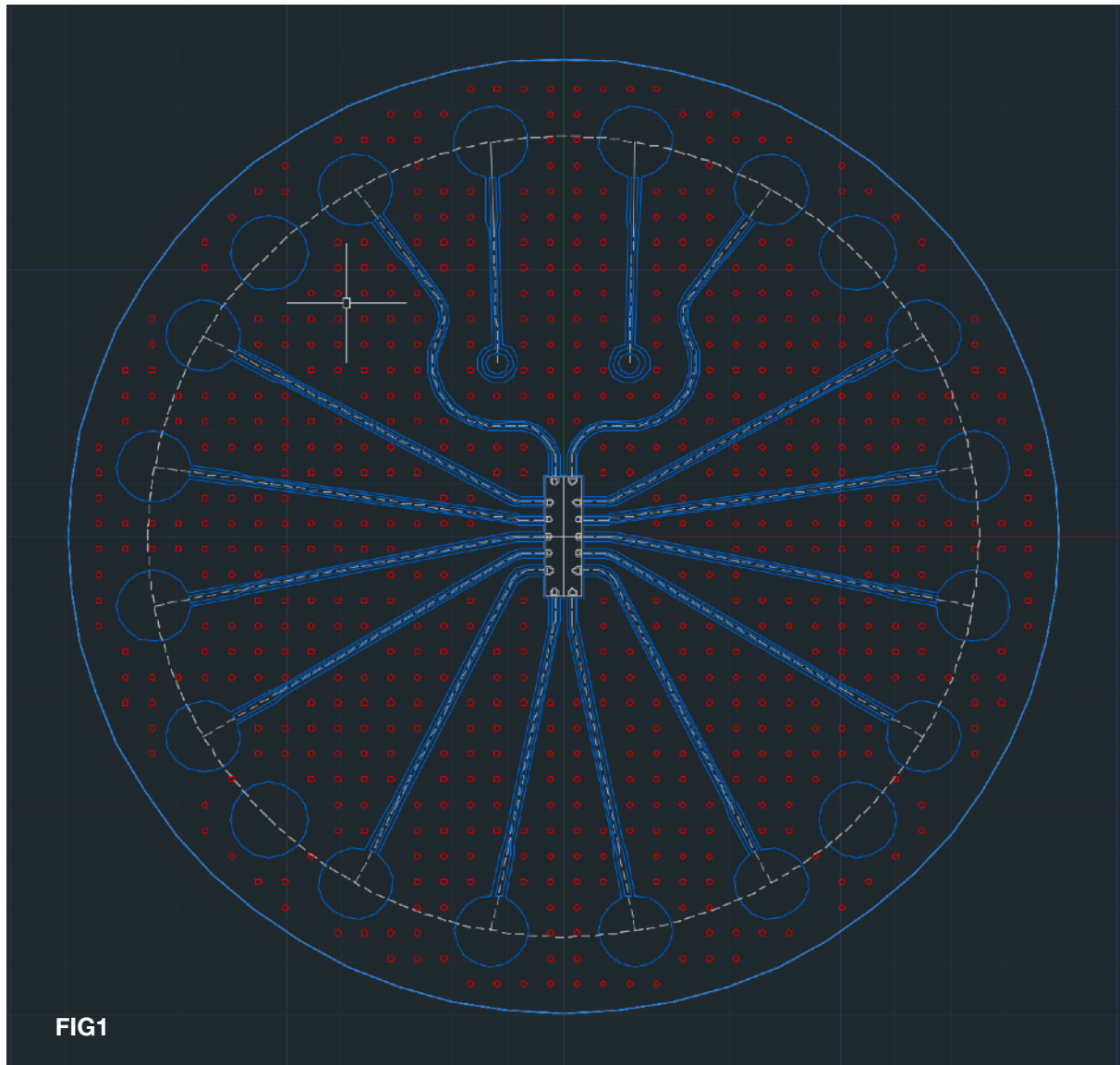
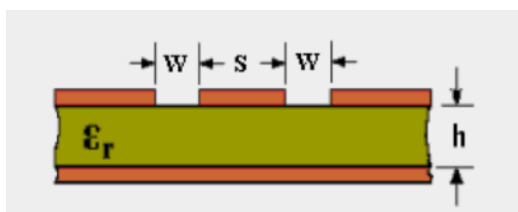


Cold Board



This document provides the description of the PCB which will be used in a Sample Cell at low temperatures.

