

2012 IEEE MTT-S International Microwave Workshop Series on Millimeter Wave Wireless Technology and Applications

(IMWS 2012)

**Nanjing, China
19-20 September 2012**



**IEEE Catalog Number: CFP12WTA-PRT
ISBN: 978-1-4673-0901-1**

2012-09-18 AM Room A-B

08:00 – 09:30

IMWS2012 Registration

09:30 – 09:50

IMWS2012 Opening Ceremony

Address from Prof. Wei Hong, General Chair

Address from Prof. Ke Wu, Chair of the IEEE MTT-S MGA

Address from Dr. Peter Staecker, 2013 IEEE President

09:50 – 10:30

IMWS2012 Keynote Talk

Microwave Ferroelectric and Reconfigurable Antennas

*Józef W. Modelski, 2008 IEEE MTT-S President, Academician of Poland (**Poland**).....1*

2012-09-18 AM Room C
10:30 – 11:20

Session TUE1

(IMWS2012 Student Paper Contest and Coffee Break)

P.1	A Low Power Variable Gain Amplifier with 50-dB Dynamic Range <i>Pilong Gao, Zhigong Wang, Jian Xu, Weibing Li, Yiqiang Wu, Lu Tang (Mainland China)</i>	3
P.2	A Wideband 0.13 μ m CMOS LC-VCO for IMT-Advanced and UWB Applications <i>Xin Tang, Fengyi Huang, Mingchi Shao, Youming Zhang (Mainland China)</i>	7
P.3	Application of diffracted Gaussian beam analysis to design 3D configured Quasi-optical Systems <i>Chengliang Li, Liang Xu, Yuan Yao, Xiaodong Chen, Junsheng Yu (Mainland China)</i>	11
P.4	CMOS Millimeter-Wave Layout-Dependent Parasitic Parameters Extraction and Optimization By Full-Wave EM Method <i>Qian Zhong, Yiming Yu, Kai Kang (Mainland China)</i>	14
P.5	Compact and High Selectivity Dual-Band Dual-Mode Microstrip BPF with Folded SIR <i>Wen Chen, Yong-jiu Zhao, Xiao-jun Zhou (Mainland China)</i>	18
P.6	Design of a Reconfigurable Low Noise Amplifier for IMT-A and UWB Systems <i>Xusheng Tang, Fengyi Huang, Youming Zhang, Shengmeng Lin (Mainland China)</i>	21
P.7	Design of a Solid-State Balanced Frequency Multiplier for Millimeter wave Applications <i>Xueli Liu, Yong Zhang, Bo Yan, Ruimin Xu (Mainland China)</i>	N/A
P.8	Design of Lower Power 4 $\times$ 10Gb/s VCSEL Driver Array <i>Xin Zhang, Peng Miao, Ling Tian, Yingmei Chen, Yong Tak Lee, BongKyu Jeong (Mainland China)</i>	29
P.9	Design of VGA for 6 GHz Radio Frequency Communication System <i>Dawei Zhao, Fengyi Huang, Xusheng Tang, Xiaopeng Sun (Mainland China)</i>	32
P.10	Experimental Demonstration of Frequency-Octupled Millimeter-wave Signal Generation Based on a Dual-Parallel Mach-Zehnder Modulator <i>Yamei Zhang, Shilong Pan (Mainland China)</i>	36
P.11	High Selectivity Dual-Band Dual-Mode Microstrip BPF with Multi-Zeros <i>Wen Chen, Yong-jiu Zhao, Xiao-jun Zhou (Mainland China)</i>	40
P.12	Investigation of DCS1800/TD-LTE Dual-Mode and Dual-Link UE System Performance Based on the High Isolation Handset Antenna <i>Anming Gao, Lingli Kong, Wei Jiang, Yong Jiang (Mainland China)</i>	44
P.13	Ka-Band Dual Circularly Polarized Transceiver Antenna for Medical Applications <i>Shunyu Fang, Zhigang Liu, Shouzheng Zhu (Mainland China)</i>	48
P.14	Low-Power Ultra-Wideband Power Detector IC in 130 nm CMOS Technology <i>Xin Yang, Yorikatsu Uchida, Qing Liu, Toshihiko Yoshimasu (Japan)</i>	52
P.15	Preliminary Design of a W-band Third Harmonic Gyrotron <i>Dimin Sun, Hongbin Chen, Guowu Ma, Fanbao Meng, Huaibi Chen (Mainland China)</i>	56

