CLAIMS

What is claimed is:

1. An acoustic wave device comprising:

a substrate;

a pad formed on the substrate;

a cap formed of an inorganic insulating material, located on the substrate and bonded to the substrate, the cap including a penetration hole formed in a location overlapping with the pad, and defining a cavity between the substrate and the cap;

a terminal filling the penetration hole, coupled to the pad on the substrate, formed of solder, and being surrounded by the cavity in a planar view; and

a functional element formed on an upper surface of the substrate and in the cavity, the functional element exciting an acoustic wave.

2. The acoustic wave device according to claim 1, wherein

the penetration hole has a tapered shape to taper from an upper surface of the cap toward the cavity.

3. The acoustic wave device according to claim 1, wherein

the pad includes a protrusion protruding upward from the upper surface of the substrate, and the terminal is bonded to the protrusion.

4. The acoustic wave device according to claim 3, wherein

the protrusion extends from the upper surface of the substrate to an inside of the penetration hole.

5. The acoustic wave device according to claim 1, wherein

the terminal protrudes upward from an upper surface of the cap.

6. The acoustic wave device according to claim 1, further comprising:

a metal layer continuously formed from an upper surface of the cap to a lower surface of the cap through an inner wall of the penetration hole, wherein

the terminal is bonded to the metal layer.

7. The acoustic wave device according to claim 1, further comprising:

a plated layer covering a surface of the terminal.

8. The acoustic wave device according to claim 1, wherein

the substrate is a piezoelectric substrate, and

the functional element is an IDT.

9. The acoustic wave device according to claim 8, wherein

the cap is formed of a piezoelectric substance or sapphire.

10. The acoustic wave device according to claim 1, wherein

the functional element is a region in which an upper electrode, a piezoelectric thin film, and a lower electrode of a piezoelectric thin film resonator overlap with each other.

11. The acoustic wave device according to claim 10, wherein the substrate is formed of silicon; and the cap is formed of silicon or glass.

12. The acoustic wave device according to claim 1, wherein the substrate and the cap are formed of a same material.