

Index

A

acoustic wave equation

1.3: Fundamentals of Waves

Ampere's Law

4.8: Curl

7.4: Ampere's Circuital Law (Magnetostatics) - Integral Form

7.9: Ampere's Law (Magnetostatics) - Differential Form

8.9: Displacement Current and Ampere's Law

Ampere's Circuital Law for magnetostatics

7.9: Ampere's Law (Magnetostatics) - Differential Form

B

balun

8.6: Transformers as Two-Port Devices

boundary conditions

5.17: Boundary Conditions on the Electric Field Intensity (E)

C

Capacitance

5.22: Capacitance

capacitor

5.16: Potential Field Within a Parallel Plate Capacitor

Cartesian Coordinate System

4.1: Vector Arithmetic

Cartesian coordinates

4.2: Cartesian Coordinates

characteristic impedance

3.7: Characteristic Impedance

Charge Distribution

5.3: Charge Distributions

charge of an electron

10.7: Physical Constants

circular polarization

9.6: Wave Polarization

circulation

4.8: Curl

Coaxial Line

3.10: Coaxial Line

5.24: Capacitance of a Coaxial Structure

Conductance

6.5: Conductance

Conduction current

6: Steady Current and Conductivity

conductivity

2.8: Electromagnetic Properties of Materials

6.3: Conductivity

Continuous Charge Distribution

5.4: Electric Field Due to a Continuous Distribution of Charge

Convection current

6: Steady Current and Conductivity

Coulomb's Law

5.1: Coulomb's Law

Cross product

4.1: Vector Arithmetic

curl

4.8: Curl

Curves

1.7: Notation

cylindrical coordinates

4.3: Cylindrical Coordinates

D

Dielectric Breakdown

5.21: Dielectric Breakdown

dielectric constant

10.1: Permittivity of Some Common Materials

dielectrics

5.20: Dielectric Media

differential air pressure

1.3: Fundamentals of Waves

Displacement current

8.9: Displacement Current and Ampere's Law

Divergence

4.6: Divergence

divergence theorem

4.7: Divergence Theorem

Dot product

4.1: Vector Arithmetic

duality

7.1: Comparison of Electrostatics and Magnetostatics

E

Electric field intensity

2.2: Electric Field Intensity

5.17: Boundary Conditions on the Electric Field Intensity (E)

Electric Flux Density

2.4: Electric Flux Density

Electric Generator

8.7: The Electric Generator

electromagnetic interference

3.1: Introduction to Transmission Lines

Electromagnetic Spectrum

1.2: Electromagnetic Spectrum

electromagnetic waves

1.1: What is Electromagnetics?

Electrostatic Energy

5.25: Electrostatic Energy

F

Faraday rotation

9.6: Wave Polarization

Faraday's Law

8.3: Faraday's Law

Ferromagnetism

2.6: Permeability

field

2.1: What is a Field?

flux

2.4: Electric Flux Density

Fourier analysis

1.5: Phasors

frequency

1.2: Electromagnetic Spectrum

fringing field

5.23: The Thin Parallel Plate Capacitor

G

Gauss' Law

5.5: Gauss' Law - Integral Form

5.7: Gauss' Law - Differential Form

Gauss' Law for Magnetic Fields

7.2: Gauss' Law for Magnetic Fields - Integral Form

7.3: Gauss' Law for Magnetism - Differential Form

geometry

1.1: What is Electromagnetics?

gradient

4.5: Gradient

guided waves

1.4: Guided and Unguided Waves

3.1: Introduction to Transmission Lines

I

imaginary number

1.5: Phasors

Impedance Matching

3.21: Impedance Matching - General Considerations

inductance

7.12: Inductance

induction

8.2: Electromagnetic Induction

8.3: Faraday's Law

infinite line charge

5.6: Electric Field Due to an Infinite Line Charge using Gauss' Law

Input Impedance

3.15: Input Impedance of a Terminated Lossless Transmission Line

Integration Over Area

4.2: Cartesian Coordinates

4.3: Cylindrical Coordinates

4.4: Spherical Coordinates

Integration Over Length

4.2: Cartesian Coordinates

4.3: Cylindrical Coordinates

4.4: Spherical Coordinates

Integration Over Volume

4.2: Cartesian Coordinates

4.3: Cylindrical Coordinates

4.4: Spherical Coordinates

inverse square law

2.3: Permittivity

J

joule heating

6.6: Power Dissipation in Conducting Media

K

Kirchoff's Voltage Law

5.10: Kirchoff's Voltage Law for Electrostatics - Integral Form

5.11: Kirchoff's Voltage Law for Electrostatics - Differential Form

L

Laplace's Equation

5.15: Poisson's and Laplace's Equations

Laplacian

4.10: The Laplacian Operator

Lenz's law

8.2: Electromagnetic Induction

Line Charge Distribution

5.3: Charge Distributions

Line Current

6.2: Current Distributions

M

magnetic field containment

[7.7: Magnetic Field of a Toroidal Coil](#)

magnetic flux

[7.12: Inductance](#)

