Petitioners' Oral Argument

Petitioners Samsung Electronics Co., Ltd., Dell Technologies Inc., and Anker Innovations Ltd.

Case Nos. IPR2022-00311 and -00312

February 24, 2023

Case Overview

IPR No.	Challenged Patents
IPR2021-00311 ("-311 IPR")	U.S. 8,477,514 ('514 Patent)
IPR2021-00312 ("-312 IPR")	U.S. 7,675,759 ('759 Patent)

Agenda

Brief Overview

- '514 and '759 Patents
- Prior Art Grounds

Common Issues -311 IPR & -312 IPR

- "system operational state of [a/said] load"
- "control said duty cycle"
- power converter "controller"
- "power system controller"
- "core state"

-311 IPR Specific Issues ('514 Patent)

- "signal characterizing a power requirement of a processor system"
- "[enable/enabling] components of a processor system"
- "over a period of time"
- "upon startup"
- Motivation to Combine Hwang/Chagny

-312 IPR Specific Issues ('759 Patent)

- "power converter operational state"
- "power converter status"
- "a power system controller configured to receive a signal"
- "within a transition time"
- Markush Groups

Challenged Patents

U.S. Patent No. 8,477,514

US008477514B2

(12) **United States Patent**
Artusi et al.

(10) **Patent No.: US 8,477,514 B2**
(45) **Date of Patent: *Jul. 2, 2013**

(54) **POWER SYSTEM WITH POWER CONVERTERS HAVING AN ADAPTIVE CONTROLLER**

(75) Inventors: **Daniel A. Artusi**, Austin, TX (US); **Ross Fosler**, Buda, TX (US); **Allen F. Rozman**, Murphy, TX (US)

(73) Assignee: **Flextronics International USA, Inc.**, San Jose, CA (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

This patent is subject to a terminal disclaimer.

(21) Appl. No.: **12/709,795**

(22) Filed: **Feb. 22, 2010**

(65) **Prior Publication Data**

US 2010/0149838 A1 Jun. 17, 2010

Related U.S. Application Data

(63) Continuation of application No. 12/051,334, filed on Mar. 19, 2008, now Pat. No. 7,667,986, which is a continuation-in-part of application No. 11/710,276, filed on Feb. 23, 2007, now Pat. No. 7,675,759, which is a continuation-in-part of application No. 11/607,325, filed on Dec. 1, 2006, now Pat. No. 7,675,758.

(51) **Int. Cl.**
H02M 3/335 (2006.01)

(52) **U.S. Cl.**
USPC **363/21.01**

(58) **Field of Classification Search**
USPC 363/21.01, 35, 37, 40, 41, 47, 48, 363/95, 97, 98, 131, 132
See application file for complete search history.

(56) **References Cited**

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(Continued)

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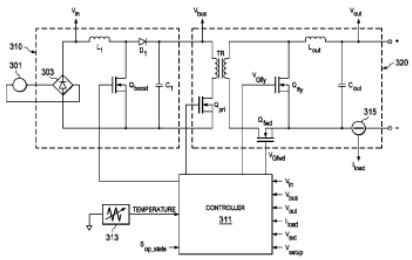
Assistant Examiner — Yemane Mehari
(74) *Attorney, Agent, or Firm* — Boisbrun Hofman, PLLC

(57) **ABSTRACT**

A power system having a power converter with an adaptive controller. In one embodiment, a power converter coupled to a load includes a power switch configured to conduct for a duty cycle to provide an output characteristic at an output thereof. The power converter also includes a power converter controller configured to receive a signal from the load indicating a system operational state of the load and enable a power converter topological state as a function of the signal.

20 Claims, 12 Drawing Sheets



Samsung, EX1001, p. 1

'514 Patent, -311 IPR, EX1001 at Cover

U.S. Patent No. 7,675,759

US007675759B2

(12) **United States Patent**
Artusi et al.

