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Wednesday, November 7

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EuMA Special Session

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Thursday, November 8

Session TH1-B1

Antennas for Sensing Applications

Room B1 08:30-10:10

Thursday, November 8

Chairs :	Kazuhiro Honda (University of Toyama, Japan), Jae-Ho Lee (Electronics and Telecommunications Research Institute (ETRI), Korea)	
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Session TH1-B2

Advanced Design of Filtering Power Dividers and Balanced Filters

Room B2 08:30-10:10

Thursday, November 8

Chairs :	Zhewang Ma (Saitama University, Japan), Wenquan Che (Nanjing University of Science and Technology, P.R. China)
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Session TH1-C1: Special Session (Invited)
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Thursday, November 8

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Advances in Power Amplifiers I
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Session TH1-K: Special Session (Invited)

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Session TH1-103

Microwave Frequency / Signal Control Circuits

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Thursday, November 8

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Session TH2-B1

Antenna Arrays and Beam-forming I

Room B1 10:30-12:10

Thursday, November 8

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Session TH2-B2

Novel Filter Design Techniques Based on Coupling Matrix

Room B2 10:30-12:10

Thursday, November 8

Chairs :	Chun-Ping Chen (Kanagawa University, Japan), Jen-Tsai Kuo (Chang Gung University, Taiwan)	
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Session TH2-C1

Terahertz Active Devices

Room C1 10:30-12:10

Thursday, November 8

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TH2-C1-3	200 GHz Power-Efficient BiCMOS Phased-Array Receiver Frontend Paolo Valerio Testa and Vincent Rieß (Technische Universität Dresden, Germany); Songhui Li (TU Dresden, Germany); Corrado Carta (Dresden University of Technology, Germany); Frank Ellinger	527

(Technische Universität Dresden, Germany)

TH2-C1-4	A 140-210 GHz Low-Power Vector-Modulator Phase Shifter in 130 nm SiGe BiCMOS Technology Paolo Valerio Testa (Technische Universität Dresden, Germany); Corrado Carta (Dresden University of Technology, Germany); Frank Ellinger (Technische Universität Dresden, Germany)	530
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Session TH2-C2

Design and Characterization of Microwave Components

Room C2 10:30-12:10

Thursday, November 8

Chairs :	Tsugumichi Shibata (Tokyo City University, Japan), He Zhu (University of Technology Sydney, Australia)	
TH2-C2-1	A Novel Concept for 2D Butler Matrix with Multi-Layers Technology Cheng-Hung Hsieh, Yi-Ting Lin, Hsiang-Chieh Jhan and Tsai Zuo-Min (National Chung Cheng University, Taiwan)	533
TH2-C2-2	Broadband Characteristics of Multi-Layer Ceramic Chip Capacitors for High-Speed Digital Signal Coupling Yoshito Kato and Tsugumichi Shibata (Tokyo City University, Japan)	536
TH2-C2-3	An Improved De-Embedding Technique for GaN High-Electron Mobility Transistors Zhennan Wei, Fengyi Huang, Xusheng Tang and Youming Zhang (Southeast University, P.R. China); Nan Jiang (S-TEK (Shanghai) High-frequency Communication Technology Co., Ltd., P.R. China)	539
TH2-C2-4	Modified Wideband Tandem Couplers with Arbitrary Coupling Coefficient and Its Implementation in Beam-Forming Networks He Zhu (University of Technology Sydney, Australia); Y. Jay Guo (University of Technology, Sydney, Australia)	542
TH2-C2-5	Improved Harmonics in Metal Insulator Metal Capacitors Using Design Techniques Praveen Arotha, Ananth Sundaram, Tamilmani Ethirajan and Balaji Swaminathan (Globalfoundries Engineering Private Limited, India)	545

Session TH2-D

Advances in Power Amplifiers II

Room D 10:30-12:10

Thursday, November 8

Chairs :	Kenji Mukai (Murata Manufacturing Co., Ltd., Japan), Shintaro Shinjo (Mitsubishi Electric Corporation, Japan)	
TH2-D-1	120-W Ku-Band GaN SSPA with Diode Linearizer for Future Broadcasting Satellite	548

	Masafumi Nagasaka (NHK, Japan); Masaaki Kojima (NHK(Japan Broadcasting Corporation), Japan); Susumu Nakazawa (NHK, Japan); Hisashi Sujikai and Shoji Tanaka (NHK Science and Technical Research Laboratories, Japan); Takuma Torii and Hiromitsu Utsumi (Mitsubishi Electric, Japan); Shintaro Shinjo (Mitsubishi Electric Corporation, Japan); Mitsuhiro Shimozawa (Mitsubishi Electric, Japan)	
TH2-D-2	A Novel Multi-Band Look-Up Table Based Digital Predistorter with a Single Common Feedback Loop Tomoya Ota, Toshio Kawasaki, Shigekazu Kimura and Ken Tamanai (Fujitsu Limited, Japan); Hiroyoshi Ishikawa (Fujitsu Laboratories Limited, Japan); Masahiko Shimizu and Maniwa Toru (Fujitsu Limited, Japan)	551
TH2-D-3	An S-Band GaN MMIC High Power Amplifier With 50W Output Power and 55% Power Added Efficiency Rocco Giofrè and Ferdinando Costanzo (University of Roma Tor Vergata, Italy); Sergio Colangeli (University of Rome Tor Vergata, Italy); Walter Ciccognani (Università of Rome Tor Vergata, Italy); Manuela Sotgia and Maurizio Cirillo (Rheinmetall Italy, Italy); Ernesto Limiti (University of Rome Tor Vergata, Italy)	554
TH2-D-4	53% PAE 32W Miniaturized X-band GaN HEMT Power Amplifier MMICs Naoko Ono, Tomohiro Senju and Kazutaka Takagi (Toshiba Infrastructure Systems & Solutions Corporation, Japan)	557
TH2-D-5	70W X-Band GaN Internally Matched FET with 40% PAE and 800MHz Bandwidth Kwanjin Oh, Sangmin Lee, Heejae Yoon and Heejun Kim (Wavice, Inc, Korea)	560

Session TH2-K

Microwave Biomedical Applications

Room K 10:30-12:10

Thursday, November 8

Chairs :	Basari Basari (Universitas Indonesia, Indonesia), Tomoaki Nagaoka (National Institute of Information and Communications Technology, Japan)	
TH2-K-1	Preliminary Numerical Analysis of Monitoring Bone Density Using Microwave Tomography Mohanad Alkhodari, Amer Zakaria and Nasser Qaddoumi (American University of Sharjah, United Arab Emirates)	563
TH2-K-2	Immunosensor Using 250MHz Shear Horizontal Surface Acoustic Wave Delay Line Hiromi Yatsuda (Japan Radio Co. Ltd., Japan)	566
TH2-K-3	Contactless Carotid Pulse Measurement Using Continuous Wave Radar Kilin Shi (Friedrich-Alexander Universität Erlangen-Nürnberg, Germany); Sven Schellenberger (Brandenburg University of Technology, Germany); Tobias Steigleder (University Hospital Erlangen, Germany); Fabian Michler and Fabian Lurz (Friedrich-Alexander Universität Erlangen-Nürnberg, Germany); Robert Weigel (Friedrich-Alexander Universität Erlangen-Nürnberg, Germany); Alexander Koelpin (BTU & Chair for Electronics and Sensor Systems, Germany)	569
TH2-K-4	Portable Biomedical Microwave Imaging Using Software-Defined Radio Anthony E Stancombe and Konstanty S Bialkowski (The University of Queensland, Australia)	572

TH2-K-5	Orthogonally-Face-to-Face Type of Micro-Electrode with Ring Resonator for Circulating Tumor Cell Detection Shouta Sora (National Institute of Technology, Kure College, Japan); Kousei Kumahara (NIT, Kure College, Japan); Masanori Eguchi and Futoshi Kuroki (National Institute of Technology, Kure College, Japan); Takeshi Yamakawa (Fuzzy Logic Systems Institute, Japan); Fumihiro Tanaka (University of Occupational and Environmental Health, Japan)	575
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Session TH2-103: Special Session (Invited)

JSPS 188 Committee / JEMEA Special Session:

Innovative Microwave Heating and Chemistry

Room 103 10:30-12:10

Thursday, November 8

Chairs :	Jun Fukushima (Tohoku University, Japan), Shuntaro Tsubaki (Tokyo Institute of Technology, Japan)	
TH2-103-1	New Aspects towards Application of Microwave Heating in Solid Systems Yuji Wada (Tokyo Insitute of Technology, Japan)	578
TH2-103-2	Electrical Properties of Ferroelectric Thin Films Crystallized by Microwave Heating Zhanjie Wang (Shenyang University of Technology, P.R. China)	581
TH2-103-3	Selective Microwave Heating of Organic Reaction Mixtures Gregory B Dudley (West Virginia University, USA)	584
TH2-103-4	Research on Microwave Chemistry in Sichuan University Kama Huang, Yanping Zhou and Li Wu (Sichuan University, P.R. China)	586
TH2-103-5	Study on Microwave Absorption Property of Multi Metal Particles by Electromagnetic Simulation Naoki Shinohara (Kyoto University, Japan)	588

