



US006847260B2

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

(10) **Patent No.:** **US 6,847,260 B2**  
(45) **Date of Patent:** **Jan. 25, 2005**

(54) **LOW DROPOUT MONOLITHIC LINEAR REGULATOR HAVING WIDE OPERATING LOAD RANGE**

(75) Inventors: **Vishal I. Gupta**, Atlanta, GA (US);  
**Prasun Raha**, Richardson, TX (US);  
**Gabriel A. Rincon-Mora**, Atlanta, GA (US)

(73) Assignee: **Texas Instruments Incorporated**,  
Dallas, TX (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.

(21) Appl. No.: **10/422,028**

(22) Filed: **Apr. 23, 2003**

(65) **Prior Publication Data**

US 2004/0212429 A1 Oct. 28, 2004

(51) **Int. Cl.**<sup>7</sup> ..... **H03F 3/45**; H03F 1/14

(52) **U.S. Cl.** ..... **330/257**; 330/292

(58) **Field of Search** ..... 330/257, 292

(56) **References Cited**

U.S. PATENT DOCUMENTS

6,084,475	A *	7/2000	Rincon-Mora	330/255
6,304,131	B1 *	10/2001	Huggins et al.	327/538
6,518,737	B1 *	2/2003	Stanescu et al.	323/280
6,600,299	B2 *	7/2003	Xi	323/280

\* cited by examiner

*Primary Examiner*—Patricia Nguyen

(74) *Attorney, Agent, or Firm*—Alan K. Stewart; W. James Brady, III; Frederick J. Telecky, Jr.

(57) **ABSTRACT**

A monolithic low dropout regulator includes an active capacitor multiplier that is used to form the dominant pole of the regulator, thereby yielding stability. This decouples the system stability from the high-frequency power supply rejection ratio (PSRR). The PSRR at high frequencies is tuned independently using a reasonable on-chip capacitor C2.

**6 Claims, 1 Drawing Sheet**







