
**ELECTROMAGNETIC
WAVES** **PIERC 34**

Progress

In

Electromagnetics

Research C

© 2013 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 34**

Progress

In

**Electromagnetics
Research C**

Chief Editor: Weng Cho Chew

EMW Publishing
Cambridge, Massachusetts, USA

CONTENTS

MICROSTRIP WIDEBAND BANDPASS FILTER WITH SIX TRANSMISSION ZEROS USING TRANSVERSAL SIGNAL-INTERACTION CONCEPTS*S. J. Xue, W. J. Feng, H. T. Zhu, and W. Q. Che*

1	Introduction	1
2	Design of the Proposed Microstrip Bandpass Filter	3
3	Measured Results and Discussions	8
4	Conclusion	9

ANALYSIS OF BAND-NOTCHED UWB PRINTED MONOPOLE ANTENNAS USING A NOVEL SEGMENTED STRUCTURE*K. Zhang, T. Wang, and L. L. Cheng*

1	Introduction	13
2	Antenna Designs and Results	15
3	Equivalent Circuits Analysis and Parametric Studies	20
4	Conclusion	26

A WIDEBAND QUADRATURE POWER DIVIDER/COMBINER AND ITS APPLICATION TO AN IMPROVED BALANCED AMPLIFIER*J.-L. Olvera-Cervantes, A. Corona-Chavez, R. Chavez-Perez, H. Lobato-Morales, J.-R. Ortega-Solis, and J.-L. Medina-Monroy*

1	Introduction	29
2	Proposed Quadrature Power Divider and Its Design Method	31
3	Implementation and Results of a Balanced Amplifier by Using the Proposed Quadrature Power Divider	35
4	Conclusions	37

A THREE-BAND T-JUNCTION POWER DIVIDER BASED ON ARTIFICIAL TRANSMISSION LINES*G. Monti, R. de Paolis, and L. Tarricone*

1	Introduction	41
2	Artificial Transmission Line	42
3	Three-band T-junction Power Divider	45

4 Conclusion 50

MULTI-BAND ORTHOGONAL LINEAR POLARIZATION DISCRIMINATION PLANAR ARRAY ANTENNA

Md. A. Hossain, E. Nishiyama, M. Aikawa, and I. Toyoda

1 Introduction 53
 2 Discrimination Mechanism 55
 3 Design of the Linear Polarization Detection Array Antenna.. 60
 4 Experimental Results and Discussions 61
 5 Conclusion 66

SMALL INVERTED-U LOOP ANTENNA FOR MIMO APPLICATIONS

S.-Y. Lin and I-H. Liu

1 Introduction 69
 2 Antenna Design 71
 3 IULA In MIMO Application for Mini-laptop 75
 4 Conclusions 82

3.5/5 GHz DUAL-BAND 8 × 8 ADAPTIVE ARRAY ANTENNA

M. A. Soliman, T. E. Taha, W. Swelam, and A. Gomaa

1 Introduction 86
 2 Survey of Our Previous Work 86
 3 Discussion of the Comparative Previous Works 90
 4 Design of Our Adaptive Model 92
 5 Conclusion 96

A TRIPLE-MODULUS FREQUENCY DIVIDER WITH EMBEDDED SWITCHES IN 90-NM CMOS PROCESS

Y.-S. Lin, Y.-H. Wang, and C.-L. Lu

1 Introduction 99
 2 Circuit Design 100
 3 Circuit Implementation and Results 104
 4 Conclusion 107

**A METAMATERIAL BASED MICROWAVE ABSORBER
COMPOSED OF COPLANAR ELECTRIC-FIELD-COUP-
LED RESONATOR AND WIRE ARRAY**

H.-M. Lee and H.-S. Lee

1	Introduction	111
2	Double-negative in-plane MMA Unit Cell Design	112
3	Experimental Result	117
4	Conclusions	118

**WIDEBAND RECONFIGURABLE LOG PERIODIC
PATCH ARRAY**

M. R. Hamid, P. S. Hall, and P. Gardner

1	Introduction	123
2	Motivation	124
3	Structural Stop Band in Aperture Coupled Arrays	125
4	Eliminating Structural Stop Band	126
5	Reconfigurable Log Periodic Aperture Coupled Patch Array Design	127
6	Simulation Results	130
7	Measurement Result	132
8	Conclusions	136

