EVALUATION ENGINEERING
For Electronic Test & Measurement

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The International Microwave Symposium Goes Virtual, Part Three

The virtual International Microwave Symposium will remain available for visitors through the end of next month, although the active components of the event have gone by. Here are some of the highlights to whet your appetite.

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Don’t forget to check out:
The International Microwave Symposium Goes Virtual, Part One
The International Microwave Symposium Goes Virtual, Part Two

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the event have gone by. We encourage you to check out the event, and here are some of the highlights to whet your appetite.

5G beamforming

Radio performance has become a critical device enabler today. The ability for an IoT product to be able to seamlessly travel through the Cloud and use all the available RF infrastructures will be a powerful force multiplier. Advanced antennas, ICs, topologies, and protocols are needed to create the optimum solution.

At the Anokiwave booth, the company was touting its portfolio of Silicon ICs for mmW 5G, SATCOM and RADAR applications. They pointed out how their specialty and advanced design capabilities create some of the industry's highest-performing 3GPP-compliant 5G radios, for applications from 5G infrastructure to Consumer Premise Equipment (CPE). And now with their second-generation SATCOM ICs, Anokiwave is enabling the market for LEO/MEO/GEO satellite ground and aero equipment.

Here's a clip explaining mmW 5G beamforming using technology developed by Anokiwave:

In the area of space development, Anokiwave and hiSky recently announced a collaboration to enable the next generation of low-cost, voice, data, and IoT SATCOM terminals. As part of this collaboration, Anokiwave will provide its ICs in Ku and K/Ka band, and hiSky will provide small form-factor terminal-based phased-array antennas, for commercial and industrial applications.

Advanced Embedded Systems

No matter how sophisticated the software, it still needs high-performance hardware embedded systems to run on. Pentek (www.pentek.com) designs embedded computer boards and recording systems for DSP, software radio, and data acquisition, with high-speed digital and analog interfaces and FPGAs in AMC, XMC, FMC, PMC, cPCI, PCIe, and VPX.

In their virtual booth, the company presented a webinar providing a look at how RFSoC compares to the current trends in A/D and D/A converters. Presented by Rodger H. Hosking, vice-president and co-founder of Pentek, the video covers on-chip resources in detail, and board and system design considerations will be discussed including power, IP optimization, standard and custom module sizes. The video also covered the support circuitry needed for optical interfaces and connections, memory, clocking, and high-signal integrity for RF inputs and outputs.

The company also recently introduced an addition to their Model 7050 RFSoC Architecture family,an eight-channel A/D and D/A converter, PCIe double-wide board based on the Xilinx Zynq UltraScale+ RFSoC. The Model 7050 brings RFSoC performance to PC platforms with a complete system on a board. The solution targets 5G and LTE wireless, SIGINT and COMINT, EW countermeasures, radar on a chip, test and measurement, satellite communications, and LiDAR applications.

RF Test

Of course, test, measurement, and evaluation is becoming more and more important to address the crowded spectrum, and optimizing the devices within it. thinkRF (https://thinkrf.com/) provides compact, networkable RF spectrum analyzers and downconverter/tuners that are deployable without a PC. At the company's virtual booth they were promoting their solutions for applications such as spectrum monitoring, signal analysis & demodulation, TSCM, SIGINT/ELINT, telecom deployment & optimization, and others.

Among the systems promoted at the virtual booth built on the company's innovative software-defined radio technologies, the ThinkRF R5550 Real-Time Spectrum Analyzer has the performance of traditional lab-grade spectrum analyzers, at a fraction of the cost, size, weight and power consumption. Designed for distributed deployment in the lab, in the field, or in a vehicle, the portable, fanless ThinkRF R5550 provides the benefits of a high-performance software-defined RF receiver, digitizer and analyzer.

The lightweight R5550 analyzer offers improved spectral performance in a rugged form factor. Based on an optimized software-defined radio receiver architecture, coupled with real-time digitization and digital signal processing, the device enables wide bandwidth, deep dynamic range, and 27 GHz frequency range in a small, stylish one-box platform.

The company also recently launched the D4000 RF Downconverter/Tuner, presented as the industry's first 40 GHz downconverter/tuner with a frequency range from 24 to 40 GHz with up to 500 MHz of real-time bandwidth (RTBW), to capture mmWave 5G signals. To leverage the performance, latency, and capacity that 5G promises, you need equipment which can properly analyze the higher frequencies and wider bandwidths of these new signals. This compact, plug-and-play thinkRF downconverter/tuner can upgrade existing field, lab, and manufacturing test equipment, reducing time to market and cost significantly.

Dedication to Simulation

It's a common demand from the engineering community to have the best in test, simulation, evaluation, and troubleshooting capability. The difference in being able to optimize a system by simulating its performance in various iterations is a critical design advantage in product development.

Visitors to the MathWorks virtual booth at the conference can see a range of tools built on the company's platform products, MATLAB and Simulink. Used to model, simulate, and deploy communications, radar, and EW systems, their tools span the RF, antenna, phased array, signal processing, and data processing disciplines. Some highlights include their Wireless Waveform Generator App, their Antenna Array Designer App, as well as improved antenna optimization workflows and installed antenna analysis for large structures.

They point out how you can perform coverage analysis using ray-tracing propagation models in complex urban environments, connect MATLAB to RF network analyzers to characterize designs, and use MATLAB and Simulink to develop systems on the RFSoC platform for communications and radar applications. You can apply deep-learning techniques such as modulation identification, RF fingerprinting, spectrum management, channel estimation, and target classification, and validate your results with off-the-shelf radios and radars

A Manufacturing Partner

MACOM designs and manufactures semiconductor products for data center, telecommunication, industrial, and defense applications. At their virtual booth, the Massachusetts-based company emphasized their design centers and sales offices throughout North America, Europe and Asia, where you can have their professionals help you create your design. MACOM is certified to the ISO9001 international quality standard, and ISO14001 environmental management standard.

At the show, among other product releases the company introduced its latest GaN-on-SiC “Pure Carbide” power amplifier product line, with the MAPC-A1000 and the MAPCA1100 first released. “This new product line significantly enhances the capability of our existing RF Power product portfolio, said Stephen G. Daly, President and Chief Executive Officer of MACOM. “GaN on Silicon Carbide is a compelling technology, and we are excited to begin offering our customers both standard and custom MACOM Pure Carbide power amplifier solutions.”

The MAPC-A1000 is a high power GaN-on-SiC amplifier, designed to operate between 30 MHz and 2.7 GHz, integrating an input match which simplifies the design-in effort. The amplifier can deliver more than 25 W (44dBm) at greater than 50% efficiency from 500 MHz to 2.7 GHz when tested in a circuit designed for operation over 2.2 GHz simultaneous bandwidth.

The MAPC-A1100 is a high power GaN-on-SiC amplifier designed to operate up to 3.5 GHz, capable of supporting both CW and pulsed operations, with output power levels of at least 65 W (48.1dBm) in an air cavity ceramic package. The two new general-purpose amplifier products target avionics, high power mobile radios, wireless systems, and test instrumentation.

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