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(54) ENABLING FAST TRANSIENT RESPONSE IN A LINEAR REGULATOR WHEN LOOP-GAIN REDUCTION IS EMPLOYED FOR FREQUENCY COMPENSATION

- (71) Applicant: Ningbo Aura Semiconductor Co., Limited, Ningbo (CN)
- Inventors: Arnold J D'Souza, Bangalore (IN); Shyam Somayajula, Bangalore (IN)
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(57)ABSTRACT

A linear voltage regulator includes a pass transistor, an error amplifier, a buffer, a load capacitor and a pair of components coupled in series between the output node of the error amplifier and the regulated output voltage node. The buffer is coupled between the error amplifier and the pass transistor. The buffer is a unity voltage-gain buffer, has a wide bandwidth and provides higher current drive to the control terminal of the pass transistor. A first component of the pair of components is provided to decrease loop gain as output current increases so as to provide frequency compensation, but reduces a speed at which the regulator can respond to output voltage transients. A second component of the pair of components is designed to at least partially negate the operation of the first component during an output voltage transient, and thereby enables the regulator to respond quickly to the transient.