2012-09-18 AM Room A-B

Session TUE2
(IMWS2012 Oral Session)

11:20 – 11:50	Towards Greener Smartphones with Microwave Measurements (Invited Talk) <i>Dominique Schreurs, IEEE MTT-S DML (Belgium)</i>	59
11:50 – 12:20	Novel materials and Devices for Millimeter-wave and THZ applications (Invited Talk) <i>James C. M. Hwang (USA)</i>	60

2012-09-18 PM Room A-B

Session TUE3
(IMWS2012 Oral Session)

13:30 – 14:00	The research on mm-wave power amplifier MMIC (Invited Talk) <i>Bin Zhang (Mainland China)</i>	61
14:00 - 14:20	Design of Ka Band Multilayer Cross-coupled Filter Based on Substrate Integrated Waveguide <i>Jingsong Huang, Lingqin Meng (Mainland China)</i>	65
14:20 - 14:40	A Novel Compact High-Performance Microstrip 26GHz Ultra-Wideband (UWB) Bandpass Filter for Vehicle Radar Systems <i>Zhewang Ma, Masataka Ohira, Chun-Ping Chen, Tetsuo Anada (Japan)</i>	69
14:40 - 15:00	A Micromachined Centre-Fed Slotted Waveguide Antenna for Mm-wave Applications <i>Yi Wang, Michael J. Lancaster (United Kingdom)</i>	73
15:00 - 15:20	The Modes in the Stepped Parallel Waveguide Excited by the Slant Incident Waves <i>Haogang Wang, Xidong Wu, Xinhua YU (Mainland China)</i>	76

2012-09-18 PM Room C
15:20 – 16:10

Session TUE4
(IMWS2012 Poster Session & Coffee Break)

P.1	0.18 μ m CMOS Limiting Amplifier for 10GB/s Optical Receiver <i>Fuhai Shang, Peng Miao, Ling Tian, Yingmei Chen, Yong Tak Lee, BongKyu Jeong</i> (Mainland China)	80
P.2	A 1.8-2.6GHz RF CMOS Up-Conversion Mixer for Wideband Applications <i>Xiaopeng Sun, Fengyi Huang, Xusheng Tang, Dawei Zhao</i> (Mainland China)	83
P.3	CMOS Phase Frequency Detector and Charge Pump for Wireless Sensor Networks <i>Xiangning Fan, Bin Li, Likai Yuan, Yujie Wang</i> (Mainland China)	87
P.4	A 60 GHz Solid-state Power Combining System <i>Yazhou Dong, Shi-wei Dong, Ying Wang</i> (Mainland China)	91
P.5	A Broadband and Miniaturized UHF RFID Tag Antenna with T-matching Network <i>Xue Zhou, Guo-qing Luo</i> (Mainland China)	95
P.6	A Fast Automatic Frequency Calibration Scheme for PLL-based Frequency Synthesizer <i>Mingchi Shao, Fengyi Huang, Xusheng Tang, Youming Zhang</i> (Mainland China)	98
P.7	A High-Rejection Substrate Integrated Waveguide Filter for Q-LINKPAN Applications <i>Tao Wu, Wei Hong, Jixin Chen</i> (Mainland China)	102
P.8	A Miniaturized Millimeter-wave Bandpass Filter with LTCC Technology <i>Yong-sheng Dai, Hong-hao Yin, Hong-tu Sun, Yuan Feng, Qiu-yue Xie, Ming Luo</i> (Mainland China)	106
P.9	A novel Balanced Frequency Tripler for Millimeter-Wave and Submillimeter-Wave Application <i>Jian Guo, Zhengbin Xu, Cheng Qian, Bo Bi, Yongjie Zhang</i> (Mainland China)	109
P.10	A novel broadband reflect-array antenna with Rectangle ring element for Ku-Band Application <i>Daiwei Jiang, Yingsong Zhang, Hao Zhang, Jun Jin</i> (Mainland China)	113
P.11	A simulation about the influence of the Gate-Source-Drain distance on the AlGaN/GaN HEMT performance at Ka-band <i>Dechun Guo, Kankan Qi, Junfeng Cui, Xiaobin Luo, Chao Yue</i> (Mainland China)	117
P.12	A Waveguide Power Divider/Combiner Using Microstrip E-plane Dual-Probe Structure <i>Ying Wang, Yi Fu, Shi-wei Dong, Ya-zhou Dong</i> (Mainland China)	121
P.13	A Wideband 8-way Radial Divider/Combiner with Stepped Impedance Transformers in Ka Band <i>Zhigang Zhang, Dalong Zhu, Dexi Liu</i> (Mainland China)	124
P.14	An ANN-Based Analysis Model for ACPWs With Finite Dimensions <i>Zhongbao Wang, Shaojun Fang</i> (Mainland China)	128

