

Military Technology: Business and Product News Update

From November 2009 *High Frequency Electronics*
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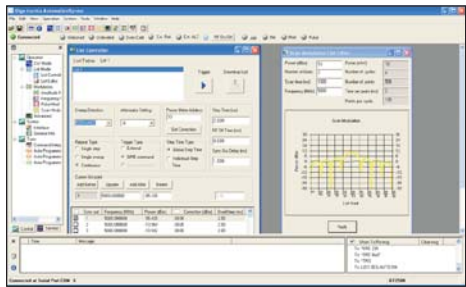
4.5-18 GHz Traveling Wave Tubes

e2v (www.e2v.com) has announced the introduction of 2 new broadband mini helix Traveling Wave Tubes (TWTs). The first tube is designed to operate at between 4.5 and 18 GHz and is available now. The second, designed to operate between 2 and 18 GHz, will be released into production later this year. The 4.5-18 GHz TWT offers world leading size, weight and performance figures, while the 2-18 GHz TWT is unique in its broadband capability.

The broadband operation of these new tubes provides the opportunity to replace multiple tubes within a system with a single tube, delivering savings on system size, weight, power requirements and cost. These TWTs extend e2v's extensive range of coupled cavity and helix TWTs designed for the exacting requirements of commercial and military applications including radar, satellite uplinks, Electronic Countermeasures (ECM) and laboratory testing equipment.

EW Software for Microwave Signal Generators

Giga-tronics (www.gigatronics.com) has introduced Automation Xpress (AX) application software for EW signal simulation using the new 2400C and 2400B series of fast-switching microwave signal generators. The new signal generators cover 100 kHz to 50 GHz, are fast switching and low phase noise. With AX software, test engineers and managers can quickly create a variety of test signals, including antenna scan modulation. AX works in the PC environment,



providing easy setup of signal simulation scenarios for testing EW radar, Elint systems and other receivers. The photo shows the AX user interface for a typical radar scan signal simulation using the list mode editor.

AX is included with the new 2400C and 2400B microwave signal generators. The software enables easy downloads of complex lists and setup, as well as modification of parameters. A comprehensive list mode, command line interpreter with script and loop capability, and an auto-programming capability are but a few of the features provided in AX.

Rubidium and GPS Time Sources

Crystek (www.crystekcrystals.com) has been named the exclusive franchise USA distributor of rubidium and GPS time sources from AccuBeat of Israel. AccuBeat's line of frequency standards provide precision signal timing for



test and measurement equipment, military and satellite communications, and wireless technology.

Crystek is now offering four AccuBeat

models: two Rubidium Frequency Standards and two GPS-Disciplined Rubidium Frequency Standards, in a number of configurations. The AR40A Rubidium Frequency Standard is an extremely small, very high performance Atomic Rubidium Frequency Standard designed to operate reliably in demanding applications and harsh environments. The unit contains a microprocessor which optimizes its performance vs. external conditions. The compact AR70A-00 includes both a Rubidium Standard and a GPS receiver. With this receiver, the standard is disciplined to the Global Positioning System, thereby providing extremely accurate and stable time and frequency. Other features include a PC channel for time and navigation data, along with a 1 pps external input and output. All outputs are derived from the Rubidium Standard, which maintains the 10 MHz and 1 pps when GPS or external 1 pps inputs are interrupted. Crystek is also offering two 19-inch rack-mount configured systems. Each model features 10 outputs and offers multiple output configurations to allow easy use.

SBIR Grants for DOE and NAVY Research Projects

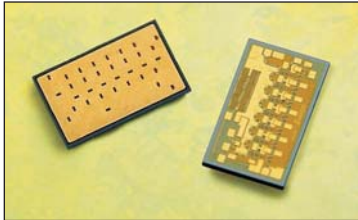
AWR (www.awrcorp.com) announces that its Simulation Technology and Applied Research (STAAR) division, which develops Analyst™ 3D finite element method (FEM) software, has been awarded three grants for U.S. government-sponsored research projects through the Small Business Innovation Research (SBIR) program. Two of the grants for FEM EM software development are from the U.S. Department of Energy. One is focused on RF cavity design and the other on current modeling to enable more rapid evaluation and design iteration of next-gener-

ation light sources and particle colliders. The third, awarded by the U.S. Navy, focuses on improving emission/ionization algorithms of 3D FEM technology in the 80 to 300 GHz range.

