

(43) **Pub. Date:** **Jul. 23, 2026**

[illegible]



US 20260213415A1

(19) **United States**

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

(10) **Pub. No.: US 2026/0213415 A1**

(43) **Pub. Date: Jul. 23, 2026**

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

(71) Applicant: **HONOR DEVICE CO., LTD.**,
Shenzhen (CN)

(72) Inventors: **Aofang Zhang**, Shenzhen (CN);
Shaojie Chu, Shenzhen (CN);
Kunpeng Wei, Shenzhen (CN); **Dehua Meng**, Shenzhen (CN)

(21) Appl. No.: **19/143,108**

(22) PCT Filed: **Aug. 14, 2023**

(86) PCT No.: **PCT/CN2023/112861**

§ 371 (c)(1),

(2) Date: **Jun. 25, 2025**

(30) **Foreign Application Priority Data**

Dec. 26, 2022 (CN) 202211674628.0

Publication Classification

(51) **Int. Cl.**
H01Q 9/04 (2006.01)
H01Q 1/24 (2006.01)

H01Q 5/20 (2015.01)

H01Q 5/357 (2015.01)

H01Q 5/50 (2015.01)

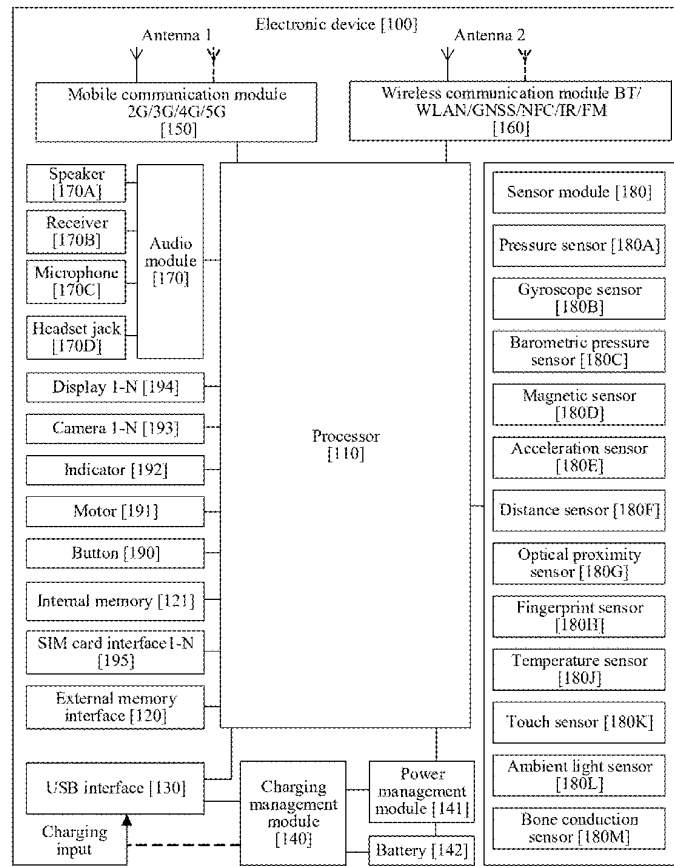
H01Q 7/00 (2006.01)

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

CPC **H01Q 9/0421** (2013.01); **H01Q 5/20**
(2015.01); **H01Q 5/357** (2015.01); **H01Q 5/50**
(2015.01); **H01Q 1/242** (2013.01); **H01Q 7/00**
(2013.01); **H01Q 9/0464** (2013.01)

(57) **ABSTRACT**

This application relates to the field of terminal technologies and the field of antenna technologies, and provides an antenna structure and an electronic device. The antenna structure includes an antenna body and a dielectric layer. The antenna body is attached to the dielectric layer. The antenna body is shaped like a ring. The antenna body includes a feed point, a gap, a first ground point, and a second ground point. The gap is located between the feed point and the second ground point, and the gap extends toward the first ground point. Through the solution, in a scenario where a border frame area of the electronic device is covered with metal, an antenna that supports a plurality of bands may still be designed through a camera decoration member area of the electronic device, which has relatively high efficiency and broadband radiation and high practicability.





US 20260221645A1

(19) **United States**

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

(10) **Pub. No.: US 2026/0221645 A1**

(43) **Pub. Date: Jul. 30, 2026**

(54) **FOLDABLE ELECTRONIC DEVICE**

Publication Classification

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

(51) **Int. Cl.**
H01Q 1/24 (2006.01)
H01Q 1/50 (2006.01)

(72) Inventors: **Chuanbo Shi**, Shanghai (CN); **Libin Sun**, Shanghai (CN); **Liang Xue**, Shanghai (CN); **Kun Feng**, Shanghai (CN); **Rundong Tang**, Shanghai (CN)

(52) **U.S. Cl.**
CPC **H01Q 1/243** (2013.01); **H01Q 1/50** (2013.01)

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

(57) **ABSTRACT**

(21) Appl. No.: **19/148,665**

(22) PCT Filed: **Dec. 18, 2024**

(86) PCT No.: **PCT/CN2024/140214**

§ 371 (c)(1),

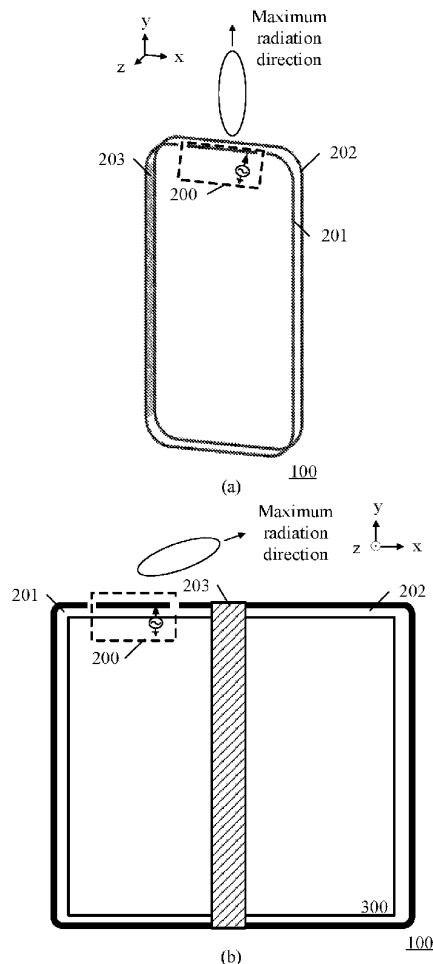
(2) Date: **Jul. 16, 2025**

(30) **Foreign Application Priority Data**

Dec. 29, 2023 (CN) 202311871918.9

Nov. 18, 2024 (CN) 202411651410.2

This application provides a foldable electronic device. The foldable electronic device includes an antenna. An operating frequency band of the antenna includes a satellite communication frequency band. The antenna includes a first radiator, a second radiator, and a first tuning circuit coupled to the second radiator. A part of a conductive side frame of a first housing is used as the first radiator, and a part of a conductive side frame of a second housing is used as the second radiator. When the foldable electronic device is in an unfolded state, the first radiator, the second radiator, and the first tuning circuit are configured to generate a radiation pattern of the antenna.





