

# Q-Cleave-E

## Reticle Design Description

### General Description:

The Q-Cleave-E reticle is a Contact reticle featuring dense and isolated contacts with varying pitches. Two types of contacts are featured in this reticle, standard contacts and OPC contacts (contacts with serifs).

The reticle is designed for use in applications requiring “cleaving” the wafer for cross-sections.

This is a single level reticle with no overlay capability.

The die size is 20mm (X) x 20mm (Y).

The percent open area is 1.67%.

The reticle was built targeting the 0.25um contacts.

The reticle floor plan is pictured in **Figure 1** and the field layout is illustrated in **Figure 2**.

### Reticle Layout:

The reticle is made up of five different modules. Two of the modules, A and B, are the same the only difference is in the length of the cell. Module A is 3mm long while Module B is 5mm. All other modules are 3mm in length.

Module A is repeated in a series of 18 locations, 9 of these locations above the center and 9 below the center. This module contains standard contacts ranging in size from 0.16um to 0.60um with 1:1, 1:3, 1:1.5 and 1:1 spacing. Module B, which is identical to Module A, is located at the center of the field. **Table 1** shows the size range for these modules. Module picture is shown in **Figure 3**.

Module C and Module D contain OPC contacts. The difference between the modules is in the size of the serif. In Module C the rule was that the serif would be half the size of the contact size and that the overlap at the corner of the contact was to be one-third the size of the serif. The rule for Module D was that the serif would be one-third the size of the contact and the serif overlay would be one-third the size of the serif. Refer to **Tables 2 and 3** for the feature size. See **Figures 4 and 5** for module layout.

Module E features the standard contacts ranging in size from 0.160 to 0.180um in two groups. In one group the spacing is 1:1 and in the other the spacing is 1:3. **Table 4** shows the size range for this module. See layout of module in **Figure 6**.

**TABLE 1 - Modules A and B**

| <b>Feature Size (um)</b> | <b>Space</b> |
|--------------------------|--------------|
| 0.600                    | 1:6          |
| 0.600                    | 1:3          |
| 0.600                    | 1:1          |
| 0.300                    | 1:6          |
| 0.300                    | 1:3          |
| 0.300                    | 1:1          |
| 0.280                    | 1:6          |
| 0.280                    | 1:3          |
| 0.280                    | 1:1.5        |
| 0.280                    | 1:1          |
| 0.260                    | 1:6          |
| 0.260                    | 1:3          |
| 0.260                    | 1:1.5        |
| 0.260                    | 1:1          |
| 0.250                    | 1:6          |
| 0.250                    | 1:3          |
| 0.250                    | 1:1.5        |
| 0.250                    | 1:1          |
| 0.220                    | 1:6          |
| 0.220                    | 1:3          |
| 0.220                    | 1:1.5        |
| 0.220                    | 1:1          |
| 0.200                    | 1:6          |
| 0.200                    | 1:3          |
| 0.200                    | 1:1.5        |
| 0.200                    | 1:1          |
| 0.180                    | 1:6          |
| 0.180                    | 1:3          |
| 0.180                    | 1:1.5        |
| 0.180                    | 1:1          |
| 0.160                    | 1:6          |
| 0.160                    | 1:3          |
| 0.160                    | 1:1.5        |
| 0.160                    | 1:1          |

**TABLE 2 - Module C**

| <b>Feature Size (um)</b> | <b>Space</b> |
|--------------------------|--------------|
| 0.220                    | 1:6          |
| 0.220                    | 1:3          |
| 0.220                    | 1:1.5        |
| 0.200                    | 1:6          |
| 0.200                    | 1:3          |
| 0.200                    | 1:1.5        |
| 0.180                    | 1:6          |
| 0.180                    | 1:3          |
| 0.180                    | 1:1.5        |
| 0.160                    | 1:6          |
| 0.160                    | 1:3          |
| 0.160                    | 1:1.5        |
| 0.140                    | 1:6          |
| 0.140                    | 1:3          |
| 0.140                    | 1:1.5        |

Serif size is  $\frac{1}{2}$  contact size  
Serif overlay is  $\frac{1}{3}$  serif size