P.15	An elliptic cavity-backed cross slot antenna <i>Fei Zhang, Guang Hua, Houxing Zhou, Wei Hong (Mainland China)</i>	132
P.16	An S-band Conical Corrugated Lens Antenna and Emissivity Measurement <i>ChunBai Wu, Hong Zhai, Chunyue Cheng, Xiaoning Sun (Mainland China)</i>	135
P.17	Design of a 10 Gb/s Laser Diode Voltage Driver in 0.18 um CMOS Technology <i>Dawei Zai, Yingmei Chen, Ling Tian, Li Zhang (Mainland China)</i>	138
P.18	Design of a 60 GHz LNA with 20 dB Gain and 12 GHz BW in 65 nm LP CMOS <i>Yuan Chai, Lianming Li, Tiejun Cui (Mainland China)</i>	142
P.19	Design of a Compact Wideband Balun between Microstrip and Coplanar Stripline <i>Zhi Chang Zheng, Guo Qing Luo (Mainland China)</i>	146
P.20	Design of a V-band Single-substrate Single-Waveguide Power-Combined Frequency Doubler Covering 50-75 GHz Band <i>Zhenhua Chen, Jinping Xu (Mainland China)</i>	149

2012-09-18 PM Room A-B

Session TUE5
(IMWS2012 Oral Session)

16:10 – 16:30	Research of Ka-Band Filter Loaded Three-gap Coupled Output Cavity <i>Meng Ge, Y Wang (Mainland China)</i>	<i>N/A</i>
16:30 – 16:50	A High-Temperature Superconducting Diplexer for Satellite Communication Applications <i>Mengtong Jin, Ming He, Lu Ji, Jingying Qu, Yong Liu, Songchao Wang, Xu Zhang, Xinjie Zhao (Mainland China)</i>	156
16:50 – 17:10	Broadband Optimization for a Terahertz Metamaterial Absorber <i>Wenyuan Huang, Wenbin Lin, Luofen Wang, Lei Chang, Cheng Liao (Mainland China)</i>	160
17:10 – 17:30	Investigation of Millimeter-Wave GaN HEMTs and A Quick Small-Signal Modeling Method <i>Zheng Zhong, Yongxin Guo, Jianjun Zhou, Chen Chen (Singapore)</i>	163

2012-09-19 AM Room A-B

Session WED1

(IMWS2012 and UCMMT2012 Joint Oral Session)

11:30 – 12:00 Traceable Microwave and MM Wave EIRP measurements (**Invited Talk**)
Herbert Schmitt (Germany) **167**

2012-09-19 PM Room A-B

Session WED2

(IMWS2012 and UCMMT2012 Joint Oral Session)

