CLAIMS

What is claimed is:

1. A dielectric filter antenna, comprising a dielectric antenna and at least one layer of dielectric resonant cavity, wherein the dielectric antenna is located at a top layer, the at least one layer of dielectric resonant cavity is located below the dielectric antenna, energy coupling is performed between the dielectric antenna and a dielectric resonant cavity adjacent to the dielectric antenna, and materials of the dielectric antenna and the dielectric resonant cavity are a ceramic dielectric with a high dielectric constant, wherein the dielectric antenna constitutes a dielectric filter together with the at least one layer of dielectric resonant cavity.

2. The dielectric filter antenna according to claim 1, wherein the energy coupling is performed between the dielectric antenna and the dielectric resonant cavity adjacent to the dielectric antenna by using a slot, a probe, or a surface metal layer disposed on the dielectric antenna and the dielectric resonant cavity adjacent to the dielectric antenna.

3. The dielectric filter antenna according to claim 1 or 2, wherein a first slot is disposed inward from a bottom surface of the dielectric antenna, a second slot is disposed inward from a top surface of the dielectric resonant cavity adjacent to the dielectric antenna, a location of the first slot is aligned with that of the second slot, and the energy coupling is performed between the dielectric antenna and the dielectric resonant cavity adjacent to the dielectric antenna by using the first slot and the second slot.

4. The dielectric filter antenna according to claim 1 or 2, wherein a first probe is disposed inward from a bottom surface of the dielectric antenna, a second probe is disposed inward from a top surface of the dielectric resonant cavity adjacent to the dielectric antenna, a location of the first probe is aligned with that of the second probe, and the energy coupling is performed between the dielectric antenna and the dielectric resonant cavity adjacent to the dielectric antenna by using the first probe and the second probe.

5. The dielectric filter antenna according to claim 4, wherein the first probe and the second probe are both metalized through-holes, and the first probe and the second probe are connected by using a pad.

6. The dielectric filter antenna according to claim 1 or 2, wherein a surface metal layer is disposed on a side surface of the dielectric antenna, a probe is disposed inward from a top surface

of the dielectric resonant cavity adjacent to the dielectric antenna, a location of the surface metal layer is aligned with that of the probe, and the energy coupling is performed between the dielectric antenna and the dielectric resonant cavity adjacent to the dielectric antenna by using the surface metal layer and the probe.

7. The dielectric filter antenna according to claim 6, wherein the probe is a metalized through-hole, and the probe and the surface metal layer are connected by using a pad.

8. The dielectric filter antenna according to any one of claims 1 to 7, wherein the dielectric antenna is a dual-polarized antenna.

9. The dielectric filter antenna according to any one of claims 1 to 8, wherein a part of a surface of the dielectric antenna has metal plating.

10. The dielectric filter antenna according to any one of claims 1 to 9, wherein all surfaces of each dielectric resonant cavity in the at least one layer of dielectric resonant cavity have metal plating.

11. An electronic device, comprising the dielectric filter antenna according to any one of claims 1 to 10.

12. An antenna array, comprising a plurality of dielectric filter antennas according to any one of claims 1 to 10, wherein the plurality of dielectric filter antennas form an array in a horizontal direction and/or a vertical direction.

13. The antenna array according to claim 12, wherein the antenna array is applied to a network device.