# 2014 Asia-Pacific Microwave Conference APNIC 2014



November 4-7, 2014, Sendai International Center, Sendai, Japan http://www.apmc2014.org/

# ADVANCE PROGRAM

# " Resilient Networks from the Microwave Heartland "

Sponsored by The Institute of Electronics, Information and Communication Engineers (IEICE) Cooperatively sponsored by IEEE MTT-S, IEEE AP-S, EuMA, URSI, IEEE MTT-S Japan/Kansai/Nagoya Chapters, The Technical Committee on Microwaves, Electronics Society, IEICE, The Technical Committee on Electronics Simulation Technology, Electronics Society, IEICE, The Technical Committee on Microwave Photonics, Electronics Society, IEICE, IEEE Sendai Section, The Japan Institute of Electronics Packaging,

Japan Society of Electromagnetic Wave Energy Applications,

IEEJ Investigative Committee on Innovative Electromagnetic Technologies and Their Applied Developments Supported by Ministry of Internal Affairs and Communications







# **PROGRAM AT A GLANCE**

#### 11/3 (Mon) Registration (16:00-19:00) "2nd Floor, Sendai International Center"

11/4 (Tue)	Room A (Tachibana)	Room B (Hagi)	Room C (Shirakashi 1)	Room D (Shirakashi 2)	Room E (Meeting Room 1)	Room F (Meeting Room 2)	Room G (Sakura)	
10:30	WS1A Introduction to Advanced Materials Measurements	WS1B Introduction to Theory of Operation and Reliability in Vector Network Analyzer Measurement at RF,	WS1C Trend of New Materials and Devices for Next Innovation	WS1D Recent Advances in Microwave Filters	SC1E Fundamentals of MMIC Design			
		Microwave and Millimeter- Wave Frequencies		LUNCH TIME				
14:30				WS2D Biomedical Effects and Applications: from Microwaves	SC2E Theory and Practice in Microwave High Power	SC2F Theory and Practice in Microwave Filter Designs		
17:30				to THz	Amplifiers			
Welcome Reception (18:00-19:30) "Sendai International Center"			Registration (9:00-18:00) "2nd Floor, Sendai International Center"					

11/5 (Wed)	Room A (Tachibana)	Room B (Hagi)	Room C (Shirakashi 1)	Room D (Shirakashi 2)	Room E (Meeting Room 1)	Room F (Meeting Room 2)	Room G (Sakura)
9:30	WE1A Multifunctional Filters	WE1B Couplers and Power Dividers I	WE1C Broadband and Multiband Antennas I	WE1D Waveguide and Transmission-Line Structures	WE1E Advanced Passive Components and Tunable Devices	WE1F Electromagnetic Compatibility	
11:10	COFFEE BREAK						
11:30	WE2 (Room H (Main Hall)) Opening ( Keynote A	Ceremony \ddress, Special Talk					
14:20	LUNCH TIME						
14.30	WE3A Wideband Filters and Couplers	WE3B Distortion Compensation	WE3C Array Signal Processing and	WE3D Metamaterials and Periodic	WE3E THz and Millimeter-Wave	WE3F Space Microwave Wireless	
16:30		Techniques	Antenna Measurements	Structures I	Integrated Circuit Technology	and Sensing Technology	14/500
16:50	COFFEE BREAK						15:30-17:00
10.00	WE4A Let us Talk and Share Ideas for Increasing Women in	WE4B GaN Focus Session I : RF GaN Status and Future	WE4C Broadband and Multiband Antennas II	WE4D Metamaterials and Periodic Structures II	WE4E Low Noise and High Power Amplifiers and Applications	WE4F High Speed Digital Circuits and System Integrity	Open Forum (Poster)
18:30	APMC - Women in Engineering (WIE) -						
		·		Registration (8:30-17:00)	"2nd Floor, Sendai Interna	ational Center"	

11/6 (Thu)	Room A (Tachibana)	Room B (Hagi)	Room C (Shirakashi 1)	Room D (Shirakashi 2)	Room E (Meeting Room 1)	Room F (Meeting Room 2)	Room G (Sakura)
8:30	TH1A Mobile and Wireless Communication System Technologies I	TH1B Novel Low Noise Amplifiers and Related Technologies	TH1C Microwave Measurement and Material Characterization I	TH1D Biomedical Applications and RFID Tag Antennas	TH1E Millimeter-Wave and Terahertz Antennas	TH1F Japanese Industrial Session	
10:10	COFFEE BREAK						TH1G 10:00-11:30
10.00	TH2A EuMA Special Session	TH2B Antennas and Propagation	TH2C Microwave Measurement and	TH2D Small-Scale Communication	TH2E National ICT R&D Projects	TH2F Advanced Microwave	Open Forum (Poster)
12:10		Communications	Material Characterization II	and Sensing Systems	in Japan	Technologies in East Asia	
12.20	LUNCH TIME						
15:30	TH3A Mobile and Wireless Communication System Technologies II	TH3B Millimeter-Wave High Power Transmitter and Switch Based on GaN and CMOS	TH3C Advances in Far-Field Wireless Power Transfer Systems	TH3D Antennas for Mobile Communications	TH3E Millimeter-Wave Communication and Radar Systems	TH3F Recent R&D Topics in East Asia	
15.50	COFFEE BREAK						TH3G
17:30	TH4A Resilient ICT Session for Disaster Relief	TH4B GaAs- and Si-Based Power Amplifiers	TH4C Near Field and Grid Solutions for Wireless Power Transfer	TH4D Couplers and Power Dividers II	TH4E Outstanding Asian Young Researchers	TH4F Broadband and Multiband Antennas III	15:30-17:00 Open Forum (Poster)
Award Banquet (19:00-21:00) "Sendai Shozankan"				Registration (8:00-17:00)	"2nd Floor, Sendai Interna	tional Center"	

11/7 (Fri)	Room A (Tachibana)	Room B (Hagi)	Room C (Shirakashi 1)	Room D (Shirakashi 2)	Room E (Meeting Room 1)	Room F (Meeting Room 2)	Room G (Sakura)
8:30	FR1A Future Mobile and Wireless Communication Systems	FR1B GaN Focus Session II : Power GaN Status and Future	FR1C Recent Advances in Bandpass Filters	FR1D Doppler Radar for Smart Buildings and Mobile Health	FR1E Design of Novel CMOS and Millimeter-Wave VCOs	FR1F Antenna Theory and CAD	
10:10							55.0
10.20	COFFEE BREAK						FR1G 10:00-11:30
10.50	FR2A Historical Review of Microwave Devices in Japan	FR2B High Efficiency GaN HEMT Power Amplifiers	FR2C Wireless Power Transfer Technologies I	FR2D Radar, Remote Sensing and Imaging Systems I	FR2E Mixers and Frequency Converters Technology for	FR2F Radio Wave Propagation Studies in Various	Open Forum (Poster)
		for Wireless Communication			RF-Frontends	Environments	
12:10							
13:30	LUNCH TIME	1	1				
	FR3A	FR3B	FR3C	FR3D	FR3E	FR3F	
	Millimeter-Wave / Terahertz Devices and Systems	ET & EER Technologies	Wireless Power Transfer Technologies II	Radar, Remote Sensing and Imaging Systems II	Millimeter-Wave and THz Tranceivers and Building	Novel Design Techniques of Planar Microwave Filters	FR3G 14:00-15:30
15:30					Blocks		(Poster)
Rump Sess	ion (18:30-20:30) <b>"Senda</b> i	Akiu Spa Hotel Iwanumaya	3"	Registration (8:00-14:30)	"2nd Floor, Sendai Interna	ational Center"	

# **FLOOR PLAN**

## Sendai International Center



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## **GREETINGS FROM THE STEERING COMMITTEE CHAIR**

It is my great honor to welcome all of you to the 2014 Asia-Pacific Microwave Conference (APMC 2014), which will be held during November 4–7, 2014 at Sendai International Center in Sendai, Japan.

As you know well, Sendai is one of the historic sites for microwave & antenna engineering and is the birthplace of Yagi-Uda antenna, which won the first worldwide historic recognition as an IEEE milestone in the Asia-Pacific region. Please get inspiration from Sendai and the microwave & antenna heritages. Three years ago, we had the Great East Japan Earthquake, which struck the Tohoku (North-eastern) region of Japan and the Tohoku was devastated by the enormous earthquake and tsunami. With the warmest help and supports from all over the world, the Tohoku's restoration and reconstruction are now in progress.

In consideration of the aim of hosting APMC 2014 in Sendai, we will host the conference under the theme of "Resilient Networks from the Microwave Heartland" and organize following two special sessions. 1) Historical session: A story of Yagi-Uda antenna and other historic stories will be introduced. 2) Resilient ICT session: R&D of wireless network and H/W against largescale disasters will be presented. We will have two excellent guest speakers, Prof. Fumiyuki Adachi, Tohoku University, and Astronaut Naoko Yamazaki. They will give talks on "Challenges Toward Spectrum-Energy Efficient Gigabit Wireless Networks" and "Life in Space and Wireless Technology," following the Opening Ceremony. I believe their talks will show the future direction of our microwave and antenna technologies. At APMC 2014, we establish "Student Design Competition" program to encourage young engineers. I hope they will exchange their technical knowledge and cultures by attending this program.

APMC 2014 is organized and sponsored by the Institute of Electronics, Information and Communication Engineers (IEICE). It is technically sponsored by IEEE MTT-S, EuMA, IEEE AP-S URSI, IEEE MTT-S Japan/Kansai/Nagoya Chapters and supported by the Ministry of Internal Affairs and Communications of Japanese Government.

I would like to express my gratitude to the authors and attendees for their technical contributions to APMC 2014. I also thank the sponsors, the supporters, the exhibitors, the committee members and the secretariats of our conference.

Finally, I wish you will completely enjoy the conference and your stay in Sendai.



Noriharu Suematsu APMC 2014 Steering Committee Chair

## **MESSAGE FROM THE TECHNICAL PROGRAM COMMITTEE CHAIR**

On behalf of the APMC 2014 Technical Program Committee (TPC), it is an honor to introduce the technical program. The APMC is the largest microwave conference in the Asia-Pacific region, bringing together international researchers, engineers, and students to showcase the most advanced research and development in microwave technologies. Sixty-five technical sessions, both oral and poster, which include various Special Sessions, are organized. In addition, the technical program will be supplemented with 5 Workshops, 3 Short Courses, one Rump Session, 2 Student Design Competitions, and one Technical Tour. The Technical Tour will feature the following labs that are involved in Research Institute of Electrical Communication (RIEC) of Tohoku University, and NICT Resilient ICT Research Center.

APMC 2014 will offer a number of new initiatives to enhance the microwave technologies in the Asia-Pacific region (IEEE Region 10). First, we invited to submit proposals for special sessions and workshops/short courses. 4 outstanding proposal special sessions and 3 hot-topic workshops were selected. Second, the student design competition, for the first time, will be organized in APMCs. Another new initiative in APMC 2014 expands the microwave community in IEICE and IEEE Region 10. Women-In-Engineering (WIE) special session offers an opportunity to talk and share the ideas for increasing women engineers in APMC. Japanese Industrial special session also shares recent progress in microwave technologies and products for future wireless systems.

The technical program will start with the Workshops and Short Courses on Tuesday, November 4, which cover from fundamental circuit/component design techniques to recent progress in device technologies and measurement in the microwave field. The technical sessions in 6 parallel tracks will be held on Wednesday, Thursday, and Friday. The last session of APMC 2014, the Rump Session, will focus on Wireless Power Transfer Systems.

The plenary session is scheduled on Wednesday morning, November 5, where Prof. Fumiyuki Adachi from Tohoku University will present his Keynote Address entitled, "Challenges Toward Spectrum-Energy Efficient Gigabit Wireless Networks." Astronaut Naoko Yamazaki will make a presentation entitled, "Life in Space and Wireless Technology" as well.



Special sessions involve EuMA session based on the collaboration between the APMC and the European Microwave Association (EuMA), Historical Review of Microwave Devices in Japan, Resilient ICT session for Disaster Relief, and so on. EuMA session will demonstrate recent progress in European microwave technologies. Historical Review session

# MESSAGE FROM THE TECHNICAL PROGRAM COMMITTEE CHAIR

will introduce linear antennas, such as Yagi-Uda antenna, microwave tubes, and phased array antennas developed in Tohoku University and Japan. Resilient ICT session will provide several perspectives on the challenges for disaster relief by resilient ICT.

The TPC selected 524 outstanding papers including invited papers from 683 submitted from 40 countries, with 285 oral presentations and 239 poster ones.

like to express our deepest gratitude to 365 reviewers, 62 subcommittee chairs, and 30 TPC members for their enthusiasm and dedication to develop an outstanding technical program. We are looking forward to an exciting program and hope you can enjoy APMC 2014 in Sendai, Japan.

Kenjiro Nishikawa APMC 2014 Technical Program Committee Chair

On behalf of the APMC 2014 Steering Committee, we would

## **SPONSORS**

The Institute of Electronics, Information and Communication Engineers (IEICE)	Platinum Sponsor Gold Sponsor Silver Sponsors	: Rohde & Schwarz Japan : ANRITSU CORPORATION : AWR Japan K.K.
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IEEE Sendai Section	Research Foundatio	n for the Electrotechnology of Chubu
The Japan Institute of Electronics Packaging	Sendai Tourism & O	Convention Bureau
Japan Society of Electromagnetic Wave Energy Applications	Support Center for	Advanced Telecommunications Technology
IEEJ Investigative Committee on Innovative Electromagnetic	Research, Founda	ation
Technologies and Their Applied Developments	The Foundation for Engineering	The Promotion of Electrical Communication
Supported by Ministry of Internal Affairs and Communications	The Murata Science	Foundation
	The Telecommunica	ation Advancement Foundation

## **CONFERENCE SITE**

The conference will be held at the Sendai International Center, which is one of the largest convention centers in Japan's Tohoku (northeast) Region, consisting of conference rooms and an exhibition hall, and is located in the urban area of Sendai City.

The Workshops & Short Courses (on November 4, 2014) and the Technical Sessions (from November 5 to 7, 2014) will be held in 6 different rooms on the 1st, 2nd, and 3rd floors of the center. There is also a large hall for the Opening Ceremony, followed by the Keynote Address and the Special Talk (on November 5). The exhibition hall will be used for the exhibition booths and Student Design Competitions.

## SENDAI

Sendai has a population of one million and is the political and economic center of Japan's Tohoku Region, one of the seven major regions in Japan. Although Sendai is a large city, it is known throughout Japan as a modern city which is in harmony with nature. The city possesses beautiful scenery, such as the Hirose River, running through central Sendai, and the lush Zelkova trees that line the central city. Greenery is especially abundant in the center of the city, which has tree-lined streets and parks.

Sendai is located approximately 300 kilometers north of Tokyo on the Pacific coast of Honshu (the largest of Japan's four major islands). It takes about 1 hour and 30 minutes to reach Sendai from Tokyo on the Tohoku Bullet Train (Tohoku Shinkansen). Sendai also has regular flights to and from major domestic and international cities.

## REGISTRATION

# **Pre-Registration (Early Bird & Advanced) and On-Site Registration**

Those who intend to participate in the 2014 Asia-Pacific Microwave Conference (APMC 2014), including the speakers, session chairs, committee members, etc., are requested to register

for the "Conference" (from November 5 to 7, 2014) and/or the "Workshops/Short Courses" (on November 4, 2014).

Pre-Registration (Early Bird & Advanced) is available on the APMC 2014 website from August 8 to October 24, 2014.

For those who cannot register beforehand, On-Site Registration is available at the Registration Desk at the Conference venue from November 3 to 7, 2014.

## **Registration Fees**

The registration fees are separated for the "Conference" and "Workshops/Short Courses," but you can take advantage of a better deal by selecting "Superpass," which covers both the "Conference" and "Workshops/Short Courses."

Those who registered for the "Conference" will get admission to the Welcome Reception (on November 4, 2014), the Opening Ceremony and Keynote Addresses (on November 5, 2014), and the Technical Sessions (from November 5 to 7, 2014).

Those who registered for the "Workshops/Short Courses" will get admission to the Workshops/Short Courses on November 4, 2014.

There are also privileges of membership of the APMC 2014 sponsoring organizations; "IEICE," "IEEE MTT-S," "IEEE AP-S," "EuMA," "URSI," "JIEP," or "JEMEA." Please visit the sponsoring organizations' websites for membership application, only if you like.

The Registration Fee differs depending on;

a. the application date for registration

b. whether the registrant is a student/retiree or not

c. whether the registrant is a member of any of the APMC 2014 Sponsoring Organizations above or not

Those who selected "Student" will be required to show their student ID on their arrival at the Registration Desk at the Conference venue. In case you are a student now and if you are graduating from school before the date of APMC 2014 (November 4, 2014), please bring a copy of your student ID to the Registration Desk. The student ID must be written either in

Registration Type		Regist	On-Site	
		EarlyBird from Aug. 8 – Sept. 30	Advanced from Oct. 1 to 24	Registration from Nov. 3 to 7
Superpass	Regular(Member)	50,000*JPY	55,000*JPY	65,000JPY
(Conference +	Regular(Non-Member)	60,000*JPY	65,000*JPY	75,000JPY
Workshops/ ShortCourse)	Student/Retiree(Member)	15,000**JPY	18,000**JPY	23,000JPY
	Student/Retiree(Non-Member)	20,000**JPY	23,000**JPY	28,000JPY
	Regular(Member)	48,000*JPY	53,000*JPY	60,000JPY
Conforance	Regular(Non-Member)	58,000*JPY	63,000*JPY	70,000JPY
Comerence	Student/Retiree(Member)	13,000JPY	16,000JPY	18,000JPY
	Student/Retiree(Non-Member)	18,000JPY	21,000JPY	23,000JPY
	Regular(Member)	6,000*JPY	7,000*JPY	10,000JPY
Workshops/ ShortCourse	Regular(Non-Member)	7,000*JPY	8,000*JPY	12,000JPY
	Student/Retiree(Member)	3,000JPY	4,000JPY	5,000JPY
	Student/Retiree(Non-Member)	4,000JPY	5,000JPY	6,000JPY

\* With Box Lunch, \*\* with box lunch for "invited" speakers

English or in Japanese.

The definition of "Retiree" is as follows: a person who is attaining the age of 60 years as of November 4, 2014, and not gainfully employed. Those who selected "Retiree" will be required to show a legal ID on their birthday on their arrival at the Registration Desk at the Conference venue. The ID must be written either in English or in Japanese.

## **Registrant's Kit**

Those who pre-registered for the "Conference" (or "Superpass") will each receive a set of the Conference Registrant's Kit, which includes a copy of the Conference Proceedings (CD-ROM), a printed name tag, a Conference Bag, etc.

The kit will also include a souvenir gift for those who preregistered early; the number of the gifts is limited and they will be provided on a first-come-first-served basis.

Those who pre-registered for the "Workshops/Short Courses" (or "Superpass") will each receive a copy of the Workshops/Short Courses Digest (USB flash drive). The registration fees ("Superpass," "Conference," and "Workshops/Short Courses") do NOT include the Banquet fee and the Rump Session fee.

## **Accompanying Family Members**

Those who pre-registered for the "Conference" (or "Superpass") can register their family members for APMC 2014. Accompanying Family Members should be the registrant's family or relative, such as his/her spouse (husband or wife), sibling (brother or sister), child, etc., who will not attend the conference sessions, but will participate in the conference's official events, such as the "Welcome Reception" (free of charge), the "Banquet" (5,000, 6000, or 8000 Japanese yen (JPY) per person; see below), and/or the "Rump Session."

Please note that Accompanying Family Members cannot attend the technical sessions of the Conference or Workshops/Short Courses, and will not be provided with a copy of the Conference Proceedings or Workshops/Short Courses Digest.

Those who are interested in participating in the Conference sessions should register individually.

Each Registrant can register up to 3 Accompanying Family Members in the Registration Form. In case there are more than 3, please enter their names and other information into the "Memo" box at the bottom of the form.

## **Award Banquet**

The APMC 2014 Award Banquet is scheduled to be held on the evening of Thursday, November 6, 2014 for the registrants of the "Conference" (or "Superpass").

The price of a Banquet Ticket for one person differs depending on the registration date;

- From August 8 to September 30, 2014 : 5,000 JPY per person
- From October 1 to 24, 2014 : 6,000 JPY per person
- From November 3 to 6, 2014 : 8,000 JPY per person

### **Rump Session**

For those who registered for the "Conference" (or "Superpass"), the Rump Session is scheduled on the evening of the last day of the Conference (Friday, November 7, 2014) at a Japanese style hotel called "Iwanumaya" in the Akiu Onsen resort area.

The registrants of the "Conference (or Superpass)" can participate in this event with an extra fee, which covers the participation in the Rump Session, a room charge for one night, dinner, and breakfast.

You can select a room type from the followings;

- Room Type A : 14,000 JPY per person (sharing a large room with 3 other participants)
- Room Type B : 22,000 JPY per person (using a small room with only 1 person)
- Room Type C : 22,000 JPY per person (sharing a large room with 1 accompanying person or friend)

Those who wish to participate in this event should pay a deposit of "14,000 JPY" through the on-line Registration System.

For the participants who selected "Room Type A," the names of the participants sharing the same room will be told at the time they arrive at the Rump Session venue, Iwanumaya. As for the participants who did not select "Room Type A," they will be informed by email, and should pay the difference from the deposit (14,000 JPY) at the Registration Desk before the Rump Session, namely, from November 3 to 6, 2014.

## **Payment Method**

For Pre-Registration, the payment should be done using the on-line Credit Card Settlement System, which will be available in the "Personal Account Page."

If you have difficulty in paying by credit card, you can select another way, "Bank Transfer," by clicking the button in the Registration System. Payment by bank transfer must be completed within 10 days from the registration date. If we find the payment not completed by then, the registration will become invalid.

For On-Site Registration, the payment should be done in cash (JPY only), or by credit card.

Acceptable Card Types:

- Pre-Registration: VISA, MASTER, Amex, Diners, JCB
- On-site Registration: VISA, MASTER, Amex, Diners (JCB is not acceptable)

## **Registration Desk**

The Registration and Information Desk will be located on the 2nd floor of the Conference venue, Sendai International Center, and will be open during the following hours:

- November 3, 2014 : 16:00-19:00
- November 4, 2014 : 09:00-18:00
- November 5, 2014 : 08:30-17:00
- November 6, 2014 : 08:00-17:00
- November 7, 2014 : 08:00-14:30

## HOTEL ACCOMMODATIONS

Rooms at ten hotels in Sendai, which are accessible from/to Sendai International Center are available through the travel agent below. Reservations can be made through the web site for the hotel accommodations.

## **OFFICIAL TRAVEL AGENT**

JTB Global Marketing & Travel Inc., the official travel agent of APMC 2014, has reserved a sufficient number of rooms at several hotels in Sendai for APMC 2014. Reservations will be processed in order of application. Details will be found at this site.

JTB Global Marketing & Travel Inc.

Convention Center

2-3-11 Higashi-Shinagawa, Shinagawa-ku, Tokyo 140-8604 Japan Business hours: 10:00-18:00

Fax: +81-3-5495-0685

Please contact JTB Global Marketing & Travel Inc. for information on sightseeing tours as well.

## YOUTH HOSTEL INFORMATION

Those with very limited budget may want to directly contact the below Youth Hostels.

Maple Sendai YH (about a 45 minutes' walk to the Conference site) http://www.jyh.or.jp/english/touhoku/maple/

Sendai Chitose YH (about a 1 hours' walk to the Coference site) http://www.jyh.or.jp/english/touhoku/sendai/

Dochuan YH (from JR Taishido station, walk for 7minutes) http://www.jyh.or.jp/english/touhoku/dochuan/

Espole Miyagi YH (from JR Rikuzen-harano-machi, walk for 20 minutes)

http://www.jyh.or.jp/english/touhoku/miyagi/

## TRANSPORTATION

## From JR Sendai Station to Conference Site by Bus:

10 minutes from West Entrance of Sendai Station (bus stop



## **HOTEL LOCATION**

## No. 9).

Take buses of No. 710, 713, 715, 719, and 720. You should get off at the 5th stop "Hakubutsukan & Kokusai Center-Mae (Sendai City Museum & Sendai International Center)". The fare is 180 JPY for one-way. Please note that you cannot use 2,000-JPY, 5,000-JPY, and 10,000-JPY bills in the bus.

## From JR Sendai Station to Conference Site on foot:

30 minutes from JR Sendai Station straight down AOBA DORI Avenue, across the OHASHI-Bridge.

## From JR Sendai Station to Conference Site by taxi:

7 minutes from Sendai Station. The fare is about 1,000 JPY for one-way.

Please show the following text to Taxi driver. (It says, "Please take this person to the Sendai International Center.")

タクシー運転手の皆さまへ (For Taxi Drivers)
 この方は<u>仙台国際センター</u>で開催する国際会議
 (APMC 2014) への参加者です.
 <u>仙台国際センター</u>までお連れ頂けますと幸いです.
 住所:〒980-0856 宮城県仙台市青葉区青葉山
 電話番号: (022) 265-2211

## Detailed information is available at the following website:

Access to Sendai: http://www.sentabi.jp/en/access/ Access to Conference site (Sendai International Center): http://www.sira.or.jp/icenter/english/access transportation.html

## **OTHER INFORMATION**

## Electricity

Electricity supply is 100 Volts/50 Hz in eastern Japan including the Sendai area, and 100 Volts/60 Hz in western Japan.

## Weather

Sendai lies in the temperate zone and has four distinct seasons. November is the beginning of winter, when Sendai is rather cold but rarely has snow. The temperature ranges between 13.7 °C (56.7 °F) and 5.2 °C (41.3 °F). Coats or sweaters are needed.

## **No Smoking Policy**

Smoking is prohibited in the Sendai International Center except at limited smoking corners.

## Currency

Japanese yen (JPY) is the only currency that is used at stores and restaurants. You can exchange foreign currencies for Japanese yen at foreign exchange banks and other authorized money exchangers by showing your passport. The exchange rate fluctuates daily.

## **Traveler's Checks and Credit Cards**

Since traveler's checks are not common in Japan, you may use

them only at major hotels and leading banks. Major credit cards, such as VISA, Master Card, AMEX, and JCB, can be used at restaurants, hotels, souvenir shops, etc.

## Tipping

Tipping is not customary in Japan. For example, you do not need to tip waiters/waitresses at restaurants.

## Japanese Traffic

There are not heavy traffic jams in Sendai area. Public transportation (railways, subway, and buses) networks are convenient.

## **Internet connection**

Internet connection through Wi-Fi will be available at the Sendai International Center. There is no charge for the service.

## **Babysitting service**

At the hotel below, which is close to the Sendai International Center, babysitting services are available.

Westin Hotel Sendai: +81-22-722-1234

## SOCIAL PROGRAM

The APMC 2014 will offer original and fascinating events: The Welcome reception, the Opening Ceremony, and the Award Banquet.

## Welcome Reception

All the participants in the Conference (from November 5 to 7) are invited to the Welcome Reception to be held from 18:00 to 19:30 on Tuesday, November 4, at the Sendai International Center Room G (Sakura, 2nd floor). The registrants of the Conference, their accompanying family members, and their accompanying student speakers can participate in this event with their "Conference" name tags on (free of charge).

## **TEA Ceremony**

Would you like to enjoy a tea ceremony between your busy sessions or exhibitions? The tea ceremony will be held for all the APMC 2014 attendees and exhibitors.

Ladies wearing Japanese traditional kimonos will serve you a bowl of green tea "maccha" and a Japanese-style confection "okashi." You will find the atmosphere of the tea ceremony comfortable and enjoy the gentle bubbling sound of water in a teakettle, the fragrance of incense, the lovely flower arrangements, and the artistic calligraphy on a scroll hanging in the alcove.

The Way of Tea ceremony "茶の湯 = Chanoyu" is a Japanese cultural tradition. In the 16th century, Tea Master Rikyu Sen established the foundations of "Chanoyu," where one respects everyone without distinction of status or rank. That is, the spiritual aspect is the most important in "Chanoyu." The culture of "Chanoyu" has greatly influenced various aspects of Japanese

culture, such as architecture, gardening, textiles, food, and cooking. You can experience the entire process of "Chanoyu" in a Japanese style room (tatami-mat room) as shown in the photo 1.

It is our pleasure that we provide you with everything you need to relax at the tea ceremony room.

Date: Wednesday, November 5, 2014

Time: 12:00-16:00 (about 30 minutes each time)

Place: Japanese style room, 1st Floor, Sendai International Center

Tickets: will be available at the registration desk



Photo.1 Japanese style ceremony room

## **Opening Ceremony**

The APMC 2014 Opening Ceremony will be held from 11:30 to 13:10 in the Main Hall (2nd floor) of the Sendai International Center on Wednesday, November 5. We will first give you a declaration and brief report by the APMC 2014 Steering Committee Chair, followed by congratulatory addresses by invited representatives of sponsoring organizations including IEEE MTT-S, IEEE AP-S, EuMA, and the Ministry of Internal Affairs and Communications.

Then, we will have the Keynote Address given by Prof. Fumiyuki Adachi, Tohoku University and the Special Talk given by Astronaut Naoko Yamazaki.

