



2003
25th IEEE GaAs IC
SYMPOSIUM

Program

Presenting:

25th Anniversary:
Prime Time for Compound
Semiconductor IC Technology

Introducing the 2004 Symposium Name Change

November 9-12, 2003
Wyndham U.S. Grant Hotel
San Diego, CA, USA



CO- SPONSORED BY
The IEEE Electron Devices Society,
The IEEE Microwave Theory and
Techniques Society, and
The IEEE Solid-State Circuits Society

SYMPOSIUM

SATURDAY, NOVEMBER 8, 2003

REGISTRATION (Short Course & Primer Course Only)

SUNDAY, NOVEMBER 9, 2003

REGISTRATION (Short Course & Primer Course Only)

Continental Breakfast for Short Course

SHORT COURSE: "Emerging Technologies Defense to Commercial"
GaAs Reliability Workshop (Registration, Workshop, and Lunch)

Short Course Lunch

REGISTRATION for Symposium (and Primer Course until 5:30)

PRIMER COURSE: "Basics of Compound Semiconductor ICs"

Symposium Opening Reception

MONDAY, NOVEMBER 10, 2003

REGISTRATION

Continental Breakfast

SYMPOSIUM OPENING

SESSION A: Plenary Session – Prime Time for Compound Semiconductor ICs

SESSION B: The Changing Face of High Speed Digital Technology

SESSION C: MMICs for Handset Applications

PANEL SESSION 1: InP vs. SiGe vs. CMOS for High Speed Digital

PANEL SESSION 2: Why Would I Want to Switch?

GaAs IC Technology Exhibition Opening Reception

TUESDAY, NOVEMBER 11, 2003

REGISTRATION

Continental Breakfast

GaAs IC TECHNOLOGY EXHIBITION

SESSION D: Reliability

SESSION E: High Speed, High Frequency Markets and MMICs

SESSION F: Simulation and Modeling

SESSION G: Amplifiers for S to W BAND Applications

Exhibition Luncheon

SESSION H: Optical Transmitter Components

PANEL SESSION 3: Is First Pass Mixed Signal Design Realizable?

SESSION I: Digital Building Blocks Beyond 40G

SESSION J: Advanced SiGe Technology

Symposium Party

WEDNESDAY, NOVEMBER 12, 2003

REGISTRATION

Continental Breakfast

SESSION K: High Speed Signal Processing

SESSION L: HBT Technology

SESSION M: Optical Receiver Components

SESSION N: Frequency Conversion ICs

PANEL SESSION 4: Base Station PA Technology - LDMOS Forever?

PANEL SESSION 5: Module to MMIC to Module – PAs here we go again!

SESSION LN1: Late News Papers

SESSION O: Emerging Technology

Close of Symposium

Visit us on the World-Wide Web at: <http://www.gaasic.org/>

AT A GLANCE

Saturday

6:00 p.m.-8:00 p.m.

Hotel Lobby

Sunday

7:00 a.m.-8:00 a.m.

Grand Ballroom Foyer

7:00 a.m.-8:00 a.m.

Grand Ballroom Foyer

8:00 a.m.-4:45 p.m.

Grand Ballroom A

8:00 a.m.-5:00 p.m.

Grand Ballroom B

12:20 p.m.-1:30 p.m.

Grand Ballroom D

5:00 p.m.-8:00 p.m.

Grand Ballroom Foyer

5:30 p.m.-8:30 p.m.

Grand Ballroom A

5:00 p.m. - 8:00 p.m.

Garden Room

Monday

7:00 a.m.-5:00 p.m.

Grand Ballroom Foyer

7:00 a.m.-8:00 a.m.

Grand Ballroom Foyer

8:00 a.m.-8:30 a.m.

Grand Ballroom

8:30 a.m.-12:00 p.m.

Grand Ballroom

1:20 p.m.-3:00 p.m.

Grand Ballroom A&B

1:20 p.m.-3:00 p.m.

Grand Ballroom C&D

3:30 p.m.- 5:00 p.m.

Grand Ballroom A&B

3:30 p.m.- 5:00 p.m.

Grand Ballroom C&D

5:00 p.m.-7:00 p.m.

Pavilion Ballroom, Crystal Ballroom

Tuesday

7:00 a.m.-5:00 p.m.

Grand Ballroom Foyer

7:30 a.m.-8:00 a.m.

Pavilion Ballroom, Crystal Ballroom

7:30 a.m.-4:00 p.m.

Pavilion Ballroom, Crystal Ballroom

8:00 a.m.-9:40 a.m.

Grand Ballroom A&B

8:00 a.m.-9:55 a.m.

Grand Ballroom C&D

10:15 a.m.-11:25 p.m.

Grand Ballroom A&B

10:15 a.m.-12:05 p.m.

Grand Ballroom C&D

12:05 p.m.-1:30 p.m.

Pavilion Ballroom, Crystal Ballroom

1:30 p.m.-2:40 p.m.

Grand Ballroom A&B

1:30 p.m.-3:00 p.m.

Grand Ballroom C&D

3:30 p.m.-5:00 p.m.

Grand Ballroom A&B

3:30 p.m.-4:40 p.m.

Grand Ballroom C&D

7:00 p.m.-10:00 p.m.

Sea World

Wednesday

7:00 a.m.-12:00 p.m.

Grand Ballroom Foyer

7:00 a.m.-8:00 a.m.

Grand Ballroom Foyer

8:00 a.m.-9:40 a.m.

Grand Ballroom A&B

8:00 a.m.-9:40 a.m.

Grand Ballroom C&D

10:00 a.m.-11:30 a.m.

Grand Ballroom A&B

10:00 a.m.-11:40 a.m.

Grand Ballroom C&D

1:00 p.m.-2:30 p.m.

Grand Ballroom A&B

1:00 p.m.-2:30 p.m.

Grand Ballroom C&D

3:00 p.m.-5:00 p.m.

Grand Ballroom A&B

3:00 p.m.-4:30 p.m.

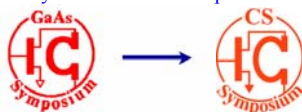
Grand Ballroom C&D

5:00 p.m.

CHAIRMAN'S MESSAGE

On behalf of the organizing committee and the IEEE Electron Devices Society, the Microwave Theory and Techniques Society, and the Solid-State Circuits Society, I invite you to be a part of the 2003 IEEE GaAs IC Symposium. This year's symposium will be held November 9th to the 12th in sunny San Diego, California at the historic U.S. Grant Hotel.

Over the last 25 years, the IEEE GaAs IC Symposium has become the preeminent international forum on developments in integrated circuit technologies using GaAs, InP, SiGe, GaN, SiC and other compound semiconductor devices. To better reflect our theme, this year's symposium will be the last one named the GaAs IC Symposium. Starting next year in Monterey, California the meeting is being renamed to the Compound Semiconductor IC Symposium (CSICS). We feel confident that this change will enable us to continue and grow the excellent tradition everyone has come to expect.



Our strong technical program brings the latest advances in high-frequency and high-speed circuits and technology. The program includes papers from both commercial and newly emerging military applications.

The technical sessions will highlight all aspects of compound semiconductor IC technology ranging from materials characterization to systems applications.

Additionally, this year's IEEE GaAs IC Symposium continues our tradition of providing focused educational opportunities through our Short Course and Primer Course, both held on Sunday, November 9th. Kevin Kobayashi has organized a timely and interesting one-day short course entitled "Emerging Technologies from Defense to Commercial" taught by five leading experts from industry and the government. In addition, Stephen Long and Donald Estreich will once again present our Primer Course, an excellent tutorial presented within the context of this year's Symposium contents. Further, you will have the opportunity to learn of new products in the GaAs IC Technology Exhibition.

To complement the full technical program, we are providing several social events to allow interactions with colleagues to catch up on the latest in our industry. Events include the Sunday evening Opening Reception, the Monday evening Technology Exhibition Reception, the Tuesday Technology Exhibition Luncheon and the Symposium Theme Party Tuesday evening at SeaWorld San Diego.

Finally, I would like to announce the winners of our Sixth Outstanding Paper Award from the 2002 Symposium. They are S. Masuda, T. Hirose, T. Takahashi, M. Nishi, S. Yokokawa, S. Iijima, K. Ono, N. Hara, and K. Joshin for their paper entitled "An Over 110-GHz InP HEMT Flip-chip Distributed Baseband Amplifier with Inverted Microstrip Line Structure for Optical Transmission Systems" from Fujitsu Laboratories and Fujitsu Quantum Devices.

We hope you'll join us for our 25th anniversary.

Chris Bozada, Chairman
2003 IEEE GaAs IC Symposium

CORPORATE BENEFACTORS

This year, we are pleased to continue with the GaAs IC Symposium Corporate Benefactors Program. This program allows companies interested in compound semiconductors to show their support of the Symposium by making contributions towards the cost of some of our social events.

These additional resources enable the Symposium to increase the quality of our event, as well as allowing companies an opportunity for some tasteful promotional activities. If your company is interested in participating, please contact the Symposium Chair, Christopher Bozada at Christopher.bozada@wpafb.af.mil or (937) 255-1874 x3376. Opportunities for contributions at all levels are still available.

As of this printing the Corporate Benefactors for the 2003 GaAs IC Symposium are as follows.

General Benefactors:

Coffee Break or Continental Breakfast:

BAE Systems
Sumitomo Electric

Theme Party (Hors D'Oeuvres or Dessert) or Opening Reception:

RF Micro Devices

Special Benefactors:

The Symposium Web Site www.gaasic.org has become a critical tool for the dissemination of information for prospective attendees of the Symposium. Every year, the web site must be updated and maintained to effectively serve this purpose. We would like to acknowledge the following company for providing the Symposium web site for the 2003 GaAs IC Symposium:

ANADIGICS

Comments regarding the web site or any publicity materials should be directed to the Publicity Chair, Bill Peatman. Links to our corporate benefactors appear on our symposium website.