US 20260221994A1

(19) **United States**

(12) **Patent Application Publication**
Ochiai

(10) **Pub. No.: US 2026/0221994 A1**

(43) **Pub. Date: Jul. 30, 2026**

(54) **ELECTRONIC DEVICE AND CONTROL METHOD FOR ELECTRONIC DEVICE**

(71) Applicant: **Sony Semiconductor Solutions Corporation**, Kanagawa (JP)

(72) Inventor: **Yasuhiro Ochiai**, Kanagawa (JP)

(21) Appl. No.: **19/141,858**

(22) PCT Filed: **Jan. 10, 2024**

(86) PCT No.: **PCT/JP2024/000222**

§ 371 (c)(1),

(2) Date: **Jun. 20, 2025**

(30) **Foreign Application Priority Data**

Feb. 13, 2023 (JP) 2023-019803

Publication Classification

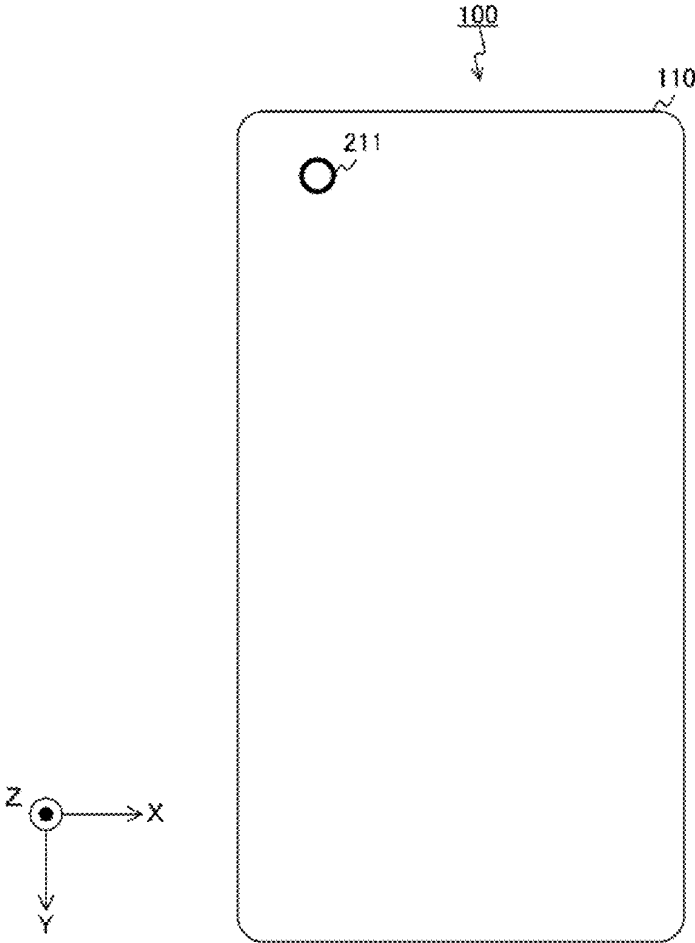
(51) **Int. Cl.**
H04B 1/10 (2006.01)
G06F 13/42 (2006.01)

G06F 21/44 (2013.01)
H01Q 1/22 (2006.01)
H04B 17/20 (2015.01)
H04L 25/02 (2006.01)

(52) **U.S. Cl.**
CPC **H04B 1/10** (2013.01); **G06F 13/4221** (2013.01); **G06F 21/44** (2013.01); **H01Q 1/22** (2013.01); **H04B 17/201** (2023.05); **H04L 25/0272** (2013.01); **G06F 2213/0026** (2013.01)

(57) **ABSTRACT**

Electronic devices with built-in components including an antenna and transmission lines, with electromagnetic interference suppression are disclosed. In one example, an electronic device includes an antenna, a plurality of transmission lines, and a control unit. In the electronic device including the antenna, the plurality of transmission lines, and the control unit, signals are transmitted through the plurality of transmission lines. Furthermore, in the electronic device including the antenna, the plurality of transmission lines, and the control unit, the control unit controls the directivity of electromagnetic waves radiated from the plurality of transmission lines on the basis of the reception performance of the antenna.





US 20260229765 A1

(19) **United States**
(12) **Patent Application Publication**
HERBSOMMER et al.

(10) **Pub. No.:** **US 2026/0229765 A1**
(43) **Pub. Date:** **Aug. 6, 2026**

(54) **PACKAGE ANTENNAS**

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

(71) Applicant: **TEXAS INSTRUMENTS
INCORPORATED**, Dallas, TX
(US)

CPC **H01Q 1/2283** (2013.01); **H01Q 7/00**
(2013.01); **H01Q 9/0407** (2013.01);
H10W 70/464 (2026.01); **H10W 74/111**
(2026.01)

(72) Inventors: **Juan HERBSOMMER**, Allen, TX
(US); **Hassan Omar ALI**, Murphy,
TX (US)

