

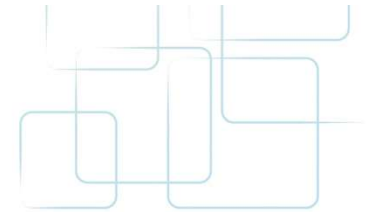


NASH2_SP3239_23B3_Batch 13
Automatic measurements CNM
Plan
Rev 0.0

October 2024
Lola Rodríguez Robles
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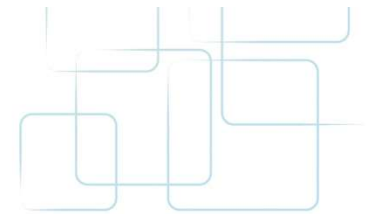
Purpose of this document



- ❖ The purpose of this paper is to perform automated measurements on a complete NASH2 wafer.
- ❖ We measure the following devices at DC.ON/DC.OFF→
 - DIE 01-01_DUT1/4
 - DIE 01-02_DUT1/2
 - DIE 01-03_DUT1/4
 - DIE 01-04_DUT1/2
 - DIE 01-05_DUT1/4
 - DIE 01-06_DUT1/4
 - DIE 01-07_DUT1/4
 - DIE 01-08_DUT1/4
 - DIE 01-09_DUT1/4
 - DIE 01-10_DUT1/4
 - DIE 01-11_DUT1/4



Summary



- I. Reticle map.
- II. Image of the reticle, die and device.
- III. Connections to be made.
- IV. Pull-in measurement at DC.ON/DC.OFF and script.
- V. Horizontal DICE and RETICULES dimensions & pitch.
- VI. Vertical DICE and RETICULES dimensions & pitch.
- VII. DICE pitch, dimensions & saw street details.
- VIII. PADS pitch.
- IX. Work to be done.