Additional international publicity for the Symposium is being provided by:

Compound Semiconductor Magazine

GENERAL INFORMATION

IEEE 25th GaAs IC Symposium November 9-12, 2003 Wyndham U.S. Grant Hotel San Diego, California

REGISTRATION

	<u>Advance</u> (Received by Oct. 9)	<u>Regular</u> (After Oct. 9 or on site)
Symposium Registration		
IEEE Member	\$480	\$530
Non-IEEE	\$530	\$600
Student	\$200	\$250
Special 1-day Registration (sessions only, no digest or social)		
IEEE Member	\$250	\$300
Non-IEEE	\$350	\$350
Short Course		
Student Registration	\$200	\$300
Primer Course		
Student Registration	\$75	\$75
Technical Digest Only	\$75	\$75
Short Course Notes Only	\$100	\$100
Digest CD ROM Only	\$100	\$100
Primer Course Notes Only	\$50	\$50
Extra Reception Ticket	\$30	\$30
Extra Theme Party Ticket	\$75	\$75

The full Symposium registration fee includes: attendance at all technical sessions and panels; one copy of the Technical Digest and CDROM; continental breakfasts; and morning and afternoon coffee breaks. Also included are admittance to: the Sunday Opening Reception; the GaAs IC Technology Exhibition Opening Reception on Monday and exhibition lunch on Tuesday; all exhibits; and the exciting Tuesday evening Theme Party. The special 1-day registration fee, however, does not include the digest and social activities. Additional copies of the Technical Digest and of the Short Course Notes will be available for purchase at the Symposium.

For **ADVANCE REGISTRATION**, complete the enclosed Advance Registration Form with your remittance of the appropriate fee (check or credit card) **BY October 9, 2003** to:

Registrar, 2003 IEEE GaAs IC Symposium
c/o IEEE Conference Management Services
445 Hoes Lane
P.O. Box 1331
Piscataway, NJ 08855-1331
USA
Tel: (732) 981-3415
FAX (732)465-6447

email: GaAs03reg@ieee.org

The remittance is payable by checks in U.S. dollars only, by personal/company check drawn on a U.S. bank, U.S. currency traveler's checks, or international money order. Checks must be made payable to "2003 IEEE GaAs IC Symposium" and must be encoded with the bank number, account number, and check number. Credit cards and wire transfers may also be used. Bank drafts from non-U.S. banks and foreign currency are unacceptable and will be returned.

We urge you to pre-register to reduce your costs and to simplify your check-in at the Symposium. Your Technical Digest and registration materials will be ready for you at the Advance Registration Desk.

Registration Center:

The Symposium Registration Center is located in the Hotel Lobby on Saturday and the Grand Ballroom Foyer for Sunday through Wednesday. The operating hours will be as follows:

Short & Primer Course Registration only

Saturday, November 8	6:00 p.m. - 8:00 p.m.
Sunday, November 9	7:00 a.m. - 8:00 a.m.
Sunday, November 9	5:00 p.m. - 5:30 p.m.(Primer)

Symposium Registration

Sunday, November 9	5:00 p.m. - 8:00 p.m.
Monday, November 10	7:00 a.m. - 5:00 p.m.
Tuesday, November 11	7:00 a.m. - 5:00 p.m.
Wednesday, November 12	7:00 a.m. - 12:00 noon

Refund Policy:

Please note that after October 9, 2003, your Advance Registration fee, Short Course fee, GaAs IC Primer fee, and fees for additional Symposium Technical Digest, or Reception/Party ticket fees are not refundable. Full refunds less \$50 handling fee will be granted for cancellations received in writing by October 9, 2003. The letter to the Symposium Registrar (see address at IEEE above) requesting the refund should state the preregistrant's name and to whom the refund check should be made payable. All refunds will be processed after the Symposium. **NO PRE-REGISTRATION REFUNDS WILL BE GRANTED AFTER October 9, 2003.**

ACCOMMODATIONS

Hotel Reservations:

A block of rooms has been reserved at special discounted rates for Symposium participants at our headquarters hotel, the historic Wyndham U.S. Grant. It is located in downtown San Diego adjacent to the famous Gaslamp Quarter, and only 5 minutes from the airport.

The hotel recently underwent extensive renovations of their guest rooms, offering direct high speed internet access, ergonomic work chair, 900 MHz cordless two-line telephone with voice mail and dataport, cable/in-room movies, CD clock radio, coffee maker, minibar, down comforters, plus other amenities. Rooms are available for smokers and with wheelchair access. They also feature room service, a fine restaurant, a sports bar, fitness center with access to nearby athletic club for racquet sports, spa services and weight room. A complimentary airport shuttle is available.

Hotel Address and Phone Numbers:

The Wyndham U.S. Grant Hotel San Diego
326 Broadway
San Diego, California 92101

Phone: 619-232-3121
Fax: 619-239-9517
Guest Fax: 619-232-3626

We ask you to please support your Symposium and more fully enjoy all the activities by staying at our official headquarters hotel. The Symposium will be penalized if our room block is not filled and this will force the Symposium to charge higher registration costs in the future. Room reservations should be made as soon as possible, and no later than Thursday, October 9, 2003. Rooms are available at the special Symposium group rate of \$160 single or double per night. These rates do not include room taxes, currently 10.5% per night. Rates are net for travel agents. A limited number of rooms have been set aside for the use of bonafide U.S. government employees at the prevailing government rate.

AFTER THE OCTOBER 9, 2003 DEADLINE, ROOMS WILL BE ON A SPACE AVAILABLE BASIS AT POSSIBLY HIGHER RATES. THERE ARE SEVERAL OTHER CONVENTIONS SCHEDULED IN SAN DIEGO DURING THIS TIME, SO ROOMS WILL BE BOOKED SOLID THROUGHOUT THE CITY. PLEASE PLAN ACCORDINGLY.

To make a reservation, please call the hotel direct at (619) 232-3121 and ask for Reservations. Be certain to request the Special Group Rate for the IEEE GaAs IC Symposium. Please do not call any regional hotel chain 800 number, since they will NOT be aware of our special arrangements.

It is strongly recommended that you call the hotel direct thereby obtaining an immediate confirmation. If you choose to mail or fax your request, be sure to follow up on it. Check-in time is 3 p.m. or later; check-out time is 12 noon. If necessary, you may cancel your reservation up to 48 hours prior to your scheduled arrival. There will be a \$50 charge for early departures; please confirm your departure date at check-in. Overnight parking charges are \$22, self-park or valet. You

can self-park at the U.S. Grant for \$9 per day, or \$12 per day for valet, if you are attending the Symposium but not staying at the hotel.

In addition to the U.S. Grant Hotel, we offer 35 rooms at the elegant and luxurious Westgate Hotel, located just across the street from the U.S. Grant. This hotel is the preferred home away from home for celebrities such as Sarah Ferguson-the Duchess of York, Tom Brokaw, Harry Belafonte, Robin Williams, Rudy Giuliani, etc. Guest rooms feature richly appointed hand crafted furnishings, dual line phones, high speed internet access, an award winning restaurant and a host of other amenities. A complimentary airport shuttle is also available.

Hotel Address and Phone Numbers:

The Westgate Hotel San Diego
1055 Second Avenue
San Diego, CA 92101

Phone: 619-238-1818
Fax: 619-557-3737

Rooms are available until October 15 at the special Symposium group rate of \$160 single or double per night. These rates do not include room taxes, currently 10.5% per night. After October 15, reservations will be taken on a space and rate availability basis.

To make a reservation, please call the hotel direct at (619) 557-3757 or (800) 221-3802. Be certain to mention you are attending the IEEE GaAs IC Symposium.

Parking: \$18 overnight with in and out privileges, valet only.

TRANSPORTATION

Special Airfares:

Special discounted airfares for the 2003 GaAs IC Symposium on November 9-12, 2003 in San Diego, California have been negotiated by IEEE Global Travel Services. Discounts are as high as 20% off the lowest published airfares with American, Continental, and United Airlines. If Saturday night stays or super-saver airfares are not applicable, deeply discounted airfares are available. Discount code A606098 entitles attendees to receive special rates that have also been negotiated with Avis Rental Car Company.

Travel arrangements using the negotiated air carriers or the carriers of your choice can be made through IEEE Global Travel Services by calling between the hours of 8:30 a.m. and 5:30 p.m. EST. Monday through Friday. Within the US and Canada, call (800) TRY-IEEE, (+1 800 879 4333); and outside of the US and Canada, call +1 732 562 5387. Or, you may visit their on-line travel service web site at <<http://www.ieeetravelonline.org>>. This secure site offers simple and convenient service through which you can search, reserve, and ticket your travel anytime, anywhere. Or you can e-mail your request to travel-team@ieee.org.

You may also your fax requirements to the IEEE Global Travel Services at +1 732 562 8815. When faxing, please be sure to include your travel dates, departure, and return times, and phone and fax numbers. A Travel Counselor will contact you promptly.

Airport Transportation:

The San Diego International Airport is five minutes from the hotel by car. A complimentary Airport Shuttle runs every 30 minutes to each of the conference hotels.

Driving Directions:

From San Diego International Airport:

Take "Airport Exit" which becomes N Harbor Dr. Drive about 1.75 miles. Turn left on Broadway. Drive about 0.66 miles. The Hotel is on the left at 326 Broadway.