(57) **ABSTRACT**

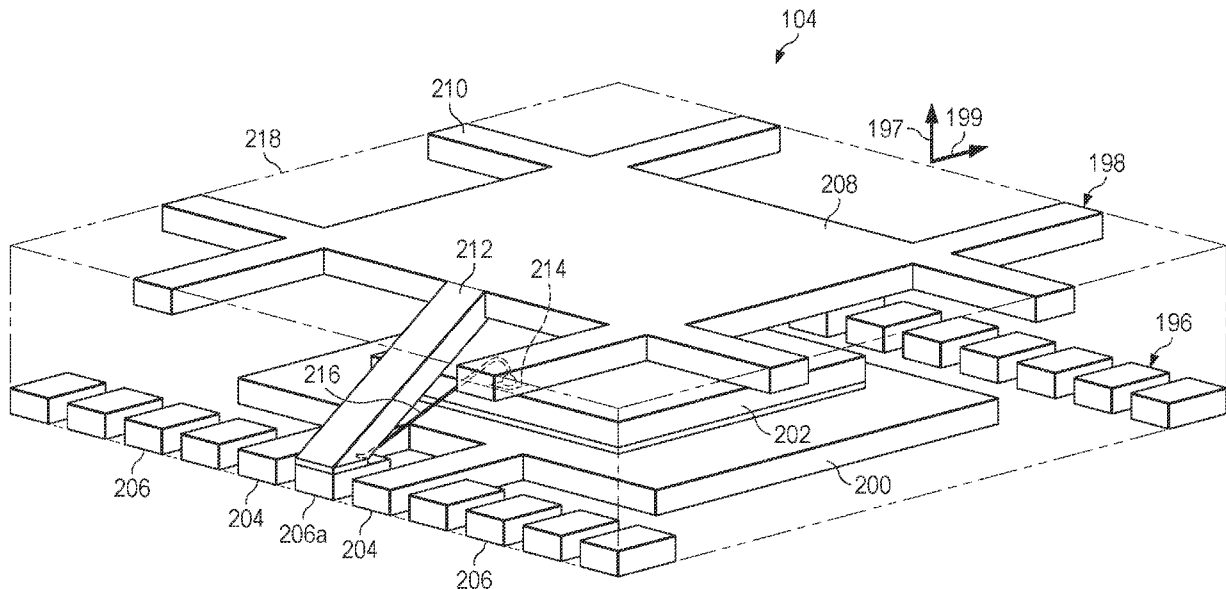
(21) Appl. No.: **19/043,318**

(22) Filed: **Jan. 31, 2025**

In examples, a semiconductor package includes a die pad extending in a horizontal direction and a semiconductor die coupled to the die pad, the semiconductor die having a device side in which circuitry is formed. The package includes a conductive terminal coupled to the device side of the semiconductor die by a bond wire and an antenna vertically distanced from the die pad and extending in the horizontal direction. The package includes a metal member extending from the antenna in the horizontal direction and a conductive member coupling the antenna to the conductive terminal. The package includes a mold compound contacting the die pad, the semiconductor die, the conductive terminal, the antenna, the metal member, and the conductive member. A portion of the conductive terminal and the metal member are exposed on one or more exterior lateral surfaces of the mold compound.

Publication Classification

(51) **Int. Cl.**
H01Q 1/22 (2006.01)
H01Q 7/00 (2006.01)
H01Q 9/04 (2006.01)
H10W 70/40 (2026.01)
H10W 74/10 (2026.01)





US 20260229777 A1

(19) **United States**
(12) **Patent Application Publication**
Yeh et al.

(10) **Pub. No.:** **US 2026/0229777 A1**
(43) **Pub. Date:** **Aug. 6, 2026**

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

Publication Classification

(71) Applicant: **COMPAL ELECTRONICS, INC.,**
Taipei City (TW)

(51) **Int. Cl.**

H01Q 5/30 (2015.01)
H01Q 1/22 (2006.01)
H01Q 5/50 (2015.01)
H04R 3/00 (2006.01)

(72) Inventors: **Yu-Hui Yeh**, Taipei City (TW);
Shih-Chia Liu, Taipei City (TW);
Yen-Hao Yu, Taipei City (TW);
Jhih-Ciang Chen, Taipei City
(TW); **Chih-Heng Lin**, Taipei City
(TW); **Shih-Ping Liu**, Taipei City
(TW)

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

CPC **H01Q 5/30** (2015.01); **H01Q 1/22**
(2013.01); **H01Q 5/50** (2015.01); **H04R**
3/00 (2013.01); **H04R 2420/07** (2013.01)

(73) Assignee: **COMPAL ELECTRONICS, INC.,**
Taipei City (TW)

(21) Appl. No.: **19/232,872**

(22) Filed: **Jun. 10, 2025**

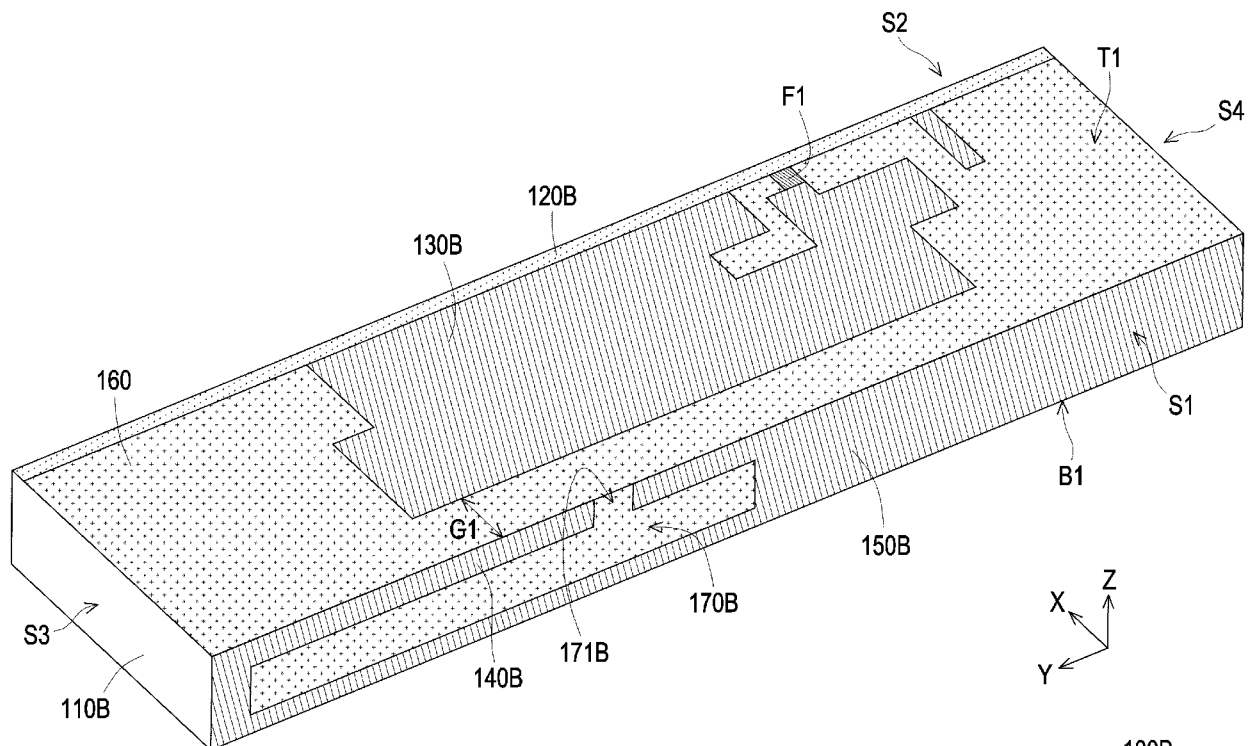
(30) **Foreign Application Priority Data**

Feb. 5, 2025 (TW)114104127

(57)

ABSTRACT

An antenna module includes a carrier, a grounding part, a first and a second radiation part, a feeding part, and a matching part. The first radiation part and the grounding part are respectively located on the carrier's top and bottom sides. The feeding part is located between the grounding part and the first radiation parts. The first radiation part is excited by the feeding part and connected with the grounding part to resonate a first resonant frequency band. The second radiation part is located between the first radiation part and the grounding part. A first coupling gap is between the first and the second radiation part. The matching part is located between the first radiation part and the grounding part and is adjacent to the second radiation part which is coupled with the first radiation part through the first coupling gap to resonate a second resonant frequency band.



