

Report: OKF7 electrical validation

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1 Electrical tests

1.1 Auxiliary board

Some parameters of the auxiliary board are measured (without any module connected).

- Consumption: 343 mA
- $V_{clp} = 2.28 \text{ V}$
- $V_{DD_D} = 3.35 \text{ V}$
- $V_{DD_A} = 3.35 \text{ V}$

1.2 AM03 smoke test

First smoke test done without changing the value of V_{clp} , V_{dd_D} of V_{dd_A} :

- POWER ON: 608 mA
- RESET: 42 mA
- ALL: 659 mA
- READ: 659 mA mA with 955 errors
- START: 1145 mA

Parameters of the auxiliary board measured after connecting the module:

	Voltages without module (V)	Adjusted voltages (V)
V_{clp}	2.28	2.15
V_{dd_D}	3.15	3.32
V_{dd_A}	3.24	3.35

2 Calibration

2.1 Oscilloscope output

The sensor number 2 was disconnected \Rightarrow only 5 sensors are working.

	Chip 1	Chip 2	Chip 3	Chip 4	Chip 5	Chip 6
REST/JTAG	OK	Disconnected	OK	OK	OK	OK
HEADER/TRAILER	OK	Disconnected	OK	OK	OK	OK
Pixels	Closed	Disconnected	OK	OK	OK	OK

2.2 DAQ calibration

2.2.1 Chip 6

Few pixels are stuck to 1 on the sub-matrix C.

- Estimation of the "middle points":

V_{ref2}	V_{ref1A}	V_{ref1B}	V_{ref1C}	V_{ref1D}
98	132	163	147	221

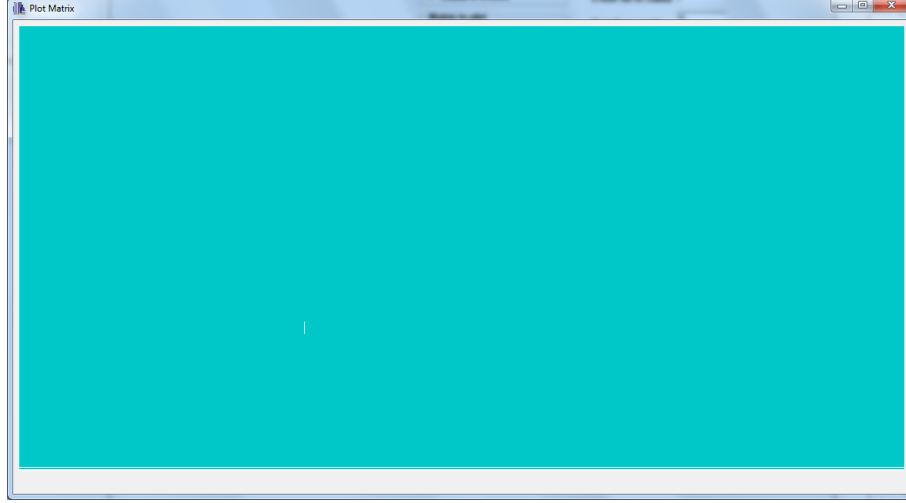


Figure 1: Discriminators output for thresholds set to 0. Few pixels on a column are always closed.

- Discriminators calibration:

V_{ref1A} START	V_{ref1B} START	V_{ref1C} START	V_{ref1D} START	V_{ref2}	V_{ref1A} STOP	Step	Event nb / step	Number of Runs
104	135	119	193	98	160	2	500	29

- Temporal noise, fixed pattern noise and offset:

Matrix	TN	FPN	Offset
A	1.023	0.574	0.412
B	0.963	0.276	0.715
C	1.052	0.501	0.524
D	1.056	0.479	0.457

- FHR:

2.2.2 Chip 5

Few pixels are stuck to 1 on the sub-matrix C.

