

To: Trey German and Advisors

From: Team 04

Date: 1/20/2015

Subject: System Level Test Plans

The system level tests we want to perform deal with the main functionality of the device. We want to make sure the user is able to input a signal we can say the device can measure, and measure it properly. The main limitation of many of these requirements come in the Analog Front End so it will be the main focus of our tests.

Requirements 1 and 3

Interaction	ID	Actors	Requirement
Inputted Signal	BBDI-1	Probes, Signal	The inputted signal must be between +15V and – 15V

Here we want to test if the device can take in a +15V to -15 V signal. The first part of this test is to ensure we can get the +/- 1.5V signal from the probes. So we can mix this test with the test for requirement BBDI-3.

Inputted Signal	BBDI-3	Probes, Signal	The signal must be able to be attenuated by 10 through the probes. (10x Probes)
-----------------	--------	----------------	---

So to test this requirement we first need a BNC connector to discrete wire converter so we can measure the output of the probes. We also need a function generator to put in a +/- 15 V sin wave into the probes. Finally we need an oscilloscope to measure the output.

First step is to connect the probes to signal, BNC connector to probes, and then the discrete wires to the oscilloscope. On the scope we want to see an attenuated sin wave that is +/- 1.5 with minimal/no phase shift. This is to be done using a square wave, saw tooth wave, and a sin wave. Also up to 7 MHz to make sure that it works continuously over this range. We want to see no change in output over this frequency range.

Once BBDI-3 is confirmed we want to continue to BBDI-1. We want to connect the discrete wires to the input of the front end. Then we want to set the front end to the smallest possible gain and measure output of the front end. We again want to see minimal phase shift, and amplitude differences. Here the scope is measuring the output across the differential pins. This should be done at a low frequency like 100 kHz.

Requirement 2

Inputted Signal	BBDI-2	Probes, Signal	The inputted signal must be below 7 MHz to be properly sampled and measured.
-----------------	--------	----------------	--

Next we want to test requirement BBDI-2 to test the frequency response of the circuit. We are going to keep the same setup as before. This time we also want to connect a spectrum analyzer to the output across the differential output pins also.

Here we are going to sweep across DC to 7MHz ensuring that the power level of the output never goes below -3dB so that the cutoff frequency is past the range of operation. Not only this we want to see if any harmonics are generated and how much. So over this frequency sweep we need to look at the spectrum analyzer and make sure the THD is below -10dB.