The proprietary parallelized 3D FEM EM simulation and analysis capability embodied in Analyst software is the result of more than a decade of development at STAAR in collaboration with the U.S. Department of Defense and U. S. Department of Energy, and has been employed to analyze extremely complex RF and microwave structures at the Fermi National Accelerator Laboratory, Stanford Linear Accelerator Center, and Naval Research Laboratory.

Ultra Broadband Traveling Wave Amplifier

Avago Technologies (www.avago.com) has introduced the industry's first ultra broadband traveling wave amplifier (TWA) for high-speed digital communications applications that operate over the 30 kHz to 80 GHz frequency range. Avago's AMMC-5025 amplifier provides



8 dB of small signal gain and excellent gain flatness of ± 0.7 dB along with better than 10 dB input and output return loss. Its performance is ideal for use in test and

measurement equipment, radar warning receivers, wideband communications and surveillance systems, and point-to-point radios.

The AMMC-5025 has a gain slope control feature and an adjustable gain control feature that allows over 25 dB of dynamic range. The superior performance features of this TWA makes it ideal for use in instrumentation and MMIC applications. With a miniature die size of 1.6 mm by 1.0 mm, the AMMC-5025 amplifier integrates easily into a wide range of RF/Microwave modules and subsystems.

Features include: 50 ohm match on input and output, ESD protection of 70V MM and 300V HBM, typical performance (at $V_d = 5V$, $I_{dsq} = 0.1A$) of 15 dBm P1dB at 40 GHz and input/output return loss of 10 dB/15 dB. The AMMC-5025 amplifier is priced at \$150 each in 1,000 piece quantities.

MIL QPL Switched Power Supply Capacitors

AVX Corporation (www.avx.com) has expanded its offering of MIL QPL products with switch mode power supply capacitors that meet MIL PRF 49470 specifications. These stacked capacitors are designed to have ultra low equivalent series resistance (ESR) and equivalent series inductance (ESL) to handle large currents and transient voltages of today's power supplies while maintaining a small footprint. AVX's MIL QPL products are uniquely suited for the filtering capacitor on the input and output of power supplies, or as a snubber capacitor. In addition to expanding its product offering, AVX has extended its test capabilities to include lighting

tests (DO-160), signal characterization, RF analysis, and voltage conditioning to meet the demands of customers.

AVX stacked capacitors now meet M level and T level certifications for all values, case sizes and voltage ranges over the $-55^{\circ}C$ to $+125^{\circ}C$ temperature range. AVX's SMX Series can operate up to $200^{\circ}C$. Lead times vary based on the size of product; stock is available through AVX distribution partners.

GaN Power Amplifier

Aethercomm (www.aethercomm.com) offers Model Number SSPA 1.71-1.88-69, a high power, Gallium Nitride (GaN) amplifier that operates



from 1710 MHz to 1880 MHz minimum and is packaged in a very compact, high performance package. This amplifier is

designed for operation in harsh environments. Typical output power is 70 watts across the band at P_{3dB} . Small signal gain is 53 to 54 dB across the band typically. Power added efficiency in saturation is typically 40% to 50% across the band. Input and output VSWR is 2.0:1 maximum.

This unit is equipped with DC switching circuitry that enables and disables the RF devices inside the amplifier in 2000 ns typical for turn on and 5000 ns typical for turn off time. Standard features include reverse polarity protection, output short and open circuit protection, and over/under voltage protection. There is a temperature sensor internal to this amplifier. This RF power amplifier operates from a +28 Vdc power supply. Standby current is ~30 mA and the quiescent current is 1.13 amps without RF drive. This unit operates over a $-40^{\circ}C$ to $+85^{\circ}C$ base plate temperature range. Noise figure is 9.0 dB typically across the band.

Stable, Rugged, Low Noise Frequency Source

TRAK Microwave (www.trak.com) has introduced the Model OSC049 Multiplied Crystal Base Source. This



oscillator is ideal for Electronic Warfare, C4ISR and radar applications. Model OSC049 utilizes a 5th overtone SC cut crystal within a low-profile package with a

proportionally controlled heater. The unit maintains excellent frequency stability of +1 ppm max. (+0.5 ppm typical) over $-40^{\circ}C$ to $+85^{\circ}C$ at 400 MHz output. The device offers low g sensitivity of $3 \times 10^{-10}/g$; a noise floor of -156 dBc/Hz; and SSB phase noise performance ranging from -116 dBc/Hz at 100 Hz offset, to -155 dBc/Hz at 1 MHz offset. Spurious signals >100 kHz offset are -100 dBc or better. Power requirements are ± 15 VDC at 6.2 watts total.