Session TH3-B1

Antenna Arrays and Beam-forming II

Room B1 13:30-15:10

Thursday, November 8

Chairs :	Jiro Hirokawa (Tokyo Institute of Technology, Japan), Mayumi Matsunaga (Tokyo University Technology, Japan)	
TH3-B1-1	Mm-Wave High Gain Substrate Integrated Cavity Excited Patch Antenna Array Jianfeng Zhu and Li Deng (Beijing University of Posts and Telecommunications, P.R. China); Yang Yang (University of Technology Sydney, Australia); Shufang Li (Beijing University of Posts and Telecommunications, P.R. China)	591
TH3-B1-4	Bandwidth Enhancement of a Series-Fed Microstrip Patch Array Antenna	600

Yohei Miura, Kazuo Yamashita, Rei Katoh and Yuzo Shibuya (Japan Radio Co., Ltd., Japan)

TH3-B1-5	Broadband Duplex Slot Antenna Array with High Isolation Wei Hu, Zheming Xie and MingYou Xie (South China University of Technology, P.R. China)	603
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Session TH3-B2

Novel Tunable Technologies and Structures

Room B2 13:30-15:10

Thursday, November 8

Chairs :	Ruey-Beei Wu (National Taiwan University, Taiwan), Hidenori Yukawa (Mitsubishi Electric, Japan)	
TH3-B2-1	A Wide Range Tunable Bandpass Filter Using Imaginary Resonance Phenomena Satoru Yokono (Japan Radio Co., Ltd., Japan); Takashi Chiba, Shotaro Nagai, Kazuo Hirabayashi and Nobuyuki Adachi (Japan Radio Co., Ltd, Japan)	606
TH3-B2-2	Tunable Filter by FBAR Using Coupling Capacitors Han-Yun Tsai and Ruey-Beei Wu (National Taiwan University, Taiwan)	609
TH3-B2-3	A Tunable Single-to-Balanced Bandpass Filter with Bandwidth Control Xu Zhu and Tao Yang (University of Electronic Science and Technology of China, P.R. China); Pei-Ling Chi (National Chiao Tung University, Taiwan); Ruimin Xu (University of Electronic Science and Technology of China, P.R. China)	612
TH3-B2-4	Miniaturized Tunable Filters with T-Coil Design Chia-Chia Lin, Han-Yun Tsai and Ruey-Beei Wu (National Taiwan University, Taiwan)	615
TH3-B2-5	Compact Multi-Function Notch Filter Using $\lambda/4$ Microstrip Resonator with Embedded Varactor-Loaded Hybrid Microstrip / CPW Structure Tianyi Wang, Xiaohui Liu, Zhixian Deng and Xun Luo (University of Electronic Science and Technology of China, P.R. China)	618

Session TH3-C1

Millimeter-wave Devices and Circuits

Room C1 13:30-15:10

Thursday, November 8

Chairs :	Hiroshi Hamada (NTT Corporation, Japan), Jeffrey Hesler (Virginia Diodes, Inc., USA)	
TH3-C1-1	On-Chip Antennas in SiGe BiCMOS Technology: Challenges, State of the art and Future Directions Herman J Ng and Dietmar Kissinger (IHP, Germany)	621
TH3-C1-2	High Responsivity Power Detectors for W/D-Bands Passive Imaging Systems in 0.13 μ m SiGe BiCMOS Technology Berkutug Ustundag and Esref Turkmen (Sabanci University, Turkey); Barbaros Cetindogan (IHP,	624

Germany); Mehmet Kaynak (IHP, Germany & Leibniz-Institut für innovative Mikroelektronik, Turkey);
Yasar Gurbuz (Sabanci University, Turkey)

TH3-C1-3	Tunable Equalizer for 64 Gbps data communication systems in 130nm SiGe Stavros Giannakopoulos (Chalmers University of Technology, Sweden); Zhongxia Simon He (Chalmers University of Technology & Microwave Electronic Lab, Sweden); Herbert Zirath (Chalmers University of Technology, Sweden)	627
TH3-C1-4	A 28 GHz Superregenerative Amplifier for FMCW Radar Reflector Applications in 45 nm SOI CMOS Manu Viswambharan Thayyil (Technische Universität Dresden, Germany); Hatem Ghaleb (TU Dresden, Germany); Niko Joram and Frank Ellinger (Technische Universität Dresden, Germany)	630
TH3-C1-5	High-Output-Power and Reverse-Isolation G-Band Power Amplifier Module Based on 80-nm InP HEMT Technology Hiroshi Hamada (NTT Corporation, Japan); Takuya Tsutsumi (NTT Access System Services Laboratories & Neko 9 Laboratories, Japan); Hiroki Sugiyama (NTT Device Technology Laboratories, NTT Corporation, Japan); Hideyuki Nosaka (NTT Corporation, Japan)	633

Session TH3-C2

EM Analysis and Scattering Problems

Room C2 13:30-15:10

Thursday, November 8

Chairs :	Takashi Hisakado (Kyoto University, Japan), Xiaochun LI (SHANGHAI Jiao Tong University, P.R. China)	
TH3-C2-1	A Compact 2-D WLP-FDTD Method for Superconducting Microstrip Lines Yan Li (Shanghai Jiao Tong University, P.R. China); Xiaochun LI (SHANGHAI Jiao Tong University, P.R. China); Junfa Mao (Shanghai Jiao Tong University, P.R. China)	636
TH3-C2-2	THz Wave Scattering by Graphene Strip Grating Embedded into a Dielectric Slab with PEC Plane Mstyslav Kaliberda (Karazin National University of Kharkiv & National University of Pharmacy, Ukraine); Leonid Lytvynenko (Institute of Radio Astronomy of the National Academy of Sciences of Ukraine, Ukraine); Sergey Pogarsky (Karazin National University of Kharkiv, Ukraine)	639
TH3-C2-3	Formulation of Single-conductor Transmission Line Model with Feedback Electric Fields by Terminal Discontinuity Daiki Tashiro and Takashi Hisakado (Kyoto University, Japan); Tohlu Matsushima (Kyushu Institute of Technology, Japan); Osami Wada (Kyoto University & Graduate School of Engineering, Japan)	642
TH3-C2-4	Generation of One-Dimensional Airy Beams by a Single-Layer Flexible Metasurface at Millimeter-Wave Band Zhuo-Wei Miao (Southeast University, P.R. China); Zhang-Cheng Hao (SEU, P.R. China); Quan Yuan (Southeast University, P.R. China)	645
TH3-C2-5	Scattering Characteristics of Vortex Electromagnetic Waves for Typical Targets Xiangxi Bu, Zhuo Zhang, Xingdong Liang and Zheng Zeng (Institute of Electronics, Chinese Academy of Sciences, P.R. China); Longyong Chen (National Key Laboratory of Science and Technology on Microwave Imaging, P.R. China); Haibo Tang (Institute of Electronics, Chinese Academy of Sciences, P.R. China)	648

Session TH3-D
mmW Low Noise Amplifiers
Room D 13:30-15:10
Thursday, November 8

Chairs :	Yasushi Itoh (Shonan Institute of Technology, Japan), Peng Wen Wong (Universiti Teknologi PETRONAS, Malaysia)	
TH3-D-1	Low-Noise Amplifiers for W-Band and D-Band Passive Imaging Systems in SiGe BiCMOS Technology Berkutug Ustundag and Esref Turkmen (Sabanci University, Turkey); Barbaros Cetindogan (IHP, Germany); Alper Guner (Sabanci University, Turkey); Mehmet Kaynak (IHP, Germany & Leibniz-Institut für innovative Mikroelektronik, Turkey); Yasar Gurbuz (Sabanci University, Turkey)	651
TH3-D-2	A 38 GHz Low Power Variable Gain LNA Using PMOS Current-Steering Device and Gm-Boost Technique Yu-Teng Chang, Yu-Ni Chen and Hsin-Chia Lu (National Taiwan University, Taiwan)	654
TH3-D-3	A W-Band Low-Noise Amplifier with Shunt Inductors and Transformer Feedback Gm-Boosting Techniques Hsing-I Tsai, Hou-Ru Pan, Hong-Shen Chen and Jenny Yi-Chun Liu (National Tsing Hua University, Taiwan)	657
TH3-D-4	An E-Band Transformer-Based 90-nm CMOS LNA Jeng-Han Tsai and Chuan-Chi Hung (National Taiwan Normal University, Taiwan); Jen-Hao Cheng (MediaTek, Taiwan); Chen-Fang Lin and Ruei-An Chang (National Taiwan Normal University, Taiwan)	660
TH3-D-5	A 76-98 GHz Broadband Low-DC-Power Low Noise Amplifier Using Coplanar Waveguide in 40 nm CMOS Process Shao-Wei Peng, Jyun-Jia Huang and Hong-Yeh Chang (National Central University, Taiwan); Yeong-Maw Chen (NCSIST, Taiwan)	663

