



(12) **Patent Application Publication**
Nafe et al.

(10) **Pub. No.:** US 2026/0074413 A1
(43) **Pub. Date:** Mar. 12, 2026

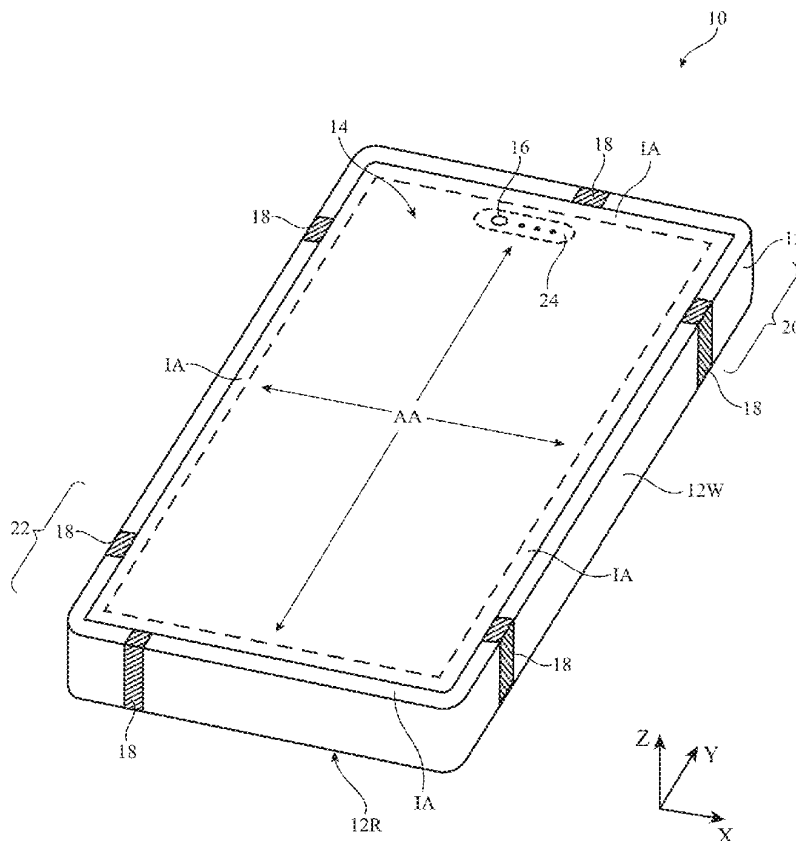
Publication Classification

(51) **Int. Cl.**
H01Q 1/24 (2006.01)
H01Q 1/48 (2006.01)
H01Q 5/30 (2015.01)
H01Q 9/04 (2006.01)

(52) **U.S. Cl.**
CPC *H01Q 1/243* (2013.01); *H01Q 1/48*
(2013.01); *H01Q 5/30* (2015.01); *H01Q*
9/0421 (2013.01); *H01Q 9/0442* (2013.01)

(57) **ABSTRACT**

An electronic device may be provided with conductive sidewalls and first and second antennas. A gap may divide the sidewalls into first and second segments separated from ground by a slot. The first antenna may be fed using a first feed coupled across the gap. The second antenna may be fed using a second feed coupled across the slot. The second antenna may include a return path coupled between a ground terminal of the first feed and the ground. The first antenna may include tuners coupled between the second segment and the ground. The first and second segments may form an asymmetric dipole that conveys signals for the first feed in a first band. The second segment may form an element that conveys signals for the first feed in a second band. The first segment may form an element that conveys signals for the second feed in a third band.





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(19) **United States**

(12) **Patent Application Publication**
KO et al.

(10) **Pub. No.: US 2026/0074420 A1**

(43) **Pub. Date: Mar. 12, 2026**

(54) **ANTENNA DEVICE**

Publication Classification

(71) Applicants: **INVENTEC (PUDONG)**
TECHNOLOGY CORPORATION,
Shanghai (CN); **INVENTEC**
CORPORATION, Taipei City (TW)

(51) **Int. Cl.**
H01Q 1/52 (2006.01)
H01Q 1/38 (2006.01)
H01Q 1/48 (2006.01)

(72) Inventors: **Chun-An KO**, Taipei City (TW);
Wen-Lin GAO, Taipei City (TW); **Yu**
Shu TAI, Taipei City (TW);
Hsin-Hung LIN, Taipei City (TW);
Wei-Chen CHENG, Taipei City (TW)

(52) **U.S. Cl.**
CPC **H01Q 1/521** (2013.01); **H01Q 1/38**
(2013.01); **H01Q 1/48** (2013.01)

(73) Assignees: **INVENTEC (PUDONG)**
TECHNOLOGY CORPORATION,
Shanghai (CN); **INVENTEC**
CORPORATION, Taipei City (TW)

(57) **ABSTRACT**

An antenna device includes a substrate, an excitation component and a low frequency matching component. The substrate has a first surface and a second surface facing away from each other. The excitation component is disposed on the first surface. The excitation component includes two first excitation portions and a second excitation portion spaced apart from each other. The two first excitation portions are symmetrical. Each of the two first excitation portions includes a first excitation section, a second excitation section, a third excitation section, a fourth excitation section and a fifth excitation section connected to each other. The fourth excitation sections of the two first excitation portions and the second excitation portion are adjacent to different sides of the substrate. A low frequency matching component is disposed on the second surface, and is spaced apart from sides of the substrate.

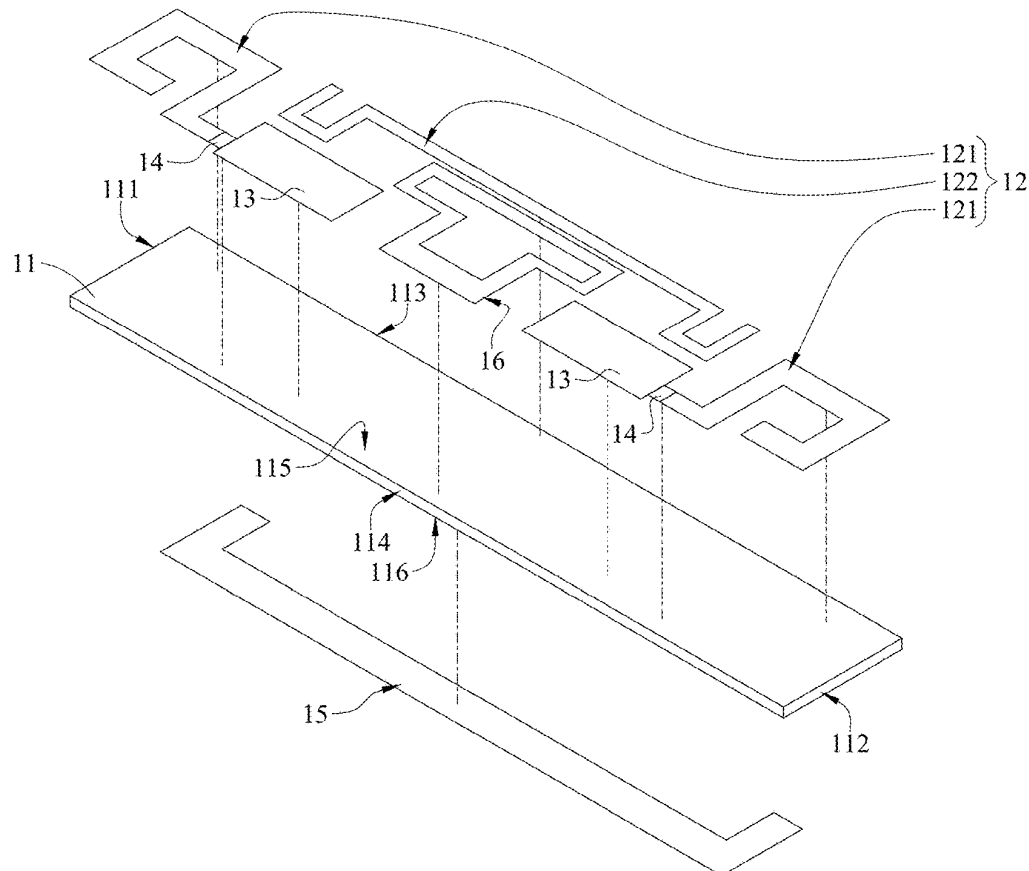
(21) Appl. No.: **18/984,305**

(22) Filed: **Dec. 17, 2024**

(30) **Foreign Application Priority Data**

Sep. 12, 2024 (CN) 202411281476.7

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(19) **United States**

(12) **Patent Application Publication**
LEE et al.

