

Digital-to-Analog Conversion System Delivers Unparalleled Signal Fidelity and Timing Resolution

Next generation serial data technologies, such as PCI Express 2, SATAIII, and HDMI 1.3, that are used in the computing, communications and consumer electronics industries require data rates that until today no Arbitrary Waveform Generator (AWG) has been able to address. Previously, no single test instrument has been able to replicate signals at the speeds necessary for these technologies to aid engineers in the test and characterization of their designs. This left engineers with a dilemma — how best to combine multiple channels from logic sources, digital signal generators, and noise generators to replicate the signals that contemporary electronic and wideband radio frequency (RF) devices employ. In some cases it was not even possible to replicate signal artifacts at higher data rates. Not surprisingly, using a combination of multiple test instruments can be quite costly, cumbersome and would often produce imprecise signals.

To help solve these problems, Tektronix has developed the AWG7000 Series. The new AWGs are powered by a new digital-to-analog (DAC) ASIC. Developed by the Tektronix Microelectronics design group using a third-generation 0.18um BiCMOS SiGe (IBM 7HP process), the DAC more than doubles the sample rate to 10 GS/s, improves vertical resolution from 8 bits to 10 bits and increases by 4 times the number of discrete resolution levels from 256 levels to 1024. By interleaving two channels, engineers can obtain a sample rate of 20 GS/s.

The highly advanced AWG7000 Series delivers the industry's best signal fidelity and timing resolution to accommodate the testing and characterization of today's serial data and wideband RF devices. This 20 GS/s performance is sufficient for generating signals up to 10 Gb/s, which are now beginning to appear with advanced serial data technologies. The AWG7000 Series can also generate up to 5.8 GHz analog signals with four times over-sampling to meet the needs of digital RF designers.

The AWG7000 Series can create signals that include real world imperfections such as jitter and noise. The user has direct control over the input data and pulse shape, in addition to the amount of noise, amplitude variation, jitter and more that can be added to the signal. As a result, digital design and RF engineers can generate signals that more accurately reflect what the devices will encounter once they reach the mass market.

Utilizing a powerful new DAC, the AWG7000 Series offers the preeminent signal source for testing and characterizing today's electronic and wideband RF devices. For the first time, engineers can generate precise, real world signals that are compliant with ultramodern data standards using a single instrument.