**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

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Case IPR2018-01152
Patent 8,698,558

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

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## I. INTRODUCTION

Petitioner raises four grounds against three claims, but only one of those grounds, an anticipation ground, is directed to independent claim 12. The other grounds are directed to claims 13 and 14, which depend from claim 12. In its anticipation analysis, the Petitioner asks the Board to consider a reference that is nearly identical to the primary reference applied during prosecution and over which independent claim 12 was allowed. And further, the Petitioner has made *no effort* to meet its burden of showing why the Board should reconsider this cumulative art. For at least this reason, the Board should 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. 1001, 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. 1001, 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:

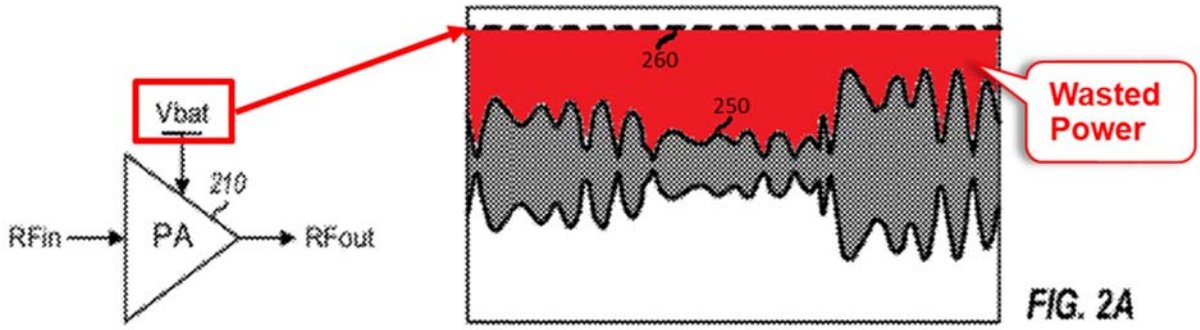


FIG. 2A

Fig. 2A illustrates using a battery voltage (Vbat) to supply PA 210, which provides an RFout signal as an amplified version of RFin. Ex. 1001, 4:1-3. RFout has a time-varying envelope illustrated by plot 250, which is juxtaposed with voltage Vbat 260. Vbat 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:

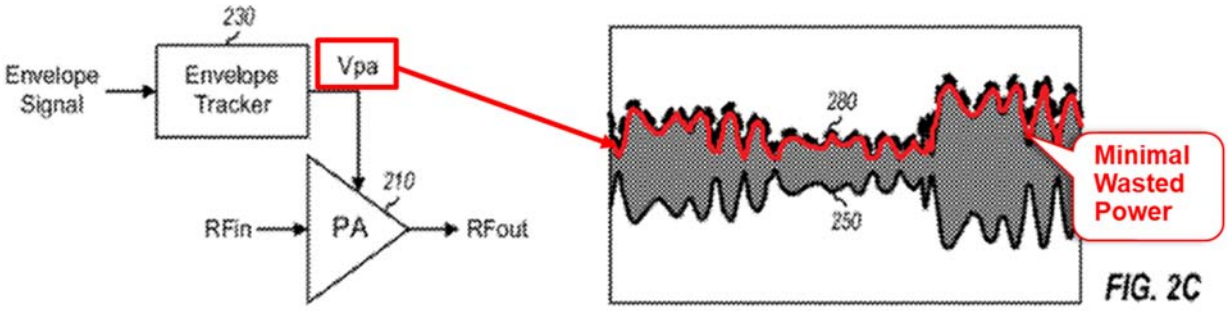

FIG. 2C

By employing envelope tracking to produce a PA power supply Vpa, represented in plot 280, the "supply voltage closely tracks the envelope [250] of the RFout signal over time." Ex. 1001, 4:21-27. This maximizes PA efficiency by minimizing the difference between Vpa and RFout over time, which results in less wasted power. *Id*. at 4:27-32.

Implementing a PA supply with envelope tracking in a mobile device poses unique challenges, because operating a mobile device with a low battery voltage is often desirable (*e.g.* to reduce power consumption, extend battery life, *etc*.). Ex.

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