Fig1 show the general design of the PCB. Blue lines show the path lines for the coplanar waveguides, white rectangle in the center - sample, red circles - via holes. There are 16 lines bringing microwave signals from SMP reverse mount connectors (GPO Vertical Launch PCB Mount A012-P9X-12) to the sample in the center. 4 circular holes at the edge used for screws.



Waveguide line parameters are the following: $s = 0.25$ mm, $w = 0.17$ mm, $h = 0.5$ mm, $\epsilon_r = 11$. This gives waveguide impedance $Z = 50$ Ohm.

FIG2

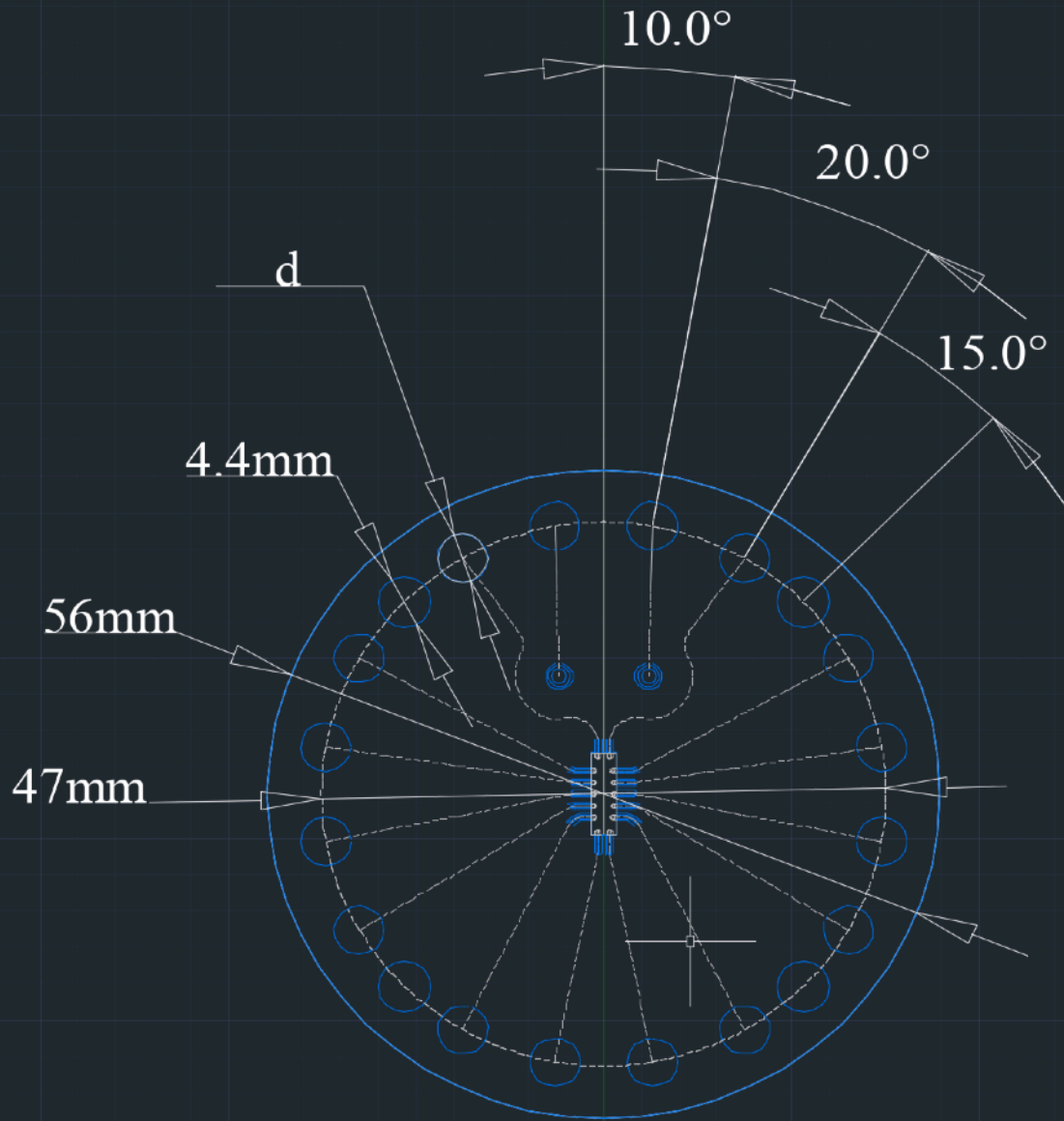


FIG2 shows sizes and position of the holes for SMP connectors. Here $d = 4.191 \text{ mm}$ (SMP diameter) + $2 \times \text{metal thickness}$ (connecting top and bottom metal layers) + 0.5 mm . Here dashed white lines are guides for the coplanar waveguide traces (the detailed position of these lines will be complicated to describe, therefore the decision where exactly to put them in your software is on you).