**TABLE 3 - Module D**

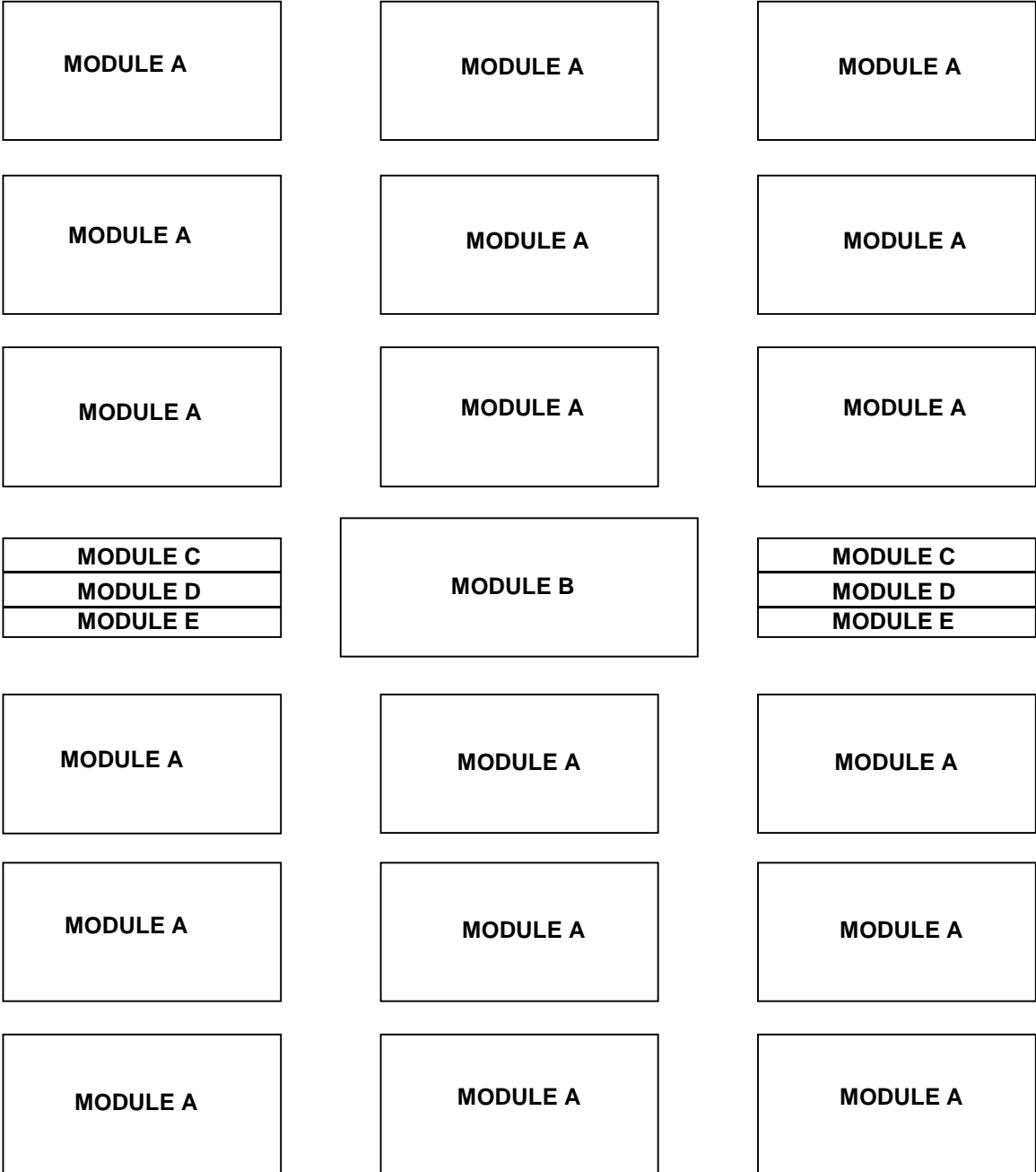
| <b>Feature Size (um)</b> | <b>Space</b> |
|--------------------------|--------------|
| 0.220                    | 1:6          |
| 0.220                    | 1:3          |
| 0.220                    | 1:1.5        |
| 0.220                    | 1:1          |
| 0.200                    | 1:6          |
| 0.200                    | 1:3          |
| 0.200                    | 1:1.5        |
| 0.200                    | 1:1          |
| 0.180                    | 1:6          |
| 0.180                    | 1:3          |
| 0.180                    | 1:1.5        |
| 0.180                    | 1:1          |
| 0.160                    | 1:6          |
| 0.160                    | 1:3          |
| 0.160                    | 1:1.5        |
| 0.160                    | 1:1          |
| 0.140                    | 1:6          |
| 0.140                    | 1:3          |
| 0.140                    | 1:1.5        |
| 0.140                    | 1:1          |