## **Award Banquet**

The APMC 2014 Award Banquet will be held from 19:00 to 21:00 on Thursday, November 6, at the party hall "Saiun" on the 4th floor of the Sendai Shozankan 「勝山館」. With a variety of cuisine, the banquet will introduce the winners of APMC 2014 Prize, APMC 2014 Student Prize, and Student Design Competition. After the greetings by the Conference Chair, you will experience the ceremony "Kagamiwari," where a large barrel of sake (Japanese rice-wine) is cracked on the top with wooden hammers to celebrate the success of APMC 2014. The APMC 2014 Prize Award Committee will announce the winners from all the participants presenting papers at the conference and will give them the APMC 2014 Prize, as well as the APMC 2014 Student Prize. The APMC 2014 Prize Award Committee will also

announce the winners from the Student Design Competition applicants and will give them the APMC 2014 Student Design Competition Award.

Each one of those who wish to participate in this event should buy a Banquet Ticket. The participants of the Award Banquet will be taken to the Sendai Shozankan by bus (free of charge).

## **Rump Session**

The Rump Session will be held at Sendai Akiu Spa Hotel Iwanumaya, located about thirty minutes west of the Conference Center by bus, on November 7, 2014. Three invited speakers will present their latest research works focused on the theme of "Wireless Power Transfer Systems."

There will be a free bus ride prepared for the participants of the Rump Session on the afternoon of November 7, 2014.

## **MEETINGS INFORMATION**

## **APMC International Steering Committee (ISC) Meeting**

The APMC ISC Meeting will be held on Wednesday, November 5, 2014 at Kawauchi Hagi Hall, Tohoku University. The APMC ISC members are invited.

Date: Wednesday, November 5, 2014

Time: 19:00-21:00

Place: Meeting Room 1-3, Kawauchi Hagi Hall, Tohoku University

## **IEEE Region 10 MTT-S Chapter Chairs Meeting**

The IEEE Region 10 MTT-S Chapter Chairs Meeting will be held on Thursday, November 6, 2014 at Kawauchi Hagi Hall, Tohoku University. The IEEE Region 10 MTT-S Chapter Chairs, MTT-S Joint Chapter Chairs, and the MTT-S AdCom members are invited.

Date: Thursday, November 6, 2014

Time: 12:00-15:00

Place: Meeting Room 1-3, Kawauchi Hagi Hall, Tohoku University

# IEEE MTT-S Technical Coordination Committee (TCC) Meeting

The IEEE MTT-S TCC meeting will be held on Thursday, November 6, 2014 at Kawauchi Hagi Hall, Tohoku University. The IEEE MTT-S TCC members are invited.

Date: Thursday, November 6, 2014

Time: 15:00-17:00

Place: Meeting Room 1-3, Kawauchi Hagi Hall, Tohoku University

## **APMC 2014 PRIZE AND APMC 2014 STUDENT PRIZE**

Papers presented at APMC 2014 will be judged by the APMC 2014 Prize Award Committee, and the authors of selected papers will be awarded the APMC 2014 Prize for outstanding contributions to the microwave field. In addition, outstanding student papers submitted to the conference will be awarded the APMC 2014 Student Prize. These Prizes, which consist of the commemorative certificates and rewards, will be presented to all

## **APMC 2014 Prize Finalists**

A Dual-Gain-Mode High Efficiency Power Amplifier for W-CDMA Data Communications Kenji Mukai, Shintaro Shinjo, Koji Yamanaka, Miyo Miyashita, Kazuya Yamamoto A Fast, Accurate and Digitally Calibrate-able Logarithmic Amplifier for Analog-Predistortion Power Amplifiers Mikyung Cho, J. Stevenson Kenney High Power Solid-State Power Amplifiers for Airborne and Space Applications in Remote Sensing and Communications Mark Koker, Edward Watkins, Naresh Deo A Wideband Diplexer using Multilayer Inductors for Compact Wireless LTCC Modules Shinpei Oshima, Takana Kaho, Yo Yamaguchi, Hiroyuki Shiba, Tadao Nakagawa New Multi-Way SIW Power Dividers with High Isolation Zheng Liu, Gaobiao Xiao Blind Adaptive Arrays with Subcarrier Transmission Power Assignment for Spectrum Superposing Kazuki Maruta, Jun Mashino, Takatoshi Sugiyama 79 GHz-band Wide field-of-view Radar System Performance in Outdoor for Pedestrian Detection Tadashi Morita, Takaaki Kishigami, Hidekuni Yomo, Makoto Yasugi, Yoichi Nakagawa Channel and Antenna Effects on the Performance of a 60 GHz UWB Impulse Transceiver Cherif Hamouda, Benoit Poussot, Martine Villegas, Jean-Marc Laheurte Radiation Pattern Measurement Assembly for Millimeter-Wave Antenna by Flip-Chip Interconnect and End Launch Connector Hsin-Chia Lu, Yi-Long Chang Dual Polarized Open-Ended Waveguide with Polarization-Independent Parasitic Elements Takashi Maruyama, Akimichi Hirota, Hiroyuki Matsumura, Tomohiro Takahashi, Toru Takahashi, Masataka Otsuka, Hiroaki Miyashita Manipulating MIMO Propagation Environment Using Tunable **Passive Repeater** Naoki Honma, Yuta Takahashi, Yoshitaka Tsunekawa

the recipients at the APMC 2014 Award Banquet to be held on Thursday, November 6, 2014.

The APMC2014 Prize Award Committee has identified the following papers as Finalists in the APMC 2014 Prize and the APMC 2014 Student Prize. The finalists must join the Award Banquet. The list below provides paper titles and author names.

## **APMC 2014 Student Prize Finalists**

Design of a K-Band Power Amplifier for High Gain, Output Power and Efficiency on 0.18- $\mu$ m SiGe BiCMOS Process

Kyoungwoon Kim, Cam Nguyen

Density Estimation Models for Strong Nonlinearities in RF Power Amplifiers

Zain Ahmed Khan, Efrain Zenteno, Magnus Isaksson, Peter Händel

The Experimental Study of THz Image Sensor in 0.18 µm CMOS Technology

Chih-Wei Lai, Wei-Cheng Chen, Tzu-Chao Yan, Chun-Hsing Li, Chien-Nan Kuo

A Lossy Triple-mode Microstrip Filter with Flat Passband Based on Nonuniform *Q*-Factors

Feng-Jun Chen, Lin-Sheng Wu, Jun-Fa Mao

Microstrip Lowpass Filters with Improved Frequency Responses Using Coupled-Line Hairpin Resonators

Junichi Tsurumi, Zhewang Ma, Masataka Ohira

A Quasi-Millimeter Wave Band Phase Shifter with MEMS Shunt Switches

Takuto Watanabe, Ryota Yamazaki, Takashi Furutsuka, Shuji Tanaka, Kenichiro Suzuki

61 GHz ISM Band FMCW Radar For Applications Requiring High Accuracy

Steffen Scherr, Serdal Ayhan, Heiko Gulan, Mario Pauli, Thomas Zwick

A Low-Power W-Band Receiver MMIC for Amplitude Modulated Wireless Communication up to 24 Gbit/s

Fabian Thome, Stephan Maroldt, Michael Schlechtweg, Oliver Ambacher

Precise Phase Measurement of Continuous Terahertz-wave Based on Balanced Self-heterodyne Technique and Its Application to Phase-contrast Imaging

Yuki Koda, Shintaro Hisatake, Jae-Young Kim, Akihiko Hirata, Katsuhiro Ajito, Tadao Nagatsuma

Miniaturized 6-port MIMO Antenna Using T-shaped Planar Inverted-F Antennas and Capacitor-loaded Notch Antennas

Kazuya Takahashi, Naoki Honma, Kentaro Murata, Yoshitaka Tsunekawa

A Circularly Polarized Antenna Array with Integrated Calibration Probes

Benjamin Rohrdantz, Alexander Stark, Esam Hawamdah, Arne F. Jacob

A Low-cost High Gain Substrate Integrated Waveguide Fed Patch Antenna Array for 60-GHz Applications

Yujian Li, Kwai-Man Luk

All the presentations at the Special Sessions have been invited by the APMC 2014 Technical Program Committee. The details of each Special Session are written in the Program of the "TECHNICAL SESSIONS (Oral Sessions)" (See pages 12–23).

## Wednesday Special Sessions

WE3F: Space Microwave Wireless and Sensing Technology Chairs: Shigeo Kawasaki, ISAS/JAXA, JAPAN Imran Mehdi, JPL/NASA, U.S.A.

Abstract: For the remote sensing, highly sensitive microwave devices and circuits in the satellite is requested. While, high efficiency and high power transmitter with compact size is needed for a deep space communication. In addition, the wireless sensor without a battery is recently proposed for health monitoring in the space craft using microwave power transmission technology. In this session, devices for astronomy, remote sensing, the deep space communication system are introduced. Further, space microwave power transmission and energy harvesting conducted by the highly performed and compact devices, circuits and antennas are discussed.

**WE4A**: Let Us Talk and Share Ideas for Increasing Women in APMC – Women in Engineering (WIE) –

Chairs: Mayumi Matsunaga, Ehime Univ., JAPAN

Qiaowei Yuan, Sendai National College of Tech., JAPAN

Abstract: The APMC WIE Session is open to all conference participants. We invite the people who agree with our scopes of interest that include increasing women participants to APMC and improving the status of women in engineering and science. Let us talk and share the ideas for increasing women in APMC over wonderful local dessert and beverages.

Ms. Sherry Hess, Vice President of Marketing at AWR Division of National Instruments, will make key speech to bring you the chance to think the question "How can we attract more females into microwave engineering as a profession?"

WE4B: GaN Focus Session I : RF GaN Status and Future Chairs: Toshihide Kikkawa, Transphorm Japan, JAPAN Joachim Würfl, Ferdinand-Braun-Institut, GERMANY

Abstract: This GaN focus invited session concentrates on the GaN RF device development. This session opens with a presentation from Sumitomo Electric, which focuses on GaN device development history and future for wireless communications. Next, WIN Semiconductors review the GaN MMIC foundry business model from L-band to Ka-band. Finally, Toshiba focuses on the effect of high power density and high breakdown voltage of GaN HEMT for C-band to X-band.

## **Thursday Special Sessions**

TH1F: Japanese Industrial Session

Chairs: Ken Takei, Hitachi Ltd., JAPAN Koji Yamanaka, Mitsubishi Electric Corp., JAPAN

Abstract: In this session, researches and developments in Japanese microwave industries are given. Examples of active and passive microwave components employed in wireless communication systems and satellite communication systems will be shown in the session.

## TH2A: EuMA Special Session

Chairs: Wolfgang Heinrich, FBH at Berlin, GERMANY Atsushi Sanada, Yamaguchi Univ., JAPAN

Abstract: The EuMA Special Session introduces recent European activities in evolutionary microwave research and development, including carbon based ballistic RF electronics, the class-S power amplifier, and detailed study of the instability mechanism in power amplifiers.

**TH2D**: Small-Scale Communication and Sensing Systems Chairs: Yifan Chen, SUSTC, CHINA Tadashi Nakano, Osaka Univ., JAPAN

Abstract: This Special Session is devoted to the principles, design, modeling, and analysis of communication and sensing systems for small-scale applications. This includes, but not limited to: molecular, mm-Wave, THz, optical, micro/nanorobotic and other physical, chemical and biological techniques; as well as novel communication and sensing techniques at small length scales. The following topics will be addressed: antennas and propagation; channel and system modeling; system architecture and protocol design; information-, communication- or network-theoretic analysis; implementations and laboratory experiments; biological, medical or industrial applications, etc.

**TH2E**: National ICT R&D Projects in Japan *Chairs*: Naomichi Numata, *Open Univ. of Japan, JAPAN* Noriharu Suematsu, *Tohoku Univ., JAPAN* 

Abstract: This focused session introduces recent wireless information communication technology (ICT) R&D projects supported by the ministry of internal affairs and communication (MIC) of Japanese government. IC chip level noise reduction technology for highly integrated RFIC for cellular phones, millimeter-wave radar/compact range communication technologies and multi-mode Software Defined Radio (SDR) Very Small Aperture Terminal (VSAT) system/devices are reviewed.

TH2F: Advanced Microwave Technologies in East Asia Chairs: Zhewang Ma, Saitama Univ. JAPAN Yo Yamaguchi, NTT Corp., JAPAN

Abstract: In this session, advanced microwave papers from Japan and China in which the APMC 2014 and APMC 2015 will be held are presented. The first paper investigates digital predistortion compensation technologies for base stations. The second paper proposes GaN devices in infrastructure systems. The third paper demonstrates an energyefficient concurrent dualband transmitter. The fourth paper present low cost THz components.

**TH3C**: Advances in Far-Field Wireless Power Transfer Systems *Chairs*: Naoki Shinohara, *Kyoto Univ., JAPAN* Apostolos Georgiadis, *CTTC, SPAIN* 

Abstract: State-of-the-art performance and novel challenges associated with wireless power transfer systems will be presented, including rectenna optimization and signal design for WPT.

**TH3E**: Millimeter-Wave Communication and Radar Systems *Chairs*: Minoru Fujishima, *Hiroshima Univ., JAPAN* Kenjiro Nishikawa, *Kagoshima Univ., JAPAN* 

Abstract: Millimeter-wave communication and radar systems session focuses on two emerging applications of high-speed communication and radar systems using advanced millimeter-wave CMOS circuits. This session opens with presentations for advanced high-speed communication with 60 GHz band. Next two presentations will discuss short-range radar systems recently allocated with 79 GHz band.

TH3F: Recent R&D Topics in East Asia Chairs: Wenhua Chen, Tsinghua Univ., CHINA Wei Hong, Southeast Univ., CHINA

Abstract: This session introduces recent R&D topics of outstanding universities in East Asia, National Taiwan University, Southeast University, University of Electronic Science and Technology of China (UESTC), and Korea Advanced Institute of Science and Technology (KAIST).

**TH4A**: Resilient ICT Session for Disaster Relief *Chairs*: Hiromitsu Wakana, *NICT, JAPAN* Takashi Hirose, *NTT Corp., JAPAN* 

Abstract: The Great East Japan Earthquake of March 11, 2011 caused severe disruption of telecommunication networks, and the failure of information gathering and delivery systems. This session will provide several perspectives on the challenges for disaster relief by resilient information and communications technologies.

TH4C: Near Field and Grid Solutions for Wireless Power Transfer

Chairs: Apostolos Georgiadis, CTTC, SPAIN Naoki Shinohara, Kyoto Univ., JAPAN

Abstract: This session focuses on novel applications and near field circuits and systems for wireless power transfer.

TH4E: Outstanding Asian Young Researchers Chairs: Kenji Itoh, Kanazawa Inst. of Tech., JAPAN Monai Krairiksh, KMITL, THAILAND

Abstract: In this session, five young researches presents their papers. The first paper demonstrates a 60-GHz sub-sampling PLL. The second paper investigates metasurface on microstrip-fed antennas. The third paper discusses about a multiband antenna with frequency selective fractional surface reflector. The fourth paper proposes effective beam forming of phased array antenna. The fifth paper will be presented by a winner of the IEEE MTT-S Japan Young Engineer Award.

## **Friday Special Sessions**

**FR1A**: Future Mobile and Wireless Communication Systems *Chairs*: Jun-ichi Takada, *Tokyo Inst. of Tech., JAPAN* Takana Kaho, *NTT Corp., JAPAN* 

Abstract: Mobile and Wireless communication systems have been developing rapidly. The evolusion affect research and development of microwave technologies with special severity. This session foucuses remarkable systems; the fifth generation (5G) cellular systems, advances wireless LAN systems, and white space communication systems.

**FR1B**: GaN Focus Session II : Power GaN Status and Future Chairs: Toshihide Kikkawa, Transphorm Japan, JAPAN Wohlmuth Walter, WIN Semiconductors Corp., JAPAN

Abstract: This GaN focus invited session part 2 concentrates on the GaN power device development for power conversion. This session opens with a presentation from FBH, which focuses on both power and RF GaN device development in Europe. Next, Bristol University reviews the GaN thermal management, which focuses on several substrates such as a GaN substrate and Diamond. Finally, Toyota reveals the automotive applications using GaN power devices.

**FR1D**: Doppler Radar for Smart Buildings and Mobile Health *Chairs*: Victor Lubecke, *Univ. of Hawaii, U.S.A.* Orga Boric-Lubecke, *Univ. of Hawaii, U.S.A.* 

Abstract: Advances in wireless and computational integrated circuits have made possible a growing range of research into the use of scattered radio waves to ascertain biomedical information from subjects to enable automated benefits in resource management and healthcare beyond the doctor's office. This session will present an overview of recent trends and achievements in the use of Doppler radar for measurements, classification, and diagnostics of biomedical phenomena to provide benefits from energy savings and assisted living to health diagnostics.

### **FR2A**: Historical Review of Microwave Devices in Japan Chairs: Kunio Sawaya, Tohoku Univ., JAPAN Yoshihiko Konishi, Hiroshima Inst. of Tech., JAPAN

Abstract: Research on microwave devises such antennas and microwave-tubes in Japan has a long history, especially in Tohoku University, Sendai. In this session, historical review of the research and development of linear antennas such as the Yagi-Uda antenna and microwave-tubes such as the split anode magnetron in Tohoku University is presented. Research and development of the phased array antennas for sevral applications in Japan is also introduced.

FR3B: ET & EER Technologies

Chairs: Donald Kimball, MaXentric Technologies LLC, U.S.A. Shinjo Shintaro, Mitsubishi Electric Corp., JAPAN

Abstract: This special session overviews recent distortion compensation techniques suitable for enhancing operating efficiency in PAs. The first paper discusses DSP techniques for linearity and efficiency enhancement of multi-band ET transmitters. The second paper introduces design examples on Sibased ET PAs for broadband wireless applications. The third paper focuses on a multi-band/multi-mode CMOS ET transmitter for WCDMA/LTE applications. The last paper reports on design techniques for an EER PA. FR3E: Millimeter-Wave and THz Tranceivers and Building Blocks

Chairs: Minoru Fujishima, Hiroshima Univ., JAPAN Huei Wang, National Taiwan Univ., TAIWAN

Abstract: Millimeter-wave and THz transceivers and building blocks session focuses on future prospects of ultrahigh-frequency integrated circuits for high-speed communication and sensing. The first paper discusses future prospects of CMOS high-speed communication. Next, two papers will discuss 300 GHz band wireless communication with InP HEMT process. Lastly, THz imaging is demonstrated with Si-based integrated circuits.

FR4R (Rump Session): Recent Progress in Wireless Power Transfer Systems

Chair: Shoichi Narahashi, NTT DOCOMO, INC., JAPAN

Abstract: This session provides a forum with a relaxed atmosphere to discuss further prospects and challenges of wireless power transfer systems. The session offers three invited speakers in these technological fields. Topics of the session comprise a design criterion for enhancing the maximum available efficiency of wireless power transfer systems, a mobile wireless power transfer system using transmission-line coupling, and wireless power transmission techniques for mobile applications.

## Wednesday, November 5

Chairs: S. Kahng, Univ. of Incheon, KOREA

Mode and HE118 Mode Dielectric Rod Resonators

**Multifunctional Filters** 

Ltd., JAPAN, <sup>2</sup>Utsunomiya Univ., JAPAN

Coupled Stepped Impedance Resonators

TAIWAN, <sup>2</sup>National Cheng Kung Univ., TAIWAN

Quad-Mode Stub-Load Resonators

## Room A (Tachibana) 2nd Floor **Session WE1A**

K. Satoh, NTT DOCOMO, INC., JAPAN

A Study on a BPF with Dual-Pass Bands Using EH118

R. Tanaka<sup>1</sup>, T. Shimizu<sup>2</sup>, Y. Kogami<sup>2</sup>, <sup>1</sup>Nihon Dengyo Kosaku Co.

Compact Dual-Band Bandpass Filter Using Inductive-

C.-C. Lin1, Y.-F. Chen2, H.-W. Wu1, H.-Y. Lee2, Kun Shan Univ.,

A Compact Eight-Channel Microstrip Quadruplexer Using

B.-H. Tseng, S.-F. Chang, C.-Y. Lin, C.-F. Chen, Tunghai Univ.,

## 9:30 - 11:10

Room B (Hagi) 2nd Floor

## Session WE1B

**Couplers and Power Dividers I** 

Chairs: H. Miyashita, Mitsubishi Electric Corp., JAPAN

> S. Sun, The Univ. of Hong Kong, HONG KONG

#### WE1B-1

Compact and Dual-Band Arbitrary Power-Split Quadrature Coupler Using the Composite Right/Left-Handed Transmission Line

P.-L. Chi, W.-Y. Chang, National Chiao Tung Univ., TAIWAN

#### **WE1B-2**

Miniaturized Dual-Band Ring Coupler with Arbitrary Power Divisions Using Composite Right/Left-Handed Transmission Lines

P.-L. Chi, P.-W. Huang, National Chiao Tung Univ., TAIWAN

WE1B-3

#### A Circuit Construction of Parallel Ring-Line Rat-Race Circuit with Very Loose Coupling Utilizing CRLH-TLs

T. Kawai<sup>1</sup>, Y. Daimon<sup>1</sup>, A. Enokihara<sup>1</sup>, I. Ohta<sup>1</sup>, K. Satoh<sup>2</sup>, Y. Suzuki<sup>2</sup>, H. Okazaki<sup>2</sup>, S. Narahashi<sup>2</sup>, <sup>1</sup>Univ. of Hyogo, JAPAN, <sup>2</sup>NTT DOCOMO, INC., JAPAN

#### **WE1B-4**

**WE1B-5** 

Design of Impedance Transforming 90 Degree Patch Hybrid Couplers

Analysis on Rejection Band for a Practical Broadband

D. Endo, A. Saitou, R. Ishikawa, K. Honjo, The Univ. of Electro-

Balun Using an Asymmetric Coupled-Line in Free Space

X. Jing, S. Sun, The Univ. of Hong Kong, HONG KONG

TAIWAN

WE1A-4

WE1A-1

WE1A-2

WE1A-3

A Dual-Band 180° Hybrid Coupler with a Filter Response Y.-C. Lee, Y.-H. Pang, H.-C. Huang, National Univ. of Kaohsiung, TAIWAN

#### WE1A-5

Reconfigurable Bandpass Filter with Very High Skirt Selectivity Using Lumped Element Dual-Behavior Resonators X. Lu, K. Mouthaan, Y.T. Soon, National Univ. of Singapore, SINGAPORE

Wednesday, November 5

## 11:30 - 13:10

Communications, JAPAN

## Room H (Main Hall) 2nd Floor Session WE2 Opening Ceremony

## **Opening Ceremony**

Keynote Address: Challenges Toward Spectrum-Energy Efficient Gigabit Wireless Networks

Speaker: Fumiyuki Adachi, Professor of Communications Engineering, Graduate School of Engineering, Tohoku University, JAPAN

### Abstract :

Wireless traffic volume has been increasing explosively. To cope with this under limited available wireless bandwidth and energy, wireless networks need to be significantly reorganized. In this talk, we will get an overview of the wireless technology advancement during the last three decades and will discuss about technical issues for spectrum-energy efficient gigabit wireless networks. As one promising solution, the concept of the distributed antenna network is introduced.

### **Biography**:

Fumiyuki Adachi received the B.S. and Dr. Eng. degrees in electrical engineering from Tohoku University, Sendai, Japan, in 1973 and 1984, respectively. In April 1973, he joined the Electrical



Communications Laboratories of NTT and conducted various fundamental researches on digital cellular mobile communications. From July 1992 to December 1999, he was with NTT DoCoMo, where he led a research group on Wideband CDMA for 3G mobile networks. Since January 2000, he has been with Tohoku University, Sendai, Japan, where he is a Professor at

the Dept. of Communications Engineering, Graduate School of Engineering. His research interest includes wireless access, equalization, transmit/receive antenna diversity, adaptive transmission, channel coding, etc. He is an IEEE Fellow and an IEICE Fellow. He was a recipient of the IEEE Vehicular Technology Society Avant Garde Award 2000, IEICE Achievement Award 2002, Thomson Scientific Research Front Award 2004, Ericsson Telecommunications Award 2008, Telecom System Technology Award 2010, Prime Minister Invention Award 2010, and KDDI Foundation Excellent Research Award 2012.

## Room C (Shirakashi 1) 3rd Floor

## Session WE1C

## **Broadband and Multiband Antennas I**

Chairs: K. Noguchi, Kanazawa Inst. of Tech., JAPAN

M. Taguchi, Nagasaki Univ., JAPAN

#### WE1C-1

Beam-Steerable Wideband Circularly Polarized Helical Antenna Array Based on Sequential Rotation Technique W.-C. Chen, C.-H. Chiu, T.-C. Tsai, S.-Y. Chen, National Taiwan Univ., TAIWAN

#### WE1C-2

Proposal of Wideband Reconfigurable Circular-Polarized Single-Port Antenna

N. Usami, A. Hirose, The Univ. of Tokyo, JAPAN

#### WE1C-3

Proposal of Compact Folded Tapered Slot Antenna for UŴB

K. Kikuta, A. Hirose, The Univ. of Tokyo, JAPAN

#### WE1C-5

Compact Broadband Circularly Polarized U-Slot Microstrip Antenna

X. Ye, M. He, P. Zhou, C. Zhang, H. Sun, Beijing Inst. of Tech., CHINA

## Room D (Shirakashi 2) 3rd Floor

## **Session WE1D**

Waveguide and Transmission-Line Structures Chairs: F. Kuroki, Kure National College of

Tech., JAPAN K. Wu, Chinese Univ. of Hong Kong,

## HONG KONG

WE1D-1 Transmission Properties of Full-Mode and Half-Mode Folded Corrugated SIW

K.W. Eccleston, Univ. of Canterbury, NEW ZEALAND

#### **WE1D-2**

Floating Connector for Surface Integrated Waveguide Components and Its Extended Applications

A. Stefanescu<sup>1</sup>, V. Buiculescu<sup>1</sup>, I. Giangu<sup>1,2</sup>, <sup>1</sup>IMT Bucharest, ROMANIA, <sup>2</sup>Politehnica Univ., ROMANIA

#### WE1D-3

Fabrication of 180GHz PTFE-Filled Waveguide and Its Bandpass Filters by SR Direct Etching

M. Kishihara<sup>1</sup>, R. Sasaki<sup>2</sup>, T. Yamamoto<sup>2</sup>, A. Yamaguchi<sup>2</sup>, Y. Utsumi<sup>2</sup> I. Ohta2, 10kayama Prefectural Univ., JAPAN, 2Univ. of Hyogo, JAPAN

#### **WE1D-4**

Design and Evaluation of Realizable and Compact Low-Impedance Transmission Lines for Two Top-Metal-Layer Semiconductor Processes P. Pahl<sup>1</sup>, S. Dieboldy<sup>2</sup>, S. Krause<sup>1</sup>, H. Gulan<sup>1</sup>, M. Pauli<sup>1</sup>, H. Masslerz<sup>3</sup>,

A. Leutherz<sup>3</sup>, I. Kallfassx<sup>4</sup>, T. Zwick<sup>1</sup>, <sup>1</sup>KIT, IHE, GERMANY, <sup>2</sup>Osaka Univ., JAPAN, <sup>3</sup>IAF, GERMANY, <sup>4</sup>Univ, of Stuttgart, GERMANY

#### **WE1D-5**

Suppression of Parasitic Surface Conduction in Au-compensated High Resistivity Silicon for 40-GHz RF-MMIC Application

N.Z.I. Hashim, A. Abuelgasim, C.H.D. Groot, Univ. of Southampton, UK

## Room E (Meeting Room 1) 1st Floor **Session WE1E**

9:30 - 11:10

### **Advanced Passive Components and Tunable** Devices

Chairs: A. Sanada, Yamaguchi Univ., JAPAN J. Machac, Czech Technical Univ. in Prague, CZECH REPUBLIC

WE1E-1 A High Quality Factor Bulk-CMOS Switch-Based Digitally Programmable RF Capacitor

A. Thomas<sup>1,2</sup>, Wi. Bakalski<sup>1</sup>, W. Simbürger<sup>1</sup>, R. Weigel<sup>2</sup>, <sup>1</sup>Infineon Tech. AG, GERMANY, <sup>2</sup>Univ. of Erlangen Nuremberg, GERMANY

#### WE1E-2

Piezoelectric Characteristics of CMOS Compatible AlN SAW Resonators

A.A.M. Ralib<sup>1</sup>, M.S. Pandian<sup>2</sup>, E.M. Ferrer<sup>2</sup>, C.T. Song<sup>2</sup>, M. Shunmugam<sup>2</sup>, A.A.B. Zainuddin<sup>2</sup>, A.N. Nordin<sup>1</sup>, <sup>1</sup>International Islamic Univ. Malaysia, MALAYSIA, <sup>2</sup>Silterra Malaysia, MALAYSIA

#### WE1E-3

A Quasi-Millimeter Wave Band Phase Shifter with MEMS Shunt Switches

T. Watanabe<sup>1</sup>, R. Yamazaki<sup>1</sup>, T. Furutsuka<sup>1</sup>, S. Tanaka<sup>2</sup>, K. Suzuki<sup>1</sup>, <sup>1</sup>Ritsumeikan Univ., JAPAN, <sup>2</sup>Tohoku Univ., JAPAN

#### **WE1E-4**

Substrate-Integrated Waveguide (SIW) Out-of-Phase T-Junction K.W. Eccleston, Univ. of Canterbury, NEW ZEALAND

#### WE1E-5

A Broadband Waveguide to Substrate Integrated Coaxial Line (SICL) Transition for W-Band Applications

M. Jiang, W. Hong, Y. Zhang, H. Zhou, Southeast Univ., CHINA

## Wednesday, November 5

Room F (Meeting Room 2) 1st Floor

## **Session WE1F**

## **Electromagnetic Compatibility**

Chairs: S. Ishigami, NICT, JAPAN T. Tobana, Akita Prefectual Univ., JAPAN

#### WE1F-1

Influence of Load Imbalance on Noise Induced in a Twisted-Wire Pair Illuminated by a Random Plane-Wave Spectrum

G. Spadacini, F. Grassi, S.A. Pignari, Politecnico di Milano, ITALY

#### WE1F-2

Characteristics on Negative Group Delay of Embedded Multi-Stage F-SIR Type Transmission Line Structure with Open Stub Resonator

Y. Kayano<sup>1</sup>, X. Yang<sup>1</sup>, H. Inoue<sup>2</sup>, <sup>1</sup>Akita Univ., JAPAN, <sup>2</sup>The Open Univ. of Japan, JAPAN

#### WE1F-3

Modal Analysis on Insulated Loop Antenna Immersed in Liquid

N. Ishii<sup>1,2</sup>, L. Hamada<sup>2</sup>, S. Watanabe<sup>2</sup>, <sup>1</sup>Niigata Univ., JAPAN, <sup>2</sup>NICT, JAPAN

Y. Hasegawa<sup>2</sup>, <sup>1</sup>Aoyama Gakuin Univ., JAPAN, <sup>2</sup>Toshiba Corp., JAPAN

## 11:30 - 13:10

Wednesday, November 5

**Special Talk**: Life in Space and Wireless Technology

### Speaker : Naoko Yamazaki, Astronaut

### Abstract :

Based on the experience onboard the International Space Station (ISS) and Space Shuttle Discovery, the way we live in space will be introduced, as well as how wireless technology contributes to missions onboard, expecting more advanced wireless technology will help our lives in space in a more robust and efficient way.