FIG3

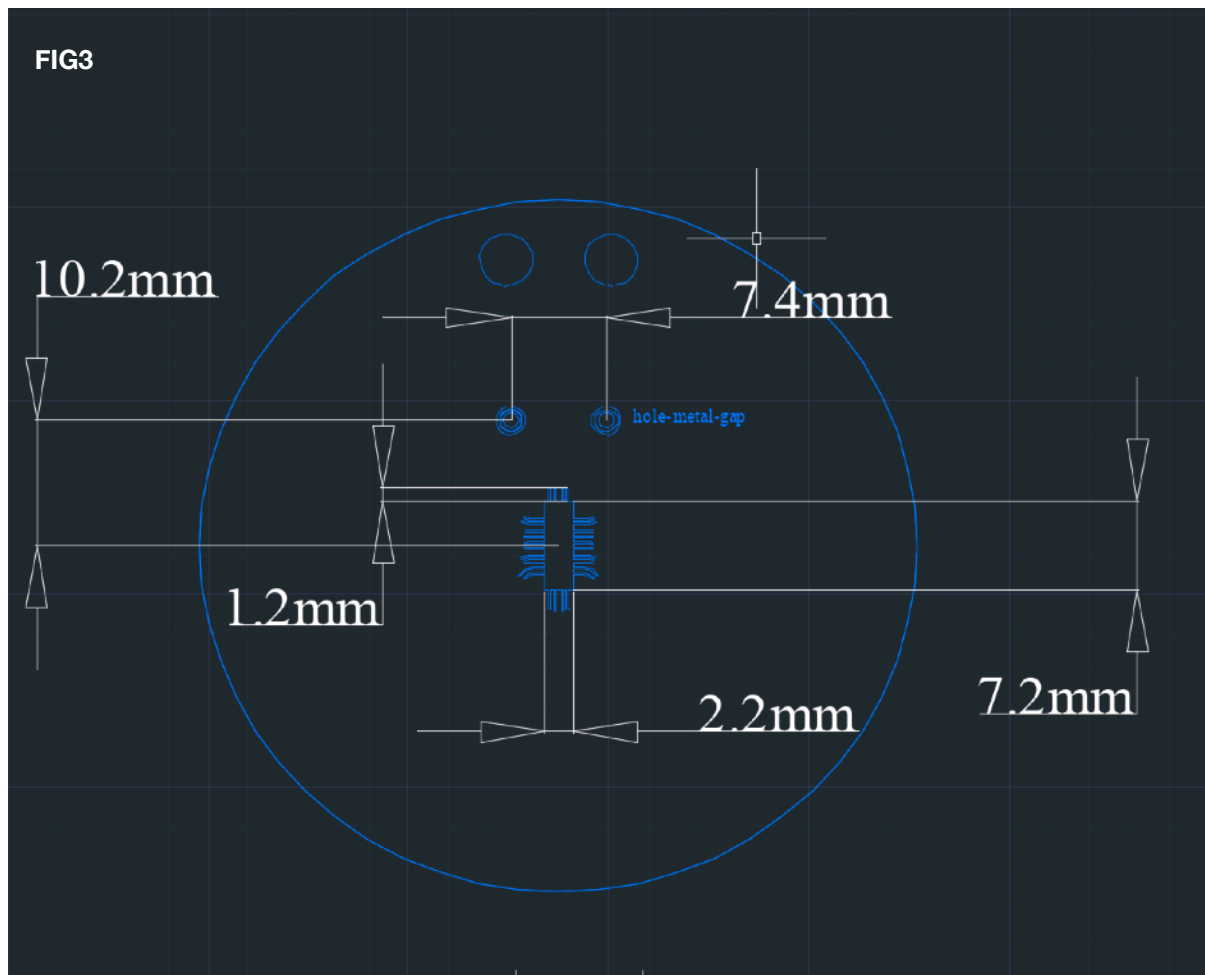


FIG3 show the the cut-out for chip. Coplanar waveguides from the cut-out region are extended straight for 1.2 mm. Two holes located at 10.2 mm from the center are used to solder 2 pin DIP socket. Its structure is hole-metal (connected to central metal of the coplanar waveguide)-insulator-metal(ground). Hole diameter is 1.25 mm.

