

892AZ

Reticle Design Description

General Description:

The 892AZ is an Attenuated Phase Shift reticle. The design is a trench/hole reticle and it consists of submicron contacts and trenches at various pitch ratios. It is a darkfield reticle. This design contains a structure, Test_Cell, that will be used for damascene process development. A binary Metal-2 plate will be designed and manufactured at a later date.

The overall die size is 32.5 x 26.0mm. The floorplan is shown on **Figure 1**. The reticle has been designed so that smaller field sizes can be exposed; a 24x19.080mm, a 20x15.6or a 8x5mm, as shown on **Figures 1A** and **1B**.

The reticle was manufactured to target the 0.14um features.

The Barcode reads 700A1892AZ.

List of Structures:

The structures featured on this reticle are listed below. Tables detailing what each module contains will follow in the next section. The structure names are as shown on the figures.

1. Line_Cell_Horz_08_Big
2. Line_Cell_Horz_08_NoDNS
3. Via_Cell
4. Test_Cell

Structure Descriptions:

Line Cell Horz (Trench)

These structures consist of five different trench widths at varied pitch ratios. The trench width is identified by a letter, and the pitch is labeled in nanometers. The Line_Cell_Horz_08_NoDNS is similar to the Line_Cell_Horz_08 except that the smaller pitch ratios, dense structures, were removed. Detail structures are shown on **Figures 2** and **3**.

- | | |
|----------|---------------|
| A | 0.10um trench |
| B | 0.12um trench |
| C | 0.14um trench |
| D | 0.16um trench |
| E | 0.18um trench |

Via Cell:

The contact/via module, Via_Cell, consists of seven different contact sizes at varied pitches. The cell is approximately 4.0 x 0.050mm and the contacts are staggered. The contact size is designated by a letter and the pitch is labeled in nanometers. A detail structure is shown on **Figure 4**.

A	0.14µm contact
B	0.16µm contact
C	0.18µm contact
D	0.20µm contact
E	0.22µm contact
F	0.24µm contact
G	0.26µm contact

The Tables that follow will illustrate this. Note that these tables contain “DESIGN SIZES” which do not necessarily reflect the sizes printed on the wafer.

Test Cell:

The Test_Cell structure contains a Kelvin module, which is placed three times within the structure and two sets of alignment chain modules, a vertical and a horizontal set. These structures reside on a 2 x 12 pad set and will be electrically testable.

The Kelvin module contains 0.26, 0.24, 0.22, 0.20, 0.18 and 0.16 type size vias. The sizes of the via alignment chain modules are designed at 0.260, 0.220 and 0.200. Each chain contains 150 vias and is configured so that the via is shifted 0.05um in each direction. (see Table 4).

The Test_Cell structure is shown in **Figure 5**. Details of the Kelvin and Alignment modules are shown on **Figures 5A** and **5B**.

TABLE 1 – Feature Sizes for Line_Cell_Horz_08_Big (see Figure 2)

Trench Width(μm)	Pitch(μm)	Pitch Ratio
0.100	0.200	1:1
0.100	0.220	1.2:1
0.100	0.240	1.4:1
0.100	0.260	1.6:1
0.100	0.280	1.8:1
0.100	0.300	2:1
0.100	0.340	2.4:1
0.100	0.400	3:1
0.100	0.600	5:1
0.100	2.100	ISO

0.120	0.240	1:1
0.120	0.260	1.16:1
0.120	0.280	1.33:1
0.120	0.300	1.5:1
0.120	0.320	1.67:1
0.120	0.360	2:1
0.120	0.400	2.33:1
0.120	0.480	3:1
0.120	0.720	5:1
0.120	2.120	ISO

0.140	0.280	1:1
0.140	0.300	1.14:1
0.140	0.340	1.42:1
0.140	0.360	1.57:1
0.140	0.380	1.71:1
0.140	0.420	2:1
0.140	0.480	2.42:1
0.140	0.560	3:1
0.140	0.840	5:1
0.140	2.140	ISO

Table 1 (Cont.)

Trench Width(μm)	Pitch(μm)	Pitch Ratio
0.160	0.320	1:1
0.160	0.360	1.25:1
0.160	0.380	1.38:1
0.160	0.400	1.5:1
0.160	0.440	1.75:1
0.160	0.480	2:1
0.160	0.540	2.37:1
0.160	0.640	3:1
0.160	0.960	5:1
0.160	2.160	ISO

0.180	0.360	1:1
0.180	0.400	1.22:1
0.180	0.440	1.44:1
0.180	0.460	1.56:1
0.180	0.520	1.89:1
0.180	0.540	2:1
0.180	0.620	2.44:1
0.180	0.720	3:1
0.180	1.080	5:1
0.180	2.180	ISO

TABLE 2 – Feature Sizes for Line_Cell_Horz_08_NoDNS (see **Figure 3**)