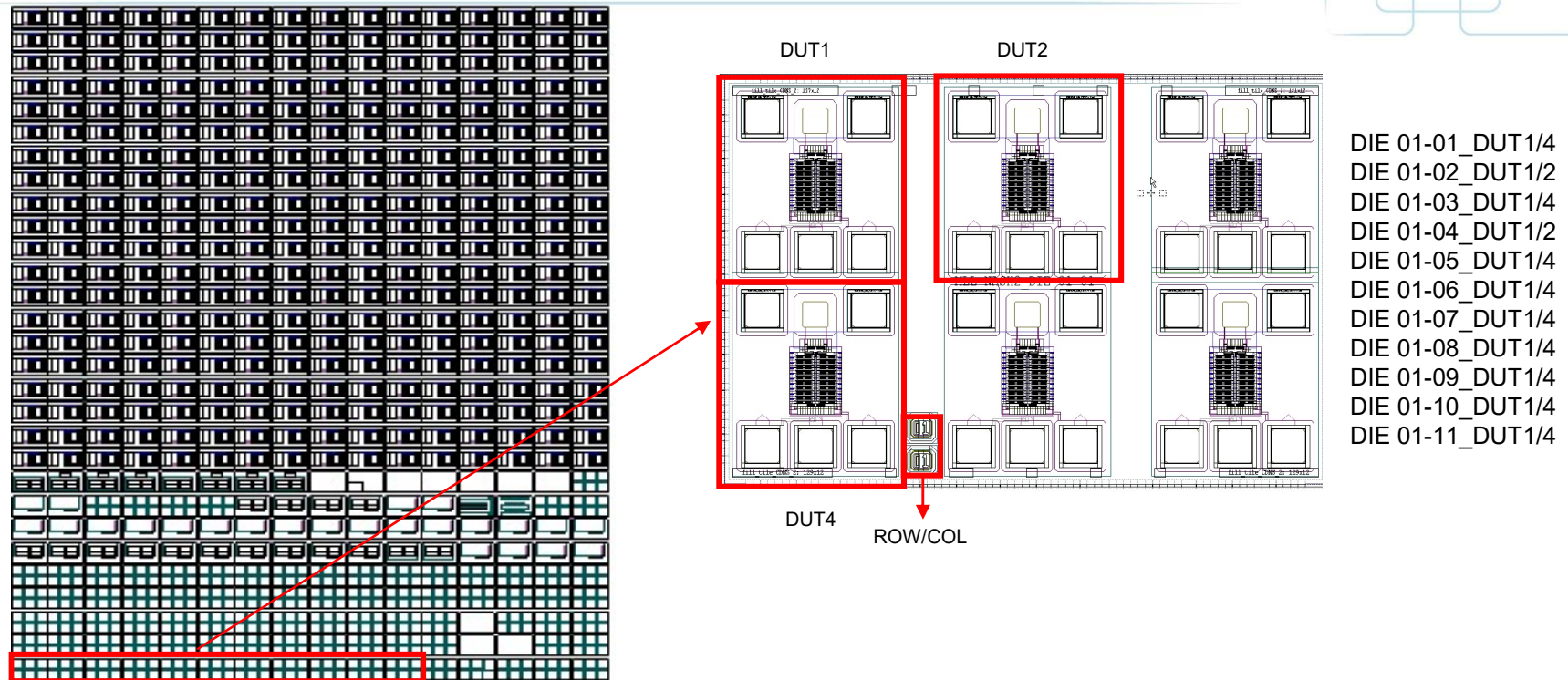
I. Reticle map



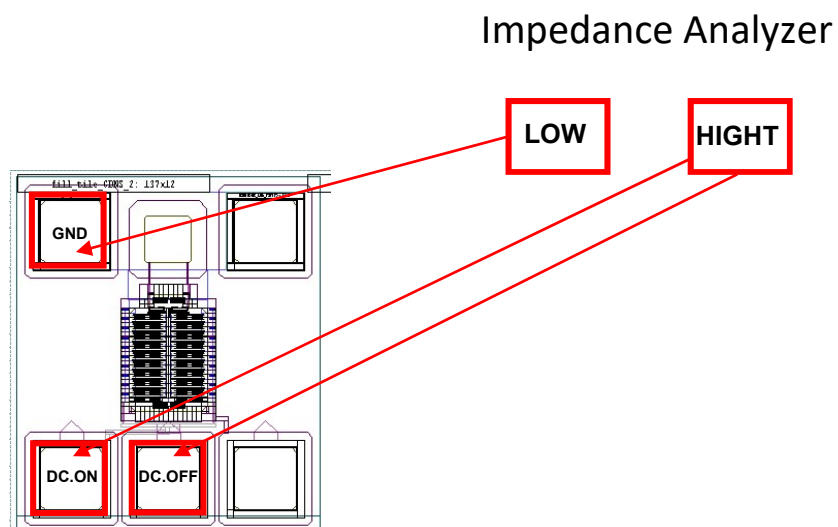
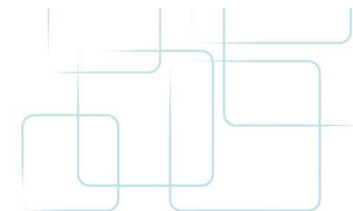
	1	2	3	4	
5	6	7	8	9	10
11	12	13	14	15	16
17	18	19	20	21	22
	23	24	25	26	



