

THE 29TH KOREAN CONFERENCE ON SEMICONDUCTORS

제 29회 한국반도체학술대회

2022. 1. 24(월) - 26(수)

강원도 하이원 그랜드호텔(컨벤션타워) **Online & Offline Hybrid**

제 29회 한국반도체학술대회가 온/오프라인 하이브리드로 개최될 예정입니다. 제 29회 한국반도체학술대회 조직위원회와 사무국은 현장 참가자의 안전을 위해 코로나19 방역 지침에 따라 일차 별 현장 참석 인원을 선착순으로 제한합니다.

현장에 참여 예정이신 참가자께서는 참석 인원 초과 시, 숙소 등 행사장 이외의 공간에서 온라인으로 참석하실 수 있으니 본 학술대회가 안전하게 마무리 될 수 있도록 적극 협조 부탁드립니다.
(** 방역 당국의 지침에 따라 변동 될 수 있습니다)

[개회식 & 기조강연 유튜브](#) [현장참가자 코로나19 대응지침](#)

ONLINE LIVE STREAMING **개회식** 1월 25일(화) 13:50-14:00

기조강연

기조강연1 / 1월 25일(화) 14:00-14:50
Memristive Neuromorphic Technology
강성모 교수 (UC산타바바)

기조강연2 / 1월 25일(화) 15:00-15:50
인공지능과 반도체: 새로운 원리의 기반
최기영 전 과기정통부장관 (서울대학교 (영예교수))

2021-10-29(금)
2021. 11. 19(금)
초록 접수 마감

2021-12-10(금)
2021. 12. 29(수)
초록 채택 통보

2021-01-07(금)
2022. 01. 14(금)
사전 등록 마감

분과	포스터세션 LIVE CHAT 일정
A. Interconnect & Package	26일(수), 09:00-11:00
B. Patterning	26일(수), 09:00-11:00
C. Material Growth & Characterization	26일(수), 14:00-16:00
D. Thin Film Process Technology	25일(화), 09:00-11:00
E. Compound Semiconductors	25일(화), 16:00-18:00
F. Silicon and Group-IV Devices and Integration Technology	25일(화), 09:00-11:00
G. Device & Process Modeling, Simulation and Reliability	25일(화), 16:00-18:00
H. Display and Imaging Technologies	25일(화), 09:00-11:00
I. MEMS & Sensors Systems	25일(화), 16:00-18:00
J. Nano-Science & Technology	26일(수), 14:00-16:00
K. Memory (Design & Process Technology)	26일(수), 14:00-16:00
L. Analog Design	26일(수), 09:00-11:00
M. RF and Wireless Design	26일(수), 14:00-16:00
N. VLSI CAD	26일(수), 09:00-11:00
O. System LSI Design	26일(수), 09:00-11:00
P. Device for Energy (Solar Cell, Power Device, Battery, etc.)	26일(수), 09:00-11:00
Q. Metrology, Inspection, Analysis, and Yield Enhancement	26일(수), 15:30-17:30
R. Semiconductor Software	26일(수), 09:00-11:00
S. Chip Design Contest	
T. AI	26일(수), 09:00-11:00
U. Bio-Medical	26일(수), 14:00-16:00



제 29회 한국반도체학술대회

The 29th Korean Conference on Semiconductors

2022년 1월 24일(월)~ 26일(수) | 강원도 하이원 그랜드호텔(컨벤션타워)

2022년 1월 26일(수), 09:00-10:30

Room K (다이아몬드 I, 6층)

F. Silicon and Group-IV Devices and Integration Technology 분과

[WK1-F] Photonic Device Technology

좌장: 조성재 교수(가천대학교)