#### **Profile** :

Naoko Yamazaki earned a Master of Science degree majored in Aerospace Engineering from the University of Tokyo in 1996, then started working for Japan Aerospace Exploration Agency (JAXA). In 1999, she was selected as an astronaut candidate and was qualified as a Soyuz-TMA Flight Engineer in 2004 and NASA

Mission Specialist in 2006. On April 5, 2010 Yamazaki was onboard Space Shuttle Discovery on the crew of STS-131, an assembly & resupply mission to the International Space Station. She retired from JAXA in 2011 and has been serving as a member of Japan Space Policy Committee and an adviser of Young Astronaut Club (YAC), etc.

**WE1F-4** 

Downsizing of LPDA for Radiation EMI Measurement M. Nagasawa<sup>1</sup>, Y. Kurosawa<sup>1</sup>, R. Suga<sup>1</sup>, O. Hashimoto<sup>1</sup>, T. Yasuzumi<sup>2</sup>,

#### **WE1F-5**

Dynamics of Electromagnetic Noise Radiations Caused by Air-discharge ESD in Spheroidal Metal Objects K. Fujita, Fujitsu Ltd., JAPAN

## Wednesday, November 5

Chairs: C.-P. Chen, Kanagawa Univ., JAPAN

Wideband Filters and Couplers

## Room A (Tachibana) 2nd Floor **Session WE3A**

K. Kawai, NTT DOCOMO, Inc, JAPAN

## 14:30 - 16:30

Room B (Hagi) 2nd Floor

## Session WE3B

**Distortion Compensation Techniques** Chairs: S. Yamanouchi, NEC Corp., JAPAN

D.Y.C. Lie, Texas Tech Univ., U.S.A.

## Room C (Shirakashi 1) 3rd Floor

#### Session WE3C

Microwave Antennas for Medical Applications

K. Ito, K. Saito, Chiba Univ., JAPAN

USV-MUSIC Algorithm

Univ., JAPAN, 2ITS, INDONESIA

Array Signal Processing and Antenna Measurements Chairs: M. Fujimoto, Univ. of Fukui, JAPAN N. Ishii, Niigata Univ., JAPAN

DOA Estimation of Linear Patch Antenna Array Using

V. Rahayu<sup>1,2</sup>, K. Yokokawa<sup>1</sup>, Q. Chen<sup>1</sup>, Y.H. Pramono<sup>2</sup>, <sup>1</sup>Tohoku

A Study on the S-Parameter Method Compensated by the

T. Sasamori, T. Tobana, Y. Isota, Akita Prefectural Univ., JAPAN

Loop Calibrator for DBF Receiver Array at Ka-Band

M.N. Pham, A.F. Jacob, Tech. Univ. Hamburg-Harburg, GERMANY

Radiation Pattern Measurement Assembly for Millimeter-

Wave Antenna by Flip-Chip Interconnect and End Launch

H.-C. Lu, Y.-L. Chang, National Taiwan Univ., TAIWAN

#### WE3B-1

#### High Efficiency Envelope Tracking Power Amplifiers for Wide Modulation Bandwidth Signals

D. Kimball, T. Nakatani, J. Yan, P. Theilmann, I. Telliez, MaXentric Tech. LLC, U.S.A.

#### **WE3A-2**

WE3A-1

A Wideband Diplexer Using Multilayer Inductors for Compact Wireless LTCC Modules

Advanced Microwave Filters in LTCC and PCB Technologies

D. Kholodnyak, V. Turgaliev, E. Vorobev, LETI, RUSSIAN FEDERATION

S. Oshima<sup>1</sup>, T. Kaho<sup>2</sup>, Y. Yamaguchi<sup>2</sup>, H. Shiba<sup>2</sup>, T. Nakagawa<sup>2</sup>, <sup>1</sup>Oyama National College of Tech., JAPAN, <sup>2</sup>NTT Corp., JAPAN

## WE3A-3

Broadband Planar Magic-T with Marchand Type Power Divider and Balun

P.-J. Chou<sup>1</sup>, P.-C. Lin<sup>2</sup>, Y.-W. Lin<sup>1</sup>, J.-C. Lu<sup>2</sup>, C.-Y. Chang<sup>1</sup>, <sup>1</sup>National Chaio-Tung Univ., TAIWAN, 2TSMC, TAIWAN

#### WE3A-4

Performance Enhancement of Miniaturized UWB Bandpass Filter

R.T. Hammed<sup>1</sup>, D. Mirshekar-Syahkal<sup>2</sup>, <sup>1</sup>Univ. of Tech., IRAQ, <sup>2</sup>Univ. of Essex, U.K.

#### WE3A-5

Reconfigurable UWB Bandpass Filter with Flexible Notch Characteristics

K. Dhwaj, C.-T.M. Wu, T. Itoh, UCLA, U.S.A.

#### **WE3B-2**

Linearization of CMOS Triple Cascode Push-Pull Power Amplifiers by Second Harmonic Feedback

K. Terajima<sup>1</sup>, K. Fujii<sup>1</sup>, T. Sonoda<sup>1</sup>, T. Takagi<sup>2</sup>, E. Nakayama<sup>2</sup>, S. Kameda<sup>2</sup>, N. Suematsu<sup>2</sup>, K. Tsubouchi<sup>2</sup>, <sup>1</sup>Wave Tech. Inc., JAPAN, <sup>2</sup>Tohoku Univ., JAPAN

## WE3B-3

A Low Distortion Doherty Amplifier by Using Tanh Function Gate Bias Control

. Komatsuzaki, H. Otsuka, K. Yamanaka, Y. Hamamatsu, K. Shirae. H. Fukumoto, Mitsubishi Electric Corp., JAPAN

#### **WE3B-4**

A Fast, Accurate and Digitally Calibrate-Able Logarithmic Amplifier for Analog-Predistortion Power Amplifiers M. Cho, J.S. Kenney, Georgia Inst. of Tech., U.S.A

#### WE3B-5

Density Estimation Models for Strong Nonlinearities in RF Power Amplifiers

Z.A. Khan<sup>1</sup>, E. Zenteno<sup>1</sup>, M. Isaksson<sup>2</sup>, P. Händel<sup>1</sup>, <sup>1</sup>Univ. of Gävle,

## Wednesday, November 5

#### Room A (Tachibana) 2nd Floor

### Session WE4A

## Let Us Talk and Share Ideas for Increasing Women

in APMC - Women in Engineering (WIE) -Chairs: M. Matsunaga, Ehime Univ., JAPAN

Q. Yuan, Sendai National College of Tech., JAPAN

#### WE4A-1

Women in Engineering

S. Hess, NI AWR Group., U.S.A.

#### WE4A-2

Prototype of Mini 4WD Supplied by Wireless Power

Q. Yuan, Sendai National College of Tech., JAPAN

#### WE4A-3

A Farewell to Prejudice, Have an Original Idea for Novel Antenna Technologies and Active Women Therein M. Matsunaga, Ehime Univ., JAPAN

WE4A-4 Round-Table Discussion

# 16:50 - 18:30

## Room B (Hagi) 2nd Floor

### **Session WE4B**

GaN Focus Session I : RF GaN Status and Future Chairs: T. Kikkawa, Transphorm Japan, JAPAN J. Wurfl, Ferdinand - Braun - Institut, GERMANY

#### WE4B-1

#### Consistent Growth and Successive Development of GaN-HEMT for Wireless Communication

H. Deguchi, K. Ebihara, Y. Hasegawa, Sumitomo Electric Device Innovations, Inc., JAPAN

#### WE4B-2

Pure-Play GaN Foundry Technology for RF Applications

C.-K. Lin, J.-H. Du, A. Wang, S.-W. Peng, C.-H. Chen, C.-H. Chen, T.-Y. Chou, W.-C. Wang, J.-S. Wu, R. Kuo, C. Huang, I.-T. Cho, W. Wohlmuth, S. Takatani, WIN Semiconductors Corp., TAIWAN

#### **WE4B-3** GaN HEMTs are Still Ongoing

K. Takagi, Toshiba Corp., JAPAN

# Room C (Shirakashi 1) 3rd Floor

### **Broadband and Multiband Antennas II**

#### WE4C-1

Low RCS, High-Gain and Wideband Mushroom Antenna Using Frequency Selective Surface

Y. Jia, Y. Liu, S. Gong, Xidian Univ., CHINA

#### WE4C-2

Phasing Element for Single-Layered Wideband Reflectarray Antenna

S. Tao, Y. Wang, A. Abbosh, Univ. of Queensland, AUSTRALIA

#### WE4C-3

Bow-Tie Patch Antenna with Complementary Edge Couple Split Ring Resonator (EC-SRR) for 2.4GHz Application H. Nornikman<sup>1</sup>, M.R. Kamarudin<sup>2</sup>, B.H. Ahmad<sup>1</sup>, S.A. Rosli<sup>1</sup>, M.Z.A AbdAziz<sup>1</sup>, A.R. Othman<sup>1</sup>, <sup>1</sup>UTeM, MALAYSIA, <sup>2</sup>UTM, MALAYSIA

#### WE4C-4

Compact Dual-Band Reconfigurable CPW Antenna with Varactor Diodes

S.-A. Yang, S.-Y. Chen, National Taiwan Univ., TAIWAN

#### WE4C-5

A Compact Dual Band-Notched Fractal Antenna for UWB Application

S. Tripathi<sup>1</sup>, A. Mohan<sup>2</sup>, S. Yadav<sup>1</sup>, <sup>1</sup>IIT Jodhpur, INDIA, <sup>2</sup>IIT Kharagpur, INDIA

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- SWEDEN, <sup>2</sup>KTH Royal Inst. of Tech., SWEDEN

## Session WE4C

T. Sasamori, Akita Prefectural Univ., JAPAN

WE3C-1

WE3C-2

WE3C-3

WE3C-4

WE3C-5

Connector

Short-Correction

Chairs: T. Ito, Toshiba Corp., JAPAN

## 14:30 - 16:30

## Room E (Meeting Room 1) 1st Floor Session WE3E

### THz and Millimeter-Wave Integrated Circuit Technology

Chairs: M. Madihian, Drexel Univ., U.S.A. M. Je, DGIST, KOREA

#### WE3E-1

Room D (Shirakashi 2) 3rd Floor

Session WE3D **Metamaterials and Periodic Structures I** 

Chairs: T. Ueda, Kyoto Inst. of Tech., JAPAN Z. Hu, Univ. of Manchester, U.K.

Evolution of Circularly Polarized Composite Right/Left-

Experimental Characterization of Volume-Mode Waves in

Near-Field Anisotropic Metamaterials with Application to

M.J. Chabalko<sup>1</sup>, W.C. Harris<sup>2</sup>, D.D. Stancil<sup>2</sup>, D.S. Ricketts<sup>2</sup>, <sup>1</sup>Carnegie

Enhancement of Phase Nonreciprocity in Microstrip-Line-

K. Enomoto<sup>1</sup>, T. Ueda<sup>1</sup>, T. Itoh<sup>2</sup>, <sup>1</sup>Kyoto Inst. of Tech., JAPAN,

Planar Microwave Frequency Splitter and Coupler Based

Room D (Shirakashi 2) 3rd Floor

**Session WE4D** 

Chairs: P.-L. Chi, National Chiao Tung Univ.,

Constitution of Left-Handed Waveguide Using Cutoff TM

Left Handed Signal Responses from Dielectric-Ferrite

Polarization and Angle of Incidence Insensitive THz

Metamaterial Absorber Based on Rotationally Asymmetric

M. Zhan<sup>1,2</sup>, X. Xie<sup>2</sup>, Z. Wang<sup>1,2</sup>, <sup>1</sup>Boston Univ., U.S.A., <sup>2</sup>UESTC, CHINA

A. Hirota, Mitsubishi Electric Corp.,

**Metamaterials and Periodic Structures II** 

TAIWAN

JAPAN

WE4D-1

**WE4D-2** 

**WE4D-3** 

Striplines

WE4D-4

Cell

Circuit Applications

D.D. Colin, Z. Hu., The Univ. of Manchester, U.K.

M. Tsutsumi, Kyoto Inst. of Tech., JAPAN

Mode

Mellon Univ., U.S.A., <sup>2</sup>North Carolina State Univ., U.S.A.

Based Composite Right/Left-Handed Metamaterials

on Conformal Surface Plasmonic Structures

X. Liu, Y. Feng, B. Zhu, Nanjing Univ., CHINA

WE3D-1

WE3D-2

WE3D-3

<sup>2</sup>UCLA, U.S.A.

WE3D-4

Handed Leaky-Wave Antenna

H Lee T Itoh UCLA USA

Wireless Power Transfer

Millimeter-Wave CMOS Radio Frequency Integrated Circuits Development and its Potential Applications D Dawn North Dakota State Univ USA

#### **WE3E-2**

The Experimental Study of THz Image Sensor in 0.18um CMOS Technology

C.-W. Lai<sup>1</sup>, W.-C. Chen<sup>1</sup>, T.-C. Yan<sup>1</sup>, C.-H. Li<sup>2</sup>, C.-N. Kuo<sup>1</sup>, <sup>1</sup>National Chiao-Tung Univ., TAIWAN, 2National Central Univ., TAIWAN

#### WE3E-3

Low Noise Amplifier MMICs for 325GHz Radiometric Applications S. Diebold<sup>4</sup>, J. Kuhn<sup>2</sup>, A. Hulsmann<sup>2</sup>, A. Leuther<sup>2</sup>, K. Dahlberg<sup>2</sup>, P. Jukkala<sup>4</sup>, M. Kantanen<sup>5</sup>, I. Kallfass<sup>6</sup>, T. Zwick<sup>7</sup>, T. Nathi<sup>8</sup>, <sup>1</sup>Oxaka Univ., JAPAN, <sup>2</sup>IAF, GERMAN, <sup>3</sup>Aalto Univ., FINLAND, <sup>4</sup>DA-Design Oy, FINLAND, <sup>5</sup>YTT Technical Research Centre of Finland, FINLAND, <sup>6</sup>Univ. of Stuttgart, GERMANY, <sup>3</sup>ESTEC, NETHERLANDS

#### WE3E-4

A Low Power Multichannel Receiver for D-Band Sensing Applications in a 0.13µm SiGe BiCMOS Technology

A. Chakraborty<sup>1,2</sup>, S. Trotta<sup>1</sup>, R. Weigel<sup>2</sup>, <sup>1</sup>Infineon Tech. AG, GERMANY, <sup>2</sup>FAU Erlangen-Nurnberg, GERMANY

#### WE3E-5

A V-Band Power Amplifier with Adaptive Bias Circuit to Save Quiescent DC Power Consumption Using 90-nm CMOS Technology

Y.-H. Hsiao, H.-C. Liao, J.-C. Kao, H. Wang, National Taiwan Univ., TAIWAN

## 16:50 - 18:30

## Room E (Meeting Room 1) 1st Floor

#### **Session WE4E**

### Low Noise and High Power Amplifiers and Applications

Chairs: T. Yoshimasu, Waseda Univ., JAPAN M. Madihian, Drexel Univ., U.S.A.

WE4E-1

A Low Power Broadband K-Band Low Noise Amplifier Y.-T. Chang, H.-C. Lu, National Taiwan Univ., TAIWAN

A High Gain K-Band LNA in GaAs 0.1-µm pHEMT for Radio Astronomy Application

Bo-Yu Chen<sup>1</sup>, Chau-Ching Chiong<sup>2</sup>, Huei Wang<sup>1</sup>, <sup>1</sup>National Taiwan Univ., TAIWAN, <sup>2</sup>Academia Sinica, TAIWAN

D.S. Farkas<sup>1</sup>, S.J. Sarkozy<sup>2</sup>, R. Katz<sup>2</sup>, <sup>1</sup>Active Wave Tech., LLC.,

## WE4E-4 Design of a 0.18-µm BiCMOS PA with Concurrent and

Non-Concurrent Operations in 10-19, 23-29 and 33-40GHz Bands

K Kim C Nguyen Texas A&M Univ., U.S.A.

#### WE4E-5

60GHz CMOS Transmitter Front-End with Built-in Temperature Sensor

## D. Dawn, North Dakota State Univ., U.S.A.

A W-Band 100nm InP HEMT Ultra Low Noise Amplifier

## Wednesday, November 5

## Room F (Meeting Room 2) 1st Floor

## Session WE3F

## Space Microwave Wireless and Sensing Technology

Chairs: S. Kawasaki, ISAS/JAXA, JAPAN I. Mehdi, JPL/NASA, U.S.A.

#### WE3F-1

The X-Band High Gain and Radiation-Hardness Low-Noise GaAs MMIC Amplifier with Cryogenic Temperature for X-Ray Astronomy

T. Noji<sup>1,2</sup>, A. Miyachi<sup>2</sup>, T. Kikuchi<sup>2</sup>, N.Y. Yamasaki<sup>2</sup>, K. Mitsuda<sup>2</sup>, S. Kawasaki<sup>2</sup>, <sup>1</sup>Tokyo Metropolitan Univ., JAPAN, <sup>2</sup>JAXA, JAPAN

#### WE3F-2

Submillimeter-Wave Remote Sensing Spectrometers

I. Mehdi, California Inst. of Tech., U.S.A.

#### WE3E-3

Interference Analysis of Dual-Band WiCoPT System for Wireless Sensor Network in RVT

R. Takamori<sup>1</sup>, K. Nishikawa<sup>1,2</sup>, Y. Maru<sup>2</sup>, S. Kawasaki<sup>2</sup>, <sup>1</sup>Kagoshima Univ., JAPAN, <sup>2</sup>JAXA, JAPAN

#### WE3F-4

Behaviour of Multi-Band RF-DC Converters in Presence of Modulated Signals for Space Based Wireless Sensors D. Belo, N.B. Carvalho, Universidade de Aveiro, PORTUGAL

#### WE3F-5

The Wireless Sensor Network System in a Reusable Rocket with ZigBee Operating at  $920 \mathrm{MHz}$ 

Yoshida<sup>1</sup>, N. Hasegawa<sup>2</sup>, C. Maekawa<sup>3</sup>, I. Urushibara<sup>3</sup>, H. S Yamazawa<sup>4</sup>, H. Sato<sup>3</sup>, S. Kawasaki<sup>1</sup>, <sup>1</sup>JAXA, JAPAN, <sup>2</sup>Kyoto Univ., JAPAN, 3AR'S Co., Ltd., JAPAN, 4Chino Corp., JAPAN

## Wednesday, November 5

#### Room F (Meeting Room 2) 1st Floor

#### Session WE4F

High Speed Digital Circuits and System Integrity Chairs: H. Nosaka, NTT Corp., JAPAN

K. Yamamoto, Mitsubishi Electric Corp., JAPAN

#### WE4F-1

A Passive Equalizer Based on a Stub and Broadside Coupled Lines for High-Speed Data Transmission

Y. Wang, M. Tang, L.-S. Wu, J.-F. Mao, Shanghai Jiao Tong Univ., CHINA

#### WE4F-2

Design of Low-Power High-Speed Divide-by-2/3 Prescalers with Improved True Single-Phase Clock Scheme

S. Jia, S. Yan, Y. Wang, G. Zhang, Peking Univ., CHINA

#### **WE4F-3**

Polarization Angle Diversity and Ouick Decodable Block Code for M2M Wireless Communication M. Aono, K. Takei, Hitachi, Ltd., JAPAN

#### **WE4F-4**

A Controlled Pulse Generator for 10th Derivative Gaussian IR-UWB in 130nm CMOS Process

L. C. Moreira<sup>1</sup>, J.F. Neto<sup>1</sup> W.A.M.V. Noije<sup>2</sup>, E.T. Rios<sup>3</sup>, <sup>1</sup>Catholic Univ. of Santos, BRAZIL, <sup>2</sup>Universidade de Sao Paulo/LSI, BRAZIL, <sup>3</sup>Universidad Popular Autonoma del Estado de Puebla, MEXICO

## WE4D-5

Terahertz Metamaterial Absorber Using Asymmetric Resonator

Y. Wen<sup>1</sup>, W. Ma<sup>1</sup>, J. Bailey<sup>2</sup>, G. Matmon<sup>2</sup>, G. Aeppli<sup>2</sup>, X. Yu<sup>1</sup>, <sup>1</sup>Peking Univ., CHINA, <sup>2</sup>Univ. College London, U.K.

Y. Mizutani<sup>1</sup>, M. Kishihara<sup>1</sup>, I. Ohta<sup>2</sup>, K. Okubo<sup>1</sup>, H. Takimoto<sup>1</sup>, <sup>1</sup>Okayama Prefectural Univ., JAPAN, <sup>2</sup>Univ. of Hyogo, JAPAN **WE4E-2** Uniplanar Metamaterial Based Dual Composite Right-/-Left Handed (D-CRLH) Microstrip Line for Microwave

#### **WE4E-3**

U.S.A., <sup>2</sup>Northrop Grumman Corp., U.S.A.

## Thursday, November 6

### Room A (Tachibana) 2nd Floor

### Session TH1A

## Mobile and Wireless Communication System Technologies I

Chairs: X. Yin, Southeast Univ., CHINA K. Tsubouchi, Tohoku Univ., JAPAN

#### TH1A-1

Enhancement of Signal Strength in Evaporation Ducting Towards Radio Wave Propagation

M.B. Roslee, Y.B. Yunus, Multimedia Univ., MALAYSIA

#### TH1A-2

#### High Temperature Superconducting Filters to Enable High Power Public Safety Mobile Broadband

A. Kerans, J. Mazierska, James Cook Univ., AUSTRALIA

#### TH1A-3

#### Multifunctional Communication Transceiver with Distance Measurement Capability

L. Xie, X. Yin, L. Yang, C. Lu, H. Zhao, Southeast Univ., CHINA

#### TH1A-4

SNR Enhancement by the Noise Elimination Technique for Decomposed OFDM Signals

Y. Shirato, M. Kotsuka, M. Muraguchi, Tokyo Univ. of Science, JAPAN

#### TH1A-5

Development of Satellite-Terrestrial Multi-Mode VSAT Using Software Defined Radio Technology

S. Kameda<sup>1</sup>, T. Okuguchi<sup>1</sup>, S. Eguchi<sup>1</sup>, N. Suematsu<sup>2</sup>, <sup>1</sup>Tohoku Univ., JAPAN, <sup>2</sup>ISB Corp., JAPAN

## Room B (Hagi) 2nd Floor

## Session TH1B

## Novel Low Noise Amplifiers and Related Technologies

Chairs: T. Kashiwa, Furuno Electric Co., Ltd., JAPAN

H. Kanaya, Kyushu Univ., JAPAN

#### TH1B-1 Wideband Low Noise Receiver Front-End Module Using LTCC Triplexer

T. Kaho<sup>1</sup>, Y. Yamaguchi<sup>1</sup>, H. Shiba<sup>1</sup>, S. Oshima<sup>2</sup>, T. Nakagawa<sup>1</sup>, <sup>1</sup>NTT Corp., JAPAN, <sup>2</sup>Oyama National College of Tech., JAPAN

#### TH1B-2

8:30 - 10:10

A Low Power, Wide Bandwidth K-Band Transformer Feedback Low Noise Amplifier with Current-Reused Topology

C.-I. Chien, Y.-C. Wang, K.-H. Chien, H.-K. Chiou, National Central Univ., TAIWAN

### TH1B-3

## A Wideband GaN Low Noise Amplifier for a Frequency Sensing System

Y. Yamaguchi, T. Kaho, M. Kawashima, H. Shiba, T. Nakagawa NTT Corp., JAPAN

#### TH1B-4

A 20GHz Low Noise CMOS Active Balun Using Asymmetric Transformer

K. Tsutsumi, R. Inagaki, T. Nakai, R. Takeuchi, E. Taniguchi, *Mitsubishi Electric Corp., JAPAN* 

#### TH1B-5

10:30 - 12:10

A Series/Shunt Switching Type Sample and Hold CMOS IC for 1 GHz-Band Direct RF Under Sampling Reception T. Koizumi, M. Motoyoshi, B. Daliso, O. Wada, S. Kameda, N. Suematsu, T. Takagi, K. Tsubouchi, *Tohoku Univ., JAPAN* 

Suematsu, T. Takagi, K. Tsubouchi, Tohoku Univ., JAPAN

## Room C (Shirakashi 1) 3rd Floor

#### Session TH1C

#### Microwave Measurement and Material Characterization I

Chairs: A. Ferrero, Keysight Tech. Inc., U.S.A. M. Horibe, NMIJ-AIST, JAPAN

#### TH1C-1

Determination of the Complex Residual Errors of a Calibrated One-Port Vector Network Analyzer Using the Ripple Test

A.A. Savin<sup>1</sup>, V.G. Guba<sup>2</sup>, <sup>1</sup>TUSUR, RUSSIAN FEDERATION, <sup>2</sup>NPK TAIR, RUSSIAN FEDERATION

#### TH1C-2

Determining Scattering Matrix of a Three-Port Reciprocal Network from One-Port Measurements

Y.-C. Lin, T.-H. Chu, National Taiwan Univ., TAIWAN

#### TH1C-3

Demonstration of On-Wafer Noise Figure Measurement of 300-GHz Amplifier MMIC Utilizing Microwave Photonic Noise Source

H.-J. Song, M. Yaita, NTT Corp., JAPAN

#### TH1C-4

Wideband Transition Between Substrate Integrated Waveguide (SIW) and Rectangular Waveguide (RWG) Based on Bend Waveguide

T. Li, W. Dou, H. Meng, Southeast Univ., CHINA

#### TH1C-5

Broadband Microwave Measurements of Nanodiamond

J. A. Cuenca, E. Thomas, S. Mandal, O. Williams, A. Porch, Cardiff Univ., U.K.

## Thursday, November 6

## Room A (Tachibana) 2nd Floor

### Session TH2A

#### **EuMA Special Session**

Chairs: W. Heinrich, FBH, GERMANY A. Sanada, Yamaguchi Univ., JAPAN

#### TH2A-1

Carbon Based Ballistic RF Electronics

F. Coccetti<sup>1</sup>, D. Mencarelli<sup>2</sup>, L. Pierantoni<sup>2</sup>, <sup>1</sup>CNRS-LAAS, FRANCE, <sup>2</sup>UNIVPM, ITALY

#### TH2A-2

The Microwave Class-S Power Amplifier: Progress Towards the Digital Transmitter

W. Heinrich, A. Wentzel, FBH, GERMANY

#### TH2A-3

Detailed Investigation of Fundamental Instability Mechanisms in Power Amplifiers

A. Suarez, F. Ramirez, Univ. of Cantabria, SPAIN

## Room B (Hagi) 2nd Floor

## Session TH2B

Antennas and Propagation Technologies for MIMO Communications

Chairs: N. Honma, Iwate Univ., JAPAN K. Kihira, Mitsubishi Electric Corp., JAPAN

**TH2B-1** Bidirectional Matching Technique for Tx and Rx Ports in Short-Range MIMO

K. Murata<sup>1</sup>, N. Honma<sup>2</sup>, K. Nishimori<sup>3</sup>, H. Morishita<sup>1</sup>, <sup>1</sup>National Defense Academy, JAPAN, <sup>2</sup>Iwate Univ., JAPAN, <sup>3</sup>Niigata Univ., JAPAN

TH2B-2 Compact MIMO/Diversity Antenna for Portable and Mobile UWB Terminals

C.H. See<sup>1,3</sup>, N.T. Ali<sup>2</sup>, A. Atojoko<sup>3</sup>, N.M Jan<sup>3</sup>, R.A. Abd-Alhameed<sup>3</sup>, O. Maki<sup>3</sup>, E. Elkazmi<sup>3,4</sup>, N.J. McEwan<sup>3</sup>, <sup>1</sup>Univ. of Bolton, U.K., <sup>2</sup>Khalifa Univ., UAE, <sup>3</sup>Univ. of Bradford, U.K., <sup>4</sup>Bani-Walid Univ., LIBYA TH2B-3

Manipulating MIMO Propagation Environment Using Tunable Passive Repeater

N. Honma, Y. Takahashi, Y. Tsunekawa, Iwate Univ., JAPAN

#### TH2B-4

Dual-frequency MIMO Antennas with Reduced Mutual Coupling

L. Yi, Y. Yu, Chongqing Univ., CHINA

#### TH2B-5

Miniaturized 6-Port MIMO Antenna Using T-Shaped Planar Inverted-F Antennas and Capacitor-Loaded Notch Antennas

K. Takahashi<sup>1</sup>, N. Honma<sup>1</sup>, K. Murata<sup>2</sup>, Y. Tsunekawa<sup>1</sup>, <sup>1</sup>Iwate Univ., JAPAN, <sup>2</sup>National Defense Academy, JAPAN

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#### Room C (Shirakashi 1) 3rd Floor

#### Session TH2C

Microwave Measurement and Material Characterization II

### Chairs: M. Janezic, NIST, U.S.A.

M. Horibe, NMIJ-AIST, JAPAN

#### TH2C-1

Evaluation of Frequency-Dependent Permeability by Harmonic Resonance Cavity Perturbation Method

T. Miura<sup>1</sup>, K. Tahara<sup>2</sup>, M. Horibe<sup>3</sup>, <sup>1</sup>The Mueller Consultant, JAPAN, <sup>2</sup>Kanto Electronics Application and Development Inc., JAPAN, <sup>3</sup>AIST, JAPAN

#### TH2C-2

TH<sub>2</sub>C-3

TH2C-4

TH2C-5

Resonator Method

SUMTEC, Inc., JAPAN

Frequencies

Constitutive

Frequency Dependence Measurement of Complex Permittivity for C-, A- and R-Plane Sapphire Substrates from 30 to 50 GHz Band

Metamaterials Using a Calibration-Independent Technique

U.C. Hasar<sup>1</sup>, G. Buldu<sup>1</sup>, M. Bute<sup>1</sup>, J.J. Barroso<sup>2</sup>, T. Karacali<sup>3</sup>, M.