Trench Width(μm)	Pitch(μm)	Pitch Ratio
0.100	0.300	2:1
0.100	0.340	2.4:1
0.100	0.400	3:1
0.100	0.600	5:1
0.100	2.100	ISO

0.120	0.320	1.67:1
0.120	0.360	2:1
0.120	0.400	2.33:1
0.120	0.480	3:1
0.120	0.720	5:1
0.120	2.120	ISO

0.140	0.340	1.42:1
0.140	0.360	1.57:1
0.140	0.380	1.71:1
0.140	0.420	2:1
0.140	0.480	2.42:1
0.140	0.560	3:1
0.140	0.840	5:1
0.140	2.140	ISO

0.160	0.360	1.25:1
0.160	0.380	1.38:1
0.160	0.400	1.5:1
0.160	0.440	1.75:1
0.160	0.480	2:1
0.160	0.540	2.37:1
0.160	0.640	3:1
0.160	0.960	5:1
0.160	2.160	ISO

Table 2 (Cont.)

Trench Width(μm)	Pitch(μm)	Pitch Ratio
0.180	0.400	1.22:1
0.180	0.440	1.44:1
0.180	0.460	1.56:1
0.180	0.520	1.89:1
0.180	0.540	2:1
0.180	0.620	2.44:1
0.180	0.720	3:1
0.180	1.080	5:1
0.180	2.180	ISO

TABLE 3 – Feature Sizes for Via_Cell (see **Figure 4**)

Pitch (μm)	Via Size(μm)	Pitch Ratio
0.420	0.140	2.00:1
0.420	0.160	1.63:1
0.420	0.180	1.33:1
0.420	0.200	1.10:1
0.520	0.140	2.71:1
0.520	0.160	2.25:1
0.520	0.180	1.89:1
0.520	0.200	1.60:1
0.520	0.220	1.36:1
0.520	0.240	1.17:1
0.520	0.260	1:1
0.800	0.140	4.71:1
0.800	0.160	4.0:1
0.800	0.180	3.44:1
0.800	0.200	3.0:1
0.800	0.220	2.64:1
0.800	0.240	2.33:1
0.800	0.260	2.08:1
1.00	0.140	6.14:1
1.00	0.160	5.25:1
1.00	0.180	4.56:1
1.00	0.200	4.00:1
1.00	0.220	3.55:1
1.00	0.240	3.17:1
1.00	0.260	2.85:1
1.20	0.140	7.57:1
1.20	0.160	6.50:1
1.20	0.180	5.67:1
1.20	0.200	5.00:1
1.20	0.220	4.45:1
1.20	0.240	4.00:1
1.20	0.260	3.62:1

Table 3 (Cont.)

Pitch (μm)	Via Size(μm)	Pitch Ratio
1.50	0.140	9.71:1
1.50	0.160	8.38:1
1.50	0.180	7.33:1
1.50	0.200	6.50:1
1.50	0.220	5.82:1
1.50	0.240	5.25:1
1.50	0.260	4.77:1
2.00	0.220	8.09:1
2.00	0.240	7.33:1
2.00	0.260	6.69:1

TABLE 4 – Feature Sizes for Test Cell (see Figure 5)

Alignment Via Chains (3 size types, two sets)

Via Size(μm)	Cell	Shift
0.260, 220, 200	Align01	0.00
0.260, 220, 200	Align02	±0.05
0.260, 220, 200	Align03	±0.100
0.260, 220, 200	Align04	±0.150
0.260, 220, 200	Align05	±0.200
0.260, 220, 200	Align06	±0.250
0.260, 220, 200	Align07	±0.300
0.260, 220, 200	Align08	±0.350
0.260, 220, 200	Align09	±0.400
0.260, 220, 200	Align10	±0.450
0.260, 220, 200	Align11	±0.500
0.260, 220, 200	Align12	±0.550

892AZ FLOORPLAN

Full field (32.5x26mm)