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US 20260229778A1

(19) **United States**

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

(10) **Pub. No.: US 2026/0229778 A1**

(43) **Pub. Date: Aug. 6, 2026**

(54) **ELECTRONIC DEVICE**

H01Q 13/10 (2006.01)

H01Q 21/28 (2006.01)

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

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

CPC **H01Q 5/342** (2015.01); **H01Q 1/243** (2013.01); **H01Q 13/10** (2013.01); **H01Q 21/28** (2013.01)

(72) Inventors: **Huatao Liu**, Shanghai (CN); **Dong Yu**, Shanghai (CN); **Jikang Wang**, Shanghai (CN)

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

(57)

ABSTRACT

(21) Appl. No.: **19/149,828**

(22) PCT Filed: **Jan. 4, 2024**

(86) PCT No.: **PCT/CN2024/070643**

§ 371 (c)(1),

(2) Date: **Jul. 21, 2025**

(30) **Foreign Application Priority Data**

Jan. 20, 2023 (CN) 202310101339.X

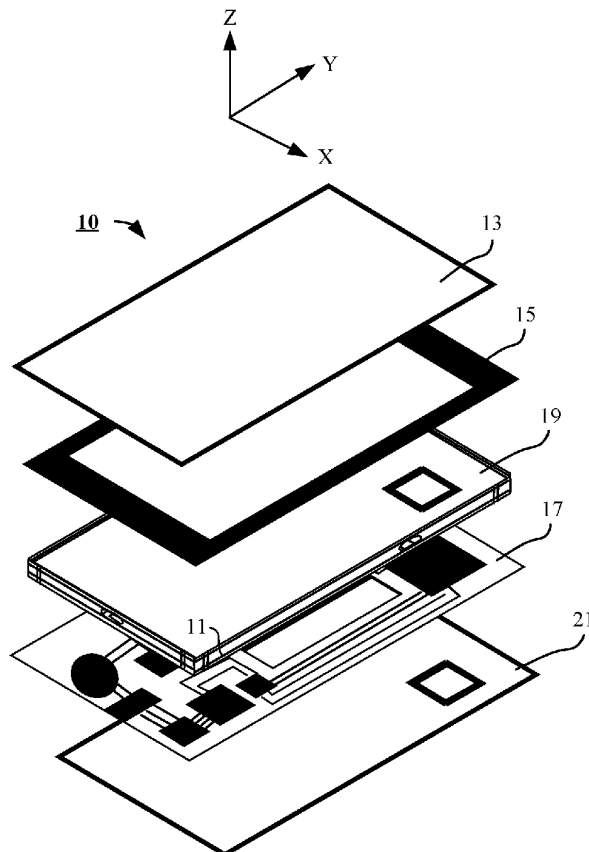
Publication Classification

(51) **Int. Cl.**

H01Q 5/342 (2015.01)

H01Q 1/24 (2006.01)

An electronic device includes a first conductive side frame, an antenna and a first feed element. The first conductive side frame comprises a first side frame between a first position and a second position, and a second side frame between the second position and a third position. The second position is provided with a first slot. The antenna comprises a radiator having the first side frame grounded at the first position, and the second side frame grounded at the third position. The first side frame comprises a first feed point, and an operating frequency band of the antenna comprises a first frequency band and a second frequency band higher than the first frequency band. The first feed element comprises a first radio frequency channel corresponding to the first frequency band, and a second radio frequency channel corresponding to the second frequency band, that are coupled to the first side frame.





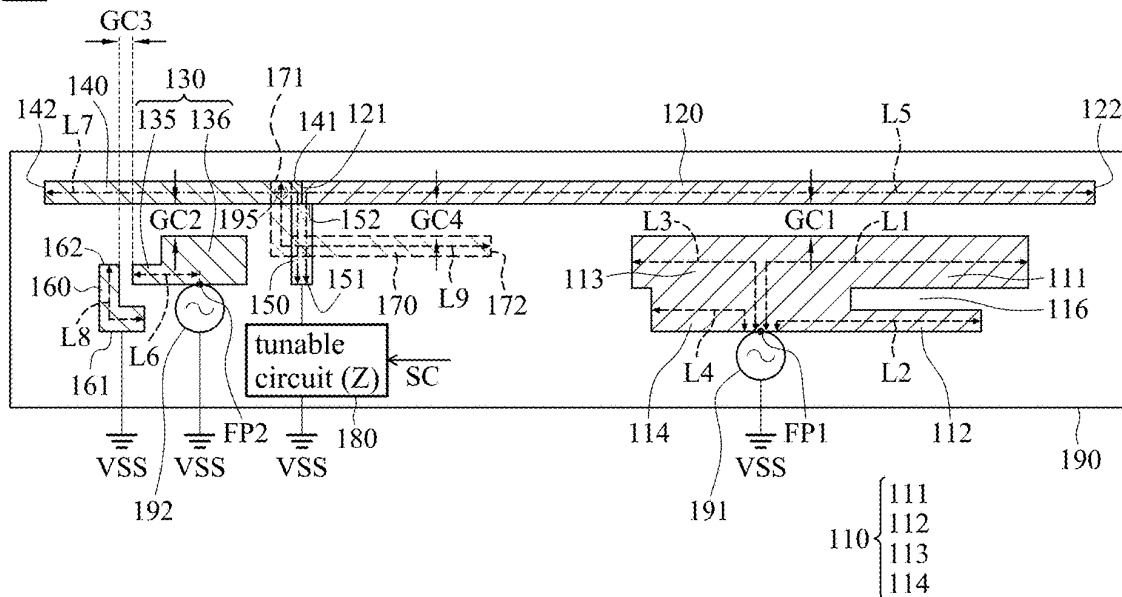
US 20260229779A1

(19) **United States**(12) **Patent Application Publication**
PENG et al.(10) **Pub. No.: US 2026/0229779 A1**(43) **Pub. Date: Aug. 6, 2026**(54) **ANTENNA SYSTEM**(71) Applicant: **WNC Corporation**, Hsinchu (TW)(72) Inventors: **Pao-Chuan PENG**, Hsinchu (TW);
Hsieh-Chih LIN, Hsinchu (TW)(21) Appl. No.: **19/302,637**(22) Filed: **Aug. 18, 2025**(30) **Foreign Application Priority Data**

Feb. 6, 2025 (TW) 114104330

Publication Classification(51) **Int. Cl.**
H01Q 5/35 (2015.01)
H01Q 21/06 (2006.01)(52) **U.S. Cl.**CPC **H01Q 5/35** (2015.01); **H01Q 21/06**
(2013.01)(57) **ABSTRACT**

An antenna system includes first to seven radiation elements, and a tunable circuit. The first radiation element has a first feeding point. The second radiation element is adjacent to the first radiation element. The third radiation element has a second feeding point. The fourth radiation element is adjacent to the third radiation element. The second radiation element and the fourth radiation element are coupled through the fifth radiation element to the tunable circuit. The tunable circuit provides a variable impedance value according to a control signal. A first antenna structure is formed by the first radiation element, the second radiation element, and the fifth radiation element. A second antenna structure is formed by the third radiation element, the fourth radiation element, the fifth radiation element, the sixth radiation element, and the seventh radiation element.