Cittani, V. Data, M. Data, S. B. Basto, T. Katadari, M. Ertugrul, 'Univ. of Gaziantep, TURKEY, 'National Inst. for Space Research, BRAZIL, 'Ataturk Univ., TURKEY

Dielectric Properties of Palmyrah Palm Juice at Microwave

R. Kanahna<sup>1</sup>, P. Keowsawat<sup>2</sup>, S. Promwong<sup>1</sup>, C. Phongcharoenpanich<sup>1</sup>,

Discussions on Measurement Accuracy of Complex

Relative Permittivity Using a Balanced-Type Circular Disk

J. Nakatsutsumi<sup>1</sup>, Y. Kobayashi<sup>2</sup>, Z.-W. Ma<sup>2</sup>, <sup>1</sup>Saitama Univ., JAPAN,

<sup>1</sup>KMITL, THAILAND, <sup>2</sup>Phetchaburi Rajabhat Univ., THAILAND

Parameters Determination of Isotopic

A. Ebata, T. Shimizu, Y. Kogami, Utsunomiya Univ., JAPAN

## Room D (Shirakashi 2) 3rd Floor

#### **Session TH1D**

**Biomedical Applications and RFID Tag Antennas** Chairs: T. Nagaoka, NICT, JAPAN M. Matsunaga, Ehime Univ., JAPAN

TH1D-1

Radar and Conventional Occupancy Sensors Performance Comparison

E. Yavari, A. Lee, K. Pang, N.A. McCabe, O. Boric-Lubecke, Univ. of Hawaii, U.S.A.

#### TH1D-2

Development of Biological Tissue Coagulation Device Composed of Helical Radiation Element by Microwave Energy

Y. Tezuka, Y. Endo, K. Saito, K. Ito, Chiba Univ., JAPAN

#### TH1D-3

Fast and Accurate Computational Electromagnetic Modeling of Non-Invasive Brain Stimulation

I. Laakso, A. Hirata, Nagova Inst. of Tech., JAPAN

#### TH1D-4

A Compact UHF RFID Tag Antenna Using Split-Ring-Resonator-Loaded Short Dipole

T.-H. Cheng, C.-H. Chiang, D.-W. Kung, S.-Y. Chen, National Taiwan Univ., TAIWAN

#### TH1D-5

Studies on a Polyester Fabric Substrate of the Feed Line to a Flexible Slot Antenna

K. Fujiwara, H. Shimasaki, K. Morimoto, N. Kuwahara, Kvoto Inst. of Tech., JAPAN

Room E (Meeting Room 1) 1st Floor **Session TH1E** 

<u>8:30 - 10:10</u>

**Millimeter-Wave and Terahertz Antennas** Chairs: Y. Kimura, Saitama Univ., JAPAN N. Honma, Iwate Univ., JAPAN

#### **TH1E-1**

A Low-cost High Gain Substrate Integrated Waveguide Fed Patch Antenna Array for 60-GHz Applications

Y. Li, K.-M. Luk, City Univ. of Hong Kong, HONG KONG

## **TH1E-2**

A Circularly Polarized Antenna Array with Integrated Calibration Probes

B. Rohrdantz, A. Stark, E. Hawamdah, A.F. Jacob, Tech. Univ. Hamburg-Harburg, GERMANY

### TH1E-3

#### Fast Analysis of THz Double-Reflector Antenna Based on Point Matching Method and Gaussian Beam Tracing

H. Wang<sup>1</sup>, Z. Lu<sup>1</sup>, J. Yu<sup>1</sup>, X. Chen<sup>2</sup>, X. Liu<sup>1</sup>, Y. Yao<sup>1</sup>, <sup>1</sup>BUPT, CHINA, <sup>2</sup>Queen Marry Univ. of London, U.K.

**TH1E-4** 

A Novel Graphene-Based Artificial Magnetic Conductor Antenna in Terahertz Band

B.-H. Gan, L.Zhou, L. Lin, W.-Y. Yin, J.-F. Mao, Shanghai Jiao Tong Univ., CHINA

#### **TH1E-5**

Investigation of a Membrane Supported D-Band Antenna with a 3D Printed Polyamide Lens

A.-C. Bunea<sup>1,2</sup>, D. Neculoiu<sup>1,2</sup>, A. Avram<sup>1</sup>, C. Rusch<sup>3</sup>, <sup>1</sup>IMT, ROMANIA, <sup>2</sup>Politehnica Univ. of Bucharest, ROMANIA, <sup>3</sup>KIT, GERMANY

## Thursday, November 6

Room F (Meeting Room 2) 1st Floor

### **Session TH1F**

Japanese Industrial Session Chairs: K. Takei, Hitachi Ltd., JAPAN K. Yamanaka, Mitsubishi Electric Corp.,

JAPAN

### TH1F-1

Compact and Lightweight Satellite Earth Stations for Rapid Link Provisioning T. Hirose, NTT Corp., JAPAN

#### TH1F-2

A New Tunable RF Front-End for Advanced 4G Handsets T. Wada, H. Obiya, T. Ogami, R. Nakajima, H. Hayafuji, M. Tani, M. Koshino, M. Kawashima, N. Nakajima, Murata Manufacturing Co., Ltd., JAPAN

### TH1F-3

Computer Assisted Design to Develop Functional Device and Modules for Wirelss Systems

K Takei M Ohnishi Hitachi Ltd. JAPAN

#### TH1F-4

Development of Wireless Communication Technologies for Future Multi-Gigabit Data Transmission

A. Honda, Z. Li, L. Zhou, K. Kasai, Y. Ohashi, Fujitsu Laboratories Ltd., JAPAN

#### TH1F-5

Near-Field RFID Sensor-Sheets to Detect Objects and Persons with No RFID Tags Attached

W. Hattori, H. Fukuda, K. Takahashi, R. Kawai, Y. Takahashi, H. Miyano, NEC Corp., JAPAN

#### Room D (Shirakashi 2) 3rd Floor

## Session TH2D

#### **Small-Scale Communication and Sensing** Systems

#### Chairs: Y. Chen, SUSTC, CHINA

T. Nakano, Osaka Univ., JAPAN

#### TH2D-1

Mobile Bionanosensor Networks Through Molecular Communication

T. Nakano, T. Hara, Y. Okaie, T. Obuchi, S. Nishio, Osaka Univ., JAPAN

#### TH2D-2

TH2D-3

TH2D-4

Small-Scale

Reflectarrays

<sup>2</sup>King's College London, U.K.

in Water at the Terahertz Band

Touch-Communication Model of Targeted Drug Delivery Y. Chen<sup>1</sup>, P. Kosmas<sup>2</sup>, P.S. Anwar<sup>1</sup>, L. Huang<sup>1</sup>, <sup>1</sup>SUSTC, CHINA,

Body-Centric Nano-Networks: EM Channel Characterisation

K. Yang<sup>1</sup>, Q.H. Abbasi<sup>2</sup>, K. Qaraqe<sup>2</sup>, A. Alomainy<sup>1</sup>, Y. Hao<sup>1</sup>, <sup>1</sup>Queen

Optical Communication with Tunable

Mary Univ. of London, U.K., <sup>2</sup>Texas A&M Univ. at Qatar, QATAR

L. Zou, M. Cryan, M. Klemm, Univ. of Bristol, U.K.

M. Ando, M. Zhang, J. Hirokawa, Tokyo Inst. of Tech., JAPAN

#### TH2E-3

Array Base Station

TH2E-1

TH2E-2

79GHz-Band Millimeter-Wave Radar High Precision and Wide Field of View Technologies

K. Miyamoto, Y. Nakagawa, Panasonic Corp., JAPAN

#### **TH2E-4**

#### Multi-Mode Portable VSAT for Disaster-Resilient Wireless Networks

N. Suematsu<sup>1</sup>, S. Kameda<sup>1</sup>, H. Oguma<sup>2</sup>, M. Sasanuma<sup>3</sup>, S. Eguchi<sup>4</sup>, K. Kuroda<sup>5</sup>, <sup>1</sup>Tohoku Univ., JAPAN, <sup>2</sup>Toyama National College of Tech., JAPAN, <sup>3</sup>SKY Perfect JSAT Corp., Minato, JAPAN, <sup>4</sup>ISB Corp., JAPAN, 5 Cyber Creative Inst., JAPAN

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## Thursday, November 6

### Room F (Meeting Room 2) 1st Floor

#### Session TH2F

Advanced Microwave Technologies in East Asia

#### Chairs: Z. Ma, Saitama Univ., JAPAN

Y. Yamaguchi, NTT Corp., JAPAN

#### TH2F-1

Base Station Digital Predistorter Compensating for Frequency-Dependent IMD Components

Y. Suzuki, J. Ohkawara, S. Mizuta, S. Narahashi, NTT DOCOMO, INC., JAPAN

#### TH2F-2

Mitsubishi Electric's GaN Devices Employed in Infrustructure Systems

K. Yamanaka, Mitsubishi Electric Corp., JAPAN

#### TH2F-3

Energy-Efficient Concurrent Dual-Band Transmitter for Multistandard Wireless Communications

W. Chen, X. Chen, S. Zhang, Z. Feng, Tsinghua Univ., CHINA

#### TH2F-4

Research Advances in Low Cost THz Passive and Active Components

Z. Hao, D. Hou, J. Chen, W. Hong, Southeast Univ., CHINA

## TH2D-5

Incident-Insensitive Frequency Selective Surface Using Degradable Material for Bio-Medical Applications J. Zhao, Q. Zhang, R. Wang, Y. Chen, SUSTC, CHINA

10:30 - 12:10

## Room E (Meeting Room 1) 1st Floor **Session TH2E**

Chairs: N. Numata, Open Univ. of Japan, JAPAN

IC Chip Level Low Noise Technology for High Speed and

M. Yamaguchi<sup>1</sup>, S. Tanaka<sup>1</sup>, Y. Endo<sup>1</sup>, M. Nagata<sup>2</sup>, H. Matsui<sup>3</sup>, M.

Iwanami<sup>4</sup>, K. Tsukamoto<sup>4</sup>, <sup>1</sup>*Tohoku Univ., JAPAN*, <sup>2</sup>*Kobe Univ., JAPAN*, <sup>3</sup>*Renesas Electronics Co., JAPAN*, <sup>4</sup>*NEC Corp., JAPAN* 

60GHz Band Compact Range Communication with a Large

N. Suematsu, Tohoku Univ., JAPAN

National ICT R&D Projects in Japan

High Quality Telecommunication Systems

## Thursday, November 6

### Room A (Tachibana) 2nd Floor

## Session TH3A

## Mobile and Wireless Communication System Technologies II

Chairs: M. Taromaru, Fukuoka Univ., JAPAN J. Zhao, Southeast Univ., CHINA

#### TH3A-1

Extended Dependable Air: Heterogeneous Wireless Network for Surface, Space and Sea

K. Tsubouchi, Tohoku Univ., JAPAN

#### TH3A-2

Blind Adaptive Arrays with Subcarrier Transmission Power Assignment for Spectrum Superposing K. Maruta, J. Mashino, T. Sugiyama, *NTT Corp., JAPAN* 

#### TH3A-3

Centralized Control of Carrier Sense Threshold and Channel Bandwidth in High-Density WLANs

T. Nakahira, K. Ishihara, Y. Asai, Y. Takatori, R. Kudo, M. Mizoguchi, NTT Corp., JAPAN

#### TH3A-4

Cooperative Back-Off Control Scheme for Point-to-Point Simultaneous Transmission Using Capture Effect M. Iwabuchi, A. Kishida, T. Shintaku, T. Onizawa, T. Sakata, NTT

Corp., JAPAN

#### TH3A-5

Experimental Evaluation of a Grouping Method Employing Network Allocation Vector Based on IEEE802.11 Wireless LAN

T. Shintaku, A. Kishida, M. Iwabuchi, T. Onizawa, T. Sakata,  $NTT\ Corp., JAPAN$ 

### Thursday, November 6

#### Room A (Tachibana) 2nd Floor

#### **Session TH4A**

#### **Resilient ICT Session for Disaster Relief**

Chairs: H. Wakana, NICT, JAPAN T. Hirose, NTT Corp., JAPAN

#### TH4A-1

An Attempt to Disaster Resilient Wireless Network H. Kumagai, K. Hamaguchi, Y. Owada, Y. Nemoto, *NICT, JAPAN* 

#### **TH4A-2**

STBC Decode-and-Forward OFDM Relay for Unmmaned Aircraft System

F. Adachi, H. Miyazaki, Tohoku Univ., JAPAN

#### TH4A-3

Movable and Deployable ICT Resource Unit for Instant Delivery of Local ICT Services

T. Sakano, S. Kotabe, T. Komukai, A. Takahara, NTT Network Innovation Lab., JAPAN

#### TH4A-4

Technical Challenges of Information Communication in Disaster Areas with Delay Tolerant Networking Technologies A. Tanaka, *NEC Corp., JAPAN* 

#### TH4A-5

Autonomous Deployment Algorithm for Resilient Mobile Mesh Networks

K. Hattori<sup>1</sup>, N. Tatebe<sup>2</sup>, T. Kagawa<sup>1</sup>, Y. Owada<sup>1</sup>, K. Hamaguchi<sup>1</sup>, <sup>1</sup>NICT, JAPAN, <sup>2</sup>The Univ. of Electro-Communications, JAPAN

## 13:30 - 15:30

## Room B (Hagi) 2nd Floor

### Session TH3B

### Millimeter-Wave High Power Transmitter and Switch Based on GaN and CMOS

Chairs: T. Kaneko, NEC Corp., JAPAN

K. Yamamoto, *Mitsubishi Electric Corp.,* JAPAN

#### TH3B-1

High Power Solid-State Power Amplifiers for Airborne and Space Applications in Remote Sensing and Communications M. Koker, E. Watkins, N. Deo, *QuinStar Tech., Inc., U.S.A.* 

TH3B-2

Millimeter-wave GaN HEMT model with VDS dependence of CDS for power amplifier applications

K. Joshin<sup>1,2</sup>, S. Ozaki<sup>2</sup>, T. Ohki<sup>1,2</sup>, N. Okamoto<sup>1,2</sup>, Y. Niida<sup>1,2</sup>, K. Makiyama<sup>1,2</sup>, <sup>1</sup>*Fujitsu Ltd., JAPAN*, <sup>2</sup>*Fujitsu Laboratories Ltd., JAPAN* **TH3B-3** 

A 65V Operation High Power X-Band GaN HEMT Amplifier

K. Kikuchi, M. Nishihara, H. Yamamoto, S. Mizuno, F. Yamaki, T. Yamamoto, *Sumitomo Electric Device Innovations, Inc., JAPAN* TH3B-4

A 10MHz-12GHz Low-Distortion High-Speed SP4T Switch Using GaN HEMTs with Oxynitride TaON Passivation

S. Koyama, M. Onishi, M. Kimishima, Advantest Laboratories Ltd., JAPAN

#### TH3B-5

A K-Band CMOS Power Amplifier with FET-Type Adaptive-Bias Circuit

T.-C. Tsai, K.-Y. Kao, K.-Y. Lin, *National Taiwan Univ., TAIWAN* TH3B-6

Design of a K-Band Power Amplifier for High Gain, Output Power and Efficiency on 0.18-µm SiGe BiCMOS Process

K. Kim, C. Nguyen, Texas A&M Univ., U.S.A.

## 15:50 - 17:30

## Room B (Hagi) 2nd Floor

## Session TH4B

GaAs- and Si-Based Power Amplifiers Chairs: K. Yamamoto, Mitsubishi Electric Corp., JAPAN

Y. Nakasha, Fujitsu Laboratories Ltd., JAPAN

### TH4B-1

CMOS-Based Power Amplifiers and Transmitters for Mm-Wave Applications

P. Asbeck, J. Buckwalter, G. Rebeiz, UCLA, U.S.A.

#### TH4B-2

A Two-Power-Mode Si-CMOS/GaAs-HBT Hybrid Power Amplifier Module for 0.9-GHz-Band W-CDMA Handsets Applications

K. Kato, T. Matsuzuka, M. Miyashita, K. Yamamoto, Y. Takahashi, S. Yamabe, K. Maeda, F. Kitabayashi, Y. Sasaki, M. Hirobe, S. Shinjo, K. Horiguchi, T. Sumino, S. Suzuki, H. Katayama, T. Shimura, H. Seki, *Mitsubishi Electric Corp., JAPAN* TH4B-3

A Dual-Gain-Mode High Efficiency Power Amplifier for W-CDMA Data Communications

K. Mukai, S. Shinjo, K. Yamanaka, M. Miyashita, K. Yamamoto, *Mitsubishi Electric Corp., JAPAN* 

#### TH4B-4

A Linear Watt-Level Power Amplifier Implemented in 28nm Standard CMOS Technology

P. Ossmann<sup>1</sup>, J. Fuhrmann<sup>2,3</sup>, K. Dufrene<sup>3</sup>, H. Pretl<sup>3</sup>, A. Springer<sup>1</sup>, <sup>1</sup>Johannes Kepler Univ., AUSTRIA, <sup>2</sup>Friedrich-Alexander-Univ. Erlangen-Nuremberg, GERMANY, <sup>3</sup>DMCE GmbH & Co. KG, AUSTRIA

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### Room C (Shirakashi 1) 3rd Floor

#### Session TH3C

### Advances in Far-Field Wireless Power Transfer Systems

Chairs: N. Shinohara, Kyoto Univ., JAPAN A. Georgiadis, CTTC, SPAIN

#### TH3C-1

Optimal Signal Selection and Rectenna Design Challenges for Electromagnetic Energy Harvesting and Wireless Power Transfer

A. Georgiadis, A. Collado, K. Niotaki, CTTC, SPAIN

#### TH3C-2

Development of Rectenna with High Impedance and High Q Antenna

N. Shinohara, Y. Zhou, Kyoto Univ., JAPAN

#### тнзс-з

Analysis of Rectifier RF-DC Power Conversion Behavior with QPSK and 16QAM Input Signals for WiCoPT System H. Sakaki<sup>1</sup>, T. Kuwahara<sup>1</sup>, S. Yoshida<sup>2</sup>, S. Kawasaki<sup>2</sup>, K. Nishikawa<sup>1,2</sup>, <sup>1</sup>Kagoshima Univ., JAPAN, <sup>2</sup>JAXA, JAPAN

#### TH3C-4

The Impact of Multi-Sine Tone Separation on RF-DC Efficiency

A. Boaventura<sup>1</sup>, N.B. Carvalho<sup>1</sup>, A. Georgiadis<sup>2</sup>, <sup>1</sup>Universidade de Aveiro, PORTUGAL, <sup>2</sup>CTTC, SPAIN

#### TH3C-5

 $\mbox{C-}$  / K-band Amplifier Circuits for Wireless Communication and Power Transmission

N. Hasegawa<sup>1,2</sup>, S. Yoshida<sup>2</sup>, S. Kawasaki<sup>2</sup>, N. Shinohara<sup>1</sup>, <sup>1</sup>Kyoto Univ., JAPAN, <sup>2</sup>JAXA, JAPAN

## Room C (Shirakashi 1) 3rd Floor

#### Session TH4C

Near Field and Grid Solutions for Wireless Power Transfer

Chairs: A. Georgiadis, CTTC, SPAIN

N. Shinohara, Kyoto Univ., JAPAN

### TH4C-1

TH4C-2

TH4C-3

TH4C-4

TH4C-5

and Misalignment

Indoor Environments

Waveguide

Applications

Cancellation Mechanism of Electromagnetic Leakage for Wireless Power Transmission System Based on Magnetic Resonant Coupling

Y. Narusue, Y. Kawahara, T. Asami, The Univ. of Tokyo, JAPAN

J. Bito, B.S. Cook, M.M. Tentzeris, Georgia Inst. of Tech., U.S.A.

H. Arai, N. Yoneyama, Yokohama National Univ., JAPAN

Design Considerations of Wireless Power

I-S Suh J-D Kim KAIST, REPUBLIC of KOREA

Wireless Power Transfer System Using Sheet-Like

Applications to Electric Vehicle Charging in Efficiency

Wireless Grid to realize Battery-Less Sensor Networks in

G. Matsushita<sup>1</sup>, D. Maehara<sup>2</sup>, Y. Kuki<sup>1</sup>, K. Sakaguchi<sup>1</sup>, S. Sampei<sup>1</sup>, K.

Araki<sup>2</sup>, <sup>1</sup>Osaka Univ., JAPAN, <sup>2</sup>Tokyo Inst. of Tech., JAPAN

Transfer

A Multi-Coil Wireless Power Transfer System Utilizing Dynamic Matching for In-Vivo and Biomedical

## Room D (Shirakashi 2) 3rd Floor

## Session TH3D

## Antennas for Mobile Communications

Chairs: M. Nakano, KDDI Lab., JAPAN T. Fukasawa, Mitsubishi Electric Corp., JAPAN

#### TH3D-1

Design of Zeroth-Order Resonant Antennas for Mobile Applications

G. Kim, B. Lee, Kyung Hee Univ., REPUBLIC of KOREA

#### TH3D-2

A Compact, Linearly-Polarized Antenna Design with Electronically Steerable Angle of Orientation

L.-P. Cai, M.-C.J. Chik, K.-K.M. Cheng, The Chinese Univ. of Hong Kong, HONG KONG

## TH3D-3

A Low SAR WWAN Antenna Design for Tablet Application S.-C. Lai, C.-M. Yang, C.-M. Jiang, C.-L. Tang, *Auden Techno Corp.*, *TAIWAN* 

#### TH3D-4

Millimeter-Wave Microstrip Bent Line Grid Array Antenna for 5 G Mobile Communication Networks

S. Hakimi, S.K.A. Rahim, UTM, MALAYSIA

#### TH3D-5

Wide-Band Double Loop Antenna Fed by Modified Single Strip Line

S. Kuroda<sup>1</sup>, R. Suga<sup>1</sup>, T. Uwano<sup>2</sup>, O. Hashimoto<sup>1</sup>, <sup>1</sup>Aoyama Gakuin Univ., JAPAN, <sup>2</sup>Office Uwano, JAPAN

## Room E (Meeting Room 1) 1st Floor Session TH3E

Millimeter-Wave Communication and Radar Systems

Chairs: M. Fujishima, Hiroshima Univ., JAPAN K. Nishikawa, Kagoshima Univ., JAPAN

#### TH3E-1

 $60\mathrm{GHz}$  Wireless Technologies for WiGig/IEEE  $802.11\mathrm{ad}$  Multi-Gigabit Systems

T. Urushihara, H. Takahashi, M. Kobayashi, H. Motozuka, M. Irie, N Shirakata, K. Takinami, *Panasonic Corp., JAPAN* 

#### TH3E-2

All-in-One 60 GHz CMOS Transceiver for Proximity Wireless Communication

T. Mitomo, Toshiba Corp., JAPAN

#### TH3E-3

Study on Interference between FMCW and Spread Spectrum Radar

K. Shirakawa, Y. Ohashi, Fujitsu Laboratories Ltd., JAPAN

TH3E-4

79 GHz CMOS Power Amplifier Considering Time- and Temperature-Degradation Model

T. Yoshida, K. Takano, C.Y. Li, K. Katayama, S. Amakawa, M. Fujishima, *Hiroshima Univ., JAPAN* 

## Thursday, November 6

Room F (Meeting Room 2) 1st Floor

## Session TH3F

#### Recent R&D Topics in East Asia

Chairs: W. Chen, Tsinghua Univ., CHINA W. Hong, Southeast Univ., CHINA

#### TH3F-1

13:30 - 15:30

Recent Progress of Advanced Microwave and System-in-Package Integration Technologies at National Taiwan Univ.

H. Wang, T.-L. Wu, P. Hsu, R.-B. Wu, K.-Y. Lin, T.-W. Huang, National Taiwan Univ., TAIWAN

#### TH3F-2

Research Activities in the State Key Laboratory of Millimeter Waves

W. Hong, Southeast Univ., CHINA

#### TH3F-3

Researches on Time-Reversed Electromagnetics at UESTC B.-Z. Wang, Y. Chen, D. Zhao, *UESTC, CHINA* 

#### TH3F-4

Millimeter Wave Integrated Circuit Researches in KAIST J. Oh, C.W. Byeon, S. Lee, S. Kong, C.S. Park, S. Hong, *KAIST*, *REPUBLIC of KOREA* 

### Room D (Shirakashi 2) 3rd Floor

### Session TH4D

#### **Couplers and Power Dividers II**

Chairs: K. Eccleston, Univ. of Canterbury, NEW ZEALAND Y. Tahara, Mitsubishi Electric Corp.,

TH4D-1

A 5.8-GHz Reconfigurable Power Divider for Wireless Power Transfer

Y. Ohta, R. Ishikawa, K. Honjo, The Univ. of Electro-Communications, JAPAN

#### TH4D-2

Miniaturization Technique for Forward-Wave Directional Couplers by Using Open Stubs and Patterned Ground Structures

S.-K. Hsu, C.-C. Tseng, T.-L. Wu, National Taiwan Univ., TAIWAN

### TH4D-3

Ring-Resonator Branch-line Coupler with Unequal Power Division

E.D. Lin, Y.-H. Pang, H.-C. Huang, National Univ. of Kaohsiung, TAIWAN

#### TH4D-4

New Multi-Way SIW Power Dividers with High Isolation Z. Liu, G. Xiao, *Shanghai Jiaotong Univ., CHINA* 

#### TH4D-5

Out-of-Phase Filtering Power Divider Using Rectangular SIW Cavity

X. Zhang, H. Wang, C. Yu, Q. Wu, W. Hong, Southeast Univ., CHINA

## Room E (Meeting Room 1) 1st Floor

### Session TH4E

**Outstanding Asian Young Researchers** *Chairs:* K. Itoh, *Kanazawa Inst. of Tech., JAPAN* 

M. Krairiksh, KMITL, THAILAND

#### TH4E-1

A 60-GHz Sub-Sampling PLL Using A Dual-Step-Mixing ILFD

T. Siriburanon, T. Ueno, K. Kimura, S. Kondo, W. Deng, K. Okada, A. Matsuzawa., *Tokyo Inst. of Tech., JAPAN* 

#### TH4E-2

Investigation of Metasurface Using Fishnet and Closed Ring Structures on Microstrip-Fed Slot Antenna

T. Hongnara, S. Chaimool, P. Akkaraekthalin, KMUTNB, THAILAND

#### TH4E-3

Gain Enhancement for Multiband Antenna with Frequency Selective Fractal Surface Reflector

C. Ratnaratorn, C. Mahatthanajatuphat, P. Akkaraekthalin, KMUTNB, THAILAND

#### TH4E-4

Effective Beam Forming of Phased Array Antenna for Efficient Microwave Power Transmission

T. Matsumuro, Y. Ishikawa, T. Ishikawa, N. Shinohara, Kyoto Univ., JAPAN

## TH4E-5

Presentation by the 2014 IEEE MTT-S Japan Young Engineering Award (Michiyuki Uenohara Memorial Award) winer

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## Room F (Meeting Room 2) 1st Floor

## Session TH4F

Thursday, November 6

Broadband and Multiband Antennas III Chairs: M. Higaki, Toshiba Corp., JAPAN Q. Chen, Tohoku Univ., JAPAN

#### TH4F-1

15:50 - 17:30

Radiation Enhanced Broadband Planar TEM Horn Antenna Y. Li, X. Yin, H. Zhao, L. Wang, M. Yang, *Southeast Univ., CHINA* 

#### TH4F-2

Waveguide Edge-Shunt Slot Array Antenna with Z-shaped Slot Partially Overlapping the Waveguide Wall

H. Watanabe, T. Ohba, S. Yamaguchi, N. Nakamoto, T. Takahashi, M. Otsuka, H. Miyashita., *Mitsubishi Electric Corp., JAPAN* 

### TH4F-3

An X-Band Dual-Mode Antenna Using Substrate Integrated Waveguide Cavity for Simultaneous Satellite and Terrestrial Links

C.-T.M. Wu<sup>1,2</sup>, T. Itoh<sup>1</sup>, <sup>1</sup>UCLA, U.S.A., <sup>2</sup>Wayne State Univ., U.S.A.