Serif size is 1/3 contact size  
Serif overlay is 1/3 serif size

**TABLE 4 - Module E**

| <b>Feature Size (um)</b> | <b>Space</b> |
|--------------------------|--------------|
| 0.160                    | 1:3          |
| 0.180                    | 1:3          |
| 0.200                    | 1:3          |
| 0.220                    | 1:3          |
| 0.250                    | 1:3          |
| 0.260                    | 1:3          |
| 0.280                    | 1:3          |
|                          |              |
| 0.160                    | 1:1          |
| 0.180                    | 1:1          |
| 0.200                    | 1:1          |
| 0.220                    | 1:1          |
| 0.250                    | 1:1          |
| 0.260                    | 1:1          |
| 0.280                    | 1:1          |

**QCLEAVE E  
FLOORPLAN**



**FIGURE 1**

QCleave - E  
Field Layout

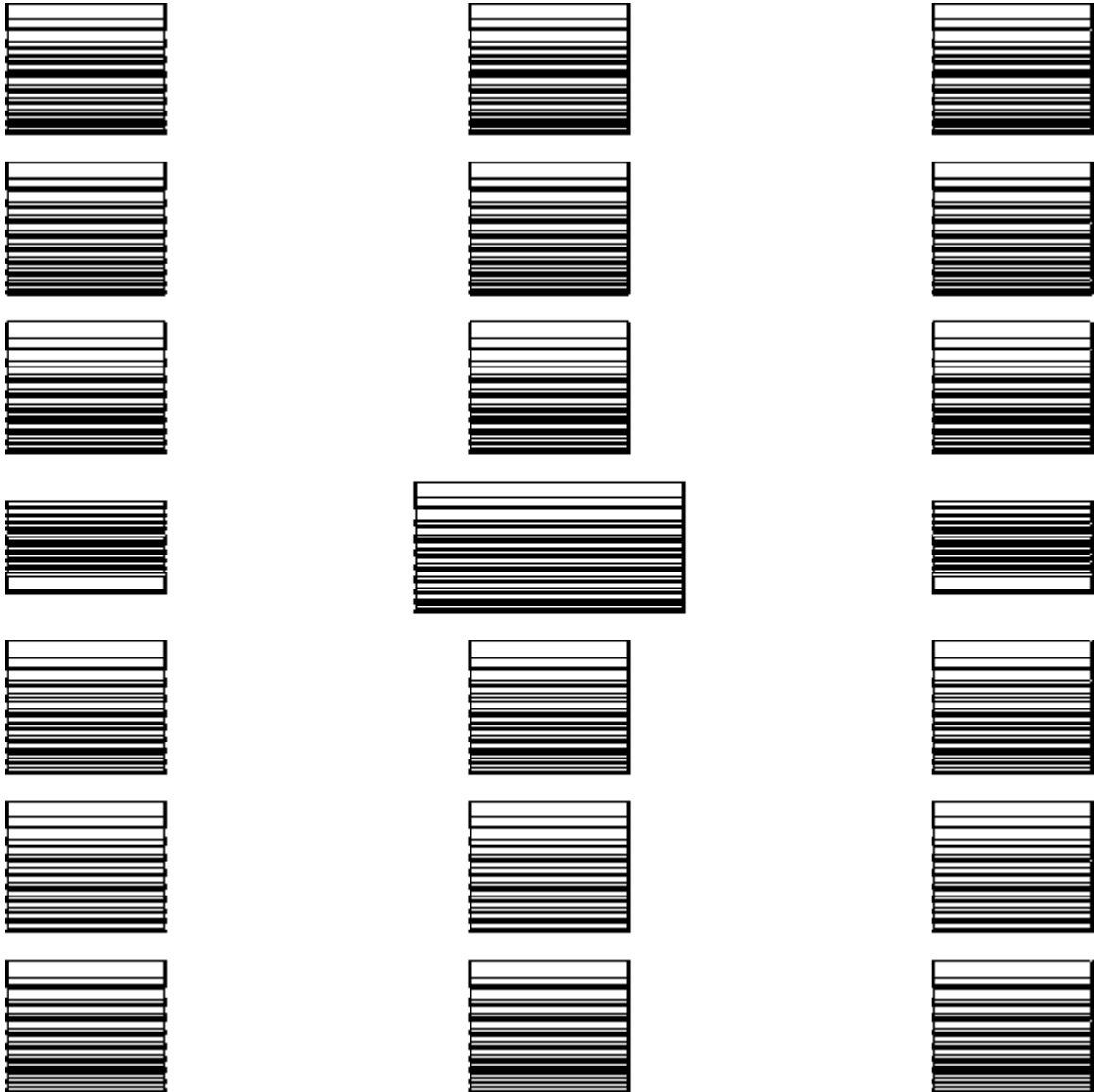


FIGURE 2

Module A

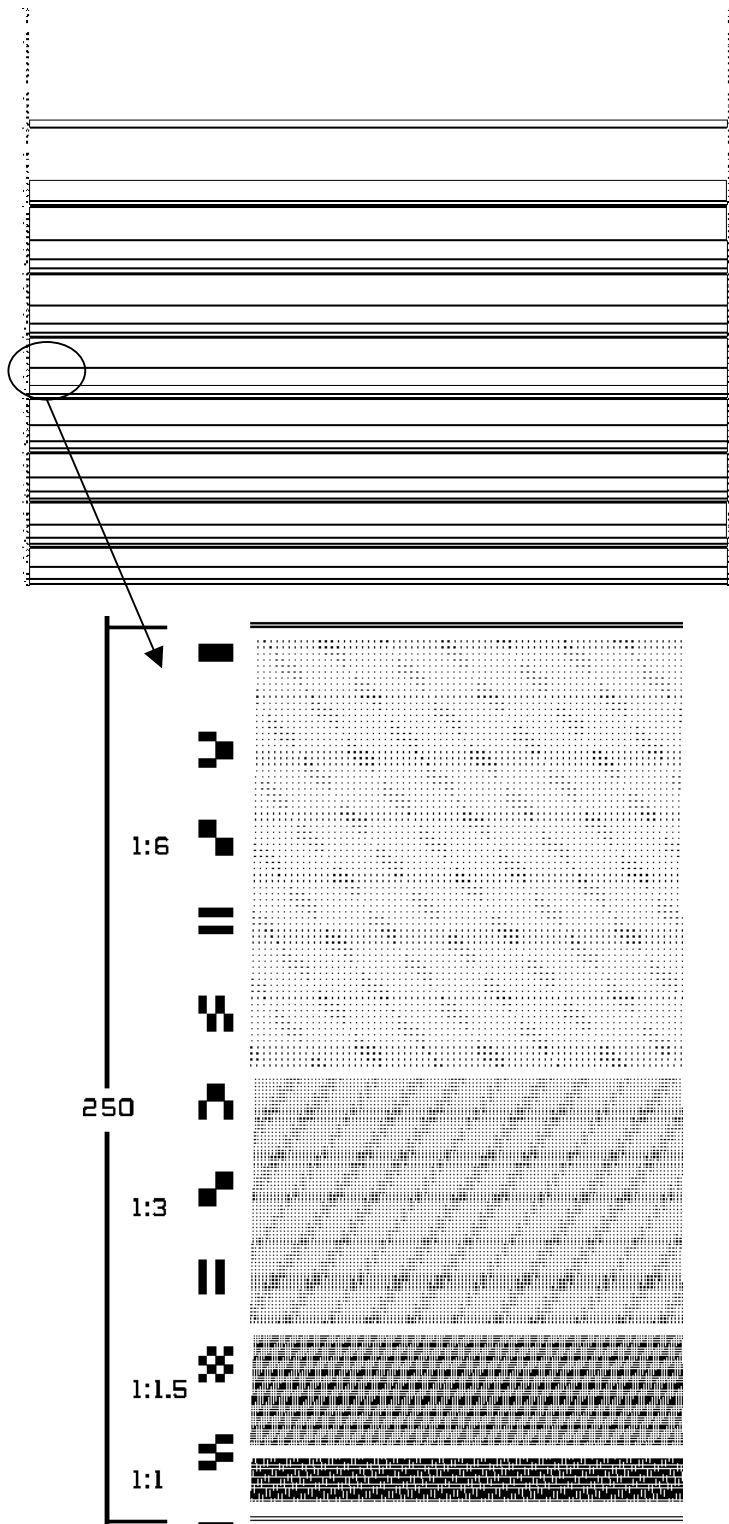


FIGURE 3

# Module C

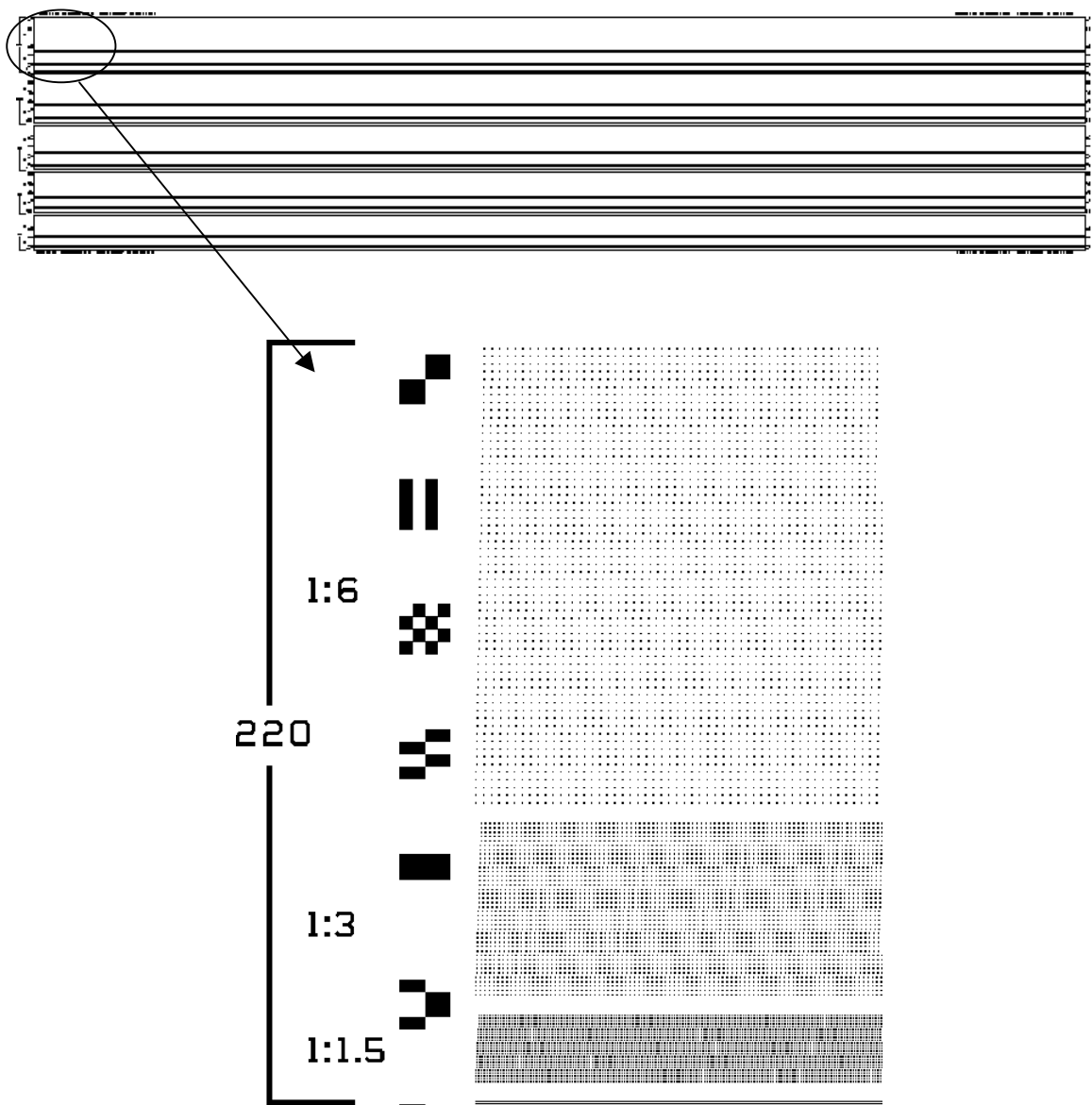


FIGURE 4

Module D

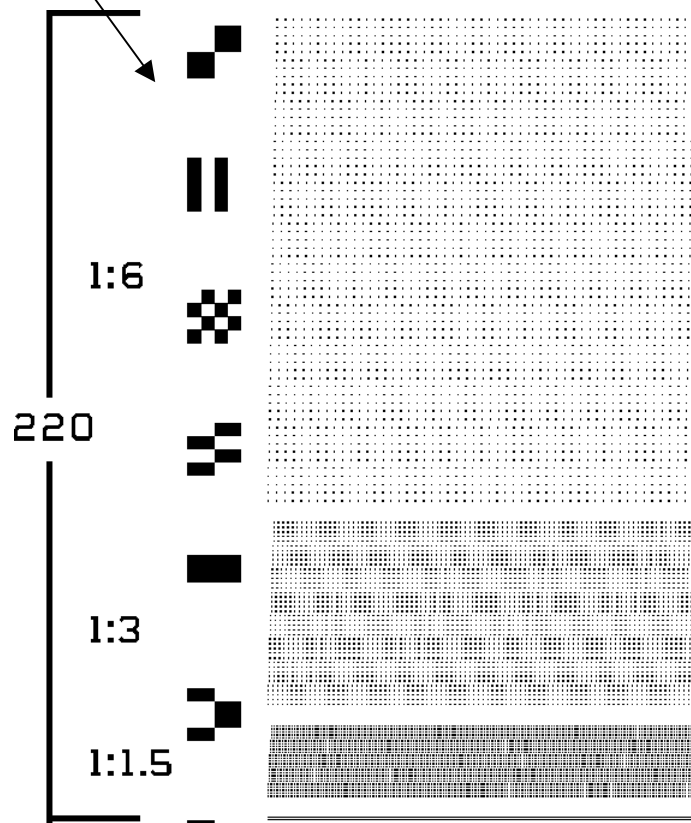
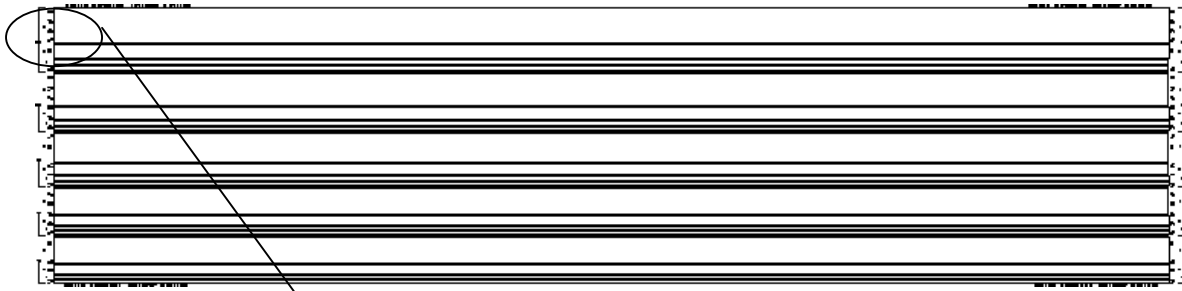


