

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Intel Corporation
Petitioner

v.

Qualcomm Incorporated
Patent Owner

Case IPR2018-01154
Patent 8,698,558

**PRELIMINARY PATENT OWNER RESPONSE TO PETITION FOR
INTER PARTES REVIEW PURSUANT TO 37 C.F.R. § 42.107**

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I. INTRODUCTION

Intel Corporation (“Intel” or “Petitioner”) raises three grounds against six claims, but all of those challenges hinge on an anticipation ground directed to the only independent claim challenged, claim 15. The other grounds are directed to claims 16 and 19, which depend from claim 15. In its anticipation analysis, Intel completely disregards Fig. 11 of the cited Kwak reference, which shows that the disclosed system does *not* meet the limitations of claim 15. Wholly ignoring Fig. 11, Intel instead provides a misleading analysis in an attempt to demonstrate that the Kwak reference teaches something that it does not. For at least this reason, the Board should deny institution.

II. THE ’558 PATENT AND ITS PROSECUTION HISTORY

A. Overview of the ’558 Patent

U.S. Patent No. 8,698,558 (“the ’558 Patent”) describes and claims inventions directed to managing the power associated with transmitting radio frequency (“RF”) signals from a mobile device. Ex. 1201, 1:5-31. The ’558 Patent teaches improvements over known power management schemes by employing a novel form of “envelope tracking.” *Id.*, Title, 3:57-60. The ’558 Patent’s power management scheme achieves substantial power savings in mobile device transmitters thereby extending a device’s battery life. *Id.* at 3:46-48.

In wireless communication systems, mobile devices communicate by transmitting encoded data signals. Ex. 1201, 1:11-17. Before transmitting through a communications channel, such encoded data signals are first conditioned to generate RF output signals. *Id.* Such conditioning typically includes an amplification step performed by a power amplifier (a “PA”) that provides a high transmit power. *Id.* at 1:21-26. A desirable characteristic of mobile device power amplifiers is an ability to provide high transmit power with high power-added efficiency and good performance even when the device’s battery is low. *Id.*

The '558 Patent discloses an efficient design for envelope tracking that employs a “switcher” and an “envelope amplifier” together with a boost converter, as illustrated in Fig. 3, with annotations below:

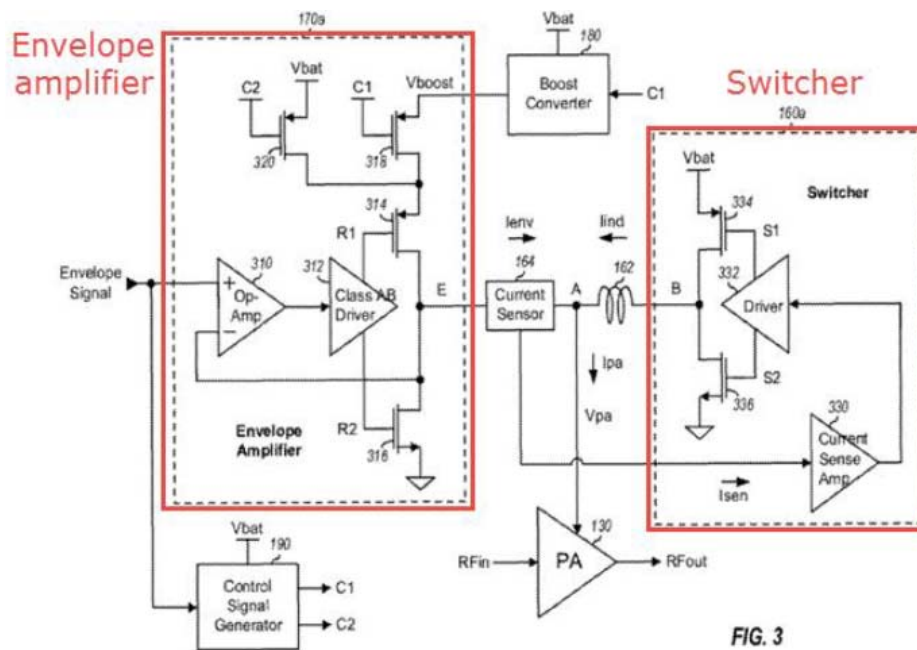


Fig. 3 illustrates an exemplary switcher 160a with envelope amplifier 170a operating cooperatively to create a supply current I_{pa} as the sum of I_{ind} from the switcher and I_{env} from the envelope amplifier. Ex. 1201, 4:34-38.

A switcher, *e.g.* 160a, “has high efficiency” and may deliver “a majority of the supply current for [PA] 130” in current I_{ind} , which contains DC and low frequency components. *Id.* at 3:14-17; 6:19-20. An envelope amplifier, *e.g.* 170a, on the other hand operates as a linear stage and has high bandwidth. *Id.* at 6:20-22. In the combination the switcher reduces the output current of the envelope amplifier thereby improving overall efficiency, while the envelope amplifier provides the high frequency components in current I_{env} . *Id.* at 3:21-25; 6:22-24. In this way, the overall efficiency increases by drawing the majority of current from the highly efficient switcher, and only relying on the envelope amplifier for the high frequency components.

In order to further increase the efficiency of the system, embodiments of a switcher are designed to implement an offset to the input current (*e.g.* I_{sen} in Fig. 3 above) “in order to generate a larger supply current via the inductor than without the offset.” Ex. 1201, 13:24-26, *see, e.g.* 10:1-18. This offset is intended to address an inefficiency arising in switchers where a reduced supply voltage (*e.g.* a reduced V_{bat}) leads to a reduced supply current causing an inductor to charge more slowly. *Id.* 6:52-61. Within the context of the disclosed apparatus, this has

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