Session TH3-K
Beam Controlled Communication Techniques
and Radar / Communication Systems
Room K 13:30-15:10
Thursday, November 8

Chairs :	Madhumita Chakravarti (Research Center Imarat, India), Kazuaki Takahashi (Panasonic Corporation, Japan)	
TH3-K-1	An Efficient Codebook-based Beam Training Technique for Millimeter-Wave Communication Systems Phonfred Okoth, Quang Ngoc Nguyen, Dhruva Dhakal and Daichi Nozaki (Waseda University, Japan); Yoshihide Yamada (Malaysia-Japan International Institute of Technology, Universiti Teknologi Malaysia, Malaysia); Takuro Sato (Waseda University, Japan)	666
TH3-K-2	Low Complexity Antenna Array Concept Using Overlapped Subarray Based Hybrid Beamforming	669

	Joerg Eisenbeis (Karlsruhe Institute of Technology, Germany); Pablo Ramos Lopez, Tobias Mahler, Christian von Vangerow and Thomas Zwick (Karlsruhe Institute of Technology (KIT), Germany)	
TH3-K-3	A mm-Wave Multi-Beam Directional and Polarimetric Agile Front-End for 5G Communications Steffen Spira, Kurt Gerd Blau, Christoph Wagner and Alexander Schulz (Technische Universität Ilmenau, Germany); Nam Gutzeit (Technische Universität Ilmenau & IMN, Germany); Jens Müller (Technische Universität Ilmenau, Germany); Reiner S. Thomä and Matthias Hein (Ilmenau University of Technology, Germany)	672
TH3-K-4	Development of 5G System Evaluation Tool Koshiro Kitao, Anass Benjebbour, Tetsuro Imai, Yoshihisa Kishiyama, Minoru Inomata and Yukihiro Okumura (NTT DOCOMO, INC., Japan)	675
TH3-K-5	24 GHz QAM-FBMC Radar with Communication System (RadCom) Jéssica Sanson (University of Aveiro & Instituto de Telecomunicacoes, Portugal); Atilio Gameiro (Telecommunications Institute/Aveiro University, Portugal); Daniel Castanheira (Instituto de Telecomunicações (IT) / University of Aveiro, Portugal); Paulo P Monteiro (Universidade de Aveiro & Instituto de Telecomunicações, Portugal)	678

Session TH3-103
Electromagnetic Compatibility (EMC) I
Room 103 13:30-15:10
Thursday, November 8

Chairs :	Ae-Kyoung Lee (ETRI, Korea), Tohlu Matsushima (Kyushu Institute of Technology, Japan)	
TH3-103-1 (Invited)	Review on Human Dosimetry for Radio-Frequency Exposure Above 6 GHz -International Exposure Standards Akimasa Hirata (Nagoya Institute of Technology, Japan)	681
TH3-103-2	Design of an X-band Microwave Magnetic Absorber composed of Multimode Dielectric Resonator Array Sofian Hamid and Dirk Heberling (RWTH Aachen University, Germany)	684
TH3-103-3	Comparison of Different SAR Limits in SAM Phantom for Mobile Phone Exposure Ae-Kyoung Lee (ETRI, Korea); Seon-Eui Hong (Broadcasting and Media Research Laboratory, Electronics and Telecommunication Research Institute, Korea); Masao Taki (Tokyo Metropolitan University, Japan); Kanako Wake (National Institute of Information and Communications Technology, Japan); Hyung Do Choi (ETRI, Korea)	687
TH3-103-4	Shielding Effect of Mu-Near-Zero Metamaterial Slab to Reduce Magnetic Flux Leakage in Wireless Power Transfer System In Gon Lee (Kongju National University, Korea); Nam Kim (Chungbuk National University, Korea); In-Kui Cho (ETRI, Korea); Ic Pyo Hong (Kongju National University, Korea)	690

Session TH4-B1
Applications of Metasurfaces
Room B1 15:30-17:10
Thursday, November 8

Chairs :	Takuji Arima (Tokyo University of Agriculture and Technology, Japan), Sungtek Kahng (Incheon National University, Korea)	
TH4-B1-1	All-Polarization Blazed Surface Haozhan Tian (University of California, Los Angeles, USA); Tatsuo Itoh (UCLA, USA)	693
TH4-B1-2	A Circularly Polarized Antenna Integrated with a Solar Cell Metasurface for CubeSat Son Xuat Ta (Hanoi University of Science and Technology, Vietnam); Ikmo Park (Ajou University, Korea)	696
TH4-B1-3	Highly Unidirectional Slot Antenna using Transmissive and Reflective Metasurfaces for WLAN and WiMAX Applications Tanan Hongnara (King Mongkut's University of Technology North Bangkok, Thailand); Sarawuth Chaimool (Khon Kaen University, Thailand); Prayoot Akkaraekthalin (King Mongkut's University of Technology North Bangkok, Thailand)	699
TH4-B1-4	An X-Band Flat Broadband Transformation-Optics-Driven Luneburg Lens Antenna for Synthetic Aperture Radar Yuanyan Su, Zhi Ning Chen, Siegfried Daquioag Balon and Ke You Cheong (National University of Singapore, Singapore)	702
TH4-B1-5	The Angular Stability of a Miniaturized Frequency Selective Surface Wi-Fi Protection Shield Go Itami (NTT & Network Technology Laboratories, Japan); Yohei Toriumi and Jun Kato (NTT, Japan)	705

Session TH4-B2
Novel Active Structures and Components
Room B2 15:30-17:10
Thursday, November 8

Chairs :	Roe Ben Yishay (ON Semiconductor, Israel), Hiroshi Mizutani (Salesian Polytechnic, Japan)	
TH4-B2-1	An L-Band SiGe HBT Active Differential Equalizer with Tunable Positive/Negative Gain Slopes Using Transistor-Loaded RC-Circuits Yasushi Itoh (Shonan Institute of Technology, Japan)	708
TH4-B2-2	Low Loss 28 GHz Digital Phase Shifter for 5G Phased Array Transceivers Roe Ben Yishay and Danny Elad (ON Semiconductor, Israel)	711
TH4-B2-3	A 7 GHz Differential 4-Stage Programmable Equalizer with Hybrid Continuous-Time/Discrete-Time Architecture in 28 nm CMOS Yohei Morishita, Junji Sato, Koji Takinami and Kazuaki Takahashi (Panasonic Corporation, Japan)	714
TH4-B2-4	A Novel Reconfigurable GaN Filter MMIC with Active Reflector	717

Hiroshi Mizutani (Salesian Polytechnic, Japan)

TH4-B2-5	A Tunable Non-Foster T-network Loaded Transmission Line Using Distributed Amplifier-Based Reconfigurable Negative Group Delay Circuit Minning Zhu and Chung-Tse Michael Wu (Rutgers University, USA)	720
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Session TH4-C1

High-Speed and Broadband Millimeter and THz Wave Systems

Room C1 15:30-17:10

Thursday, November 8

Chairs :	Akihiko Hirata (Chiba Institute of Technology, Japan), Ho-Jin Song (POSTECH, Korea)	
TH4-C1-1	Performance Evaluation of a 32-QAM 1-Meter Wireless Link Operating at 220-260 GHz with a Data-Rate of 90 Gbps Pedro Rodriguez-Vazquez (Bergische Universität Wuppertal, Germany); Janusz Grzyb (University of Wuppertal, Germany); Bernd Heinemann (IHP, Germany); Ullrich Pfeiffer (University of Wuppertal, Germany)	723
TH4-C1-2	Resonant Tunneling Diode Receiver for Coherent Terahertz Wireless Communication Naoki Nishigami, Yousuke Nishida and Sebastian Diebold (Osaka University, Japan); Jaeyoung Kim (Rohm Co, Ltd., Japan); Masayuki Fujita and Tadao Nagatsuma (Osaka University, Japan)	726
TH4-C1-3	Study on the Number and Size of Cells Composed of Multiple-Beam Transmission Base Station System Yuma Kase and Tomohiro Seki (Nihon University, Japan)	729
TH4-C1-4	A 60-GHz 10-Gb/s OOK Modulator with Transformer-Feedback Technique for High Gain and On-Off Isolation in 90-nm CMOS Po-Hsiang Chuang, Jung-Lin Lin, Yu-Hsuan Lin, Yunshan Wang and Huei Wang (National Taiwan University, Taiwan)	732
TH4-C1-5	Asynchronous Measurement of Millimeter Waves Using Integrated One-Dimensional Multi-Channel Probe Yuya Asano (Gifu University, Japan); Hirohisa Uchida (ARKRAY Inc., Japan); Makoto Tojo, Yoichi Oikawa and Kunio Miyaji (Think-Lands Co., Ltd., Japan); Shintaro Hisatake (Gifu University, Japan)	735

