Curriculum Vitae

JIN-WEI SHI
Department of Electrical Engineering
National Central University, Taoyuan, 320, TAIWAN
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Interests

ultrahigh speed/power photodiodes and avalanche photodiodes, high-speed vertical-cavity surface-emitting laser and photodiode for optical interconnect, light source and detector for FMCW LiDAR.

Education

B.S., Electrical Engineering, **National Taiwan University**, Taipei, Taiwan.
1998.6.
Ph.D., Electro-Optical Engineering, **National Taiwan University,** Taipei, Taiwan, 2002.6. Thesis: Metal-Semiconductor-Metal Traveling Wave Photodetectors Advisor: Chi-Kuang Sun

Experience

NATIONAL TAIWAN UNIVERSITY **Taipei, TAIWAN**
Graduate Institute of Electro-Optical Engineering
Research Assistant 1998.8 –2002.7
Research topics cover design and modeling of ultra-high speed and high power traveling wave photodetector/photomixer, measurement of ultra-high speed device (E-O sampling), nonlinearity of low temperature grown GaAs based photodetector, and optoelectronic generation of sub-millimeter wave.

UNIVERSITY of CALIFORNIA **Santa Barbara, CA**
Department of Electrical and Computer Engineering
Visiting Scholar 2000.6- 2000.9 and 2001.2-2001.8
Research includes fabrication of ultrahigh speed and high power traveling wave photodetector/photomixer, photomixer array, membrane THz photomixer.

INDUS. TECH. RES. INS. **Hsinchu, TAIWAN**
Electronics Research & Service Organization
Consultant 2002/12~2003/8
Research includes Si/SiGe/SiC based optical communication systems on a single Si chip (SOC), high speed HPT, ultra-high gain-bandwidth product APD.

NATIONAL CENTRAL UNIVERSITY **Taoyuan, TAIWAN**
Department of Electrical Engineering
Assistant Professor 2003/8~2006/8
Associate Professor 2006/8 to 2012/01
Professor 2011/8- now
Research includes high-speed and high-power photodiode, THz photonic transmitter, electro-absorption modulator, Si/SiGe based avalanche photodiode, High-speed GaN based LED, High-Speed VCSEL, Infrared and visible white-light LED

UNIVERSITY of CALIFORNIA **Santa Barbara, CA**
Department of Electrical and Computer Engineering
Visiting Professor 2011/02-2012/02 and 2016/02-2017/02
Research includes Si photonic integrated circuit, sub-THz photonic transmitter-mixer, photonic wireless communication with ultra-high data rate.

Contributions

Some of Prof. Shi's most important contributions are, first of all, his demonstration of a revolutionary epi-layer structure for avalanche photodiode (APD) and high-power photodiodes (PD). By inserting additional field control layers inside the multiplication layers of ultra-fast APDs, the burden imposed by the tremendous increase of the dark current for pursuing high-speed performance can be released with a simultaneous improvement in their sensitivity. This novel APD structure has since been put into mass production by Source photonic, Hisilicon Optoelectronics, and LandMark Optoelectronics with a further 2 dB enhancement of the sensitivity achieved as compared to that of other state-of-the-art APD products for **10G passive optical network (PON) market**. On the other hand, in the traditional millimeter-wave (MMW)/THz PD, the output power is usually limited by its low optimum bias voltage (< -1V). He has shown how, by inserting an additional field control layer inside the epi-structure of a high-power PD, the device can sustain an overshoot electron drift-velocity under a high bias, allowing an unprecedented increase in the THz/MMW output power, which allows the realization of an MMW photonic system with enough output power for practical applications. On the other hand, Prof. Shi is one of the pioneering leaders in the field of single-mode VCSEL research. He is the co-inventor of Zn-diffusion VCSEL and is the first to demonstrate Zn-diffusion VCSELs with a record-high single-mode power and high-speed performance for sensing and data communication. Compared with other reported technologies for single-mode VCSELs, the Zn-diffusion VCSEL technology is the only one which can simultaneously deliver high single-mode power and reduce its resistance. He has transferred his Zn-diffusion VCSEL structure to Unikorn Semiconductor in mass production for light source in the **proximity sensor module in the Apple iPhone** due to that it can effectively reduce the resistance of ion-implanted VCSEL to meet the requirement of high-reliability. In addition to Zn-diffusion technique discussed above, Prof. Shi was the first to demonstrate oxide-relief structures which could greatly reduce the parasitic capacitance in VCSELs. In comparison to the other reported techniques, such as multi-oxide layers, oxide-relief is the only one which can simultaneously improve both speed and reliability performance. He has transferred this VCSEL structure to the industry, such as Source Photonic, Unikorn Semiconductor, and AboCom communications for mass production of **short-reach data communication VCSEL transmitter**.

