Amendments to the Claims:

This listing of claims replaces all prior versions and listings of claims in this application.

Listing of the Claims:

1. (Currently Amended): A smartphone antenna device comprising:

a substrate having a first major surface and a second major surface facing away from the first major surface;

the first major surface comprising a first central portion, a first inner ring portion surrounding the first central portion, and a first outer ring portion surrounding the first inner ring portion;

the second major surface comprising a second central portion overlapping the first central portion, a second inner ring portion surrounding the second central portion and overlapping the first inner ring portion, and a second outer ring portion surrounding the second inner ring portion and overlapping the first outer ring portion;

a first antenna pattern formed on the first major surface and comprising an inner coil formed on the first inner ring portion and an outer coil surrounding the inner coil formed on the first outer ring portion;

a second antenna pattern formed on the second major surface and comprising an inner antenna pattern formed on the second inner ring portion, and an outer antenna pattern formed on the second outer ring portion;

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the inner antenna pattern comprising a plurality of curved lines at least part of which are generally parallel to each other and form a radially-extending inner gap on the second inner ring portion;

the outer antenna pattern comprising a plurality of curved lines at least part of which are generally parallel to each other and form a radially-extending outer gap on the second outer ring portion;

wherein the radially-extending outer gap on the second outer ring portion and the radially-extending inner gap on the second inner ring portion are connected and aligned in a radial direction;

an inner extension line formed on the second major surface such that the inner extension line extends along the radial direction through both the radially-extending inner gap and the radially-extending outer gap;

an outer extension line formed on the second major surface such that the outer extension line extends along the radial direction through the radially-extending outer gap;

wherein the inner extension line and the outer extension line are extending substantially in parallel;

wherein each of the inner extension line and the outer extension line formed on the second major surface overlaps the outer coil formed on the first outer ring portion of the first major surface; and

wherein the smartphone antenna device is configured to provide a wireless power charging antenna comprising ~~form an electrically parallel connection between~~ the inner coil and

the outer coil surrounding the inner coil that are electrically connected in parallel using at least the inner extension line and the outer extension line,

wherein the smartphone antenna device further comprises at least one of a near-field communication (NFC) antenna and a magnetic secure transmission (MST) antenna.

2. (Original): The smartphone antenna device of Claim 1, wherein the smartphone antenna device is configured to form the electrically parallel connection between the inner coil and the outer coil such that the inner coil is electrically connected to both the inner extension line and the outer extension line.

3. (Original): The smartphone antenna device of Claim 1, wherein the smartphone antenna device is configured to form the electrically parallel connection between the inner coil and the outer coil such that the inner extension line electrically contacts an innermost portion of the inner coil.

4. (Original): The smartphone antenna device of Claim 1, wherein the smartphone antenna device is configured to form the electrically parallel connection between the inner coil and the outer coil such that the outer extension line electrically contacts an outermost portion of the inner coil.

5. (Original): The smartphone antenna device of Claim 1, wherein the smartphone antenna device is configured to form the electrically parallel connection between the inner coil and the

outer coil such that the inner coil is electrically interposed between the inner extension line and the outer extension line.

6. (Original): The smartphone antenna device of Claim 1, wherein the smartphone antenna device is configured to form the electrically parallel connection between the inner coil and the outer coil such that the inner extension line electrically contacts an innermost portion of the inner coil, such that the outer extension line electrically contacts an outermost portion of the inner coil, and further such that the inner coil is electrically interposed between the inner extension line and the outer extension line.

7. (Currently Amended): The smartphone antenna device of Claim 1, wherein the smartphone antenna device comprises ~~an~~ the NFC antenna pattern, wherein two NFC antenna extension lines formed on the second major surface such that the two NFC antenna extension lines extend along the radial direction through both the radially-extending inner gap and the radially-extending outer gap, wherein the NFC antenna pattern is formed on the second central portion and connected to the two NFC antenna extension lines.

8. (Original): The smartphone antenna device of Claim 1, wherein the first antenna pattern and the second antenna pattern are electrically connected with each other through a plurality of vias, wherein the inner coil includes a wire line having a width different from that of a wire line of the outer coil, wherein the inner coil has a first number of turns that is greater than that of the outer coil.

