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List of Figures

Figure 1-1:(a) Transmission line with load (ZL), (b) Schematic of Transmission Line with circuit quantities [Source: Pozar, 2005] 5
Figure 1- 2: Material classifications based on constitutive parameters (Source: Engheta and Ziolkowski, 2006) 7
Figure 1-3: Physical realization of negative ε: thin conducting wires (Source: Engheta and Ziolkowski, 2006) 8
Figure 1-4: Physical realization of negative μ: Split Ring Resonator (SRR) (Source: Engheta and Ziolkowski, 2006) 8

Figure 2- 1: (a) Schematic of SSMA (Source: Chambers, 1994) (b) Typical performance of SSMA for Rs=308Ω/sq, d=3.2mm and ε=4.2 11
Figure 2- 2: (a) Variation of sheet resistivity with reflection level (b) variation of sheet resistivity for maximum bandwidth with the angle of incidence and polarization (Source: Chambers, 1994) 13
Figure 2- 3 : Normalized bandwidth vs reflectivity level for specified spacer permittivity (Source: Chambers, 1994) 13
Figure 2- 4: (a) Schematic of Jaumann absorber (b) Typical response of Jaumann absorber (Source: Chambers and Tennant, 1996) 14
Figure 2- 5: (a) Normalized bandwidth vs the number of layers for spacer permittivity ε=1.1 (b) resistive sheet profile for N=7 and ε=1.1 (Source: Chambers and Tennant, 1996) 14
Figure 2- 6: Unit cell of absorber consists of (a) Electric ring resonator (ERR) on the front side (b) cut wire on the backside (c) unit cell of the designed absorber (Source: Landy et al., 2008) 16
Figure 2- 7: Simulated transmission, absorption and reflectance of the absorber formed by infinite periodic arrangement of the unit cell shown in Figure 2-6 (b) Loss mechanism in the absorber using field quantities (Source: Landy et al., 2008) 16
Figure 2- 8: (a) Unit cell of wire-based absorber along with equivalent circuit model (b) simulated response of the absorber [Source: Pang et al., 2013] 17
Figure 2- 9: (a) and (b) Unit cell design and simulated response of wideband absorber using copper metal and FR4 substrate (Source: Bhattacharyya, et al., 2015) (c) and (d) Design and simulated response of wideband absorber using copper metal and FR4 substrate (Source: Sood and Tripathi, 2015) 18
Figure 2- 10 :(a) and (b) Simulated response of the absorber in co and cross-polarization and effective absorbance (Source: Kundu et al., 2017) (c) and (d) Simulated response of the absorber in co and cross-polarization and effective absorbance (Source: Tian et al., 2016) 19
Figure 2- 11: (a) Unit cell of designed dual-band absorber (b) simulated response (c) and (d) simulated field quantities at 11.15 GHz and 16.01 GHz respectively (Source: Li et al., 2010) 20
Figure 2- 12 :(a), (b) and (c) Unit cell design of single, dual and triple-band absorber by scaling of the unit cell respectively (d), (e) and (f) simulated response (Source: Li et al., 2011) 21
Figure 2- 13: (a) and (b) Unit cell design and the simulated response of the absorber respectively (Source: Dimitriadis et al., 2012) 22
Figure 2- 14 : (a) and (b) Unit cell design and the simulated response of the absorber (Source: Yang et al., 2013) 22
Figure 2- 15: (a), (b) and (c) Unit cell design, equivalent circuit and the simulated response of the resistive ink-based absorber respectively (Source: Pang et al., 2011) 23

