US 20240178750A1

(19) **United States**

(12) **Patent Application Publication** (10) **Pub. No.: US 2024/0178750 A1**

YANG et al. (43) **Pub. Date: May 30, 2024**

(54) **SYSTEMS AND METHODS FOR VALLEY LOCKING RELATED TO QUASI-RESONANT SWITCHING POWER SUPPLIES**

(71) Applicant: **ON-BRIGHT ELECTRONICS (SHANGHAI) CO., LTD.**, Shanghai (CN)

(72) Inventors: **PENGLIN YANG**, Shanghai (CN); **YUAN LIN**, Shanghai (CN)

(21) Appl. No.: **18/499,155**

(22) Filed: **Oct. 31, 2023**

Related U.S. Application Data

(63) Continuation of application No. 17/562,805, filed on Dec. 27, 2021, now Pat. No. 11,901,813.

(30) **Foreign Application Priority Data**

Dec. 28, 2020 (CN) 202011576478.0

Publication Classification

(51) **Int. Cl.**

H02M 3/00	(2006.01)
H02M 1/00	(2006.01)
H02M 3/335	(2006.01)

(52) **U.S. Cl.**

CPC ***H02M 3/01*** (2021.05); ***H02M 1/0003*** (2021.05); ***H02M 3/335*** (2013.01); ***H02M 3/33507*** (2013.01)

(57) **ABSTRACT**

Controller and method for a quasi-resonant switching power supply. For example, a controller for a quasi-resonant switching power supply includes: a valley detector configured to receive a voltage signal, detect one or more voltage valleys of the voltage signal in magnitude, and generate a detection signal representing the detected one or more voltage valleys; a valley-locking controller configured to receive one or more signals, generate a mode control signal that indicates a selected valley-locking mode based at least in part on the one or more signals, select from the detected one or more voltage valleys, one or more valleys that correspond to the selected valley-locking mode, and generate a valley control signal indicating the one or more selected valleys; and a gate driver configured to generate a drive signal based on at least information associated with the valley control signal.