HP 5370 Processor Board – Test Procedure

2013-12-07
Use with PCB V3.1 10/25/2013

Summary:

Each trace on the board will be tested for opens and shorts with errors displayed using four LEDs on the attached BeagleBone single-board-computer (top component in Figure 1 below). The BeagleBone runs the Linux operating system and it is important to let the test finish, and Linux shutdown, before removing power. This is described in the steps below.

Procedure:

1. Figure 1 shows the BeagleBone and the two blue edge connectors that will attach to the board-under-test. The right edge connector carries +5V DC from an AC power module that should be compatible with China AC power outlets.
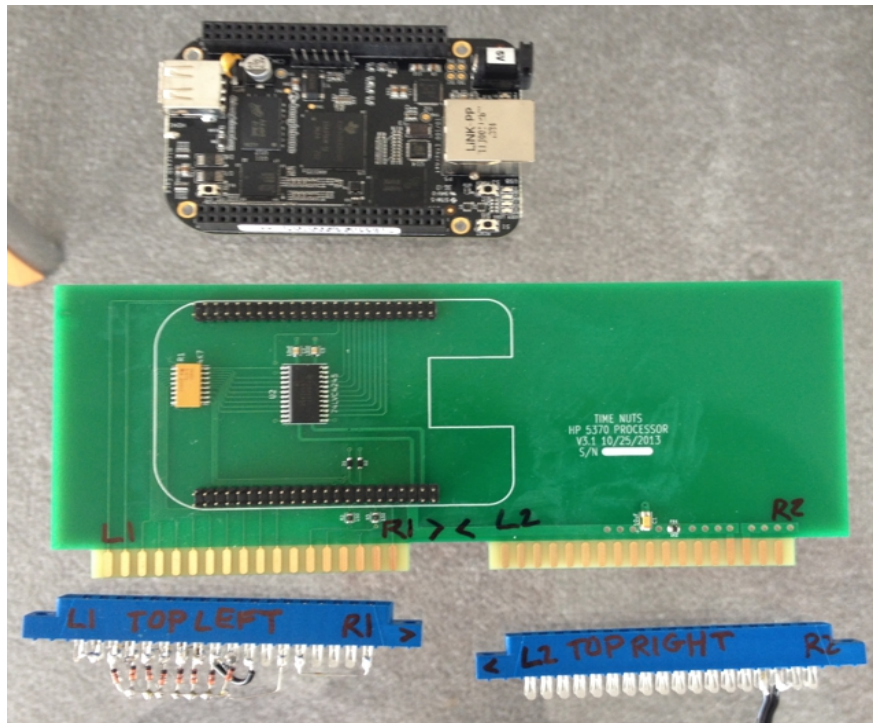

Figure 1: Test fixture components

2. Attach the BeagleBone and the two blue edge connector to the board-under-test as shown in Figure two. It is **very important** to attach the BeagleBone and the blue edge connectors with the proper orientation as the connectors are not polarized.
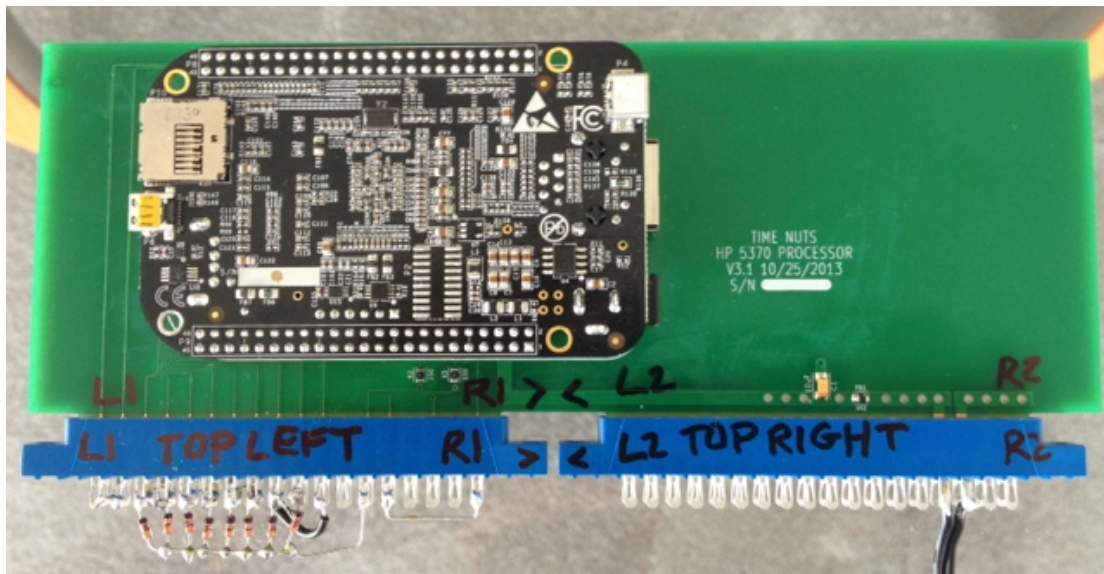
Figure 2: Assembled test fixture