II. Image of the reticle, die and device.



III. Diagram of the connections and values of the sweep.

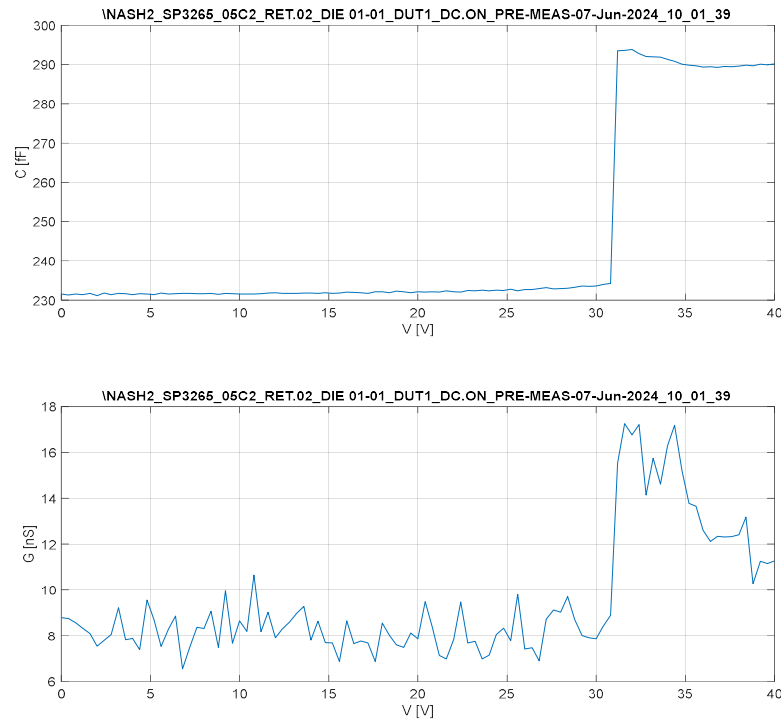
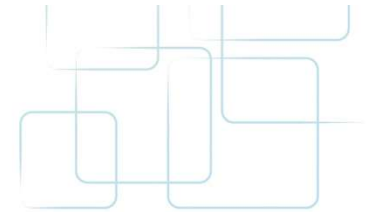


VALUES OF THE SWEEP

OscLevel=0.5
OscFreq=1e6
NumPoints=101
StartVolt=0
StopVolt=40
PrecisionAvg=5
PointAverage=0
AveragePoints=8
SweepAverage=0
AverageSweeps=8



IV. Pull-in measurement at DC.ON and script

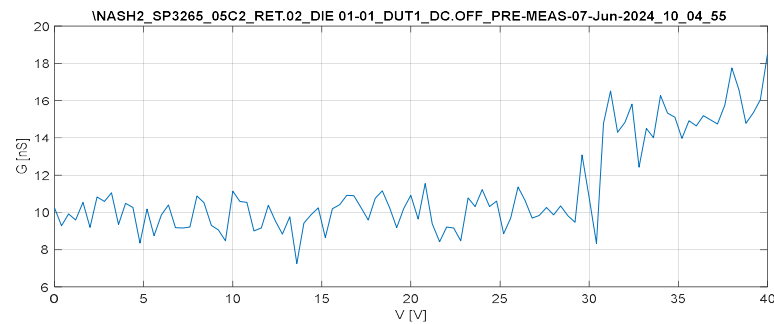
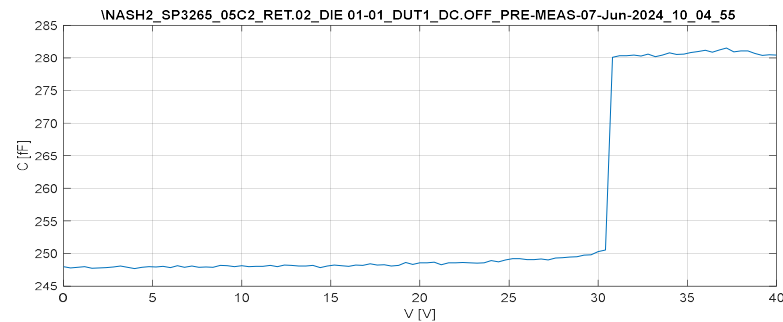
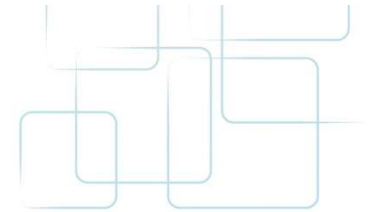