#### TH4F-4

Dual Polarized Open-Ended Waveguide with Polarization-Independent Parasitic Elements

T. Maruyama<sup>1</sup>, A. Hirota<sup>1</sup>, H. Matsumura<sup>2</sup>, T. Takahashi<sup>1</sup>, T. Takahashi<sup>1</sup>, M. Otsuka<sup>1</sup>, H. Miyashita<sup>1</sup>, <sup>1</sup>*Mitsubishi Electric Corp.*, JAPAN, <sup>2</sup>Mitsubishi Electric Engineering Company Ltd., JAPAN

Y. Li, P. Yang, J. Ouyang, F. Yang, UESTC, CHINA

#### TH4F-5 Compact Circularly Polarized K/Ka Band Co-aperture

Antenna Design

## Friday, November 7

### Room A (Tachibana) 2nd Floor

#### **Session FR1A**

## **Future Mobile and Wireless Communication**

## Systems

Chairs: J. Takada, Tokyo Inst. of Tech., JAPAN T. Kaho, NTT Corp., JAPAN

#### FR1A-1

5G Mobile Radio Access System Using SHF/EHF Band Y. Okumura, NTT DOCOMO, INC., JAPAN

#### FR1A-2

Advanced Progress in IEEE 802.11 WLAN Standardization Y. Asai, NTT Corp., JAPAN

#### FR1A-3

White Space Communication Systems Toward 5th Generation Mobile Communication Systems

H. Harada<sup>1,2</sup>, K. Ishizu<sup>2</sup>, H. Murakami<sup>2</sup>, <sup>1</sup>Kyoto Univ., JAPAN, <sup>2</sup>NICT, JAPAN

## Room B (Hagi) 2nd Floor

## **Session FR1B**

### GaN Focus Session II: Power GaN Status and Future

Chairs: T. Kikkawa, Transphorm Japan, JAPAN W. Walter, WIN Semiconductors Corp., JAPAN

#### FR1B-1

European GaN Device Technologies for Microwave and Power Switching Applications J. Wurfl, FBH, GERMANY

8:30 - 10:10

FR1B-2 Novel Thermal Management and Its Analysis in GaN Electronics

M. Kuball, J.A. Calvo, R.B. Simon, J.W. Pomeroy, Univ. of Bristol, U.K.

#### FR1B-3

GaN Power Device for Automotive Applications T. Kachi, Toyota Central R&D Labs., Inc., JAPAN

## Room C (Shirakashi 1) 3rd Floor

## Session FR1C

### **Recent Advances in Bandpass Filters**

Chairs: T. Kawaguchi, Toshiba Corp., JAPAN H. Yoshikawa, Kyocera Corp., JAPAN

#### FR1C-1

A Very Thin Waveguide Filter with Attenuation Poles Constructed by Impedance-Step Slot-Loaded Patches T. Akashi, H. Deguchi, M. Tsuji, Doshisha Univ., JAPAN

#### FR1C-2

Comparison of Surface Mounted High Quality Filters for Combination of Substrate Integrated and Waveguide Technology

J. Schorer<sup>1</sup>, J. Bornemann<sup>1</sup>, U. Rosenberg<sup>2</sup>, <sup>1</sup>Univ. of Victoria, CANADA, <sup>2</sup>Mician Global Engineering GbR, GERMANY

#### FR1C-3

Reconfigurable Coupled-Line Bandpass Filter with Electrically Actuated Liquid-Metal Tuning

R.C. Gough, J.H. Dang, A.M. Morishita, A.T. Ohta, W.A. Shiroma, Univ. of Hawaii, U.S.A.

#### FR1C-4

Design of Ultra-Compact 60-GHz Millimeter-Wave CMOS On-Chip Bandpass Filter with Two Controllable Transmission Zeros

Y.-C. Chen, L.-K. Yeh, H.-R. Chuang, National Cheng Kung Univ., TAIWAN

#### FR1C-5

Design of Digitally Tunable Bandpass Filter for Spectrum Sensing Application in the TVWS

H.-K. Kim, J.-H. Lee, S.W. Yun, Sogang Univ., REPUBLIC of KOREA

## Friday, November 7

## Room A (Tachibana) 2nd Floor

## Session FR2A

### Historical Review of Microwave Devices in Japan

Chairs: K. Sawaya, Tohoku Univ., JAPAN Y. Konishi, Hiroshima Inst. of Tech., JAPAN

#### FR2A-1

Historical Review of Research and Development on Linear Antennas in Tohoku Univ

K. Sawaya, Tohoku Univ., Japan

#### FR2A-2

History of the Microwave-Tube Art at Tohoku Univ. K. Yokoo, K. Mizuno, Tohoku Univ., JAPAN

#### FR2A-3

Research and Development on Phased Array Antennas in Japan

Y. Konishi, Hiroshima Inst. of Tech., JAPAN

## Room B (Hagi) 2nd Floor

## **Session FR2B**

### **High Efficiency GaN HEMT Power Amplifiers** for Wireless Communication

Chairs: M. Kuball, Univ. of Bristol, U.K. K. Inoue, Sumitomo Electric Industries, Ltd., JAPAN

### FR2B-1

10:30 - 12:10

GaN HEMT High Efficiency Power Amplifiers for 4G/5G Mobile Communication Base Stations

T. Kaneko, K. Shiikuma, K. Kunihiro, NEC Corp., JAPAN

#### FR2B-2

Analysis and Performance of Drain Bias "In-Dependent" Class-J Power Amplifier

V. Carrubba, E. Ture, R. Quay, F.V. Raay, M. Musser, O. Ambacher, IAF. GERMANY

#### FR2B-3

A 1.5GHz GaN HEMT Fifth-Harmonic-Peaking Class-EF Power Amplifier with 85% Drain Efficiency and 42dBm Output Power

M. Thian, A. Barakat, V. Fusco, The Queen's Univ. of Belfast, U.K.

#### FR2B-4

Two Signal Power Level Design for Shunt-Connected Type GaN HEMT Doherty Power Amplifier without a Quarter-Wave Inverter

Y. Iguchi, Y. Takayama, R. Ishikawa, K. Honjo, The Univ. of Electro-Communications, JAPAN

## Room C (Shirakashi 1) 3rd Floor

#### Session FR2C

Wireless Power Transfer Technologies I Chair: K. Sakaguchi, Osaka Univ., JAPAN

#### FR2C-1

U-Shaped Harmonic Rejection Filtenna for Compact Rectenna Application

M.I. Sabran<sup>1</sup>, S.K.A. Rahim<sup>1</sup>, T.A. Rahman<sup>1</sup>, A.A. Eteng<sup>1</sup>, Y Yamada<sup>2</sup>, <sup>1</sup>UTM, MALAYSIA, <sup>2</sup>National Defense Academy, JAPAN

#### FR2C-2

Design of a Broadband Microwave Rectifier from 40 MHz to 4740 MHz Using High Impedance Inductor

D. Wang, M.-D. Wei, R. Negra, RWTH Aachen Univ., GERMANY

### FR2C-3

Triple-Band Single-Diode Microwave Rectifier Using CRLH Transmission Line

T. Oka, T. Ogata, K. Saito, S. Tanaka, Shibaura Inst. of Tech., JAPAN

#### FR2C-4

Investigation on Threshold Distance for Efficiency Enhanced Wireless Power Transfer Using Bulk Metamaterial

A.L.A.K. Ranaweera, T.P. Duong, J.-W. Lee, Kyung Hee Univ., REPUBLIC of KOREA

#### FR2C-5

Introduction to Synthesized Magnetic Field Focusing Technology

J.P. Cheon, B.H. Choi, J.H. Kim, C.T. Rim, KAIST, REPUBLIC of KOREA

	6:5 <i>0</i> - 10:	10 Friday, November /	
Room D (Shirakashi 2) 3rd Floor	Room E (Meeting Room 1) 1st Floor	Room F (Meeting Room 2) 1st Floor	
Session FR1D	Session FR1E	Session FR1F	
Doppler Radar for Smart Buildings and Mobile	Design of Novel CMOS and Millimeter-Wave	Antenna Theory and CAD	
Health	VCOs	Chairs: M. Yamamoto, Hokkaido Univ., JAPAN	
Chairs: V. Lubecke, Univ. of Hawaii, U.S.A. O. Boric-Lubecke, Univ. of Hawaii, U.S.A.	Chairs: T. Lee, Boeing, U.S.A. J. Weiler, Northrop Grumman Space and Tech., U.S.A.	T. Arima, <i>Tokyo Univ. of A&amp;T, JAPAN</i>	
FR1D-1 Doppler Radar Noncontact Imaging of Human Cardiac Motion	FR1E-1 Design of 24 GHz CMOS VCO Using Armstrong Topology with Asymmetric Transformer	FR1F-1 Analytical Characteristic Expression for Dualband Antennas Embedded with Elements inside the Antenna	
C. Li <sup>1</sup> , A. Zhu <sup>2</sup> , S. Qiao <sup>3</sup> , Y. Sun <sup>4</sup> , L. Ran <sup>2</sup> , <sup>1</sup> <i>Texas Tech Univ., U.S.A.</i> , <sup>2</sup> <i>Zhejiang Univ., CHINA</i> , <sup>3</sup> <i>Zhejiang Univ. City College, CHINA</i> , <sup>4</sup> <i>Nanjing Inst. of Electronic Equipment, CHINA</i>	PY. Wang <sup>1</sup> , YC. Shen <sup>1</sup> , MC. Chou <sup>1</sup> , KH. Chuang <sup>1</sup> , YC. Chang <sup>12</sup> , DC. Chang <sup>2</sup> , S.S.H. Hsu <sup>1</sup> , <sup>1</sup> National Tsing Hua Univ., TAIWAN, <sup>2</sup> NARL, TAIWAN	A. Saitou, S. Onodera, R. Ishikawa, K. Honjo, The Univ. of Electro- Communications, JAPAN	
FRID-2 Waarde Danslas Dadas Haakk Manitas mith Castar	FR1E-2 Millimeter Ways VCO Using Stringd Industor	FR1F-2 Study on Bodon Cross Section for the Diamo Antonno in	

Wearable Doppler Radar Health Monitor with Gesture

Y.-C. Chiu, F.-K. Wang, Y.-R. Chou, T.-S.Horng, National Sun Yat-Sen Univ., TAIWAN

#### FR1D-3

Control

Analysis of a Fall Detection Radar Placed on the Ceiling and Wall

M. Mercuri<sup>1</sup>, P.J. Soh<sup>1,2</sup>, X. Zheng<sup>1</sup>, P. Karsmakers<sup>1</sup>, G.A.E. Vandenbosch<sup>1</sup>, P. Leroux<sup>1</sup>, D. Schreurs<sup>1</sup>, <sup>1</sup>KU Leuven, BELGIUM, <sup>2</sup>Universiti Malaysia Perlis, MALAYSIA

#### FR1D-4

Smart Occupancy Sensors

C. Song, E. Yazavi, V. Lubecke, O. Boric-Lubecke, Univ. of Hawaii, U.S.A.

#### FR1D-5

FR2D-1

FR2D-2

Structures

FR2D-3

Concept

GERMANY FR2D-4

FR2D-5

Microscopy

Millimeter-Wave

Image Processing

Doppler Radar for Sleep Medicine

M. Baboli, B. Soll, O. Boric-Lubecke, V. Lubecke, Univ. of Hawaii, U.S.A.

#### Millimeter-Wave VCO Using Striped Inductor

H. Tsuji<sup>1</sup>, Y. Itano<sup>1,2</sup>, K. Komoku<sup>1</sup>, T. Morishita<sup>1</sup>, S. Yoshitomi<sup>2</sup>, N. Itoh<sup>1</sup>, <sup>1</sup>Okayama Prefectural Univ., JAPAN, <sup>2</sup>Toshiba Corp., JAPAN

#### FR1E-3

Design of Linear CMOS VCO Based on Cross-Coupled Pair Topology with Double Tuning Technique

M.-T. Hsu, Y.-Y. Lee, R.-W. Jhong, National Yunlin Univ. of Science and Tech., TAIWAN

#### **FR1E-4**

An Ultra-Wideband and Gain Linearized CMOS VCO with Minor Phase Noise Variation

M. Aqeeli, A. Alburaikan, C. Muvianto, X. Huang, Z. Hu, The Univ. of Manchester, U.K.

#### FR1E-5

Implementation of 5GHz Current-Reused VCO with Linearity

M.-T. Hsu, A.-C. Ou, R.-W. Jhong, NYUST, TAIWAN

on Radar Cross Section for the Plasma Antenna in UHF Band

K. Takahagi<sup>1</sup>, S. Kitagawa<sup>1</sup>, T. Naito<sup>2</sup>, H. Ogino<sup>2</sup>, <sup>1</sup>Ministry of Defense, JAPAN, <sup>2</sup>Mitsubishi Electric Corp., JAPAN

#### FR1F-3

Time Domain Analysis of a Plasmonic Metamaterial for Terahertz Spoof Localized Surface Plasmons K. Fujita, Fujitsu Ltd., JAPAN

#### FR1F-4

Improvement of Frequency Sweeping by MoM Matrix Interpolation Combined with Stoer-Bulirsch Algorithm for Multilayered Structures

Z. Song, W.-D. Li, Y. Zhang, Southeast Univ, CHINA

#### **FR1F-5**

Frequency Beam-Scanning Circularly Polarized Leaky-Wave Antenna Based on Lateral Sparse Substrate Integrated Waveguide

C. Jin, N. Wang, X. Xu, H. Sun, Beijing Inst. of Tech., CHINA

#### Room D (Shirakashi 2) 3rd Floor

Displacement Measurement and Monitoring with Ground-

Polarimetric UWB SAR for Subsurface Imaging of Building

C.N. Koyama, K. Takahashi, Y. Iitsuka, M. Sato, Tohoku Univ., JAPAN

Multistatic Short Range Imaging with a Nonuniform SFCW

F. Gumbmann, A. Schiessl, Rohde & Schwarz GmbH & Co. KG,

Near-Field Thermal Imaging by Passive Millimeter-Wave

M. Ishino, S. Nakamura, T. Nozokido, Univ. of Toyama, JAPAN

Imaging Frequencies with Complex-Valued Self-Organizing Map

Active

Y. Arima, A. Hirose, The Univ. of Tokyo, JAPAN

Based SAR; Case Study at Aratozawa

L Zou K Takahashi M Sato Tohoku Univ. JAPAN

Chairs: M. Krairiksh, KMITL, THAILAND

## **Session FR2D** Radar, Remote Sensing and Imaging Systems I

H. Kobayashi, Osaka Inst. of Tech., JAPAN

## **Session FR2E** Mixers and Frequency Converters Technology

Room E (Meeting Room 1) 1st Floor

#### for **RF-Frontends**

Chairs: R. Kagiwada, Northrop Grumman Space and Tech., U.S.A. M. Golio, IEEE, U.S.A.

#### FR2E-1

Direct Conversion Receiver with High Conversion Gain and Wide Tuning Range in  $0.18 \mu m$  CMOS

Z. Haiwei<sup>1</sup>, L. Yuanchun<sup>1</sup>, F.-H. Huang<sup>2</sup>, X. Quan<sup>1</sup>, <sup>1</sup>City Univ. of Hong Kong, HONG KONG, <sup>2</sup>Chang Gung Univ., TAIWAN

#### FR2E-2

Low Voltage High Linearity Ultra-Wideband Folded Mixer for Direct Conversion Receivers

Y.-R. Lin, H.-Y. Chang, R.-Y. Huang, R.-M. Weng, National Dong Hwa Univ., TAIWAN

#### FR2E-3

A Mutual Phase Synchronization Type Push-Push Oscillator Array Using Simple Coupling Circuit

T. Sameshima, T. Tanaka, I. Toyoda, Saga Univ., JAPAN

#### FR2E-4

Using Multiple

Chua's Chaotic Oscillator as the GaAs Manufacturing Process State Indicator

E. Kuxa<sup>1</sup>, A.E. Parker<sup>1</sup>, S.J. Mahon<sup>2</sup>, A.P. Fattorini<sup>2</sup>, W.-K. Wang<sup>3</sup>, R. Kuo3, M.C. Heimlich1, 1Macquarie Univ., AUSTRALIA, 2Macom Tech. Solutions, AUSTRALIA, <sup>3</sup>WIN Semiconductors, TAIWAN

### FR2E-5

RF Front-End Circuit Employing LC-Tank for Carrier Aggregation

K. Kawai<sup>1</sup>, M. Nakajima<sup>2</sup>, Y. Takagi<sup>1</sup>, H. Okazaki<sup>1</sup>, S. Narahashi<sup>1</sup>, <sup>1</sup>NTT DOCOMO, INC., JAPAN, <sup>2</sup>NTT Corp., JAPAN

## Friday, November 7

#### Room F (Meeting Room 2) 1st Floor

#### Session FR2F

**Radio Wave Propagation Studies in Various** Environments

Chairs: Y. Maekawa, Osaka Electro-Communication Univ., JAPAN

## T. Imai, NTT DOCOMO, INC., JAPAN

Optimized High-Order Finite-Difference Time-Domain (2, 4) Method

M. Zhu<sup>1</sup>, L. Zhao<sup>2</sup>, Q. Cao<sup>1</sup>, <sup>1</sup>NUAA, CHINA, <sup>2</sup>R&D Nanjing ASSEN Environment Tech. Co. Ltd., CHINA

#### FR2F-2

Clustering of Multipath Components Utilizing Geometrical Parameters for Indoor Double-Directional Propagation Channel

P. Hanpinitsak<sup>1</sup>, M. Kim<sup>2</sup>, J. Takada<sup>1</sup>, <sup>1</sup>Tokyo Inst. of Tech., JAPAN, 2Niigata Univ., JAPAN

## FR2F-3

Building Penetration Loss Measurements for TVWS Systems H. Sawada<sup>1</sup>, T. Kan<sup>1</sup>, K. Mizutani<sup>1</sup>, K. Ishizu<sup>1</sup>, H. Murakami<sup>1</sup>, H. Harada<sup>1,2</sup>, <sup>1</sup>NICT, JAPAN, <sup>2</sup>Kyoto Univ., JAPAN

#### FR2F-4

The Effect of Bushes Shorter than One Meter to Radio Propagation in 920-MHz Band

N. Tsutsui, M. Hara, H. Shimasaki, Y. Kado, M. Ichida, Kyoto Inst. of Tech., JAPAN

### FR2F-5

Soil Density Tool Using Radio Wave Surface Reflection Method

M.B. Roslee, K.B. Subari, I.B. Shahdan, Multimedia Univ., MALAYSIA

FR2F-1

10:30 - 12:10

## Friday, November 7

#### Room A (Tachibana) 2nd Floor

## 13:30 - 15:30

## Room B (Hagi) 2nd Floor

## Session FR3A

### Millimeter-wave / Terahertz Devices and Systems

Chairs: H. Toda, Doshisha Univ., JAPAN T. Nomura, Toyota Central R&D Labs., Inc., JAPAN

#### FR3A-1

Ultra-Compact Quad-Channel 28-Gbaud Linear Driver Module for InP Mach-Zehnder Modulator

H. Wakita, M. Nagatani, S. Yamanaka, H. Tanobe, H. Nosaka, NTT Corp., JAPAN FR3A-2

Low-Loss Post-Wall Waveguide and Broadband-Transition to Microstrip Line Realized in 0.6mm-Thick Liquid Crystal Polymer-Substrate for Millimeter-Wave Application

Y. Uemichi<sup>1</sup>, A. Kojima<sup>2</sup>, Y. Nakatani<sup>2</sup>, R. Hosono<sup>1</sup>, N. Guan<sup>1</sup>, J. Hirokawa<sup>3</sup>, M. Ando<sup>3</sup>, <sup>1</sup>Fujikura Ltd., JAPAN, <sup>2</sup>Electronics Business Company Fujikura Ltd., JAPAN, <sup>3</sup>Tokyo Inst. of Tech., JAPAN

#### FR3A-3

Channel and Antenna Effects on the Performances of a 60GHz UWB Impulse Transceiver

C. Hamouda<sup>1</sup>, B. Poussot<sup>1</sup>, M. Villegas<sup>2</sup>, J-M. Laheurte<sup>1</sup>, <sup>1</sup>*ESYCOM* (*Universite Paris-Est*), *FRANCE*, <sup>2</sup>*ESYCOM*(*ESIEE Paris*), *FRANCE* **FR3A-4** 

A Low-Power W-Band Receiver MMIC for Amplitude Modulated Wireless Communication Up to 24Gbit/s

F. Thome<sup>1,2</sup>, S. Maroldt<sup>1</sup>, M. Schlechtweg<sup>1</sup>, O. Ambacher<sup>1,2</sup>, <sup>1</sup>*IAF*, *GERMANY*, <sup>2</sup>*Univ. of Freiburg, GERMANY* 

FR3A-5 16-Gbit/s Wireless Terahertz Transmission at 300-GHz Band Using a Polymeric Thin-Film Antenna Receiver with Base-bandwidth Enhancement Circuits

M. Inoue<sup>1</sup>, M. Hodono<sup>1</sup>, M. Oka<sup>2</sup>, Y. Minamikata<sup>2</sup>, D. Tsuji<sup>2</sup>, M. Fujita<sup>2</sup>, T. Nagatsuma<sup>3</sup>, <sup>1</sup>*Nitto Denko Corp., JAPAN*, <sup>2</sup>*Osaka Univ., JAPAN* **FR3A-6** 

Precise Phase Measurement of Continuous Terahertz-Wave Based on Balanced Self-Heterodyne Technique and Its Application to Phase-Contrast Imaging

Y. Koda<sup>1</sup>, S. Hisatake<sup>1</sup>, J.-Y. Kim<sup>2</sup>, A. Hirata<sup>2</sup>, K. Ajito<sup>2</sup>, T. Nagatsuma<sup>1</sup>, <sup>1</sup>Osaka Univ., JAPAN, <sup>2</sup>NTT Corp., JAPAN

ET & EER Technologies Chairs: D. Kimball, MaXentric Tech. LLC, U.S.A. S. Shinjo, Mitsubishi Electric Corp., JAPAN

#### FR3B-1

## DSP Techniques for Linearity and Efficiency Enhancement of Multi-Band Envelope Tracking Transmitters

F.M. Ghannouchi<sup>1</sup>, A.K. Kwan<sup>1</sup>, M. Younes<sup>1</sup>, W. Chen<sup>2</sup>, <sup>1</sup>Univ. of Calgary, CANADA, <sup>2</sup>Tsinghua Univ., CHINA

#### FR3B-2

Design of Highly-Efficient Monolithic Silicon Power Amplifiers Using Envelope-Tracking for Broadband Wireless Applications

D.Y.C. Lie, J. Lopez, Y. Li, J. Tsay, Texas Tech Univ., U.S.A.

#### FR3B-3

#### Techniques of Envelope Tracking Transmitter for Base-Station and Mobile Applications

H.S. Son, J.H. Kim, W.Y. Kim, J.Y. Jang, I.Y. Oh, C.S. Park, KAIST, REPUBLIC of KOREA

#### FR3B-4

A Study on the Frequency Response Compensation for Envelope Amplifiers in EER Power Amplifiers

A. Yamaoka, K. Yamaguchi, Toshiba Corp., JAPAN

## Room C (Shirakashi 1) 3rd Floor

## Session FR3C

#### Wireless Power Transfer Technologies II

Chairs: Y. Konishi, Hiroshima Inst. of Tech., JAPAN

T. Seki, NTT Corp., JAPAN

#### FR3C-1

Trends, Technical and Regulatory Issue, and Standardization Concerning Commercialization of Wireless Power Transfer Technologies

H. Shoki, Toshiba Corp., JAPAN

#### FR3C-2

A 2.45GHz Efficient 3D Rectenna Designed Using a Novel Yagi-Uda Array

Z. Wang<sup>1</sup>, Y.-Y. Hu<sup>1</sup>, X. Yu<sup>1</sup>, L.-W. Guo<sup>1</sup>, L. Wang<sup>1</sup>, J.L.-W. Li<sup>1,2</sup>, <sup>1</sup>UESTC, CHINA, <sup>2</sup>Monash Univ., AUSTRALIA

#### FR3C-3

Efficient Supply Power Control by PWM Technique for Microwave Wireless Power Transfer Systems

R. Ishikawa, K. Honjo, *The Univ. of Electro-Comminications, JAPAN* FR3C-4

A Criterion Proposed for Inductive Coupling and Magnetic Resonance Coupling in Wireless Power Transfer System

H. Shim<sup>1</sup>, J. Park<sup>1</sup>, S. Nam<sup>1</sup>, B. Lee<sup>2</sup>, <sup>1</sup>Seoul National Univ., REPUBLIC of KOREA, <sup>2</sup>Kyung Hee Univ., REPUBLIC of KOREA FR3C-5

Feasibility Study of Simple Model to Emulate Electromagnetic Field Leaked from Wireless Power Transfer Systems by Using Electromagnetic Field Simulation

Y. Kanasaki, T. Hirobe, H. Uno, T. Kaneko, Panasonic System Networks R&D Lab. Co., JAPAN

FR3C-6

Analysis on Electromagnetic Field Leaked from Wireless Power Transfer System for Electric Vehicle Located at Case Study House

T. Hirobe, H. Uejima, H. Uno, Y. Tateno, K. Ikeda, Panasonic System Networks R&D Lab. Co., Ltd., JAPAN

Session FR3B

## Friday, November 7

## Room D (Shirakashi 2) 3rd Floor

## Session FR3D

## Radar, Remote Sensing and Imaging Systems II

Chairs: M. Sato, Tohoku Univ., JAPAN F. Gumbmann, Rohde & Schwarz GmbH & Co. KG, GERMANY

#### FR3D-1

Remote Sensing of the Physical Qualities of Fruits

P. Leekul<sup>1</sup>, T. Limpiti<sup>2</sup>, T. Tantisopharak<sup>1</sup>, P. Yoiyod<sup>1</sup>, S.t Chivapreecha<sup>1</sup>, C. Phongcharoenpanich<sup>1</sup>, M. Krairiksh<sup>1</sup>, <sup>1</sup>Walailak Univ., THAILAND, <sup>2</sup>KMITL, THAILAND

#### FR3D-2

79GHz-Band Wide Field-of-View Radar System Performance in Outdoor for Pedestrian Detection

T. Morita, T. Kishigami, H. Yomo, M. Yasugi, Y. Nakagawa, *Panasonic Corp., JAPAN* 

#### FR3D-3

61GHz ISM Band FMCW Radar For Applications Requiring High Accuracy

S. Scherr, S. Ayhan, H. Gulan, M. Pauli, T. Zwick, KIT, GERMANY

#### FR3D-4

Probing Angle Compensation Method for Enhancing Vital Sign Detection with Doppler Radar

X. Gao, J. Krook, J.-R. Okuda, O. Boric-Lubecke, Univ. of Hawaii at Manoa, U.S.A.

#### FR3D-5

A Low-Power UWB Radar Transceiver with Fast Switching Wideband LNA for Short-Range Detection

Y.-S. Won, S. Yuwono, J.-H. Jung, S.-K. Han, S.-G. Lee, KAIST, REPUBLIC of KOREA

Room E (Meeting Room 1) 1st Floor Session FR3E

## Millimeter-Wave and THz Tranceivers and Building Blocks

Chairs: M. Fujishima, Hiroshima Univ., JAPAN H. Wang, National Taiwan Univ., TAIWAN

### FR3E-1

A Millimeter-Wave CMOS Transceiver Toward More Than 300Gbps

K. Okada, Tokyo Inst. of Tech., JAPAN

#### FR3E-2

#### InP HEMT Amplifier Design and Packaging Techniques for Multi-10-Gbps Data Reception in Sub-Millimeter-Wave Bands

Y. Nakasha<sup>1</sup>, M. Sato<sup>1</sup>, Y. Kawano<sup>1</sup>, T. Suzuki<sup>1</sup>, H. Matsumura<sup>1</sup>, S. Shiba<sup>1</sup>, T. Takahashi<sup>1</sup>, K. Makiyama<sup>1</sup>, T. Iwai<sup>2</sup>, N. Hara<sup>1</sup>, <sup>1</sup>*Fujitsu Ltd., JAPAN*, <sup>2</sup>*Fujitsu Laboratories Ltd., JAPAN* 

#### FR3E-3

## 250-300GHz Waveguide Module with Ridge-Coupler and InP-HEMT IC

T. Kosugi<sup>1</sup>, H. Hamada<sup>1</sup>, H. Takahashi<sup>2</sup>, H.-J. Song<sup>2</sup>, A. Hirata<sup>2</sup>, H. Matsuzaki<sup>1</sup>, H. Nosaka<sup>1</sup>, <sup>1</sup>NTT Photonics Laboratories, JAPAN, <sup>2</sup>NTT Microsystem Integration Laboratories, JAPAN

