List of Symbols and Acronyms

Units

dB	Decibel
dBi	Decibel unit with respect to isotropic radiator
GHz	Giga Hertz frequency
MHz	Mega Hertz frequency

Symbols

Z_L	Antenna load impedance
η	Antenna radiation efficiency
ϕ	Azimuthal angle
Z_0	Characteristics impedance
f_C	Center frequency
g	Coupling gap between feed and ground
t	Conductor thickness
D	Directivity
E_θ, E_ϕ	Electric fields in the azimuth and elevation plane
ε_{eff}	Effective permittivity of the substrate
ε_o	Free-space permittivity
θ	Elevation angle
η_0	Free-space impedance
λ_0	Free-space wavelength
l_{feed}	Feed length
w_f	Feed width
μ_0	Free-space permeability
p	Gap between patch and ground
d	Horizontal distance between vertical slot and patch edge
h	Height of the dielectric substrate
h_1	Height of ground plane
L_{p1}	Head length of convex hexagon
Z_{in}	Input impedance
L	Length of the substrate
L_v	Length of vertical extended thin ground
l_{g1}-l_{g5}	Length of the thin ground plane
tan δ	Loss tangent
A	Major axis of elliptical slot
B	Minor axis of elliptical slot
k_{nm}	m^{th} root of the Bessel function
w_n	Neck width of patch
f_0	Operating frequency
ε_r	Permittivity or dielectric constant of the substrate
φ	Phase difference
μ_r	Permeability of the material
β	Propagation constant
l_f	Peripheral length of tapered vertical slot
Q	Quality Factor of Antenna
f_r	Resonating frequency
Γ	Reflection coefficient
P_{rad}	Radiated power
U_0	Radiation intensity
S_{11}	Reflection Coefficient at port 1
c	Speed of light
S	side length of the pentagonal patch
S'	Side length of parasitic patch
s_1, s_2	Stair case step width
S_1,S_2	Side length of iteration patch
l_1	Tapered ground length
d_1	Vertical distance between vertical slot and patch edge
w_1,w_2	Width of fork teeth
λ_g	Wavelength in guide or dielectric medium
k	Wave number in dielectric
W	Width of the substrate
w_g	Width of thin ground plane