**THREE ELEMENT DUAL SEGMENT TRIANGULAR
DIELECTRIC RESONATOR ANTENNA FOR X-BAND
APPLICATIONS**

A. Gupta, R. K. Gangwar, and S. P. Singh

1	Introduction	139
2	The Antenna Geometry	140
3	Results and Discussion	144
4	Conclusion	148

**NOVEL WIDEBAND TUNABLE RESONATOR AND THE
APPLICATION TO FREQUENCY-AGILE BANDPASS
AND BANDSTOP FILTERS**

Y.-L. Ma, W.-Q. Che, J.-X. Chen, and J.-R. Mao

1	Introduction	151
2	Analysis of Proposed Tunable Resonator	152
3	Design of Tunable Filters Using Proposed Resonator	154

4 Conclusions 161

EXPERIMENTAL INVESTIGATION OF ULTRA WIDE-BAND DIVERSITY TECHNIQUES FOR ON-BODY RADIO COMMUNICATIONS

Q. H. Abbasi, M. M. Khan, S. Liaqat, M. Kamran, A. Alomainy and Y. Hao

1 Introduction 165
 2 UWB On-body Diversity Measurement Settings 168
 3 Diversity Technique Analysis 170
 4 Evaluation of the Diversity Scheme and On-body Radio Channel Characteristics 173
 5 Conclusion 178

A NOVEL TRI-MODE BANDWIDTH TUNABLE FILTER WITH HARMONIC SUPPRESSION

D.-H. Jia, Q.-Y. Feng, X.-G. Huang, and Q.-Y. Xiang

1 Introduction 183
 2 Filter Design 184
 3 Fabrication and Measurements 189
 4 Conclusion 192

LOW-INSERTION LOSS PIN DIODE SWITCHES USING IMPEDANCE-TRANSFORMATION NETWORKS

M. Liu, R. Jin, J. Geng, and X. Liang

1 Introduction 195
 2 Design Principle 196
 3 Results and Discussion 200
 4 Conclusion 201

BROADBAND SINGLE-FED SINGLE-PATCH CIRCULARLY POLARIZED MICROSTRIP ANTENNA

F. Xu, X.-S. Ren, Y.-Z. Yin, and S.-T. Fan

1 Introduction 203
 2 Description of Antenna and Design 205
 3 Results and Discussion 206
 4 Conclusion 211

A NOVEL MICROSTRIP GRID ARRAY ANTENNA WITH BOTH HIGH-GAIN AND WIDEBAND PROPERTIES

P. Feng, X. Chen, X.-Y. Ren, C.-J. Liu, and K. Huang

1	Introduction	215
2	Antenna Configuration	217
3	Antenna Optimization	219
4	Results and Discussion	221
5	Conclusion	224

A NEW BROADBAND MICROSTRIP QUADRATURE HYBRID WITH VERY FLAT PHASE RESPONSE

A. Ladu and G. Pisano

1	Introduction	227
2	Concept	228
3	Design	228
4	Modelling	231
5	Experimental Results	235
6	Conclusion	236

BEHAVIORAL MODELING OF RF POWER AMPLIFIERS WITH MEMORY EFFECTS USING ORTHONORMAL HERMITE POLYNOMIAL BASIS NEURAL NETWORK

X.-H. Yuan and Q.-Y. Feng

1	Introduction	239
2	OHPBNN PA Behavioral Model	241
3	Training Algorithm and Validation Results	244
4	Conclusion	249

A COMPOSITE DIPOLE ANTENNA ARRAY WITH DIRECT FEED

S. Lin, Y.-C. Lin, X. Liu, M.-Q. Liu, X.-R. Ma, and L.-W. Jing

1	Introduction	253
2	Antenna Structure	254
3	Simulation Analysis	255
4	Tested Results	259
5	Conclusion	262