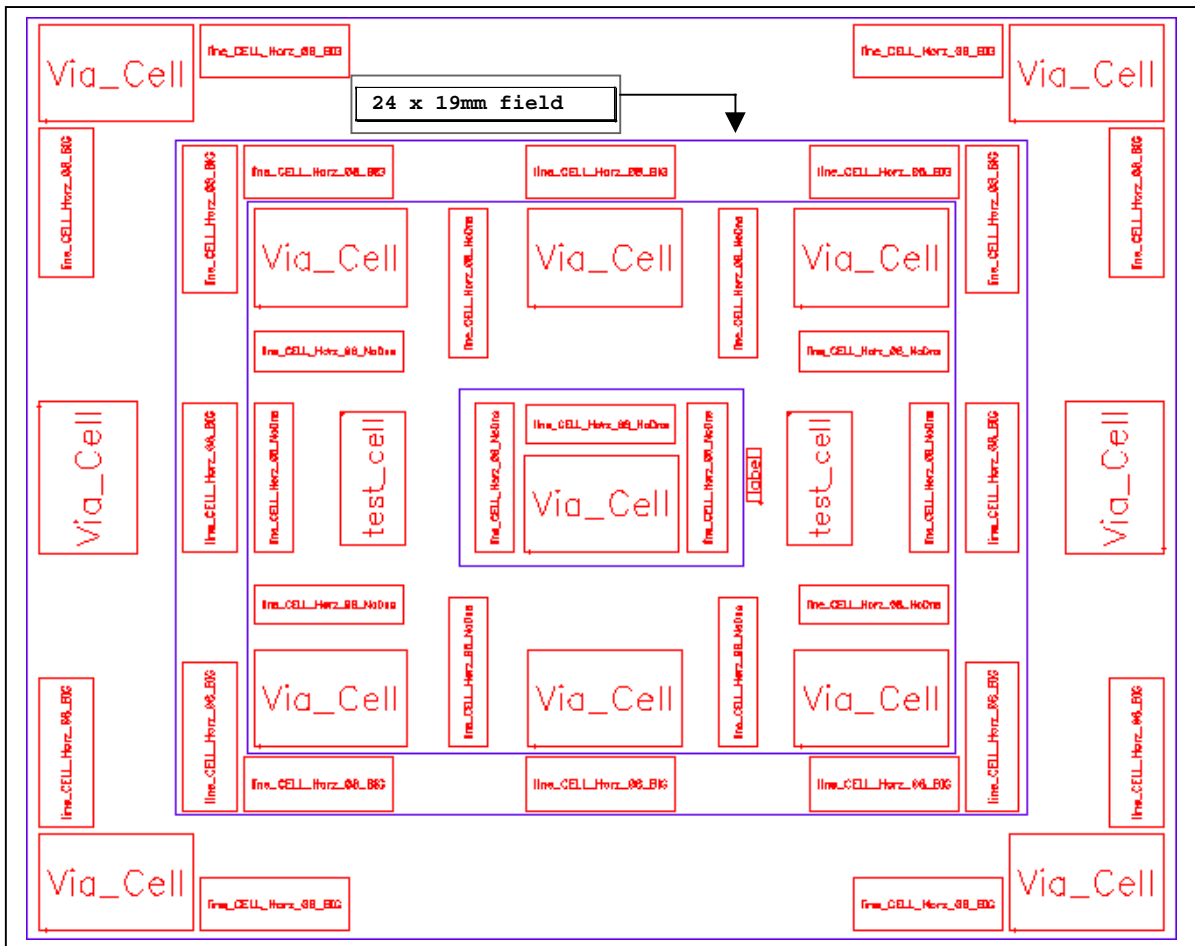


FIGURE 1

892AZ FLOORPLAN 20x15.6 FIELD

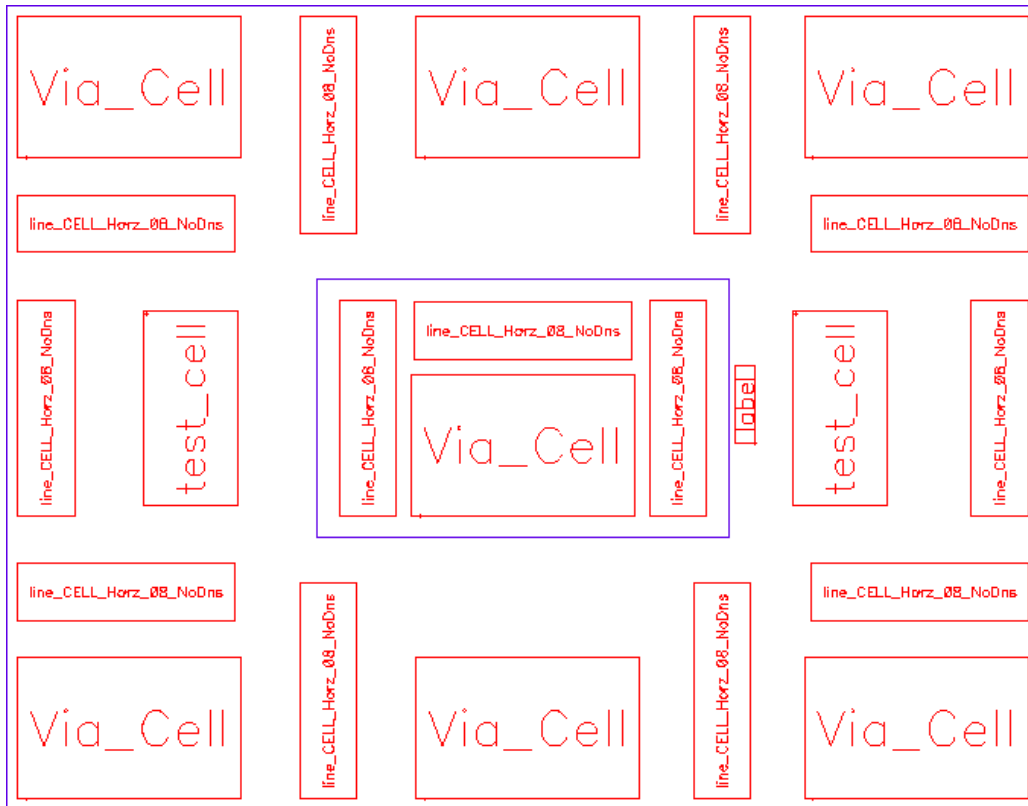


FIGURE 1A

892AZ FLOORPLAN
Center Field (8x5mm)

