

Status Update at MPP - Module and ladder tests

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Phase 3 production batches:

L1	P3-1:	8
	P3-2:	8
	P3-3:	8
L2	P3-4:	18
	P3-5:	18
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	total	60

34 modules have been tested.

8 were identified as problematic.

6 of L2 were sorted out after probe card testing.

20 remaining for testing
(partially in kapton assembly state).

W02_IFx	W01_IB	W08_OF2	W03_OB1
W03_IFx	W02_IB	W09_OF1	W05_OB1
W05_IFx	W03_IB	W09_OF2x	W06_OB1
W08_IFx	W09_IBx	W11_OF1	W08_OB1
W32_IF	W32_IB	W11_OF2?	W08_OB2
W41_IF	W41_IB	W12_OF1	W09_OB1
W42_IF	W42_IB	W32_OF1	W09_OB2x
W43_IFx	W43_IB	W32_OF2	W12_OB1
W44_IF	W44_IB	W33_OF1	W12_OB2
W45_IF	W45_IB	W33_OF2	W32_OB2
W46_IF	W46_IB	W41_OF1	W33_OB1
W47_IF	W47_IB	W43_OF1	W42_OB1
		W44_OF1	W42_OB2
		W44_OF2	W44_OB1
		W45_OF1	W44_OB2
		W45_OF2	W45_OB2
		W46_OF1	W46_OB1
		W46_OF2	W46_OB2

MPP	HLL	Göttingen	Bonn	Failed on probe card	BEAST
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Phase 3 production batches:

L1	P3-1:	8
	P3-2:	8
	P3-3:	8
L2	P3-6:	5
	P3-4:	18
	P3-5:	18
	P3-7:	7
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	total	72

55 modules have been tested.

**about 17 remain for testing
(waiting for kapton attachment).**

IF	IB	OF	OB
W02_IFx?	W01_IB	W02_OF1	W03_OB1
W03_IFx	W02_IB	W03_OF2	W04_OB1
W04_IF	W03_IB	W04_OF1	W05_OB1
W05_IFx	W04_IB	W05_OF1	W06_OB1x
W08_IFx	W09_IBxr	W08_OF2	W08_OB1
W09_IF	W13_IB	W09_OF1xr	W08_OB2
W13_IF	W32_IB	W09_OF2x	W09_OB1r
W32_IF	W41_IB	W11_OF1	W09_OB2
W41_IF	W42_IB	W11_OF2x	W10_OB1
W42_IF	W43_IB	W12_OF1x	W12_OB1
W43_IFxr	W44_IB	W32_OF1	W12_OB2
W44_IF	W45_IB	W32_OF2	W32_OB2
W45_IF	W46_IB	W33_OF1	W33_OB1
W46_IF	W47_IB	W33_OF2	W42_OB1
W47_IF		W41_OF1	W42_OB2
		W43_OF1r	W44_OB1x
		W44_OF1	W44_OB2
		W44_OF2	W45_OB2
		W45_OF1	W46_OB1
		W45_OF2r	W46_OB2
		W46_OF1	
		W46_OF2	

MPP	HLL	Göttingen	Bonn
Failed on probecard		BEAST	

x : problem

r : rework



KW06 to KW09

- W32_OB2: gradeA
- W45_OB2: gradeA
- W33_OB1: gradeA
- W42_OB1: gradeA
- W33_OF1: gradeA

KW09 and KW10

W46_OF1 and W46_OF2: fighting with link problems at pxdtest1
(modules sent to Bonn, no link problems there)

KW10 and KW11

W33_OF2: gradeA

at the moment no more modules for testing available, waiting for kapton attachment



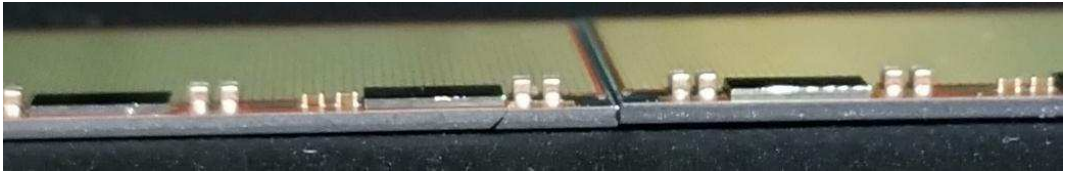
P3-6	P3-7	waiting for kapton (repair)
W04_IF	W02_OF1	W43_IF
W09_IF	W03_OF2	W09_IB
W13_IF	W04_OF1	W09_OF1
W04_IB	W05_OF1	W09_OB1
W13_IB	W04_OB1	W43_OF1
	W10_OB1	W45_OF2

re-testing L1 ladders in mean time

- L1_015: W47_IF & W02_IB
- L1_016: W44_IF & W47_IB → discovered short in IB, 10 drains affected
- L1_017: W32_IF & W44_IB
- L1_018: W41_IF & W41_IB