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US 20260236071A1

(19) **United States**

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

(10) **Pub. No.: US 2026/0236071 A1**

(43) **Pub. Date: Aug. 13, 2026**

(54) **LAPTOP COMPUTER**

Publication Classification

(71) Applicant: **Quanta Computer Inc.**, Taoyuan City (TW)

(51) **Int. Cl.**
G06F 1/16 (2006.01)

(72) Inventors: **Hui LIN**, Taoyuan City (TW);
Chen-An LU, Taoyuan City (TW)

(52) **U.S. Cl.**
CPC **G06F 1/1698** (2013.01); **G06F 1/1616** (2013.01); **G06F 1/1683** (2013.01)

(21) Appl. No.: **19/092,272**

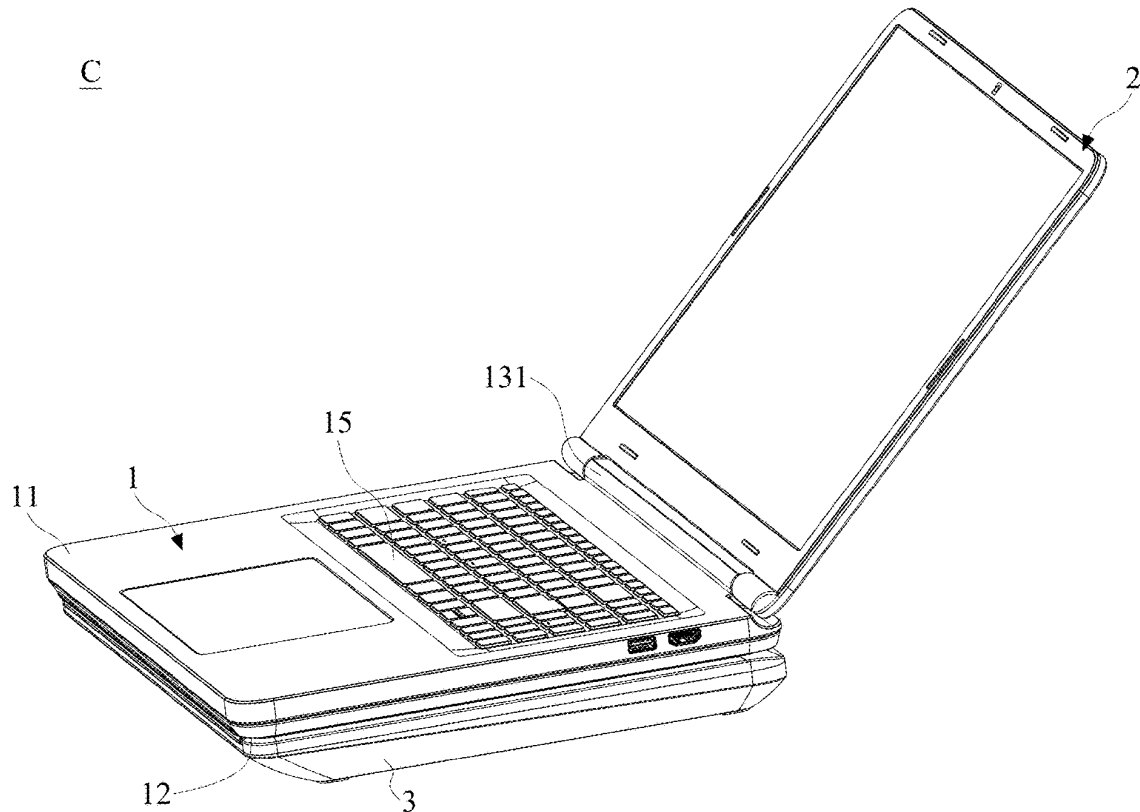
(57) **ABSTRACT**

(22) Filed: **Mar. 27, 2025**

A laptop computer is provided. The laptop computer includes a computer body, a cover, an antenna bracket and an antenna module. The computer body includes a first hinge unit and a second hinge unit. The cover is rotatably connected to the computer body via the first hinge unit. The antenna bracket is rotatably connected to the computer body via the second hinge unit. The antenna module is disposed on the antenna bracket and configured to transmit a wireless signal.

(30) **Foreign Application Priority Data**

Feb. 13, 2025 (TW) 114105334





US 20260237885A1

(19) **United States**

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

(10) **Pub. No.: US 2026/0237885 A1**

(43) **Pub. Date: Aug. 13, 2026**

(54) **ANTENNA IN PACKAGE STRUCTURE AND DESIGN METHOD**

Publication Classification

(71) Applicant: **METAWAVE CORPORATION**,
Carlsbad, CA (US)

(51) **Int. Cl.**
H01Q 1/22 (2006.01)
H01Q 19/00 (2006.01)
H10W 70/65 (2026.01)

(72) Inventors: **Kevin GU**, Carlsbad, CA (US); **Hadi Saeidi MANESH**, Carlsbad, CA (US); **Neda BATHAEI**, Carlsbad, CA (US); **Ricky Donald HECKLER**, Carlsbad, CA (US); **Raymond Anthony HAYNES**, Carlsbad, CA (US); **Andrew John BONTHRON**, Carlsbad, CA (US)

(52) **U.S. Cl.**
CPC **H01Q 1/2283** (2013.01); **H01Q 19/005** (2013.01); **H10W 70/65** (2026.01)