#### FR3E-4

Si-Based Sub-THz Heterodyne Imaging Circuits

D. Yoon, K. Song, J. Kim, J.-S. Rieh, Korea Univ., REPUBLIC of KOREA

## Room F (Meeting Room 2) 1st Floor

### Session FR3F

## Novel Design Techniques of Planar Microwave Filters

Chairs: J.-T. Kuo, Chang Gung Univ., TAIWAN M. Ohira, Saitama Univ., JAPAN

#### FR3F-1

13:30 - 15:30

A Lossy Triple-mode Microstrip Filter with Flat Passband Based on Nonuniform Q-Factors

F.-J. Chen, L.-S. Wu, L.-F. Qiu, J.-F. Mao, Shanghai Jiao Tong Univ., CHINA

#### FR3F-2

Bandpass-Filter Design Based on the Cul-de-Sac Coupling Matrix by Using Open-Loop Microstrip Resonators

T. Ueda, Y. Sugimoto, H. Deguchi, M. Tsuji, Doshisha Univ., JAPAN

#### FR3F-3

Ultra-Compact Shorted Ring Resonator Bandpass Filter with Wide Upper Stopband

T.-W. Lin<sup>1</sup>, J.-T. Kuo<sup>2</sup>, S.-J. Chung<sup>1</sup>, <sup>1</sup>National Chiao Tung Univ., TAIWAN, <sup>2</sup>Chang Gung Univ., TAIWAN

#### FR3F-4

Design of the Wide Stopband Microstrip Bandpass Filter by Cascading Stepped Coupled Lines

C.-N. Liu, C.-H. Teng, C.-W. Tang, National Chung Cheng Univ., TAIWAN

#### FR3F-5

3GHz-Band Superconducting Wide-Band Filter for Small Microwave Receiver

N. Shiokawa, T. Kawaguchi, K. Nakayama, M. Yamazaki, H. Kayano,  $Toshiba\ Corp., JAPAN$ 

FR3C-6 Microstrin Lownass

Microstrip Lowpass Filters with Improved Frequency Responses Using Coupled-Line Hairpin Resonators

J. Tsurumi, Z. Ma, M. Ohira, Saitama Univ., JAPAN

## Wednesday, November 5

## 15:30 - 17:00

## Session WE3G

#### Room G (Sakura) 2nd Floor

#### WE3G-1

A Constant Fractional-Bandwidth Control Scheme for Tunable Closed-Ring Bandpass Filter

Y.-M. Chen, C.-H. Yang, S.-F. Chang, C.-C. Chang, National Chung Cheng Univ., TAIWAN

#### WE3G-2

New Compact Pentaplexer Using Stub-Loaded Stepped Impedance Resonators

Y.-W. Chen<sup>1</sup>, G.-S. Chen<sup>2</sup>, H.-W. Wu<sup>2</sup>, Y.-K. Su<sup>1,2</sup>, <sup>1</sup>National Cheng Kung Univ., TAIWAN, <sup>2</sup>Kun Shan Univ., TAIWAN

#### WE3G-3

A Study of Waveguide Power Combiner Allowing for the Variable Number of Input Ports

A. Hirota, Y. Tahara, T. Owada, Y. Yasunaga, Y. Sakai, M. Miyazaki, H. Miyashita., Mitsubishi Electric Corp., JAPAN

#### WE3G-4

A Wilkinson Power Divider with Transmission Zero in Desired Stopband Using Embedded Parallel Resonator

W.-D. Lin<sup>1</sup>, R.-. Liu<sup>1</sup>, B.-L. Chen<sup>1</sup>, P.-H. Deng<sup>1</sup>, S.-F. Chao<sup>2</sup>, <sup>1</sup>National Univ. of Kaohsiung, TAIWAN, <sup>2</sup>National Kaohsiung Marine Univ., TAIWAN

#### WE3G-5

A Multi-functional Coupler of Four-Port Crossover and Continuously Tunable Power Divider

Y.-T. Chen, Y.-H. Pang, National Univ. of Kaohsiung, TAIWAN

#### WE3G-6

Compact and Harmonic-Suppressed 3-dB 90° Hybrid A Compact and Harmonic-suppress Coupler Using Coupled-Line Section

J. Kim, J.-G. Yook, Yonsei Univ., REPUBLIC of KOREA

#### WE3G-7

#### A High Isolation Ouasi-Circulator with Self-Adjusting Technique

P.-W. Chen, M.-T. Lai, H.-W. Tsao, J.-S. Wu, National Taiwan Univ., TAIWAN

#### **WE3G-8**

High-Selectivity E-Band Image-Reject Filters in SiGe Technology

M. Thian<sup>1</sup>, M. Tiebout<sup>2</sup>, F. Dielacher<sup>2</sup>, V. Fusco<sup>1</sup>, <sup>1</sup>The Queen's Univ. of Belfast, U.K., <sup>2</sup>Infineon Tech., AUSTRIA

#### WE3G-9

Shunt Characterization Technique of Decoupling Transmission Line for Millimeter-Wave CMOS Amplifier Design

K.K. Tokgoz, K. Lim, K. Okada, A. Matsuzawa, Tokyo Inst. of Tech., JAPAN

#### WE3G-10

A Vertical Interconnect with DC-Block Using a Low-Cost Technology at mm-Wave Frequencies

C. Friesicke, B. Rohrdantz, A. Stark, A.F. Jacob, Tech. Univ. Hamburg-Harburg, GERMANY

#### WE3G-11

Study on Measurement Method of Permittivity for Low-Loss Materials Using Microstrip Ring-Resonator

Y. Kato, M. Horibe, M. Ameya, S. Kurokawa, AIST, JAPAN

#### WE3G-12

Q-Band Waveguide-to-Suspended-Stripline Transition with DC/IF Return Path

J Guo J Xu Y Cui Z Xu C Oian Southeast Univ. CHINA

#### WE3G-13

Quarter-Mode Substrate Integrated Waveguide

N. Wang, C. Jin, X. Xu, H. Sun, Beijing Inst. of Tech., CHINA

#### WE3G-14

Analysis of Propagation Characteristics in Graphene-Based Rectangular Waveguides Using Mode-Matching Technique Q.Tang, L.Zhou, B.-H. Gan, Y.-P. Zhang, J.-F. Mao, Shanghai Jiao Tong Univ., CHINA

#### WE3G-15

Dispersion Characteristics of Dielectric Loaded Circular Quadruple-Ridged Waveguide

G. Li, Y. Cheng, A. Ma, Northwest Univ. for Nationalities, CHINA

#### WE3G-16

Time Domain Analysis of Non-Uniform Transmission Lines Based on WLP-FDTD

P. Yu, X. Li, N.Wang, J. Mao, Shanghai Jiao Tong Univ., CHINA

#### WE3G-17

Calculation of Quasistatic Parameters for Asymmetric Coplanar Waveguides Using Fuzzy Logic

C. Karpuz<sup>1</sup>, O. İnan<sup>2</sup>, A. K. Görür<sup>1</sup>, <sup>1</sup>Pamukkale Univ., TURKEY, <sup>2</sup>Mehmet Akif Ersoy Univ., TURKEY

#### WE3G-19

Design of Antenna Feed for Mono-Pulse Auto-Tracking Ground Station

Y.-J. Lee<sup>1</sup>, W.-L. Chen<sup>1</sup>, S.-K. Yaung<sup>2</sup>, R.-M. Yang<sup>2</sup>, M.-H. Chen<sup>3</sup>, C.-Y. Chu<sup>3</sup>, S.-J. Chung<sup>1</sup>, <sup>1</sup>NCTU, TAIWAN, <sup>2</sup>NARL, TAIWAN, <sup>3</sup>Victory Microwave Corp., TAIWAN

#### WE3G-20

Compact Tunable Crossover with Wide Tuning Range Using Coupled Lines

H. Zhu, Y. Wang, A.M. Abbosh, The Univ. of Queensland, AUSTRALIA

#### WE3G-21

Miniature Rectangular Ring Band-Pass Filter with Embedded Barium Strontium Titanate Capacitors

N. Osman<sup>1</sup>, C. Free<sup>2</sup>, <sup>1</sup>Universiti Putra Malaysia, MALAYSIA, <sup>2</sup>Univ. of Sussex, U.K.

#### WE3G-22

Influence of Post-Annealing on the Performance of BST Thin Film Varactors

M.F.A. Khalid<sup>1</sup>, A.S. Holland<sup>2</sup>, K. Ghorbani<sup>3</sup>, <sup>1</sup>UiTM, MALAYSIA, <sup>2</sup>RMIT Univ., VIETNAM, <sup>3</sup>RMIT Univ., AUSTRALIA

#### WE3G-23

Triple Band Microstrip Slot Antenna for WiMax/WLAN Networks

A. Nosrati, Razi Univ., IRAN

## WE3G-24

A Compact Multiband Planar Antenna for Integrated Mobile Wireless Radio Access Applications

C.-S. Chuang , T.-T. Ku , J.-H. Zeng, Lunghwa Univ., TAIWAN

#### WE3G-25 Planar Microstrip-fed Antenna for 2.4GHz WLAN and

UWB Application

C.-F. Tseng, W.-H. Chang. C.-H. Hsu, National United Univ., TAIWAN

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#### WE3G-26

High Performance Dual-Band Dual-Polarized Magneto-Electric Dipole Base Station Antenna

S. Chen, K.-M. Luk, City Univ. of Hong Kong, HONG KONG

#### WE3G-27

An Extremely Wideband Planar Monopole Antenna with Triple Notched Stop Bands

M.M. Sharma<sup>1</sup>, J.K. Deegwal<sup>2</sup>, M.C. Govil<sup>3</sup>, A. Kumar<sup>4</sup>, <sup>1</sup>Govt. Engineering College, INDIA, <sup>2</sup>Suresh Gyan Vihar Univ., INDIA, <sup>3</sup>Malaviya National Inst. of Tech., INDIA, 4Govt. Women Engineering College, INDIA

#### WE3G-28

Microstrip Fractal Antenna with Minkowski Island Split Ring Resonator (MI-SRR) for WiFi and WiMAX Application

H. Nornikman<sup>1</sup>, M.R. Kamarudin<sup>2</sup>, B.H. Ahmad<sup>1</sup>, M.Z.A. AbdAziz<sup>1</sup>, A.R. Othman<sup>1</sup>, <sup>1</sup>UTeM, MALAYSIA, <sup>2</sup>UTM, MALAYSIA

#### WE3G-29

Rectangular Dielectric Resonator Antenna for Wideband and High Gain Applications

P. Patel<sup>1</sup>, B. Mukherjee<sup>2</sup>, J. Mukherjee<sup>1</sup>, <sup>1</sup>IIT, INDIA, <sup>2</sup>IIITDM Jabalpur, INDIA

#### WE3G-30

A Design of E/Ka Dual-Band Patch Antenna with Shared Aperture

Z. Wang<sup>1</sup>, L. Xiao<sup>2</sup>, L. Fang<sup>1</sup>, H. Meng<sup>1</sup>, <sup>1</sup>Southeast Univ., CHINA, <sup>2</sup>Huawei Tech. Co., Ltd, CHINA

#### WE3G-31

Wideband Dual-Polarized L-Probe Proximity-Fed A Wideband Dual-rotatized E Annular Ring Antenna with Compact Size

B.L. Liu, F. Wang, C. Chen, W.D. Chen, USTC, CHINA

#### WE3G-32

Dual Patch Microstrip Antenna on LTCC Technology H. Jumaat, M.T. Ali, S. Subahir, N.H.M. Sukaimi, N.M. Fauzi, UiTM, MALAYSIA

#### WE3G-33

WE3G-34

WE3G-35

WE3G-36

WE3G-37

Feeding Network

Industries Corp., CHINA

Design of Broadband Polarization-Sensitive Reflectarray Using a Single-Layer Substrate and Double Printed Dipole Arravs X. Zeng, Y. Ge, Huaqiao Univ., CHINA

Evaluation of Antenna with Periodically Variable Directivity

A Substrate Integrated Slot Antenna Array Using Higher

A Four-Band Dual-Polarized Cavity-Backed Antenna on

W-Band High-Gain LTCC Antenna Array with LWG

B. Cao<sup>1</sup>, H. Wang<sup>1</sup>, Y. Wang<sup>1</sup>, D. Huang<sup>1</sup>, Y. Huang<sup>2</sup>, X. Du<sup>3</sup>, <sup>1</sup>NUST,

CHINA, <sup>2</sup>Suzhou Bohai Microsystem Co., Ltd., CHINA, <sup>3</sup>China North

P. Wu, S. Liao, Q. Xue, City Univ. of Hong Kong, HONG KONG

Y. Idoguchi, M. Saito, Univ. of the Ryukyus, JAPAN

LTCC Technology for 60GHz Applications Y.-W. Hsu, Y.-C. Lin, National Taiwan Univ., TAIWAN

Order Mode Feeding Network

## 15:30 - 17:00

Wednesday, November 5

#### WE3G-38

W-Band LTCC Helical Antenna Array with Substrate Integrated Horn

B. Cao<sup>1</sup>, H. Wang<sup>1</sup>, Y. Wang<sup>1</sup>, J. Zheng<sup>1</sup>, C. Sun<sup>1</sup>, Y. Huang<sup>2</sup>, <sup>1</sup>NUST, CHINA, <sup>2</sup>Suzhou Bohai Microsystem Co., Ltd., CHINA

#### WE3G-39

Broadband W-Band On-Chip Yagi Antenna Using Superstrate for High Efficiency and Endfire Radiation

#### WE3G-40

205-240 GHz Aperture Coupled Antenna for Dielectric Lens Applications B. Göttel, Y.L. Sit, H. Gulan, M. Pauli, T. Zwick, *KIT*, *GERMANY* 

#### WE3G-41

A Novel 0.22-THz On-Chip Antenna Based AMCs H. Zhu<sup>1,2</sup>, N. Li<sup>1,2</sup>, J. Zeng<sup>1,2</sup>, X. Li<sup>1,2</sup>, B. Ai<sup>2</sup>, <sup>1</sup>BUPT, CHINA, <sup>2</sup>Beijing Jiaotong Univ., CHINA

#### WE3G-42

High-Gain E-Band IPD-Based Antenna Using Flip-Chip Technology

T.-Y. Lin<sup>1,2</sup>, T. Chiu<sup>2</sup>, C. Hung<sup>2</sup>, H.-C. Chen<sup>2</sup>, D.-C. Chang<sup>1</sup>, <sup>1</sup>CIC, TAIWAN, <sup>2</sup>National Central Univ., TAIWAN

#### WE3G-43

A Novel High Gain K-Band H-Plane SIW Horn Antenna Using Dielectric Loading

Y. Tang, Z. Wang, L. Xia, P. Chen, UESTC, CHINA

#### WE3G-44

Offset Reflectarray Using Single-Layer Microstrip Elements with High Metallic Conductor Areas

J.S. Kim<sup>1</sup>, J.H. Yoon<sup>1</sup>, Y.J. Yoon<sup>1</sup>, W.-S. Lee<sup>2</sup>, J.-H. So<sup>2</sup>, <sup>1</sup>Yonsei Univ., REPUBLIC of KOREA, <sup>2</sup>ADD, REPUBLIC of KOREA

#### WE3G-45

A Single-Layer Antenna-Filter-Antenna Array with Polarization Rotation Characteristic

X.-C. Zhu<sup>1</sup>, W. Hong<sup>1</sup>, Z.-C. Hao<sup>1</sup>, L. Cheng<sup>1</sup>, J.-X. Zhuang<sup>1</sup>, K. Wu<sup>2</sup>, <sup>1</sup>Southeast Univ., CHINA, <sup>2</sup>POLY, CANADA

#### WE3G-46

Design of Novel Optically Transparent Antenna for RFID Applications

N. He<sup>1</sup>, Y. Yao<sup>1</sup>, J. Yu<sup>1</sup>, X. Chen<sup>2</sup>, <sup>1</sup>BUPT, CHINA, <sup>2</sup>Queen Mary, Univ. of London, U.K.

#### WE3G-47

SRR Embedded Ferrite Superstrate Based Beam Scanning of 10GHz Single Microstrip Patch Antenna

F. Sultan, S.S.I. Mitu, KFUPM, SAUDI ARABIA

## WE3G-48

Numerical Estimation of E-Field Uniformity in a Reverberation Chamber Using a Simple Multipath Fading Model

K. Harima, NICT, JAPAN

#### WE3G-49

Analysis of Coupling Voltage of Ground Slot Located Nearby Two Microstrip Lines on a Printed Circuit Board T. Tobana, T. Sasamori, Y. Isota, *Akita Prefectural Univ., JAPAN* 

#### WE3G-50

Upper-Bounds to the Near- and Far-End Conversion Loss in Unbalanced Differential Lines

Y. Yang<sup>1</sup>, X. Wu<sup>1</sup>, F. Grassi<sup>2</sup>, G. Spadacini<sup>2</sup>, S. A. Pignari<sup>2</sup>, <sup>1</sup>Xi'An Jiaotong Univ., CHINA, <sup>2</sup>Politecnico di Milano, ITALY

#### WE3G-51

K. Otsuka, S. Suzuki, K. Kiyomi, Y. Tomizuka, T. Ohno, K. Tanii, Kisarazu National College of Tech., JAPAN

#### WE3G-52

A Simple Method of Estimating the Conducted Emission from Automotive Electric Power Steering (EPS) System

J. Jung<sup>1</sup>, S.-I. Jeung<sup>2</sup>, J.-H. Yeom<sup>1</sup>, N. Kim<sup>1</sup>, Y.-S. Kim<sup>1</sup>, S. Kee<sup>1</sup>, <sup>1</sup>Mando, REPUBLIC of KOREA, <sup>2</sup>Huwin, REPUBLIC of KOREA

#### WE3G-53

Fast Prediction for Conducted EMI in Flyback Converters J. Liu<sup>12</sup>, Y. Wang<sup>12</sup>, D. Jiang<sup>1</sup>, Q. Cao<sup>1</sup>, <sup>1</sup>NUAA, CHINA, <sup>2</sup>NUIST, CHINA

## **TECHNICAL SESSIONS (Poster Sessions)**

## Thursday, November 6

Fully-Integrated CMOS Differential Class-E Power

Amplifier with Combined Waveform-Shaping Network and

C. Zhai, K.-K.M. Cheng, The Chinese Univ. of Hong Kong, HONG

A Fully Integrated 2.4GHz Adaptive Biased CMOS Power

.5-GHz 1-V High Efficiency CMOS Class-E Amplifier

T.A. Kurniawan, X. Yang, Z. Sun, X. Xu, T. Yoshimasu, Waseda

A Fully Integrated CMOS Broad Band Power Amplifier

R. Bhattacharya, R. Gupta, A. Basu, K. Rawat, S.-K. Koul, Indian

Analytical Model of Voltage Division Inside Stacked-FET

Partial Sigma-Delta Modulated Signal and Application to

Y. Zhu, O. Klimashov, D. Bartle, Skyworks Solution Inc., U.S.A.

S. Kusunoki, Sonv-Mobile Communications, Inc., JAPAN

Amplifier for 802.11g WLAN Application

IC Using Back-gate Voltage Injection

Using a Low-Q Matching Strategy

J. Ho, H.-W. Tsao, National Taiwan Univ., TAIWAN

## 10:00 - 11:30

## Session TH1G

Linearity Improvement

Transformer-Based Balun

C.-C. Chen, G.-C. Lin, ITRI, TAIWAN

#### Room G (Sakura) 2nd Floor

#### TH1G-1 A CMOS T/R Switch Using a MOSFET Diode Pair for

TH1G-2

KONG TH1G-3

TH1G-4

Univ., JAPAN

Inst. of Tech., INDIA

TH1G-5

TH1G-6

Switch

TH1G-7

#### TH1G-14

#### Ultra-Wideband Millimeter-Wave On-Wafer Characterization of Bipolar Junction Transistors with EM-Based Three-Step De-Embedding

J. Bae<sup>1</sup>, S. Jang<sup>1</sup>, S. Jordan<sup>2</sup>, C. Nguyen<sup>1</sup>, <sup>1</sup>Texas A&M Univ., U.S.A., <sup>2</sup>TowerJazz Semiconductor, U.S.A.

#### TH1G-15

Analytical Design of Small-Signal Amplifier with Maximum Gain in Conditionally Stable Region

S. Mizukusa, K. Takano, K. Katayama, S. Amakawa, T. Yoshida, M. Fujishima, Hiroshima Univ., JAPAN

#### TH1G-16

Towards Millimeter-Wave High PAE High Power Using Ultrathin Al-Rich Barrier GaN Devices

F. Medjdoub, E. Okada, B. Grimbert, M. Zegaoui, D. Ducatteau, N. Rolland, IEMN, FRANCE

#### TH1G-17

AlGaN/GaN HEMTs Versus InAlN/GaN HEMTs Fabricated by 150-nm Y-Gate Process

H. Ichikawa, C. Mizue, I. Makabe, Y. Tateno, K. Nakata, K. Inoue, Sumitomo Electric Industries, Ltd., JAPAN

#### TH1G-18

70W C-Band GaN Solid State Power Amplifier for Satellite Use

T. Hirano, A. Shibuya, T. Kawabata, M. Kido, K.Yamada, K. Seino, A. Ichikawa, A. Kamikokura, Mitsubishi Electric TOKKI Systems Corp., JAPAN

## TH1G-19

The Improvement of Efficiency in L-Band 10W GaN HEMT Power Amplifier by Harmonic Injection

K. Fujii<sup>1</sup>, K. Terajima<sup>1</sup>, T. Sonoda<sup>1</sup>, T. Takagi<sup>2</sup>, S. Kameda<sup>2</sup>, N. Suematsu<sup>2</sup>, K. Tsubouchi<sup>2</sup>, <sup>1</sup>Wave Tech. Inc., JAPAN, <sup>2</sup>Tohoku Univ., JAPAN

### TH1G-20

TH1G-21

Pas

A High Efficiency GaN HEMT High Power Amplifier at L-Band

N. Kosaka, E. Kuwata, M. Hangai, K. Yamanaka, T. Yamasaki, H. Koyama, Mitsubishi Electric Corp., JAPAN

M. Coers, W. Bosch, Graz Univ. of Tech., AUSTRIA

#### TH1G-8

Power Amplifier

An Integrated Inverse-F Power Amplifier Design Approach for Heating Applications in a Microwave Resonant Cavity

A. Imtiaz, Z. A. Mokhti, J. Cuenca, J. Lees, Cardiff School of Engineering, U.K.

#### TH1G-9

## Switchable Matched Ring Resonator in SPDT Discrete Switch Design for WiMAX and LTE in 3.5GHz Band

N.A. Shairi<sup>1</sup>, P.W. Wong<sup>2</sup>, B.H. Ahmad<sup>1</sup>, <sup>1</sup>CeTRI, UTeM, MALAYSIA, <sup>2</sup>UTP, MALAYSIA

#### **TH1G-10**

An Novel Integrated Antenna Switch for DCS/UMTS Application

G.-H. Shen<sup>1</sup>, H.-L. Peng<sup>1</sup>, X.-C. Hong<sup>1</sup>, B.-Q. Zong<sup>2</sup>, Z. Yu<sup>2</sup>, J.-F. Mao1, 1Shanghai Jiao Tong Univ., CHINA, 2ZTE Corp., CHINA

#### TH1G-11

### An Improved AgilentHBT Model for InP DHBT

O. Li<sup>1</sup>, L. Wang<sup>1</sup>, W. Cheng<sup>2</sup>, H. Lu<sup>2</sup>, G. Gu<sup>1</sup>, J. Zhang<sup>1</sup>, R. Xu<sup>1</sup>, <sup>1</sup>UESTC, CHINA, <sup>2</sup>Science and Tech. on Monolithic Integrated Circuits and Modules Laboratory, CHINA

#### TH1G-12

Noncontiguous Channel Amplification with a Multilevel Outphasing Transmitter Without Digital Predistortion

T.M. Hone, A.F. Aref, J. Guan, R. Negra, RWTH Aachen Univ., GERMANY

#### TH1G-22

Investigation of Body Bias Effect in P-GaN Gate HEMTDevices

H.-C. Chiu, L.-Y. Peng, C.-W. Yang, H.-C. Wang, F.-T. Chien, Chang Gung Univ., TAIWAN

#### **TH1G-24**

Modeling of Frequency Dispersion at Low Frequency for GaN HEMT

Y. Yamaguchi, T. Oishi, H. Otsuka, T. Nanjo, H. Koyama, Y. Kamo, K. Yamanaka, Mitsubishi Electric Corp., JAPAN

#### TH1G-25

#### A Novel Analytical Method for GaAs/GaN pHEMTs Intrinsic Parameters Extraction

Y. Yuan<sup>1,2</sup>, Z. Zhong<sup>2,3</sup>, Y. Guo<sup>2,3</sup>, S. Mu<sup>1</sup>, <sup>1</sup>NUST, CHINA, <sup>2</sup>National Univ. of Singapore, SINGAPORE, <sup>3</sup>NUS, CHINA

#### TH1G-26

A New Analytical Technique of Bias-Dependent Drain Resistance Extraction in HEMTs

A.A. Kokolov, L.I. Babak, TUSUR, RUSSIAN FEDERATION

#### TH1G-27

A 4-Way Frequency Splitter Based on Plasmonic Broadband Slow-Wave Systems

Y. Jin Zhou<sup>1,2</sup>, B.J. Yang<sup>1</sup>, <sup>1</sup>Shanghai Univ., CHINA, <sup>2</sup>Southeast Univ., CHINA

#### TH1G-28

Influence of Ground Plane with Variable Conductivity on Metamaterial Absorption

Y. Wen1, W. Ma1, J. Bailey2, G. Matmon2, G. Aeppli2, X. Yu1, Peking Univ., CHINA, <sup>2</sup>Univ. College London, U.K.

#### TH1G-29

Implementation of a Wire Medium in a X-Band Horn Antenna: Simulation and Experiment

A. Tomaz<sup>1</sup>, J.J. Barroso<sup>2</sup>, P.J. Castro<sup>2</sup>, U.C. Hasar<sup>3</sup>, A.J.F. Orlando<sup>1</sup>, <sup>1</sup>ITA, BRAZIL, <sup>2</sup>INPE, BRAZIL, <sup>3</sup>Univ. of Gaziantep, TURKEY

#### TH1G-30

Dual Layer Polarization Insensitive Dual Band Metamaterial Absorber with Enhanced Bandwidths

S. Bhattacharyya, K.V. Srivastava, Indian Inst. of Tech., INDIA

#### TH1G-31

Tunable Complimentary Frequency Selective Surface (CFSS) Based on Graphene for THz Application

L. Lin<sup>1</sup>, L.-S. Wu<sup>1</sup>, L. Zhou<sup>1</sup>, W.-Y. Yin<sup>1,2</sup>, J.-F. Mao<sup>1</sup>, <sup>1</sup>Shanghai Jiao Tong Univ., CHINA, <sup>2</sup>Zhejiang Univ., CHINA

#### TH1G-32

Investigation of Plasmon Hybridization in Split-Ring Resonators

D. Kitayama, H.-J. Song, M. Yaita, NTT Corp., JAPAN

#### TH1G-33

Planar Dual-Band Fork Three-Way Power Dividers with Inductor-Terminated Transmission Lines

X. Wang<sup>1</sup>, I. Sakagami<sup>2</sup>, M. Yoshikawa<sup>1</sup>, <sup>1</sup>Univ. of Tsukuba, JAPAN, <sup>2</sup>Univ. of Toyama, JAPAN

#### TH1G-34

Stability Investigations of GaN Truly-Differential Feedback Design of the Semi-Lump Bandpass Wilkinson Power Divider

Y.-H. Chou, G.-L. Chen, HuaFan Univ., TAIWAN

#### TH1G-35

A Low-Cost Small-Size 6 GHz Quadrature Coupler for IPD-Based SiP Radio Systems

Y.-C.Hsu<sup>1</sup>, I. Haroun<sup>2</sup>, D.-C. Chang<sup>1</sup>, R. Amaya<sup>3</sup>, K. Hettak<sup>3</sup>, <sup>1</sup>NARL, TAIWAN, <sup>2</sup>Carleton Univ., CANADA, <sup>3</sup>Communications Research Centre, CANADA

#### TH1G-36

Analysis of Coupled-Trough-Waveguide Based on E-Plane Planar Circuit Approach

Y. Namba<sup>1</sup>, M. Kishihara<sup>1</sup>, I. Ohta<sup>2</sup>, K. Okubo<sup>1</sup>, H. Takimoto<sup>1</sup>, <sup>1</sup>Okayama Prefectural Univ., JAPAN, <sup>2</sup>Univ. of Hyogo, JAPAN

#### TH1G-37

Broadband Slot-Coupled Directional Coupler Loading Conductor Strips

T. Naemura, S. Amimoto, H. Deguchi, M. Tsuji, Doshisha Univ., JAPAN

#### TH1G-38

Narrowband Direction-of-Arrival Estimation with a Single Antenna Using Compressed Sensing

A. Nalobin, I. Rolfes, Ruhr-Universität Bochum, GERMANY

15:30 - 17:00

Thursday, November 6

Room G (Sakura)

2nd Floor

#### TH1G-39

A Linear Retro-Nulling Antenna Array with the Second Null at an Arbitrary Direction

S.-N. Hsieh<sup>1</sup>, T.-H. Chu<sup>2</sup>, <sup>1</sup>Academia Sinica, TAIWAN, <sup>2</sup>National Taiwan Univ., TAIWAN