Measuring C,B using Keysight E4990A -- Agilent 4294A

Variables - Measurement

```
clear;
RunName = 'NASH2';
IpAddress = '192.168.63.52';
OscLevel = 0.5; % Volt, 5e-3 to 1, Resolution 1e-3
OscFreq = 1e6; % Hz, 20 to 10e6, Resolution 1e-3
NumPoints = 101; % Number of points per sweep, 2 to 1601
StartVolt = 0; % Volt, -40 to +40, Resolution 1-3
StopVolt = 40; % Volt, -40 to +40, Resolution 1-3
PrecisionAvg = 5; % 1|2|3|4|5
PointAverage = 0; % 0|1
AveragePoints = 8; % 1 to 999
SweepAverage = 0; % 0|1
AverageSweeps = 8; % 1 to 999
strPath = '';
```


IV. Pull-in measurement at DC.OFF and script



Measuring C,B using Keysight E4990A -- Agilent 4294A

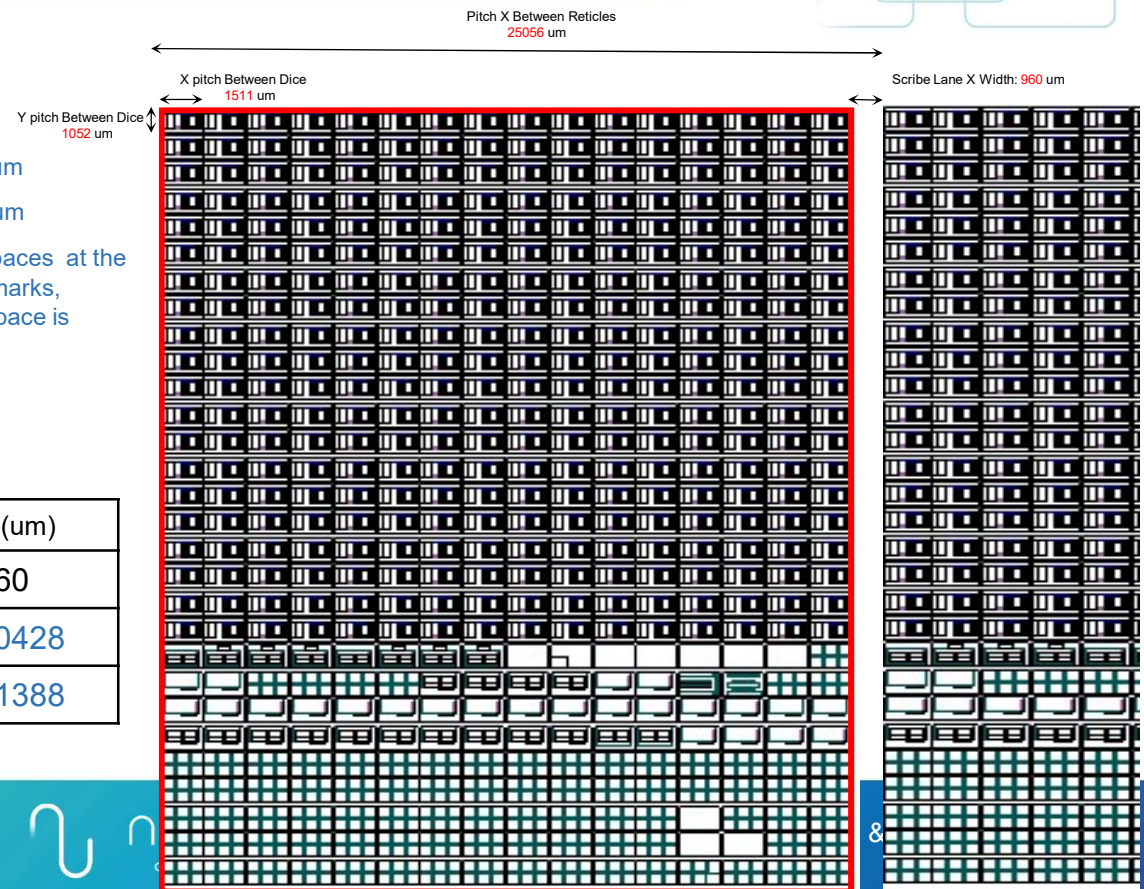
Variables - Measurement

```
clear;  
RunName = 'NASH2';  
IpAddress = '192.168.63.52';  
OscLevel = 0.5; % Volt, 5e-3 to 1, Resolution 1e-3  
OscFreq = 1e6; % Hz, 20 to 10e6, Resolution 1e-3  
NumPoints = 101; % Number of points per sweep, 2 to 1601  
StartVolt = 0; % Volt, -40 to +40, Resolution 1-3  
StopVolt = 40; % Volt, -40 to +40, Resolution 1-3  
PrecisionAvg = 5; % 1|2|3|4|5  
PointAverage = 0; % 0|1  
AveragePoints = 8; % 1 to 999  
SweepAverage = 0; % 0|1  
AverageSweeps = 8; % 1 to 999  
strPath = '';
```