Session TH4-C2

Novel Wireless Systems and Propagation

Room C2 15:30-17:10

Thursday, November 8

Chairs :	Jerome Cheron (NIST, USA), Shuichi Obayashi (Toshiba Corporation, Japan)	
TH4-C2-1	Effect of Human Body Shadowing on Spatial Correlation of Indoor Millimeter MIMO Branches	738

	Shuichi Obayashi (Toshiba Corporation, Japan); Takeo Fujii (The University of Electro-Communications, Japan)	
TH4-C2-2	Performance Evaluation of an IEEE 802.11af Prototype in a Suburban Environment Antonio III Montejo and Alberto Bañacia (University of San Carlos, Philippines); Hirokazu Sawada and Kentaro Ishizu (National Institute of Information and Communications Technology, Japan); Takeshi Matsumura (Kyoto University & National Institute of Information and Communications Technology (NICT), Japan); Kazuo Ibuka and Fumihide Kojima (National Institute of Information and Communications Technology, Japan)	741
TH4-C2-3	Propagation of Compact-Modeling Measurement Uncertainty to 220 GHz Power-Amplifier Designs Jerome Cheron and Dylan Williams (NIST, USA); Konstanty Lukasik (KU Leuven, Belgium & Warsaw University of Technology, Poland); Richard Chamberlin, Benjamin F Jamroz and Erich Grossman (NIST, USA); Wojciech Wiatr (Warsaw University of Technology, Poland); Dominique Schreurs (KU Leuven, Belgium)	744
TH4-C2-5	Silicon Metadevices for Vortex Beam Generation at Visible Frequencies Zhixia Xu, Yicheng Hou, Changjiang Su, Hongxin Zhao, Shunli Li and Xiaoxing Yin (Southeast University, P.R. China)	750

Session TH4-D

Monolithic Receivers and Transmitters

Room D 15:30-17:10

Thursday, November 8

Chairs :	Mizuki Motoyoshi (Tohoku University, Japan), Jae-Sung Rieh (Korea University, Korea)	
TH4-D-1	A 28GHz 4-Channel Transmit / Receive RF Core-Chip with Highly-Accurate Phase Shifter for High SHF Wide-Band Massive MIMO in 5G Wataru Yamamoto, Koji Tsutsumi and Takaya Maruyama (Mitsubishi Electric Corporation, Japan); Takanobu Fujiwara (Mitsubishi Electric Corporation, Japan); Tatsuya Hagiwara and Ai Osawa (Mitsubishi Electric Corporation, Japan); Mitsuhiro Shimozaawa (Mitsubishi Electric, Japan)	753
TH4-D-2	36-40 GHz Tx/Rx Beamformers for 5G mm-Wave Phased-Array Chun-Nien Chen, Yi-Hsien Lin and Yin-Lin Liu (National Taiwan University, Taiwan); Wei-Jun Liao and Yu-Hsiang Nien (National Chung Cheng University, Taiwan); Hsin-Chia Lu (National Taiwan University, Taiwan); Tsung-Heng Tsai (National Chung Cheng University, Taiwan); Tian-Wei Huang (National Taiwan University, Taiwan); Huei Wang (National Taiwan University, Taiwan)	756
TH4-D-3	A Ku-Band 8-Element Phased-Array Receiver in 0.18- μ m CMOS Technology Yiming Yu, Xiaoning Zhang, Zhengdong Jiang, Yunqiu Wu, Chenxi Zhao, Huihua Liu and Kai Kang (University of Electronic Science and Technology of China, P.R. China)	759
TH4-D-4	Design of V-Band CMOS Low-Noise Amplifier and Mixer with Integrated Transformers Hong-Shen Chen, Wen-Chieh Huang and Jenny Yi-Chun Liu (National Tsing Hua University, Taiwan)	762
TH4-D-5	A Ku-Band Receiver with 12-to-20-dB Gain, -14-dBm IP1dB in 65-nm CMOS Technology Depeng Cheng and Lianming Li (Southeast University, P.R. China)	765

Session TH4-K

System Techniques - Material, Component, Circuit, and Evaluation Aspects

Room K 15:30-17:10

Thursday, November 8

Chairs :	Julian L Webber (Osaka University & Advanced Telecommunications Research Institute International, Japan), Herbert Zirath (Chalmers University of Technology, Sweden)	
TH4-K-1	Clipping-and-Bank-Filtering Technique in Joint Crest Factor Reduction and Digital Predistortion for Power Amplifiers Siqi Wang (GeePs, centralesupelec); Morgan Roger (Supélec, France); Caroline Lelandais-Perrault (Supélec, France)	768
TH4-K-2	Cancelling Noise in Multi-Band Digital-Intensive Transmitters Sungwon Chung (University of Southern California, USA); Rui Ma (Mitsubishi Electric Research Lab, USA)	771
TH4-K-3	Evaluation of Link Level Performance Considering EVM of Transmit Signal for Downlink NOMA Kenta Mayama, Kohei Akimoto, Suguru Kameda and Noriharu Suematsu (Tohoku University, Japan)	774
TH4-K-4	Emulator to Generate Multiple Heterogeneous Interference Signal in Korean Unlicensed Band Sangjoon Lee (Kookmin University, Korea); Hyungoo Yoon (Myongji College, Korea); Kyung-Jin Baik (Kookmin University, Korea); Byung Jun Jang (Kookmin Univ, Korea)	777

Session TH4-103

Electromagnetic Compatibility (EMC) II

Room 103 15:30-17:10

Thursday, November 8

Chairs :	Katsushige Harima (National Institute of Information and Communications Technology, Japan), Tohlu Matsushima (Kyushu Institute of Technology, Japan)	
TH4-103-1	Both-side Retrodirective System for Minimizing the Leak Energy in Microwave Power Transmission Takayuki Matsumuro (Ryukoku University, Japan); Yohei Ishikawa (Kyoto University, Japan); Masashi Yanagase (Murata Manufacturing Co., Ltd., Japan); Naoki Shinohara (Kyoto University, Japan)	780
TH4-103-2	Investigation of Radiated Immunity Testing Using White Gaussian Noise and Multitone Signals Katsushige Harima (National Institute of Information and Communications Technology, Japan); Daichi Akita and Tetsuya Nakamura (TOYO Corporation, Japan)	782
TH4-103-3	ESD-Reliability Enhancement in a High-voltage 60 V Square-type pLDMOS by the Guard-Ring Engineering Shen-Li Chen, Yi-Hao Chiu, Yu-Lin Jhou, Pei-Lin Wu and Po-Lin Lin (National United University, Taiwan); Yu-Jen Chen (National Sun Yat-sen University, Taiwan)	785

Session TH1-IF
Interactive Forum II
Room A 10:00-11:30
Thursday, November 8

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TH1-IF-03	Phase Noise Improvement of a Ku-Band Push-Push Oscillator Using Injection Locking via Two Magnetic Coupling Points Elton Nascimento Lima (Graduate School of Science and Engineering, Saga University, Japan); Takayuki Tanaka and Ichihiko Toyoda (Faculty of Science and Engineering, Saga University, Japan)	794
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	Nuremberg, Germany); Julian Adametz (FAU, Germany); Martin Vossiek (LHFT, Friedrich-Universität Erlangen-Nürnberg, Germany); Yassen Dobrev and Peter Gulden (Symeo GmbH, Germany)	
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TH1-IF-14	Squint SAR Ground Moving Target Imaging and Motion Parameters Estimation with Keystone Transform Jiefang Yang and Yunhua Zhang (National Space Science Center, Chinese Academy of Sciences, P.R. China)	827
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(Chinese University of Hong Kong, Hong Kong)

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TH3-IF-41	Flat Retroreflector Mimicking a Cylindrical Retroreflector with a Function of a Luneburg Lens Tsutomu Nagayama, Seiji Fukushima and Toshio Watanabe (Kagoshima University, Japan); Atsushi Sanada (Osaka University, Japan)	1055
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TH3-IF-44	Design Methodology of a Single-Beam Passive Reflectarray for Controlling Arbitrary Illuminations Jiawei Han (ESIGELEC, IRSEEM & Normandie Univ, UNIROUEN, France); Constant Manouan Aka Niamien (Normandie Univ, UNIROUEN, ESIGELEC/IRSEEM, Rouen, France); Zouheir Riah (Normandie Univ UNIROUEN ESIGELEC/IRSEEM, France)	1064
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TH3-IF-46	Ground-Wave-Suppressed High-Frequency Sky-Wave Radar Based on Practically-Realizable Bandgap Structure Liang-Yu Ou Yang (National Chung-Shan Institute of Science & Technology, Taiwan); Shih-Yuan Chen (National Taiwan University, Taiwan)	1070
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Friday, November 9

