Testing and Diagnosing PDA/SmartPhone Boards

The MicroMaster processor board test solutions from International Test Technologies can be used to test all types of CPU-based boards. This application brief shows how the solution can be configured to test a PDA/SmartPhone.

The tester is driven by an external PC, and consists of a CPU emulator, which takes control of the UUT's processor. Once in control, test programs and diagnostics can be directed and sequenced under the control of the host PC. Additionally an I/O emulator is available, which provides the facilities to stimulate and/or measure activity on the boards I/O connector. Using this top-down and bottom-up approach full testing can take place in seconds, rather than minutes

Figure 1 shows the components of the solution, and figure 2 shows an optional fixture, which can be used to automate the connection of UUT to the test instruments – ideal for high volume production test.

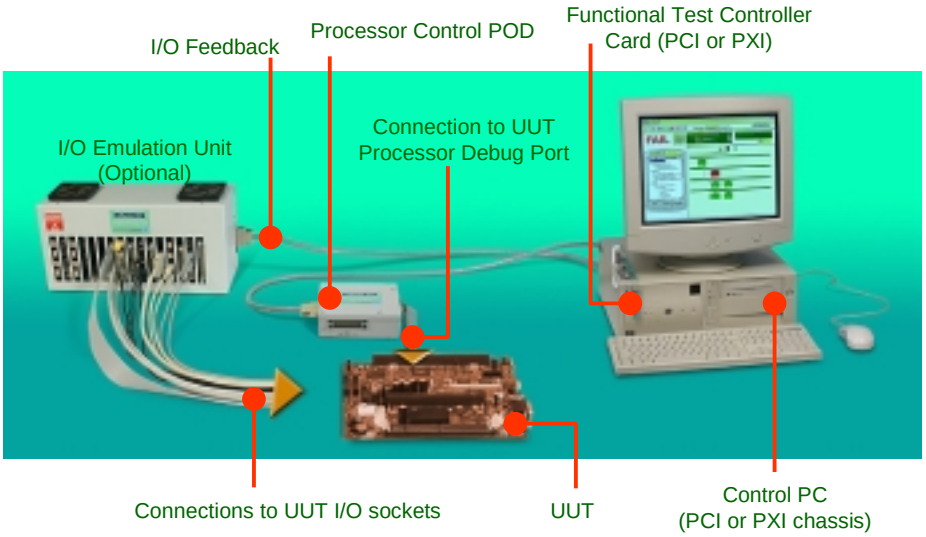

Fig. 1 – Test Solution Components

Fig. 2 – Fixture for Automated Connection

Figure 3 shows how the tester's hardware components are configured for an example PDA application, and the table overleaf shows the test sequence and program, which is run by the tester. Results returned are pass/fail, or pass/fail with full diagnostics to bus and component level.

