
**ELECTROMAGNETIC
WAVES** **PIERL 41**

Progress

In

Electromagnetics

Research Letters

© 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 1937-6480

**ELECTROMAGNETIC
WAVES** **PIERL 41**

Progress

In

**Electromagnetics
Research Letters**

Chief Editor: Weng Cho Chew

EMW Publishing
Cambridge, Massachusetts, USA

CONTENTS

HIGH-STABILITY CONNECTION METHOD FOR THE INNER CONDUCTOR OF HIGH-POWER VACUUM COAXIAL RESONATOR

Xumin Yu, Xiaohong Tang, Dan Tang, Juan Wang, and Feng Dai

1	Introduction	1
2	Typical Connection Method for the Inner Conductor of a Coaxial Resonator	3
3	Analysis of the Three Types of Mechanical Connections	7
4	Experimental Verification	8
5	Conclusion	9

WIDEBAND CIRCULARLY POLARIZED DIELECTRIC RESONATOR ANTENNA WITH A SQUARE SPIRAL MICROSTRIP FEEDLINE

Lei Zhang, Yong-Chang Jiao, and Zi-Bin Weng

1	Introduction	11
2	Configuration of Antenna	12
3	Simulation Result and Discussion	14
4	Conclusions	19

INVESTIGATION OF DUAL-BAND BALUN BANDPASS FILTERS BASED ON COUPLED RING RESONATORS

Hui Wang, Bi Huan Yin, Wei Kang, Guo Yang, and Wen Wu

1	Introduction	21
2	Dual-Band Balun-BPFs Design	22
3	Results and Discussion	25
4	Conclusion	27

A NOVEL TUNABLE ANTENNA AT THZ FREQUENCIES USING GRAPHENE-BASED ARTIFICIAL MAGNETIC CONDUCTOR (AMC)

Xu-Chen Wang, Wen-Sheng Zhao, Jun Hu, and Tian Zhang

1	Introduction	29
2	The Reflection Characteristics of Graphene-based AMC	30
3	Antenna Model and Characterization	34

4 Conclusion 36

IMPROVED GRATING MONOPOLE ANTENNA WITH ZIGZAG FOR DVB-T APPLICATION

*Chemsedinne Zebiri, Michel Ney, Raed A. Abd-Alhameed
Fatiha Benabdelaziz, Mohamed Lashab, and Chan Hwang See*

1 Introduction 40
 2 Antenna Design 41
 3 Antenna Design and Experimental Results 43
 4 Conclusion 46

A COMPACT DUAL-MODE RESONATOR WITH SQUARE LOOPS AND ITS BANDPASS FILTER APPLICATIONS

Ying Liu, Hong-Xing Zheng, and Li-Ying Feng

1 Introduction 51
 2 Dual-mode Resonator with Loaded Square Loops 53
 3 Dual-mode Bandpass Filter Design 55
 4 Measurements 57
 5 Conclusion 59

ELECTRIC AND MAGNETIC FIELDS PRODUCED BY A CURRENT FLOWING ALONG A HORIZONTAL CONDUCTOR LOCATED OVER A PERFECTLY CONDUCTING GROUND PLANE — REVISITED

Vernon Cooray and Gerald Cooray

1 Introduction 63
 2 Electromagnetic Fields of Accelerating Charges 66
 3 Electromagnetic Fields Generated by a Current Pulse Propagating with Uniform Velocity and without Attenuation 67
 4 Electromagnetic Fields Generated by a Current Pulse Propagating along a Horizontal Conductor 70
 5 Conclusions 74

BROADBAND CPW-FED CIRCULARLY POLARIZED ANTENNA WITH AN IRREGULAR SLOT FOR 2.45 GHz RFID READER

Lu Chen, Xueshi Ren, Yingzeng Yin, and Zedong Wang

1 Introduction 77

2	Antenna Design and Analysis	78
3	Simulated and Measured Results	82
4	Conclusion	84

MULTI-BAND RECTANGULAR MICROSTRIP ANTENNA USING A METAMATERIAL-INSPIRED TECHNIQUE

Xi-Wang Dai, Zhen-Ye Wang, Long Li, and Chang-Hong Liang

1	Introduction	87
2	Basic Antenna Configuration	88
3	Design of Two Type Multi-band Antenna	89
4	Conclusion	94

A MONOLAYER MULTI-OCTAVE BANDWIDTH LOG-PERIODIC MICROSTRIP ANTENNA

Fang Lei, Zeng Rui Li, Qing Xin Guo, Hui Zhang, Xue Qin Zhang Jie Wang, Guo Sheng Liu, Jun Hong Wang, and Yaoqing Yang