Session FR1-B1
Millimeter-Wave Antenna Technologies
Room B1 08:30-10:10
Friday, November 9

Chairs :	Kunio Sakakibara (Nagoya Institute of Technology, Japan), Young Joong Yoon (Yonsei University, Korea)	
FR1-B1-1	Via-less Waveguide to Microstrip Line Transition with Tolerance to Misalignment of Circuit Patterns Takashi Maruyama and Shigeo Udagawa (Mitsubishi Electric Corporation, Japan)	1082
FR1-B1-2	Experimental Investigation of Residual Substrate Effect in CMOS On-Chip Antenna Design Chun-Chi Lin (Industrial Technology Research Institute, Taiwan); Pei-Yu Lyu (National Chung Cheng University, Taiwan); Chia-Chan Chang (National Chung-Cheng University, Taiwan)	1085
FR1-B1-3	Design and Experiment of Wideband Circularly-Polarized Millimeter-Wave Transmitarrays Zhihao Jiang, Xiaowei Zhu and Zhe Song (Southeast University, P.R. China); Ling Tian (University of Southeast, P.R. China); Nianzu Zhang (SEU, P.R. China)	1088
FR1-B1-4	Design Analysis of Folded Reflectarray Element for High Aperture Efficiency Jun Gi Jeong and Young Joong Yoon (Yonsei University, Korea); Youngwook Kim (California State University, Fresno, USA); Hyungrak Kim (Daelim University, Korea)	1091

Session FR1-B2
Couplers and Dividers I
Room B2 08:30-10:10
Friday, November 9

Chairs :	Kwok-keung (Michael) Cheng (Chinese University of Hong Kong, Hong Kong), Pei-Ling Chi (National Chiao Tung University, Taiwan)	
FR1-B2-1	A Modified Wilkinson Power Divider with Wide Dual-band Frequency Ratio Range Pu-Hua Deng (National University of Kaohsiung, Taiwan)	1094
FR1-B2-2	A Power Divider with Controllable Transmission Zeros Using Lumped Artificial Transmission Line Siang Chen and Tzong-Lin Wu (National Taiwan University, Taiwan)	1097
FR1-B2-3	Analysis and Verification of three-way Gysel Power Divider with Arbitrary Power-Dividing Ratio	1100

Yihua Zhou, Haidong Chen, Wenquan Che, Tingting Liu, Wenjie Feng and Wanchen Yang (Nanjing University of Science and Technology, P.R. China); Quan Xue (South China University of Technology, P.R. China)

FR1-B2-4 Design of the Wide-Stopband Balun With Stepped Coupled Lines 1103
Chun-Yuan Huang, Guan-Yin Lin and Ching-Wen Tang (National Chung Cheng University, Taiwan)

Session FR1-D: Special Session (Invited)

Recent Advances in Metamaterial and Metasurfaces for Antenna Applications

Room D 08:30-10:10

Friday, November 9

Chairs : Toru Uno (Tokyo University of Agricultural Technology, Japan), Naobumi Michishita (National Defense Academy, Japan)

FR1-D-1 Measured Performance of Broadband Frequency Selective Surface to Reduce Return Loss of Dielectric Plate Designed by Matrix Analysis of Equivalent Circuit 1106
Tomihiko Ikegami, Kunio Sakakibara, Shota Ino and Nobuyoshi Kikuma (Nagoya Institute of Technology, Japan)

FR1-D-2 Design of Transmission Line Resonator Based CRLH Leaky-Wave Antenna 1109
Yujiro Kushiyama and Takuji Arima (Tokyo University of Agriculture and Technology, Japan); Toru Uno (Tokyo University of Agricultural Technology, Japan)

FR1-D-3 Leaky-Wave Antennas of CRLH Waveguide Using the Cutoff TM₀₁ Mode and Sector-Shaped Cutoff TE Mode 1112
Jungo Nakajima (Doshisha University, Japan)

FR1-D-4 Negative Effective Permeability Material Composed of Multi-Layer Ceramic Capacitors 1115
Thanh Binh Nguyen, Naoyuki Kinai, Naobumi Michishita and Hisashi Morishita (National Defense Academy, Japan); Teruki Miyazaki and Masato Tadokoro (The Yokohama Rubber Co., Ltd., Japan)

FR1-D-5 Unit Cell Block for 3-D Isotropic Negative-Index Metamaterials Impedance-Matched to Free Space by Using Dielectric Cubes and Metallic Mesh 1118
Takuya Yamaguchi, Takumi Ishiyama and Tetsuya Ueda (Kyoto Institute of Technology, Japan); Tatsuo Itoh (UCLA, USA)

Session FR1-K

High Frequency Oscillators

Room K 08:30-10:10

Friday, November 9

Chairs : Nobuyuki Itoh (Okayama Prefectural University, Japan), Hiroshi Okazaki (NTT DOCOMO, Japan)

FR1-K-1	A 16-GHz-Band Low-Supply-Voltage Class-C VCO IC with Switching Feedback Circuit in 40-nm SOI CMOS Mengchu Fang, Xiao Xu and Toshihiko Yoshimasu (Waseda University, Japan)	1121
FR1-K-2	60-GHz Millimeter-Wave Voltage-Controlled Oscillators Using Transformer-Tuning Technique Hao-Jiun Wu, Chien-Chang Chou, Chun-Yu Ku, Tzuen-Hsi Huang and Huey-Ru Chuang (National Cheng Kung University, Taiwan); Tsai-Kan Chien (Industrial Technology Research Institution (ITRI), Taiwan); Tai-Hsing Lee (ITRI, Taiwan)	1124
FR1-K-3	Low Phase Noise Integrated Mechanically Tunable Oscillator Based on Multi-layer SIW Bandpass Filter Ruoqiao Zhang (Southeast University, P.R. China)	1127
FR1-K-4	Two Ultra-Low Power mm-Wave Push-Pull VCOs in FD-SOI CMOS Therese Forsberg, Johan Wernehag, Henrik Sjöland and Markus Törmänen (Lund University, Sweden)	1130
FR1-K-5	70% Improvement in Q-Factor of Spiral Inductor and its Application in a Switched K-Band VCO Using 0.18 μm CMOS Technology Islam Mansour (Egypt-Japan University of Science and Technology (E-JUST), Egypt); Ahmed Allam, Adel B. Abdel-Rahman and Mohammed Abo-Zahhad (EJUST, Egypt); Ramesh Pokharel (Kyushu University, Japan)	1133

Session FR1-103
Microwave Heating and Chemistry
Room 103 08:30-10:10
Friday, November 9

Chairs :	Yoshio Nikawa (Kokushikan University, Japan), Changjun Liu (Sichuan University, P.R. China)	
FR1-103-1	Permittivity and Electric Conductivity Measurement and Microwave Heating Behavior of Mo/Cordierite Composite Materials Noboru Yoshikawa (Graduate School of Environmental Studies, Tohoku University, Japan)	1136
FR1-103-2	Studies on a Frequency-Stabilized Power-Adjustable Magnetron Based on Equivalent Model Xiaojie Chen, Hang Lin, Zhenlong Liu, Kama Huang and Changjun Liu (Sichuan University, P.R. China)	1139
FR1-103-3	Feasibility Study on a Microwave Heating Applicator Using Electromagnetic Coupling Tomohiko Mitani (Kyoto University, Japan); Daichi Nishio and Naoki Shinohara (Kyoto University, Japan)	1142
FR1-103-4	A 5.8 GHz Microwave Applicator by Post-Wall Waveguide Yuu Nishie (Okayama Prefectural University, Japan); Mitsuyoshi Kishihara and Kensuke Okubo (Okayama Prefectural University, Japan); Akinobu Yamaguchi and Yuichi Utsumi (University of Hyogo, Japan)	1145
FR1-103-5	Development of Rapid Heating and Cooling Technology by Single-Mode Microwave Cavity Applied for Nanoparticle Synthesis Masateru Nishioka and Masato Miyakawa (National Institute of Advanced Industrial Science and Technology (AIST), Japan)	1148

Session FR1-J: Special Session (Invited)

Silicon-Based mmW/THz Technologies

Room K 08:30-10:10

Friday, November 9

Chairs :	Shuhei Amakawa (Hiroshima University, Japan), Davide Guermandi (IMEC, Belgium)	
FR1-J-1	CMOS Devices and Circuits for THz Applications	1151
(Invited)	Chun-Hsing Li (National Tsing Hua University, Taiwan); Te-Yen Chiu and Wei-Min Wu (National Central University, Taiwan)	
FR1-J-2	Phase Modulated mm-Wave Radars in Advanced CMOS Technology	1154
	Davide Guermandi (IMEC, Belgium); Piet Wambacq (IMEC/VUB, Belgium); Andre Bourdoux and Jan Craninckx (IMEC, Belgium)	
FR1-J-3	Scalable Wideband and Wide-Angle Beam Steering mm-Wave/THz Radiator and Phased Arrays in Silicon	1157
	Hossein Jalili (University of California, Davis, USA); Omeed Momeni (University of California Davis, USA)	
FR1-J-4	Millimeter-wave CMOS Transceiver Toward 1Tbps Wireless Communication	1160
	Kenichi Okada (Tokyo Institute of Technology)	