Figure 3-1 :(a) Side view multiband absorber, Front view of (b) single (c) dual (d) triple-band absorber 28
Figure 3- 2: Fabricated (a) triple, (b) dual and (c) single-band absorber 28
Figure 3-3: Return loss (measured & simulated) and variation of polarization angle (simulated) (a, d) for single, (b, e) dual, and (c, f) triple-band absorber 29
Figure 3- 4: (a) Side View (b) Front view of metamaterial absorber 31
Figure 3-5: (a) Fabricated Absorber (b) Experimental and simulated Return loss for normal incidence, (c) Simulated Return loss for 0-600 incidence, (d) Bandwidth variation with incidence angle 32
Figure 3-6: Side view of proposed absorber along with wave vector, electric field and magnetic field directions 33
*Figure 3-7: Representative and retrieved values of the real and imaginary part of permittivity [*Source: *Zhang, et al., 2014]* 34
Figure 3-8: (a) Simulated return loss of the dielectric absorber for different thickness (b) Simulated return loss of wire-based metamaterial absorber for different wire length and tfr = 1mm 35
Figure 3-9: (a) Simulated return loss of the designed absorber for different wire element length (l), (b) Simulated absorptivity (c) Co and Cross polarization reflection of the absorber for l = 5.2mm and d = 2mm (d) Simulated return loss for a different angle of incidence 35
Figure 3-10: Electric field and power loss density at absorbing frequencies 9.7 GHz and 12.5 GHz of the proposed absorber for l=5.2mm and d=2mm 36

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Figure 4- 1: Measured the real and imaginary part of the material parameters of the control sample and composite *38*
Figure 4-2: Side view of the dielectric absorber (b) Simulated reflection of synthesized dielectric absorber for different d values and tfr=1mm *39*
Figure 4-3: (a) & (b) side and top view respectively, of the absorber along with wave vector, electric and magnetic field for p=12mm, a=10mm, d=1.75 mm and tfr=1mm *39*
Figure 4-4: (a) Orientation of the wave vector, electric field and magnetic field for different polarization angles (b) Simulated results for polarization angles 0° to 45° *40*
Figure 4-5: (a) and (c) Orientation of the wave vector, electric field and magnetic field for oblique incidence under TM and TE modes respectively (b) and (d) Simulated results for oblique incidence 0° to 60° under TM and TE modes respectively *40*
Figure 4-6: Simulated reflection for different square patch sizes (d=1.75 mm and tfr=1mm) *41*
Figure 4-7: Simulated electric field and power loss distribution at absorbing frequencies 12 GHz and 16 GHz respectively *42*
Figure 4-8: (a) Synthesized dielectric absorber (b) Schematic of measurement setup (c) Simulated and measured reflection of dielectric absorber *43*
Figure 4-9: (a) Fabricated square patch-based dielectric absorber (b) Simulated and experimental results for square patch-based dielectric absorber ((c) to (f)) Measured reflection from metal and absorber for varied aspect angle at different frequencies *44*

Figure 5-1: (a) Schematic of the SSMA (b) Simulated reflection of the SSMA for d = 3.2 mm and Rs = 308 Ω/sq *46*
Figure 5-2: (a) Enlarged top view of proposed absorber along with field directions (b) Simulated reflection for d = 3.2 mm, Rs = 200 Ω/sq, p = 12 mm and a = 10 mm *47*
Figure 5-3: (a) Simulated reflection for different patch size (b) and (c) Simulated reflection for different angle of incidence TE and TM modes respectively *47*
Figure 5-4: Simulated field quantities at 13 GHz and 16 GHz for p=12mm, a=10mm, d=3.2mm (a) and (b) Electric field at 13 GHz and 16 GHz respectively (c) and (d) Power loss density at 13 *48*
Figure 5-5: (a) Fabricated Absorber (b) Simulated and measured reflection (c) Measured reflection from the metal and the absorber at 13 GHz for different aspect angles *48*
Figure 5- 6: Simulated reflection of SS for Rs = 50, 100, 200 Ω/sq and FR4 (permittivity 4.2 and loss tangent 0.02) spacer thickness = 3.0 mm *50*
Figure 5- 7: (a) Front View of WMA (b) Simulated reflection in Co and Cross polarization of the WMA for p = 10 mm, tfr = 1 mm, l = 6 mm, w = 0.8 mm *51*
Figure 5-8: (a) Enlarged side view and (b) Simulated reflection in Co and Cross polarization of the proposed absorber for p=10mm, l=5.5mm, w= 0.8mm, tfr=3.0mm, tsp=2.0mm, tres=0.1mm and Rs=50Ω/sq *51*
Figure 5-9: Simulated reflection of the absorber for the wire length (l=7 and 8 mm), p = 10 mm, w = 0.8 mm, tfr=3.0 mm, tres = 2.0 mm and Rs = 50Ω/sq *52*
Figure 5-10: (a) Simulated reflection of the absorber for FR4 substrate thickness (tfr = 3 and 4 mm), l = 8 mm, tsp = 2 mm and Rs = 50Ω/sq and (b) Simulated reflection of the absorber for FR4 spacer thicknesses (tsp=1, 2 and 3mm), tfr = 3.0 mm, l = 5.5 mm, Rs = 50Ω/sq *52*
Figure 5-11: Simulated power loss density for p = 10 mm, l = 5.5, tfr = 3.0 mm, tres = 0.1 mm, tsp = 2.0 mm *53*
Figure 5-12: Fabricated absorbers using low-cost screen printing technique with p=10mm, l = 5.5mm, w=0.8mm, tfr = 3.0mm, tsp =2.0mm, Rs=50 ohm/sq and p=10mm, l = 8mm, w=0.8mm, tfr = 4.2mm, tsp =1.5mm, Rs=50 ohm/sq *53*
Figure 5-13: Simulated and experimental data for (a) p=10mm, l = 5.5mm, w=0.8mm, tfr = 3.0mm, tsp =2.0mm, Rs=50 ohm/sq (b) p=10mm, l = 8mm, w=0.8mm, tfr = 4.2mm, tsp =1.5mm, Rs=50 ohm/sq *54*