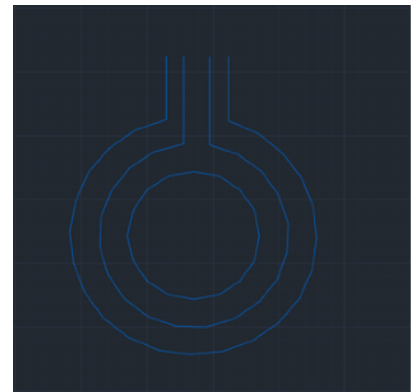


FIG4

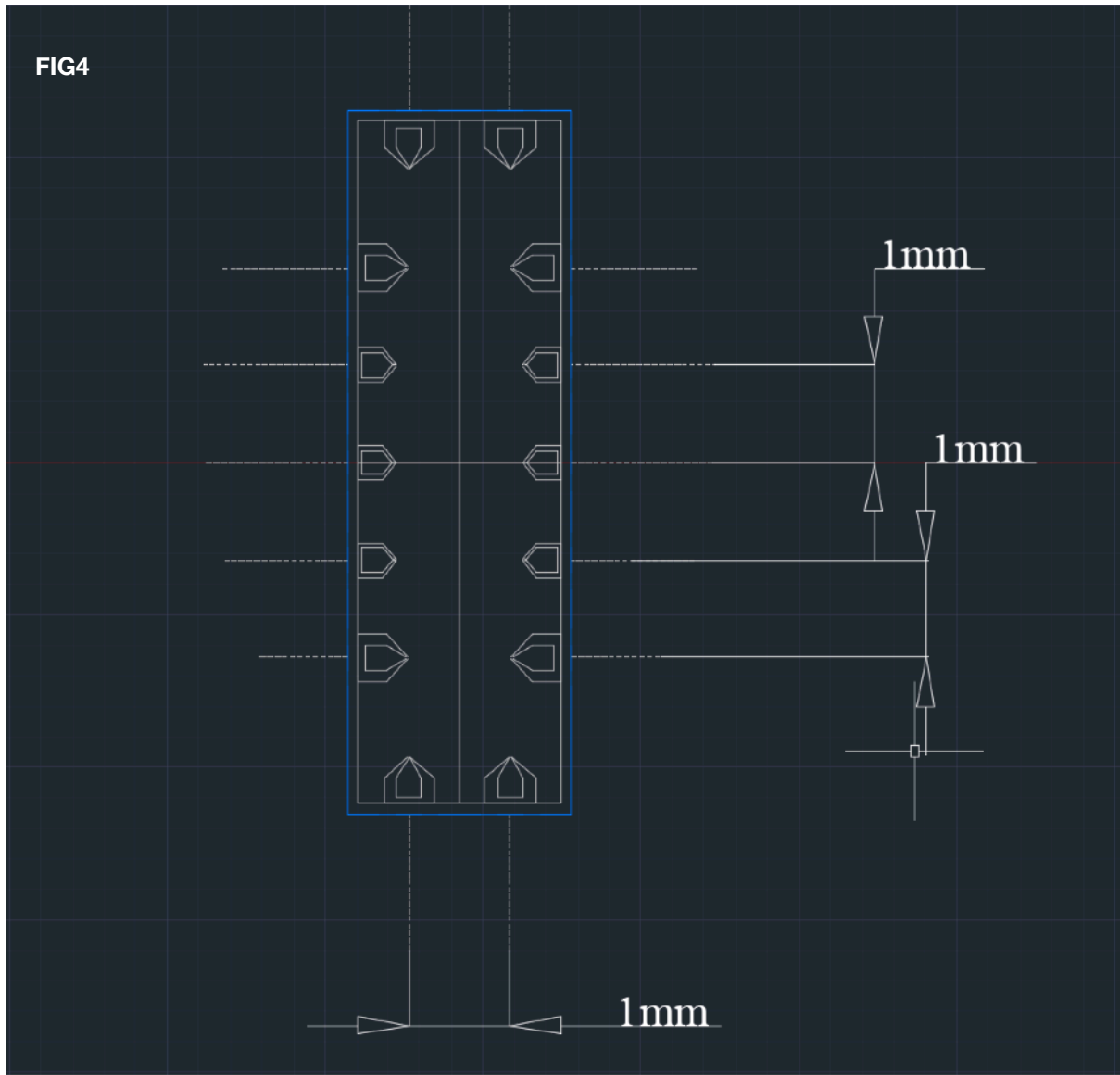


FIG4 show cut-out area and location of the center of coplanar waveguide lines. Cut-out rectangle can have