(10) **Pub. No.: US 2026/0074422 A1**

(43) **Pub. Date: Mar. 12, 2026**

(54) **MULTI-FOLDABLE ELECTRONIC DEVICE INCLUDING ANTENNA**

(52) **U.S. Cl.**

CPC **H01Q 5/378** (2015.01); **G06F 1/1618** (2013.01); **H01Q 3/02** (2013.01)

(71) Applicant: **Samsung Electronics Co., Ltd.**,
Suwon-si (KR)

(72) Inventors: **Minkyung LEE**, Suwon-si (KR);
Kyungmoon SEOL, Suwon-si (KR);
Cheolhong SON, Suwon-si (KR);
Kyihyun JANG, Suwon-si (KR);
Jaebong CHUN, Suwon-si (KR)

(57)

ABSTRACT

A multi-foldable electronic device includes: a multi-foldable housing including a first housing, a second housing, a third housing between the first housing and the second housing, a first hinge rotatably connecting the first housing and the third housing, and a second hinge rotatably connecting the second housing and the third housing, wherein in a folded state of the multi-foldable electronic device; a flexible display module including a first display area disposed in the first housing, a third display area extending from the first housing and disposed in the third housing, and a second display area extending from the third display area and disposed in the second housing; at least one antenna radiator configured to transmit and/or receive signals of a designated frequency band; and a metal layer positioned in the second housing and configured to adjust frequency characteristics of the at least one antenna radiator in the folded state of the multi-foldable electronic device, wherein in the folded state of the multi-foldable electronic device, the metal layer is positioned between the first display area of the flexible display module and a ground positioned in the second housing, and is electrically connected to the ground.

(21) Appl. No.: **19/380,463**

(22) Filed: **Nov. 5, 2025**

Related U.S. Application Data

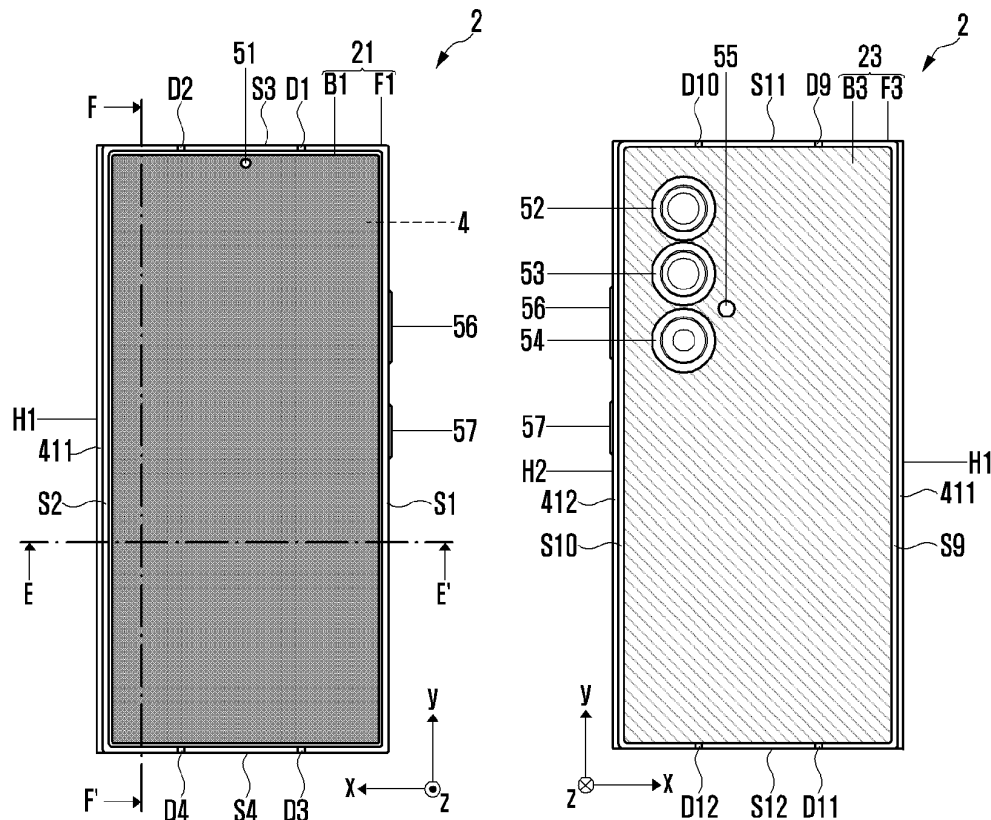
(63) Continuation of application No. PCT/KR2025/014010, filed on Sep. 9, 2025.

Foreign Application Priority Data

Sep. 9, 2024 (KR) 10-2024-0122598
Jan. 31, 2025 (KR) 10-2025-0012613

Publication Classification

(51) **Int. Cl.**
H01Q 5/378 (2015.01)
G06F 1/16 (2006.01)
H01Q 3/02 (2006.01)





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(19) **United States**

(12) **Patent Application Publication**
SUN et al.

(10) **Pub. No.: US 2026/0074430 A1**

(43) **Pub. Date: Mar. 12, 2026**

(54) **ANTENNA STRUCTURE AND ELECTRONIC
DEVICE**

Publication Classification

(71) Applicant: **WNC Corporation**, Hsinchu (TW)

(72) Inventors: **Tzu-Kuan SUN**, Hsinchu (TW);
Ching-Wen CHEN, Hsinchu (TW);
Jen-Chao LU, Hsinchu (TW);
Shih-Kai HSU, Hsinchu (TW)

(51) **Int. Cl.**
H01Q 13/10 (2006.01)
H01Q 1/22 (2006.01)
H01Q 9/30 (2006.01)
H01Q 19/00 (2006.01)

(52) **U.S. Cl.**
CPC **H01Q 13/106** (2013.01); **H01Q 1/2266**
(2013.01); **H01Q 9/30** (2013.01); **H01Q**
19/005 (2013.01)

(21) Appl. No.: **19/312,492**

(22) Filed: **Aug. 28, 2025**

Related U.S. Application Data

(60) Provisional application No. 63/691,498, filed on Sep.
6, 2024.