(21) Appl. No.: **19/147,708**

(22) PCT Filed: **Jan. 3, 2024**

(86) PCT No.: **PCT/US2024/010204**

§ 371 (c)(1),

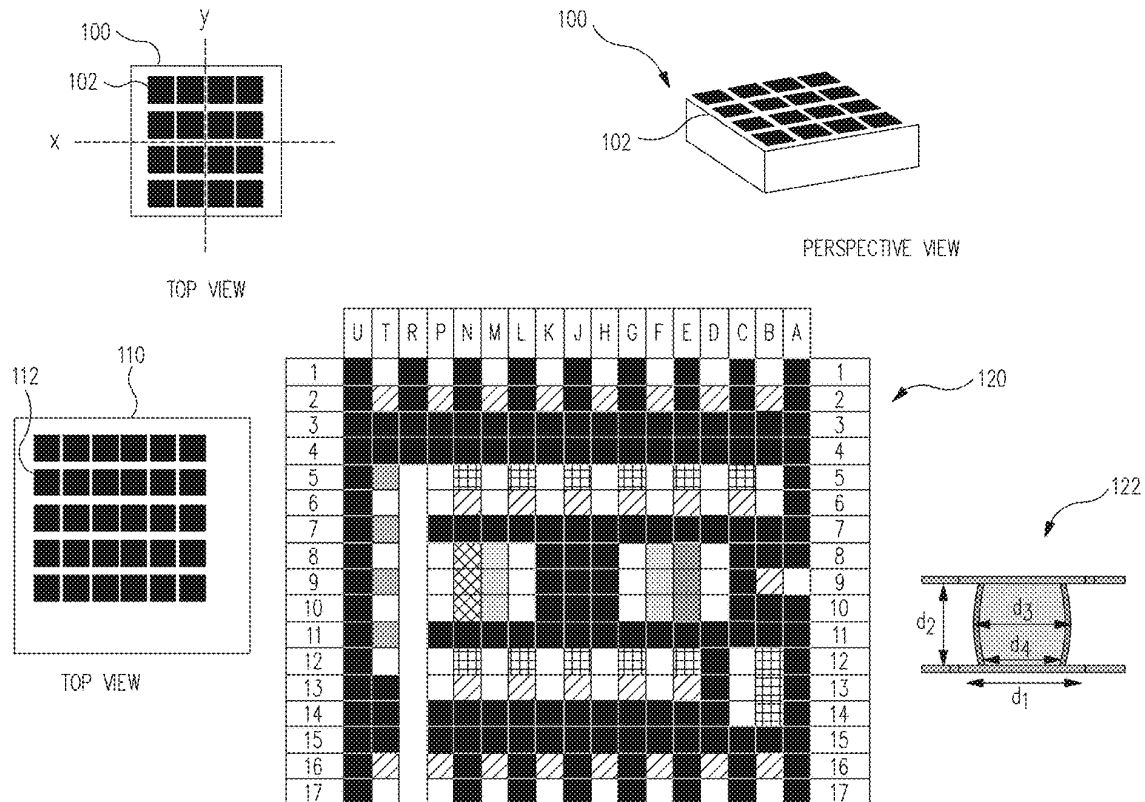
(2) Date: **Jul. 13, 2025**

Related U.S. Application Data

(60) Provisional application No. 63/438,961, filed on Jan. 13, 2023.

(57) **ABSTRACT**

In accordance with various embodiments, a multi-layer electromagnetic antenna in package (AiP) device is provided. The device has a plurality of radiating elements configured in a symmetric pattern. Each of the radiating elements having a transmission line through the multi-layer device. Each of the transmission lines having a same electrical length to maintain a consistent phase of transmission signals. The device has a resonant cavity formed within the layers.





US 20260237903A1

(19) **United States**

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

(10) **Pub. No.: US 2026/0237903 A1**

(43) **Pub. Date: Aug. 13, 2026**

(54) **APPARATUS COMPRISING LOOP ANTENNA**

(30) **Foreign Application Priority Data**

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

Oct. 7, 2023 (KR) 10-2023-0133872
Nov. 30, 2023 (KR) 10-2023-0170367

(72) Inventors: **Wongi HWANG**, Suwon-si (KR);
Sanghoon CHOI, Suwon-si (KR);
Taegyu KIM, Suwon-si (KR); **Dokyun KIM**, Suwon-si (KR); **Kwangseok AHN**, Suwon-si (KR); **Jina JONG**, Suwon-si (KR); **Taihwan CHOI**, Suwon-si (KR); **Gun LIM**, Suwon-si (KR); **Minjoo HWANG**, Suwon-si (KR)

Publication Classification

(51) **Int. Cl.**
H01Q 7/00 (2006.01)
(52) **U.S. Cl.**
CPC **H01Q 7/00** (2013.01)

(57) **ABSTRACT**

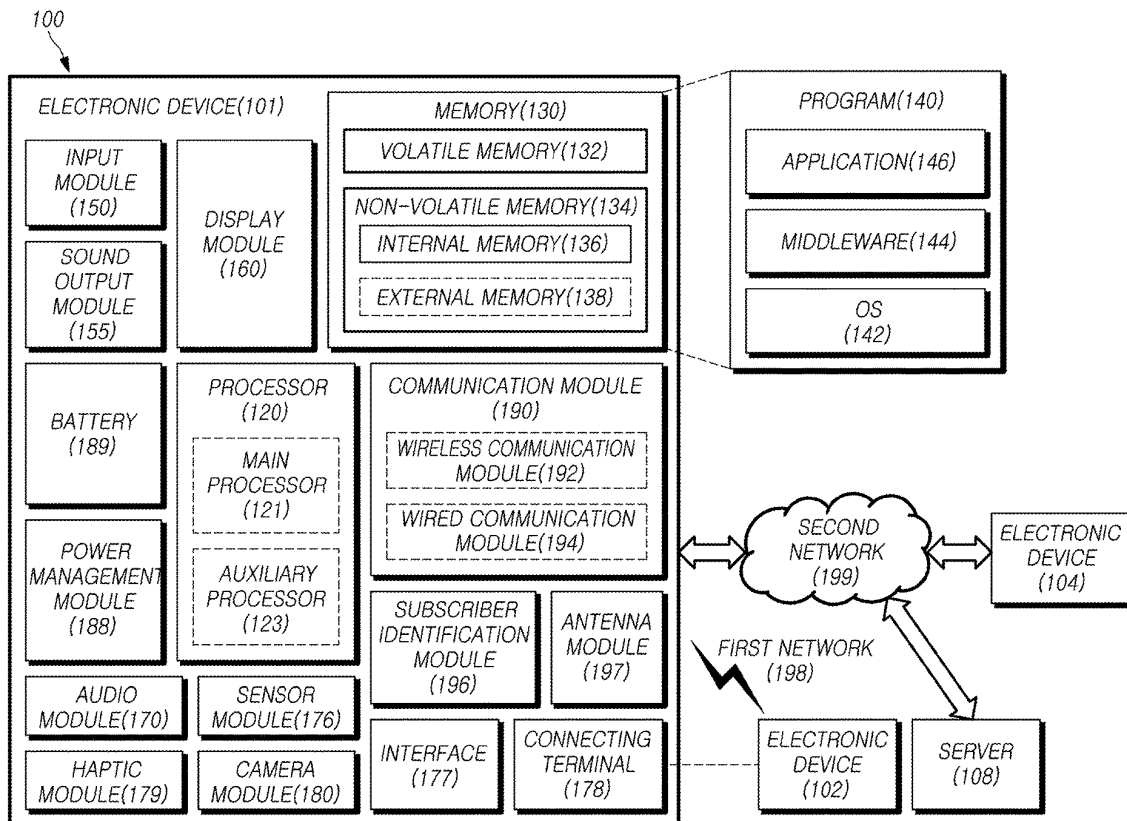
The disclosure discloses an electronic device including a loop antenna. The electronic device includes a housing including an exterior side wall of the electronic device and a rear side of the electronic device, a loop antenna disposed in the housing, the loop antenna including a first loop portion and a second loop portion, an integrated circuit (IC) disposed in the housing, for driving the loop antenna, wherein the first loop portion is configured to radiate a signal in a direction through the rear side of the electronic device, and the second loop portion is configured to radiate a signal through the exterior side wall.

(21) Appl. No.: **19/638,714**

(22) Filed: **Apr. 3, 2026**

Related U.S. Application Data

(63) Continuation of application No. PCT/KR2024/014753, filed on Sep. 27, 2024.





US 20260237904 A1

(19) **United States**
(12) **Patent Application Publication**
LIN et al.