Figure 6- 1 : (a) Side and (b) top view of TLMA along with wave vector, electric and magnetic field directions *57*
Figure 6- 2: (a) Equivalent Circuit Model for the TLMA (b) Simulated reflection of the TLMA *58*
Figure 6-3: (a) Side and (b) Top view of the absorber along with wave vector, electric and magnetic field directions *58*
Figure 6-4: (a) Simulated reflection of the absorber for Co and Cross polarizations (b) Simulated results for polarization angles 0° to 45° (c) and (d) Simulated results for oblique incidence 0° to 60° under TE and TM modes respectively *59*
Figure 6-5: Parametric analysis of the design parameters (a) square patch size (p = 30 mm, tfr = 3 mm = tfr1) (b) thickness of base FR4 sheet (tfr1) (p = 30 mm, tfr = 3mm, a = 7.7mm) (c) thickness of the upper FR4 sheet (tfr) (p = 30 mm, tfr1 = 3 mm, a = 7.7mm) and (d) periodicity (a=7.7 mm, tfr =3 mm = tfr1) *60*
Figure 6-6: Simulated electric field and power loss density for the proposed absorber (a) and (b) Electric field at 6 GHz and 14 GHz respectively (c) and (d) Power loss density at 6 GHz and14 GHz respectively *61*

Figure 6-7: (a) Fabricated TLMA without the square patch (b) Simulated and measured data of the TLMA (c) Schematic of measurement setup (d) Fabricated TLMA with the metallic square patch (e) Simulated and measured data of TLMA with metallic square patch 62
Figure 6-8: Measured reflection from a metal plate and the absorber for varied aspect angle at different frequencies (a) 6 GHz (b) 8 GHz (c) 12 GHz (d) 14 GHz 63

`

List of Tables

Table 1- 1: Maxwell Equations: Differential and Integral forms *1*
Table 1-2: Electromagnetic Spectrum: Types, wavelength range and generation techniques *2*
Table 1- 3: Approximate Band Designation for Microwave frequencies [Pozar, 2005] *3*
Table 1- 4: Radar and range equations [E.F. Knott, 2004] *4*
Table 1- 5: RCS reduction in dB with percentage absorption and associated range advantage *5*
Table 1- 6:Transmission line: summary of equations [Pozar, 2005] *6*

Table 2- 1: Parameters associated with SSMA [Chambers, 1994] *12*
Table 2- 2: EM wave parameters in a material medium *15*
Table 2-4: Summary of different classes of microwave absorbers along with fabrication and advantages *23*
Table 2- 5: Limitations associated with different classes of microwave absorbers *24*
Table 2- 6: Bandwidth enhancement using engineered planar structures *24*