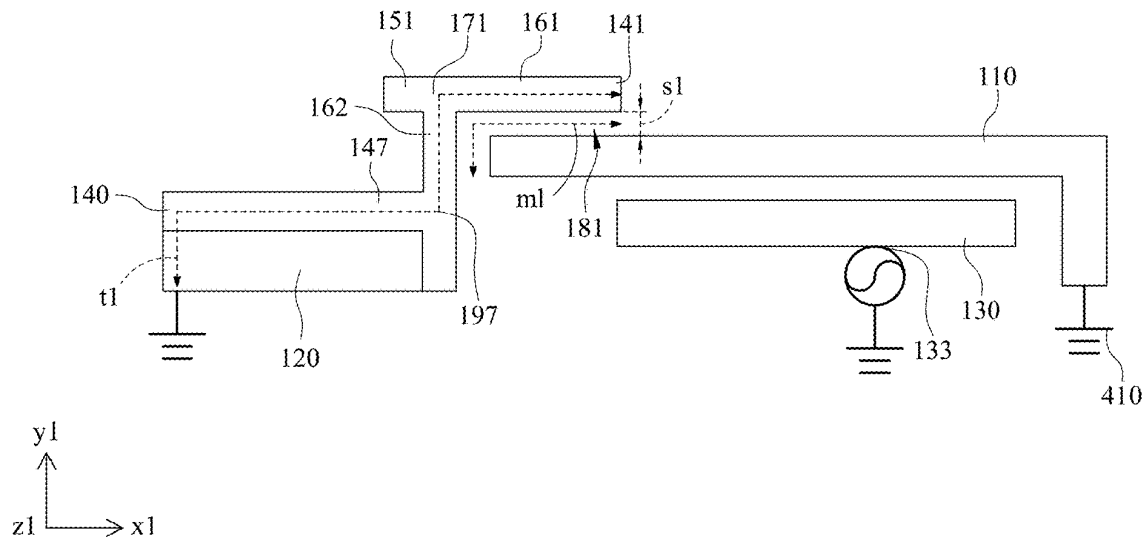
Foreign Application Priority Data

Jan. 22, 2025 (TW) 114102887

(57) **ABSTRACT**

An antenna structure includes a signal unit, a first ground unit, a second ground unit and a parasitic unit. The signal unit is configured for disposing a feed port thereon. The first ground unit is disposed correspondingly to the signal unit and configured to be connected to a system ground. The second ground unit is separated from the first ground unit and configured to be connected to the system ground. The parasitic unit is adjacent to the second ground unit and configured to be coupled to the first ground unit. The signal unit, the first ground unit, the second ground unit and the parasitic unit are made of the same or different conductive materials.

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(19) **United States**

(12) **Patent Application Publication**
YU et al.

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(54) **ANTENNA DEVICE**

Publication Classification

(71) Applicants: **INVENTEC (PUDONG) TECHNOLOGY CORPORATION**,
Shanghai (CN); **INVENTEC CORPORATION**, Taipei City (TW)

(51) **Int. Cl.**
H01Q 19/10 (2006.01)
H01Q 21/00 (2006.01)
(52) **U.S. Cl.**
CPC **H01Q 19/10** (2013.01); **H01Q 21/00** (2013.01)

(72) Inventors: **Chun-Wei YU**, Taipei City (TW);
Shun-Cheng XIE, Taipei City (TW);
Yu Shu TAI, Taipei City (TW);
Hsin-Hung LIN, Taipei City (TW);
WEI-CHEN CHENG, Taipei City (TW)

(73) Assignees: **INVENTEC (PUDONG) TECHNOLOGY CORPORATION**,
Shanghai (CN); **INVENTEC CORPORATION**, Taipei City (TW)

(21) Appl. No.: **18/979,320**

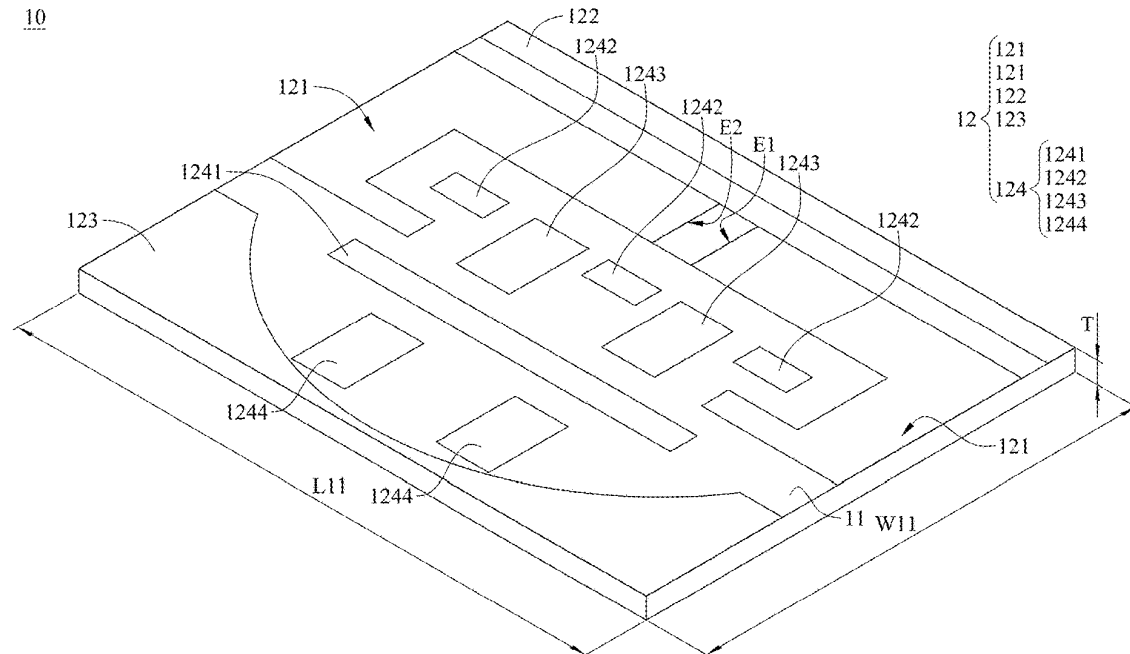
(22) Filed: **Dec. 12, 2024**

(30) **Foreign Application Priority Data**

Sep. 12, 2024 (CN) 202411282311.1

(57) **ABSTRACT**

An antenna device includes a substrate and an antenna component. The antenna component is disposed on the substrate, and includes two hook-shaped excitation bodies, a guider, a reflector and an impedance matching body. The hook-shaped excitation bodies are spaced apart from each other and symmetrical to each other. Opposite ends of the hook-shaped excitation bodies are respective located opposite to each other. An end of one of the hook-shaped excitation bodies has a feeding end. An end of another one of the hook-shaped excitation bodies has a grounding end located opposite to the feeding end. The guider is located on a side of the hook-shaped excitation bodies. The reflector is located on a side of the hook-shaped excitation bodies located away from the guider. The impedance matching body includes an inductor. The inductor is located between the hook-shaped excitation bodies and the reflector.





