
**ELECTROMAGNETIC
WAVES** **PIERC 26**

Progress

In

Electromagnetics

Research C

© 2012 EMW Publishing. All rights reserved.

No part of this publication may be reproduced. Request for permission should be addressed to the Publisher.

All inquiries regarding copyrighted material from this publication, manuscript submission instructions, and subscription orders and price information should be directed to: EMW Publishing, P. O. Box 425517, Kendall Square, Cambridge, Massachusetts 02142, USA.

E-ISSN 1937-8718

**ELECTROMAGNETIC
WAVES** **PIERC 26**

Progress

In

Electromagnetics

Research C

Chief Editor: Weng Cho Chew

EMW Publishing

Cambridge, Massachusetts, USA

CONTENTS

250 MHZ TO 30 GHZ, UNILATERAL CIRCUIT MODEL FOR INGAP/GAAS HBT*T. T. Thein, C. L. Law, and K. Fu*

1	Introduction	1
2	Simplified Unilateral and Miller Approximation Performance	2
3	Analysis For Unilateral Circuit Model	4
4	Simulated Results and Discussion	8
5	Conclusion	10

A COMPACT ULTRAWIDEBAND MONOPOLE ANTENNA WITH 5.5 GHZ NOTCHED BAND*P. Moeikham, C. Mahatthanajatuphat, and P. Akkaraekthalin*

1	Introduction	13
2	The Proposed UWB Monopole Antenna	15
3	The Proposed UWB Antenna with a Notched Band	18
4	Conclusion	25

MATCHING NETWORK USING ONE CONTROL ELEMENT FOR WIDELY TUNABLE ANTENNAS*C.-S. Lee and C.-L. Yang*

1	Introduction	29
2	Analysis and Simulations for Tunable Matching Network	32
3	Fabrication and Measurements Setup	37
4	Results and Discussions	39
5	Conclusion	41

COMPACT METAL MOUNTABLE UHF RFID TAG ON A BARIUM TITANATE BASED SUBSTRATE*T. Bjorninen, A. A. Babar, L. Ukkonen, L. Sydanheimo**A. Z. Elsherbeni and J. Kallioinen*

1	Introduction	43
2	Theoretical Background and Tag Performance Considerations	45
3	Tag Antenna Design	47
4	Experimental Results and Discussion	52
5	Conclusions	54

**EXPERIMENTAL OBSERVATION OF COLLISIONS OF
NONLINEAR ENVELOPE PULSES IN LEFT-HANDED
TRANSMISSION LINES PERIODICALLY LOADED
WITH SCHOTTKY VARACTORS**

K. Narahara and Y. Yamane

1	Introduction	59
2	Fundamental Properties of the Test Left-handed Line	61
3	Experiments	62
4	Discussion	67
5	Conclusion	69

**CALIBRATION OF A SIX-PORT POSITION SENSOR
VIA SUPPORT VECTOR REGRESSION**

H. Peng, T. Yang, and Z. Q. Yang

1	Introduction	71
2	Operating Principle	72
3	Experiment and Results	75
4	Conclusion	79

**BROADBAND CPW-FED CIRCULARLY POLARIZED
ANTENNA WITH EQUIANGULAR TAPERED-SHAPED
FEEDLINE FOR ULTRA-WIDEBAND APPLICATIONS**

Q. Chen, H.-L. Zheng, T. Quan, and X. Li

1	Introduction	83
2	Antennas Design	84
3	Results and Discussions	86
4	Conclusion	94

**DESIGN OF A WIDE BAND EIGHT-WAY COMPACT
SIW POWER COMBINER FED BY A LOW LOSS GCPW-
TO-SIW TRANSITION**

R. Kazemi, R. A. Sadeghzadeh, and A. E. Fathy

1	Introduction	97
2	Design of an Ultra Wideband GCPW-to-SIW Transition	98
3	Power Divider Design	102
	3.2 SIW Straight Y-junction	106
4	Eight-way X-band SIW Power Divider Experiments and Results	108

NOVEL CAPACITIVE GAP-COUPLED BANDPASS FILTER USING NON-UNIFORM ARBITRARY IMAGE IMPEDANCE

D.-J. Jung and S. Lim

1	Introduction	111
2	Proposed Design Method Using Non-uniform Arbitrary Image Impedances	112
3	Verification of Proposed Equations	117
4	Conclusion	120