9. (Original): A smartphone comprising:

a display device comprising a display surface;

a rear cover comprising a rear surface facing away from the display surface;

a battery placed between the display device and the rear cover; and

the smartphone antenna device of Claim 1,

wherein the substrate is in the form of a flexible printed circuit board and placed between the battery and the rear cover, wherein at least one of the inner coil and the outer coil are configured for wireless battery charging.

10. (Original): The smartphone of Claim 9, wherein the smartphone antenna device is configured to form the electrically parallel connection between the inner coil and the outer coil such that the inner extension line electrically contacts an innermost portion of the inner coil, such that the outer extension line electrically contacts an outermost portion of the inner coil, and further such that the inner coil is electrically interposed between the inner extension line and the outer extension line.

11. (Original): A smartphone antenna device comprising:

an antenna substrate having a first major surface and a second major surface facing away from the first major surface;

a first antenna pattern formed on the first major surface and comprising an inner conductive coil and an outer conductive coil surrounding the inner conductive coil, wherein the first major surface comprises a first central area surrounded by the inner conductive coil;

a second antenna pattern formed on the second major surface and comprising an inner pattern, an outer pattern, and an extension pattern,

the inner pattern comprising a plurality of curved conductive lines and defining a radially-extending inner channel, wherein the plurality of curved conductive lines of the inner pattern does not extend into the radially-extending inner channel, wherein at least part of the curved conductive lines of the inner pattern overlaps the inner conductive coil formed on the first major surface and is electrically connected to the inner conductive coil through vias;

the outer pattern comprising a plurality of curved conductive lines and defining a radially-extending outer channel, wherein the plurality of curved conductive lines of the outer pattern generally surrounds the plurality of curved conductive lines of the inner pattern and does not extend into the radially-extending outer channel, wherein at least part of the curved conductive lines of the outer pattern overlaps the outer conductive coil formed on the first major surface and is electrically connected to the outer conductive coil through vias; and

the extension pattern comprising an inner conductive extension line and an outer conductive extension line, wherein the inner conductive extension line extends through the radially-extending outer channel and through at least part of the radially-extending inner channel, whereas the outer conductive extension line extends through at least part of the radially-extending outer channel but does not extend through the radially-extending inner channel,

wherein the smartphone antenna device is configured to form an electrically parallel connection between the inner conductive coil and the outer conductive coil using at least the inner conductive extension line and the outer conductive extension line.

12. (Original): The smartphone antenna device of Claim 11, wherein at least some of the plurality of curved conductive lines of the inner pattern extend generally parallel to one another, wherein at least some of the plurality of curved conductive lines of the outer pattern extend generally parallel to one another.

13. (Original): The smartphone antenna device of Claim 11, wherein the outer conductive extension line extends substantially straight in the radially-extending outer channel, wherein the inner conductive extension line extends substantially straight in both the radially-extending inner channel and the radially-extending outer channel.

14. (Original): The smartphone antenna device of Claim 11, wherein the outer conductive extension line is electrically connected to the outer conductive coil and also electrically connected to a first contact terminal, wherein the inner conductive extension line is electrically connected to the inner conductive coil and also electrically connected to a second contact terminal.

15. (Original): The smartphone antenna device of Claim 11, wherein the smartphone antenna device is configured to form the electrically parallel connection between the inner conductive

coil and the outer conductive coil such that the inner conductive coil is electrically connected to both the inner conductive extension line and the outer conductive extension line.

16. (Original): The smartphone antenna device of Claim 11, wherein the smartphone antenna device is configured to form the electrically parallel connection between the inner conductive coil and the outer conductive coil such that the inner conductive extension line electrically contacts an innermost portion of the inner conductive coil.

17. (Original): The smartphone antenna device of Claim 11, wherein the smartphone antenna device is configured to form the electrically parallel connection between the inner conductive coil and the outer conductive coil such that the outer conductive extension line electrically contacts an outermost portion of the inner conductive coil.

18. (Original): The smartphone antenna device of Claim 11, wherein the smartphone antenna device is configured to form the electrically parallel connection between the inner conductive coil and the outer conductive coil such that the inner conductive coil is electrically interposed between the inner conductive extension line and the outer conductive extension line.

