Supplementary Material

The Characteristics of the Second and Third Virtual Cathodes in an Axial Vircator for the Generation of High-Power Microwaves

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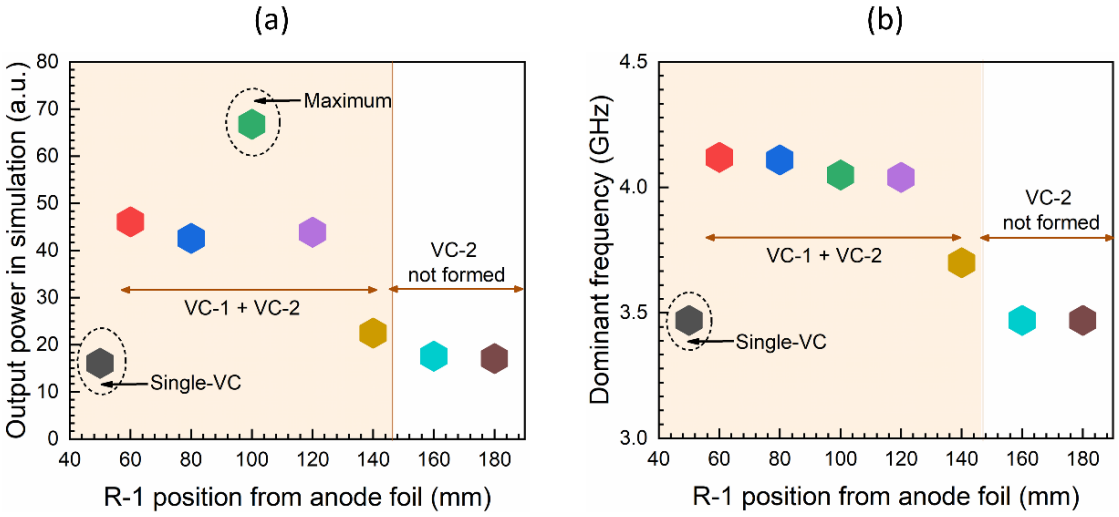

Figure S1. (**a**) The qualitative analysis of the output power when changing the position of R-1 and formed second VC. (**b**) Main oscillating frequency in simulation with single and two-VCs. The power enhancing is maximum with two VCs, when R-1 was 100 mm from anode and the frequency is 4 GHz.

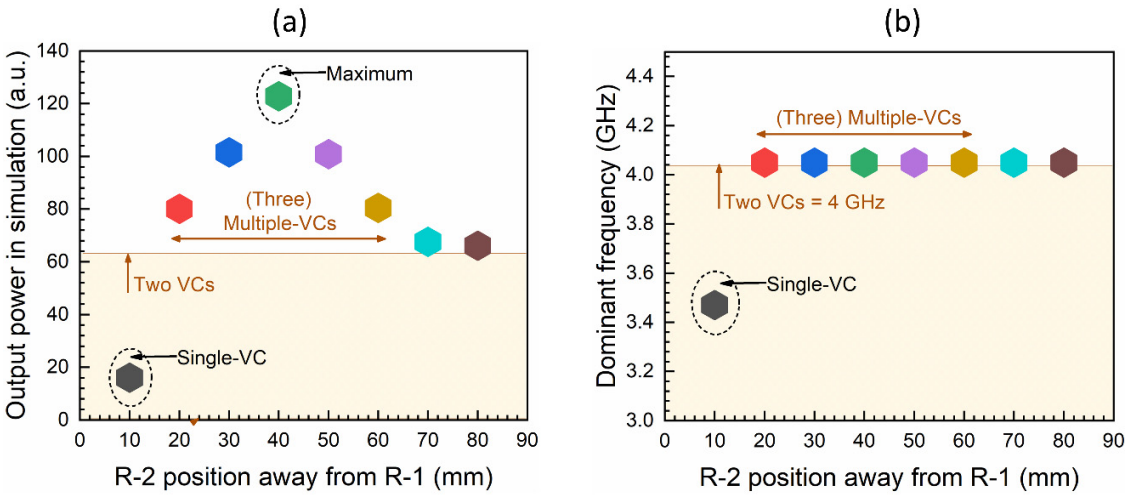

Figure S2. (**a**) The qualitative analysis of the output power when changing the position of R-2 and formed three or multiple-VCs. (**b**) Main oscillating frequency in simulation with single and multiple-VCs. The power enhancing is maximum with two VCs, when R-2 was 40 mm from R-1 and the frequency was determined to be 4 GHz.

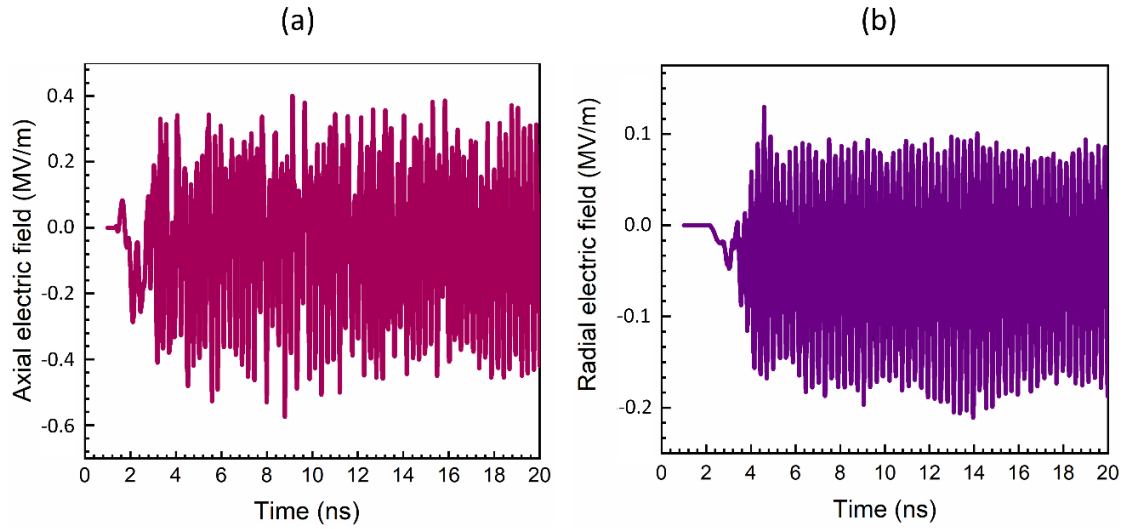

Figure S3. The electric field distribution of conventional VCO obtained in simulation, where, (**a**) axial electric field, and (**b**) radial electric field.