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**SUGIMOTO**(10) **Pub. No.: US 2022/0352857 A1**(43) **Pub. Date: Nov. 3, 2022**(54) **TRANSIMPEDANCE AMPLIFIER CIRCUIT**(71) Applicant: **SUMITOMO ELECTRIC INDUSTRIES, LTD.**, Osaka (JP)(72) Inventor: **Yoshiyuki SUGIMOTO**, Osaka (JP)(21) Appl. No.: **17/660,476**(22) Filed: **Apr. 25, 2022**(30) **Foreign Application Priority Data**

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A transimpedance amplifier circuit includes an amplifier circuit that converts a current signal into a voltage signal with a gain being varied based on a control signal and a gain control circuit that generates the control signal based on an amplitude of the voltage signal. The gain control circuit includes a detection circuit that generates an amplitude-detection-signal in accordance with the amplitude of the voltage signal, a setting circuit that generates an amplitude-reference-signal, a differential voltage generation circuit that generates a differential-voltage-signal obtained by offsetting a voltage difference between the amplitude-detection-signal and the amplitude-reference-signal based on an amplitude-setting-signal, an operational transconductance amplifier (OTA) that generates a differential-current-signal based on the differential-voltage-signal, and a variable capacitor circuit having a variable capacitance being varied based on the amplitude-setting-signal, and configured to be charged/discharged by the differential-current-signal and output a charging voltage. The control signal is generated based on the charging voltage.

