PXD Production Status

Daniel Klose, Rainer Richter
on behalf of the MPG Semiconductor Lab.

Processing of PXD9 Batches

Results of 'Inline Measurements'

Yield and Module Counting

Schedule

PXD Production Status

- PXD9-7 (4 wafer) finished
- PXD9-8 (9 wafer) back thinning

  matrix yield measurements done
- PXD9-9 (6 wafer)

  matrix yield measurements started
- PXD9-10 (6 wafer) starts next week

PXD9-8 Measurements after Metal 2

at this stage matrix processing is finished

characterization via global contacts

Source, Cleargate,

Gate and Clear (resistor bus system)

in addition static DEPFET IVs are taken by a needle card

connected to a test pad adaptor

-> integrity of the readout lines (drains)

shorts and opens

PXD9-8 AllClear vs Source

Most crucial measurement

	W32	W33	W41	W42	W43	W44	W45	W46	W47
IB	ok	bad	ok	ok	ok	ok	ok	ok	ok
OF1	ok	ok	ok	bad	ok	ok	ok	ok	ok
OF2	ok	ok	bad	ok	bad	ok	ok	ok	bad
OB1	bad	ok	bad	ok	bad	ok	bad	ok	bad
OB2	ok	bad	bad	ok	ok	ok	ok	ok	bad
IB	ok	bad	ok	ok	ok	ok	ok	ok	ok

Summary Shorts in Polylines

Gate <-> Cleargate

Not lethal but leads to defect rows (1 row : 0.5% of the matrix)

	W32	W33	W41	W42	W43	W44	W45	W46	W47
IF	0	2+	1	1	0	1-2	1	1	1
OF1	1	0	1	0	0	0	1	0	2-3
OF2	0	0	1	0	1	0	0	0	2+
OB1	1-2	1	2+	1	2+	1-2	1	1	2+
OB2	0	1-2	2+	0	0	0	0	0	2+
IB	0	2-3	0	0	0	0	0	1	1

open Drain lines

Not lethal but leads to defect columns (1 column : 0.1% of the matrix)

	W32	W33	W41	W42	W43	W44	W45	W46	W47
IF	0	0	0	2	0	0	0	0	0
OF1	0	0	0	0	0	0	0	0	0
OF2	0	0	0	0	0	0	0	1	0
OB1	0	0	0	0	bad	0	0	0	0
OB2	0	0	0	0	1	0	0	0	0
IB	0	0	0	0	0	0	0	0	0

shorten Drain lines

Not lethal but leads to defect columns (1 column : 0.1% of the matrix)
most of them will be repaired

	W32	W33	W41	W42	W43	W44	W45	W46	W47
IF	0	0	0	2	0	0	2	0	0
OF1	0	0	0	0	0	0	0	0	3 D-G
OF2	0	0	2	0	0	0	0	0	0
OB1	0	0	0	0	bad	2	0	0	0
OB2	0	0	0	0	1	0	0	0	0
IB	0	0	0	0	0	0	0	0	0

Module Counting

	PXD9-6 3 wafer Pilot	PXD9-7 4 wafer		PXD9-8** 9 wafer		Total up to now	
Type		>99%*	>98%*	>99%*	>98%*	>99%*	>98%*
8 +1 IF	2	2	4	8	8	10	12
8 + 1 IB	2	4	4	8	8	12	12
12 OF	6	4	5	13	14	17	19
12 x OB	4	5	7	10	10	15	17

- Pixel yield: estimation from identified bad rows and columns dominated by Gate to ClearGate shorts

** PXD9-8 production not yet finished: yield results only from the matrix
but according to experiences from PXD9-6 and PXD9-7 yield on balcony and EOF is very good (measured after copper)

PXD Production Schedule

- PXD9-7 (4 wafer) finished
- PXD9-8 (9 wafer) - 4 weeks left

  scheduled end of October
- PXD9-9 (6 wafer) - 8 weeks left

  scheduled end of November

Summary

PXD productions are running smoothly ☺

no crucial yield issues

slightly ahead schedule