KW08 - L2_022

- first hot L2 ladder with two grade B modules
- W11_OF2: still working and alive
- W06_OB1: broken, crack in silicon → SW JTAG is broken, also crack in matrix source current high (about 75 mA) with gates still off



- unusual offset in height about $90 \mu\text{m}$ (usual $< 10 \mu\text{m}$)
- probably related to different tool set “Aufbau2” (so far “Aufbau1” was used)

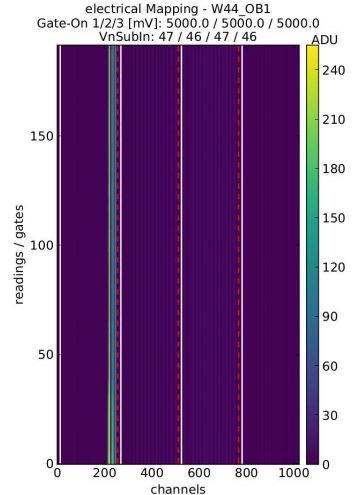
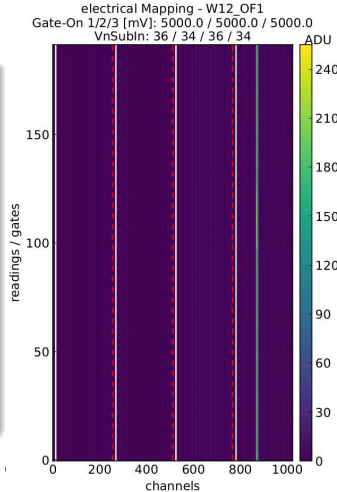


KW09 - L2_023

- dummy modules (electrically not working)
- again with “Aufbau1” and calibration of tools before gluing
- offset better again

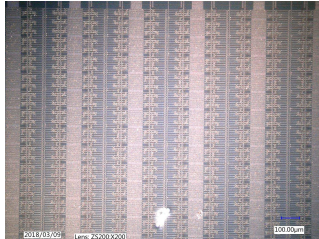
KW10 - L2_024

- W12_OF1 and W44_OB1
- digital ok, but both modules had gate supply lines in current limit
- indication of affected drains in pedestal frames



pattern indicated shorts between gate and drain lines

It was possible to identify geometrically matching damages in the matrix:



W12_OF1



W44_OB1

- attempt to get rid of the shorts by etching the damaged lines at HLL
- gate shorts gone, but problems with hv current now (hidden before)

measures

- effort to clean up the clean room and keep it clean
- new gluing procedure including module and jig cleaning and inspection right before gluing



L1 ladders

L1_012	C - Switchers removed and crack in matrix
L1_013	C - overheated and separated
L1_014	B - many broken pixels in W01_IB
L1_015	A
L1_016	B - short, 10 drains affected, rest working
L1_017	A
L1_018	A
L1_019	A - Switcher power off problem
L1_020	A
L1_021	A

L1 modules left

W02_IF	switcher incident
W03_IB	tested grade A
W42_IB	tested grade A
W43_IF	DCD reworked
W09_IB	kapton exchange
W04_IB	P3-6
W13_IB	P3-6
W04_IF	P3-6
W09_IF	P3-6
W13_IF	P3-6

- 10 hot L1 ladders were already glued
- 6 grade A L1 ladders available
- 5 more L1 ladders can be glued in the best case
- reminder: we need 8 ladders for layer 1



L2 ladders

L2_022 C - W06_OB1 broken during gluing
L2_024 C - shorts in the matrix

L2 modules left

17 OF (10 tested and waiting for gluing)
18 OB (15 tested and waiting for gluing)

- 2 hot L2 ladders were already glued
- 0 grade A L2 ladders available
- 17 more L2 ladders can be glued in the best case
- reminder: we need 12 ladders for layer 2