rounded corners with radius < 1.2 mm.

FIG5

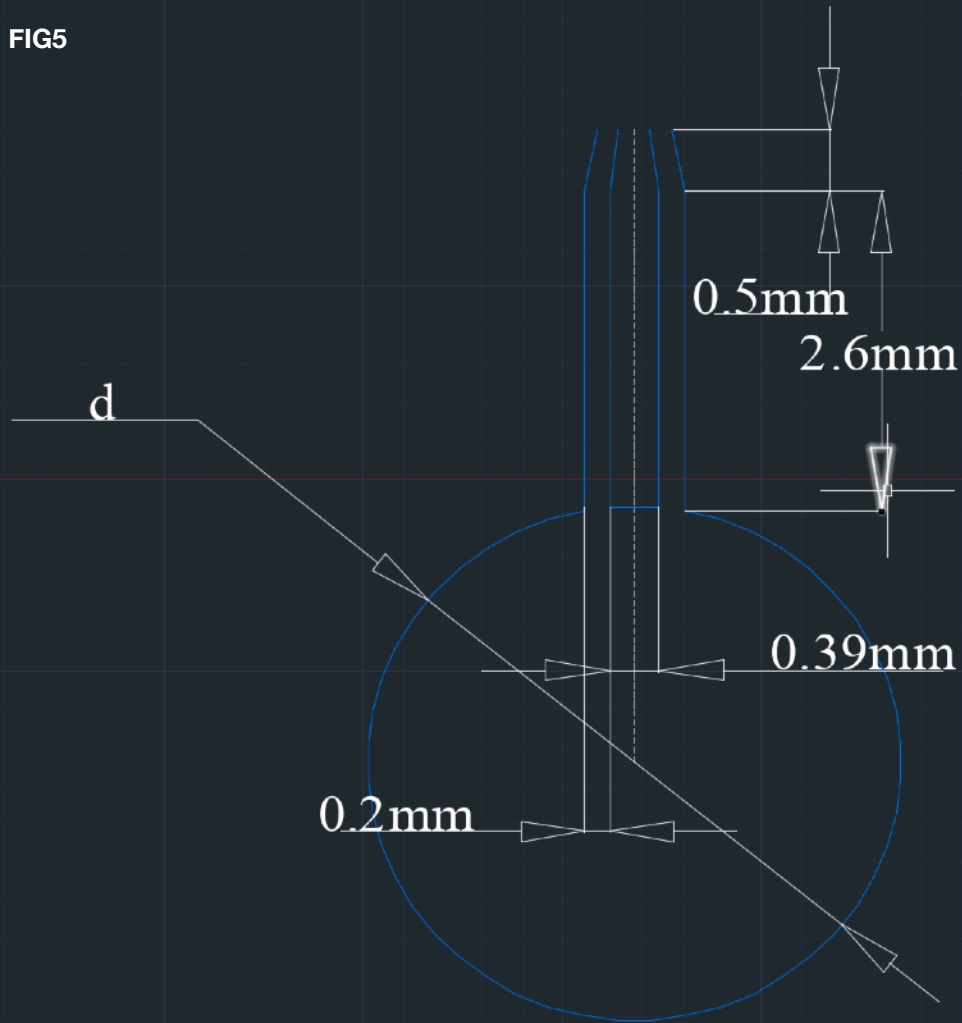


FIG5 shows the hole for the SMP connector and the layout for the coplanar waveguide. There are 16 holes.