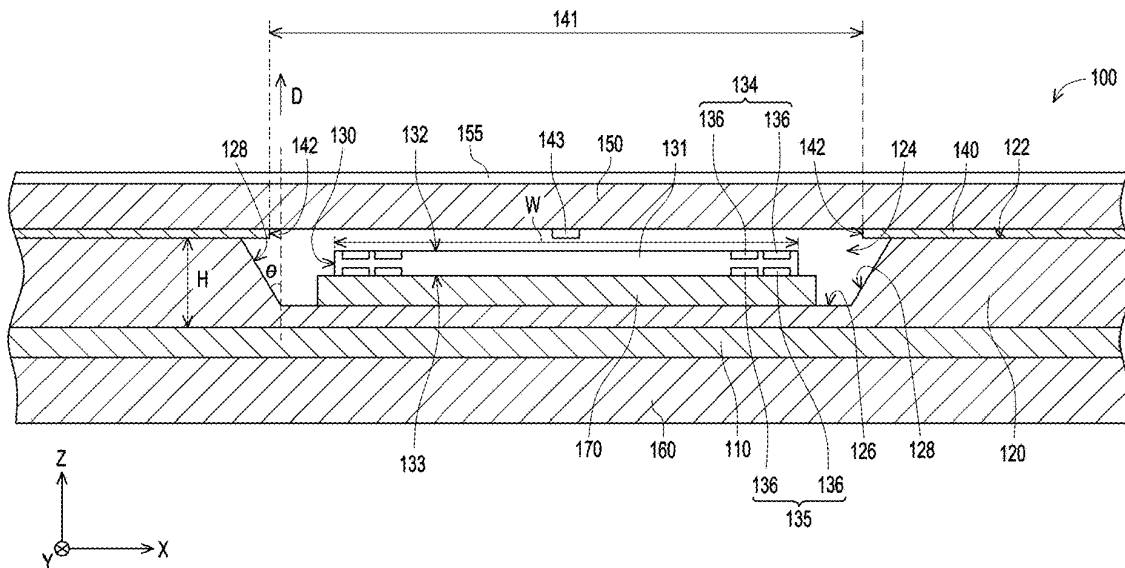
US 20260075704A1

(19) **United States**(12) **Patent Application Publication**
Liao et al.(10) **Pub. No.: US 2026/0075704 A1**(43) **Pub. Date: Mar. 12, 2026**(54) **ELECTRONIC DEVICE**(71) Applicant: **PEGATRON CORPORATION,**
TAIPEI CITY (TW)(72) Inventors: **Chih-Wei Liao,** Taipei City (TW);
Huan-Chia Chang, Taipei City (TW);
Chao-Hsu Wu, Taipei City (TW); **Hau**
Yuen Tan, Taipei City (TW);
Tsung-Chi Tsai, Taipei City (TW);
Ming-Huang Chen, Taipei City (TW)(73) Assignee: **PEGATRON CORPORATION,**
TAIPEI CITY (TW)(21) Appl. No.: **19/186,411**(22) Filed: **Apr. 22, 2025**(30) **Foreign Application Priority Data**

Sep. 11, 2024 (TW) 113134433

Publication Classification(51) **Int. Cl.**
H05K 1/02 (2006.01)
H01Q 1/22 (2006.01)
H01Q 7/00 (2006.01)(52) **U.S. Cl.**CPC **H05K 1/0237** (2013.01); **H01Q 1/2266**
(2013.01); **H01Q 7/00** (2013.01); **H05K**
2201/0707 (2013.01); **H05K 2201/09827**
(2013.01); **H05K 2201/10098** (2013.01); **H05K**
2201/10371 (2013.01); **H05K 2201/10553**
(2013.01)(57) **ABSTRACT**

An electronic device includes a motherboard, a metal shielding cover, a near field communication (NFC) antenna module, and a shielding member. The metal shielding cover covers one side of the motherboard and includes a top surface away from the motherboard and an accommodating groove recessed in the top surface. The near field communication antenna module is disposed in the accommodating groove, and the near field communication antenna module is signal-connected to the motherboard. The shielding member is disposed on the top surface and includes a sensing area corresponding to the near field communication antenna module. The sensing area includes multiple through holes and a support structure located between the through holes.





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(19) **United States**

(12) **Patent Application Publication**
Liao et al.

(10) **Pub. No.: US 2026/0058367 A1**

(43) **Pub. Date: Feb. 26, 2026**

(54) **ELECTRONIC DEVICE**

(71) Applicant: **PEGATRON CORPORATION,**
TAIPEI CITY (TW)

(72) Inventors: **Chih-Wei Liao,** Taipei City (TW);
Chao-Hsu Wu, Taipei City (TW);
Hao-Hsiang Yang, Taipei City (TW);
Sheng-Chin Hsu, Taipei City (TW)

(73) Assignee: **PEGATRON CORPORATION,**
TAIPEI CITY (TW)

(21) Appl. No.: **19/215,347**

(22) Filed: **May 22, 2025**

(30) **Foreign Application Priority Data**

Aug. 23, 2024 (TW) 113131849

Publication Classification

(51) **Int. Cl.**
H01Q 5/35 (2015.01)
H01Q 1/22 (2006.01)

H01Q 1/36 (2006.01)

H01Q 1/48 (2006.01)

H01Q 1/52 (2006.01)

(52) **U.S. Cl.**

CPC **H01Q 5/35** (2015.01); **H01Q 1/36**

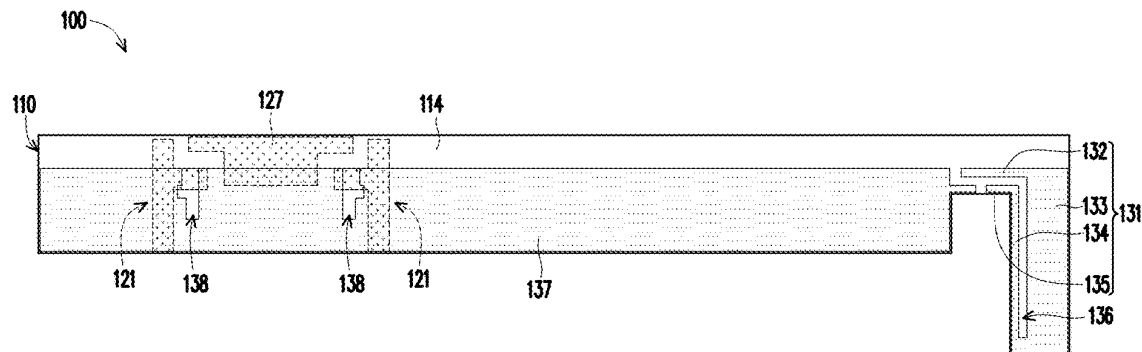
(2013.01); **H01Q 1/48** (2013.01); **H01Q 1/523**

(2013.01); **H01Q 1/22** (2013.01)

(57)

ABSTRACT

An electronic device includes at least one antenna assembly. Each of the at least one antenna assembly includes a substrate, two first radiators, a decoupling element, a second radiator, and a ground plane. The substrate has a first surface and a second surface opposite to each other. The two first radiators are disposed on the first surface, each of the first radiators includes a first feed end, and each of the first radiators is adapted to operate in a high frequency band. The decoupling element is disposed on the first surface, is located between the two first radiators, and has a first slot with each of the first radiators. The second radiator is disposed on the second surface, includes a second feed end, and is adapted to operate in a low frequency band and a medium frequency band. The ground plane is disposed on the second surface.





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(19) **United States**

(12) **Patent Application Publication**
CHU et al.

(10) **Pub. No.: US 2026/0074414 A1**

(43) **Pub. Date: Mar. 12, 2026**

(54) **ANTENNA AND ELECTRONIC DEVICE**

Publication Classification

(71) Applicant: **Honor Device Co., Ltd.**, Shenzhen (CN)

(51) **Int. Cl.**
H01Q 1/24 (2006.01)
H01Q 5/328 (2015.01)

(72) Inventors: **Shaojie CHU**, Shenzhen (CN); **Aofang ZHANG**, Shenzhen (CN); **Yiwu HU**, Shenzhen (CN); **Ning MA**, Shenzhen (CN); **Shichao LI**, Shenzhen (CN)

(52) **U.S. Cl.**
CPC **H01Q 1/243** (2013.01); **H01Q 5/328** (2015.01)