Session FR2-B1

Broadband and Multi-band Antennas

Room B1 10:30-12:10

Friday, November 9

Chairs :	Ryo Yamaguchi (SOFTBANK Corp., Japan), Eisuke Nishiyama (Saga University, Japan)	
FR2-B1-1	Prototype of 12/21GHz-band Dual-circularly Polarized Receiving Antenna for Satellite Broadcasting	1163
	Masafumi Nagasaka and Susumu Nakazawa (NHK, Japan); Masaaki Kojima (NHK(Japan Broadcasting Corporation), Japan); Shoji Tanaka (NHK Science and Technical Research Laboratories, Japan)	
FR2-B1-2	Bandwidth Enhancement of a Double-Element Vivaldi Antenna with Sum and Difference Radiation Patterns	1166
	Seyed-Ali Malakooti (University of Adelaide, Australia); Christophe Fumeaux (The University of Adelaide & School of Electrical and Electronic Engineering, Australia)	
FR2-B1-3	A Broadband Circular Polarized Hexagon Patch Antenna with Three-Feeds	1169
	Changjiang Su, Cheng Lu and Xiaoxing Yin (Southeast University, P.R. China)	
FR2-B1-4	The Design of Smartwatch Antenna for Bluetooth and 5G Applications	1172
	Zhu Duan (Nanjing University of Information Science and Technology, P.R. China); Lijie Xu (Nanjing	

University of Posts and Telecommunications, P.R. China)

FR2-B1-5	Design Methodology of Single-Layer Wideband Notch Antenna with Interdigital Capacitor Constant Manouan Aka Niamien (Normandie Univ, UNIROUEN, ESIGELEC/IRSEEM, Rouen, France)	1175
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Session FR2-B2
Couplers and Dividers II
Room B2 10:30-12:10
Friday, November 9

Chairs :	Motomi Abe (Mitsubishi Electric, Japan), Qing-Xin Chu (South China University of Technology, P.R. China)	
FR2-B2-1	A Wide Band Coupler with High Directivity Using Phase Compensation for LTE Jongmo Lim (Samsung Electro-Mechanics, Korea); Hyun-Jin Yoo and Yoo-Sam Na (Samsung Electro-Mechanics, Korea)	1178
FR2-B2-2	Dual-Function Circuit with Crossover/Branch-Line Coupler Characteristics I-Ju Chen and Yi-Hsin Pang (National University of Kaohsiung, Taiwan)	1181
FR2-B2-3	Design of the Compact Planar Butler Matrix Chen-Chan Tang, Chun-Yuan Huang and Ching-Wen Tang (National Chung Cheng University, Taiwan)	1184
FR2-B2-4	An In-phase Balanced-to-Single-Ended Power Divider with Arbitrary Power Division Ratio Kai Xu, Jin Shi, Wei Zhang and Gire Merphy Mbongo (Nantong University, P.R. China)	1187
FR2-B2-5	A Substrate Integrated Coaxial Line Dual-Band Balun for 5G Applications Satya Krishna Idury and Soumava Mukherjee (Indian Institute of Technology Jodhpur, India)	1190

Session FR2-D
Metamaterials, EMBGs and FSSs II
Room D 10:30-12:10
Friday, November 9

Chairs :	Ye Han (Nanjing University of Posts and Telecommunications, P.R. China), Toshio Watanabe (Kagoshima University, Japan)	
FR2-D-1	A Study on Nonreciprocal CRLH-TL Composed of Gyrator and Series Capacitor Kensuke Okubo, Masayuki Ishihara, Mitsuyoshi Kishihara and Hironori Takimoto (Okayama Prefectural University, Japan)	1193
FR2-D-2	A 2-D Via-Free Indefinite Anisotropic Medium with LH and RH modes Degenerated at the Γ -Point Yuto Kato (National Institute of Advanced Industrial Science and Technology & Osaka University, Japan); Masahiro Horibe (National Institute of Advanced Industrial Science and Technology, Japan); Atsushi Sanada (Osaka University, Japan)	1196

FR2-D-3	Generation of Orbital Angular Momentum Vortex Waves on Both Sides of the Cascaded Metasurfaces Wang Lingling (Nanjing University of Aeronautics and Astronautics, P.R. China); Xiangkun Kong (Nanjing University of Aeronautics and Astronautics, P.R. China)	1199
FR2-D-4	Digital Microfluidics for Terahertz Digital and Programmable Metamaterials: A Proof-of-Concept Study Fangjing Hu, Peiyi Song, Kai Luo, Huafeng Liu, Kai Zhang, Zhenggang Hu and Liang-Cheng Tu (Huazhong University of Science and Technology, P.R. China)	1202
FR2-D-5	Reflectionless Metalens Collimating Multi-OAM Waves for Antenna Gain Enhancement in Wireless Communication Yudai Shigeta and Atsushi Sanada (Osaka University, Japan); Atsushi Fukuda and Kunihiro Kawai (NTT DOCOMO, INC., Japan); Hiroshi Okazaki (NTT DOCOMO, Japan)	1205

Session FR2-K
Emerging III-V Devices / Circuits
Room K 10:30-12:10
Friday, November 9

Chairs :	Hiroshi Okazaki (NTT DOCOMO, Japan), Atsushi Fukuda (NTT DOCOMO, INC., Japan)	
FR2-K-1	Effect of AlN Spacer on the AlGaIn/GaN HEMT Device Performance at Millimeter-Wave Frequencies Chun Wang (National Chiao Tung University, Taiwan); Heng-Tung Hsu (National Chiao Tung University & International College of Semiconductor Technology, Taiwan); Ting-Jui Huang, Jun-Kai Fan and Edward Chang (National Chiao Tung University, Taiwan)	1208
FR2-K-2	A 26-W X-Band High Efficiency GaN MMIC Power Amplifier with Compact Spurious Suppression Filters Jun Kamioka, Eigo Kuwata, Masatake Hangai, Kazuhiko Nakahara, Yoshitaka Kamo and Shintaro Shinjo (Mitsubishi Electric Corporation, Japan); Mitsuhiro Shimozawa (Mitsubishi Electric, Japan)	1211
FR2-K-3	18GHz-/28GHz-Band Gain-Boosted Feedback Power Amplifiers Using Affordable GaN HEMT MMIC Process Tsukasa Yasui (The University of Electro-Communications, Japan); Ryo Ishikawa (The University of ElectroCommunications, Japan); Kazuhiko Honjo (The University of Electro-Communications, Japan)	1214
FR2-K-4	10-MHz-to-70-GHz Ultra-Wideband Low-Insertion-Loss SPST and SPDT Switches using GaAs PIN Diode MMIC Process Hao-En Liu, Xiang Lin and Hong-Yeh Chang (National Central University, Taiwan); Yu-Chi Wang (Win Semiconductors Corporation, Taiwan)	1217

Session FR2-103
Material Characterization Techniques
at Microwave and Millimeter-wave Frequencies
Room 103 10:30-12:10
Friday, November 9

Chairs :	Masahiro Horibe (National Institute of Advanced Industrial Science and Technology, Japan), Karsten Kuhlmann (Physikalisch-Technische Bundesanstalt (PTB), Germany)	
FR2-103-1	Measurements of Interface Conductivity of Copper-clad Dielectric Substrates at Millimeter Wave Frequencies Using TE _{02σ} Mode Dielectric Rod Resonator Excited by NRD Guide Naoki Hirayama, Akira Nakayama and Hiromichi Yoshikawa (Kyocera Corporation, Japan)	1220
FR2-103-2	Frequency Dependence Measurement of Conductivity of Copper Plates by the Balanced-Type Disk Resonator Method Yoshio Kobayashi and Sotaro Kobayashi (SUMTEC, Inc., Japan); Hirokazu Kawabata (Tomo Industrial Technology Center, Japan)	1223
FR2-103-3	Equivalent Conductivity Characterization of Silver-Coated Plastic Antenna Components in Ku, K and Ka Bands Plamen I. Dankov (Sofia University "St. Kliment Ohridski" & SU, Bulgaria); Rossen Traykov and Vesselin Peshlov (RaySat Bulgaria Ltd, Bulgaria); Stanimir Kamenopolski (MatriQx Antenna Systems Ltd., Bulgaria)	1226
FR2-103-4	Microwave characteristics of a Conductor Backed CPW by a Home Printed Electronics Technology with Silver Nanoparticle Ink Takashi Shimizu and Yoshinori Kogami (Utsunomiya University, Japan)	1229
FR2-103-5	An Interferometric Sensor for Scanning Microwave Microscopy Application Aleksandra Baskakova, Giuseppe Stella and Karel Hoffmann (Czech Technical University in Prague, Czech Republic)	1232