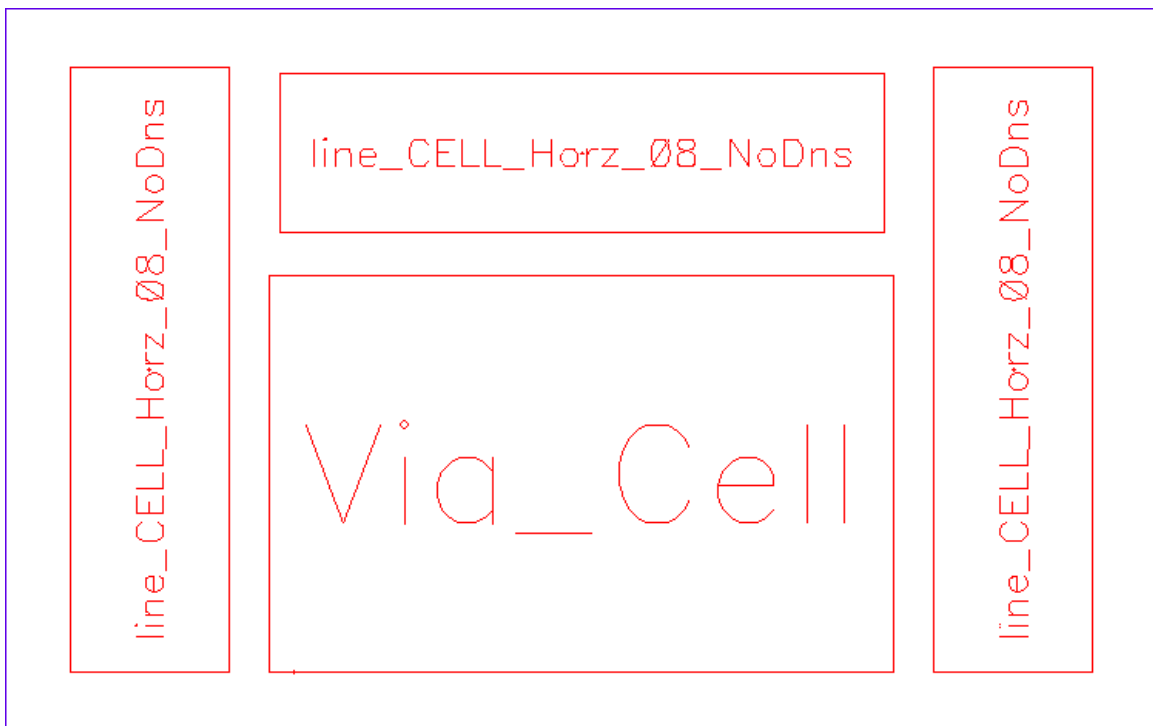


FIGURE 1B

892AZ
Line_Cell_Horz_08_BIG