From North on Interstate 5:

Take 4th Ave. exit. Turn right on Broadway. The Hotel is on the right at 326 Broadway.

From East on Interstate 8:

Take 163 south the freeway ends and turns into 10th Ave. Continue south for about 5 blocks. Turn right on Broadway. The Hotel is on the right at 326 Broadway.

ADDITIONAL INFORMATION

Message Desk:

A Symposium Message Desk will be in operation in the Registration area during registration hours from Sunday, November 9 at 5pm to Wednesday, November 12 at noon. Please advise callers who wish to reach you during the day to ask the hotel operator for the IEEE GaAs IC Symposium message desk. The Wyndham U.S. Grant Hotel's main telephone number is 619-232-3121. Please check the message board periodically during the Symposium.

Distribution of Relevant Information:

The GaAs IC Symposium will provide an officially designated area near the registration desk to serve as the proper display area for those in need of space to disseminate free material relevant to the GaAs IC industry. Printed material of any form will not be allowed to indiscriminately proliferate the registration area, hallways, lobbies, or other gathering areas, in proximity to the Symposium, technical sessions, evening social activities, panel sessions, or the exhibition.

Meeting Room Locations:

All meetings will be held in the various ballrooms on the second level of the U.S. Grant Hotel. Short and primer course registration will be held in the Hotel Lobby on Saturday from 6:00pm – 8:00 pm. Conference registration will be held daily in the Grand Ballroom Foyer, the technical and panel sessions will take place in the Grand Ballroom. Specifically, the primer and short courses will be held in Grand Ballroom A. The Sunday night welcoming reception will take place in the Garden Room at the Lobby Level. Exhibits and related events will be held in the Lower Level in the Pavilion Ballroom, Crystal Room and the Horton Room. Please refer to the 'Symposium at a Glance' (inside front cover) and the locator map (inside back cover) for specific room locations.

No Photographic and/or Recording Equipment:

No photographic or recording equipment will be permitted at any time during the technical sessions of the IEEE GaAs IC Symposium.

Breakfasts:

On Sunday, November 9 a continental breakfast will be available for Short Course registrants only in the Grand Ballroom Foyer. There will be a complimentary continental breakfast for all Symposium attendees to be held in the Grand Ballroom Foyer on Monday and Wednesday and at the GaAs IC Technical Exhibition on Tuesday on the Lower Level of the Hotel.

Coffee Breaks:

The locations of coffee breaks will be as follows:

Short Course Registrants (only) –

Sunday, November 9: Grand Ballroom Foyer

Primer Course Registrants (only) –

Sunday, November 9: Grand Ballroom Foyer

Symposium Registrants –

Monday, November 10: Grand Ballroom Foyer

Tuesday, November 11: Lower Level

Wednesday, November 12: Grand Ballroom Foyer

Symposium Social Events:

SYMPOSIUM OPENING RECEPTION

We welcome you to San Diego on Sunday evening, November 9 from 5:00 p.m. to 8:00 p.m. in the Garden Room of the Wyndham U.S. Grant Hotel. Come and meet up with your old friends and make new acquaintances over light hors d'oeuvres and wine, beer, or soft drinks. One free admission is included with your registration, and extra tickets may be purchased at registration for \$30.

EXHIBITION OPENING RECEPTION

Our exhibitors are hosting a reception to mark the exhibition opening on Monday, November 10 from 5:00 p.m. to 7:00 p.m. Every Symposium participant is invited to enjoy the hors d'oeuvres and schmooze and cruise the exhibits in the Pavilion Ballroom, Crystal and Horton Rooms of the U.S. Grant Hotel.

EXHIBITION LUNCH

On Tuesday at 12 noon the Exhibition Luncheon will be hosted in the Pavilion Ballroom, Crystal and Horton Rooms on the Lower Level of the U.S. Grant Hotel. The lunch is free to all Symposium participants, so come along, visit with the exhibitors, ask questions, make deals and find out what is going on in our industry.

SYMPOSIUM PARTY

Join us for the Symposium Theme Party on Tuesday, November 11, from 7:00 pm to 10:00 pm (buses depart the Hotel at 6:00 pm). This year we are returning to SeaWorld. We will be departing from the hotel on luxury motor coaches to be greeted at the SeaWorld main gate by costumed characters. We will enjoy a private cocktail and hors d'oeuvre reception at the Wild Arctic. This unprecedented attraction features a breathtaking simulated helicopter flight over the frozen North. But the excitement doesn't end there! After disembarking, enter Base Station Wild Arctic, a realistic center for polar exploration that features above and underwater viewing of polar bears, beluga whales, walrus, and harbor seals. This attraction captures the beauty and starkness of the Arctic environment. We will also enjoy SeaWorld's Penguin Encounter the most extensive exhibit of Antarctic birds in the world. The Penguin Encounter offers continuous viewing of seven species of penguins frolicking in their sub-zero environment. Watch with amusement as penguins dive, swim, and interact with each other. We will dine on a wonderful dinner buffet at Nautilus Pavilion. Located alongside Mission Bay, the glass-enclosed Nautilus Pavilion provides a unique setting for our dining experience. The good food and refreshments will provide an excellent atmosphere to meet with colleagues old and new. The evening finale will feature Shamu's *House of Douse Show!*

For further information about the attractions of SeaWorld, please visit their WEB site at www.seaworld.com. One Free admission to the symposium party is included with each full registration, and extra tickets can be purchased at the registration center for only \$75.

San Diego Attractions:

San Diego, with its sunny days and year-round mild climate, invites you to relax and play. San Diego spells non-stop fun at such popular attractions as Sea World, the Wild Animal Park and Legoland. Explore the most famous San Diego attraction - the San Diego Zoo located in beautiful Balboa Park. Or spend an afternoon building sand castles on a warm inviting beach. Picture a stroll through beautiful La Jolla as the sun sets over the blue Pacific. Fish, frolic or just sunbathe on the pristine beaches of Mission Bay Park. Families love the stroll along the historic Embarcadero from Seaport Village to the Star of India. This is where you take to the water on the Coronado ferry or view San Diego Bay, Pt. Loma and U.S. naval vessels from the deck of a cruise boat. A favorite San Diego attraction that draws visitors and natives alike is Old Town- experience the beginnings of San Diego history, shop in the Bazaar del Mundo, and dine on great Mexican food. All this and much more awaits you.

Weather:

The temperature in San Diego is relatively stable. The average maximum for November is about 70F (21C) and the average minimum is 55F (12C). Rain is possible but not likely. Average precipitation in San Diego for the month of November is 1". It is advisable to dress in layers, with light weight clothes during the day, and sweaters and jackets at night.

SYMPOSIUM HIGHLIGHTS

Technical Program:

The technical program for the 2003 IEEE GaAs IC Symposium consists of 65 technical papers, five panel sessions, an Industry Exhibit, the annual Short Course “Emerging Technologies from Defense to Commercial” and our introductory level class on Compound Semiconductor ICs (the Primer Course “Basics of Compound Semiconductor ICs”). This year we have invited 25 papers on a wide range of important topics. In addition, we continue the tradition of including important, late breaking news.

Exciting new developments from a variety of compound semiconductor disciplines will be presented. There is a tremendous amount of activity in the wireless and optical communication areas, as well as a strong interest in military electronics.

Short Course: “Emerging Technologies from Defense to Commercial”

This year the GaAs IC Symposium will present the sixteenth in a series of Short Courses applicable to various aspects of RF, Microwave and high speed circuit technology. The course will discuss the latest trends in advanced technologies used in both defense and commercial applications. An overview of DARPA sponsored emerging technologies and their role in meeting defense needs will kick off the short course. Presentation on several of these advanced technologies will follow including focused instruction on RF MEMs, GaN and infrastructure applications, latest advances in SiGe, and InP HBT technology and circuit applications. The course material is tailored for engineers of all experiences ranging from device technologists, circuit designers, and entrepreneurs silently scoping out opportunities for that next commercial wave.

Topics Covered and Instructors:

Overview of Technologies – Dr. Robert F. Leheny
RF MEMs – Professor Gabriel Rebeiz
Advances in SiGe – Dr. Herbert Knapp
GaN for Infrastructure – Dr. Jeffrey Shealy
InP HBTs and Circuit Applications- Dr. Marko Sokolich

Registration for the course is as noted in “Registration”. A limited number of Short Course Notes will be available after the course for purchase by Symposium registrants, subject to availability.

Direct questions to:

Kevin Kobayashi, Short Course Organizer
Sirenza Microdevices (formerly Stanford Microdevices)
310-257-0569
kkobayashi@sirenza.com

Primer Course: Basics of Compound Semiconductor ICs

The GaAs IC Symposium will again offer an introductory-level class, "Basics of GaAs, InP, and SiGe RFICs," intended for professionals in the electronics industry with little or no experience in compound semiconductor ICs or for anyone who wants an excellent review. The class covers analog/microwave and optical communications ICs and

their applications. The material is designed to provide a brief overview of concepts and issues unique to compound semiconductor ICs so that participants will be better able to profit from the Symposium Technical Program. The class is taught by Donald B. Estreich, an Agilent Technologies manager with 24 years experience in design and application of GaAs analog and microwave ICs, and Stephen Long, a University of California, Santa Barbara professor, also with 24 years experience in GaAs IC development. The class will be held Sunday evening, November 9th, from 5:30 p.m. to 8:30 p.m.

