

(19) United States

(12) Patent Application Publication (10) Pub. No.: US 2024/0213879 A1 **ASAHI**

(43) Pub. Date:

Jun. 27, 2024

(54) SWITCHING POWER SUPPLY DEVICE

(71) Applicant: **DENSO CORPORATION**, Kariya-city

Inventor: TAKASHI ASAHI, Kariya-city (JP)

(21)Appl. No.: 18/597,294

(22) Filed: Mar. 6, 2024

Related U.S. Application Data

Continuation of application No. PCT/JP2022/ 035913, filed on Sep. 27, 2022.

(30)Foreign Application Priority Data

(JP) 2021-172432

Publication Classification

(51) Int. Cl. H02M 3/156 (2006.01)

(52) U.S. Cl. CPC *H02M 3/156* (2013.01)

(57)ABSTRACT

A switching power supply device includes an on-timing generation circuit that generates an on-timing signal for turning on a switching element. The on-timing generation circuit includes: an error amplifier that outputs an error amplification signal obtained by amplifying a difference between a feedback voltage and a reference voltage; a common voltage generation unit that generates a common voltage; a ripple signal generation unit that generates a forward phase ripple signal and a reverse phase ripple signal; and a comparator that generates the on-timing signal by comparing a pair of differential signals generated based on the error amplification signal, the common voltage, the forward phase ripple signal and the reverse phase ripple