(21) Appl. No.: **19/389,527**

(22) Filed: **Nov. 14, 2025**

Related U.S. Application Data

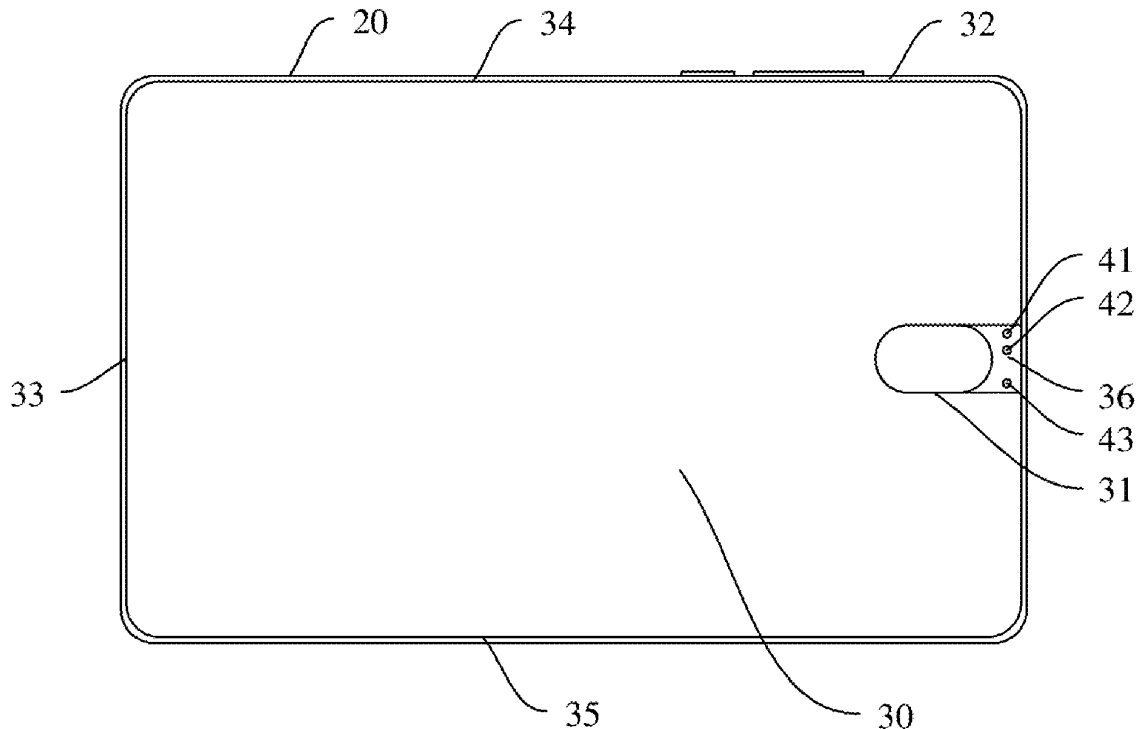
(63) Continuation of application No. PCT/CN2024/079025, filed on Feb. 28, 2024.

(30) **Foreign Application Priority Data**

May 22, 2023 (CN) 202310583314.8

(57) **ABSTRACT**

This application discloses an antenna and an electronic device, and relates to the field of antenna technologies. The antenna is used in the electronic device. The electronic device includes a metal back housing, a metal middle frame, and a metal screen substrate. A first window is formed between the screen substrate and the metal middle frame, and a second window is provided on the metal back housing. A first ground terminal, a feed terminal, and a second ground terminal are disposed on the screen substrate, the feed terminal is located between the first ground terminal and the second ground terminal, and projections of the first ground terminal, the feed terminal, and the second ground terminal are connected to the metal back housing by using metal connectors respectively.

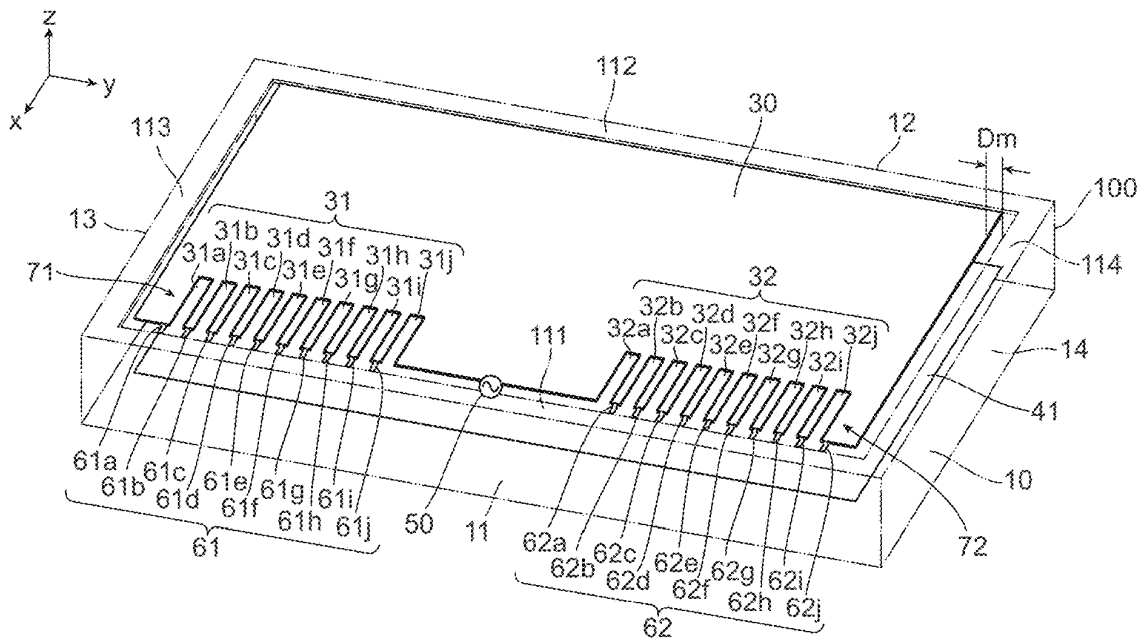




US 20260074437A1

(19) **United States**(12) **Patent Application Publication**
MIYASAKA et al.(10) **Pub. No.: US 2026/0074437 A1**(43) **Pub. Date: Mar. 12, 2026**(54) **ANTENNA DEVICE****Publication Classification**(71) Applicant: **Mitsubishi Electric Corporation,**
Tokyo (JP)(51) **Int. Cl.**
H01Q 19/15 (2006.01)
H01Q 5/307 (2015.01)(72) Inventors: **Takuya MIYASAKA,** Tokyo (JP);
Shingo YAMAURA, Tokyo (JP);
Kengo NISHIMOTO, Tokyo (JP)(52) **U.S. Cl.**
CPC **H01Q 19/15** (2013.01); **H01Q 5/307**
(2015.01)(73) Assignee: **Mitsubishi Electric Corporation,**
Tokyo (JP)(57) **ABSTRACT**(21) Appl. No.: **19/388,116**

An antenna device according to the present disclosure includes: a metal housing which includes an opening part on one surface, and in which a liquid crystal display including a transparent conductive film facing the opening part is disposed; an antenna conductor that includes an end surface forming a gap being a slot line between the end surface and an edge surrounding the opening part of the metal housing, constitutes a composite right handed/left handed transmission line on at least part of the slot line, causes the composite right handed/left handed transmission line on the slot line to function as a leaky wave antenna, and allows visible light to transmit through the antenna conductor; and a power feeding point disposed in the gap.

(22) Filed: **Nov. 13, 2025****Related U.S. Application Data**(63) Continuation of application No. PCT/JP2023/
024851, filed on Jul. 5, 2023.



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(19) **United States**

(12) **Patent Application Publication**
Zhang et al.

