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More on Passive Components

Scott L. Spencer
Publisher



This past February, *HFE's* Senior Technical Editor Tom Perkins mentioned that he had received a few comments from our readers that more should be said about passive components. In the past, some design engineers never gave much thought to these devices we refer to as passive components—resonators, filters, diplexers, power dividers, directional couplers, impedance transformers, waveguides, transmission lines and connectors as well as antennas. Not because they weren't important—of course they were. It was that these components were readily available with short lead times from multiple established manufacturers and distributors.

But, as circuit design shifted away from discrete devices in favor of MMICs, designers seized the opportunity to integrate passive components into their circuit designs. One of the first challenges for most was the on-chip spiral inductor. Believe it or not, there was a time in the early stages of MMIC design when modern 3D Planar Electromagnetic circuit modeling, synthesis, and simulation software for microwave circuit design simply did not exist, and when early versions began to emerge these tools were not available for use by every engineer. The on-chip inductor became so important because its performance has a tremendous impact on overall circuit performance, and ultimately cost. Designing for the correct inductance value, plus achieving a high self-resonance frequency and a high quality Q factor, involved consideration of various geometrical parameters, such as track width, track spacing, number of turns and layout area. This was often accomplished through many cycles of trial and error—and at great expense. Fortunately today companies like Agilent, Ansys, AWR Corp, CST, Sonnet and others offer software solutions that make first-pass success a reality.

Sign Up for Webcast on Passives

There is still a noticeable interest expressed by readers of this magazine for more discussion on passive components. In light of this *High Frequency Electronics* will conduct an on-line webcast on August 28th at 1:00 PM EST. Presented by Tom Perkins, the webinar will examine basic components such as resistors, inductors, capacitors, printed circuit functions, circulators, connectors, combinations of these, and their fundamental parameters. The state of present technology available in the microwave marketplace will be reviewed. Tom will also briefly touch on some possible future innovations that could provide revolutionary changes in circuit techniques. This informative webinar should be useful to all who read and

enjoy *HFE* and will be geared toward students, entry level engineers and technicians, sales and marketing personnel, project managers, and procurement personnel. Tom Perkins is a veteran RF/microwave design engineer and engineering manager and will be available for follow-up questions. Sign-up is simple. Just go to www.highfrequencyelectronics.com and click on the banner that says "Free HFE Webcast-August 28." While on the website take the opportunity to renew your subscription, visit the websites of our advertisers, scroll through the archives and check out the featured new products.

NIWeek 2013

About the time this issue goes on press, National Instrument's NIWeek 2013 will be fully under way. I attended last year's meeting and was impressed with scope of the conference, especially the hands-on workshops; exhibits showcasing the latest advancements in design, research, and test; and keynote presentations from leading technology thought leaders. Last year also featured the debut of the NI's PXIe-5644R RF vector signal transceiver (VST), the first software designed instrument that combines a vector signal generator and vector signal analyzer with a user-programmable FPGA into a single PXI modular instrument. The VST is still generating a lot of industry buzz as more and more users experience first-hand its capabilities and programming flexibility.

This year organizers plan for over 250 interactive technical sessions, case study presentations, and panel discussions for beginners to advanced developers. Sessions on how to optimize efficiency in your test and Data Acquisition Systems, implement advanced technology for industrial design, measurement, and control; and emerging trends in science and industry are all a part of NIWeek 2013. This well-run event even offers

participants a chance to earn continuing education units (CEUs) and take software certification exams for NI LabVIEW, NI LabWindows™/CVI, and NI TestStand software.

IMS 2013

It has been eight weeks or more since the IMS 2013 concluded in

Seattle. In his July editorial Tom Perkins summarized the most important aspects of the Symposium quite succinctly. I would like to take the opportunity to say thanks to all the volunteers, committee members, delegates, sponsors, and the exhibition management team for making this year's event a success.