



## **Winslow Adaptics test to the extreme!**

Since the early 90's Winslow Adaptics have been using innovative design techniques and methodologies to help their customer solve the problems they have encountered caused by component obsolescence. These solutions have become increasingly more complex, and the designs more cutting edge, as the customer designs and the technology of the components being used to solve the problems have evolved with time. However, more recently, we find ourselves using this expertise in the design of test adapters to support the work of companies involved in obsolescence mitigation.

The design and manufacturer of test adapters has always been within the main core of the Winslow Adaptics business but the complexity now being encountered has moved this specialist subject from simple designs to designs which are now more complex than the obsolescence solution itself.

Three main reasons have caused this requirement for the high tech, test adapter: the need to develop the obsolescence solution in conjunction with the actual circuitry of the original design, the ever increasing need to test those devices acquired from less secure sources prior to assembly on finished product and finally more stringent regression testing of the final obsolescence solution.

### **Incorporating JTAG**

More and more obsolescence solutions are using CLPDs and FPGAs to replace the unavailable original designs, especially where these devices were ASICs. To assist these solutions the test adapters are used during two phases of the design. Initially, during the software design, associated with the development of the solution, where the adapter must accommodate the device to be used and provide a connection to the host system. Later this adapter must then be able to interface with the target board, accommodate the device and its associated boot chip, provide monitoring points for a logic analyser, and finally communications with the development host usually by a JTAG interface.

The above does not usually present too many problems but when the target board has to be used within its physical environment this introduces space, especially height constraints and as a result innovation is most certainly the order of the day. A recent multi-national project requiring such an adapter ended up using interface components only used in the manufacture of the latest generation of mobile phones.

### **Counterfeit component testing**

Much has been written and reported on the increasing occurrences of counterfeit components, these days not only confined to high value devices. It now seems that if there is someone out there looking for a component then there is someone else with a printing set marking up dummy devices with, of course, the associated paperwork. Testing by a third party test house can filter out most of the rogue devices but instances have been found where even this process falls short and the only secure method is to test the components on the target board and within the enclosed target environment. To enable this, the adapter must be able to solder down onto the target board and socket the device under test. To enable the target board to then be re-introduced into its overall environment and operated across its full functionality and operating conditions places near impossible design constraints on the design of the adapter. The use of latest generation board interfaces and device to board membranes have been able to produce final solutions whose size is no greater than the device courtyard and a height of 10mm.

The regression testing of product which has been subject to obsolescence mitigation is becoming more and more important especially as the technology of the components used to solve the problems are far removed from the originals used in design. Slowing down devices is not as easy as it sounds and can introduce a number of timing issues which can only be seen under real operating conditions. The other problem which can only be solved by full regression testing is the lack of design documents to today's standards meaning that the only way to ensure that the replacement design will operate correctly under all conditions is to carry out full regression testing. Test adapters for this purpose tend to fall between design support units and those used for counterfeit testing, depending on how the testing is to be carried out and what problems need to be investigated along the way.

Much has changed from the days when to test a device all that was needed was signal isolation of all connections and the ability to attach each line to either ground or Vcc. Today's test adapters are probably more sophisticated than the solution they are trying to test and target board they are to be used on.

Winslow Adaptics have followed this design progression and now offer a range of products and solutions which match twenty first century technology as well as those of yesteryear.

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