#### TH1G-40

2D Antenna Radiation Pattern Retrieval Using Reflection Coefficient Measurement

Z. Du, V. Viikari, J. Ala-Laurinaho, A.V. Raisanen, Aalto Univ., FINLAND

#### TH1G-41

A Free-space Measurement of Complex Permittivity in 8GHz-40GHz

N. Zhang, J. Cheng, G. Zhang, C. Cheng, J. Liu, BIRMM, CHINA

#### TH1G-42

Reflectivity Verification of TiO<sub>2</sub>-Coated Carbon Fiber-Reinforced Plastic Surface for Radio Telescope in W-Band S.-N. Hsieh<sup>1</sup>, M.-T. Chen<sup>1</sup>, T.-H. Chu<sup>2</sup>, <sup>1</sup>Academia Sinica, TAIWAN, <sup>2</sup>National Taiwan Univ., TAIWAN

#### TH1G-43

A Compact Tunable Antenna for LTE Mobile Applications H. Wang, G. Yang, *Shanghai Univ., CHINA* 

#### TH1G-44

An Electrically Small Circularly Polarized Antenna Using a Dipole-Fed Cross Spiral Antenna

M. Matsunaga, M. Shiraga, Y. Kuroda, Ehime Univ., JAPAN

#### TH1G-45

Planar Antenna for GSM/PCS/Wi-Fi and UWB Applications W.-C. Wu, T.-H. Du, W.-H. Tu, National Central Univ., TAIWAN

#### TH1G-46

A Smart Fluorescent Antenna with Ethernet Over AC Power (EoP) for Wi-Fi Application

K.A.C. Mat<sup>1</sup>, M.T. Ali<sup>1</sup>, M.R. Kamarudin<sup>2</sup>, H. Ja'afar<sup>1</sup>, A.A.A Aziz<sup>1</sup>, H.M. Zali<sup>1</sup>, <sup>1</sup>UiTM, MALAYSIA, <sup>2</sup>UTM, MALAYSIA

#### TH1G-47

Ultra Wideband Antenna for Repeater Applications S. Kharche<sup>1</sup>, G S. Reddy<sup>1</sup>, R.K. Gupta<sup>2</sup>, J. Mukherjee<sup>1</sup>, <sup>1</sup>IIT, INDIA, <sup>2</sup>Terna Engineering College, INDIA

#### TH1G-48

A Coupled Resonator Decoupling Network for In-Device Coexistence of Two Collocated Antennas

L. Zhao, K. Qian, K.-L. Wu, The Chinese Univ. of Hong Kong, HONG KONG

#### TH1G-49

Compact High Gain Planar Antenna Composed of Inverted L Antenna Fabricated by Coplanar Waveguide

M. Taguchi, T. Kida, Nagasaki Univ., JAPAN

### TH1G-50

Microstrip Antenna Array with a Series Capacitively-Coupled Feeding Network for 12GHz Band Applications C.-Y. Hsu<sup>1</sup>, L.-T. Hwang<sup>1</sup>, S.-M. Wang<sup>1</sup>, F.-S. Chang<sup>2</sup>, C.-F. Liu<sup>2</sup>, <sup>1</sup>National Sun Yat-Sen Univ., TAIWAN, <sup>2</sup>Cheng Shiu Univ., TAIWAN

#### TH1G-51

An X-Band Circularly Polarized Antenna for Satellite Applications

Y.-J. Lee<sup>1</sup>, J.-H. Lu<sup>1</sup>, I.-Y. Tarn<sup>2</sup>, S.-L. Chen<sup>2</sup>, S.-J. Chung<sup>1</sup>, <sup>1</sup>National Chiao-Tung Univ., TAIWAN, <sup>2</sup>NARL, TAIWAN

#### TH1G-52

A Novel Approach to the Recovery of Aperture Distribution of Phased Arrays with Single RF Channel Using Neural Networks

T. Sallan<sup>1</sup>, A.B. Abdel-Rahman<sup>12</sup>, M. Alghoniemy<sup>3</sup>, Z. Kawasaki<sup>4</sup>, <sup>1</sup>E-JUST, <sup>2</sup>South Valley Unvi., EGYPT, <sup>3</sup>Univ. of Alexandria, EGYPT, <sup>4</sup>Osaka Univ., JAPAN

## TH3G-1

Session TH3G

## A CMOS Direct Injection-Locked Frequency Divider with Locking Range Enhancement

C.-Y. Xiao, W.-H. Yen, S. Wang, National Taipei Univ. of Tech.,  $\mathit{TAIWAN}$ 

#### TH3G-2

A Constant Output Power Q-Band VCO with Distributed Cross-Coupled-Gm Core and A-Mode pMOS Varactors Y.-C. Wang, H.-K. Chiou, K.-H. *Chien, National Central Univ.*,

TAIWAN

#### TH3G-3

Implementation of the Even Harmonic Mixer Driven by the Pulsed LO

H. Hama, J. Hashimoto, K. Itoh, K. Noguchi, T. Hirota, S. Makino, Kanazawa Inst. of Tech., JAPAN

#### TH3G-4

An Integrated Enhanced-Locking-Range Injection-Locked Frequency Divider with Internal VCO

S. Lee<sup>1</sup>, S. Jang<sup>2</sup>, C. Nguyen<sup>2</sup>, <sup>1</sup>Samsung Electronics Co. Ltd., REPUBLIC of KOREA, <sup>2</sup>Texas A&M Univ., U.S.A.

#### TH3G-5

A K-Band Low Power High Accuracy Quadrature VCO Using Gate-Modulated Coupling and Transformer Feedback Technique

M.-H. Li, Y.-H. Liao, H.-Y. Chang, National Central Univ., TAIWAN

#### TH3G-6

Development of RF Attenuation Measurement Standard Using VNA

W.K. Perangin-angin<sup>1</sup>, A. Widarta<sup>2</sup>, <sup>1</sup>Puslit KIM-LIPI, INDONESIA, <sup>2</sup>NMIJ/AIST, JAPAN

#### TH3G-7

Noise Figure Verification Using Cold-Source and Y-Factor Technique for Amplifier and Down-Converted Mixer H.-F. Hsiao, C.-H. Tu, D.-C. Chang, Y.-Z. Juang, *NARL*, *TAIWAN* 

#### TH3G-8

Measuring Signal Generator Source Match B.D. Hall, Callaghan Innovation, NEW ZEALAND

#### TH3G-9

Connection Repeatability of Cross-Sonnected Waveguide Verification Standards for Millimeter-Wave Vector Network Analysis

H. Huang<sup>1,2</sup>, N.M. Ridler<sup>2</sup>, M.J. Salter<sup>2</sup>, <sup>1</sup>National Inst. of Metrology, CHINA, <sup>2</sup>National Physical Lab., U.K.

#### TH3G-10

Integrated Instantaneous Frequency Measurement Subsystem Based on Multi-Band-Stop Filters

B.G.M. Oliveira<sup>12</sup>, M.T. Melo<sup>1</sup>, I. Llamas-Garro<sup>3</sup>, M. Espinosa-Espinosa<sup>3</sup>, M.R.T. Oliveira<sup>1</sup>, E.M.F. Oliveira<sup>1</sup>, <sup>1</sup>Universidade Federal de Pernambuco, BRAZIL, <sup>2</sup>Instituto Federal de Pernambuco, BRAZIL, <sup>3</sup>CTTC, SPAIN

#### TH3G-11

Novel Non-Contact Measurement Technology by Radiation Model Extraction of Broadband Circuit and Signal Reconstruction

Y.-H. Yeh<sup>1</sup>, H.-F. Li<sup>1</sup>, S.-M. Wu<sup>1</sup>, R.-F. Hsu<sup>1</sup>, C.-C. Chen<sup>2</sup>, <sup>1</sup>National Univ. of Kaohsiung, TAIWAN, <sup>2</sup>Ministry of Economic Affairs, TAIWAN TH3G-12

#### Microwave Resonating Sensors for Real Time Weight Monitoring of Powdered, Granular and Liquid Samples

V. Nocella<sup>1</sup>, L. Pelliccia<sup>2</sup>, E. Fratticcioli<sup>2</sup>, F. Cacciamani<sup>1</sup>, R. Sorrentino<sup>1</sup>, <sup>1</sup>Univ. of Perugia, ITALY, <sup>2</sup>RF Microtech Srl, ITALY

Thursday, November 6

15:30 - 17:00

#### TH3G-13

Study on Evaluation Techniques of Effective Conductivity for Copper-Clad Dielectric Substrates

S. Nikaido, T. Shimizu, Y. Kogami, Utsunomiya Univ., JAPAN

#### TH3G-14

Wideband Bandpass Filter with Wide Stopband Based on Stub-Loaded Resonator

B. Zhang, S.S. Li, J.-M. Huang, BUPT, CHINA

#### TH3G-16

A New Design of Very Compact UWB Band-Stop Filter Using Coupled W-Shaped Strips N. Ojaroudi, Islamic Azad Univ., IRAN

#### TH3G-17

Suspended Stripline UWB Bandpass Filter with Adjustable Transmission Zero

Z.-X. Xu<sup>1</sup>, X. Yu<sup>1</sup>, J.-Q. Liu<sup>1</sup>, K.S.O. Kwakye<sup>1</sup>, J.L.-W. Li<sup>1,2</sup>, <sup>1</sup>UESTC, CHINA, <sup>2</sup>Monash Univ., AUSTRALIA

#### TH3G-18

A Novel Channel Coding Scheme for Digital RF Transmitter Comprising a 1-Bit Band-Pass Delta-Sigma Modulator

T. Maehata<sup>1</sup>, S. Kameda<sup>2</sup>, N. Suematsu<sup>2</sup>, <sup>1</sup>Sumitomo Electric Industries, Ltd., JAPAN, 2Tohoku Univ., JAPAN

#### TH3G-20

Improved JSDM Method Applied Under SCM Model

Y. Li, J. Zhao, Y. He, C. Zhu, Southeast Univ., CHINA

#### **TH3G-21**

Balanced Orthogonal Code for Polarization Angle Diversity K. Takei, Hitachi Ltd., JAPAN

#### TH3G-22

BER vs. Guard-Band Analysis of Adjacent QPSK Modulated Carriers on a Satellite Transponder

M. Yceer, S. Glgnl, Turksat, TURKEY

#### TH3G-23

1/2fs Direct RF Under Sampling Reception in Different RX Channels

D. Banda<sup>1,2</sup>, O. Wada<sup>1,3</sup>, T.T. Ta<sup>1,4</sup>, S. Kameda<sup>1</sup>, N. Suematsu<sup>1</sup>, T. Takagi<sup>1</sup>, K. Tsubouchi<sup>1</sup>, <sup>1</sup>Tohoku Univ., JAPAN, <sup>2</sup>The Univ. of Zambia, ZAMBIA, 3Mitsubishi Electric Corp., JAPAN, 4Toshiba Corp., JAPAN

#### **TH3G-24** System Stability of SS-CDMA Location and Short Message Communication Using QZSS

Taira, Y. Miyake, S. Kameda, N. Suematsu, T. Takagi, K. Tsubouchi, Tohoku Univ., JAPAN

#### TH3G-25

Design of an L-Band Radiometer Front End for Medical Radiometry

V.M. Ravi, K. Arunachalam, Indian Inst. of Tech., INDIA

#### TH3G-26

Local Exposure Antenna for Small Animals in 6GHz-10GHz Range

K. Funakura, Y. Kushiyama, T. Arima, T. Uno, Tokyo Univ, Agriculture and Tech., JAPAN

#### TH3G-27

A Specific Absorption Rate Measurement above 300MHz with Thermal Method

R. Shimofusa, Y. Okano, Tokyo City Univ., JAPAN

#### TH3G-28

FDTD Computation of Temperature Elevation in the Head Model Due to Dipole Antenna with Measured Blood Flow Rate

S. Ota, I. Laakso, A. Hirata, Nagoya Inst. of Tech., JAPAN

#### TH3G-29

Improvement of Backscatter Properties of C-Shaped Dipole Scatterer for Chipless RFID

M. Polivka, J. Machac, Czech Technical Univ. in Prague, CZECH REPUBLIC

#### **TH3G-30**

Equivalent Circuit of the Excitation to a Slot Antenna and the Matching to a Complex Impedance

K. Yoshimatsu, K. Sato, T. Kubo, H. Shimasaki, Kyoto Inst. of Tech., JAPAN

#### TH3G-31

An Isotropic Receiver for Area Discrimination with Magnetoquasistatic Fields

A. Sasaki, R. Okuizumi, T. Mizota, H. Morimura, O. Kagami, NTT Corp., JAPAN

#### TH3G-32

A Small Size Planar MIMO LTE Antenna System for USB Dongle Application

S.-C. Lai, C.-M. Jiang, Y.-S. Chiou, C.-L. Tang, Auden Techno Corp., TAIWAN

#### **TH3G-33**

Channel Capacity Determination of a Pattern Reconfigurable Automotive Roof-Top LTE Antenna

T. Mahler, J. Kowalewski, T. Schipper, T. Zwick, IHE, KIT, GERMANY

#### TH3G-34

High Isolation 2.4/5.2/5.8GHz WLAN and 2.5GHz WiMAX Antenna for Laptop Computer Application

Y.-T. Huang<sup>1</sup>, C.-T. Li<sup>1</sup>, W.-S. Chang<sup>1</sup>, W.-H. Hsu<sup>2</sup>, <sup>1</sup>Wistron NeWeb Corp., TAIWAN, <sup>2</sup>Shu-Te Univ., TAIWAN

#### **TH3G-35**

A Compact Dual-Band MIMO Antenna for Wireless LAN Applications

C.-S. Chuang<sup>1</sup>, H.-S. Fang<sup>2</sup>, J.-S. Sun<sup>2</sup>, <sup>1</sup>Lunghwa Univ. of Science and Tech., TAIWAN, 2National Taipei Univ. of Tech., TAIWAN

#### TH3G-36

Design of a Wideband Printed MIMO Monopole Antenna Using Neutralisation Lines Technique

E. Elkazmi1,3, C.H. See2,3, N.A. Jan3, R.A. Abd-Alhameed3, N. Ali4, N.J. McEwan<sup>3</sup>, <sup>1</sup>Bani-Walid Univ., LIBYA, <sup>2</sup>Univ. of Bolton, U.K., <sup>3</sup>Univ. of Bradford, U.K., <sup>4</sup>Khalifa Univ., UAE

#### TH3G-37

Small-Size WLAN MIMO Antenna Array with High Isolation for Laptop Computer Application

S.-C. Chen, J.-Y. Sze, K.-J. Chuang, National Defense Univ., TAIWAN

TH3G-38

Planar Spatial Diversity Sectored UWB Antenna with WiMAX and WLAN Band Notch Characteristics

K. Chhabilwad, G.S. Reddy, J. Mukherjee, IIT Bombay, INDIA

#### TH3G-39

Ergodic Capacity with Optimal Matching for Spatially Correlated 2×2 MIMO systems in 3-D Isotropic Scattering Environment

J. Jeong, G.K. Tran, K. Araki, Tokyo Inst. of Tech., JAPAN

#### TH3G-40

Proposal of MIMO Ultra-Wide Band Antenna with Low Mutual Coupling

N.Q. Dinh, L.T. Trung, Le Quy Don Technical Univ., VIET NAM

#### TH3G-41

Method to Reduce Complexity of MLD in Passive MIMO Using Beam-Forming at Receiver

R. Takahashi<sup>1</sup>, K. Terasaki<sup>1</sup>, K. Murata<sup>2</sup>, N. Honma<sup>1</sup>, Y. Tsunekawa<sup>1</sup>, Iwate Univ., JAPAN, <sup>2</sup>National Defense Academy, JAPAN

10:00 - 11:30

Friday, November 7

### Session FR1G

#### Room G (Sakura) 2nd Floor

#### FR1G-1

A Stopband-Tunable Low-Noise Differential Amplifier with Dual-Passband and Triple-Stopband Using Varactor-Tuned Bias Circuits

K. Sakamoto, Y. Itoh, Shonan Inst. of Tech., JAPAN

#### FR1G-2

Design of UWB LNA Using RC Feedback Technology M.-T. Hsu, J.-C. Yang, J.-R. Jhan, *National Yunlin Univ. of Science* and Tech. TAIWAN

#### FR1G-3

Enhancement Mode GaAs PHEMT LNA Protection Switch Module for TD-LTE and TD-SCDMA Infrastructure Applications

S.-H. Khoo, M.-S. Chow, P.-S. Ooi, Avago Tech. Malaysia, MALAYSIA

#### FR1G-4

A Low Noise Figure Single-to-Differential Low Noise Amplifier for Wideband Applications

L.-W. Chen, H.-Y. Chang, R.-Y. Huang, R.-M. Weng, National Dong Hwa Univ., TAIWAN

#### FR1G-5

Mitigation Technique for High Altitude Electro Magnetic Pulse (HEMP) For GPS Receiver

P. Ratna, S. Jain, J. Chattopadhyay, Advanced System Laboratory, INDIA

#### FR1G-6

A Series of 4.8V High Linearity Low Noise Amplifiers for Cellular Base Station Applications

S.-H. Khoo, C.-C. Loh, T.-H. Tan, Avago Tech. Malaysia, MALAYSIA

#### FR1G-7

A 4GHz Cryogenic Amplifier in 0.18um General Purpose BiCMOS Technology

Y.-S.J. Shiao<sup>1</sup>, G.-W. Huang<sup>1</sup>, T.-H. Chiueh<sup>2</sup>, <sup>1</sup>NDL, TAIWAN, <sup>2</sup>National Taiwan Univ., TAIWAN

#### FR1G-8

Theory of Gain and Stability of Small-Signal Amplifiers with Lossless Reciprocal Feedback

S. Amakawa, Hiroshima Univ., JAPAN

#### FR1G-9

142GHz Schottky Diode Mixer in CMOS 0.13- $\mu$ m

H.-S. Wu<sup>1</sup>, C. Wang<sup>2</sup>, C.-K.C. Tzuang<sup>1</sup>, <sup>1</sup>Tianjin Univ., CHINA, <sup>2</sup>Huawei, CHINA

#### FR1G-10

A High LO-to-RF Isolation 32-52GHz Triple Cascode Down-Conversion Mixer with 2-12GHz IF Bandwidth for ALMA Band-1 J.-C. Kao<sup>1</sup>, C.-F. Chou<sup>1</sup>, C.-C. Chiong<sup>2</sup>, C.-C. Chuang<sup>2</sup>, H. Wang<sup>1</sup>,

<sup>1</sup>National Taiwan Univ., TAIWAN, <sup>2</sup>ASIAA, TAIWAN **FRIG-11** A High Power W-Band CMOS Transmitter for Gb/s Data

## Link

J.-C. Cheng, J.Y.-C. Liu, National Tsing Hua Univ., TAIWAN

### FR1G-12

An Integrated Q-band 6-bit Digital Attenuator with Low Insertion Loss

L. Zhao<sup>1</sup>, W. Liang<sup>1</sup>, X. Xu<sup>2</sup>, X. Jiang<sup>1,2</sup>, J. Zhou<sup>1</sup>, <sup>1</sup>Southeast Univ., CHINA, <sup>2</sup>Milliway Microelectronics Co, CHINA

#### FR1G-13

## A Miniature 52-66 GHz Sub-Harmonic IQ Demodulator with Low LO Power in 65-nm CMOS

C.-A. Hsieh, Y.-H. Lin, H. Wang, National Taiwan Univ., TAIWAN

#### FR1G-14

60 GHz 0.18µm CMOS Schottky-Diode Ring-Mixer Down-Converter

Y.-C. Hsiao<sup>1</sup>, C. Meng<sup>1</sup>, T.-W. Wang<sup>1</sup>, G.-W. Huang<sup>2</sup>, <sup>1</sup>National Chiao Tung Univ., TAIWAN, <sup>2</sup>National Nano Device Lab., TAIWAN

#### FR1G-16

Broadband Rectifier Design Based on Quality Factor of Input Matching Circuit

H. Sakaki, K. Nishikawa, Kagoshima Univ., JAPAN

#### FR1G-17

A Novel Wide Dynamic Range Rectifier Design For Wireless Power Transfer System

H. Sakaki<sup>1</sup>, F. Kuroiwa<sup>1</sup>, M. Tsujii<sup>1</sup>, M. Muraguchi<sup>1</sup>, K. Nishikawa<sup>1</sup>, K. Kawai<sup>2</sup>, H. Okazaki<sup>2</sup>, S. Narahashi<sup>2</sup>, <sup>1</sup>Kagoshima Univ., JAPAN, <sup>2</sup>NTT DOCOMO, INC., JAPAN

#### FR1G-18

A Bandpass Filter with High Selectivity and a Wide Stopband

J.-M. Yan, Jingdezhen Ceramic Institute, CHINA, NUST, CHINA

#### FR1G-19

Microstrip Open-loop Filter Using Multilayer Liquid Crystal Polymer Technology

B. Liu, F. Zhu, Y.-P. Zhou, D. Shen, Y.-W.Liu, Y.-P. Zou, NUAA, CHINA

#### FR1G-20

Compact Multimode Bandpass Filters with Wide Upper Stopband Using Dual-Mode DGS Resonators

B. Peng, S. Li, B. Zhang, S. Wang, BUPT, CHINA

#### FR1G-21

Artificial Dielectric Filter Suitable for Base-Stations T. Ishizaki, S. Nojiri, N. Hama, *Ryukoku Univ., JAPAN* 

#### FR1G-22

Maxwell Equations, Coupled Mode Theory and Coupling Coefficient

I. Awai<sup>1</sup>, Y. Zhang<sup>2</sup>, <sup>1</sup>Ryutech Corp., JAPAN, <sup>2</sup>Ryukoku Univ., JAPAN

#### FR1G-23

A Compact Highly Selective Bandpass Filter with Wide Upper-Stopband

W. Nie<sup>1,2</sup>, Y. Fan<sup>1</sup>, S. Luo<sup>2</sup>, Y. Guo<sup>2</sup>, <sup>1</sup>UESTC, CHINA, <sup>2</sup>National Univ. of Singapore, SINGAPORE

#### FR1G-24

Compact Microstrip Lowpass Filter with Sharp Roll-off and Wide Stopband by Cascading Multiple Resonators R. PM, A. Parambil, J. PM, *Cochin Univ. of Science & Tech., INDIA* 

R. I W, A. I aramon, J. I W, Cochin Ontv. of Science & Tech., INDIA

#### FR1G-25

Design of 60-GHz Compact and Low-Insertion loss Stepped-Impedance Coupled-Line CMOS On-Chip Bandpass Filter

P.-K. Chuang, L.-K. Yeh, H.-R. Chuang, National Cheng Kung Univ., TAIWAN

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#### FR1G-26

Novel Unit-Cell Structure of Composite Right/Left Handed Transmission Lines Keeping the Balanced Condition

D. Goto, K. Yokota, H. Deguchi, M. Tsuji, Doshisha Univ., JAPAN

#### FR1G-27

Reflectarray with Arbitrarily Shaped Elements Having Four-Axial Symmetry

T. Asada, S. Matsumoto, H. Deguchi, M. Tsuji,  $Doshisha\ Univ.,\ JAPAN$ 

#### FR1G-28

Metamaterial-Inspired Wideband Absorber Adopting Biconical Structure

J.-H. Lee, B. Lee, Kyung Hee Univ., REPUBLIC of KOREA

#### FR1G-29

Equivalent Circuit Modeling of an Ultra-Thin Dual-Band Microwave Metamaterial Absorber

S. Bhattacharyya, S. Ghosh, K.V. Srivastava, Indian Inst. of Tech., INDIA

#### FR1G-30

Fully-Printed Phase-Compensation Method for the Outputs of the Compact Metamaterial Dual-Band 3-Way Power-Divider

K. Jang<sup>1</sup>, H. Kim<sup>1</sup>, M.K. Khattak<sup>1</sup>, J. Jeon<sup>1</sup>, K.-H. Koo<sup>1</sup>, H.-J. Kim<sup>2</sup>, H.-S. Lee<sup>2</sup>, S. Kahng<sup>1</sup>, <sup>1</sup>Incheon National Univ., REPUBLIC of KOREA, <sup>2</sup>LIG NEXI Co., Ltd., REPUBLIC of KOREA FR1G-31

A Tri-Band Branch-Line Coupler Design Using Double-Lorentz Transmission Line Metamaterial

F. Mazeh<sup>1</sup>, H. Ayad<sup>1,2</sup>, A. Khalil<sup>1</sup>, M. Fadllallah<sup>1</sup>, J. Jomaah<sup>1,2</sup>, <sup>1</sup>Lebanese Univ., LEBANON, <sup>2</sup>IMEP-LAHC, Grenoble INP, FRANCE

#### FR1G-32

Localized Electromagnetic Distortion in 2D Metal Hole Array and Its Application to Imaging of Permittivity Distribution

G. Itami<sup>1</sup>, T. Akiyama<sup>1</sup>, O. Sakai<sup>1</sup>, Y. Harada<sup>2</sup>, <sup>1</sup>Kyoto Univ., JAPAN, <sup>2</sup>Kyoto Prefectural Univ. of Medicine, JAPAN

#### FR1G-33

FR1G-35

JAPAN

А

FR1G-36

FR1G-37

Millimeter Wave VNA

Wave Imaging System

<sup>1</sup>SIMIT, CHINA, <sup>2</sup>GUCAS, CHINA

A. Widarta, M. Horibe, NMIJ/AIST, JAPAN

Spectral-Domain Formulation of Photonic Crystal Waveguide Devices Formed by Circular Cylinders

K. Watanabe, Y. Nakatake, Fukuoka Inst. of Tech., JAPAN

#### FR1G-34 A V-Band CMOS 90nm PLL

Y.-R. Chung, Y.-H. Yu, Y.-C. Lu, Y.-J.E. Chen, National Taiwan

Univ., TAIWAN

Frequency Domain Phase Noise Compensation Employing

Adaptive Algorithms for Millimeter-Wave OFDM Systems

K. Matsumoto, Y. Chang, G.K. Tran, K. Araki, Tokyo Inst. of Tech.,

Consideration of Traceability on the Linearity of a

A 94GHz Compact Receiver Module for Passive Millimeter-

P.-F. Sun<sup>1,2</sup>, L. Wu<sup>1</sup>, J.-Y. Ding<sup>1,2</sup>, X.-W. Sun<sup>1</sup>, Y. Ye<sup>1,2</sup>, R. Tong<sup>1</sup>,

Friday, November 7

14:00 - 15:30

### Session FR3G

#### Room G (Sakura) 2nd Floor

#### FR1G-38

#### Proposal to Expand Frequency Tuning Range in Millimeter-Wave Band Tunable Filter

T. Kawamura, A. Otani, *Anritsu Corp., JAPAN* 

#### FR1G-39

## Compact Terahertz Waveguide Band-Pass Filter Based on Silicon Micromachining Technique

S. Liu<sup>1</sup>, J. Hu<sup>1</sup>, Y. Zhang<sup>1</sup>, L. Li<sup>1</sup>, D. Lei<sup>1</sup>, Y. Zhou<sup>1</sup>, B. Yan<sup>1</sup>, R. Xu<sup>1</sup>, Q. Xue<sup>2</sup>, <sup>1</sup>UESTC, CHINA, <sup>2</sup>City Univ. of Hong Kong, HONG KONG

#### FR1G-40

Noise Analysis for Multi-Channel 'THz Torch' Thermal Infrared Wireless Communications Systems

F. Hu, S. Lucyszyn, Imperial College London, U.K.

#### FR1G-41

Hemispherical Dielectric Resonator Antenna Loaded with a Novel Sierpinski Carpet Fractal Based Photonic Band Gap Structure for Wireless Application

B. Mukherjee<sup>1</sup>, P. Patel<sup>2</sup>, J. Mukherjee<sup>2</sup>, <sup>1</sup>Indian Inst. of Information Tech., Design & Manufacturing, INDIA, <sup>2</sup>Indian Inst. of Tech. Bombay, INDIA

FR1G-42 Experimental Analysis of E/O and O/E Conversion Performances for Radio-on-Fiber of Digital Wireless Communication Systems

M. Itoh<sup>1</sup>, S. Oshiba<sup>2</sup>, S. Seki<sup>1</sup>, <sup>1</sup>Oki Electric Industry Co., Ltd., JAPAN, <sup>2</sup>Kyoto Inst. of Tech., JAPAN

#### FR1G-43

Fine Wavelength Stabilization of the DFB Laser at the Flexible Grid by Photo-Mixing with Reference Wavelengths A. Saeki, K. Kato, *Kyushu Univ., JAPAN* 

#### FR1G-44

Requirement for Antenna of Wireless Power Transmission System

M. Taguchi, I. Mine, Nagasaki Univ., JAPAN

#### FR3G-1

## Compact Microstrip Electronically Tunable Power Divider with Chebyshev Bandpass Response

C.-F. Chen, C.-Y. Lin, B.-H. Tseng, S.-F. Chang, Tunghai Univ., TAIWAN

#### FR3G-2

High Q, Miniaturized Dual-Mode Coaxial Bandpass Filter C. Sovuthy, W.P. Weny, *UTP, MALAYSIA* 

#### FR3G-3

K-Band Substrate Integrated Waveguide T-Junction Diplexer Design by Mode-Matching Techniques

Z. Kordiboroujeni<sup>1</sup>, J. Bornemann<sup>1</sup>, T. Sieverding<sup>2</sup>, <sup>1</sup>Univ. of Victoria, CANADA, <sup>2</sup>Mician GmbH, GERMANY

#### FR3G-4

Lossy Filter with Uniform Q-Factors by Optimization Method

L.-F. Qiu<sup>1</sup>, L.-S. Wu<sup>1</sup>, W.-Y. Yin<sup>1,2</sup>, J.-F. Mao<sup>1</sup>, <sup>1</sup>Shanghai Jiao Tong Univ., CHINA, <sup>2</sup>Zhejiang Univ., CHINA