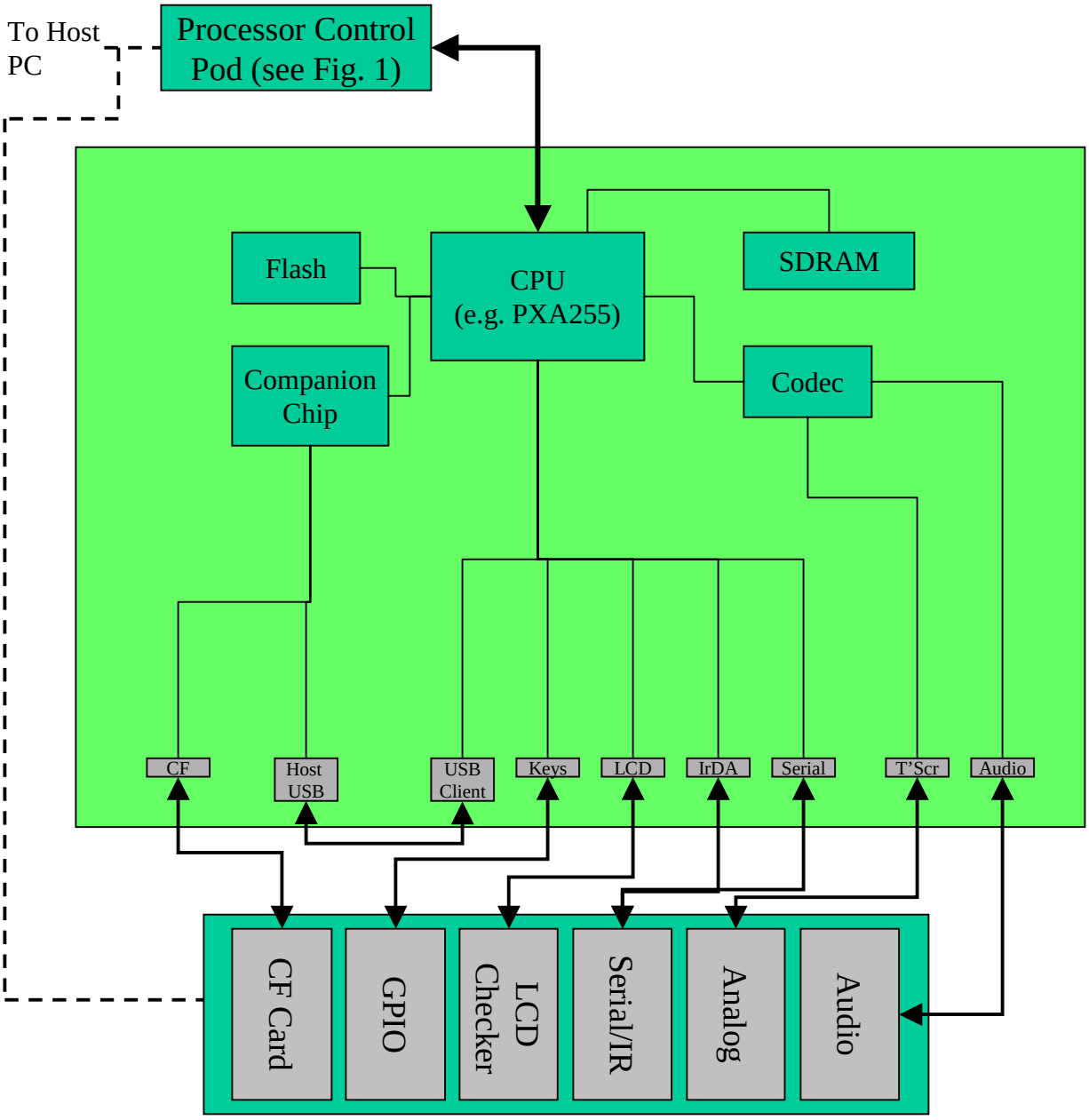

Fig. 3 – PDA Test

Test Sequence and Coverage

Test Name	Test Sequence	What it Tests
Power	1. Power on UUT 2. Check key voltages using analog test card.	1. Soft on/off circuitry OK? 2. Key voltages within range?
CPU	1. CPU ID Check 2. CPU BIST Check 3. Take control of CPU	1. JTAG OK? 2. CPU OK? 3. CPU infrastructure OK?
General Bus	Boot ROM Bus Test	Verifies all buses from CPU to boot flash
Flash Test	1. ID Check 2. CRC Check	1. Verifies access to flash from CPU. 2. Verifies flash and flash contents
SDRAM	1. Memory controller register test. 2. Configure memory controller. 3. Memory test for opens, stucks and shorts to all buses. 4. Optional test for all memory cells.	1. Verifies access and operation of CPU memory controller. 2. Verifies all buses from CPU to SDRAM. 3. Verifies that all SDRAM cells are operational.
Companion Chip	1. Register Test 2. Configure for normal operation	1. Verifies communications and buses from CPU to Companion Chip 2. Verifies Companion Chip registers.
Audio	1. Register Test to CPU audio digital controller. 2. Configure for normal operation 3. Audio Codec register test 4. Configure codec for normal operation 5. Audio generation and measurement test using ITT audio card.	1. Verifies CPU audio function access and operation. 2. Verifies communications to Codec. 3. Verifies codec and all audio channels for generation or measurements.
TouchScreen	1. Pen up/down 2. Pen X,Y position	1. Verifies X+, X-, Y+, and Y- voltages from touch-screen using ITT analog card.
CompactFlash (CF)	1. ID Check 2. Read/write test	1. Verifies communications and buses between companion chip and CF device.

Test Sequence and Coverage (continued)

Test Name	Test Sequence	What it Tests
Host/Client USB	1. Register test USB host 2. Register test USB client 3. Configure USB host and client for normal operation. 4. Loopback test from host to client.	1. Communications to host and client controllers from CPU. 2. USB client port 3. USB host port
Keys	1. Key up/down check using ITT digital I/O card to simulate key presses	1. Operation of keypad port.
IrDA	1. Register test 2. Configure for normal operation 3. Loopback test using ITT IrDA emulator card.	1. Operation of CPU IrDA function. 2. Operation of IrDA port and transceiver.
Serial	1. Register test 2. Configure for normal operation 3. Loopback test using ITT serial emulator card.	1. Operation of CPU serial function. 2. Operation of serial port
LCD	1. Reset and run UUT 2. Get operator to verify screen or use ITT LCD checker card	1. UUT boot OK 2. LCD port OK

For more information contact:

International Test Technologies

Tel – +353-74-9188100

Email – sales@intertesttech.com

Web – www.intertesttech.com