V. Horizontal DICE and RETICULES dimensions & pitch

- Pitch between DICE is $X = 1431\mu\text{m} + 80\mu\text{m} = 1511\mu\text{m}$
 $Y = 972\mu\text{m} + 80\mu\text{m} = 1052\mu\text{m}$
- Pitch Between Reticules is $X = 24096\mu\text{m} + 960\mu\text{m} = 25056\mu\text{m}$
 $Y = 30428\mu\text{m} + 960\mu\text{m} = 31388\mu\text{m}$
- Scribe lane width is $80\mu\text{m}$, for Nash2 SMIC added $880\mu\text{m}$ spaces at the top and right of the GDS to place PCM TSK and alignment marks, combined the $80\mu\text{m}$ street(scribe lane), total chip to chip space is should be $880+80=960\mu\text{m}$

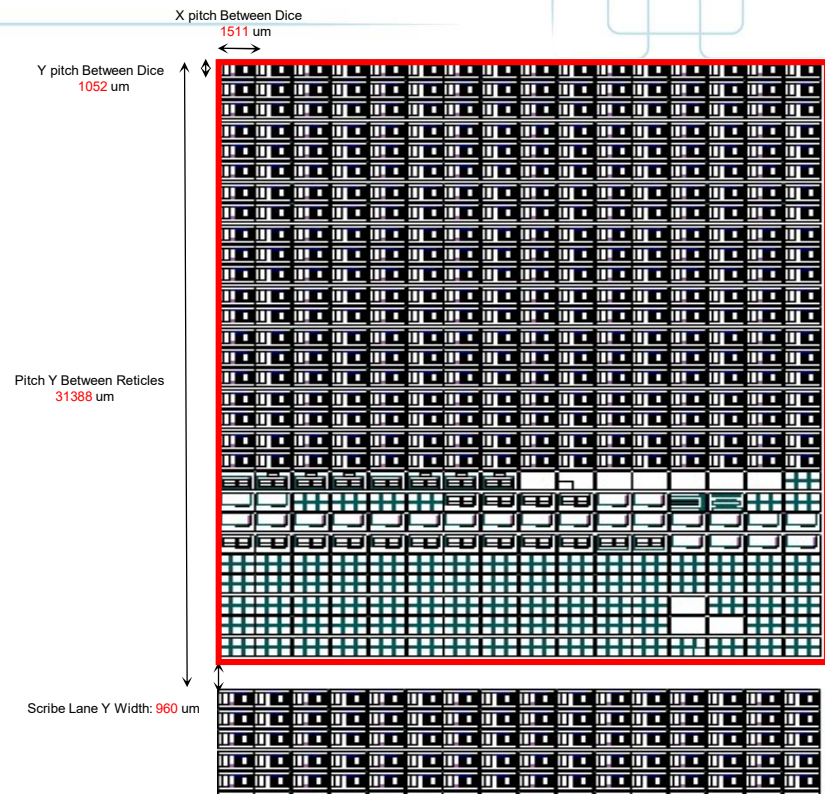
Nash2	X (um)	Y (um)
A:Scribe Lane Width	960	960
B:Window size (including seal ring)	24096	30428
Reticle Pitch= A+B	25056	31388