FIG6

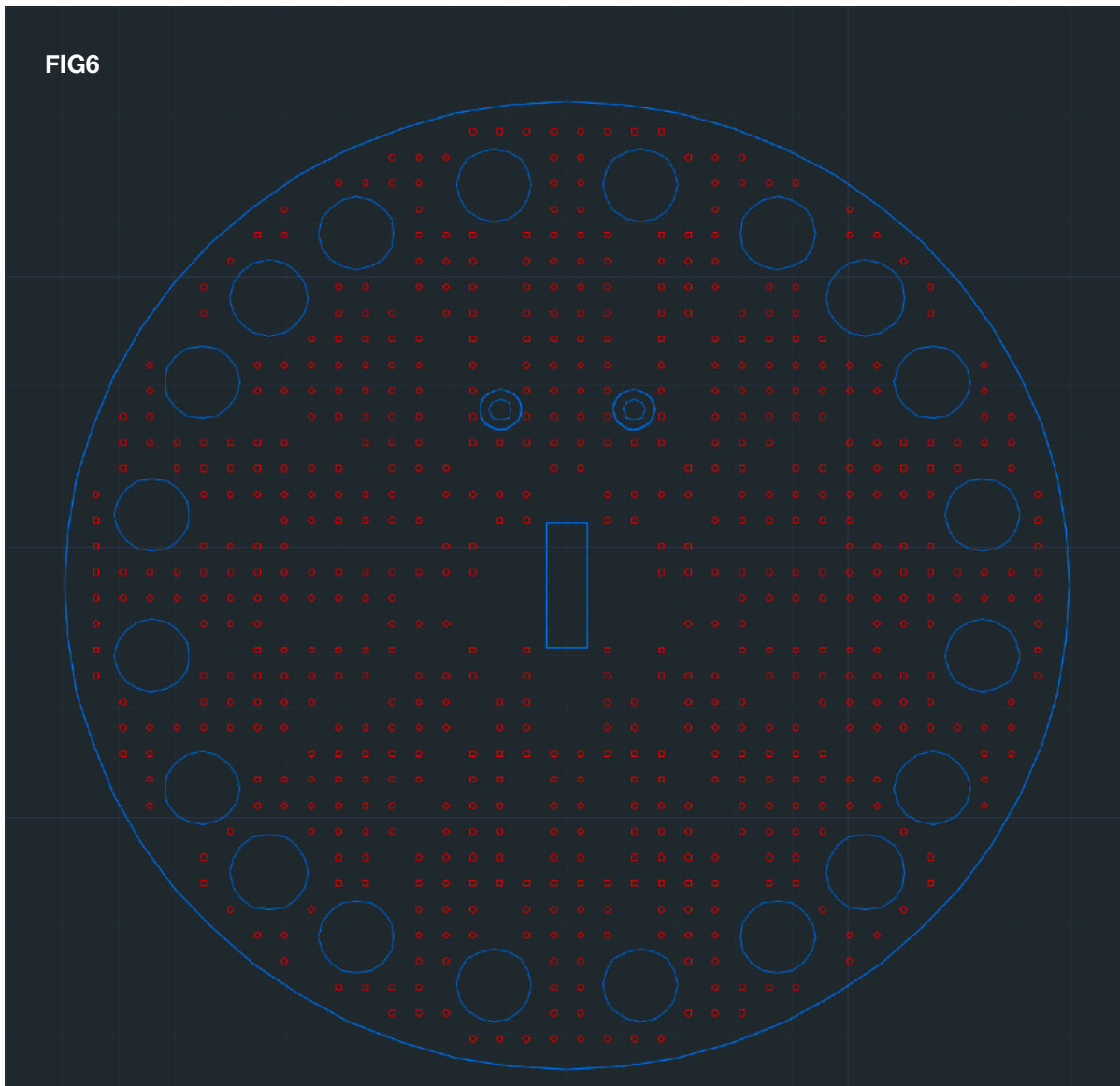


FIG6 shows the bottom side of the PCB. Via holes located in a grid 1.5 mm x 1.5 mm, and diameter is 0.36 mm.