FIGURE 5

# Module E

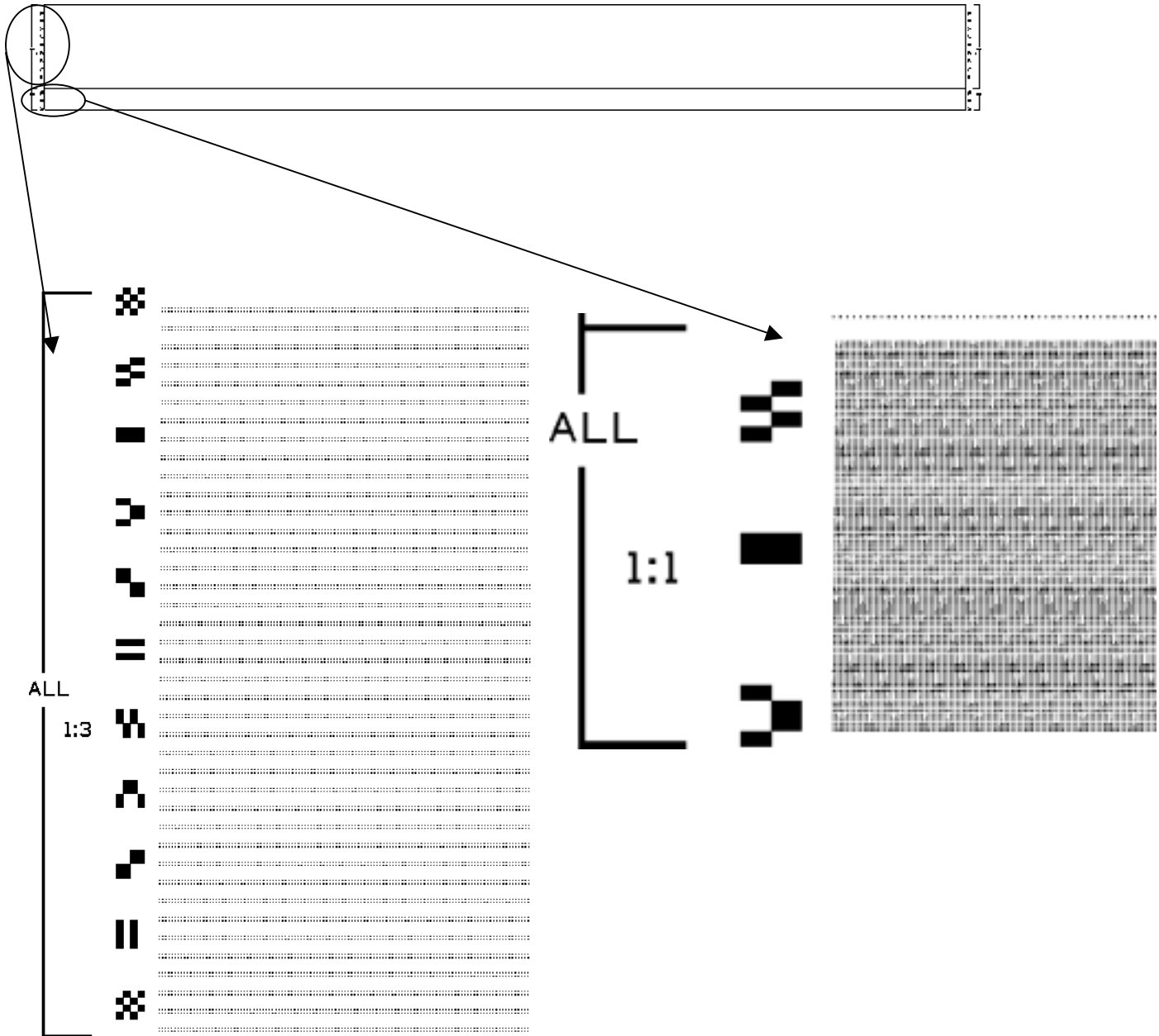


FIGURE 6