The registration fee is \$175 for professionals and \$75 for students. The fee includes a handout containing a copy of the overheads with an extensive reference list. Space is limited, so **ADVANCE REGISTRATION IS HIGHLY RECOMMENDED**. For additional information, please contact the Primer Course Coordinator:

Mohammad Madihian
NEC Laboratories America Inc.
Princeton, NJ
Phone: 609-951-2916

Registration for the class is as noted in "Registration". A limited number of copies of the handouts will be available to symposium registrants, subject to availability. The cost is \$50.

Panel Sessions:

This year we have five exciting Panel Sessions spread over the 3 days of the technical sessions. These are intended to be timely, thought-provoking, educational, and possibly even controversial. The topics are as follows:

Panel Session 1:

**"InP vs. SiGe vs. CMOS for high speed digital applications
Performance, reliability, costs and market conditions"**

Monday, November 10th, 3:30p.m. - 5:00 p.m.

Panel Session 2:

"Why Would I Want to Switch?"

Monday, November 10th, 3:30 p.m. - 5:00 p.m.

Panel Session 3:

"Is First Pass Success for Complex Mixed Signal Design Realizable?"

Tuesday, November 11th, 1:30p.m. – 3:00 p.m.

Panel Session 4:

"Base Station PA Technology - LDMOS Forever?"

Wednesday, November 12th, 1:00 p.m. – 2:30 p.m.

Panel Session 5:

"Module to MMIC to Module – PAs here we go again"

Wednesday, November 12th, 1:00 p.m. – 2:30 p.m.

Please see the "Symposium Program" section later in this brochure for more complete descriptions of each of these Panel Sessions (listed according to their day and time).

GaAs IC Technology Exhibition:

The 2003 GaAs IC Technology Exhibition will be held concurrently with the IEEE GaAs IC Symposium on November 10th and 11th in the Pavilion Ballroom and the Crystal and Horton Rooms located on the Lower Level of the U.S. Grant Hotel. The Exhibition is open to all Symposium registrants. A wide variety of companies who sell state-of-the-art compound semiconductor integrated circuits as well as companies who sell critical products and services to the III-V IC industry will be represented. The early list of exhibitors already includes:

ACCENT OPTICAL TECHNOLOGIES
AMERICAN XTAL TECHNOLOGY
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COMPOUND SEMICONDUCTOR MAGAZINE
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The Exhibition will feature informative and interesting displays with corporate representatives on hand between the hours of 5:00 p.m. and 8:00 p.m. on Monday, November 10th and 7:30 a.m. to 4:00 p.m. on Tuesday, November 11th. The Exhibition will also host the Exhibition Opening Reception on Monday evening from 5:00 p.m. until 7:00 p.m. and the Exhibition Luncheon from noon until 1:30 p.m. on Tuesday. All Symposium coffee breaks on Tuesday including breakfast will be held in the exhibition area.

There is still time for additional organizations to participate in the Exhibition. Interested parties should contact Mr. Harry Kuemmerle of VIP Meetings & Conventions, Pacific Palisades, CA at (310) 459-4691, Fax (310) 459-0605, e-mail: vipmtgs@aol.com. Or visit the GaAs IC Symposium's website at www.gaasic.org to download application forms or for additional information on the Exhibition, including the latest list of exhibitors.

Late-Breaking News Papers:

We have solicited papers containing late-breaking news for the Symposium Program. The times and locations of these presentations will be posted at the Symposium, as well as on the GaAs IC Symposium website at

<http://www.gaasic.org/>

In addition, extended abstracts for these papers will appear in the Symposium Digest.

Late news paper submissions are due Aug 14 5PM EDT. Submissions must be submitted in 4 page extended abstract format and camera ready for digest printing. E-mail abstracts to 2003abstracts@sirenza.com

Technical Digest:

Extra copies of the Technical Digest can be purchased by Symposium registrants through Advance Registration. A limited number of digests will also be available for sale at the Registration Desk after 1:00 p.m. on Tuesday, November 11th. The cost of the paper bound digest, if ordered through Advance Registration or purchased on-site, is \$75. The CD ROM Digest for 2003 will also be offered for \$100. A limited number of digests from previous years will be available for \$40. Digests will also be available after the Symposium by mail from the IEEE Customer Service Center, 445 Hoes Lane, Piscataway, NJ 08854 at (800) 701-4333.

Outstanding Paper Award:

The 2003 IEEE GaAs IC Symposium will select a contributed paper for the Outstanding Paper Award. All contributed regular papers (not the invited papers) will automatically be considered as candidates. Symposium attendees will have an opportunity to provide feedback through a Symposium questionnaire as well as to the Session Chairpersons. The award winner will be publicly announced shortly after this year's Symposium with the award formally presented at next year's Compound Semiconductor IC Symposium.

Short Course

Sunday, November 9, 2003
Wyndham U.S. Grant Hotel
Grand Ballroom A
8:00 a.m. - 4:45 p.m.

“Emerging Technologies from Defense to Commercial”

Course Coordinator: **Kevin Kobayashi**
Sirenza Microdevices
310-257-0569
kkobayashi@sirenza.com

Short Course Description

This year the GaAs IC Symposium will present the sixteenth in a series of Short Courses applicable to various aspects of RF, Microwave and high speed circuit technology. The course will discuss the latest trends in advanced technologies used in both defense and commercial applications. An overview of DARPA sponsored emerging technologies and their role in meeting defense needs will kick off the short course. Presentation on several of these advanced technologies will follow including focused instruction on RF MEMs, GaN and infrastructure applications, latest advances in SiGe, and InP HBT technology and circuit applications.

Each technology presentation will start out with describing the device physics fundamentals, technology evolution and roadmap, IC and system applications (both commercial and defense, present and future), and a discussion on specific circuit examples which illustrate the advantages (or disadvantages) of each technology and its device-circuit design considerations.

Topics Covered and Instructors:

- a) Overview of DARPA Sponsored Technologies –
 Dr. Robert F. Leheny
- b) RF MEMs – Professor Gabriel Rebeiz
- c) Advances in SiGe – Dr. Herbert Knapp
- d) GaN for Infrastructure – Dr. Jeffrey Shealy
- e) InP HBTs and Circuit Applications- Dr. Marko Sokolich

In the unlikely event that an instructor is unable to participate, an alternate instructor may be substituted.

Who Should Attend

The short course is a must for everyone interested in knowing the latest in advanced design technologies and their applications to both defense and commercial systems. Our lectures will cater to a range of interests and experience levels. The course is designed to give all attendees a solid overview of the device technology from device physics fundamentals through specific circuit examples and applications.

Short Course Schedule

The course will be held on Sunday November 9th and will begin with a continental breakfast. Instructors will begin promptly at 8:00AM. A lunch will be provided as well as morning and afternoon refreshment breaks.

- 7:00AM **Registration and Breakfast
(Grand Ballroom Foyer)**
- 8:00AM **Introduction and Overview (Grand Ballroom A)**
Kevin Kobayashi, Sirenza Microdevices
- 8 :05AM **DARPA Sponsored Technologies for Emerging
Defense Needs**
Dr. Robert Leheny, DARPA
- 9:25AM **RF MEMs**
Professor Gabriel Rebeiz, University of Michigan
- 10:45AM **Coffee Break**
- 11:00AM **Advances in SiGe Technology**
Dr. Herbert Knapp, Infineon
- 12:20PM **Lunch (Grand Ballroom D)**
- 1:30PM **(Grand Ballroom A)**
**Gallium Nitride Power Amplifier (PA)
Technology for Wireless Infrastructure**
Dr. Jeffrey B. Shealy, RFMD
- 2:50PM **Coffee Break**
- 3:05PM **InP Technology and Circuit Applications**
Dr. Marko Sokolich, HRL Laboratories, LLC
- 4:25PM **Questions and Discussion**
- 4:45PM **Close of Short Course**

Short Course Pre-Registration

So that we may properly plan for attendance, we encourage you to pre-register for the Short Course. A limited number of registrations will be available on-site immediately prior to the start of the course. The price for the Short Course is **\$350** for those that pre-register, and **\$450** for those that register on-site. The price for students is **\$200** for those that pre-register, and **\$300** for on-site registration. The registration fee includes the lectures, a book of Short Course Notes, continental breakfast, lunch, and morning/afternoon refreshments. Additional copies of the Short Course Notes may be purchased for **\$100** each.

Primer Course

Sunday, November 9, 2003
Wyndham U.S. Grant Hotel
Grand Ballroom A
5:30 p.m. - 8:30 p.m.

"Basics of Compound Semiconductor ICs"

Course Coordinator: **Mohammad Madihian**
NEC Laboratories America, Inc.
Princeton, NJ
Phone: 609-951-2916

Instructors: **Stephen I. Long**
University of California
Santa Barbara, CA
Donald B. Estreich
Agilent
Santa Rosa, CA

Course Objective and Description:

The popular primer course "Basics of Compound Semiconductor ICs" is an introductory-level class intended for professionals in the electronic industry with little or no experience in compound semiconductor IC technology. It also provides an excellent review for those with more experience. The course covers: digital and analog/RF/microwave circuits; III/V materials; MOS and bipolar devices; and fabrication technology. The course is tailored to provide background for symposium participants to better understand and appreciate the papers presented, including a glossary of those ever-cryptic acronyms. Throughout the course, comparisons among the GaAs technologies will be presented as well as comparisons with silicon technologies. Also, a number of GaAs integrated circuits along with the intended applications will be described.

Instructors Stephen I. Long and Donald B. Estreich each have over 20 years of experience working with GaAs ICs. A copy of their viewgraphs with an extensive bibliography will be distributed to each Primer Course registrant. Ample discussion time will provide an opportunity for participants to have questions answered by the instructors.

