

A through substrate via for millimeter-wave frequencies is shown. The via is formed by copper nanowires connecting the bottom to the top surfaces of a porous alumina membrane. It is shown here that the nanowire-via is simple to fabricate using only six low-cost processing steps. Its dimensions and spacing are only limited by the photolithography process, reaching small sizes, important for high-density interconnections. The nanowire-vias were tested as CPW transitions and characterized up to 70 GHz. The results show low insertion loss of less 0.2 dB per transitions at 70 GHz.