Table 5-1: Comparison with reported absorbers *49*
Table 5- 2: Comparison with reported absorbers *54*

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List of Symbols

Symbol	*Description*
ε	Medium permittivity
ε'	Real part of ε
ε''	Imaginary part of ε
μ	Medium permeability
μ'	Real part of μ
μ''	Imaginary part of μ
ε_o	Free space permittivity $8.85*10^{-12}$ F/m
μ_o	Free space permeability $4\pi*10^{-7}$ H/m
V	Volt
A	Ampere
Coul	Coulomb
Wb	Weber
H	Henry
F	Farad
m	Meter
E	Electric field intensity V/m
H	Magnetic field intensity A/m
H*	Complex Conjugate of Magnetic field intensity
D	Electric flux density Coul/m^2
B	Magnetic flux density Wb/m^2
M	Fictitious magnetic current density Wb/m^2
J	Electric current density A/m^2
ρ	Electric charge density Coul/m^3
η	Impedance of the medium
η_o	Impedance of free space
v	Speed of electromagnetic waves
c	Speed of electromagnetic waves in free space ($3x10^8$ m/sec approximate)
f	Frequency of electromagnetic waves (Hertz)
λ	Wavelength of electromagnetic waves (m)
R	Radar range
P_r	Reflected power
P_t	Transmitted power
σ_{RCS}	Radar cross-section
G_t	Transmitted antenna gain
G_r	Reflected antenna gain
dB	Decibel
Γ	return loss
γ	Complex propagation constant
α	Attenuation constant
β	Phase constant
Z_o	Free space impedance
Z_L	Load impedance
V(z)	Voltage function of z
I(z)	Current function of z
ρ*	Complex conjugate of reflection coefficient
Rs	Series Resistance (Ω)
Y	Admittance
G_{opt}	Optimum sheet conductance
$G_{opt\theta}$	Optimum sheet conductance for different incidence angle
G	Sheet conductance
f_c	Central frequency

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Y_o	Admittance of free space
Y_{in}	Input admittance
d	Thickness of the substrate (mm)
a	Square patch dimension
p	Periodicity of the unit cell
l	Length of the Wire element
w	Width of the wire element
g	Gap
θ	Angle of incidence
Φ	Angle of Polarization

List of Abbreviations

Abbreviation	*Full form*
EM	Electromagnetic Waves
ME	Maxwell's Equations
S	Poynting Vector
P	Power of EM Waves
ds	Area element
dv	Volume element
dl	Line element
HF	High frequency
VHF	Very high frequency
UHF	Ultra-high frequency
GPS	Global positioning satellite
DTH	Direct to home
RCS	Radar cross-section
WAN	Wide area network
Wi-Fi	Wireless fidelity
FM	Frequency modulation
US	United States of America
MHz	Megahertz
GHz	Gigahertz
A	Absorption
R	Reflection
T	Transmission
EMI	Electromagnetic interference
EMC	Electromagnetic compatibility
SSMA	Salisbury screen microwave absorber
TLMA	Triple-layer microwave absorber
WBMA	Wire-based metamaterial absorber
TEM	Transverse Electromagnetic
TE	Transverse Electric
TM	Transverse Magnetic
RL	Return loss
L	Inductance
G	Conductance
R	Resistance
C	Capacitance
WBA	Wire-based absorber
MWBMA	Multiple wires based metamaterial absorber
WBMA	Wire-based metamaterial absorber
BW	Bandwidth
MBA	Material based absorber
BE	Bandwidth enhancement
Z_{FSS}	Impedance due to frequency selective surface
Z_d	Impedance due to material
DMBMA	Dielectric material based microwave absorber
TL	Transmission line
DNG	Double positive
ENG	Epsilon negative
MNG	Mu negative
EPS	Engineered planar structures
NBW	Normalized bandwidth

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tfr	Thickness of FR4 substrate
tfr1	Thickness of FR4 substrate
Z_{ss}	Impedance of Salisbury Screen
tres	Thickness of resistive sheet
ERR	Electric Ring Resonator
t_{sp}	Thickness of spacer