Magnetic flux density

[2.5: Magnetic Flux Density](#)

Magnetostatics

[7: Magnetostatics](#)

[7.4: Ampere's Circuital Law \(Magnetostatics\) -](#)

[Integral Form](#)

[7.9: Ampere's Law \(Magnetostatics\) - Differential](#)

[Form](#)

Maxwell's Equations

[8.1: Comparison of Static and Time-Varying](#)

[Electromagnetics](#)

Microstrip Line

[3.11: Microstrip Line](#)

mutual inductance

[7.12: Inductance](#)

N

notation

[1.7: Notation](#)

O

Ohm's Law for Electromagnetics

[6.3: Conductivity](#)

ohmic heating

[6.6: Power Dissipation in Conducting Media](#)

P

Parallel Plate Capacitor

[5.16: Potential Field Within a Parallel Plate](#)

[Capacitor](#)

path function

[5.9: Independence of Path](#)

perfect electrical conductor

[5.19: Charge and Electric Field for a Perfectly](#)

[Conducting Region](#)

Permeability

[2.6: Permeability](#)

[2.8: Electromagnetic Properties of Materials](#)

[10.2: Permeability of Some Common Materials](#)

permeability of free space

[10.7: Physical Constants](#)

permittivity

[2.3: Permittivity](#)

[2.8: Electromagnetic Properties of Materials](#)

[10.1: Permittivity of Some Common Materials](#)

permittivity of free space

[10.7: Physical Constants](#)

phase propagation constant

[4.10: The Laplacian Operator](#)

phase velocity

[1.3: Fundamentals of Waves](#)

[9.5: Uniform Plane Waves - Characteristics](#)

phasefronts

[9.3: Types of Waves](#)

phasor

[1.5: Phasors](#)

[1.7: Notation](#)

Photoelectric effect

[1.2: Electromagnetic Spectrum](#)

Plane waves

[9.4: Uniform Plane Waves - Derivation](#)

Plate Capacitor

[5.23: The Thin Parallel Plate Capacitor](#)

Poisson equation

[5.15: Poisson's and Laplace's Equations](#)

Poisson's Equation

[4.10: The Laplacian Operator](#)

polarization

[9.6: Wave Polarization](#)

position

[1.7: Notation](#)

Poynting vector

[9.7: Wave Power in a Lossless Medium](#)

properties of materials

[1.1: What is Electromagnetics?](#)

R

resistance

[6.4: Resistance](#)

Resistors

[6.4: Resistance](#)

S

SI Units

[1.6: Units](#)

sound

[1.3: Fundamentals of Waves](#)

speed of light in free space

[10.7: Physical Constants](#)

Spherical coordinates

[4.4: Spherical Coordinates](#)

Standing Waves

[3.13: Standing Waves](#)

Stokes' Theorem

[4.9: Stokes' Theorem](#)

Surface

[1.7: Notation](#)

Surface Charge Distribution

[5.3: Charge Distributions](#)

Surface Current Distribution

[6.2: Current Distributions](#)

T

Telegrapher's Equations

[3.5: Telegrapher's Equations](#)

thin parallel plate capacitor

[5.23: The Thin Parallel Plate Capacitor](#)

time

[1.7: Notation](#)

Toroidal Coil

[7.7: Magnetic Field of a Toroidal Coil](#)

Transformer

[8.5: Transformers - Principle of Operation](#)

U

unguided waves

[1.4: Guided and Unguided Waves](#)

Uniform Plane Waves

[9.4: Uniform Plane Waves - Derivation](#)

[9.5: Uniform Plane Waves - Characteristics](#)

unit vectors

[1.7: Notation](#)

units

[1.6: Units](#)

V

Vector arithmetic

[4.1: Vector Arithmetic](#)

Vector Operators

[10.5: Mathematical Formulas - Vector Operators](#)

vectors

[1.7: Notation](#)

volume

[1.7: Notation](#)

Volume Charge Distribution

[5.3: Charge Distributions](#)

Volume Current Distribution

[6.2: Current Distributions](#)

W

wave

[1.3: Fundamentals of Waves](#)

wave impedance of free space

[10.7: Physical Constants](#)

wavelength

[1.3: Fundamentals of Waves](#)

wavenumber

[1.3: Fundamentals of Waves](#)