Course Agenda:

5:30 p.m. Introduction
5:35 p.m. GaAs History, Materials, and Processes
6:00 p.m. Device Operation
6:30 p.m. Discussion
6:40 p.m. Break
6:50 p.m. Digital Circuits
7:30 p.m. Analog/RF/Microwave Circuits
8:10 p.m. Summary and Discussion
8:30 p.m. Close

OTHER MEETINGS

2003 GaAs Reliability Workshop:

The 18th annual Workshop on GaAs Reliability, sponsored by JEDEC JC-14.7 Committee on GaAs Reliability and Quality Standards and the EIA, and with co-sponsorship of the Electron Devices Society of the IEEE, will be held in conjunction with the IC Symposium on Sunday, November 9, 2003, from 8:00 a.m. to 5:00 p.m. at the U.S. Grant Hotel in Grand Ballroom B.

The workshop will bring together researchers, manufacturers and users of GaAs and other III-V compound semiconductor devices. Papers presenting the latest results, including work-in-progress, and new developments in all aspects of GaAs reliability will be presented. Potential authors are requested to submit an electronic copy of a one to two page comprehensive summary, suitable for a 15 minute presentation, to: Dr. Wallace T. Anderson, Technical Program Chairman, at anderson@estd.nrl.navy.mil, Naval Research Laboratory, Code 6835, Washington DC 20375, phone (202) 767-1755. The deadline for receipt of submissions is August 20, 2003, and the Advanced Program will be published on our WEB site when available. Late news papers of significant interest will also be considered.

Registration for the workshop is \$95.00 in advance, or \$125.00 at the door. To pre-register, mail your name, Post Office address, email address, and phone number with a check for \$95 to: EIA/JEDEC, JC-14.7 Workshop, 2500 Wilson Boulevard, Arlington, VA 22201-3834 by October 23, 2003. Registration includes a full day of GaAs reliability papers, two breaks, a luncheon and a copy of the Proceedings. Late registration will be available from 7:30 a.m. to 8:30 a.m. on the morning of the workshop. For further information or to download a pre-registration form, visit our WEB site at www.jedec.org and click on GaAs, or contact: Anthony A. Immorlica, Jr., Workshop Chairman, BAE SYSTEMS, 65 Spit Brook Road, MER15-1351, Nashua, NH, (603) 885-1100, anthony.a.immorlica@baesystems.com.

SEMI Compound Semiconductor Materials Standards and ASTM Committee Meeting

The next SEMI Standards Compound Semiconductor Materials Committee meeting is scheduled during the IEEE GaAs IC Symposium for Monday, November 10, 2003 from 8:00-10:00 PM (PST) in a meeting room (TBD) in the Georgian Room at the U.S. Grant hotel in San Diego, California.

SEMI and ASTM hold joint meetings to develop test methods and specifications as a cooperative effort.

The SEMI Standards Compound Semiconductor Materials Committee would like to cordially invite the 2003 IEEE GaAs IC Symposium attendees interested in the development of internationally approved standards for Wafer Specifications (GaAs, InP, SiC dimensions/orientation, electrical properties), Epitaxy Layer Specifications, non-destructive mobility measurements, eddy current probe measurement resolution, test methods for etch pit density (EPD), room temperature resistivity mapping and investigations of electronic data interchange (EDI) codes for wafer marking to attend the next committee meeting on Monday, November 10, 2003.

Based in San Jose, Calif., SEMI is an international industry association serving more than 2,500 companies participating in the semiconductor and flat panel display equipment and materials markets. SEMI maintains offices in Austin, Beijing, Boston, Brussels, Hsinchu, Moscow, Seoul, Singapore, Tokyo and Washington, D.C. For more information, visit SEMI on the Internet at www.semi.org.

For additional information, please contact:

Committee Co-chair:

James Oliver
Northrop-Grumman
P.O. Box 1521 M/S 3K13
Baltimore, MD 21203
Phone: 410-765-0117
j.oliver@ngc.com

Committee Co-chair:

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Freiberger Compound Materials, USA
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SEMI Contact:

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SYMPOSIUM PROGRAM

Monday, November 10, 2003

REGISTRATION AND CONTINENTAL BREAKFAST

7:00 a.m. - 5:00 p.m.

Registration –Grand Ballroom Foyer

7:00 a.m. - 8:00 a.m.

Continental Breakfast - Grand Ballroom Foyer

SYMPOSIUM OPENING

8:00 a.m. - 8:25 a.m.

Grand Ballroom

Introduction and Awards Presentation

2003 Symposium Chairman

Chris Bozada, *Air Force Research Laboratory*

2003 Technical Program Chairman

Brad Nelson, *Sirenza Microdevices*

SESSION A: PLENARY SESSION

8:30 a.m. – 12:00 p.m.

Grand Ballroom

Chairpersons: Kevin Kobayashi, *Sirenza Microdevices*
Gary Valentine, *Raytheon Electronic Systems*

8:30 a.m.

A.1 Challenges and Future Opportunities for Compound Semiconductor Electronics (Invited)

John C. Zolper, *DARPA/MTO 3701 North Fairfax Dr., Arlington, VA 22203*

9:00 a.m.

A.2 25 Years of Digital III-V IC Technology: A Perspective (Invited)

Dr. Richard C. Eden, *Technology Applications*

9:30 a.m.

A.3 GaAs: The Wireless Device Technology of the Future and the Past (Invited)

George Bechtel, *Consultant*

10:00 a.m. - 10:30 a.m. **Coffee Break**

Monday, November 10, 2003

10:30 a.m.

- A.4 **Quad Band Cellular Power Amplifier Solutions (Invited)**
Freek van Straten, *Philips Semiconductors, Business Line RF Modules, Gerstweg 2, 6534 AE Nijmegen, The Netherlands*

11:00 a.m.

- A.5 **Current Advances in Capacitive RF MEMS Switches (Invited)**
Brandon Pillans, *Raytheon Space and Airborne Systems, Advanced Product Center*

11:30 a.m.

- A.6 **Progress in GaAs Metamorphic HEMT Technology for Microwave Applications (Invited)**
Phillip M. Smith, *BAE SYSTEMS Nashua, NH USA*

12:00 noon **End of Session A**

12:00 noon. - 1:20 p.m. **Break for Lunch**

SESSION B: The Changing Face of High Speed Digital Technology

1:20 p.m. – 3:00 p.m.

Grand Ballroom A&B

Chairpersons: Sorin Voinigescu, *University of Toronto*
Yasuro Yamane, *NTT Photonics Labs*

1:20 p.m.

- B.1 **An OC-768 Transponder for 40 and 43 Gb/s Short-Reach Links (Invited)**
John Paul Mattia, and the Big Bear Networks Technical Team,
Big Bear Networks, Sunnyvale, California

1:50 p.m.

- B.2 **High Speed CMOS Circuits up to 40 Gb/s and 50GHz (Invited)**
H. Wohlmuth, D. Kehrer, and M. Tiebout,
H. Knapp, M. Wurzer, W. Simbürger, *Infineon Technologies AG, Corporate Research, Otto-Hahn-Ring 6, D-81739 Munich, Germany*

2:20 p.m.

- B.3 **A Complete 40Gb/s Front-End Chip Set in InP SHBTs**
Z. Lao, M. Yu, V. Radisic, V. Ho, M. Xu, K. Guinn, S. Lee, and K.C. Wang, *Advanced Product Development Center, Opnext, Inc., Thousand Oaks, CA 91360*

2:40 p.m.

End of Session B

2:40 p.m. - 3:30 p.m. **Coffee Break**

Monday, November 10, 2003

SESSION C: MMICs for Handset Applications

1:20 p.m. – 3:00 p.m.

Grand Ballroom C&D

Chairpersons: Joy Laskar, *Georgia Institute of Technology*
Mitch Shifrin, *Hittite Microwave*

1:20 p.m.

- C.1 **Direct Conversion Receiver IC for CDMA-2000 (Invited)**
M. Hafizi, S. Feng, TL. Fu, B. Ruth, R. Schwab, K. Schulze,
P. Karlsen, Q. Gu, O. Narhi, K. Kananen, and C. Wakeham,
*Nokia Mobile Phones, 12278 Scripps Summit Drive; San Diego,
CA, 92131*

1:50 p.m.

- C.2 **Wireless Communication MMIC Development Activities in Japan (Invited)**
Noriharu Suematsu, *Information R&D Center, Mitsubishi
Electric Corporation, 5-1-1 Ofuna, Kamakura-city, Kanagawa
247-8501, Japan*

2:20 p.m.

- C.3 **A 2.3V PHEMT Power SP3T Antenna-Switch IC for GSM Handsets**
Z. Gu, D. Johnson, S. Belletete, M. Ayvazian, and D. Fryklund,
Skyworks Solutions, Inc. 20 Sylvan Road, Woburn MA 01801

2:40 p.m.

- C.4 **A 0.5 – 3 GHz High Linearity Enhancement Mode pHEMT Mixer with Square Wave Drive and Sum Terminating Diplexer**
Michael Vice, *Agilent Technologies, Inc.*

3:00 p.m.

End of Session C

3:00 p.m. - 3:30 p.m. **Coffee Break**

Monday, November 10, 2003

**PANEL SESSION 1: InP vs. SiGe vs. CMOS for
High Speed Digital
Applications: Performance,
Reliability, Costs and Market
Conditions**

3:30 p.m. - 5:00 p.m.–Grand Ballroom A&B

Moderators: Pierre Mandeville, *Nortel Networks*
Sorin Voinigescu, *University of Toronto*

In The Changing Face of High Speed Digital Technology session we have seen papers on digital circuits operating at 40Gb/s and beyond fabricated using InP, SiGe and a newcomer in this league, CMOS technologies. This panel will address the relative merits and drawbacks of these three technologies for digital applications. The discussion will revolve around performance, reliability, costs and market conditions. Is the performance actually good enough to provide a robust solution? Is the technology pushed beyond its limit for long time reliability typically required in long-haul systems? What are the costs inherent to that technology? What is the business case for it? What are the market conditions? Hope you can join us in this debate that promises to be lively!

