SOLID 32CH ampl brdtest procedure

Table of Contents

version history

version 0.1 initial proposal

Last saved date : 20 Jan 2017 14:08:16

introduction

One of the boards of the first production batch should be checked careful by an expert to see that it is 100 % correct. So this action should spot eventual wrong resistor values and eventual wrong capacitors in the signal path. It is harder to spot wrong decoupling capacitor values.
This board will be used to generate the acceptance values for the measurements below. Or min / max values for simple measurement or templates for pulse responses.
For new batches the DC output values and the VCOM should be measured for one board to spot wrong resistor values as this is not so easy to spot in the procedure below .

The test procedure below should identify none conformities of the production. So mainly bad soldering , shorts , open connections .

general remarks

The DUT is powered via the test board. (TBRD)

Power for the TBRD : + 7 V ~ 1 A , - 4 V ~ 1 A

All measurements should be stored .

Procedure

Start-up :

The startup procedure should give an first indication that all active components are correctly working.

- power connector connected to amplifier board.
- connect the IO line for activating the power of the DUT .
- activate the power for the DUT
- software check current if current is
  The power current should give a good indication if all amplifiers are soldered correctly.
  - > 130 % of expected , switch off power , stop measurement
  - current < 90 % , 110 % < 130% (10 % tolerance accepted)
    check with multimeter output levels , stop measurement
- connect I2C to amplifier board
- read the temperature of the temperature probe and write and read an ee-prom page . This should confirm the correct working of the I2C lines and the temperature IC.
- connect 75V to bias connector of the amplifier board
  This test should confirm the correct working of the bias circuit (and bias DAC)
  - with multimeter : check HVin in store the result
  - set 5 values for the bias and check HV bias with multimeter .store the result
- Remove HV
- Program addresses trim DAC's
  - connect the LDA lines to the corresponding test holes
  - set 10 values for each DAC output and measure (via processor)
    This test should confirm the correct working of the trim DAC's
- Remove I2C
- power off

Signal response measurement

connect amplifier board(connected to the TBRD) to ADC board (64 chan)

- activate the power to the DUT
- set the power cntrl line of the DUT via the ADC board

- check I2C functionality
  This test should conform the full functionality of the I2C lines and communication with the devices.
  - check one value for the bias
  - check one value for the trim DAC's
  - check the temperature and read the ee-prom
- check the pedestal and rms accept 90 -- 110%
  This should spot wrong connection in the offset circuit and / or Vcom etc. Not clear if all these are covered with this test.
- check signal response
  These test should confirm (much as can be detected) that all coupling capacitors are correctly soldered and that the signal resistors and capacitors are correct.
  - sine differential 100K 500 K , 1 M , 2 M, 4 . 8 14 MHz xmV for group 1 then for group 2
    - check signal for group 1 (in respect to template)
    - check signal for group 2 (cross talk)
  - Step function (input is saw waveform , need triggered software)
    - different amplitudes
      - check pulse response (need template for different amplitudes
  - common mode 100K 500 K , 1 M , 2 M 4 , 8 14 MHz for group 1 then for group 2
    This should spot mismatches for the components in the signal path
  - Power supply rejection 100K 500 K , 1 M , 2 M, 4 . 8 14 MHz
    This eventual can spot bad decoupling capacitors .

power off

Not covered by these tests :

- de-coupling capacitors of the I2C devices. Not clear if this can be tested at all.

fix ID

In case test passed :

- remove from ADC board
- power the board
- connect I2C , set ee-prom values (serial nr etc)
- power off the board for 10 s
- power the board
- read back ee-prom check if ok

- power off the board
- connect the lock lines
- power the board
- lock the ee-prom
- power off the board
- power the board
- read back the ee-prom
- write 0 to ee-prom
- read back ee-prom (check not 0)

done ..