3. Apply AC power. As shown in Figure 3 below the power LED will light. The status LEDs will then light and flash as Linux boots on the BeagleBone.
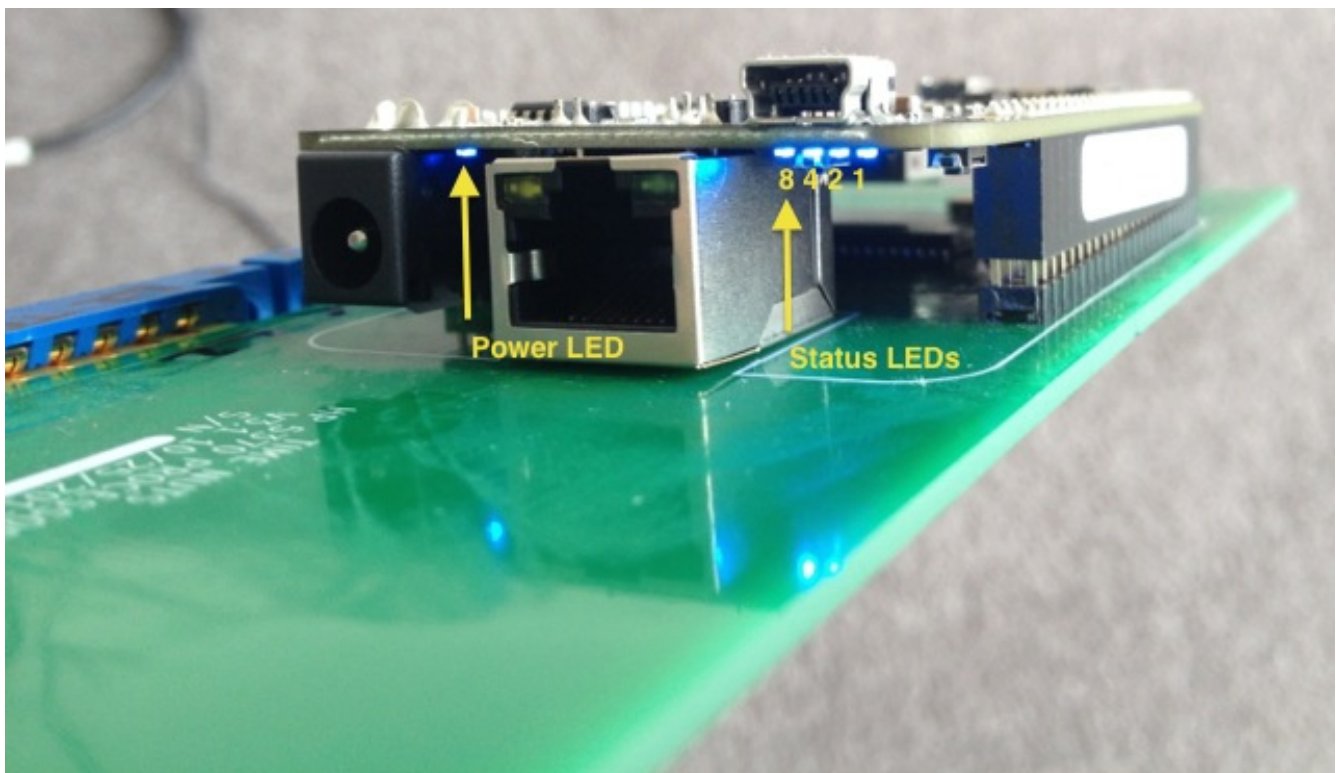

Figure 3: LED locations

4. After about 30 seconds the "testing" LED pattern shown in Figure 4 will begin. If there are no errors found the LEDs will light in this back-and-forth pattern ten times. After the LEDs have turned off wait 15 seconds. Then it is safe to remove AC power and disconnect. The board has passed testing.

