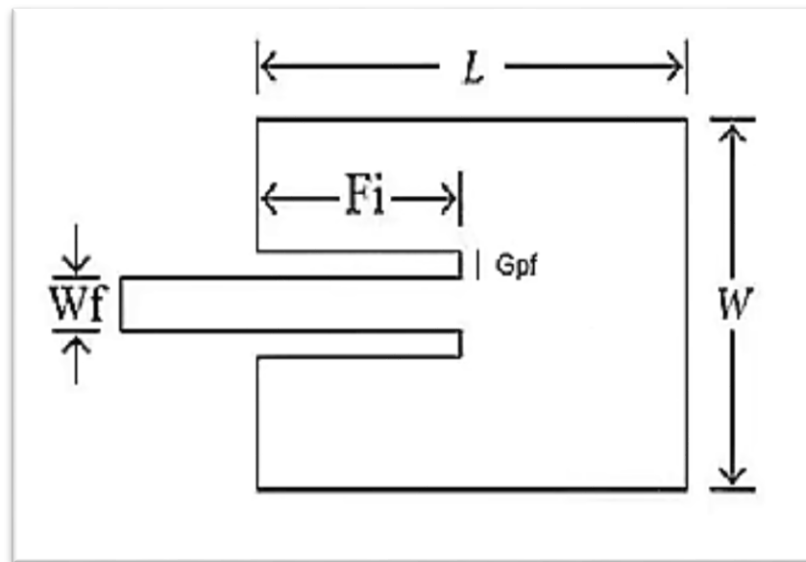


RECTANGULAR MICROSTRIP PATCH ANTENNA

Problem Statement 1

To design a square patch antenna on a FR4 substrate. The frequency is 2.45GHz and the thickness is 1.6mm, dielectric constant = 4.3

USAGE: WIFI, WLAN, WBAN (Substrate Dependent)



Parameter	Dimension(mm)	Description
W	28.45	Width of Patch
L	28.45	Length of Patch
Wg	2*W	Width of Ground
Lg	2*L	Length of Ground
Gpf	1	Gap between Feed Line and Patch
Fi	9	Inset Feed Slot Length
Wf	1.137	Width of Feedline
Hs	1.6	Height of Substrate
Ht	0.035	Height of Copper

DESIGN STEPS:

STEP1 Modelling of **Ground Plane** ➡ Brick ➡ Esc

Xmin	Xmax	Ymin	Ymax	Zmin	Zmax
$-W_g/2$	$W_g/2$	$-L_g/2$	$L_g/2$	0	Ht

Material: **Copper Annealed**

STEP2 Modelling of **Substrate Plane** ➡ Brick ➡ Esc

Xmin	Xmax	Ymin	Ymax	Zmin	Zmax
$-W_g/2$	$W_g/2$	$-L_g/2$	$L_g/2$	Ht	Ht+Hs

Material: **FR-4 lossy**

STEP3 Modelling of **Patch Plane** ➡ Brick ➡ Esc

Xmin	Xmax	Ymin	Ymax	Zmin	Zmax
$-W/2$	$W/2$	$-L/2$	$L/2$	Ht+Hs	$2*Ht+Hs$

Material: **Copper Annealed**

STEP4 Modelling of **Empty Space** ➡ Brick ➡ Esc

Xmin	Xmax	Ymin	Ymax	Zmin	Zmax
$-(W_f/2+G_{pf})$	$(W_f/2+G_{pf})$	$-L/2+Fi$	$-L/2$	Ht+Hs	$2*Ht+Hs$

Material: **Nickel** *Live life at high frequency...*

STEP5 Modelling of **Feed Line** ➡ Brick ➡ Esc

Xmin	Xmax	Ymin	Ymax	Zmin	Zmax
$-W_f/2$	$W_f/2$	$-L/2+Fi$	$-L_g/2$	Ht+Hs	$2*Ht+Hs$

Material: **Copper Annealed**

STEP6 Excitation of Rect Patch Antenna

PICK ➡ PICK FEED

MACRO ➡ SOLVER ➡ PORTS ➡ CALCULATE PORT EXTENTION COEFFICIENT

$W=1.137$; $H=1.6\text{mm}$; $k=6.29$; $e_{psr}=4.3$

CALCULATE ➡ CONSTRUCT PORT FROM PICKED FACE

STEP7 Simulate