VI. Vertical DICE and RETICULES dimensions & pitch

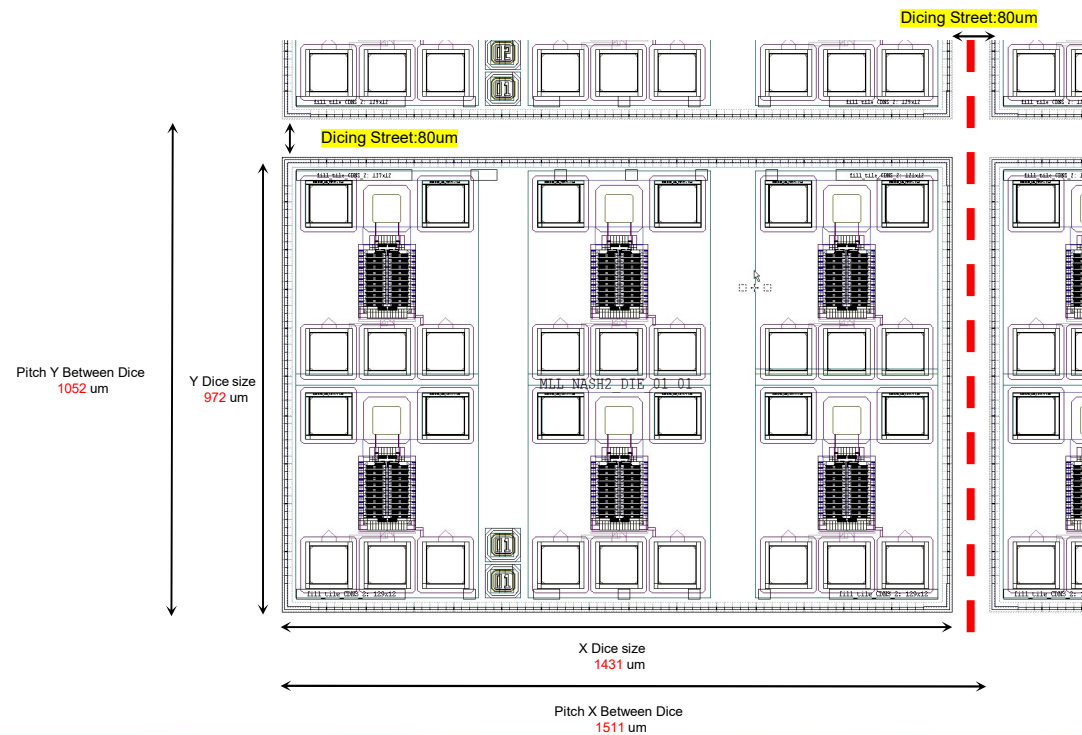
- Pitch Between DICE is $X = 1431\mu\text{m} + 80\mu\text{m} = 1511\mu\text{m}$
 $Y = 972\mu\text{m} + 80\mu\text{m} = 1052\mu\text{m}$
- Pitch Between Reticules is $X = 24096\mu\text{m} + 960\mu\text{m} = 25056\mu\text{m}$
 $Y = 30428\mu\text{m} + 960\mu\text{m} = 31388\mu\text{m}$
- Scribe lane width is $80\mu\text{m}$, for Nash2 SMIC added $880\mu\text{m}$ spaces at the top and right of the GDS to place PCM TSK and alignment marks, combined the $80\mu\text{m}$ street (scribe lane), total chip to chip space is should be $880+80=960\mu\text{m}$

Nash2	X (um)	Y (um)
A:Scribe Lane Width	960	960
B:Window size (including seal ring)	24096	30428
Reticle Pitch= A+B	25056	31388