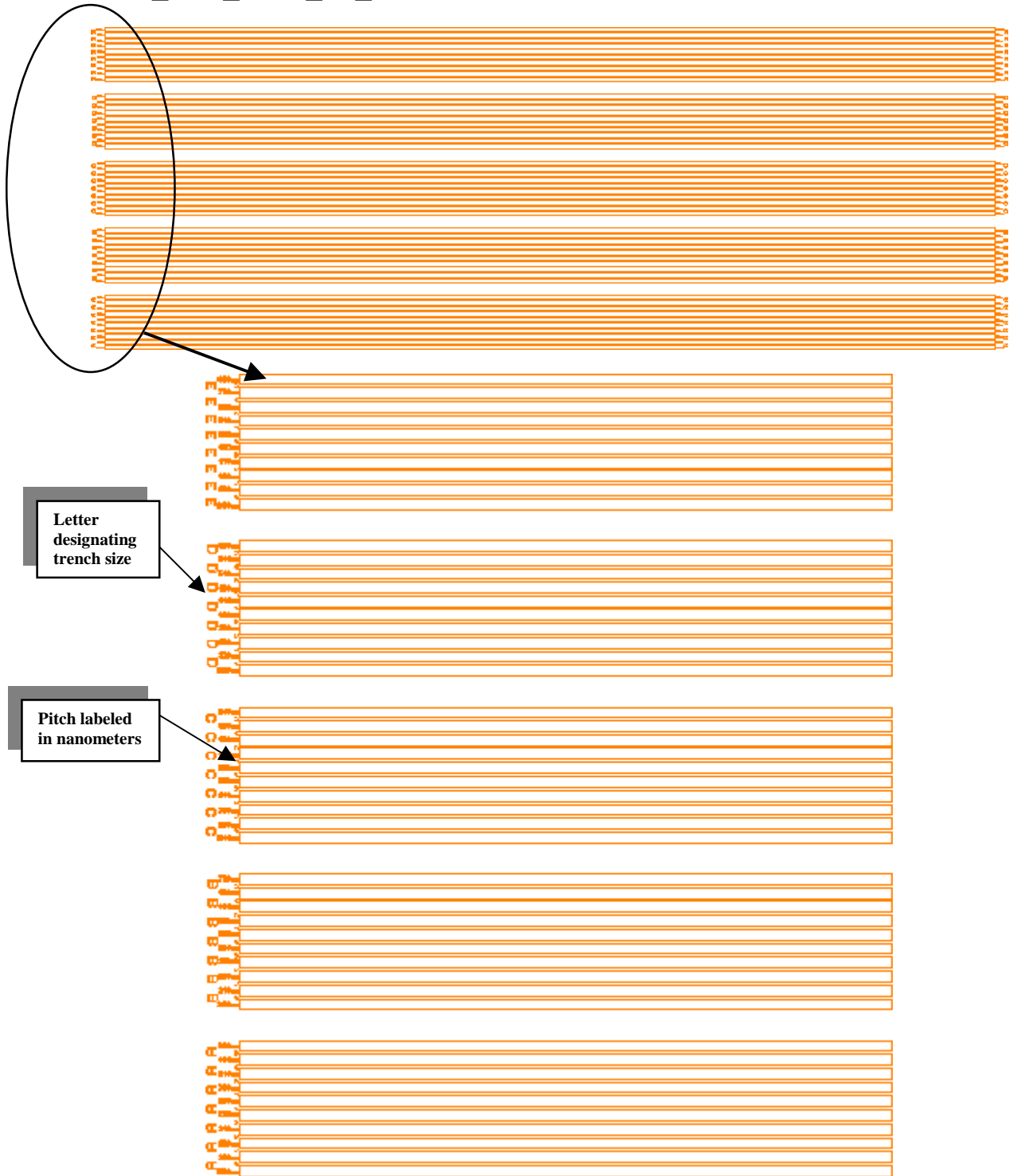


FIGURE 2

892AZ
Line_CELL_Horz_08_NoDNS

