



US 20230231294A1

(19) **United States**
(12) **Patent Application Publication** (10) **Pub. No.: US 2023/0231294 A1**
KIM et al. (43) **Pub. Date: Jul. 20, 2023**

(54) **ANTENNA PACKAGE AND IMAGE DISPLAY
DEVICE INCLUDING THE SAME**

Publication Classification

(71) Applicant: **DONGWOO FINE-CHEM CO., LTD.**,
Jeollabuk-do (KR)

(51) **Int. Cl.**
H01Q 1/22 (2006.01)
H04M 1/02 (2006.01)
H01Q 1/38 (2006.01)
H05K 3/46 (2006.01)

(72) Inventors: **Young Ju KIM**, Gyeonggi-do (KR);
Dong Pil PARK, Incheon (KR); **Byung
Jin CHOI**, Incheon (KR); **Na Yeon
KIM**, Seoul (KR); **Han Sub RYU**,
Gyeongsangbuk-do (KR)

(52) **U.S. Cl.**
CPC **H01Q 1/2266** (2013.01); **H01Q 1/38**
(2013.01); **H01Q 1/2283** (2013.01); **H04M**
1/0277 (2013.01); **H05K 3/4691** (2013.01);
H05K 1/0216 (2013.01)

(21) Appl. No.: **18/125,271**

(57) **ABSTRACT**

(22) Filed: **Mar. 23, 2023**

Related U.S. Application Data

(63) Continuation of application No. PCT/KR2021/
012452, filed on Sep. 14, 2021.

(30) **Foreign Application Priority Data**

Sep. 29, 2020 (KR) 10-2020-0126493

An antenna package includes a first antenna device including a first antenna unit, a second antenna device disposed at a level different from that of the first antenna device, the second antenna device including a second antenna unit that has a radiation direction different from that of the first antenna unit, a first circuit board electrically connected to the first antenna unit, a second circuit board electrically connected to the second antenna unit, and a third circuit board electrically and independently connected to the first circuit board and the second circuit board, the third circuit board having at least one antenna driving integrated circuit (IC) chip mounted thereon.

