



# BOURBAKY

TEST & MESURE



**ST Microelectronics**, one of the major semiconductor manufacturer for wireless and multimedia components has worked with **BOURBAKY** an **Agilent Channel Partner**, to design test system able to characterize fast interfaces.



## Advanced Test Tool for Critical Timing Characterization

New multimedia application processors provide high performances with dedicated on-chip imaging and graphics processors. Such chip enable smart phones, mobile multimedia devices, internet access products, and car entertainment systems to play broadcasted media content, record images and video clips, and perform bidirectional audio-visual communication with other systems in real time. A lot of interfaces are embedded for camera, color LCD display, TV output, Flash-card, USB, FireDA, DDR SDRAM, ...

BOURBAKY provided a complete test bench able to characterize integrated interfaces and delivered complete solution for the DDR controller one. Timing specifications for DDR interface are beyond capabilities of conventional testors. Much more, usage of adjustable delay locked loop (DLL) to drive DDR memory devices make delicate the characterization process. Using high end equipment and innovative design this test bench is able to control device under test (DUT) and deliver highly accurate ( $\ll 100$  ps) DDR memory simulation signals over full specification range, as well as measure DUT issued signals within a few tens of picoseconds. Such capabilities and accuracy range are beyond any other today available test system.

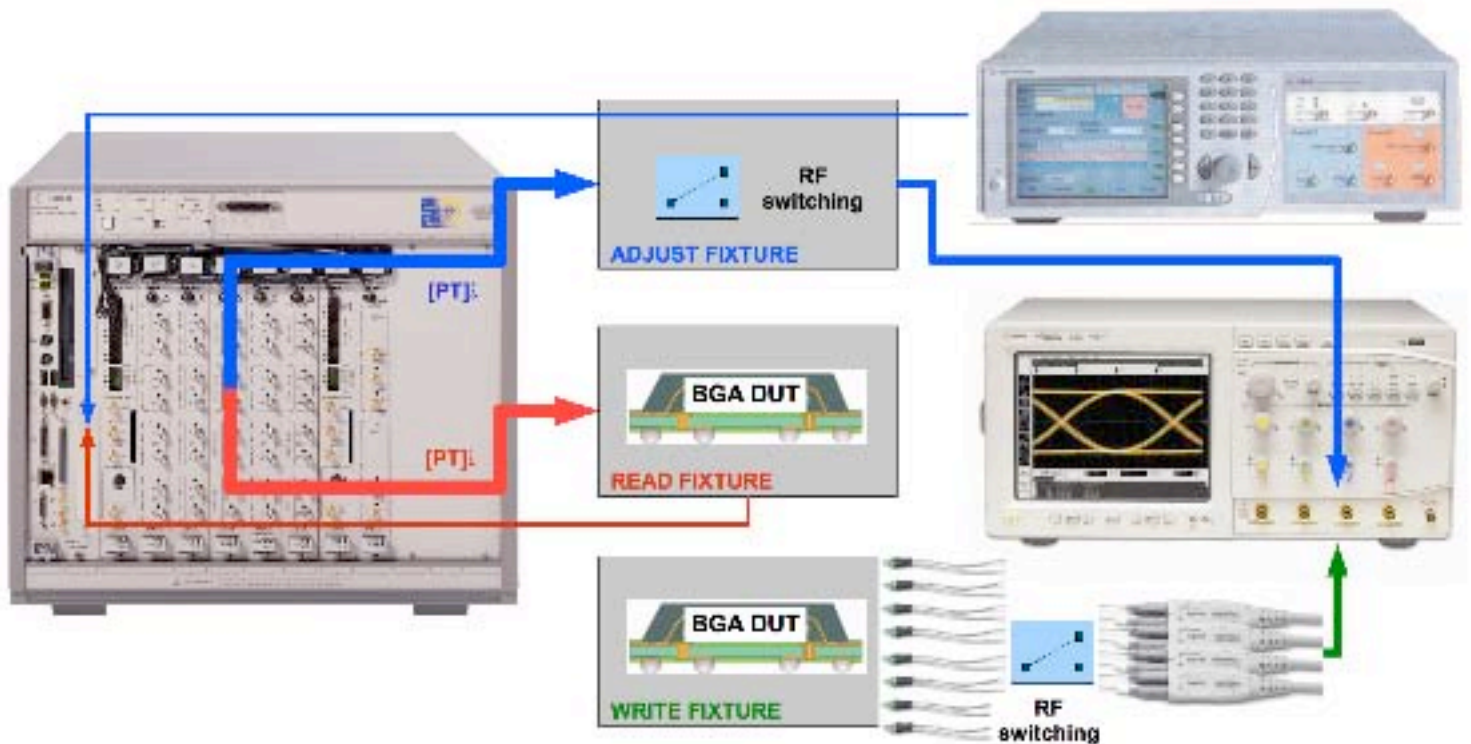
Aside unique timing accuracy; measurement sequencing enables execution of automated Test Plan for complete suite of characterization including sweep and Shmoo capabilities.



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# DDR Controller Characterization Basic Synoptic



Timing high accuracy is achieved as well in analyze mode of DUT generated sequences as in tester generated sequences on buses.

For analyze on [write fixture](#), knowing test board propagation times and using high end probing equipment on DSO enables high accuracy. Several Agilent E2679A probe heads may be multiplexed to one 1132A probe amplifier in order to get fully automated measurements.



Adjust Fixture

For generated burst, a calibrated [adjust fixture](#) (knowing each [PT](#) propagation time) is used to adjust pattern de-skew against [PT](#) [read fixture](#). With such adjustment, timing uncertainty at DUT BGA is in range of 50 ps maximum skew related to clock from DUT, (and even smaller in case of test system generated clock).

Test system uses an *ARM RealView ICE* to control DUT through JTAG interface and enables synchronization between measurement and specific downloaded code to get complete test sequences automatization.



## Equipment used

- Pulse Generator:** Agilent 81134A
- Pattern Generator:** Agilent 81200 VXI system  
E4805B/E4832A-E4838A
- Scope:** Agilent DSO 80404B  
1132A InfiniiMax probes
- Logic Analyzer:** Agilent 16903A, 16760A,  
E5406A SoftTouch
- Power Supplies:** Agilent 6611C
- Switching:** 87106A
- Auxiliary Control:** Agilent 34980A with  
34946A/34947A/34950A



## **BOURBAKY**

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