13:30 – 14:00	Substrate Integrated Waveguide (SIW) Technology: New Research Trends for Low-Cost and Eco-Friendly Wireless Systems (Invited Talk) <i>Maurizio Bozzi (Italy)</i>	168
14:00 – 14:30	Flip-Chip Assembled 60GHz CMOS Receiver Front-End (Invited Talk) <i>Masaomi Tsuru, Japan (Japan)</i>	169

2012-09-19 PM Room C
15:00 – 15:50

Session WED3

(IMWS2012 Poster Session & UCMMT2012 Student Paper Contest & Coffee Break)

IMWS2012 Poster Session

P.1	Design of Wideband Planar Power Dividers/Combiners <i>Lei Zhang, Xiaowei Zhu, Jianfeng Zhai (Mainland China)</i>	173
P.2	Development of V-Band Low Noise Amplifiers in 90nm CMOS <i>PinPin Yan, Jixin Chen, Wei Hong (Mainland China)</i>	176
P.3	Linear Array-fed Reflector Antenna for Spatial Power Combining based on NURBS <i>Shuisheng Ruan, Zeming Xie (Mainland China)</i>	179
P.4	Microstrip Series Fed Antenna Array for Millimeter Wave Automotive Radar Applications <i>Chong Yi, Wenbin DOU (Hong Kong)</i>	183
P.5	Millimeter-wave Design and Fabrication of GaAs Micromachined Patch Antenna <i>Lina Pan, Shixing Jia, Fang Hou, Jian Zhu, Yuanwei Yu (Mainland China)</i>	186
P.6	Pattern Synthesis with UCA for the generation of Bessel-Type Beam at Terahertz <i>Yan-zhong Yu, Caiqiang Zheng, Wen-bin Dou (Mainland China)</i>	189
P.7	Q Band Multi-beam Antenna Based on MEMS and Substrate Integrated Waveguide Technology <i>Peng Chen (Mainland China)</i>	193
P.8	Research and Design of Quasi-optical system for Sub-millimeter Wave Radiometer <i>Nan Chen, Yuan Yao, Junsheng Yu, Xiaodong Chen, Cheng Yang, Zejian Lu (Mainland China)</i>	196
P.9	Role of Shape and Periodicity in Extraordinary Transmission of Periodic Arrays at THz Range <i>Wei Xiong, Jun Yao, Wei Li, Jingling Shen, Binbin Li (Mainland China)</i>	199
P.10	0.18 μ m 4.8GHz CMOS 1V LC VCO for Wireless Sensor Networks <i>Xiangning Fan, Yan Wei, Bin Li, Yujie Wang (Mainland China)</i>	202

2012-09-19 PM Room A-B

Session WED4

(IMWS2012 and UCMMT2012 Joint Oral Session)

15:50 – 16:20 Millimeter-wave Technology for Medical Applications (**Invited Talk**)
Fu-Jiang Lin (Mainland China) **206**

17:00 – 18:00

Lab Tour

2012-09-20 AM Room A

Session THU1
(IMWS2012 Oral Session)

09:00 – 09:30	Advances in Modeling and Optimization Techniques for Microwave Design (Invited Talk) <i>Qijun Zhang (Canada)</i>	207
09:30 – 09:50	A 122 GHz four Element Patch Array fed by Electromagnetic Coupling <i>Stefan Beer, Benjamin Göttel, Heiko Gulan, Christian Rusch, Thomas Zwick (Germany)</i>	208
09:50 – 10:10	A High Speed Frequency Divider in 0.18μm CMOS for Wireless Sensor Networks <i>Xiangning Fan, Bin Li, Yanqiang Du, Yujie Wang, Lu Yu (Mainland China)</i>	212

2012-09-20 AM Room C
10:10 – 11:00

Session THU2

(IMWS2012 Poster Session & Coffee Break)

