UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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INTEL CORPORATION,
Petitioner

v.

QUALCOMM INCORPORATED,
Patent Owner.

————————

IPR2019-00049
Patent 9,154,356 B2

————————

Before MICHELLE N. WORMMEESTER, SCOTT B. HOWARD,
and AARON W. MOORE, *Administrative Patent Judges*.

MOORE, *Administrative Patent Judge*.

JUDGMENT
FINAL WRITTEN DECISION
No Challenged Claims Unpatentable
35 U.S.C. § 318(a)

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I.   INTRODUCTION

A.   *Background*

Intel Corporation ("Petitioner") filed a Petition for *inter partes* review of claims 2–8 and 11 of U.S. Patent No. 9,154,356 B2 (Ex. 1201, "the '356 patent"). Paper 3 ("Pet."). Qualcomm Incorporated ("Patent Owner") filed a Preliminary Response. Paper 7.

On July 10, 2019, we instituted an *inter partes* review of claims 2–8 and 11. Paper 8 ("Inst. Dec."), 19. Patent Owner then filed a Patent Owner Response (Paper 12, "PO Resp."), Petitioner filed a Reply (Paper 18, "Pet. Reply"), and Patent Owner filed a Sur-Reply (Paper 22, "PO Sur-Reply"). An oral hearing was held on April 7, 2019, and a transcript of the hearing is included in the record. Paper 29 ("Tr.").

The Board has jurisdiction under 35 U.S.C. § 6. This Final Written Decision is issued pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73.

For the reasons that follow, we determine that Petitioner has *not* shown by a preponderance of the evidence that claims 2–8 and 11 of the '356 patent were unpatentable.

B.   *Related Matters*

Petitioner filed two petitions, IPR2019-00128 and IPR2019-00129, seeking *inter partes* review of claims 1–8, 10, 11, 17, and 18 of the '356 patent based on prior art different than that presented in this petition. On May 27, 2020 we issued Final Written Decisions in those cases, determining that Petitioner had not shown that any claims were unpatentable.

Petitioner filed another petition, IPR2019-00047, seeking *inter partes* review of claims 1, 7, 8, 10, 11, 17, and 18 of the '356 patent based on prior

art different than that presented in this petition and the '128 and '129 petitions, and concurrently filed another petition, IPR2019-00048, seeking *inter partes* review of claims 1, 9, 10, 17, and 18 of the '356 patent based on the same prior art presented in this petition.

The Petition states that Patent Owner "has asserted the '356 patent against Apple in *Certain Mobile Electronic Devices and Radio Frequency and Processing Components Thereof*, Investigation No. 337-ITC-1093, currently pending before the International Trade Commission" and "also has asserted the '356 patent against Apple in another currently pending case, *Qualcomm Inc. v. Apple Inc.*, No. 3:17-cv-02398 (S.D. Cal.)." Pet. 1. In updated mandatory notices filed on October 7, 2019, Petitioner advised the Board that the District Court litigation has been dismissed and that the ITC investigation has been terminated. *See* Paper 13.

C.   *The '356 Patent*

The '356 Patent is directed to "[l]ow noise amplifiers . . . supporting carrier aggregation." Ex. 1201, code (57). In the embodiment described in the Abstract, an "input RF signal includes transmissions sent on multiple carriers at different frequencies," a "first amplifier stage receives and amplifies [the input signal] and provides a first output RF signal to a first load circuit when the first amplifier stage is enabled," and a "second amplifier stage receives and amplifies the input RF signal and provides a second output RF signal to a second load circuit when the second amplifier stage is enabled." *Id*.

Figure 6A, reproduced below, details an example of a low noise amplifier according to the '356 patent. *Id.* at 1:54–55.
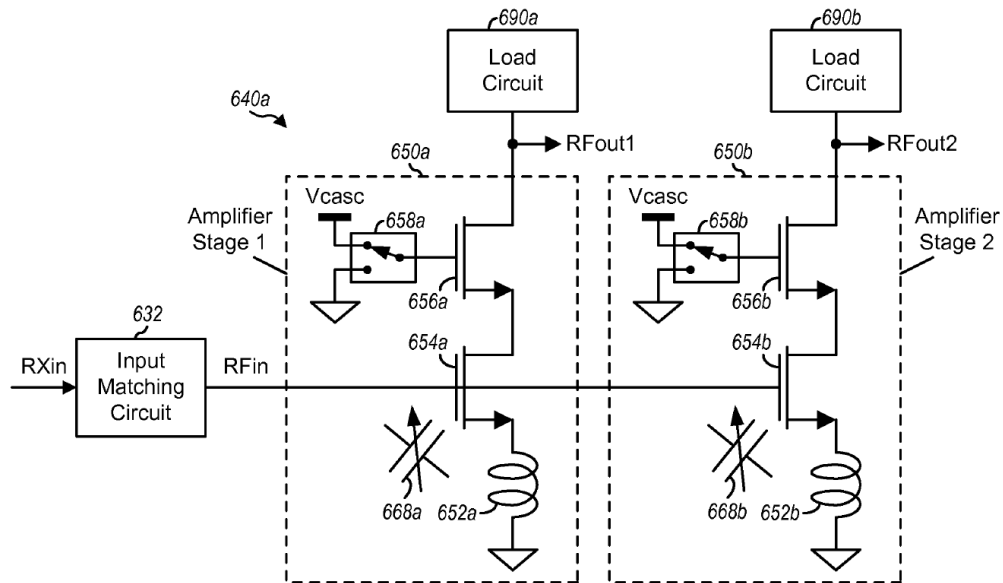

FIG. 6A

Figure 6A shows "an LNA with inductive degeneration and cascode shutoff." Ex. 1201, 1:54–55.

As shown above, amplifier stage 650a includes source degeneration inductor 652a, gain transistor 654a, cascode transistor 656a, and switch 658a. Ex. 1201, 7:58–8:4. Similarly, amplifier stage 650b includes source degeneration inductor 652b, gain transistor 654b, cascode transistor 656b, and switch 658b. *Id.* at 8:4–9. Both amplifier stages 650a and 650b are coupled to common input matching circuit 632 and to respective load circuits 690a and 690b. *Id.* at 7:47–49.

In operation, matching circuit 632 receives receiver input signal RXin, performs input matching for low noise amplifier 640a, and provides input RF signal RFin to low noise amplifier 640a. Ex. 1201, 7:49–52. Input RF signal RFin may include transmissions on one set of carriers or

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