

(12) **United States Patent**
Petty

(10) **Patent No.:** **US 7,990,119 B2**
(45) **Date of Patent:** **Aug. 2, 2011**

(54) **MULTIMODE VOLTAGE REGULATOR CIRCUIT**

(75) Inventor: **John Stewart Petty**, Chapel Hill, NC (US)

(73) Assignee: **Telefonaktiebolaget L M Ericsson (publ)**, Stockholm (SE)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 440 days.

(21) Appl. No.: **12/181,739**

(22) Filed: **Jul. 29, 2008**

(65) **Prior Publication Data**

US 2010/0026250 A1 Feb. 4, 2010

(51) **Int. Cl.**
G05F 1/40 (2006.01)

(52) **U.S. Cl.** 323/273; 323/282; 323/268

(58) **Field of Classification Search** 323/225, 323/226, 273, 274, 282, 284

See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

6,424,128 B1	7/2002	Hiraki et al.	
6,737,839 B2	5/2004	Hiraki et al.	
6,836,417 B2	12/2004	Hiraki et al.	
6,897,715 B2	5/2005	Barber, Jr. et al.	
6,943,514 B1 *	9/2005	Chen et al.	318/400.29
7,498,769 B1 *	3/2009	Potantin et al.	320/125
7,609,039 B2 *	10/2009	Hasegawa	323/273

* cited by examiner

Primary Examiner — Jessica Han

(57) **ABSTRACT**

A multimode voltage regulator circuit includes a linear regulator sub-circuit configured to supply current to a load in a low-current mode, responsive to a first control signal from a first control path, as well as a switching regulator sub-circuit configured to supply current to the load in a high-current mode, responsive to a second control signal from a second control path. The circuit further comprises a shared error amplifier configured to generate an error signal based on the difference between a reference voltage and a feedback signal coupled from the load, and a switch configured to selectively route the error signal to the first control path in the low-current mode and to the second control path in the high-current mode.

14 Claims, 5 Drawing Sheets