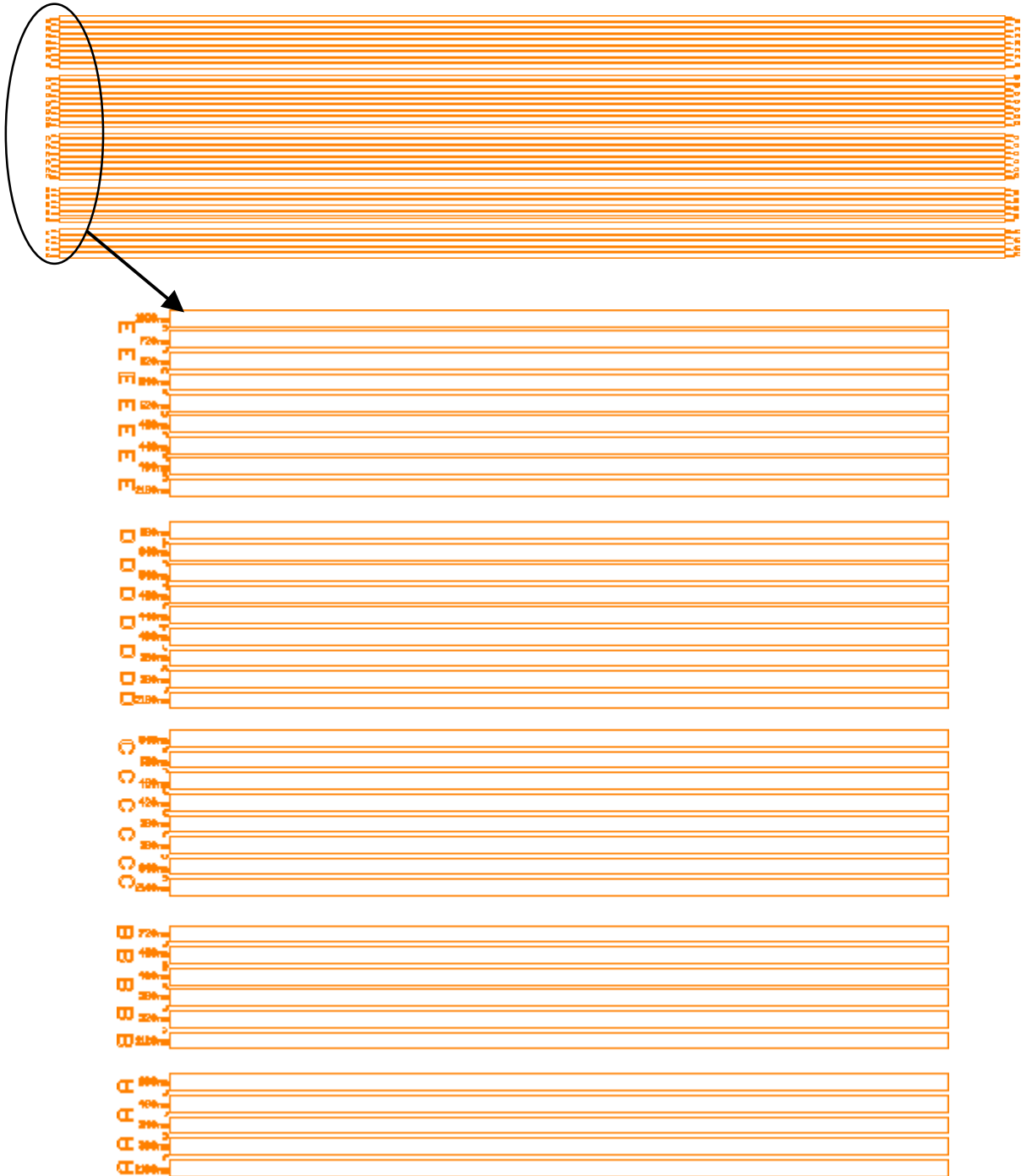
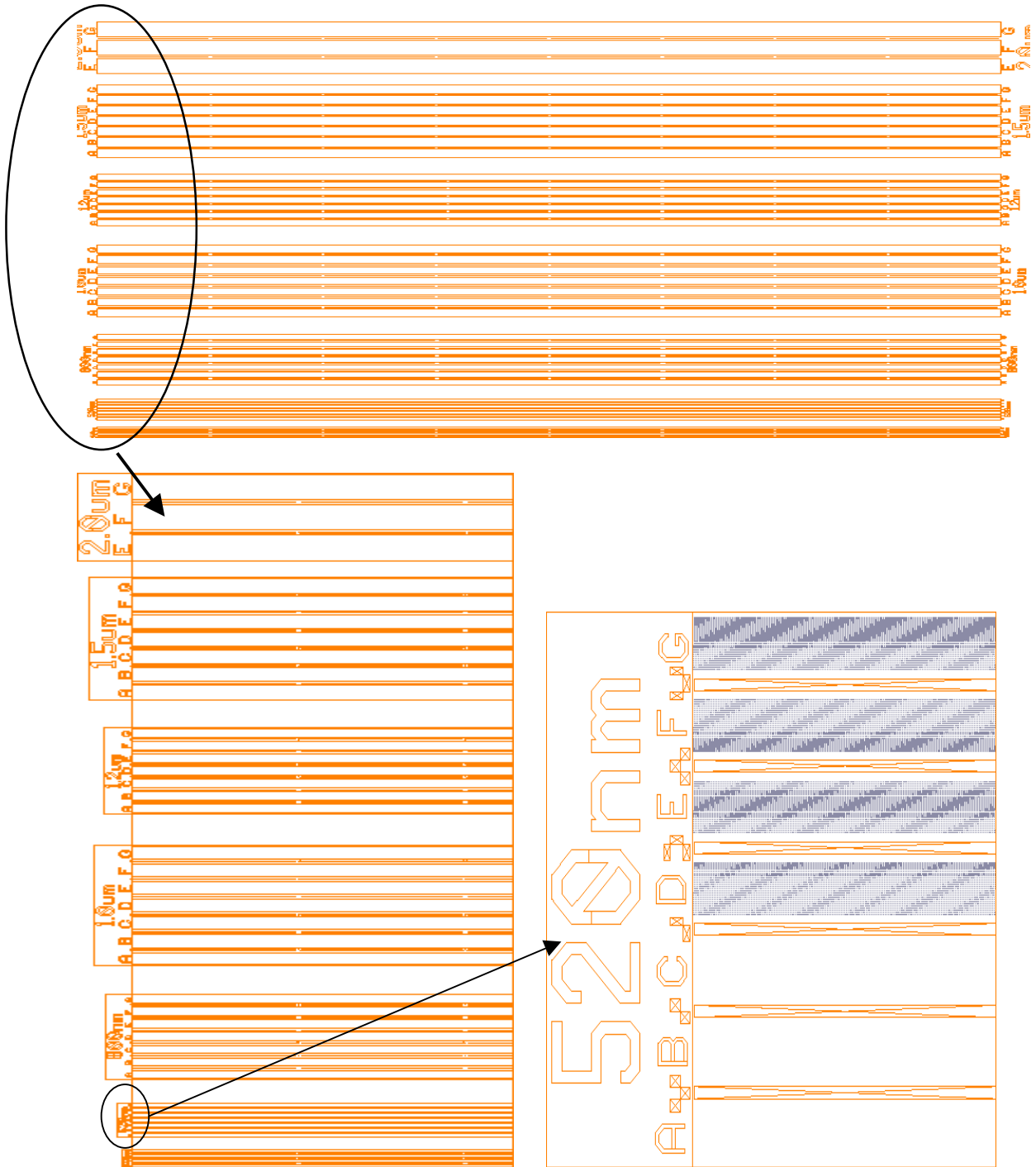


