	Quality assurance of the SCT barrel hybrid fabrication		
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DRAFT

Quality assurance of the SCT barrel hybrid fabrication

abstract

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Distribution List

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History of Changes			
Rev. No.	*Date*	*Pages*	*Description of changes*
A	dd/mm/yy	All	First version

Table of Contents

How to make Table of Contents (TOC) in the FrameMaker:

1. High-light the section title to include

2. From the menu, click "Special" > "Marker"

3. In the pop-up window, select "Cross-Ref", and click "Marker"

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5. From the menu, click "File" > "Generate"

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8. If the paragraph format is not appropriate, edit the preference page of xxx.TOC from the menu, "View" > "Preference page", and the last page in the preference page

1   Cu/Polyimide Flex circuits

1.1   Visual inspection by vendor

Aim: check all flex circutis for the defects

Procedure: Visual inspection is performed either by unassisted eye or with a magnifying device such as microscope or magnifying glass. Where not specifically instructed, the inspection is normally performed by unassisted eye.

Acceptance: as defined in the document [xx]

1.2   Specimen tests by vendor

Aim: check of the electrical, mechanical, physical, environmental, and chemical characteristics

Procedure: performed by specimen per process lot (the size of lot to be clarified) as specified below

Acceptance: as defined in the document [xx]

1.3   Integrity test of lines by vendor

Aim: Check electrical continuity and neighbour short of all lines of all flex circuits

Procedure: Check by probing

Acceptance: No discontinuity, no neighbour short

1.4   Resistance of lines and planes

Aim: In order to test the etching process of circuit, measure the resistance of lines and planes by sampling per lot.

Procedure: measure the resistance of long lines, such as clock, and planes of Vcc, Vdd and ground by using a digital multimeter (DMM) sensitive to less than 1 mΩ. Resistance is measeured from a connector pad to the far end side.

Acceptance:

For line   < 200 mΩ ?

For Vcc   < 100   ?

For Vdd   < 100   ?

For ground <   50   ?

2   Cu/Polyimide/Cabon-bridge hybrid

2.1   Resistance of planes

Aim: In order to test an adhesion process of circuit and CC-bridge, we measure the resistance of planes of reinforced flex circuit.

Procedure: Same as 1-2)

Acceptance:

For ground <   20 mOhm ?

3 Passive-component-stuffed hybrids

(Complete hybrid w/o readout ICs)

3.1 Heat cycle of 10 sets of from -20 to 20 degree.

Aim: Check correspondence between the resistance of thermisters and temperature

Procedure: We monitor the resistance of thermisters and the temperature.

Acceptance: Correspondence < 10% ?

3.2 Resistance of lines

Aim: In order to test an soldering process of components, we measure the resistance of 2 set of clock, command and thermister lines

Procedure: Same as 1-2)

Acceptance:

For clock and command lines = 1 kOhm (1%) ?

For thermister lines = ? kOhm (?%) at 25 degree

3.3 Capacitance of planes

Aim: In order to test an soldering process of components, we measure the capacitance of Vcc-ground and Vdd-ground.

Procedure: We measure the capacitance of planes by using LCR meter at low frequency.

Acceptance:

For Vcc-ground > 1 microF ?

For Vdd-ground > 1 microF ?

4 ASIC-stuffed hybrids

4.1 Current of Vcc and Vdd

Aim: Check Vcc and Vdd current.

Procedure:

Acceptance:

Icc < 1A ?

Idd < 1A ?

4.2 Heat cycle of 10 sets of from -20 to 20 degree

with turnning on electricity.

4.3   Current of Vcc and Vdd

Aim: Check Vcc and Vdd current.

Procedure:

Acceptance:

Icc < 1A ?

Idd < 1A ?

*** stream delay

*** strobe delay

4.4   Data run 1 (Quick Scan < 5 min.)

Aim: Detect dead channels

Procedure: In order to detect dead channels quickly, we carry on the following data run,

   No trim. Comp=any Edge=Off

   Qin=2 fC

   only 2 points threshold scan, Vth=0 and 400 mV.

Acceptance:

Live channel means 100% Eff at Vth=0 mV and 0% at 400 mV.

Yeild of live channles > ? %

4.5   Data run 2 (Quick Scan < 5 min.)

Aim: Repeat test 4-1) using another clock and command lines.

Procedure: same as 4-1)

Acceptance: same as 4-1)

4.6   Data run 3 (Quick Scan < ? min.)

Aim: Check all token bypass lines

Procedure: In order to check all token bypass lines, we carry on the quick scan with masking readout IC one by one.

Acceptance: same as 4-1)

4.7   Data run 4 (Trim Sacn < 1 hour)

Aim: Set TrimDAC

Procedure: In order to detect channels which are not able to trim, we carry on a trim scan.

We trim *** mV at ### fC.

Acceptance: Yeild of trimmed channles > ? %

4.8 Data run 5 (Qinjection Sacn < 5 min.)

Aim: Quick noise measurement

Procedure: In order to measure noise, we carry on Qinjection Sacn at *** mV thrshold and S-curve fitting.

Acceptance:

Good channles means that their noise are < ? fC.

Yeild of good channles > ? %

4.9 Data run 6 (Full Sacn < 3 hour.)

Aim: Check gain and noise

Procedure: In order to measure gain and noise, we carry on threshold scans with varying Qinjection.

Acceptance:

Good channles means that their noise are < ? fC and

that their gain are $$$ +- &&&.

Yeild of good channles > ? %

5 Compelete module

Applying to sensor with 150V, repaet test set of 4.

References

[1] Author(s), "Title", reference id, date