

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE PATENT TRIAL AND APPEAL BOARD

Intel Corporation
Petitioner

v.

Qualcomm Incorporated
Patent Owner

Case IPR2018-01153
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

Consideration of the two obviousness grounds proposed by the Petitioner would require the Board to address, and effectively overturn, the decisions of the ITC and the Patent Office. In its first proposed ground, the Petitioner asks the PTAB to revisit the decision of the Patent Office by proposing a prior art combination that is nearly identical to the primary reference applied during prosecution. And the second proposed ground asserts a combination of references that has already been considered and found insufficient by the ITC. The Petitioner, having the burden of proof, has not even attempted to demonstrate why the PTAB should reconsider the cumulative art submitted in Ground I, or second guess the conclusions of the ITC in Ground II. The Board should therefore exercise its discretion to 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. 1101, 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 devices' battery life. *Id.* at 3:46-48.

In wireless communication systems, mobile devices communicate by transmitting encoded data signals. Ex. 1101, 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 ("PAE") and good performance even when the device's battery is low. *Id.*

Prior to the priority date of the '558 Patent, typical PAs in a mobile device were supplied with a constant power supply voltage, regardless of the PA's output power. The '558 Patent illustrates this in Fig. 2A, below with annotation:

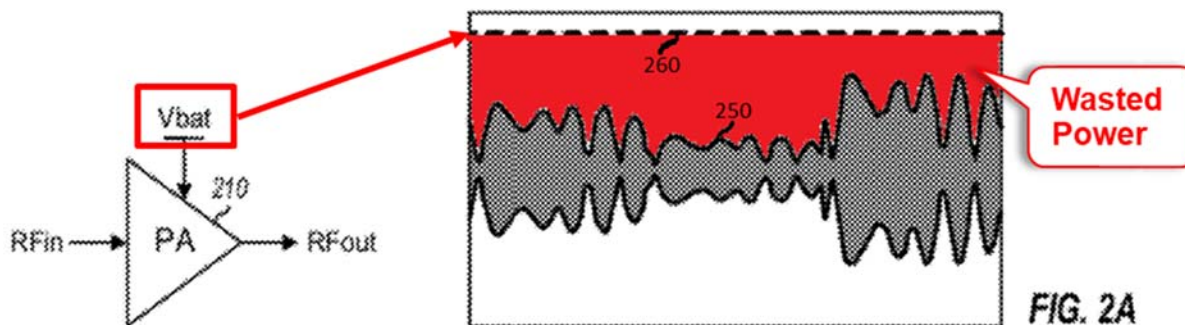
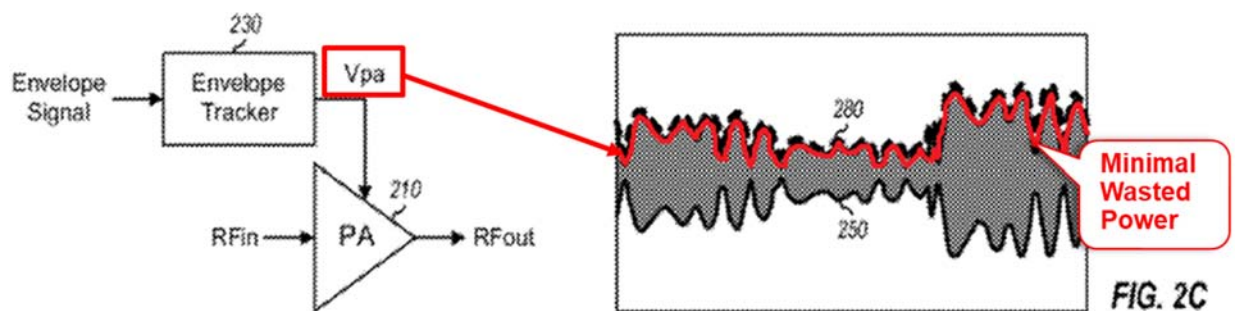


Fig. 2A illustrates using a battery voltage (V_{bat}) to supply PA 210, which provides an RFout signal as an amplified version of RFin. Ex. 1101, 4:1-3. RFout has a time-varying envelope illustrated by plot 250, which is juxtaposed with voltage V_{bat} 260. V_{bat} remains higher than the largest amplitude of RFout's envelop in order to prevent clipping of RFout by PA 210. *Id.* at 4:2-7. A drawback to this scheme is that the difference between the battery voltage and the envelop of the RFout signal (shaded red) represents wasted power. *Id.* at 4:7-9.

As wasted power is undesirable, especially where power is limited by battery life, the '558 Patent employs "envelope tracking" in order to better manage power consumption by using only an amount of power that is needed for a particular signal. A PA employing envelope tracking is illustrated in Fig. 2C, with annotations, below:



By employing envelope tracking to produce a PA power supply V_{pa} , represented in plot 280, the "supply voltage closely tracks the envelope [250] of the RFout signal over time." Ex. 1101, 4:21-27. This maximizes PA efficiency by

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