(10) **Pub. No.: US 2026/0066530 A1**

(43) **Pub. Date: Mar. 5, 2026**

(54) **ANTENNA AND COMMUNICATION DEVICE**

Publication Classification

(71) Applicant: **HUAWEI TECHNOLOGIES CO., LTD.**, Shenzhen (CN)

(51) **Int. Cl.**
H01Q 1/52 (2006.01)
H01Q 3/12 (2006.01)

(72) Inventors: **Qingxia Zhang**, Xi'an (CN); **Libin Sun**, Shanghai (CN); **Chen Zhang**, Xi'an (CN); **Chengcheng Nie**, Xi'an (CN)

(52) **U.S. Cl.**
CPC **H01Q 1/521** (2013.01); **H01Q 3/12** (2013.01)

(73) Assignee: **HUAWEI TECHNOLOGIES CO., LTD.**, Shenzhen (CN)

(57) **ABSTRACT**

(21) Appl. No.: **19/385,395**

(22) Filed: **Nov. 11, 2025**

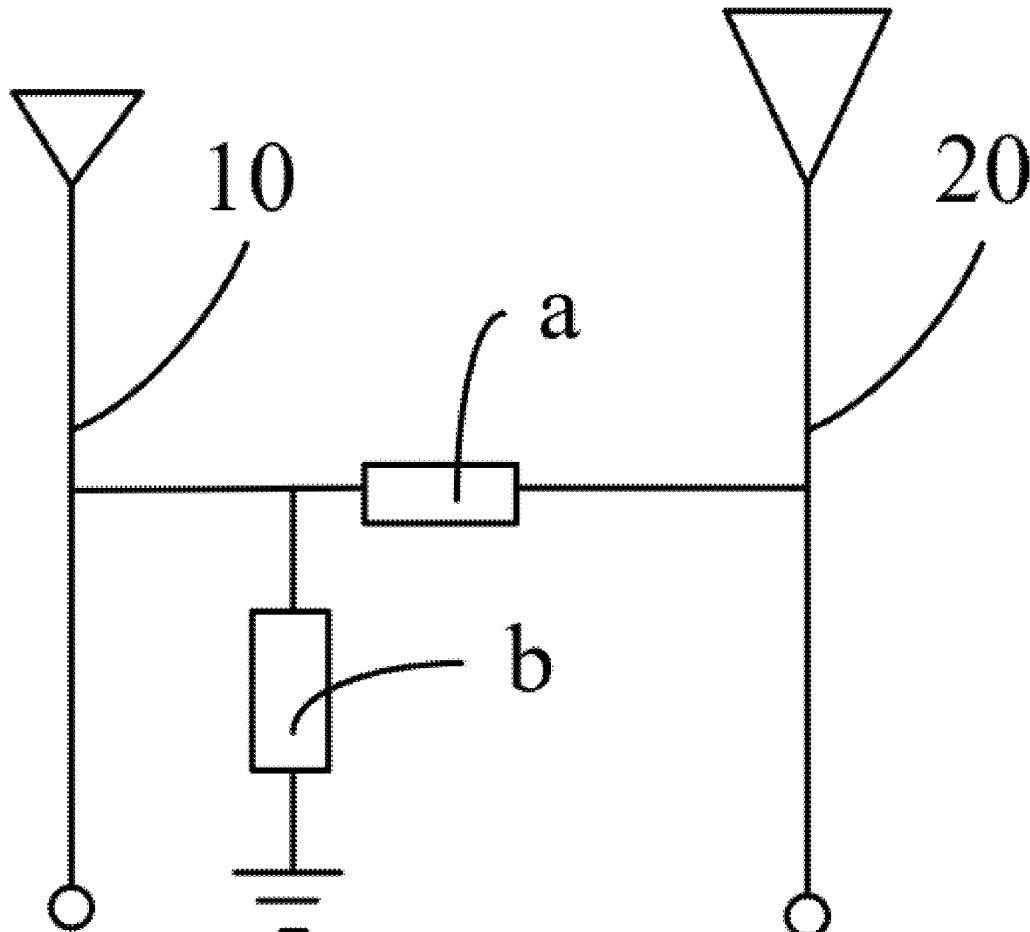
Related U.S. Application Data

(63) Continuation of application No. PCT/CN2024/077942, filed on Feb. 21, 2024.

Foreign Application Priority Data

May 18, 2023 (CN) 202310568976.8

An antenna and a communication device are provided. The antenna includes a first antenna element, a second antenna element, and a connection structure. The first antenna element and the second antenna element each have a feed point. The connection structure connects the first antenna element to the second antenna element. The connection structure is extendable in a direction perpendicular to a connection direction of the first antenna element and the second antenna element. The connection structure adjusts isolation between the first antenna element and the second antenna element through extension.





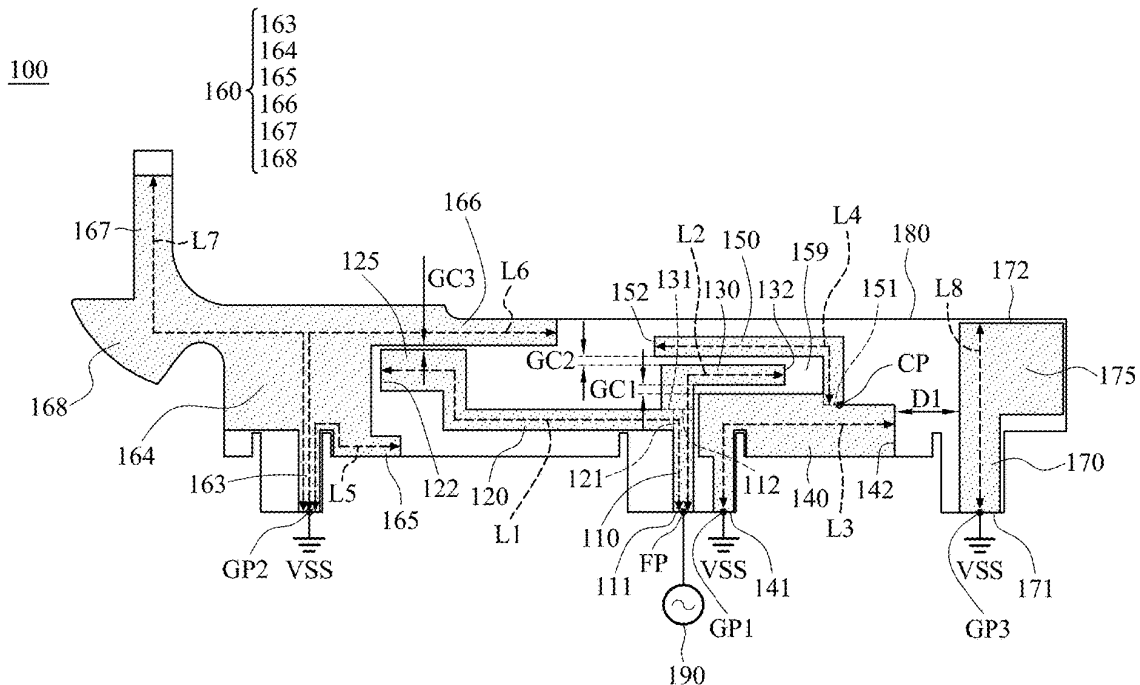
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(19) **United States**(12) **Patent Application Publication**
CHANG et al.(10) **Pub. No.: US 2026/0066537 A1**(43) **Pub. Date: Mar. 5, 2026**(54) **ANTENNA STRUCTURE**(71) Applicant: **Quanta Computer Inc.**, Taoyuan City (TW)(72) Inventors: **Kai-Hsiang CHANG**, Taoyuan City (TW); **Chung-Ting HUNG**, Taoyuan City (TW); **Chin-Lung TSAI**, Taoyuan City (TW); **Yi-Ling TSENG**, Taoyuan City (TW); **Yu-Chen ZHAO**, Taoyuan City (TW); **Chun-I CHENG**, Taoyuan City (TW)(21) Appl. No.: **18/923,203**(22) Filed: **Oct. 22, 2024**(30) **Foreign Application Priority Data**

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Publication Classification(51) **Int. Cl.**
H01Q 5/357 (2015.01)
H01Q 1/24 (2006.01)
H01Q 1/38 (2006.01)(52) **U.S. Cl.**CPC **H01Q 5/357** (2015.01); **H01Q 1/243** (2013.01); **H01Q 1/38** (2013.01)(57) **ABSTRACT**

An antenna structure includes a feeding radiation element, a first radiation element, a second radiation element, a third radiation element, a fourth radiation element, a fifth radiation element, and a sixth radiation element. The first radiation element is coupled to the feeding radiation element. The second radiation element is coupled to the feeding radiation element. The first radiation element and the second radiation element substantially extend in opposite directions. The third radiation element is coupled to a first grounding point. The fourth radiation element is coupled to the third radiation element. Both the third radiation element and the fourth radiation element are adjacent to the second radiation element. The fifth radiation element is coupled to a second grounding point. The fifth radiation element is adjacent to the first radiation element. The sixth radiation element is coupled to a third grounding point.