P.1	Super-resolution Staring Imaging Radar Based on Stochastic Radiation Fields <i>Yuanyue Guo, Dongjin Wang, Xuezhi He, Bo Liu (Mainland China)</i>	216
P.2	Two-Dimensional EBG Transmission Line and H-Plane Horn Array at 0.14THz <i>Hui Zhu, Linlin Hu, Rui Song, Hongbin Chen, Junqiang Wu, Shaoqiu Xiao (Mainland China)</i>	220
P.3	Varactor-Tuned Half Mode Substrate Integrated Waveguide Reflection-Type Phase Shifter <i>Ji Li, Jixin Chen, Peng Chen, Fang Zhu (Mainland China)</i>	223
P.4	Volume Integral Equation for Analysis of Dielectric Periodic Structures <i>Shan Zhao, Naiqian Zhang, Jianxun Su, Dong Li (Mainland China)</i>	226
P.5	Terahertz Dual-Band Nearly Perfect Absorbers Based on Combined of Two Types of FSS Elements <i>Jianhua Wu, Weiping Qin (Mainland China)</i>	230
P.6	Analysis of vane loading for a disc-loaded waveguide in Gyro-TWT <i>Shuyuan Peng, Zhaochuan Zhang, Jirun Luo (Mainland China)</i>	233
P.7	Design of Tri-reflector Compact Antenna Test Range from 40GHz to 100GHz <i>Zejian Lu, Xiaodong Chen, Junsheng Yu, Yuan Yao, Cheng Yang, Hongbin Ge (Mainland China)</i>	236
P.8	A Low Power 0.3-3.8 GHz Low-Noise Mixer With Noise Cancellation <i>Changguo Shen, Zhiqun Li (Mainland China)</i>	240
P.9	A new calibration standard design for Polarization Correlation Radiometers <i>Chunyue Cheng, Hong Zhai (Mainland China)</i>	244
P.10	Scaling Technologies for Millimeter-wave GaN-HEMTs <i>Yongsheng Dai, Jianjun Zhou, Jianfeng Chen, Min Han (Mainland China)</i>	248
P.11	Low RCS Antenna Based on EBG Structure <i>Qiang Gao (Mainland China)</i>	N/A
P.12	Design of Automatic Frequency Calibration Used in the PLL Frequency Synthesizer for 2.4GHz WSN <i>Xiangning Fan, Haihong Tang, Lu Yu, Bin Li (Mainland China)</i>	255
P.13	A Novel Active Frequency Selective Surface Based on Complementary Structures <i>Zhuoru Bao, Yang Yang, Xiaoxiang He, Xin Wang (Mainland China)</i>	259
P.14	Design of a Novel Structure SIW Filter <i>Lei Xia, Jinhua Xie, Guang Hua (Mainland China)</i>	262
P.15	Research on parameters of TM ₀₁₀ mode in cylindrical coaxial cavity resonator <i>Fengzhen Hua, Bin Shen, Zhaochuan Zhang (Mainland China)</i>	266

P.16	A Simple Sample-and-Hold Circuit for TWT Power Detecting <i>Jie Liu, Xin Hu, Gang Wang, Xiaobao Su (Mainland China)</i>	270
P.17	Research on Traveling-Wave Waveguide-Based Spatial Power Divider Combiner <i>Ying Wang, Yi Fu, Ya-Zhou Dong, Hongxi Yu, Qinxin Chu, (Mainland China)</i>	272
P.18	Design of a SIR Bandpass Filter with Spurious Passband Suppression using Defected Ground Structure and Spurline <i>Lingqin Meng, Long Ren, Jingsong Huang (Mainland China)</i>	276
P.19	A fully integrated LNA for COMPASS Receiver in SiGe-BiCMOS technology <i>Jin li, Wenyuan Li (Mainland China)</i>	280

2012-09-20 AM Room A

Session THU3
(IMWS2012 Oral Session)

11:00 – 11:30	A 50-70GHz Frequency Doubler in 90nm CMOS (Invited Talk) <i>Jixin Chen (Mainland China)</i>	284
11:30 – 12:00	Wideband 60-GHz LTCC Circularly Polarized Patch Antenna with a U-Slot (Invited Talk) <i>Yong-Xin Guo (Singapore)</i>	287