Session FR2-J

Radar Architectures, Signal Processing, and Systems

Room K 10:30-12:10

Friday, November 9

Chairs :	Futoshi Kuroki (National Institute of Technology, Kure College, Japan), Withawat Withayachumnankul (The University of Adelaide, Australia)	
FR2-J-1	A Scalable 77 GHz Massive MIMO FMCW Radar by Cascading Fully-Integrated Transceivers Andreas Och (DICE GmbH & Co KG, Austria & Friedrich-Alexander Universität Erlangen-Nürnberg, Germany); Clemens Pfeffer and Jochen Schrattenecker (DICE GmbH & Co KG, Austria); Stefan Schuster (Voestalpine Stahl GmbH & Institute for Communications and Information Engineering, Austria); Robert Weigel (Friedrich-Alexander Universität Erlangen-Nürnberg, Germany)	1235
FR2-J-2	Evaluation of ISAR-Based Autofocus Methods for Estimation of True-Speed-Over-Ground Using a 24 GHz FMCW-Radar Torsten Reissland and Bjoern Lenhart (Universität Erlangen-Nürnberg, Germany); Johann Lichtblau (Friedrich-Alexander-Universität, Germany); Michael Sporer (Friedrich-Alexander Universität Erlangen-Nürnberg, Germany); Alexander Koelpin (BTU & Chair for Electronics and Sensor Systems, Germany); Robert Weigel (Friedrich-Alexander Universität Erlangen-Nürnberg, Germany)	1238
FR2-J-3	Application of MUSIC Method to Multicarrier Optical FM-CW Radar System Based on Optical-	1241

	Modulator-Based Optical Frequency Comb Shintaro Otani (Aoyama Gakuin University, Japan)	
FR2-J-4	A 7-9 GHz UWB Radar Sensor Module with Single Chip Radar IC and on-Board Antenna Byeong Jae Seo and Jun Young Yoo (Kwangwoon University, Korea); Sang Gyun Kim (Silicon R&D, Korea); Yun Seong Eo (Kwangwoon University, Korea)	1244
FR2-J-5	Two-Dimensional Subspace-Based Model Order Selection Methods for FMCW Automotive Radar Systems Yuliang Sun (HELLA GmbH & Co. KGaA & Ruhr-University Bochum, Germany); Tai Fei (HELLA GmbH & Co. KGaA, Germany); Nils Pohl (Ruhr-University Bochum & Fraunhofer FHR, Germany)	1247

Session FR3-B1
Smart and Reconfigurable Antennas
Room B1 13:30-15:10
Friday, November 9

Chairs :	Wayne A. Shiroma (University of Hawaii, USA), Ichihiko Toyoda (Saga University, Japan)	
FR3-B1-1	A Polarization-Reconfigurable Antipodal Dipole Antenna Using Liquid Metal Matthew Moorefield, Aaron T. Ohta and Wayne A. Shiroma (University of Hawaii, USA)	1250
FR3-B1-2	A Polarization Switchable Active Array Antenna Integrating a Multiport Oscillator and PSK Modulators Maodudul Hasan and Hiroki Ushiroda (Saga University, Japan); Eisuke Nishiyama and Ichihiko Toyoda (Faculty of Science and Engineering, Saga University, Japan)	1253
FR3-B1-3	A Fully Integrated Frequency Reconfigurable Antenna Co-designed as a Whole Circuit on Silicon Rozenn Allanic and Denis Le Berre (Lab-STICC - UBO Brest, France); Yves Quéré (Université de Brest, France); Cedric Quendo (Lab-STICC - UBO Brest, France); David Chouteau, Virginie Grimal, Damien Valente and Jérôme Billoué (Université de Tours, France)	1256
FR3-B1-4	Design of A Phased Array Antenna for Indoor Positioning System Chai-Eu Guan (Nagasaki University, Japan); Kuniaki Yoshitomi and Haruichi Kanaya (Kyushu University, Japan)	1259

Session FR3-B2
Novel Technologies for Wireless Communication Systems
Room B2 13:30-15:10
Friday, November 9

Chairs :	Tadashi Kawai (University of Hyogo, Japan), Tzyh-Ghuang Ma (National Taiwan University of Science and Technology, Taiwan)	
FR3-B2-1	Circuit Simulator for Wideband Lumped Element Circulator	1262

	Shigeru Takeda (Magnontech Ltd., Japan); Takao Okada (Orient Microwave Corp., Japan)	
FR3-B2-2	Generalized Topology and Design Method for a New Class of Wideband Phase Shifters Based on Multimode Resonators Yun-Peng Lyu (Nanjing University of Posts and Telecommunications, P.R. China); Lei Zhu (University of Macau); Chonghu Cheng (Nanjing University of Post & Telecommunication, P.R. China)	1265
FR3-B2-3	Compact On-chip Quadruplexer Using Lumped Elements on Integrated Passive Device Process Huy Nam Chu, Poki Chen and Tzyh-Ghuang Ma (National Taiwan University of Science and Technology, Taiwan)	1268
FR3-B2-4	Cryogenic 29-50 GHz Orthomode Transducer for Radio Astronomical Receiver Chau-Ching Chiong (Institute of Astronomy and Astrophysics, Academia Sinica, Taiwan); Chen Chien and Chih-Cheng Chang (Institute of Astronomy and Astrophysics, Academia Sinica, Taiwan); Ted Huang (ASIAA, Taiwan); Yuh-Jing Hwang (Institute of Astronomy and Astrophysics, Academia Sinica, Taiwan)	1271
FR3-B2-5	Development of Zero-shrinkage-LTCC Substrate for Millimeter-wave Applications Koichi Tokita (Tokyo Metropolitan Industrial Technology Research Institute, Japan); Yuichi Hashimoto (Adamant Namiki Precision Jewel Co., Ltd., Japan); Kohei Fujiwara (Tokyo Metropolitan Industrial Technology Research Institute, Japan); Asako Suzuki and Yuso Ishida (Adamant Namiki Precision Jewel Co., Ltd., Japan); Hidehiko Yamaoka (Tokyo Metropolitan Industrial Technology Research Institute, Japan)	1274

Session FR3-D
Metamaterials, EMBGs and FSSs III
Room D 13:30-15:10
Friday, November 9

Chairs :	Ryuji Kuse (Kumamoto University, Japan), Shah Nawaz Burokur (LEME, France)	
FR3-D-1	Novel 3D Bandpass Frequency Selective Structures Based on Stacked Planar Slotlines: Modelling, Design and Validation Wanping Zhang (Nanjing University of Posts and Telecommunications, P.R. China); Bo Li (NJUPT, P.R. China); Lei Zhu (University of Macau, Macau SAR, China); Ye Han and Yun-Peng Lyu (Nanjing University of Posts and Telecommunications, P.R. China)	1277
FR3-D-2	Proposal and Design of Dual-Polarized Frequency Selective Absorbers with Passband and Notched-Band Ye Han (Nanjing University of Posts and Telecommunications, P.R. China); Lei Zhu (University of Macau, Macao); Bo Li (NJUPT, P.R. China); Yumei Chang (Nanjing University of Posts and Telecommunications & State Key Laboratory of Millimeter Waves, P.R. China); Lijie Xu (Nanjing University of Posts and Telecommunications, P.R. China)	1280
FR3-D-3	A New Fitness Function in Binary Particle Swarm Optimization for Efficient Design of Frequency Selective Surfaces Yang Dae Do (Yonsei University, Korea)	1283
FR3-D-4	A Band-Pass Frequency Selective Surface with Wideband Rejection Characteristic	1286

Ning Liu, Xianjun Sheng, Xiang Gao, Dongming Guo and Rui Yang (Dalian University of Technology, P.R. China)

FR3-D-5	Design of a Novel 2.5-D Frequency Selective Surface Element Using Fibonacci Spiral for Radome Application Krushna Kanth Varikuntla (National Institute of Technology Tiruchirappalli, India); Raghavan S (NIT, India)	1289
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Session FR3-K: Special Session (Invited)

Advance in Numerical Simulation Technology Does Not stop !