1	Introduction	97
2	Antenna Configuration	99
3	Simulation and Measurement Result	100
4	Conclusions	103

COMPACT STEP-IMPEDANCE RING RESONATOR FOR QUAD-BAND BAND-PASS FILTER

Feng Wei, Qiu-Lin Huang, Xin-Huai Wang, Wen-Tao Li and Xiao-Wei Shi

1	Introduction	105
2	Analysis and Design	106
3	Results and Discussion	109
4	Conclusion	111

A NOVEL UWB OCTAGONAL SEMI-RING MONOPOLE ANTENNA WITH WING-SHAPED CPW FEEDING STRUCTURE

Majid Rafiee, Mohd F. Ain, and Md. Shahar Aftanasar

1	Introduction	113
2	Antenna Structure	114
3	Results and Discussion	118
4	Conclusion	121

DESIGN OF SEVERAL POWER DIVIDERS USING CPW-TO-MICROSTRIP TRANSITION

Maoze Wang, Fushun Zhang, Jian Sun, Ke Chen, and Bin Wen

1	Introduction	125
2	In-phase Power Divider	126
3	Out-of-phase Power Divider	129
4	Non-coplanar Out-of-phase Power Divider	131
5	Conclusions	133

MEMS COMPATIBLE SEVER FOR 220 GHz ULTRA WIDE BAND TWTA: DESIGN AND PARTICLE-IN-CELL ANALYSIS

Anisullah Baig, Larry R. Barnett, Diana Gamzina and Neville C. Luhmann, Jr.

1	Introduction	136
2	220 GHz Ultra Wideband TWTA	137
3	MEMS Compatible Wideband Distributed Sever (~ 12 mm) for 220 GHz Sheet Beam TWT Amplifier	138
4	Particle-In-Cell (PIC) Analysis of Long Sever \sim mm at different conductivities	139
5	MEMS Compatible Wideband Distributed Sever (~ 4 mm) for 220 GHz Sheet beam TWT Amplifier	141
6	Particle-In-Cell (PIC) Analysis of Short Sever ~ 4 mm and Optimization	143
7	Sever Effect on the RF Electric Field and Electron Beam Modulation	144
8	Conclusion	146

A NOVEL PATTERN AND FREQUENCY RECONFIGURABLE MICROSTRIP PARASITIC ARRAY

Qiaona Qiu, Shuxi Gong, Yunxue Xu, Yu Cao, Pei Duan and Cheng Chen

1	Introduction	149
2	Physical Structure and Radiation Mechanism	150
3	Analysis and Results	153
4	Conclusions	156

A FSS WITH STABLE PERFORMANCE UNDER LARGE INCIDENT ANGLES

Tao Ma, Hang Zhou, Yuan Yang, and Bo Liu

1	Introduction	159
2	Design and Analysis	160
3	Experiment	162
4	Conclusion	164

DESIGN OF DUAL BAND FILTER BASED ON A NOVEL DGS STRUCTURE

Yang Li, Hong-Chun Yang, and Shao-Qiu Xiao

1	Introduction	167
2	Design Procedure	168
3	Simulation and Measurement Results	172
4	Conclusions	174

A BROADBAND CIRCULARLY POLARIZED ANTENNA FED BY HORIZONTAL L-SHAPED STRIP

Jian-Jun Wu, Xue-Shi Ren, Ying-Zeng Yin, and Ze-Dong Wang

1	Introduction	175
2	Design of Antenna	176
3	Parametric Studies	178
4	Measured Results	182
5	Conclusion	183

LOWPASS FILTER WITH WIDE STOPBAND AND SHARP SKIRT USING NOVEL DEFECTED GROUND STRUCTURE

Yang Li, Hong-Chun Yang, and Shao-Qiu Xiao

1	Introduction	185
2	DGS Unit Design	186
3	Parametric Study	188
4	Lowpass Filter Design	188
5	Conclusions	190

**COMPACT TUNABLE DUAL-BAND BANDPASS FILTER
BASED ON SUBSTRATE INTEGRATED WAVEGUIDE
AND DEFECTED GROUND STRUCTURE**

Zhu-Dan Wang, Feng Wei, Li Zhang, and Xiao-Wei Shi

1	Introduction	193
2	Design and Analysis of Proposed Filter	194
3	Results and Discussion	200
4	Conclusion	201