FIGURE 3

892AZ
VIA_Cell

FIGURE 4



892AZ
Test_Cell

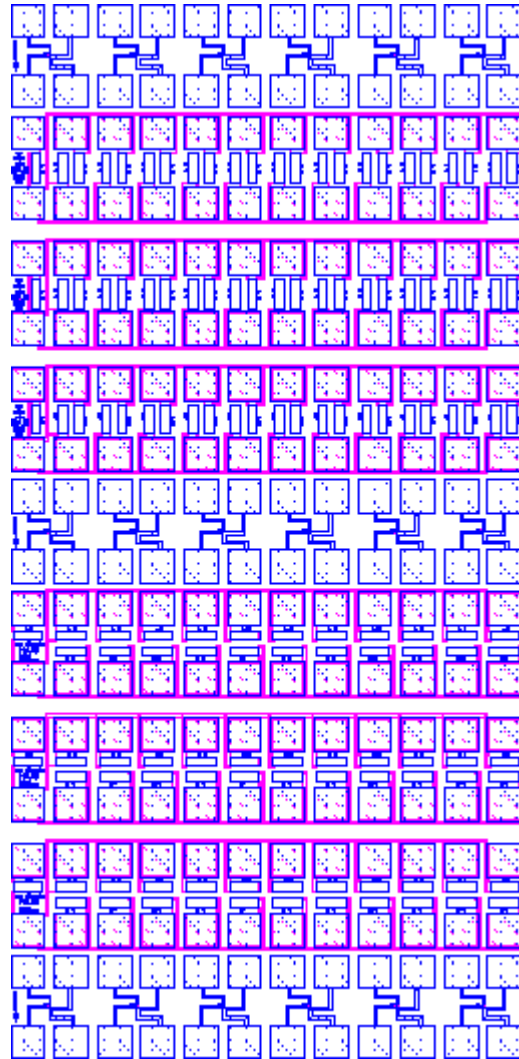


FIGURE 5

892AZ
Kelvin3

