Claims

1. A waveguide network or waveguide bus comprising:

a substrate having a plurality of integrated circuits disposed thereon; and

a dielectric waveguide configured for transmission of radio frequency signals, on or in the substrate,

wherein the plurality of integrated circuits are coupled via the dielectric waveguide.

2. The waveguide network or waveguide bus according to claim 1, wherein the ~~dielectric waveguide is configured for transmission of radio frequency signals~~ dielectric waveguide includes at least one substantially arrowhead shaped end.

3. The waveguide network or waveguide bus according to any preceding claim, wherein the dielectric waveguide is configured to have a bandwidth of at least 100 GHz.

4. The waveguide network or waveguide bus according to any preceding claim, wherein the dielectric waveguide is arranged to interconnect the plurality of integrated circuits to form a network, the network being configured as a ring topology, a star topology or a bus topology.

5. The waveguide network or waveguide bus according to claim 4, further comprising a network hub disposed on the substrate to centrally interconnect the plurality of integrated circuits, if the network is configured as the tree topology.

6. The waveguide network or waveguide bus according to claim 5, wherein the network hub is a passive waveguide component comprising a waveguide resonator for signal amplification.

7. The waveguide network or waveguide bus according to any of claims 4 to 6, wherein the network is communicably couplable to other equivalently configured networks on the substrate using network bridges.

8. The waveguide network or waveguide bus according to claim 7, wherein each network bridge is a passive waveguide component arranged as an inter-coupled waveguide or an end-coupled waveguide.

9. The waveguide network or waveguide bus according to claims 5 and 7, wherein the dielectric waveguide, network hub and network bridges are formed on the substrate using a fabricating method being one of printing, injection stamping, and etching.

10. The waveguide network or waveguide bus according to any preceding claim, wherein the dielectric waveguide comprises a plurality of discrete sections and at least one junction having a plurality of gaps at where the discrete sections congregate.

11. The waveguide network or waveguide bus according to claim 10, wherein the width of each gap is approximately ten percent of the wavelength of a signal frequency transmitted through the dielectric waveguide.

12. The waveguide network or waveguide bus according to any preceding claim, wherein each integrated circuit is coupled to the dielectric waveguide using a waveguide coupler.

13. The waveguide network or waveguide bus according to claim 12, wherein the waveguide coupler is configured as a planar horn antenna.

14. The waveguide network or waveguide bus according to claim ~~2~~1, wherein the dielectric waveguide is configured to permit the radio frequency signals to be transmitted concurrently and/or serially.

15. The waveguide network or waveguide bus according to any preceding claim, wherein the substrate is a printed circuit board.

16. A waveguide network or waveguide bus comprising:

a printed circuit board having a plurality of integrated circuits disposed thereon; and

a dielectric waveguide configured for transmission of radio frequency signals, on or in the printed circuit board,

wherein the plurality of integrated circuits are coupled via the dielectric waveguide.

17. A dielectric waveguide configured for transmission of radio frequency signals and configured to be attached to the surface of, or integrated into, a substrate, the dielectric waveguide comprising:

a first end arranged to be connectable to an integrated circuit disposed on the substrate; and

a second end arranged to be connectable to another equivalent dielectric waveguide.