A PLANAR RECONFIGURABLE MULTIFUNCTIONAL ANTENNA FOR WLAN/WIMAX/UWB/PCS-DCS/UMTS APPLICATIONS

S. Manafi, S. Nikmehr, and M. Bemani

1	Introduction	123
2	Antenna Description	125
3	Simulations and Experimental Results	128
4	Conclusion	136

CORRUGATED SUBSTRATE INTEGRATED WAVEGUIDE (SIW) ANTIPODAL LINEARLY TAPERED SLOT ANTENNA ARRAY FED BY QUASI-TRIANGULAR POWER DIVIDER

T. Djerafi and K. Wu

1	Introduction	139
2	SIW Corrugated Antipodal LTSA	141
3	Triangular Power Distribution	145
4	Conclusion	149

A NOVEL MGF BASED ANALYSIS OF CHANNEL CAPACITY OF GENERALIZED-K FADING WITH MAXIMAL-RATIO COMBINING DIVERSITY

V. K. Dwivedi and G. Singh

1	Introduction	153
2	Generalized-K Fading Channel Model	155
3	MGF-based Channel Capacity Analysis	157
4	Result and Discussion	160
5	Conclusion	162

THE CLOSE-FORM SOLUTION FOR SYMMETRIC BUTLER MATRICES

C. Leclerc, H. Aubert, A. Ali, A. Annabi, and M. Romier

1	Introduction	167
2	Recurrence Relations for Calculating the Scattering Parameters of Lossless and Symmetric Butler Matrices	169
3	Close-form Expressions of the S -Parameters for Lossless and Symmetric Butler Matrices	172
4	Conclusion	173
	Appendix A. The Close-form Expressions of Butler Scattering Matrix Derived From Mathematical Induction	174

UHF RECTENNA USING A BOWTIE ANTENNA

G. Monti and F. Congedo

1	Introduction	181
2	Proposed Rectenna Architecture	183
3	Conversion Efficiency Measurements	187
4	Conclusion	191

EXPERIMENTAL VALIDATION OF LINEAR APERIODIC ARRAY FOR GRATING LOBE SUPPRESSION

S. Suárez, G. León, M. Arrebola, L. F. Herrán, and F. Las-Heras

1	Introduction	193
2	Aperiodic Array Study	195
3	Experimental Results	198
4	Conclusion	201

CIRCULARLY POLARIZED BROADBAND ANTENNA WITH CIRCULAR SLOT ON CIRCULAR GROUND-PLANE

R. Joseph and T. Fukusako

1	Introduction	205
2	Antenna Structure	206
3	Parametric Studies and Optimization of the Antenna	208
4	Experimental Results	212
5	Conclusion	215

THz POWER DIVIDER CIRCUITS ON PLANAR GOUBAU LINES (PGLs)

A. Treizebre, S. Laurette, Y. Xu, R. G. Bosisio, and B. Bocquet

1	Introduction	219
2	Planar Goubau Line on Substrates	220
3	Matched Load	222
4	Power Divider	223
5	Conclusion	226

MINIATURIZED DUAL-MODE RESONATORS WITH MINKOWSKI-ISLAND-BASED FRACTAL PATCH FOR WLAN DUAL-BAND SYSTEMS

J. C. Liu, H. H. Liu, K. D. Yeh, C. Y. Liu, B. H. Zeng and C. C. Chen

1	Introduction	230
2	Configurations and Basis	231
3	Dual-mode Wide-band BPF with 2nd Order MIB Fractal Resonator	234
4	Conclusions	240

ROBUST ADAPTIVE DETECTION AGAINST SIRV CLUTTER IN THE PRESENCE OF STEERING VECTOR MISMATCHES

X. Dai, G. Cui, and L. Kong

1	Introduction	245
2	Problem Formulation and Detector Design	247
3	Adaptive Schemes	251
4	Performance Assessment	252
5	Conclusions	255

A SELECTIVE LINEAR TRANSCEIVER DESIGN OVER CORRELATED LARGE-MIMO CHANNELS

F. Y. Qian, R. K. Mai, Y. S. Zhu, and H. Li

1	Introduction	259
2	System Model	261
3	Selective Linear Transceiver Design for Large-MIMO Systems	262
4	Numerical Results and Discussion	267
5	Conclusion	271
	Appendix A. Numerical Methods to Obtain λ	271