



BOURBAKY

Advanced Test Tool for Digital to Analog Converter



ST Microelectronic, one of the major semiconductor R&D manufacturer for wireless and video components has worked with **BOURBAKY** an **Agilent Channel Partner**, to design their new DAC control tool for Central Laboratory located at Grenoble.



The wireless and video application market requires better converter components to meet end user sound, video or telecom transmission quality expectation. Fine characterisation for 10 to 14 bits converters operating at hundreds of Megahertz sampling frequency becomes a real challenge and an heavy task for Lab engineers. Accuracy, repeatability and traceability must be present on each stage of measurement test procedure. Such job requires specialized high end T&M (Test & Measurement) equipment as well as a tremendous Lab knowledge to run tests, take into account fixturing effects, ... Test results may help Design engineer to adjust component performance. Measurement results may also be reused through simulation software to verify complete application including the DAC. Doing so enable to link real world with simulation capability.

BOURBAKY choose to use the new EMA (Electronic Measurement Automation) software architecture to design this ATTDAC (Advanced Test Tool for Digital to Analog Converter). Best suited high end T&M equipment enables highly accurate measurement. Combining these elements in one “**Toast Burner**” DAC test system allows fast, accurate and efficient verification for engineer. Lab Engineer uses the ATTDAC test platform to perform standard test and characterize alone components. Design Engineer gets real model data from same ATTDAC platform to use with ADS (Advanced Design System).

The ATTDAC used by ST microelectronics is a path between the complex design world and the real world. This system provides all necessary measurement capabilities to complete the simulation in ADS from Agilent Technologies. Embedded results presentation is useful for instant check, data export capability enable off-line analyze.

ATTDAC is a key to speed up conception to production cycle, it helps ST microelectronics to reduce Time to Market and to reach goals of today new products.



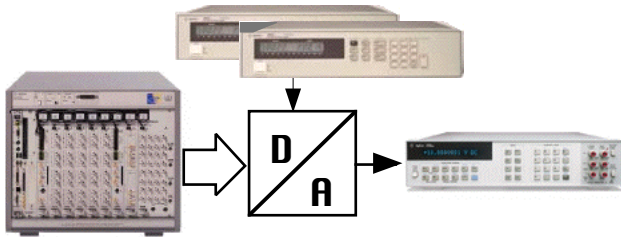
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ATTDAC is built on EMA software concept, allowing two major benefits :

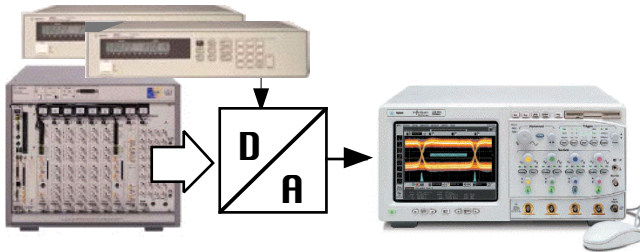
- independance from test equipment used, as each device uses a separate -but normalized- s/w driver.
- Toast Burner like user interface, for task like autosequencing, elementary test procedure adjustment, sweeping, or data manipulation (adjustment parameters, fixturing deskew, results storage, retrieval, exportation ...)

Static Measurements



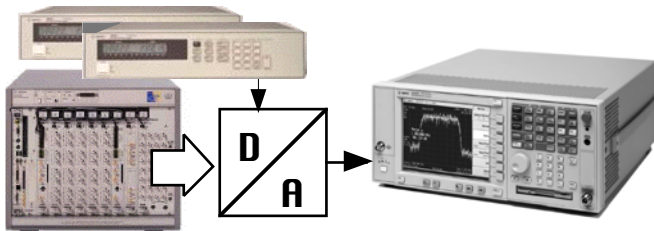
Used to extract linearity (differential an integral). The pattern generator send a digital ramp signal to DUT and synchronize measurement device.

Pseudo-Static Measurements



It concerns settling or rising time, and in fact a full range of timing results.

Dynamic Measurements



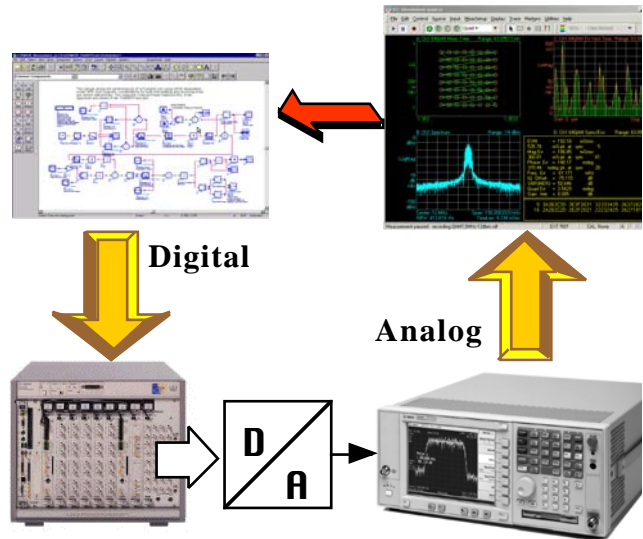
Using a Performance Spectrum Analyzer enables to get THD, SFDR and Noise results.

Advanced Design with ADS

Agilent EEsoft ADS with ATTDAC enables designer to evaluate DAC in the final application and may be a key to improve ratio performance versus function cost. ADS generate the “real-world” stimuli from final

application to download in the ATTDAC pattern generator. ATTDAC exercise the DUT and return measurements to ADS. From this point ADS can use measured results in a complete simulation.

As an example, DAC -real- impact on BER



performance when using normalized digital modulation may be conducted in few seconds.

Agilent Equipment used in ATTADC

- Pattern Generator 81200
 - Clock Module E4805A (1 kHz-670 MHz)
 - Gen. Module E4832A (2 Mbit/channel)
 - Front End E4838A (670 Mhz, 3.5 Vpp)
- DC Power Supply 6633B
 - 100W output, Current measurement in μ A range
- Multimeter 3458A
 - 8.5 digits, up to 100,000 readings/sec, 8ppm/year
- Scope 54846B
 - 4 Ch, 2.25 GHz, 8GSa/s
- Spectrum E4443A
 - 3 Hz-6.7 GHz Frequency range, 1 Hz-8 MHz RBW,
 - 0-70 dB Attenuation in 2 dB steps
- Interface & s/w Library
 - PCI/GPIB 82350B
 - LAN/GPIB E5810A
 - SICL/Win E2094L



BOURBAKY

BP 36 - 13, Rue des Alpes
F-07302 TOURNON Cedex

www.bourbaky.com

info@bourbaky.com

Tel +33 4 75 07 81 20

Fax +33 4 75 07 29 74



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