19. (Original): The smartphone antenna device of Claim 11, wherein the smartphone antenna device is configured to form the electrically parallel connection between the inner coil and the outer coil such that the inner extension line electrically contacts an innermost portion of the inner coil, such that the outer extension line electrically contacts an outermost portion of the inner coil,

and further such that the inner coil is electrically interposed between the inner extension line and the outer extension line.

20. (Original): The smartphone antenna device of Claim 11, wherein the inner conductive coil has a first number of turns between two ends thereof, wherein the outer conductive coil has a second number of turns between two ends thereof, wherein the first number is greater than the second number.

21. (Original): The smartphone antenna device of Claim 11, wherein the inner conductive coil has, at least in part, a first line width, wherein the outer conductive coil has, at least in part, a second line width, wherein the second line width is greater than the first line width, wherein the inner conductive coil has a first number of turns between two ends thereof, wherein the outer conductive coil has a second number of turns between two ends thereof, wherein the first number is greater than the second number.

22. (Original): The smartphone antenna device of Claim 11, wherein the inner conductive coil has, at least in part, a first line width, wherein the outer conductive coil has, at least in part, a second line width, wherein the second line width is greater than the first line width.

23. (Original): The smartphone antenna device of Claim 11, wherein the radially-extending outer channel is wider than the radially-extending inner channel, wherein the radially-extending outer channel and the radially-extending inner channel are connected and aligned in a radial direction.

24. (Original): The smartphone antenna device of Claim 11, wherein the inner conductive coil is hereinafter referred to as a first coil, wherein the outer conductive coil is hereinafter referred to as a second coil, wherein the first coil comprises a first inner end portion and a first outer end portion, wherein the second coil comprises a second inner end portion and a second outer end portion, wherein one of the first inner end portion and the first outer end portion is electrically coupled to one of the second inner end portion and the second outer end portion to provide the electrically parallel connection between the first coil and the second coil.

25. (Original): The smartphone antenna device of Claim 24, wherein one of the first inner end portion and the first outer end portion is coupled to one of the second inner end portion and the second outer end portion to provide the electrically parallel connection, wherein the other one of the first inner end portion and the first outer end portion is coupled to the other one of the second inner end portion and the second outer end portion to provide the electrically parallel connection.

26. (Original): The smartphone antenna device of Claim 11, further comprising another pattern formed on the second major surface and generally surrounding both the inner pattern and the outer pattern.

27. (Original): A smartphone comprising:

a display device comprising a display surface;

a rear cover comprising a rear surface facing away from the display surface;

a battery placed between the display device and the rear cover; and

the smartphone antenna device of Claim 11,

wherein the antenna substrate is in the form of a flexible printed circuit board and placed between the battery and the rear cover, wherein at least one of the inner conductive coil and the outer conductive coil are configured for wireless battery charging.

28. (Original): The smartphone of Claim 27, wherein the smartphone antenna device is configured to form the electrically parallel connection between the inner coil and the outer coil such that the inner extension line electrically contacts an innermost portion of the inner coil, such that the outer extension line electrically contacts an outermost portion of the inner coil, and further such that the inner coil is electrically interposed between the inner extension line and the outer extension line.

29. (New): The smartphone antenna device of Claim 1, wherein the smartphone antenna device comprises the MST antenna comprising an MST antenna pattern formed on the second major surface.

30. (New): The smartphone antenna device of Claim 29, wherein the MST antenna pattern comprises an MST coil formed on the second major surface.

31. (New): The smartphone antenna device of Claim 1, wherein the smartphone antenna device comprises the MST antenna comprising an MST antenna pattern formed on the first major surface.

32. (New): The smartphone antenna device of Claim 31, wherein the MST antenna pattern comprises an MST coil formed on the first major surface.

33. (New): The smartphone antenna device of Claim 11, wherein the smartphone antenna device comprises the MST antenna comprising an MST antenna pattern formed on the second major surface.

34. (New): The smartphone antenna device of Claim 33, wherein the MST antenna pattern comprises an MST coil formed on the second major surface.

35. (New): The smartphone antenna device of Claim 11, wherein the smartphone antenna device comprises the MST antenna comprising an MST antenna pattern formed on the first major surface.

36. (New): The smartphone antenna device of Claim 33, wherein the MST antenna pattern comprises an MST coil formed on the first major surface.