- Estimation of the "middle points":

V_{ref2}	V_{ref1A}	V_{ref1B}	V_{ref1C}	V_{ref1D}
98	177	169	109	67

- Discriminators calibration:

V_{ref1A} START	V_{ref1B} START	V_{ref1C} START	V_{ref1D} START	V_{ref2}	V_{ref1A} STOP	Step	Event nb / step	Number of Runs
104	135	119	193	98	160	2	500	29

- Temporal noise, fixed pattern noise and offset:

Matrix	TN	FPN	Offset
A	0.939	0.369	0.314
B	0.993	0.264	0.679
C	1.010	0.385	0.407
D	1.051	0.340	0.825

2.2.3 Chip 4

- Estimation of the "middle points":

V_{ref2}	V_{ref1A}	V_{ref1B}	V_{ref1C}	V_{ref1D}
98	119	121	85	126

- Discriminators calibration:

V_{ref1A} START	V_{ref1B} START	V_{ref1C} START	V_{ref1D} START	V_{ref2}	V_{ref1A} STOP	Step	Event nb / step	Number of Runs
91	93	57	98	98	147	2	500	29

- Temporal noise, fixed pattern noise and offset:

Matrix	TN	FPN	Offset
A	0.961	0.386	0.463
B	0.945	0.235	0.513
C	1.027	0.488	0.590
D	1.947	0.362	0.703

2.2.4 Chip 3

- Estimation of the "middle points":

V_{ref2}	V_{ref1A}	V_{ref1B}	V_{ref1C}	V_{ref1D}
98	191	145	95	73

- Discriminators calibration:

V_{ref1A} START	V_{ref1B} START	V_{ref1C} START	V_{ref1D} START	V_{ref2}	V_{ref1A} STOP	Step	Event nb / step	Number of Runs
163	117	65	45	98	219	2	500	29

- Temporal noise, fixed pattern noise and offset:

Matrix	TN	FPN	Offset
A	0.987	0.450	-0.035
B	0.957	0.289	0.126
C	1.044	0.521	0.224
D	1.065	0.435	-0.006

2.2.5 2

The chip was disconnected from the flex.

2.2.6 1

The chip is still connected to the flex but is not working properly. In the JTAG files, the discriminators are set to 225.

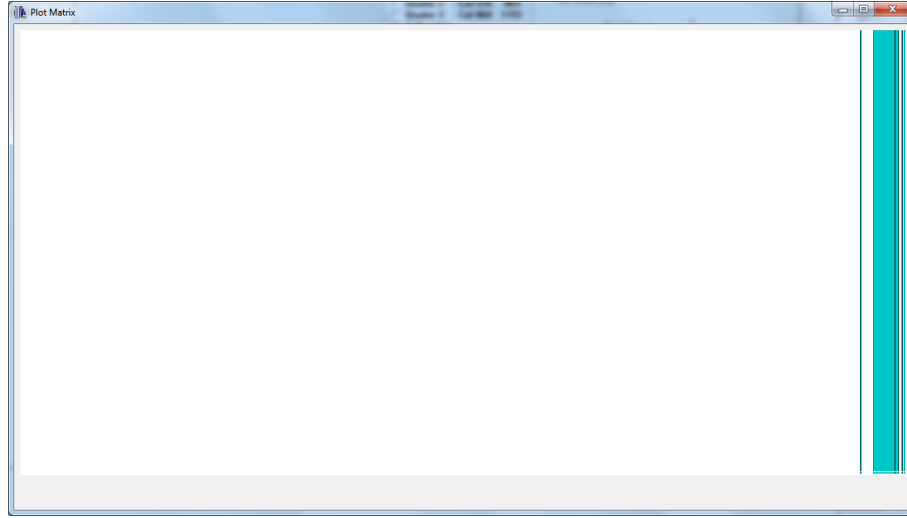


Figure 2: Discriminators output for thresholds set to 0. Almost all of the discriminators are always closed.

3 Fake Hit Rate