WK1-F-1 09:00-09:15	Capacitance Matching for a Non-volatile SIS Optical Phase Shifter with an HZO MFM Capacitor Jae-Hoon Han ¹ , Seung-Min Han ^{1,2} , Dae-Hwan Ahn ¹ , Woo-Young Choi ² , and Jin-Dong Song ¹ ¹ Center for Opto-Electronic Materials and Devices, KIST, ² Department of Electrical and Electronic Engineering, Yonsei University
WK1-F-2 09:15-09:30	Free-Carrier Absorption-Assisted Photodetection Using A TiO₂/Ti/TiO_x Tri-Layer Film-Based Waveguide Bolometric Detector for Si Photonic Sensors Joonsup Shim ¹ , Jinha Lim ¹ , Dae-Myeong Geum ¹ , Jong-Bum You ² , Joon Pyo Kim ¹ , Woo Jin Baek ¹ , Jae-Hoon Han ³ , and SangHyeon Kim ¹ ¹ KAIST, ² NNFC, ³ KIST
WK1-F-3 09:30-09:45	Non-Volatile Resonance Wavelength Shift of a Si PN Ring Resonator with an HZO Ferroelectric Capacitor Seung-Min Han ^{1,2} , Dae-Won Rho ² , Dae-Hwan Ahn ¹ , Jin-Dong Song ¹ , Woo-Young Choi ² , and Jae-Hoon Han ¹ ¹ Center for Opto-Electronic Materials and Devices, KIST, ² Department of Electrical and Electronic Engineering, Yonsei University
WK1-F-4 09:45-10:00	Performance Estimation of a Highly Efficient and Low-loss KTN Optical Phase Shifter for Silicon Photonics Seong Ui An, Yu Shin Kim, Seung Hyeon Han, and Younghyun Kim Department of Photonics and Nanoelectronics, BK21 FOUR ERICA-ACE Center, Hanyang University
WK1-F-5 10:00-10:15	Avalanche Mode LED based on CMOS Technology Doyoon Eom ^{1,2} , Woo-Young Choi ¹ , and Myung-Jae Lee ² ¹ Department of Electrical and Electronic Engineering, Yonsei University, ² Post-Silicon Semiconductor Institute, KIST
WK1-F-6 10:15-10:30	Guard Ring 최적화를 통한 Single-Photon Avalanche Diode의 성능 향상 Hyun-Seung Choi ^{1,2} , Youngcheol Chae ¹ , and Myung-Jae Lee ² ¹ Department of Electrical and Electronic Engineering, Yonsei University, ² Post-Silicon Semiconductor Institute, KIST

Avalanche Mode LED Based on CMOS Technology

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A light-emitting diode(LED) is widely used in many applications like displays, communications, biomedical applications, and general illumination. Among them, research on optical coupling is being actively progressed with a lot of interest. In particular, monolithic optical coupling based on CMOS technology has been reported recently[1]. For monolithic optical coupling, Si based LEDs are essential. In general, Si LEDs operate in forward bias and emit light in the near infrared(NIR) wavelength, whereas CMOS photodiode(PD)s have low detection efficiency in this wavelength range (Fig. 1(a)). Therefore, the optical coupling performance is poor. Due to this, III-V LEDs are normally used, but the fabrication of III-V LED is complex and expensive compared to Si LEDs. If avalanche-mode LEDs based on Si are used, it is possible to shift the LED wavelength from NIR to VIS, and consequently, better optical coupling efficiency can be achieved (Fig 1(b)). In this paper, the avalanche-mode LEDs fabricated in the CMOS technology is demonstrated and their characteristics are reported.

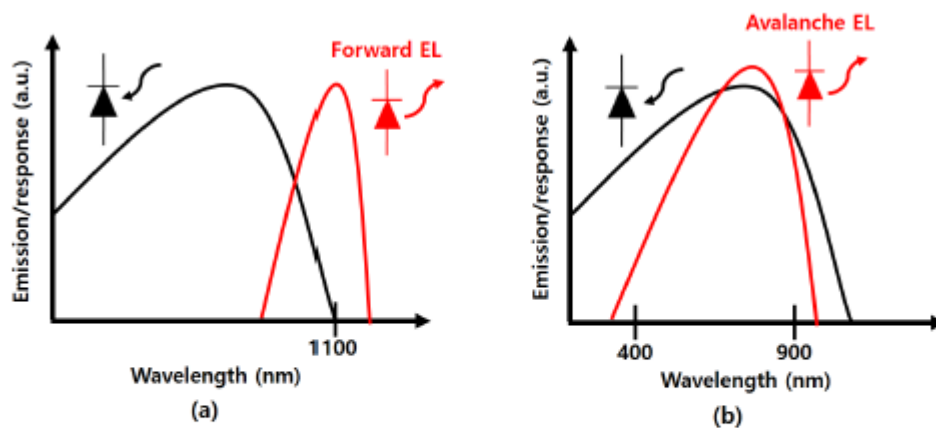


Fig 1. (a) Forward electroluminescence of Si LED, (b) Avalanche electroluminescence of Si LED

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References [1] Dutta, S., "Avalanche-mode silicon LEDs for monolithic optical coupling in CMOS technology," Ph.D. dissertation (University of Twente, The Netherlands, 2017).