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(19) **United States**

(12) **Patent Application Publication**
KIM et al.

(10) **Pub. No.: US 2026/0066539 A1**

(43) **Pub. Date: Mar. 5, 2026**

(54) **ANTENNA STRUCTURE AND ANTENNA
DEVICE INCLUDING THE SAME**

(52) **U.S. Cl.**
CPC **H01Q 5/371** (2015.01); **H01Q 5/385**
(2015.01)

(71) Applicant: **Samsung Electronics Co., Ltd.**,
Suwon-si (KR)

(72) Inventors: **Seongjung KIM**, Suwon-si (KR);
Woncheol LEE, Suwon-si (KR);
Youngki LEE, Suwon-si (KR); **Hyung
Sun LIM**, Suwon-si (KR)

(73) Assignee: **Samsung Electronics Co., Ltd.**,
Suwon-si (KR)

(21) Appl. No.: **19/080,623**

(22) Filed: **Mar. 14, 2025**

(30) **Foreign Application Priority Data**

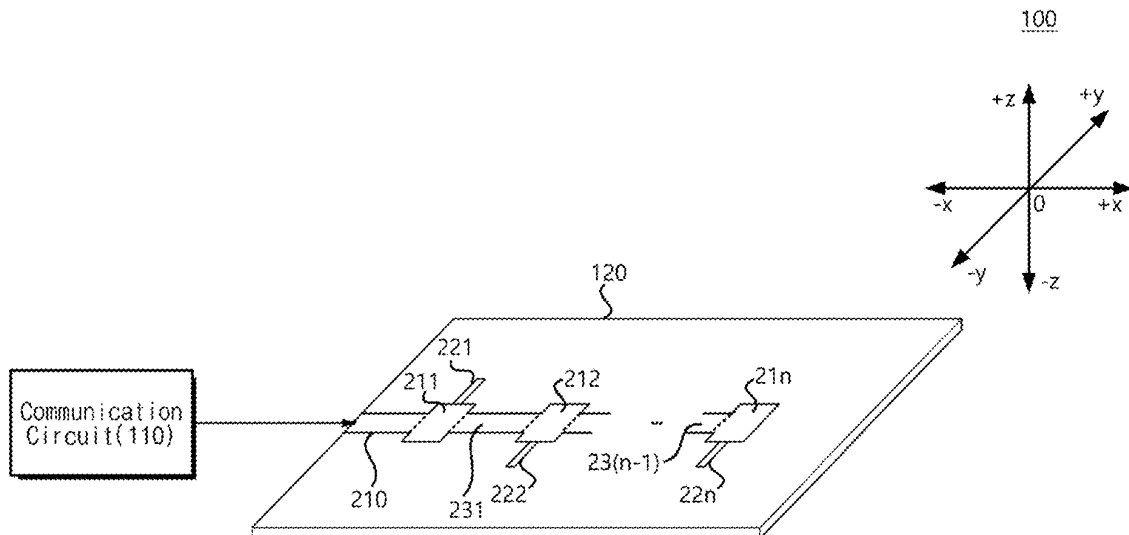
Aug. 27, 2024 (KR) 10-2024-0115003

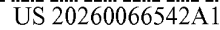
Publication Classification

(51) **Int. Cl.**
H01Q 5/371 (2015.01)
H01Q 5/385 (2015.01)

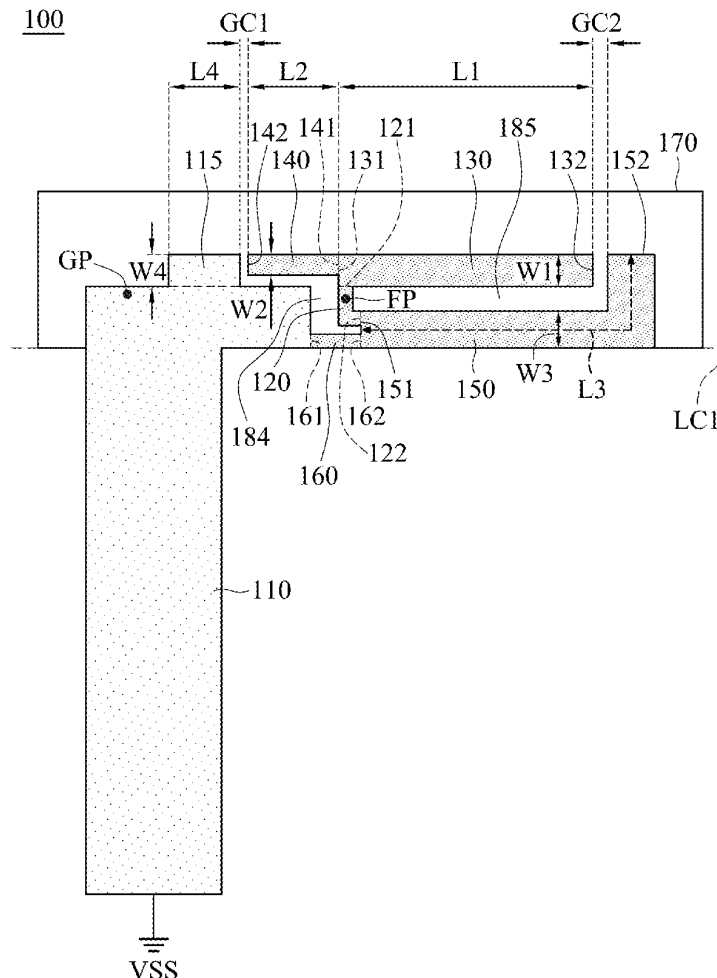
(57) **ABSTRACT**

An antenna device includes a feed line extending in a first direction on one surface of a substrate, a first antenna element connected to the feed line in a second direction, substantially perpendicular to the first direction, a second antenna element connected to the feed line, spaced apart from the first antenna element at a predetermined interval, and extending in a third direction opposite to the second direction, and a communication circuit for transmitting a radio-frequency (RF) signal of a predetermined frequency band through the first and second antenna elements by feeding power to one end of the feed line. The feed line may include first and second connection portions connected to the first and second antenna elements, respectively, and a first intermediate portion between the first and second connection portions. The first intermediate portion may have a width smaller than that of the first or second connection portion.





(43) **Pub. Date:** **Mar. 5, 2026**





US 20260066543A1

(19) **United States**

(12) **Patent Application Publication**
KAWABE

(10) **Pub. No.: US 2026/0066543 A1**

(43) **Pub. Date: Mar. 5, 2026**

(54) **MULTILAYER SUBSTRATE AND ANTENNA DEVICE**

(71) Applicant: **Murata Manufacturing Co., Ltd.**,
Nagaokakyo-shi (JP)

(72) Inventor: **Kentaro KAWABE**, Nagaokakyo-shi
(JP)

(73) Assignee: **Murata Manufacturing Co., Ltd.**,
Nagaokakyo-shi (JP)

(21) Appl. No.: **19/381,158**

(22) Filed: **Nov. 6, 2025**

Related U.S. Application Data

(63) Continuation of application No. PCT/JP2024/
014504, filed on Apr. 10, 2024.