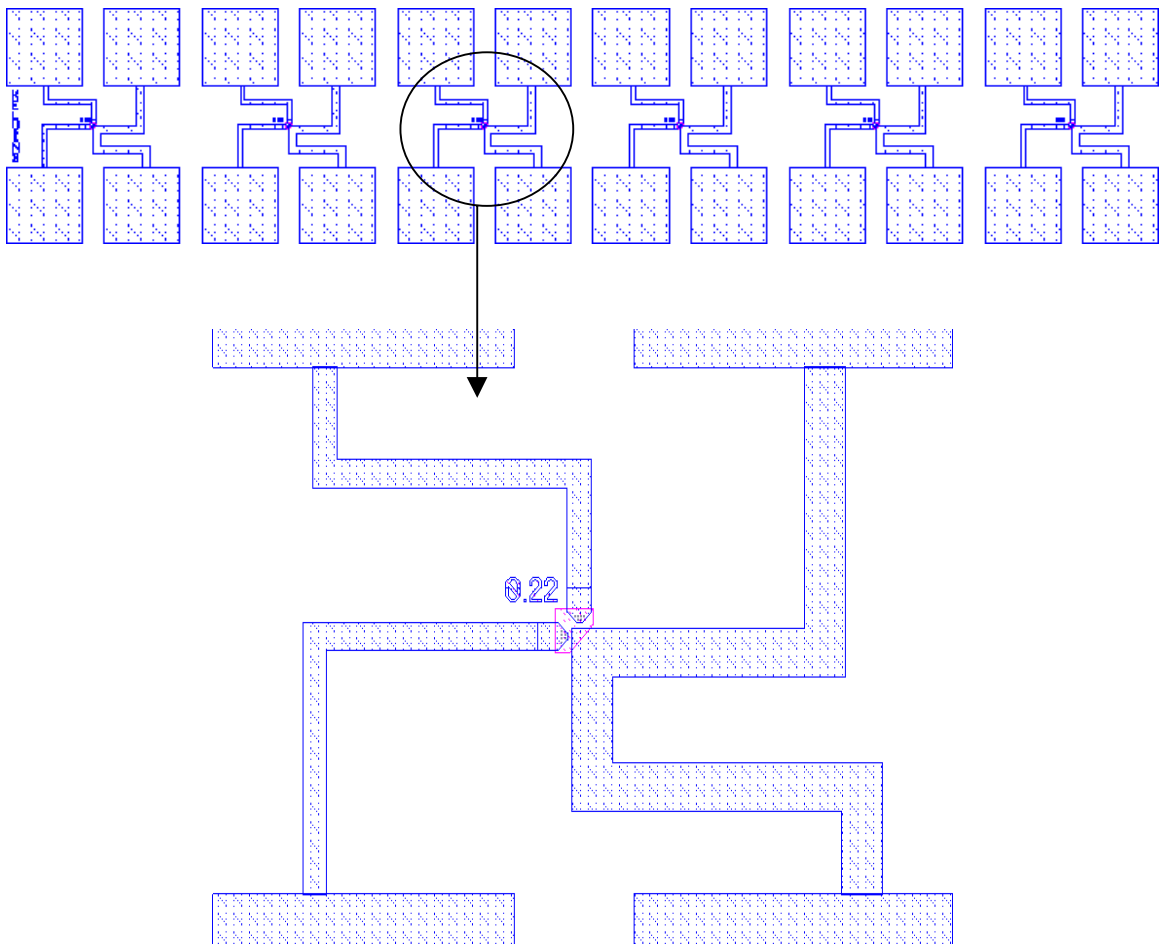


FIGURE 5A

892AZ Litho Alignment Via Chain

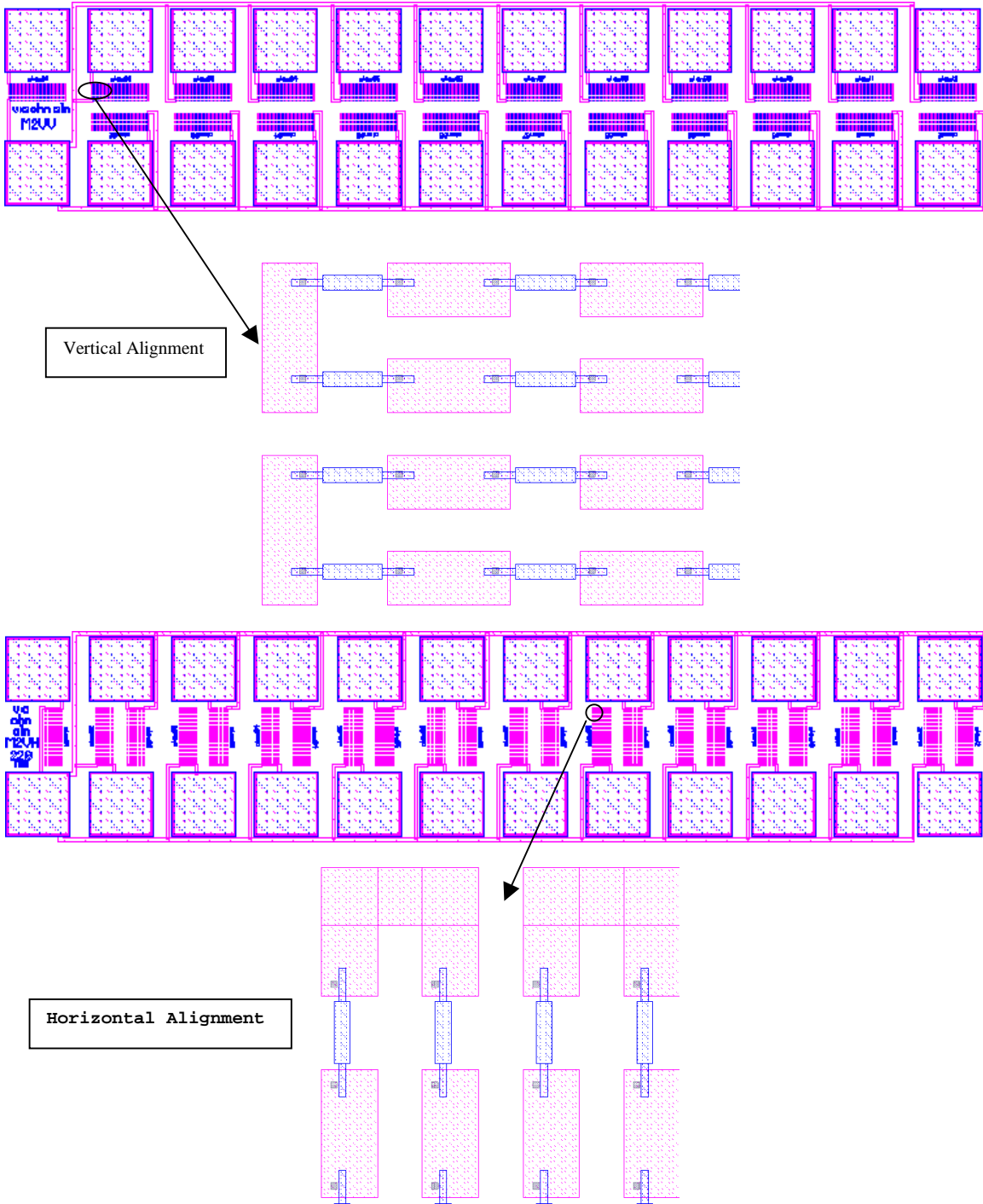


Figure 5B