#### FR3G-5

W-Band Compact Band-Pass Filter Based on E-Plane Insert Technology

L. Hu, Z. Wang, L. Xia, F. Guo, UESTC, CHINA

#### FR3G-6

Efficient Approaches to Eliminate Influence Caused by Micro-Machining in Fabricating H-Plane Iris Band-Pass Filters

C. Zhao, T. Kaufmann, Y. Zhu, C.-C. Lim, The Univ. of Adelaide, AUSTRALIA

#### FR3G-7

Flexible RF One-Chip Active Filter Based on Recursive Architecture in UHF Range

T. Omori, K. Seo, T. Fujikawa, C.-J. Ahn, K. Hashimoto, Chiba Univ., JAPAN

#### FR3G-8

Design of Dual-Mode Tunable Filter with Constant Fractional Bandwidth Using Varactors

H.-Y. Tsai, T.-Y. Huang, R.-B. Wu, National Taiwan Univ., TAIWAN

#### FR3G-9

A Modified Doublet Bandpass Filter with Substrate Integrated Waveguide -to- Defected Ground Structure Cell for Bandwidth Enhancement and Source-Load Coupling Y.M. Huang, Z. Shao, C.J. You, Z. He, *UESTC, CHINA* 

#### FR3G-10

MIMO OFDM Radar Networks: Inter- & Intra-System Interference Handling

Y.L. Sit, T. Zwick, KIT, GERMANY

#### FR3G-11

ISAR Imasing for Search Radar System Using Modified Compressed Sensing Method

H.-J. Kim<sup>1</sup>, W.-Y. Song<sup>1</sup>, Y.-D. Kim<sup>1</sup>, E.-J. Yang<sup>2</sup>, N.-H. Myung<sup>1</sup>, <sup>1</sup>KAIST, REPUBLIC of KOREA, <sup>2</sup>ADD, REPUBLIC of KOREA

#### FR3G-12

Fast Bistatic ISAR Image Generation for Realistic CAD Model Using the Shooting and Bouncing Ray Technique D.J. Yun<sup>1</sup>, J.I. Lee<sup>1</sup>, J.H. Yoo<sup>2</sup>, N.H. Myung<sup>1</sup>, <sup>1</sup>KAIST, REPUBLIC of KOREA, <sup>2</sup>ADD, REPUBLIC of KOREA

#### FR3G-13

Displacement Estimation and Monitoring from Ground-Based SAR Amplitude Components

L. Zou, K. Takahashi, M. Sato, Tohoku Univ., JAPAN

#### FR3G-14

Automatic Algorithm for Estimating Fundamental Periodicity of Jet Engine Modulation Signals

J.-H. Park<sup>1</sup>, W.-Y. Yang<sup>1</sup>, J.-W. Bae<sup>2</sup>, S.-C. Kang<sup>3</sup>, C.-H. Kim<sup>3</sup>, N.-H. Myung<sup>1</sup>, <sup>1</sup>KAIST, REPUBLIC of KOREA, <sup>2</sup>Samsung Thales, REPUBLIC of KOREA, <sup>3</sup>ADD, REPUBLIC of KOREA

#### FR3G-15

Automatic Extraction of Jet Engine Blade Number Based on Joint Time-Frequency Analysis of Jet Engine Modulation Signals

W.-Y. Yang<sup>1</sup>, J.-H. Park<sup>1</sup>, J.-W. Bae<sup>2</sup>, S.-C. Kang<sup>2</sup>, N.-H. Myung<sup>2</sup>, <sup>1</sup>KAIST, REPUBLIC of KOREA, <sup>2</sup>Samsung Thales, REPUBLIC of KOREA FR3G-17

#### Novel Permittivity Estimation for Dielectric Plate by Radar Image

H. Kobayashi<sup>1</sup>, S. Takaoka<sup>2</sup>, Y. Yamaguchi<sup>2</sup>, <sup>1</sup>Osaka Inst. of Tech., JAPAN, <sup>2</sup>Niigata Univ., JAPAN

#### FR3G-18

A Generalized Permittivity Model for Describing Ash Particle with Respect to Exposed Temperature

T.C. Baum, L. Thompson, K. Ghorbani, RMIT Univ., AUSTRALIA

#### FR3G-19

Investigation of RF Frequency Effect on Detection Performance of Vital-Sign CW Doppler Radar

H. Kuo, H. Chuang, National Cheng Kung Univ., TAIWAN

#### FR3G-20

FPGA-Based M-Sequence Ground Penetrating Radar S. Brueckner, D. Seyfried, J. Schoebel, *Technische Universitaet Braunschweig, GERMANY* 

#### FR3G-21

A CMOS 65nm DC-17GHz Single Pole Eight Throw Switch for 8GHz Radar Impulse Communication

A. Azhari, S. Takumi, S. Kenta, T. Kikkawa, *Hiroshima Univ.*, JAPAN

#### FR3G-22

Millimeter-Wave-Based Simulation and Basic Experiment for Ultrasonic Radar Sensor - Installed in Sensor Network for Care Environment -

M. Hikita, T. Sato, Y. Kaneda, Kogakuin Univ., JAPAN

#### FR3G-23

Quantitative Jet Engine Localization in HRR-JEM Radar Images

J.-H. Park<sup>1</sup>, W.-Y. Yang<sup>1</sup>, J.-W. Bae<sup>2</sup>, S.-C. Kang<sup>2</sup>, N.-H. Myung<sup>1</sup>, <sup>1</sup>KAIST, REPUBLIC of KOREA, <sup>2</sup>Samsung Thales, REPUBLIC of KOREA

#### FR3G-24

A Study of Coil Orientations to Enhance the Transfer Efficiency of a Multi-Repeater Wireless Power Transmission System

M.Q. Nguyen, D. Khoroshansky, S. Luce, O. Osasona, N. Joshi, S. Rao, J.-C. Chiao, UTA, U.S.A.

#### FR3G-25

Square Electrically Small EAD Antenna Array for RF Energy Harvesting from TV Broadcast Tower

D. Xie<sup>1</sup>, X. Liu<sup>1</sup>, H. Guo<sup>1</sup>, X. Yang<sup>1,2</sup>, <sup>1</sup>Soochow Univ., CHINA, <sup>2</sup>State Key Laboratory of Millimeter Waves, CHINA

14:00 - 15:30

#### FR3G-26

Wireless Power Transfer Via Electric Field Resonance Coupling

M. Kusunoki, D. Obara, M. Masuda, Furukawa Electric Co., Ltd., JAPAN

#### FR3G-27

Development of Underwater WPT System Independent of Salinity

Y. Sawahara<sup>1</sup>, D. Futagami<sup>1</sup>, T. Ishizaki<sup>1</sup>, I. Awai<sup>2</sup>, <sup>1</sup>Ryukoku Univ., JAPAN, <sup>2</sup>Ryutech Corp., JAPAN

#### FR3G-28

Analysis of Electric and Magnetic Coupling Components for Spiral Resonators Used in Wireless Power Transfer

Y. Zhang<sup>1</sup>, T. Yoshikawa<sup>1</sup>, I. Awai<sup>2</sup>, <sup>1</sup>Ryukoku Univ., JAPAN, <sup>2</sup>Ryutech Corp., JAPAN

#### FR3G-29

Design of a Compact Planar Witricity Device with Good Efficiency for Wireless Applications

M.H.M. Salleh, N. Seman, D.N.A. Zaidel, UTM, MALAYSIA

#### FR3G-31

General 3D Gaussian Beam Diffraction on Curved Reflector Edge

Z. Lu<sup>1</sup>, X. Liu<sup>1</sup>, Y. Yao<sup>1</sup>, X. Chen<sup>2</sup>, J. Yu<sup>1</sup>, H. Wang<sup>1</sup>, <sup>1</sup>BUPT, CHINA, <sup>2</sup>Univ. of London, U.K.

#### FR3G-32

Estimation of Bistatic Radar Cross-Section from Simplified Leaf Structures

P.J. Co, J. Takada, Tokyo Inst. of Tech., JAPAN

#### FR3G-33

Propagation Measurement for TVWS Interference Evaluation

H. Sawada<sup>1</sup>, T. Kan<sup>1</sup>, K.i Mizutani<sup>1</sup>, K. Ishizu<sup>1</sup>, H. Murakami<sup>1</sup>, H Harada<sup>1,2</sup>, <sup>1</sup>*NICT*, *JAPAN*, <sup>2</sup>*Kyoto Univ.*, *JAPAN* 

#### FR3G-34

Solution for Scattering by a Wedge with Periodic Anisotropic Impedance Faces

F. Zhang, G.-Q. Zhu, Y.-H. Zhang, S.-Y. He, Wuhan Univ., CHINA

#### FR3G-35

Radio Markers for Lane-Keeping Support System Using Specified Low PowerRadio Device

Y. Isota, T. Tobana, T. Sasamori, Akita Prefectural Univ., JAPAN

#### FR3G-36

Analysis of Coupling Effects to PCBs with Adjacent Compartments Inside Waveguide Using the mBLT Equation J.-K. Du<sup>1</sup>, S.-Y. Hyun<sup>1</sup>, J. Lee<sup>2</sup>, J.S. Choi<sup>2</sup>, J.-G. Yook<sup>1</sup>, <sup>1</sup>Yonsei Univ., REPUBLIC of KOREA, <sup>2</sup>ADD, REPUBLIC of KOREA

#### FR3G-37

Ionospheric Scintillation of GPS Microwave Signals in Singapore

D.Y. Heh<sup>1</sup>, D. S. Murti<sup>1</sup>, E.L. Tan<sup>1</sup>, E.K. Poh<sup>1,2</sup>, K.V. Ling<sup>1</sup>, Y.L. Guan<sup>1</sup>, <sup>1</sup>Nanyang Technological Univ., SINGAPORE, <sup>2</sup>DSO National Laboratories, SINGAPORE

#### FR3G-38

Design of Dipole Antenna with Reflector for RCS Reduction Using Reradiation Interference Cancellation

S. Kitagawa, R. Suga, O. Hashimoto, Aoyama Gakuin Univ., JAPAN

#### FR3G-39

#### Design of Microstrip Patch Antenna Excited By Coplanar Waveguide Edge Slot

Y. Ohshima, T. Kamei, T. Kawano, National Defense Academy, JAPAN

#### FR3G-40

An Efficient Reduction Technique for PEEC

L.K. Yeung, The Chinese Univ. of Hong Kong, HONG KONG

#### FR3G-41

Novel Miniaturized BDS Dual-Band Antenna Based on Composite Right/Left-Handed Substrate Integrated Waveguide

S. Fang<sup>1</sup>, T. Wang<sup>1</sup>, Z. Liu<sup>1</sup>, S. Zhu<sup>1</sup>, Y. Luo<sup>2</sup>, <sup>1</sup>East China Normal Univ., CHINA, <sup>2</sup>Shanghai Normal Univ., CHINA

#### FR3G-42

A Novel Miniaturized Quarter-Mode Circular Polarization Antenna Based on SIW Loaded with Dual-CSRR for BDS Application

T. Wang, S. Fang, S. Zhu, East China Normal Univ., CHINA

#### FR3G-43

Novel UWB Vivaldi Antenna with Low RCS

W. Jiang, Y. Li, S. Gong, W. Wang, Xidian Univ., CHINA

#### FR3G-44

Efficient Method for Analysis of Radome in Receiving Mode

B. Wang, M. He, J. Liu, C. Zhang, H. Sun, Beijing Inst. of Tech., CHINA

#### FR3G-45

#### Solving the Volume-Surface Integral Equation Using the Spherical Harmonics Expansion Based Multilevel Fast Multipole Algorithm

J. Liu, M. He, B. Wang, C. Zhang, H. Sun, Beijing Inst. of Tech., CHINA

### FR3G-46

Radiation of a Ring Current above a Semitransparent Disk V.A. Kaloshin<sup>1,2</sup>, K.K. Klionovski<sup>3</sup>, <sup>1</sup>*IRE of RAS, RUSSIAN FEDERATION,* <sup>2</sup>*MIPT, RUSSIAN FEDERATION,* <sup>3</sup>*Concern Morinformsystem-Agat JSC, RUSSIAN FEDERATION* 

#### FR3G-47

A Dual-Feed Circularly-Polarized Traveling-Wave Array Antenna

K.S.O. Kwakye<sup>1</sup>, J.L.-W. Li<sup>1,2</sup>, Z.-X. Xu<sup>1</sup>, S.B. Amo<sup>1</sup>, <sup>1</sup>UESTC, CHINA, <sup>2</sup>Monash Univ., AUSTRALIA

#### FR3G-48

#### Flexible Antennas Using a New Material

N.A.M. Affendi<sup>1</sup>, N.A.L. Alias<sup>2</sup>, N.M. Razali<sup>2</sup>, Z. Awang<sup>2</sup>, A. Samsuri<sup>2</sup>, <sup>1</sup>Universiti Malaysia Perlis, MALAYSIA, <sup>2</sup>UiTM, MALAYSIA

#### FR3G-49

FDTD Analysis of UWB Microstrip Antenna with Dual Band-Notched Characteristic

N. Ojaroudi, Islamic Azad Univ., IRAN

## WORKSHOPS

*Tuesday, November 4* 10:30-17:30

Room A (Tachibana) 2nd Floor

## WS1A

## **Introduction to Advanced Materials Measurements**

Organizers: Michael Janezic, National Institute of Standards and Technology (NIST), U.S.A.

> Shelley Begley, Agilent Technologies, U.S.A. Masahiro Horibe, National Institute of Advanced Industrial Science and Technology (AIST), National Metrology Institute of Japan (NMIJ), JAPAN

The purpose of this full-day workshop is to provide an overview and demonstration of the state-of-the-art techniques used to measure the dielectric permittivity and permeability properties of materials that are widely Inc. into microwave devices and components. The first half of the workshop, tutorial in nature, will provide a framework for selecting the appropriate measurement technique and will overview the most relevant techniques for accurately measuring low-loss and high-loss solid and liquid dielectric materials at microwave, millimeter-wave frequencies and above. In the second half of the workshop, attendees will have an opportunity to see and operate many of these techniques demonstrated in an interactive laboratory-like environment, where the practical details of dielectric permittivity and permeability measurements will be emphasized.

WS1A-1	Overview of Dielectric Measurement Techniques
	Mike Janezic, NIST, U.S.A.
WS1A-2	Broadband Transmission-line Techniques
	Mike Janezic, NIST, U.S.A.
WS1A-3	Measurement Techniques of Dielectric Substrates for
	Microwave and Millimeter wave Circuits by Resonator
	Methods
	Takashi Shimizu Utsunomiya Uniy JAPAN

- WS1A-4 Liquid Measurements Using and Open-Ended Coaxial Probe
- Shelly Begley, Agilent Technologies, U.S.A.
- WS1A-5 Frequency Characteristics Evaluation by the Cavity Perturbation Method Taro Miura, *Kanto Electric Application Development*, *JAPAN*
- WS1A-6 Millimeter-Wave Measurements: Broadband Quasi-Optical Techniques
- WS1A-7 Magnetic Permeability Measurements *Ryowa Electronics Co., Ltd., JAPAN*
- WS1A-8 Metamaterial Measurement Using S-Parameter Method *Agilent Technologies, JAPAN*
- WS1A-9 Application Measurements for Agriculture Products Monai Krairiksh, *KMITL, THAILAND*
- WS1A-10 Round Table Discussion Hans-on Demonstrations Supported by Agilent Technologies
  - Circular Cavities (SUMTEC)
  - Liquid Measurements using and Open-Ended coaxial Probe (*Agilent Technologies*)
  - Quasi-Optical Techniques (AIST)
  - Harmonic Permeability Measurement (*KEAD*)
  - Magnetic Permeability Measurements (*Ryowa Electric*)

*Tuesday, November 4 10:30-17:30* 

Room B (Hagi) 2nd Floor

WS1B

Introduction to Theory of Operation and Reliability in Vector Network Analyzer Measurement at RF, Microwave and Millimeter-Wave Frequencies

Organizers: Masahiro Horibe, AIST, JAPAN

Dominique Schreurs, KU Leuven, BELGIUM

Following recent successful workshops on uncertainties and measurement traceability in microwaveand millimeter-wavemeasurements, from Asia-Pacific Microwave Conference 2009 (titled, "Establishing Confidence in Microwave Measurements") and several workshops in Microwave Week and European Microwave Week, this workshop will continue presenting more practical and fundamental information on evaluating accuracy of measurements made at RF, microwave and millimeter-wave frequencies. In particular case, this workshop will give some knowledge for establishing reliable measurement with broad-band frequency range. This will concentrate on the fundamental measurement techniques and somewhat application measurement solutions at these frequencies -S-parameter, non-linear network analysis and on-wafer. The workshop will conclude with a roundtable discussion reviewing all talks around reliable measurements that are currently required, and in the coming few years.

Overviews: Requests of Reliable Measurements from **WS1B-1** Industrial and Scientific Fields Masahiro Horibe, NMIJ-AIST, JAPAN WS1B-2 Standard and VNA Evaluation at Millimeter Wave and RF Masahiro Horibeand Anton Widarta, NMIJ-AIST, JAPAN **WS1B-3** Six-port Network Analysis ToshiyukiYakabe, Electric Telecommunication Univ., JAPAN **WS1B-4** Connectorized Vector Network Analysis Jon Martens, Anritsu Company, U.S.A. Calibrationand System Verification in Vector Network WS1B-5 Analyzer Measurements Ken Wong, Agilent Technologies, U.S.A. Measurement Uncertainty and Vector Network WS1B-6 Analysis Blair Hall, MSL, NEW ZEALAND WS1B-7 S-Parameter Multiport Uncertainty: From the Theory to a Useful Tool Andrea Ferrero, Agilent Technologies, SWITZERLAND WS1B-8 Strategies for RF Probe Calibration Choon Beng Sia, Cascade Microtech, SINGAPORE Understanding and Dealing with Calibration Residual WS1B-9 Errors at the Wafer-Level Andrej Rumiantsev, Brandenburg Univ. of Technology Cottbus, GERMANY WS1B-10 Towards Greener Smartphones with Microwave Measurements Dominique Schreurs, KULeuven, BELGIUM

## WORKSHOPS

*Tuesday, November 4* 10:30-17:30

Room C (Shirakashi 1) 3rd Floor

## WS1C

Trend of New Wide Band Gap Materials and Devices for Next Innovation

Organizers: Toshihide Kikkawa, Transphorm Japan, JAPAN Kazuya Yamamoto, Mitsubishi Electric, JAPAN

This workshop covers new wide band-gap materilas and devices. Trend and future of GaN, SiC GaO, ZnO, Diamond, and GaN on Diamond will be presented for next innovation. This workshop will expand the dedicated application area. Power application or new application will be included in addition to RF application. Firstly, GaN and SiC will be compared for power application. Then, Oxide –based materials as the next new materials will be introduced to the attendees to understand current device level. Diamond and GaN on Diamond will be reviewed Considering the thermal management. Finally, GaN reliability status and RF application trend will be summarized to compare with other materials.

 WS1C-1 200 mm GaN-on-Si Status: Comparison of e-Mode p-GaN and Recessed MISHEMT Devices
 Denis Marcon, Marleen Van Hove, Dirk Wellekens, Niels Posthuma, Shuzhen You, Xuanwu Kang, Tian-Li Wu, Maarten Willems, Steve Stoffels and Stefaan Decoutere, IMEC, BELGIUM

- WS1C-2 SiC Device; Current Status and Future Tsunenobu Kimoto, *Kyoto Univ., JAPAN*
- WS1C-3 Gallium Oxide (Ga<sub>2</sub>O<sub>3</sub>) Devices for Next Generation Applications
  Masataka Higashiwaki<sup>1</sup>, Kohei Sasaki<sup>2,1</sup>, Takafumi Kamimura<sup>1</sup>, Man Hoi Wong<sup>1</sup>, Daivasigamani Krishnamurthy<sup>1</sup>, Akito Kuramata<sup>2</sup>, Takekazu Masui<sup>3</sup>, Shigenobu Yamakoshi<sup>2</sup>, <sup>1</sup>National Institute of Information and Communications Technology (NICT), JAPAN, <sup>2</sup>Tamura Corp., JAPAN, <sup>3</sup>Koha Co. Ltd., JAPAN
- WS1C-4 ZnO Device; Current and Future Shigehiko Sasa, Osaka Inst. Tech., JAPAN
- WS1C-5 Diamond Electronic Devices for Future Application Yasuo Koide, *National Institute for Materials Science* (*NIMS*), *JAPAN*
- WS1C-6 GaN-on-Diamond a Short History Daniel Twitchen, *Bruce Bolliger and Daniel Twitchen, Element Six, U.S.A.*
- WS1C-7 GaN Reliability and Thermal Management David Via, *Air Force Research Laboratories (AFRL)*, U.S.A.
- WS1C-8 European GaN for RF Applications: Current Status and Trends
   Guillaume Callet, Herve Blanck, Jan Grunenputt, Bernd Shauwecker, Benoit Lambert, Zineb Ouarch, Marc Camiade, Philippe Sin, Pierre-Franck Alleaume, UMS, FRANCE

*Tuesday, November 4 10:30-13:30* 

Room D (Shirakashi 2) 3rd Floor

WS1D

## **Recent Advances in Microwave Filters**

Organizers: Zhewang Ma, Saitama Univ., JAPAN Masataka Ohira, Saitama Univ., JAPAN

Microwave filters are of significant importance in modern communication systems. This workshop is aimed at providing topics on recent progress in the research and development of RF/ microwave filters, with emphasis on filters having tunable/ reconfigurable functions, low loss, high rejection, steep transition between passband and stopband, and wide stopband. The first talk focuses on the development of miniature RF filters using liquid crystal polymer (LCP) multilayer circuit technology and electronically reconfigurable RF planar filters based on the integration of active tuning/switching elements onto planar filtering structures. The second talk presents four novel methods to design compact microstrip bandpass filters with wide stopbands. In the third talk, a simple and straightforward parameter-extraction method for transversal resonator array filters are introduced in order to design multi-mode planar bandpass filters with transmission zeros. The final talk describes the development of transmitting/receiving high-Tc superconducting (HTS) ultra-narrowband bandpass filters and their applications.

- WS1D-1 Miniature and Reconfigurable Microwave Planar Filters Jiasheng Hong, *Heriot-Watt Univ.*, U.K.
- WS1D-2 Design of Compact Microstrip Bandpass Filters with Wide Stopband Ching-Wen Tang, National Chung Cheng Univ.,

Ching-Wen Tang, National Chung Cheng Univ., TAIWAN

- WS1D-3 A Parameter-Extraction Method for Transversal Resonator Array Bandpass Filters and Its Applications to Multi-Mode Filter Designs Masataka Ohira, *Saitama Univ., JAPAN*
- WS1D-4 Transmitting/Receiving Superconducting Filters for Wireless Applications Hiroyuki Kayano, *Toshiba Corp., JAPAN*

## WORKSHOPS

## *Tuesday, November 4* 14:30-15:30

Room D (Shirakashi 2) 3rd Floor

### WS2D

**Biomedical Effects and Applications: from Microwaves** to Millimeterwaves

Organizers: Olga Boric-Lubecke, Univ. of Hawaii at Manoa, U.S.A.

Victor Lubecke, Univ. of Hawaii at Manoa, U.S.A.

This workshop will explore recent findings and advances in understanding the effects of electromagnetic waves on human tissue, and the use of microwave technology in medical imaging and diagnostics. The topics will includE RF Aspects of MRI, microwave and millimeter wave diagnostics, wireless vital signs monitoring and localization, and implantable wireless devices.

- WS2D-1 RF Aspects of MRI
- Robert Caverly, Villanova Univ., U.S.A.
- WS2D-2 RF/Microwave Indoor Human-Aware Localization Changzhi Li, *Texas Tech, U.S.A.*
- WS2D-3 Microwave and Millimeter-Wave Diagnostics Yoshio Nikawa, *Kokushikan Univ., JAPAN*
- WS2D-4 A Wearable Radar Badge for Vital Sign Detection, Wireless Positioning and Wireless Data Transmission Shengfuh Chang, *National Chung Cheng Univ.*, *TAIWAN*

# SHORT COURSES

Tuesday, November 4 10:30 - 13:30

Room E (Meeting Room 1) 1st Floor

## SC1E

## Fundamentals of MMIC Design

Organizer: Kenjiro Nishikawa, Kagoshima Univ., JAPAN

Lecturer: Tsuneo Tokumitsu, Sumitomo Electric Device Innovations Inc., JAPAN

A half-day overview of (monolithic) microwave circuit designs is presented providing with enough number of examples. Learning the basics and summarize them in each engineer's mind is extremely valuable for his/her future work. The contents are picked up from indeed what I gained through my career. The circuits to be presented are transmission lines, amplifiers, oscillators, mixers, and control circuits, basing on S parameter, Fourier series, and orthogonal mode analysis. When showing examples, my recent and current developmental results are included. Finally, this short course is concluded with encouragement for young engineers.

## *Tuesday, November 4* 14:30 - 15:30

Room E (Meeting Room 1) 1st Floor

## SC2E

## **Theory and Practice in Microwave High Power Amplifiers**

Organizer: Koji Yamanaka, Mitsubishi Electric Corp., JAPAN Lecturer: Ryo Ishikawa, Univ. of Electro-Communications, JAPAN

The short course provides basic theory and fundamental design techniques of microwave high power amplifiers. The content is linked to the APMC Student Design Competition (SDC) held during APMC 2014 for the first time in the history of APMC. The SDC is a chance to try practical implementation of high power amplifiers designed from predetermined specifications, while the short course supports the theoretical and technical aspects of microwave high power amplifier designs. The attendees can enjoy microwave technologies, through both the learning at the short course and the challenging at the SDC.

## **SHORT COURSES**

## *Tuesday, November 4* 14:30 - 15:30

Room F (Meeting Room 2) 1st Floor

SC<sub>2</sub>F

## **Theory and Practice in Microwave Filter Designs**

Organizers: Masataka Ohira, Saitama Univ., JAPAN Hiroyuki Kayano, Toshiba Corp., JAPAN Lecturer: Zhewang Ma, Saitama Univ., JAPAN

In this short course, the basic design theory and fundamental design techniques of microwave filters are described based on the most commonly used equivalent circuits of microwave filters and various types of design examples. Some important aspects in the design of microwave filters are also interpreted, including physical considerations of electromagnetic behaviors happened in the filter structures and appropriate use of circuit and electromagnetic simulators for the effective design of filters.

The contents of this short course are linked to the APMC Student Design Competition (SDC) held during APMC 2014 for the first time in the history of APMC. The SDC is a good chance to try practical implementation of bandpass filters designed from predetermined specifications, while the short course provides the theoretical and technical basics of microwave filter designs. The attendees can enjoy microwave technologies, through both the learning at the short course and the challenging at the SDC.

## **RUMP SESSIONS**

## Friday, November 7 18:30-20:30

Conference room, Sendai Akiu Spa Hotel Iwanumaya

FR4R

## **Recent Progress in Wireless Power Transfer Systems** *Chair:* Shoichi Narahashi, *NTT DOCOMO, INC., JAPAN*

Wireless power transmission or transfer technologies have been one of the widely-recognized research fields in radio science and technology for the past few years. The technologies retain the potential to affect a great many aspects of our everyday lives because they enable us to charge batteries without power cable connection. As represented by wireless charging systems for electric vehicles, there have been significant research and development activities on wireless power transfer systems with the objective of the industrial application of these technologies.

This session provides a forum with a relaxed atmosphere to discuss further prospects and challenges of wireless power transfer systems. The session offers three invited speakers in these technological fields.

FR4R-1	A Lucid Design Criterion for Wireless Power
	Transfer Systems to Enhance Their Maximum
	Available Efficiency
	T. Ohira, Toyohashi Univ. of Tech., JAPAN
FR4R-2	Mobile Power Transfer System Using Transmission-
	Line Coupling
	T. Ishizaki, Ryukoku Univ., JAPAN
FR4R-3	Wireless Power Transmission for Mobile
	Applications
	T. Higashino, M. Okada, Nara Inst. of Science and
	Tech., JAPAN

## **STUDENT DESIGN COMPETITIONS**

APMC Student Design Competitions will be held during APMC 2014 for the first time in the history of APMC.

All students in microwave engineering are solicited to challenge the following competitions.

Track A : High efficiency GaN amplifier design

Track B : Printed circuit board bandpass filter design

The winners will be decided with the measurement results.

Please visit http://www.apmc2014.org/competition.html for detailed information.

The competitions will be held on November 6, 2014 at Room G (Sakura).

The winners will win the honor of the first Asia-Pacific champion together with prizes.

Award ceremony will be included in the Award Banquet on the same day in the evening.

Those who wish to join the competition should send the application form to <apmc2014sdc@apmc2014.org>.

The application form can be found in <a href="http://www.apmc2014">http://www.apmc2014</a>. org/competition.html>.

Deadline for the application is October 14, 2014. But late applications may be accepted only if measurement time slots are available.

APMC Student Design Competitions are supported by Rohde&Schwartz, Anritsu, Keysight Technologies and Sumitomo Electric Device Innovations with their measurement instruments and GaN transistors.

## **EXHIBITION**

The APMC 2014 exhibition will be organized at the conference venue on November 4-7. Some companies including the sponsors of APMC 2014 will exhibit the latest microwave products and technologies at this exhibition. Also, some exhibition booths will be provided for university student authors of accepted papers to present their latest research outcomes.

## **ORGANIZING COMMITTEE**

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