

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE PATENT TRIAL AND APPEAL BOARD

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SEMICONDUCTOR COMPONENTS INDUSTRIES, LLC  
(d/b/a ON SEMICONDUCTOR),  
Petitioner,

v.

POWER INTEGRATIONS, INC.,  
Patent Owner.

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Case IPR2016-01600  
Patent 7,834,605 B2

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Before THOMAS L. GIANNETTI, BRIAN J. McNAMARA, and  
LYNNE E. PETTIGREW, *Administrative Patent Judges*.

PETTIGREW, *Administrative Patent Judge*.

FINAL WRITTEN DECISION  
35 U.S.C. § 318(a) and 37 C.F.R. § 42.73

## I. INTRODUCTION

In this *inter partes* review, Petitioner, Semiconductor Components Industries, LLC, d/b/a ON Semiconductor, challenged claims 1, 2, 5, and 9 of U.S. Patent No. 7,834,605 B2 (Ex. 1001, “the ’605 patent”). After we instituted review of all challenged claims, Patent Owner, Power Integrations, Inc., filed a non-contingent Motion to Amend seeking cancellation of the challenged claims and proposing substitute claims 13–16.

We have jurisdiction to conduct this *inter partes* review under 35 U.S.C. § 6. This Final Written Decision is entered pursuant to 35 U.S.C. § 318(a) and 37 C.F.R. § 42.73. For the reasons discussed below, Patent Owner’s Motion to Amend is *granted* with respect to cancellation of claims 1, 2, 5, and 9, and *denied* with respect to proposed substitute claims 13–16.

### A. Procedural History

Petitioner filed a Petition seeking *inter partes* review of claims 1, 2, 5, and 9 of the ’605 patent. Paper 1 (“Pet.”). Patent Owner filed a Preliminary Response. Paper 8 (“Prelim. Resp.”). Applying the standard set forth in 35 U.S.C. § 314(a), which requires demonstration of a reasonable likelihood that Petitioner would prevail with respect to at least one challenged claim, we instituted an *inter partes* review of all challenged claims on the sole unpatentability ground asserted in the Petition—anticipation under 35 U.S.C. § 102(b)<sup>1</sup> by de Sartre.<sup>2</sup> Paper 11 (“Inst. Dec.”).

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<sup>1</sup> The Leahy-Smith America Invents Act, Pub. L. No. 112-29, 125 Stat. 284 (2011) (“AIA”), amended 35 U.S.C. § 102. Because the ’605 patent has an effective filing date before the effective date of the applicable AIA amendments, we refer to the pre-AIA version of 35 U.S.C. § 102.

<sup>2</sup> U.S. Patent No. 4,692,853, issued Sept. 8, 1987 (Ex. 1005).

Following institution, Patent Owner did not file a Response to the Petition pursuant to 37 C.F.R. § 42.120. Instead, pursuant to 35 U.S.C. § 316(d) and 37 C.F.R. § 42.121, Patent Owner filed a Motion to Amend that was not contingent on a determination that the original claims are unpatentable. Paper 16 (“Mot.”). In its Motion, Patent Owner requested that claims 1, 2, 5, and 9 be cancelled and replaced with proposed substitute claims 13–16. Mot. 1. Petitioner filed an Opposition to the Motion to Amend (Paper 18, “Opp.”), and Patent Owner filed a Reply to Petitioner’s Opposition (Paper 21, “Reply”).

Thereafter, on October 4, 2017, the United States Court of Appeals for the Federal Circuit issued its decision in *Aqua Products, Inc. v. Matal*, 872 F.3d 1290 (Fed. Cir. 2017) (en banc), addressing the burden of persuasion that applies when the Board considers the patentability of proposed substitute claims in a motion to amend. Following a conference call with the parties, we authorized additional briefing on the Motion to Amend. Paper 28, 3. Petitioner filed a Supplemental Response to Patent Owner’s Motion to Amend (Paper 29, “Pet. Supp. Resp.”), and Patent Owner filed a Reply to Petitioner’s Supplemental Response (Paper 31, “PO Supp. Reply”).

An oral hearing was held on November 15, 2017. A transcript of the hearing has been entered into the record. Paper 34.

### *B. Related Matters*

The ’605 patent was involved in the following district court proceeding: *Power Integrations, Inc. v. Fairchild Semiconductor Int’l, Inc.*, No. 1:08-cv-00309 (D. Del.). Pet. 2; Paper 4, 2. An appeal from the district court to the United States Court of Appeals for the Federal Circuit was pending at the time the Petition and Preliminary Response in this case were

filed. *See* Pet. 2, 25–26; Paper 4, 2. On December 12, 2016, the Federal Circuit held claims 1 and 2 of the '605 patent invalid, reversing a jury verdict that claims 1 and 2 were not anticipated by U.S. Patent No. 4,763,238 to Maige (Ex. 1008). *Power Integrations, Inc. v. Fairchild Semiconductor Int'l, Inc.*, 843 F.3d 1315, 1335–38 (Fed. Cir. 2016); *see* Paper 9, 2. Patent Owner did not file a petition for a writ of certiorari to the United States Supreme Court within the time period for filing such a petition. *See* Opp. 4.

### *C. The '605 Patent*

The '605 patent describes a switch mode power supply with an approximately constant output voltage when the output current is below an output current threshold and an approximately constant output current when the output voltage is below an output voltage threshold. Ex. 1001, 1:32–38, 1:51–53. In a described embodiment, the power supply includes a regulator circuit that controls the voltage and current at the output of the power supply. *Id.* at 5:31–49, Fig. 4. The regulator includes an internal switch (e.g., a power metal oxide semiconductor field effect transistor (MOSFET)) coupled to the primary winding of the power supply's energy transfer element (e.g., a transformer). *Id.* at 5:37–43, Fig. 4. The regulator may modify the duty cycle of the switch to control the output voltage based on feedback from the output of the power supply. *Id.* at 4:50–53, 5:37–39. The regulator also may modify the duty cycle by turning off the switch when the switch current reaches a current limit. *Id.* at 5:40–43.

According to the '605 patent, there is a fixed delay between the time the switch current reaches a current limit threshold and the time the switch is finally disabled. *Id.* at 3:18–24. This results in a current “overshoot” that

will vary based on the input voltage of the power supply. *Id.* at 3:24–27. More specifically, at higher direct current (DC) input voltages, the actual current limit ramps to a higher level above the current limit threshold than at lower DC input voltages. *Id.* at 3:31–33.

The '605 patent attempts to overcome the problem of current variations and thereby achieve a power supply with an approximately constant output current. *Id.* at 2:45–50, 3:14–17. The purported solution is a power supply regulator circuit that creates a variable current limit threshold that increases during the on-time of the switch. *Id.* at [57], 1:53–59. Because the current overshoot is greater at higher DC input voltages than at lower DC input voltages, a variable current limit threshold should be lower for higher DC input voltages to compensate for the excess current during the delay time. *Id.* at 3:40–44; *see* Ex. 1003 ¶ 22 (Decl. of Dr. Douglas Holberg). Further, because the switch current increases more quickly when the DC input voltage is high, a current limit will be reached earlier in a switching cycle when the DC input voltage is higher than when it is lower. Ex. 1001, 3:45–49; *see* Ex. 1003 ¶¶ 22–23. Thus, a variable current limit threshold that increases from a first level to a second level during the on-time of the switch results in an effective current limit (the sum of the variable current limit and the excess current during the delay) that is approximately constant across different input voltages. Ex. 1001, 3:50–62; *see* Ex. 1003 ¶ 23.

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