Panel Members:

Allan Armstrong	<i>RHK</i>
Greg Freeman	<i>IBM</i>
Paul Kempf	<i>Jazz Semiconductor</i>
Minh Le	<i>Vitesse Semiconductor</i>
Chan Nguyen	<i>Global Communication Semiconductor (GCS)</i>
Kevin Glass	<i>Intel</i>

Monday, November 10, 2003

PANEL SESSION 2: Why Would I Want to Switch?

3:30 p.m. - 5:00 p.m.—**Grand Ballroom C&D**

Moderators: Gary Valentine, *Raytheon*
Dave Halchin, *RF Micro Devices*

Switches are an integral part of almost all RF microwave and millimeter wave systems used extensively in commercial and defense applications. In fact, newer systems, such as quad band PAs, require even more complex functionality. There are several potential solutions for the majority of these applications. This panel will discuss some of these solutions and explore the tradeoffs between the various technologies. This will include some of the basic requirements such as insertion loss, isolation, linearity and control logic as well as potential limitations of each technology such as reliability and RF power handling. Historically, the defense industry has funded advanced technology and made it feasible to be used in commercial applications. The panel will discuss defense applications of the technology and its insertion into commercial products. Also, the panel will address the following questions, where applicable: Is the technology capable of integrating the control logic on board? Can this technology be integrated with a transceiver/PA chip, or is this even feasible? With the mounting cost pressures, is there a path for cost reduction and what is it? Does the technology require any 'special' packaging needs?

Panel Members:

Dan Curcio	<i>Tyco(M/A COM)</i>
David Seed	<i>Skyworks Solutions</i>
Dave Johnson	<i>Skyworks Solutions</i>
Brandon Pillans	<i>Raytheon</i>
Gabriel Rebeiz	<i>University of Michigan</i>
Dylan Kelley	<i>Peregrine Semiconductor</i>

Monday, November 10, 2003

GaAs Technology Exhibition
Opening Reception
Pavilion Ballroom
Lower Level

5:00 p.m. - 7:00 p.m.

Tuesday, November 11, 2003

REGISTRATION AND CONTINENTAL BREAKFAST

7:00 a.m.- 5:00 p.m.

Registration – Grand Ballroom Foyer

7:30 a.m. - 8:30 a.m.

Continental Breakfast – Grand Ballroom Foyer

SESSION D: Reliability

8:00 a.m. – 9:40 a.m.

Grand Ballroom A&B

Chairpersons: John Martinez, *BAE Systems*
Walter Wohlmuth, *TriQuint Semiconductor*

8:00 a.m.

D.1 On the Investigation of Gate Metal Inter-diffusion in GaAs HEMTs

Y.C. Chou, D. Leung, R. Lai, R. Grundbacher,
M. Biedenbender, Q. Kan, D. Eng, M. Wojtowicz, P.H. Liu,
and A. Oki, *Northrop Grumman Space Technology, Redondo
Beach, CA 90278*

8:20 a.m.

D.2 Degradation Mechanism of PHEMTs Under Large Signal Operation

T. Hisaka, Y. Nogami, A. Hasuike, H. Sasaki, N. Yoshida,
K. Hayashi, T. Sonoda, and J. A. del Alamo, *High Frequency &
Optical Semiconductor Div. Mitsubishi Electric Corporation,
Hyogo, Japan*

8:40 a.m.

D.3 Reliability of Commercial InGaP/GaAs HBTs under High Voltage Operation

K. T. Feng, Y. Yang, and C. Nguyen, *Global Communication
Semiconductors (GCS), Inc., 23155 Kashiwa Court, Torrance,
CA 90505*

9:00 a.m.

D.4 Accelerated Life Test Results of InGaAs/InP Single Heterojunction Bipolar Transistors

Rainier Lee, *Vitesse Semiconductor, 741 Calle Plano Camarillo,
CA 93012*

9:20 a.m.

D.5 Low Frequency Noise –Based Monitoring of the Effects of RF and DC Stress on AlGaIn/GaN MODFETs

P. Valizadeh, and D. Pavlidis, *Department of Electrical
Engineering and Computer Science, The University of
Michigan, Ann Arbor, MI 48109-2122, USA*

9:40 a.m.

End of Session C

9:40 a.m. – 10:15 a.m. **Coffee Break**

Tuesday, November 11, 2003

SESSION E: High Speed, High Frequency Markets and MMICs

8:00 a.m. – 9:55 a.m.

Grand Ballroom C&D

Chairpersons: Dan Scherrer, *Agilent Technologies*
Tony Quach, *Air Force Research Laboratory*

8:00 a.m.

E.1 **Developments of Gigabit Wireless Links in Japan (Invited)**
Keiichi Ohata, *Photonic and Wireless Devices Research Laboratories, NEC Corporation, 2-9-1 Seiran, Otsu, Shiga 520-0833, Japan*

8:25 a.m.

E.2 **60 GHz Radio Design Challenges (Invited)**
Kevin Kornegay, *Cornell University, School of ECE, 413 Philips Hall, Ithaca, NY 14853-5401*

8:50 a.m.

E.3 **Development of 60 GHz Front End Circuits for High Data Rate Communication Systems in Sweden and Europe (Invited)**
Herbert Zirath, *Chalmers University of Technology, Göteborg, Sweden*

9:15 a.m.

E.4 **V-band Fully Integrated TX/RX Single-chip 3-D MMICs Using Commercial GaAs pHEMT Technology For High-speed Wireless Applications**
K. Nishikawa, B. Piernas, T. Nakagawa, K. Araki, and K. Cho, *NTT Network Innovation Laboratories, NTT Corporation, 1-1 Hikari-no-oka, Yokosuka, 239-0847, Japan*

9:35 a.m.

E.5 **Highly Linear and Compact MMW Phased Array Transmitters**
R. Lai, M. Siddiqui, B. Pitman, M. Nishimoto, K. Johnson, S. Din, O. Fordham, G. Schreyer, R. Grundbacher, L. Callejo and D. Streit, *Northrop Grumman Space Technology, Redondo Beach, CA 90278*

9:55 a.m.

End of Session E

9:55 a.m. – 10:15 a.m. **Coffee Break**

SESSION F: Simulation and Modeling

10:15 a.m. – 11:35 a.m.

Grand Ballroom A&B

Chairpersons: Olin Hartin, *Motorola*
Walter Wohlmuth, *TriQuint Semiconductor*

10:15 a.m.

F.1 **Numerical Analysis of Compound Semiconductor RF Devices (Invited)**
V. Palankovski, S. Wagner, and S. Selberherr, *Institute for Microelectronics, TU Vienna, Gusshausstr. 27–29, A-1040 Vienna, Austria*

10:45 a.m.

F.2 **Physics Based Analytical Model of Base-Collector Charge of III-V HBTs**

Tuesday, November 11, 2003

R. van der Toorn, J.C.J. Paasschens, and R.J. Havens, *Philips Research Laboratories, Prof. Holstlaan 4, 5656 AA Eindhoven, The Netherlands*

10:55 a.m.

F.3 **Optimization of the Collector Profile of InGaP/GaAs HBTs for Increased Robustness**

M. Pfost, V. Kubrak, and P. Zwicknagl, *Infineon Technologies AG, Otto-Hahn-Ring 6, D-81730 Munich, Germany*

11:15 a.m.

F.4 **Analysis and Modeling of Dispersion Characteristics in AlGaIn/GaN MODFETs**

S.H. Hsu and D. Pavlidis, *Department of Electrical Engineering and Computer Science, The University of Michigan, Ann Arbor, MI 48109-2122, USA*

11:35 p.m.

End of Session F

SESSION G: Amplifiers for S to W band Applications

10:15 a.m. – 12:05 p.m.

Grand Ballroom C&D

Chairpersons: Dave Halchin, *RF Micro Devices*
Paul Blount, *Hittite Microwave Corp.*

10:15 a.m.

G.1 **70% Efficient Switched-Mode Microwave Power Amplifiers (Invited)**

Z. Popovic, S. Pajic, N. Wang, and P. Bell, *University of Colorado at Boulder, Boulder, CO 80309-0425*

10:45 a.m.

G.2 **GaAs Bi-Directional Amplifier For Low Cost Electronic Scanning Array Antenna**

J.M. Yang, R. Lai, Y.H. Chung, M. Nishimoto, M. Battung, W. Okamura, and Reynold Kagiwada, *Northrop Grumman Space Technology, One Space Park, Redondo Beach, CA 90278*

11:05 a.m.

G.3 **Cellular/PCS Dual-Band MMIC Power Amplifier Of A Newly Devised Single-Input Single-Chain Network**

Ki Y. Kim and Chul S. Park, *School of Engineering, Information and Communications University (ICU), 58-4 Hwaam, Yuseong, Daejeon 305-732, Korea*

11:25 a.m.

G.4 **High Dynamic Range, Triple Gate-Based and Compact DC-40 GHz Variable Attenuator MMIC for Ka-band Variable Gain Amplifier ICs**

B. Lefebvre, A. Bessemoulin, H. Amara, R. Sévin, and P. Quentin, *United Monolithic Semiconductors, route départementale 128 – BP46, 91401 Orsay Cedex, France*

Tuesday, November 11, 2003

11:45 a.m.