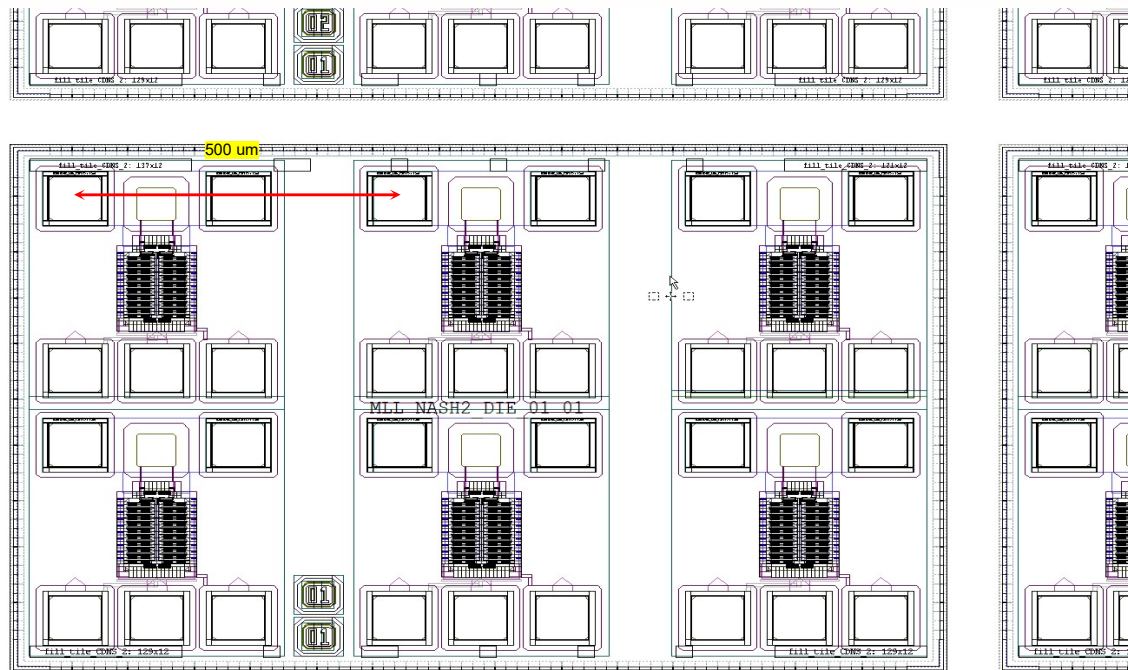
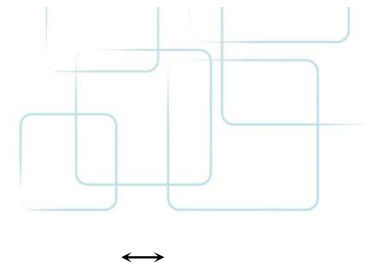


VII .DICE pitch, dimensions & saw street details

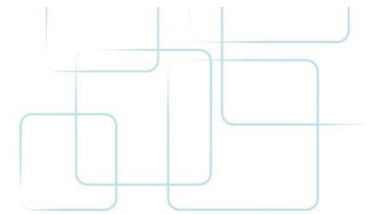
- Pitch between dice is X= 1511 μm
Y= 1052 μm
- DIE size is X= 1431 μm
Y= 972 μm
- Dicing street width between dice: 80 μm



VIII .PADS pitch, dimensions & saw street details



IX. Work to be done

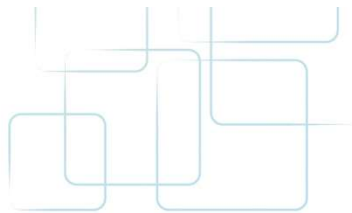


Perform DC.ON and DC.OFF measurements of the following devices on all wafer reticles:

- DIE 01-01_DUT1/4
- DIE 01-02_DUT1/2
- DIE 01-03_DUT1/4
- DIE 01-04_DUT1/2
- DIE 01-05_DUT1/4
- DIE 01-06_DUT1/4
- DIE 01-07_DUT1/4
- DIE 01-08_DUT1/4
- DIE 01-09_DUT1/4
- DIE 01-10_DUT1/4
- DIE 01-11_DUT1/4



Document Revisions



Revision	Author	Date	Comments
Rev 0.0	Lola Rodríguez	16/10/2024	Initial document



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