(10) **Pub. No.:** **US 2026/0237904 A1**
(43) **Pub. Date:** **Aug. 13, 2026**

(54) **ANTENNA STRUCTURE AND FORMING METHOD THEREOF**

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

CPC **H01Q 9/0407** (2013.01); **B32B 3/266** (2013.01); **B32B 7/12** (2013.01); **B32B 15/09** (2013.01); **B32B 2307/584** (2013.01); **B32B 2307/7376** (2023.04); **B32B 2457/00** (2013.01)

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

(72) Inventors: **Yi-Chieh LIN**, Hsinchu (TW); **Jing Wen CHEN**, Hsinchu (TW)

(21) Appl. No.: **19/430,387**

(22) Filed: **Dec. 23, 2025**

(30) **Foreign Application Priority Data**
Feb. 11, 2025 (TW)114105084

Publication Classification

(51) **Int. Cl.**

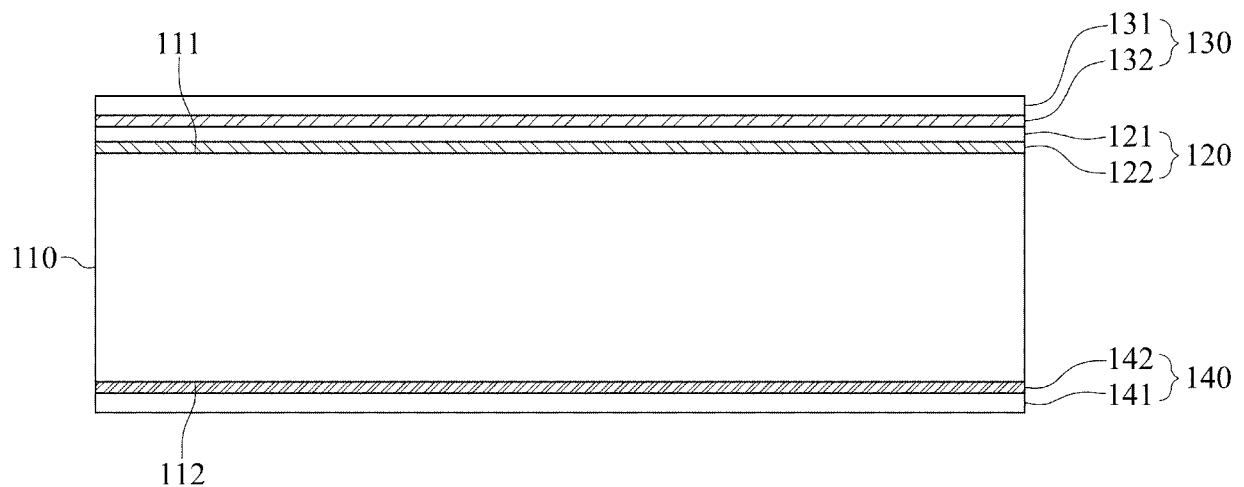
H01Q 9/04 (2006.01)
B32B 3/26 (2006.01)
B32B 7/12 (2006.01)
B32B 15/09 (2006.01)

(57)

ABSTRACT

An antenna structure includes a substrate, an antenna unit and a first protection portion. The substrate has a first surface. The antenna unit is disposed on the first surface and includes a metal pattern layer and a glue layer. The glue layer is configured to adhere the metal pattern layer to the first surface. The first protection portion is disposed on the metal pattern layer and includes a first protection layer and a first glue layer. The first protection layer includes at least one feeding hole. The first glue layer is configured to adhere the first protection layer to the metal pattern layer.

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US 20260237905 A1

(19) **United States**
(12) **Patent Application Publication**
Quach

(10) **Pub. No.:** **US 2026/0237905 A1**
(43) **Pub. Date:** **Aug. 13, 2026**

(54) **ANTENNA WITH MULTIPLE BANDWIDTH
ENHANCEMENT TECHNIQUES**

Publication Classification

(71) Applicant: **Neptune Technology Group LLC,**
Tallassee, AL (US)

(51) **Int. Cl.**
H01Q 9/04 (2006.01)
H01Q 5/20 (2015.01)
H01Q 13/10 (2006.01)

(72) Inventor: **Tan Dinh Quach,** Montgomery, AL
(US)

(52) **U.S. Cl.**
CPC **H01Q 9/0407** (2013.01); **H01Q 5/20**
(2015.01); **H01Q 13/10** (2013.01)

(73) Assignee: **Neptune Technology Group LLC,**
Tallassee, AL (US)

(21) Appl. No.: **19/441,990**

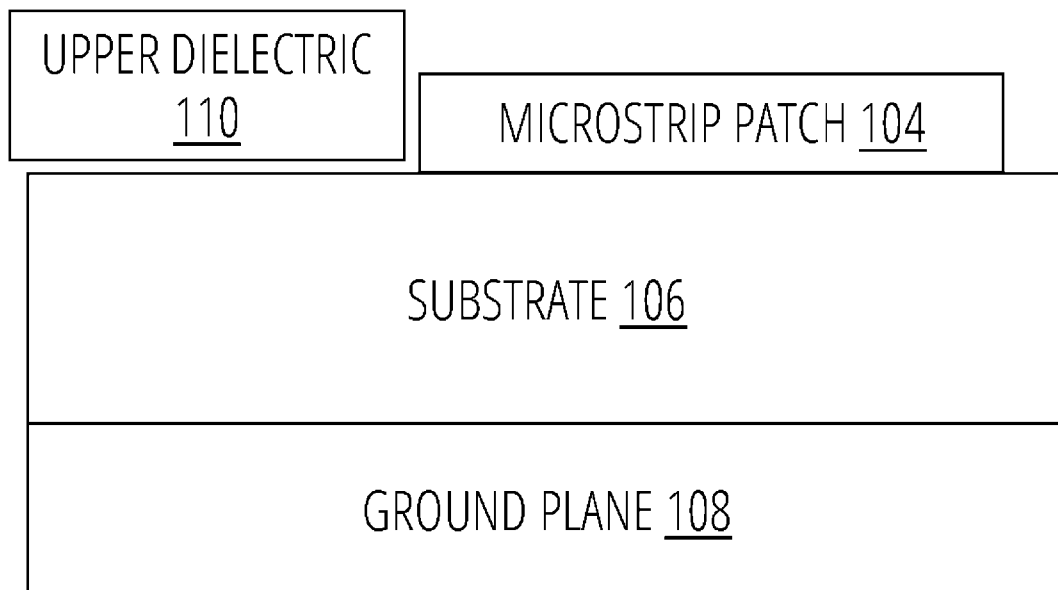
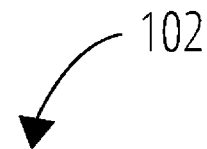
(22) Filed: **Jan. 7, 2026**

(57) **ABSTRACT**

A microstrip antenna may include a substrate with a first surface and a second surface. A microstrip patch, which may include a pair of slots and a perimeter slot, may be coupled to the first surface of the substrate. Additionally, a ground plane may be coupled to the second surface of the substrate. The microstrip antenna may provide dual resonance within a predetermined range of frequencies.