G.5 77 GHz Low Noise Amplifier for Automotive Radar Applications

R. Eye, and D. Allen, *TriQuint Semiconductor, 500 W. Renner Road Richardson, TX 75218 U.S.A*

12:05 p.m.

End of Session G

Exhibition Lunch
Pavilion Ballroom
12:00 noon – 1:30 p.m.

SESSION H: Optical Transmitter Components

1:30 p.m. – 3:00 p.m.

Grand Ballroom A&B

Chairpersons: Pierre Mandeville, *Nortel Networks*
Zhihao Lao, *HRL Laboratories*

1:30 p.m.

H.1 Optical Modulators for Fiber Systems (Invited)

Maxime Poirier, *Bookham Technology, 1-10 Brewer Hunt way, Ottawa, ON, K2K 2B5 Canada*

2:00 p.m.

H.2 10Gb/s Modulator Driver IC With Ultra High Gain and Compact Size Using Composite Lumped-Distributed Amplifier Approach

J. Jeong and Y. Kwon, *School of EECS, Seoul National University, San 56-1 Shinlim-Dong, Kwanak-ku, Seoul 151-742, Korea*

2:20 p.m.

H.3 A High-gain InP D-HBT Driver Amplifier with 50 GHz Bandwidth and 10 Vpp Differential Output Swing at 40 Gb/s

Y. Baeyens, N. Weimann, R. Kopf, V. Houtsma, Y. Yang, A. Tate, J. Weiner, P. Roux, P. Paschke, and Y.K. Chen, *Lucent Technologies - Bell Laboratories, 600 Mountain Ave., Murray Hill, NJ 07974, USA*

2:40 p.m.

End of Session H

3:00 p.m. - 3:30 p.m. **Coffee Break**

Tuesday, November 11, 2003

**PANEL SESSION 3: Is First Pass Success for
Complex Mixed Signal Design
Realizable?**

1:30 p.m. - 3:30 p.m.—**Grand Ballroom C&D**

Moderators: Tony Quach, *Air Force Research Laboratory*
Dan Scherrer, *Agilent Technologies*

Components for consumer / military electronics are becoming highly sophisticated and complex in terms of functionality and requirements. However, the design and product development cycles are being reduced dramatically due to market pressures. Chip designers in this new age require the knowledge and tools to implement analog, RF, and digital circuits on a single chip. Under such a tremendous pressure, it is the CAD tools that may save the day.

The NeoCAD program was intended to bridge some of the gaps between today's commercial CAD tools and the level of functionality required by designers to develop high speed converters and other mixed signal circuits in reasonable time frames. This panel session will look at mixed signal simulation needs, capabilities of current design tools, and possibilities for future CAD tools from the perspective of designers, EDA vendors, and the NEOCAD program.

Panel Members:

Gregory Creech	<i>Air Force Research Laboratory</i>
Anthony Gadiant	<i>Neolinear</i>
Myung-Jun Choe	<i>Rockwell Science Center</i>
Jim Caravella	<i>Motorola Semiconductor</i>
Jenny Ford	<i>Phillips Semiconductor</i>
Chris Mueth	<i>Agilent Technologies</i>
TBD	<i>Cadence Design Systems</i>

SESSION I: Digital Building Blocks Beyond 40G

3:30 p.m. – 5:00 p.m.

Grand Ballroom A&B

Chairpersons: Andre Hendarman, *Vitesse Semiconductor*
Anu Mahajan, *TriQuint Semiconductor*

3:30 p.m.

**I.1 InP HEMT IC Technology for 40 Gbit/s and Beyond
(Invited)**

K. Murata, K. Sano, H. Fukuyama, Y. Yamane, Y. K. Fukai,
H. Kitabayashi, H. Sugahara, and T. Enoki, *NTT Photonics
Laboratories, NTT Corporation 3-1 Morinosato Wakamiya,
Atsugi, Kanagawa, 243-0198 Japan*

4:00 p.m.

**I.2 A 80-Gbit/s D-type Flip-flop Circuit Using InP HEMT
Technology**

T. Suzuki, T. Takahashi, T. Hirose, and M. Takigawa, *FUJITSU
LABORATORIES LTD., 10-1 Morinosato-Wakamiya, Atsugi*

Tuesday, November 11, 2003

4:20 p.m.

1.3 1.5-V Low Supply Voltage 43-Gb/s Delayed Flip-Flop Circuit

Y. Amamiya, Y. Suzuki, J. Yamazaki, A. Fujihara, S. Tanaka, and H. Hida, *Photonic and Wireless Devices Research Laboratories, NEC Corporation 34 Miyukigaoka, Tsukuba, Ibaraki 305-8501, Japan*

4:40 p.m.

1.4 Up-to-50-GHz-Clock InP DHBT Digital ICs and Optical System Experiments

J. Godin, M. Riet, S. Blayac, P. Berdaguier, V. Dhalluin, M. Kahn, A. Kasbari, V. Puyal, J. Moulu, F. Jorge, S. Vuye, L. Giraudet, B. Franz, A. Konczykowska, *ALCATEL R&I/OPTO+, Route de Nozay, 91460 Marcoussis, Fran*

5:00 p.m.

End of Session I

SESSION J: Advanced SiGe Technology

3:30 p.m. – 5:00 p.m.

Grand Ballroom C&D

Chairpersons: Julio Costa, *RF Micro Devices*
Jan-Erik Mueller, *Infineon Technologies*

3:30 p.m.

J.1 Silicon-Germanium BiCMOS Technologies for Power Amplifier Applications (Invited)

J.B. Johnson, A.J. Joseph, J. Dunn, V. Ramachandran, L. Lanzerotti, D. Sheridan, D. Coolbaugh, S. Sweeney, R. M. Mallidi, R. Singh, *IBM Microelectronics Division, Essex Junction, VT USA 05452*

4:00 p.m.

J.2 SiGe BiCMOS Technology for Highly Integrated Wireless Transceivers (Invited)

M. Racanelli, Pingxi Ma, P. Kempf, *Jazz Semiconductor, 4321 Jamboree Rd., Newport Beach, CA 92660*

4:30 p.m.

J.3 Reliability Characteristics of 200 GHz f_T / 285 GHz f_{MAX} SiGe HBTs

G. Freeman, Z. Yang, F. Guarin, J.-S. Rieh, D. Ahlgren, E. Hostetter, *Semiconductor Research and Development Center, IBM Microelectronics, Hopewell Junction, NY 12533 USA*

4:50 p.m.

End of Session J

Symposium Theme Party

SeaWorld

7:00 p.m. - 10:00 p.m.

Wednesday, November 12, 2003

REGISTRATION AND CONTINENTAL BREAKFAST

7:00 a.m.- 12:00 noon

Registration – Grand Ballroom Foyer

7:00 a.m. - 8:00 a.m.

Continental Breakfast - Grand Ballroom Foyer

SESSION K: High Speed Signal Processing

8:00 a.m.-9:40 a.m.

Grand Ballroom A&B

Chairpersons: Bert Oyama, *Northrop Grumman Space Technology*
Marko Sokolich, *HRL Laboratories LLC*

8:00 a.m.

**K.1 Equalization and the Evolution of Gb Communications
(Invited)**

A. J. Kim, M. Vrazel, V. M. Hietala, E. Gebara, C. Pelard1,
S. Bajekal, S. E. Ralph, and J. Laskar, *Quellan, Inc., 250 14th
St, 4th Floor, Atlanta, GA 30319*

8:30 a.m.

**K.2 Multilevel Signaling and Equalization over Multimode Fiber
at 10 Gbit/s**

C. Pelard, E. Gebara, A. J. Kim, M. Vrazel, E. J. Peddi, V. M.
Hietala, S. Bajekal1, S. E. Ralph, and J. Laskar, *Quellan, Inc.,
250 14th Street N.W. 4th floor, Atlanta, GA, USA*

8:50 a.m.

**K.3 2nd IF sampling 4th order Bandpass Delta-Sigma Modulator
for Digital Receiver Applications (Invited)**

J.F. Jensen, Al Cosand, H. Chris Choe, *HRL Laboratories, LLC
3011 Malibu Canyon Road, Malibu, CA 90265-4799*

9:20 a.m.

K.4 A 5-b 10-GS/s A/D Converter for 10-Gb/s Optical Receivers

J. Lee, P. Roux, T. Link1, Y. Baeyens, Y.-K. Chen, *Bell Labs,
Lucent Technologies, Murray Hill, NJ 07094, USA*

9:40 a.m.

End of Session K

Wednesday, November 12, 2003

SESSION L: HBT Technology

8:00 a.m.-9:50 a.m.

Grand Ballroom C&D

Chairpersons: Jan-Erik Mueller, *Infineon Technologies*
Cedric Monier, *Northrop Grumman Space Technology*

8:00 a.m.

L.1 High-Speed InP/InGaAs DHBTs with a Thin Pseudomorphic Base (Invited)

M. Ida, K. Kurishima, K. Ishii, and N. Watanabe, *NTT Photonics Laboratories, NTT Corporation, 3-1 Morinosato Wakamiya, Atsugi-shi, Kanagawa 243-0198, Japan*

8:30 a.m.

L.2 Submicron Scaling InP/InGaAs Single Heterojunction Bipolar Transistor Technology with $f_T > 400$ GHz for >100 GHz applications

J.W. Lai, W. Hafez, R. Chan, D. Caruth and M. Feng, *University of Illinois, 208 N. Wright Street, Urbana, IL 61801*

8:50 a.m.