- Technological Collaboration Brings a New World -

Room K 13:30-15:10

Friday, November 9

Chairs :	Hideaki Kimura (NTT Network Service Systems Laboratories, Japan), Yasuhide Tsuji (Muroran Institute of Technology, Japan)	
FR3-K-1 (Invited)	Automated Microstrip Bandpass Filter Design Using Feedforward and Inverse Models of Neural Network Masataka Ohira, Ao Yamashita and Zhewang Ma (Saitama University, Japan); Xiaolong Wang (Jilin University, P.R. China)	1292
FR3-K-2	Topology Optimization Using Beam Propagation Method for Fabrication Tolerant Optical Waveguide Devices Akito Iguchi and Yasuhide Tsuji (Muroran Institute of Technology, Japan); Takashi Yasui and Koichi Hirayama (Kitami Institute of Technology, Japan)	1295
FR3-K-3	Object Identification from GPR Images by Deep Learning Jun Sonoda (National Institute of Technology, Japan)	1298
FR3-K-4	Numerical Simulation and Experiments on Advanced Traffic Engineering Takashi Miyamura (NTT, Japan); Akira Misawa (Chitose Institute of Science and Technology, Japan); Akio Kawabata (NTT, Japan)	1301
FR3-K-5	Future Society Created by Progress of Numerical Simulation Technology Hideaki Kimura (NTT Network Service Systems Laboratories, Japan)	1304

Session FR3-103

Microwave Measurement and Sensing

Room 103 13:30-15:10

Friday, November 9

Chairs :	Masahiro Horibe (National Institute of Advanced Industrial Science and Technology, Japan)
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FR3-103-1	Capacitance Extraction De-Embedding Method to Address Board Variability David Molinero (Wispry, inc, USA); Shawn Cunningham (Wispry, inc., USA); Art Morris (Wispry, USA)	1306
FR3-103-2	Magnetoelectric Microwave Magnetic Field Sensor at 3 GHz Sebastian Salzer (University of Kiel, Germany); Christine Kirchhof (CAU Kiel, Germany); Eckhard Quandt (Christian-Albrechts-Universität zu Kiel, Germany); Michael Höft (Kiel University, Germany); Reinhard Knoechel (CAU Kiel, Germany)	1309
FR3-103-3	Efficiency Calculation of Non-Periodic Metasurface Based on Modified Near Field to Far Field Transformation Ashif Aminulloh Fathnan (University of New South Wales, Canberra, Australia); David Powell (University of New South Wales, Australia)	1312
FR3-103-4	A Stacked Planar Sensor Concept for Minimally Invasive Plasma Monitoring Dennis Pohle (Ruhr-University Bochum, Germany); Christian Schulz and Moritz Oberberg (Ruhr-Universität Bochum, Germany); Michael Friedrichs (Leuphana University Lüneburg, Germany); Alexandra Serwa and Peter Uhlig (IMST GmbH, Germany); Jens Oberrath (Leuphana University Lüneburg, Germany); Peter Awakowicz and Ilona Rolfes (Ruhr-Universität Bochum, Germany)	1315
FR3-103-5	Heat-Resistant 3D Printed Microwave Devices Vincent Laur, Mira Kaissar Abboud, Azar Maalouf and Den Palessonga (Lab-STICC / University of Brest, France); Alexis Chevalier (University of Brest & Lab-STICC UMR CNRS 3192, France); Julien Ville (IRDL / University of Brest, France)	1318

Session FR3-J
Radar Applications and Remote Sensing
Room K 13:30-15:10
Friday, November 9

Chairs :	Jerdvisanop Chakarothei (National Institute of Information and Communications Technology, Japan), Jaeyoung Kim (Rohm Co, Ltd., Japan)	
FR3-J-1 (Invited)	Small Satellite Constellations to Provide Rapid-Refresh Microwave Observations of Severe Storms, Hurricanes and Typhoons Steven C. Reising, V. Chandrasekar, Chris Kummerow and Wesley Berg (Colorado State University, USA); Todd Gaier (Jet Propulsion Laboratory, California Institute of Technology, USA); Shannon Brown (JPL-CalTech, USA); Sharmila Padmanabhan and Boon Lim (Jet Propulsion Laboratory, California Institute of Technology, USA)	N/A
FR3-J-2	Screen Printed Chipless RFID Resonator Design for Remote Sensing Applications Tharindu Athauda (Monash University, Australia); Nema Karmakar (MONASH University, Australia)	1321
FR3-J-3	Sensing Performance Evaluation of Landslides Prediction System Using Public AM Radio Broadcasting Kousei Kumahara (NIT, Kure College, Japan); Masanori Eguchi and Futoshi Kuroki (National Institute of Technology, Kure College, Japan)	1324
FR3-J-4	Characterization of Layered Dielectric Materials Using Ultra-Wideband FMCW-Radar Measurements Jochen Jebramcik, Jan Barowski and Ilona Rolfes (Ruhr-Universität Bochum, Germany)	1327

Session FR1-IF
Interactive Forum IV
Room A 10:00-11:30
Friday, November 9

FR1-IF-01	Parallel-Coupled-Line Quasi-Elliptic Single-Ended and Balanced Bandpass Filters Chih-Jung Chen (National Taiwan Ocean University & National Taiwan Ocean University, Taiwan); Chun-Lung Chen (National Taiwan Ocean University, Taiwan)	1330
FR1-IF-02	Bandpass Filter with Capacitively Loaded Coupled Lines for Wideband Spurious Rejection Peng Chen, Luping Li and Kai Yang (University of Electronic Science and Technology of China, P.R. China); Qiang Chen (Tohoku University, Japan)	1333
FR1-IF-03	Matrix Synthesis of Cascaded K-Tuplets Filters with Frequency-Variant Couplings Yuxing He and Nobuyuki Yoshikawa (Yokohama National University, Japan)	1336
FR1-IF-04	A Design of Balun Bandpass Filter for Wide Stopband Attenuation Base on Stepped Impedance Resonators Phirun Kim, Wang Qi, Girdhari Chaudhary and Yongchae Jeong (Chonbuk National University, Korea)	1339
FR1-IF-05	A Novel 3.5 GHz Low-Loss Bandpass Filter Using I.H.P. SAW Yuichi Takamine, Tsutomu Takai and Hideki Iwamoto (Murata Manufacturing Co., Ltd., Japan); Takeshi Nakao (Murata MFG, Japan); Masayoshi Koshino (Murata Manufacturing Co., Ltd., Japan)	1342
FR1-IF-06	Novel Length Independent Beltrami Resonators Using Corrugated Reflectors Ryo Mochizuki (Kyoto University, Japan); Yuma Takano (Osaka University, Japan); Naoki Shinohara (Kyoto University, Japan); Atsushi Sanada (Osaka University, Japan)	1345
FR1-IF-07	Compact Ultra-Narrowband Superconducting Filter using Asymmetric Twin-Spiral Resonators Lin Tao, Bin Wei, Xubo Guo and Bisong Cao (Tsinghua University, P.R. China)	1348
FR1-IF-08	Compact Microstrip Lowpass Filter with Ultra-Wide Stopband Thulaseedharan Kodyattuvela Rekha, Parambil Abdulla and Thevaruparambil Abdalnazer Nisamol (Cochin University of Science and Technology, India)	1351
FR1-IF-09	Compact Quasi-Elliptic Bandpass Filter Using Magnetically Coupled LC Resonator Pair Ting-Yi Lin (National Taiwan University & GICE, Taiwan); Tzong-Lin Wu (National Taiwan University, Taiwan)	1354
FR1-IF-10	Miniaturized EMSIW Filter with High out of Band Rejection Xing-He Nie (Southeast University & State Key Laboratory of Millimeter Waves, P.R. China); Wei Hong (Southeast University, P.R. China)	1357
FR1-IF-11	Analysis and Determination of Microwave Filter Order Eng Leong Tan and Ding Yu Heh (Nanyang Technological University, Singapore)	1360
FR1-IF-12	Design and Fabrication of 3-Pole BPF Configured by Hairpin Resonators and Different Types of Coupling and Feed Types at 20 GHz Satoshi Ono (The University of Electro-Communications, Japan)	1363
FR1-IF-13	A Compact Power Divider Using Dual Composite Right-/Left-Handed Resonators (D-CRLH) with Filtering Response I-Ju Chen, Wen-Chen Lee and Yi-Hsin Pang (National University of Kaohsiung, Taiwan)	1366

FR1-IF-14	A Notch Filter Design Using Quarter-Mode SIW Cavities with High Mode Suppression Xiaolong Huang, Liang Zhou and Junfa Mao (Shanghai Jiao Tong University, P.R. China)	1369
FR1-IF-15	Design of Holographic Metasurface for Antenna Beam Steering Based on Liquid Crystal Technology Xiang Zhang, Qingyuan Zhang and Chang Chen (University of Science and Technology of China, P.R. China); Weidong Chen (University of Science & Technology of China, P.R. China); Bin Liu (University of Science and Technology of China, P.R. China); Jian Cai (Institute of Microelectronics of the Chinese Academy of Sciences, P.R. China)	1372
FR1-IF-16	Reconfigurable Metasurface as Microwave Reflectors and Polarization Converters Badreddine Ratni (Univ Paris Nanterre, France); André de Lustrac (Institut d'Electronique Fondamentale - Université Paris-Sud, France); Gérard-Pascal Piau (Airbus, France); Shah Nawaz Burokur (LEME, France)	1375
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