



LOOP CONTROL DETECTION CIRCUIT AND
METHOD FOR DETECTING CURRENT FEEDBACK

ABSTRACT OF THE DISCLOSURE

A loop control detection circuit (100) is provided for detecting feedback values in a current feedback control loop to determine if the control loop is in or out of control. The loop control detection circuit (100) includes a comparison circuit and a register circuit. The comparison circuit includes a first comparator (102) and a second comparator (106) that receive a feedback control loop signal from a current feedback control loop that is provided as the gate or gate-to-source voltage of a low side driver (24). The first comparator (102) compares the feedback control loop signal to a first voltage reference signal that corresponds to the threshold voltage of the low side driver (24) and generates a first comparison output signal in response. The second comparator (106) compares the feedback control loop signal to a second voltage reference signal that corresponds to the rail or supply voltage of a reference amplifier (28) of the current feedback control loop and generates a second comparison output signal in response. The register circuit includes a first flip-flop (104), a second flip-flop (108), and an enabling circuit (110). The first flip-flop (104) and the second flip-flop (108) receive a timing signal in an enabled state, such as a commutator control signal, at their clock inputs and, in response, generate a first loop control detection signal and a second loop control detection signal, respectively, in a state indicating that the current feedback control loop is in control. The first flip-flop (104) and the second

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flip-flop (108) receive the first comparison output signal and the second comparison output signal, respectively, and generate the first loop control detection signal and the second loop control detection signal, respectively. The first loop control detection signal is generated in a state indicating that the current feedback control loop is out of control in response to receiving the first comparison output signal in a state indicating that the first reference signal is larger than the feedback control loop signal. The second loop control detection signal is generated in a state indicating that the current feedback control loop is out of control in response to receiving the second comparison output signal in a state indicating that the second reference signal is less than the feedback control loop signal. The enabling circuit (110) receives the first loop control detection signal and the second loop control detection signal and generates a loop control detection signal (120) in a state indicating that the current feedback control loop is out of control in response to receiving the first loop control detection signal or the second loop control detection signal in a state indicating that the current feedback control loop is out of control.

FIGURE 1

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