0-Tile Anode Bandwidth Result

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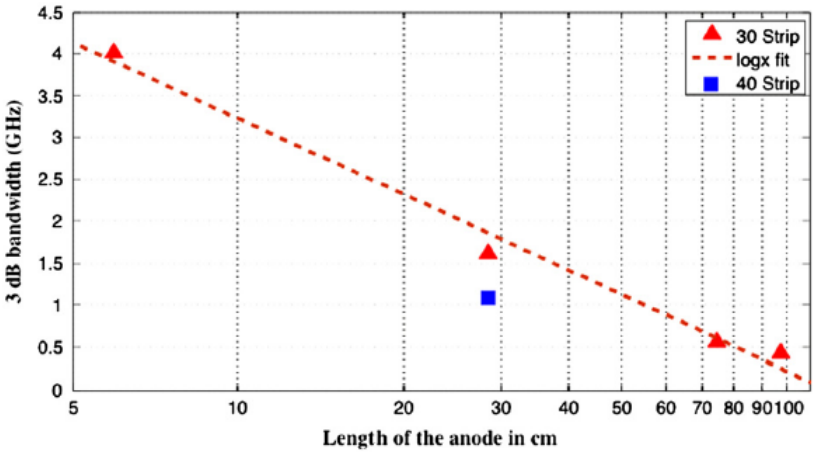
The result in paper ("RP strip-line anodes for Psec large-area MCP-based photodetectors") for the 0-tile anode ("30 Strips Fanout" in the paper) was reproduced. The result in the paper was as follows:



The 0-tile anode (left-most data point) has a $3dB$ bandwidth of $4.1GHz$. I found the 0-tile anode that was used to produce the result, and also made a new one. The results for measuring these two tiles are:

old $4.14GHz$ and $4.13GHz$ (made on two different ports)

new $4.11GHz$ and $4.11GHz$ (made on two different ports)

Some problems occured before this result was obtained. These problems are:

1. The cables used to connect the network analyzer and the anode was not fast enough; this resulted in unstable transmision rate. The cables used to produce the result above are printed with "Mini-Circuits CBL-0.5M-SMSM+ #81128" and "Mini-Circuits CBL-1.5M-SMSM+ #83136". Datasheet online show that they are good for frequencies up to $18GHz$. Cables printed with "Pasternack Enterprises PO BOX 16759 IRVINE, CA 92623-6759 USA SLL-166" did not produce stable results.

2. The PC transition card was not close to the copper ground plate. In obtaining the result above, the new anode was clamped down to ensure that there is no gap between the PC card and the ground. When the clamps are removed, the $3dB$ bandwidth becomes $3.50GHz$, and the graph for transmission rate over frequency is lowered at frequencies $3.75GHz$, $2.27GHz$ and $1.06GHz$.

3. Too much solder was used on the copper strip connectings the two PC cards. For the result above, the amount of solder was kept at minimum: only a small amount of solder was applied on the PC card strip-lines, and no solder was applied above the copper strip. When I added some more solder, the bandwidth went down to $3.78GHz$.