Related U.S. Application Data

(60) Provisional application No. 63/757,542, filed on Feb. 12, 2025.

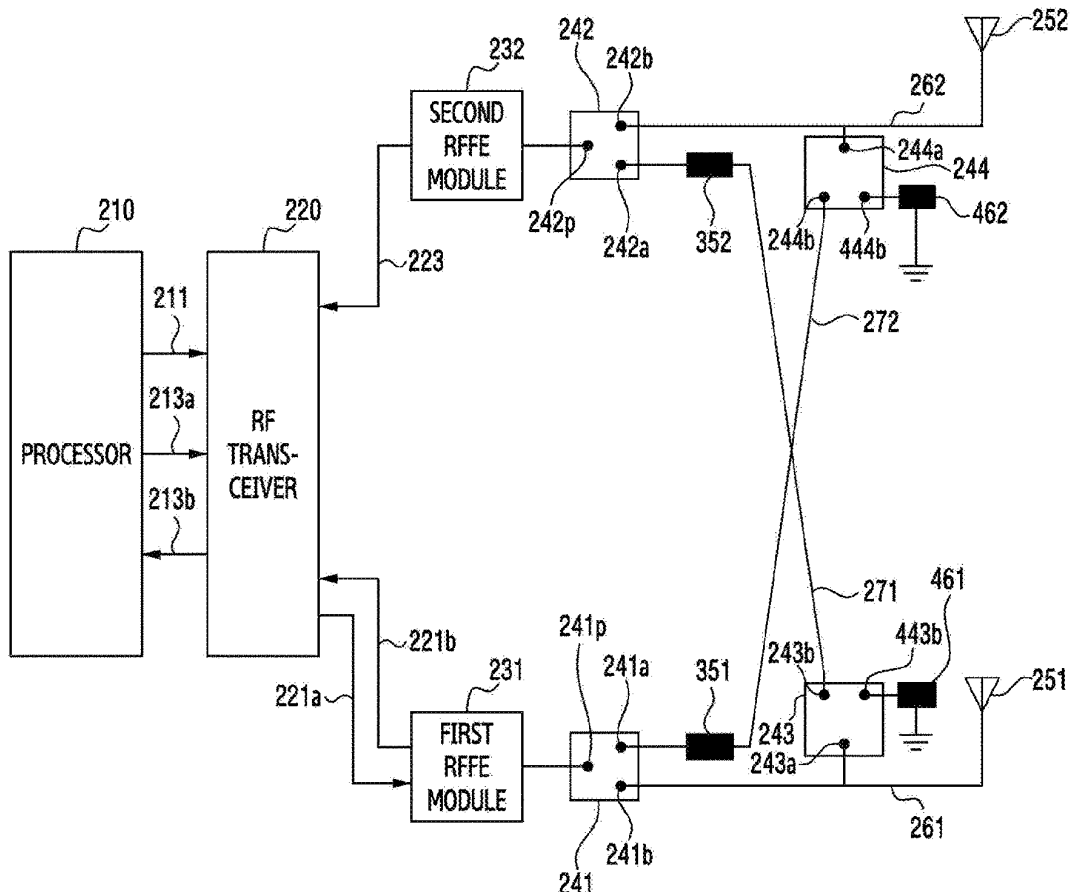




US 20260238236A1

(19) **United States**(12) **Patent Application Publication**
CHO et al.(10) **Pub. No.: US 2026/0238236 A1**(43) **Pub. Date: Aug. 13, 2026**(54) **ELECTRONIC DEVICE COMPRISING
ANTENNA****H05K 1/181** (2026.01)**H05K 7/14** (2006.01)(71) Applicant: **SAMSUNG ELECTRONICS CO.,
LTD.**, Suwon-si (KR)(52) **U.S. Cl.**CPC **H04B 1/0064** (2013.01); **H04B 1/40**
(2013.01); **H05K 1/181** (2013.01); **H05K**
7/1427 (2013.01); **H05K 2201/10098**
(2013.01)(72) Inventors: **Namjun CHO**, Suwon-si (KR);
Hyoseok NA, Suwon-si (KR)(21) Appl. No.: **19/646,270**(22) Filed: **Apr. 13, 2026****Related U.S. Application Data**(63) Continuation of application No. PCT/KR2024/
015434, filed on Oct. 11, 2024.(30) **Foreign Application Priority Data**Oct. 13, 2023 (KR) 10-2023-0137215
Dec. 5, 2023 (KR) 10-2023-0174986**Publication Classification**(51) **Int. Cl.**
H04B 1/00 (2006.01)
H04B 1/40 (2015.01)(57) **ABSTRACT**

An electronic device may include: a plurality of antennas including a first antenna and a second antenna; an RF transceiver; a first RFFE module electrically connected to the RF transceiver and configured to transmit or receive a signal; a second RFFE module electrically connected to the RF transceiver and configured to receive a signal; and a plurality of switching circuits including a first switching circuit connected to the first RFFE module and a second switching circuit connected to the second RFFE module, wherein the first switching circuit may be configured to selectively connect the first RFFE module with the first antenna in a first connection mode or with the second antenna in a second connection mode, and the second switching circuit may be configured to selectively connect the second RFFE module with the second antenna in the first connection mode or with the first antenna in the second connection mode.





US 20260238267A1

(19) **United States**

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

(10) **Pub. No.: US 2026/0238267 A1**

(43) **Pub. Date: Aug. 13, 2026**

(54) **ANTENNA SWITCHING CIRCUIT AND ELECTRONIC DEVICE COMPRISING SAME**

Publication Classification

(51) **Int. Cl.**
H04B 7/06 (2006.01)
H04B 1/50 (2006.01)
(52) **U.S. Cl.**
CPC **H04B 7/0602** (2013.01); **H04B 1/50** (2013.01)

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(21) Appl. No.: **19/641,082**

(22) Filed: **Apr. 7, 2026**

Related U.S. Application Data

(63) Continuation of application No. PCT/KR2024/013679, filed on Sep. 10, 2024.

Foreign Application Priority Data

Oct. 7, 2023 (KR) 10-2023-0133844
Oct. 31, 2023 (KR) 10-2023-0148559

(57) **ABSTRACT**

An electronic device includes: a processor; an RF transceiver; a first filter for a first frequency band; a second filter for a second frequency band; a radio frequency front end (RFFE) circuit including an antenna switching circuit; a first antenna; a second antenna; and an impedance adjustment circuit electrically connected to a sounding reference signal (SRS) output port of the antenna switching circuit. The impedance adjustment circuit provides a characteristic impedance of a specified magnitude at the SRS output port. The first antenna is configured to transmit or receive signals in the first frequency band via the antenna switching circuit in which the characteristic impedance of the specified magnitude is provided to the SRS output port. The second antenna is configured to transmit SRSs in the second frequency band via the antenna switching circuit and the impedance adjustment circuit coupled to the SRS output port of the antenna switching circuit.