L.3 InP HBT Integrated Circuit Technology with Selectively Implanted Subcollector and Regrown Device Layers

M. Sokolich, M.Y. Chen, D.H. Chow, Y. Royter, S. Thomas III, C.H. Fields, D.A. Hitko, B. Shi, M. Montes, S.S. Bui, Y.K. Boegeman, A. Arthur, J. Duvall, R. Martinez, T. Hussain, R.D. Rajavel, K. Elliott, and J.D. Thompson, *HRL Laboratories, LLC, 3011 Malibu Canyon Road, Malibu, CA 90265-4799*

9:10 a.m.

L.4 Low Phase Noise MMIC VCOs for Ka-Band Applications with improved GaInP/GaAs-HBT Technology

J. Hilsenbeck, F. Lenk, W. Heinrich, and J. Würfl, *Ferdinand-Braun-Institut für Höchstfrequenztechnik (FBH), Albert-Einstein-Straße 11, 12489 Berlin, Germany*

9:30 a.m.

L.5 60 GHz-band Low Noise Amplifier and Power Amplifier Using InGaP/GaAs HBT Technology

S. Handa, E. Suematsu, H. Tanaka, Y. Motouchi, M. Yagura, A. Yamada, and H. Sato, *Advanced Technology Research*

9:50 a.m.

End of Session L

9:40 a.m. - 10:00 a.m.

Coffee Break

Wednesday, November 12, 2003

SESSION M: Optical Receiver Components

10:00 a.m.

Grand Ballroom A&B

Chairpersons: Bob Cordell, *Tyco Telecommunications*
Anu Mahajan, *TriQuint Semiconductor*

10:00 a.m. –11:40 a.m.

**M.1 Photoreceivers for High-bit-rate Communication Systems
(Invited)**

Hiroshi Ito, *NTT Corporation, 3-1 Morinasato Wakamiya,
Atsugi-shi, Kanagawa 243-0198, Japan*

10:30 a.m.

**M.2 Optical Receiver Module Using an InP HEMT
Transimpedance Amplifier for over 40 Gbit/s**

H. Fukuyama, K. Murata, K. Sano, H. Kitabayashi, Y. Yamane,
T. Enoki, and H. Sugahara, *NTT Photonics Laboratories, NTT
Corporation, 3-1 Morinosato Wakamiya, Atsugi, Kanagawa,
243-0198 Japan*

10:50 a.m.

**M.3 6 k Ω , 43 Gb/s Differential Transimpedance-Limiting
Amplifiers with Auto-zero Feedback and High Dynamic
Range**

H. Tran, F. Pera, D. S. McPherson, D. Viorel, and S. P.
Voinigescu, *Quake Technologies Inc., 80 Hines Rd. Ottawa,
ON, K2K 2T8 Canada,*

11:20 a.m.

**M.4 An InGaAs/InP HBT Differential Transimpedance
Amplifier with 47 GHz Bandwidth**

J. S. Weiner, J. S. Lee, A. Leven, Y. Baeyens, V. Houtsma,
G. Georgiou, Y. Yang, J. Frackoviac, A. Tate, R. Reyes, R. F.
Kopf, W. J. Sung, N. G. Weimann, and Y. K. Chen, *Bell
Labs/Lucent Technologies, 600 Mountain Ave. Murray Hill, NJ
07974*

11:40 a.m.

End of Session M

Wednesday, November 12, 2003

SESSION N: Frequency Conversion ICs

10:00 a.m. – 11:40 a.m.

Grand Ballroom C&D

Chairpersons: Mohammad Madihian, *NEC Laboratories America, Inc.*
Paul Blount, *Hittite Microwave Corp.*

10:00 a.m.

N.1 **A DC-40 GHz InP HBT Gilbert Multiplier**
K.W. Kobayashi, *SIRENZA MICRODEVICES 24015 Garnier
St., Torrance CA 90505*

10:20 a.m.

N.2 **A High Spectral Purity GaAs PHEMT MMIC Balanced
Frequency Quadrupler**
T. Masuda, V. Löwenmark, H. Zirath, and R. Kozhuharov,
*Chalmers University of Technology, Department of
Microelectronics, Göteborg, Sweden*

10:40 a.m.

N.3 **A 55 GHz HEMT Monolithic Voltage Controlled Sources**
R. Kozhuharov, T. Masuda, H. Zirath, V. Löwenmark, and
L. Landen, *Chalmers University of Technology, SE-41296,
Gothenburg, Fysikgränd 3*

11:00 a.m.

N.4 **Design of W-Band VCOs with High Output Power for
Potential Application in 77 GHz Automotive Radar Systems**
H. Li, H.-M. Rein, and T. Suttorp, *Ruhr-University Bochum, AG
Halbleiterbauelemente, D-44780 Bochum, Germany*

11:20 a.m.

N.5 **A 18-45 GHz Double-Balanced Mixer with Integrated LO
Amplifier and Unique Suspended Coplanar Balun**
H. Morkner, S. Kumar, and M. Vice, *Agilent Technologies WSD
R&D, 350 West Trimble Road, San Jose, California, 95131*

11:40 a.m.

End of Session N

Wednesday, November 12, 2003

**PANEL SESSION 4:
Base Station PA Technology - LDMOS Forever?**

1:00 p.m.-2:30 p.m.

Grand Ballroom A&B

Moderators: Jan-Erik Mueller, *Infineon Technologies*
Bill Peatman, *ANADIGICS*

LDMOS is the dominant technology for base station PAs for many reasons including performance, cost, reliability. Given that systems providers are loath to change a winning (or working) recipe, it seems to be a tough sell for competing technologies to make any headway against LDMOS. This panel will review the technology of base station PAs including

- Requirements for present and future base station PAs
- Technology drivers from system's perspective
- Potential of the technologies for disruptive changes in base station PA architecture
- Status and prospects of competing semiconductor technologies
- Development trends such as higher functionality and increased PAE at back-off
- Commercial aspects including time to market, cost/performance trade-offs, etc.

The panel consists of experts from several technology and systems perspectives

Panel Members:

Helmut Brech	<i>Motorola</i>
Jun Fukaya	<i>Fujitsu Quantum Devices Limited</i>
Tim Henderson	<i>TriQuint Semiconductor</i>
John Palmour	<i>Cree</i>
Jeff Shealy	<i>RF Micro Devices</i>
Bill Vassilakis	<i>Powerwave Technologies</i>

Wednesday, November 12, 2003

PANEL SESSION 5 :
Module to MMIC to module, PAs here we go again!

1:00 p.m. - 2:30 p.m.

Grand Ballroom C&D

Organizers/Moderators: Dave Halchin, *RF Micro Devices*
Julio Costa, *RF Micro Devices*

Power Amplifiers (PAs) for Cellular phones have gone full circle and past in the last 10 years. The transition has been from a module dominated product 10 years ago to a MMIC dominated market and to the current situation of module dominated today. The original modules consisted of a fully matched and stable PA, designed to work in a 50 Ω environment. The MMIC supplanted the earlier modules due to cost and flexibility issues for the end equipment manufacturers. The migration back to modules has occurred to enable a smaller total footprint and to increase the yield/performance of the function for the phone companies. These new modules are typically required to operate over multi-bands and are on a path to ever increasing functionality. Modules are commercially available with power control circuitry, harmonic filters and diversity switches contained within. What is the future for these modules? Will GaAs continue to be the semiconductor of choice for the PA? How close to the baseband processor will they be? How close to the antenna? Will they be 50 Ω in and out? These and other trends will be discussed by our panel of experts assembled from around the industry.

Panel Members:

Ali Khatibzadeh *ANADIGICS*
Mark Bloom *Motorola*
Freek van Straten *Philips*
Andrew Christie *RF Micro Devices*

Wednesday, November 12, 2003

SESSION LN1: Late News

3:00 p.m.- 5:00 p.m.

Grand Ballroom A&B

Chairpersons: Paul Blount, *Hittite Microwave Corp.*
John Martinez, *BAE Systems*

SESSION O: Emerging Technology

3:00 p.m. – 4:30 p.m.

Grand Ballroom C&D

Chairpersons: Peter Asbeck, *University of California San Diego*
Bill Peatman, *ANADIGICS*

3:00 p.m.

O.1 DARPA's ABCS Program: Low Power-Consumption, High Speed ICs Using 6.1 Å Semiconductors (Invited)

Jagdeep Shah, *Defense Advanced Research Projects Agency (DARPA), Microsystems Technology Office (MTO), 3701 N. Fairfax Drive, Arlington, VA 22203*

3:30 p.m.

O.2 Metamorphic AlSb/InAs HEMT for Low-Power, High-Speed Electronics

R. Tsai, M. Barsky, J. B. Boos, B. R. Bennett, J. Lee, R. Magno, C. Namba1, P. H. Liu, D. Park, R. Grundbacher, and A. Gutierrez, *Northrop Grumman Space Technology, Inc., Redondo Beach, CA 90278*

3:50 p.m.

O.3 Improved Fabrication Process for Obtaining High Power Density AlGaIn/GaN HEMTs

R. Thompson, V. Kaper, T. Prunty, J. R. Shealy, *Cornell Nanofabrication Facility and School of Electrical and Computer Engineering, Cornell University, Ithaca, NY 14853*

4:10 p.m.

O.4 Low Standby Leakage Current Power Amplifier Module made with Junction PHEMT Technology

M. Nakamura, N. Saka, M. Shimada, T. Kimura, H. Motoyama, I. Hase, *SONY, Micro Systems Network Company, Semiconductor Technology Development Group, 4-14-1 Asahi-cho, Atsugi-shi, Kanagawa 243-0014, Japan*

4:30 p.m.

End of Session P

5:00 p.m.

Close of Symposium

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Notes

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