(10) **Patent No.: US 7,675,759 B2**
(45) **Date of Patent: Mar. 9, 2010**

(54) **POWER SYSTEM WITH POWER CONVERTERS HAVING AN ADAPTIVE CONTROLLER**

(75) Inventors: **Daniel A. Artusi**, Austin, TX (US); **Ross Fosler**, Buda, TX (US); **Allen F. Rozman**, Murphy, TX (US)

(73) Assignee: **Flextronics International USA, Inc.**, San Jose, CA (US)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 248 days.

(21) Appl. No.: **11/710,276**

(22) Filed: **Feb. 23, 2007**

(65) **Prior Publication Data**

US 2008/0130322 A1 Jun. 5, 2008

Related U.S. Application Data

(63) Continuation-in-part of application No. 11/607,325, filed on Dec. 1, 2006.

(51) **Int. Cl.**
H02M 3/335 (2006.01)

(52) **U.S. Cl.** **363/21.01**

(58) **Field of Classification Search** 363/35, 363/37, 40, 41, 47, 48, 95, 97, 131, 132, 363/21.01; 323/355, 362
See application file for complete search history.

(56) **References Cited**

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(Continued)

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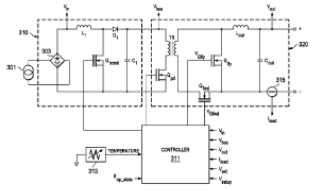
(74) *Attorney, Agent, or Firm*—Slater & Matsil, L.L.P.

(57) **ABSTRACT**

A power system having a power converter with an adaptive controller. The power system is coupled to a load and includes a power system controller that receives a signal indicating a system operational state of the load and selects a power converter operational state as a function thereof. The power system also includes a power converter with a power switch that conducts for a duty cycle to provide a regulated output characteristic at an output thereof. The power converter also includes a controller that receives a command from the power system controller to enter the power converter operational state and provides a signal to control the duty cycle of the power switch as a function of the output characteristic and in accordance with the command, thereby regulating an internal operating characteristic of the power converter to improve an operating efficiency thereof as a function of the system operational state.

20 Claims, 9 Drawing Sheets



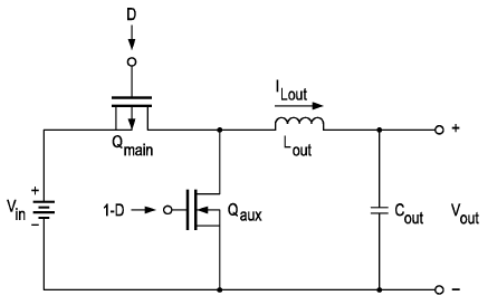
Samsung, EX1001, p. 1

'759 Patent, -312 IPR, EX1001 at Cover

Overview – Challenged Patents

"A switch-mode power converter (also referred to as a 'power converter') is a power supply or power processing circuit that converts an input voltage waveform into a specified output voltage waveform."

'514 Patent, -311 IPR, EX1001 at 2:42-45
'759 Patent, -312 IPR, EX1001 at 1:21-24



'514 Patent, -311 IPR, EX1001 at FIG. 2
'759 Patent, -312 IPR, EX1001 at FIG. 2

"As known in the art, and explained in the '514 Patent background, the duty cycle of the switches (i.e., ratio of on-time to the total switching period) in a power converter can be adjusted to regulate the output voltage Vout of the power converter. *Id.*, 2:57-3:9, 11:15-18; EX1002,¶38."

-311 IPR, Petition (Paper 3) at 4 (citing EX1001 and EX1002)
See also -312 IPR, Petition (Paper 3) at 4 (citing EX1001 and EX1002)

"The '514 Patent acknowledges that it was 'well known' to control output characteristics (e.g., the output voltage) of a converter based on the needs of a microprocessor coupled to the output. *Id.*, 4:63-5:4. But, the '514 Patent purports to improve upon the prior art by adjusting an internal operating characteristic of the power converter based on a signal from an external source. *Id.*, 6:36-44."

-311 IPR, Petition (Paper 3) at 4-5 (citing EX1001)
See also -312 IPR, Petition (Paper 3) at 4-5 (citing EX1001)

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