Foreign Application Priority Data

May 17, 2023 (JP) 2023-081878

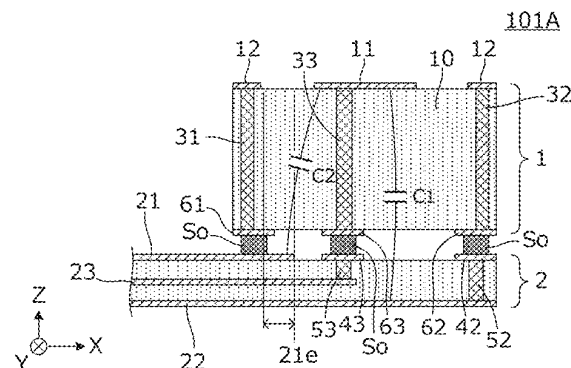
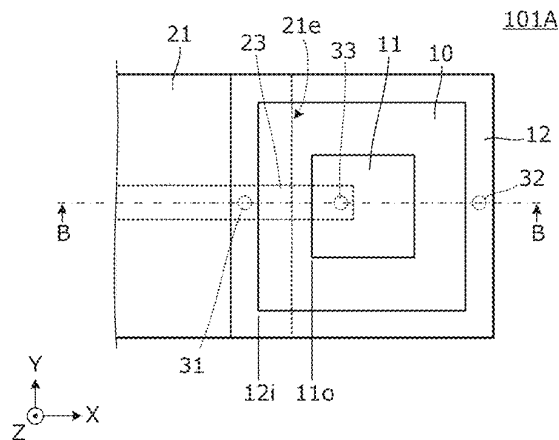
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(57) **ABSTRACT**

A transmission line section of a multilayer substrate forms a stripline including an upper ground conductor, a lower ground conductor, and a signal line conductor. The antenna section includes a signal line conductor interlayer connection conductor that electrically connects the radiation conductor to the signal line conductor, and one or more ground conductor interlayer connection conductors that electrically connect an upper-surface annular ground conductor to the lower ground conductor and the upper ground conductor of the transmission line section. Viewed in the stacking direction of a plurality of base materials, the entire surface of the radiation conductor overlaps the lower ground conductor, and an end portion of the upper ground conductor is inside an annular shape formed by the upper-surface annular ground conductor at a position that overlaps the signal line conductor but does not overlap the radiation conductor.





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(54) **ELECTRONIC DEVICE COMPRISING
ANTENNA STRUCTURE**

(30) **Foreign Application Priority Data**

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(71) Applicant: **Samsung Electronics Co., Ltd.**,
Suwon-si (KR)

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(72) Inventors: **Sunghoon JUNG**, Suwon-si (KR);
Soyeon Kang, Suwon-si (KR); **Dongho
Kim**, Suwon-si (KR); **Sangyun Lee**,
Suwon-si (KR); **Seongho Cho**,
Suwon-si (KR); **Isaac Jo**, Suwon-si
(KR)

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(73) Assignee: **SAMSUNG ELECTRONICS CO.,
LTD.**, Suwon-si (KR)

(57) **ABSTRACT**

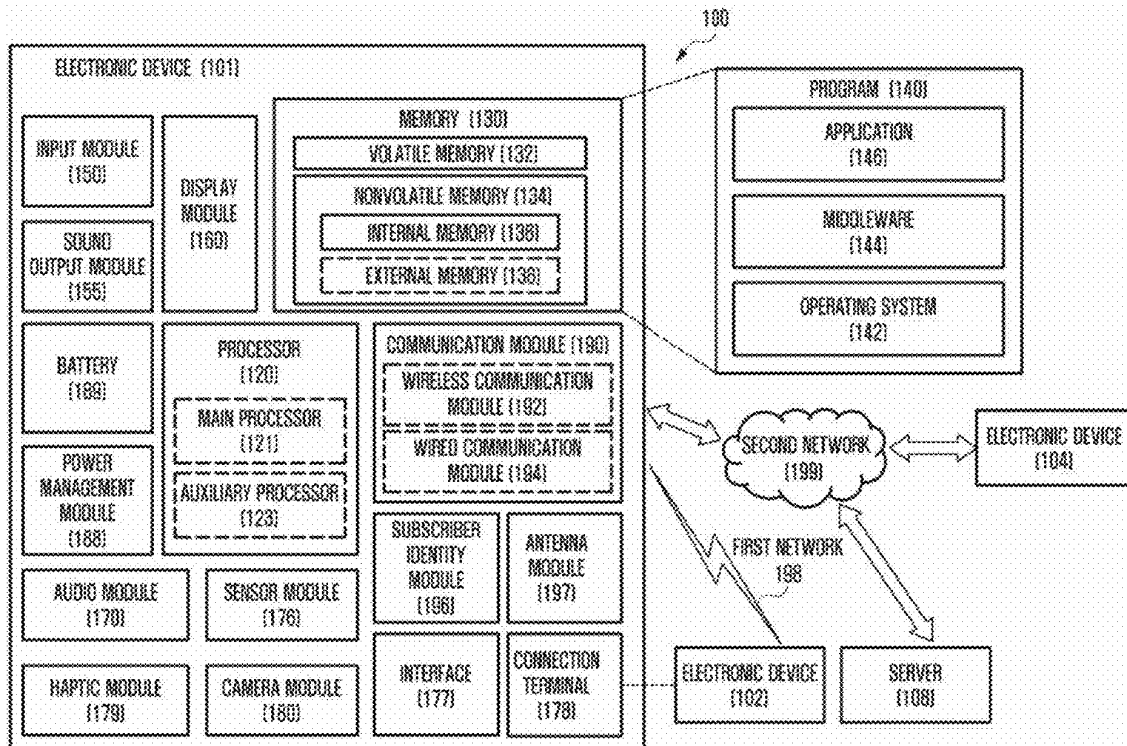
(21) Appl. No.: **19/327,663**

An electronic device includes: a housing including a front surface plate, a rear surface plate, and a side surface member between the front surface plate and the rear surface plate; a printed circuit board inside the housing and including a first wire; and an antenna structure between the printed circuit board and the rear surface plate, where the antenna structure includes a first slit at a position corresponding to a position of the first wire.

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(54) **ANTENNA AND ELECTRONIC DEVICE
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Publication Classification

(71) Applicant: **SAMSUNG ELECTRONICS CO.,
LTD.**, Suwon-si (KR)

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(72) Inventors: **Cheolhong SON**, Suwon-si (KR);
Kyungmoon SEOL, Suwon-si (KR);
Yoonjung KIM, Suwon-si (KR);
Sehyun PARK, Suwon-si (KR)

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(73) Assignee: **SAMSUNG ELECTRONICS CO.,
LTD.**, Suwon-si (KR)

(21) Appl. No.: **19/365,701**

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ABSTRACT

According to various embodiments, the electronic device may include at least one housing; a first display disposed in the inner space of at least one housing; a second display disposed in the inner space to be facing the opposite direction of the first display and including a display panel and a conductive sheet disposed on the rear surface of the display panel; a board disposed in the inner space; a wireless communication circuit disposed on the board and electrically connected through the first point of the conductive sheet; and a grounding structure electrically connected to the conductive sheet in the second point spaced at a distance from the first point, wherein the wireless communication circuit is configured to transmit or receive wireless signals in the specified frequency band through at least a portion of the conductive sheet.

