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(54) Title: IMAGER PIXEL

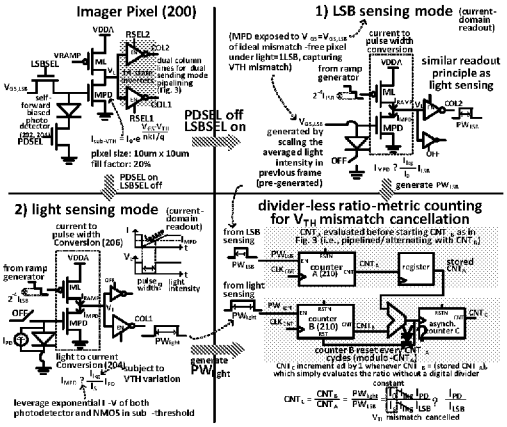

Figure 2

(57) Abstract: An imager pixel comprising a forward-biased photo-detector with readout transistor for light-to-current conversion, and a ratiometric readout system comprising a current to pulse width converter. The readout system operates in a light mode to: generate a first current proportional to a photodetector current and a leakage current, on exposure to a photodetector voltage; and convert the first current to a first pulse width; and operates in a least significant bit (LSB) mode to: generate a second current proportional to a least significant bit (LSB) current and the leakage current, on exposure to a gate-source voltage; and convert the second current to a second pulse width. The system includes a converter circuit for converting the first pulse width to a count (CNTB) and the second pulse width to a count (CNTA), and a counting circuit for providing a radiometric readout based on a ratio of CNTB to CNTA.

WO 2023/238068 A3

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A. CLASSIFICATION OF SUBJECT MATTER

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According to International Patent Classification (IPC)

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

H04N, H03K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

FAMPAT, Google Scholar, IEEE Xplore: imager, sensor, pixel, photosite, photodetector, diode, forward-biased, transistor, ratiometric, ratio, dynamic range, current, pulse, width, light intensity, least significant bit, leakage, threshold, mismatch, and related terms.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P,X	AHMED, K.A. ET AL., Imager with Dynamic LSB Adaptation and Ratiometric Readout for Low-Bit Depth 5-μW Peak Power in Purely-Harvested Systems. *2022 IEEE Symposium on VLSI Technology and Circuits*, 17 June 2022, pages 50-51 [Retrieved on 2024-01-09] <DOI: 0.1109/VLSITECHNOLOGYANDCIR46769.2022.9830147>	1-14
A	US 2021/0258531 A1 (GRUEV, V. ET AL.) 19 August 2021 Whole document	1-14
A	US 2017/0041517 A1 (IKEDA, T.) 9 February 2017 Whole document	
A	CN 111770245 A (CHANGCHUN INST OPTICS FINE MECH & PHYSICS CAS) 13 October 2020 Whole document of the original non-English language document (a machine translation is enclosed **only** for your reference)	

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Date of the actual completion of the international search	Date of mailing of the international search report
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Information on patent family members

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Note: This Annex lists known patent family members relating to the patent documents cited in this International Search Report. This Authority is in no way liable for these particulars which are merely given for the purpose of information.

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2021/0258531 A1	19/08/2021	NONE	
US 2017/0041517 A1	09/02/2017	JP 2020198631 A JP 2017034677 A JP 2022048209 A JP 2023033646 A	10/12/2020 09/02/2017 25/03/2022 10/03/2023
CN 111770245 A	13/10/2020	NONE	