

METAL-FREE MONOLITHIC EPITAXIAL GRAPHENE-ON-DIAMOND PWB

ABSTRACT OF THE DISCLOSURE

5 According to some embodiments, an apparatus includes
a circuit board made of polycrystalline diamond. The
circuit board is formed by deposition of layers of
poly(hydridocarbyne). Each layer has the geometry of a
cross section of the circuit board. The circuit board
10 is further formed by pyrolysis of the layers of
poly(hydridocarbyne) at a temperature greater than or
equal to 100 degrees Celsius and less than or equal to
800 degrees Celsius. The apparatus additionally includes
a plurality of tubes formed within the circuit board. The
15 tubes have a plurality of terminations at one or more
surfaces of the circuit board. Each tube comprises a
layer of graphene that is operable to permit each tube to
conduct electrical current. Each layer of graphene is
formed by thermolysis of the polycrystalline diamond
20 circuit board at a temperature greater than or equal to
900 degrees Celsius. Each tube is substantially hollow
each layer of graphene forms an outer surface of the
respective tube.

25 Figure 7