Electrical Test of HDI
With HP Logic Analysis System
(J:\glast\documents\Electrical Test Procedure.doc)

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In each step of this test, a certain result is expected. **The expected results are underlined** in the description below. If you find a result other than expected, stop the test immediately and report it to one of the GLAST staffs.

1. Setup

1.1 Turn on a logic analysis system HP16550A or HP16510A, a power supply HP662x, a power supply Kenwood PWR18-1.8Q, an HV source Keithley 237 (or equivalent instrument).
1.2 Wear wrist strap to avoid electrostatic discharge to HDI.
1.3 Connect an HV output of Keithley to a LEMO connector on the interface board.
1.4 Invoke "electronicsTest.vi" and run it.
(The program resides J:\glastlab\labview\detectorTest\electronicsTest.vi)
1.5 Wait until the logic analyzer is initialized and you see "Ready" in a message field of the window of electronicsTest.
1.6 Connect a cable (with a Nanonics connector) attached to the interface board to the left side connector of the HDI to be tested.

2. Power on Electronics

2.1 Supply powers to HDI by typing "RCL", "1", then "Enter" on HP662x.
2.2 Supply powers to the interface board by pressing "Output" on PWR18-1.8Q.
2.3 Read voltages and currents. **The voltages and currents must be as listed in a table below.** Write down currents on HDI log book if you test it before a burn-in test.

	Power Supply	Voltage	Current (mA)
DVDD	HP662x channel 1	3.0	16.0 – 18.0
AVDD2	HP662x channel 2	2.0	35.0 – 37.0
AVDD	HP662x channel 3	5.0	– 27.0

3 HV bias circuit check

You should do a test in this section only when you test HDI after the HDI is bonded to a Kapton sheet on a tray and after the HDI is bent down. Otherwise, skip this section.
3.1 Set the Keithley HV source to 10V.
3.2 Turn on an operation of the Keithley HV source to output the voltage.
3.3 Read the current on the display. **It must be less than 100 nA.**
3.4 Measure voltage on bias electrodes on a Kapton sheet with DVM. You should measure it at least one electrode for each ladder with a protective cover on. Use a special probe to touch an electrode, which has a banana terminal on one end and a

wire-wrap wire wrapped on a wooden stick on the other end. Carefully put the stick into a gap between the tray and the cover**. <u>You should see about 9.7 V or above on all the electrodes you touch.</u>**

3.5 Remove the special probe and stay away from the tray.

3.6 Raise an output voltage to 20 V and read the current. **<u>It must be less than 100 nA.</u>**

3.7 Repeat the previous step up to 100 V. You should read the current every 10 V step. **<u>The current must be less than 100 nA at 100 V.</u>**

3.8 Lower the voltage to 0 V.

3.9 Turn off an operation of the Keighley HV source.

4 Electrical Test of HDI with Logic Analyzer

4.1 Specify a template file by pushing "Template File" button on the window of electronicsTest.vi. The file is in "J:\glastlab\tests\hdi_qa\testPattern".

To test it from the left side: Use "alltest_tplL.txt" as a template.

To test it from the right side: Use "alltest_tplR.txt" as a template.

4.2 Specify an output file name and a log file name by pushing "Output File" button and "Log File" button, respectively. The file names should be as in a table below. Use "R" instead of "L" in front of ".txt" when you test HDI from the right side. Select a directory "J:\glastlab\tests\hdi_qa\hdiXX", where XX is an HDI ID.

You are testing HDI…	Output File Name	Log File Name
before burn-in test	PreBurnIn_outL.txt	PreBurnIn_logL.txt
before potting HDI	BeforePot_outL.txt	BeforePot_logL.txt
after bending down HDI	AfterBend_outL.txt	AfterBend_logL.txt
before stacking a tray	BeforeStack_outL.txt	BeforeStack_logL.txt

4.3 Type in GTRC address into "GTRC address" field on the window. The GTRC address is written on an HDI data sheet.

4.4 Choose "left" or "right" of "Readout direction" field of the window depending on which side of HDI you connect the cable.

4.5 Press "Run" button on the window. It takes about 5 minutes to test it.

4.6 Once you see "Ready" in a message field of the window, the test is over. You should check three check boxes to the right of "Run" button. **<u>All of the three boxes must show a green check mark.</u>** If you see one red cross mark or more, you should open the log file to diagnose it (or ask Masa to diagnose it if you are not familiar with it).

4.7 Disable outputs of Kenwood PWR18-1.8Q by pushing "Output" button.

4.8 Disable outputs of HP 662x by pressing "RCL", "0", and "Enter" in this order.

4.9 Disconnect the cable with the Nanonics connector from HDI you have tested.

5 Test the right side of HDI

5.1 Connect the cable to the right side connector of the HDI.

5.2 Repeat section 2 through 4.

5.3 Update the database. Update the HDI database after a pre-burn-in test, and the tray database after other tests.