

WHAT IS CLAIMED IS:

1. An antenna with a radiator fixed by fusion, which is incorporated in a terminal, comprising:

5 an antenna part including a 3D-patterned metal radiator which is suitable for band characteristics and has holes for combination with fusion projections, and a carrier having a stepped groove corresponding to the pattern of the metal radiator and the fusion projections formed in the stepped
10 groove, wherein the metal radiator is combined to the stepped groove of the carrier and is fused to the fusion projections; and

an external case which is formed on the antenna part to cover an outer surface of the antenna part.

15

2. The antenna according to claim 1, wherein the metal radiator has the 3D pattern by bending conductive metal deployed through press working.

20 3. The antenna according to claim 1, wherein the depth of the stepped groove of the carrier is equal to or smaller than the thickness of the metal radiator.

4. The antenna according to claim 1, further comprising
25 an additional step which is formed in the vicinity of the

fusion projections within the stepped groove and makes the outer surface flush with the fusion projections.

5 5. The antenna according to claim 1, wherein the carrier is formed by injection molding.

 6. The antenna according to claim 1, wherein the metal radiator is combined to the stepped groove with no gap to prevent the metal radiator from being deformed due to resin
10 intrusion in double injection.

 7. The antenna according to claim 1, wherein the external case is a rear case of the terminal.

15 8. The antenna according to claim 1, wherein the metal radiator is buried between the carrier and the external case.

 9. The antenna according to claim 1, wherein the metal radiator includes a hook-like lock in its planar one side,
20 the carrier includes a jaw corresponding to the lock, and the lock is exposed out of the carrier and the external case by joining of the lock and the jaw such that the lock is electrically connected to a power feeder of the terminal.

25 10. The antenna according to claim 1, wherein each of

the metal radiator and the carrier includes insertion holes in which one or more contact pins are to be inserted, and is electrically connected to a power feeder of the terminal through the one or more contact pins connected to the power
5 feeder of the terminal.

11. The antenna according to claim 1, wherein the metal radiator includes an extension formed by bending a portion of the metal radiator in one side of the metal radiator and
10 is electrically connected to a power feeder of the terminal through the extension.

12. The antenna according to claim 1, wherein the metal radiator is FPCB.
15

13. An antenna with a radiator fixed by fusion, which is incorporated in a terminal, comprising:

an antenna part including a 3D-patterned metal or FPCB radiator which is suitable for band characteristics and has
20 holes for combination with fusion projections, and a carrier having a stepped groove corresponding to the pattern of the metal or FPCB radiator and the fusion projections formed in the stepped groove, wherein the metal or FPCB radiator is combined to the stepped groove of the carrier and is fused
25 to the fusion projections.

14. A method of manufacturing an antenna with a radiator fixed by fusion, which is incorporated in a terminal, comprising the steps of:

forming a 3D-patterned metal radiator which is suitable
5 for band characteristics and has holes for combination with fusion projections;

injecting a carrier having a stepped groove corresponding to the pattern for combination of the radiator and the fusion projections to be inserted in the holes;

10 combining the radiator to the stepped groove of the carrier such that the fusion projections of the carrier are inserted in the holes of the radiator and fusing the fusion projections; and

covering outer surfaces of the combined radiator and
15 carrier with an external case.

15. The method according to claim 14, wherein the step of forming a 3D-patterned metal radiator includes forming a terminal connected to a power feeder of the terminal in one
20 side of the radiator.

16. The method according to claim 14, wherein the metal radiator is FPCB.