



US005867015A

United States Patent [19]

Corsi et al.

[11] **Patent Number:** 5,867,015

[45] **Date of Patent:** Feb. 2, 1999

[54] **LOW DROP-OUT VOLTAGE REGULATOR WITH PMOS PASS ELEMENT**

[75] Inventors: **Marco Corsi; Robert B. Borden**, both of Plano, Tex.; **Michael R. Kay**, Greensboro, N.C.; **Nicolas Salamina**, Dallas, Tex.; **Gabriel A. Rincon**, Margate, Fla.

[73] Assignee: **Texas Instruments Incorporated**, Dallas, Tex.

[21] Appl. No.: **992,706**

[22] Filed: **Dec. 17, 1997**

Related U.S. Application Data

[60] Provisional application No. 60/033,679, Dec. 19, 1996.

[51] **Int. Cl.**⁶ **G05F 3/16**

[52] **U.S. Cl.** **323/316; 327/542**

[58] **Field of Search** **327/542; 365/226; 323/316, 314, 313**

[56] References Cited

U.S. PATENT DOCUMENTS

4,954,769	9/1990	Kalthoff	323/313
5,751,639	5/1998	Ohsawa	365/226

Primary Examiner—Shawn Riley
Attorney, Agent, or Firm—Alan K. Stewart; Wade James Brady, III; Richard L. Donaldson

[57] ABSTRACT

A voltage regulator circuit includes: a first MOS transistor 12 coupled between a voltage supply line and an output node 44, the first MOS transistor 12 providing a stable voltage on the output node 44; a source follower 24 coupled to a gate of the first MOS transistor 12; an amplifier 38 coupled to a gate of the source follower 24 for controlling the response of the first MOS transistor 12; negative feedback circuitry coupled between the output node 44 and the amplifier 38, the feedback circuitry providing feedback to the amplifier 38; a current conveyer 46 coupled to the first MOS transistor 12; and positive feedback circuitry 26 coupled between the current conveyer 46 and the source follower 24.

5 Claims, 1 Drawing Sheet