5. If there is an error one of the patterns in Figure 5 will flash ten times. After that the LEDs are turned off and it is safe to disconnect after 15 seconds. Note that the 8-4-2-1 orientation of the LEDs matches what is shown in Figure 3.
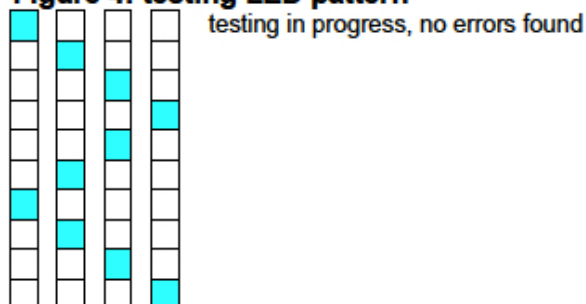
Figure 4: testing LED pattern

testing in progress, no errors found

Figure 5: error LED pattern

8	4	2	1	LED location from Figure 3
□	□	□	■	open or shorted: LRST and LNMI; check: NMI_N, D2, R1, R3
□	□	■	□	open or shorted: LVMA and CLK
□	□	■	■	open or shorted: LA6 and LR_W
□	■	□	□	open or shorted: LA0 and LA1
□	■	□	■	open or shorted: LA2 and LA3
□	■	■	□	open or shorted: LA4 and LA5
□	■	■	■	open or shorted: LIRQ; also check: IRQ_N, D1, R1, R2, U2
■	□	□	□	open or shorted: D0_N, LD0 and LIRQ; also check: U2, DIR, OE_N, R1
■	□	□	■	open or shorted: D1_N, LD1 and LIRQ; also check: U2, DIR, OE_N, R1
■	□	■	□	open or shorted: D2_N, LD2 and LIRQ; also check: U2, DIR, OE_N, R1
■	□	■	■	open or shorted: D3_N, LD3 and LIRQ; also check: U2, DIR, OE_N, R1
■	■	□	□	open or shorted: D4_N, LD4 and LIRQ; also check: U2, DIR, OE_N, R1
■	■	□	■	open or shorted: D5_N, LD5 and LIRQ; also check: U2, DIR, OE_N, R1
■	■	■	□	open or shorted: D6_N, LD6 and LIRQ; also check: U2, DIR, OE_N, R1
■	■	■	■	open or shorted: D7_N, LD7 and LIRQ; also check: U2, DIR, OE_N, R1

6. In Figure 5 the signal names shown (e.g. LIRQ) are the same as in the schematic. Figure 6 below shows how the edge connectors are wired. For example LA0 and LA1 are wired together so LA0 can be set to a one or zero and the value read back on LA1 to test that those two traces are connected together and not shorted to +5V or ground. Also the other traces are checked to see if LA0 or LA1 are shorted to them.
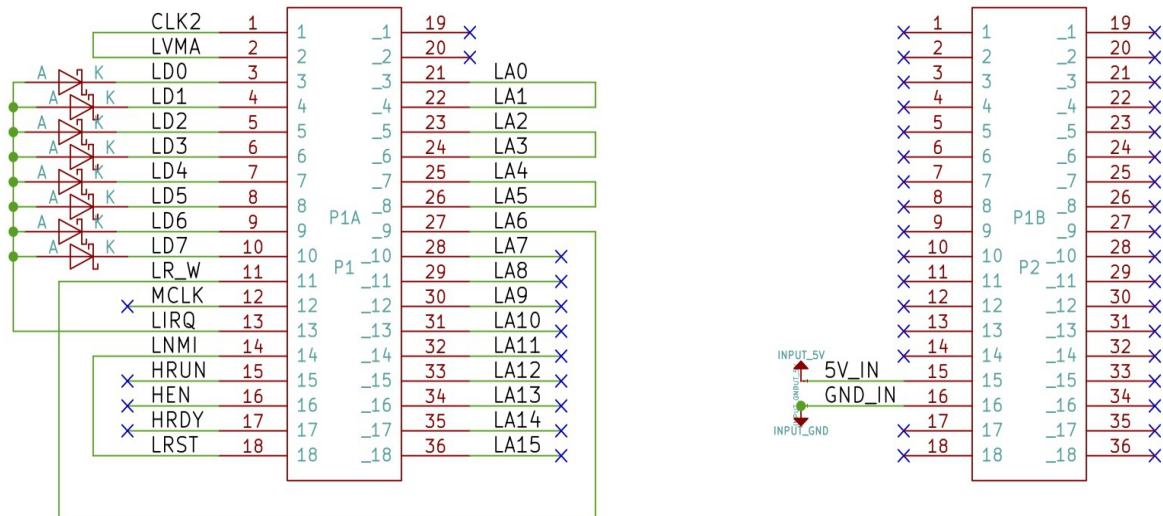

Figure 6: Edge connector schematic

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