Publications

Authored and co-authored 178 SCI journal papers, 2 book editor, 6 invited book chapters, over 134 international conference papers, 30 U.S.A. patents, 30 Taiwan patents, 6 invited magazine reports, and several invited international conference papers.

Awards & Honors

Invited speaker in IEEE/OSA OFC 2011
Invited speaker in IEEE IPC (formerly LEOS) 2012, 2017, 2021
Invited speaker in Plastic Optical Fiber (POF) Conference 2012
Invited magazine report in Compound Semiconductor 2012
Invited magazine report in SPIE Newsroom 2007, 2013, and 2017
Invited speaker in SPIE Photonic West 2015, 2017, and 2022
Invited speaker in JASP Autumn meeting at 2016
Invited speaker in ICO-24 2017
Invited speaker in PIERS 2018
Invited speaker in MOC 2025
2007 CIEE Young Research Award
2007, 2009-2013 Outstanding Research Awards at National Central University
2013 till now Distinguished Professor at National Central University
OFC Technical Program Committee (From 2009-2011)
SSDM Technical Program Committee (2012)
MWP Technical Program Committee (2012)
CLEO-PR Technical Program Committee (2013)
IPRM Technical Program Committee (2014)
OECC Technical Program Committee (2014-2016, 2022)

2010 國科會吳大猷獎(Outstanding Young Research Award at National Science Council of Taiwan)
2012 IEEE Senior Member
World's top 2% scientists list by Stanford University (2021-2023); Over 6280 google citations to publications; H-index= 43
Associate editor of ***Optics Express*** (2017-2023)
Guest editor-in-chief of the ***Optics Express*** *special issue of "Photonic Technologies for Autonomous Cars"* (2019)
Guest editor for the 2018 ***IEEE Journal of Selected Topics in Quantum Electronics (JSTQE)****, their special issue about optical detectors.*
VCSEL work to be selected as cover page of ***2022 IEEE JSTQE special issue on semiconductor laser***
2021 科技部未來科技獎
2024 國科會產學計畫特優獎
2023 Optica (formerly OSA) Fellow with the following citation: *"for contributions to ultrafast photodiodes and high-speed VCSELs for optics fiber communications"*
2025 IEEE Fellow with the following citation: *"for contributions to high-speed photodetectors and VCSELs for optics fiber communications"*

Selective Journal Publications of Prof. Jin-Wei Shi: (*corresponding author)

(2025)

1. Cheng-Wei Lin, Zhe-Wei Hsu, Jian-Wei Tung, Xin Chen, Chia-Hsuan Wang, Dong Hao, Jia-Liang Yen, J.-J. Liu, Ming-Jun Li, and **Jin-Wei Shi***, "Single-Mode VCSELs With Zn-Diffusion Apertures for Applications in Co-Packaged Optics Systems," in *IEEE Journal of Selected Topics in Quantum Electronics*, vol. 31, no. 2: Pwr. and Effic. Scaling in Semiconductor Lasers, pp. 1-9, March-April 2025, Art no. 1501409, doi: 10.1109/JSTQE.2024.3454318.
2. Yen-Kun Wu, Chao-Chuan Kuo, Pei-Syuan Lin, Sean Yang, H.-S. Chen, Jack Jia-Sheng Huang, and **Jin-Wei Shi***, "Thinning of Cascaded Multiplication Layers in Avalanche Photodiodes for High-Speed and High-Power-Tolerant Performance," in *Journal of Lightwave Technology*, vol. 43, no. 2, pp. 690-700, Jan., 2025.

(2024)

3. Y. -C. Huang, N. -W. Chen, Y. -K. Wu, Naseem and **J. -W. Shi***, "Improvements in the Maximum THz Output Power and Responsivity in Near-Ballistic Uni-Traveling-Carrier Photodiodes With an Undercut Collector," in *Journal of Lightwave Technology*, vol. 42, no. 7, pp. 2362-2370, 1 April1, 2024, doi: 10.1109/JLT.2023.3340502.
4. Yu-Kuan Tsai, Zheng-Xiang Liao, Yu-Xiang Lin, H.-S. Chen, Jack Jia-Sheng Huang, Pei-Hsun Wang, Chia-Chien Wei, You-Chia Chang, Yung Hung, and **Jin-Wei Shi**, "Linearization of wavelength sweeping lasers for the construction of 4-D FMCW LiDAR images of slow-moving objects using baseband beat note signals," *Opt. Express,* vol. 32, pp. 20401-20411, May, 2024.
5. Yan-Chieh Chang, Ye-Kun Wu, Chia-Chien Wei, You-Chia Chang, Tzyy-Sheng Horng, and **Jin-Wei Shi*,** "Window size dependence of gain and bandwidth in avalanche photodiodes with multiple multiplication layers under near Geiger-mode operation," *Opt. Express,* vol. 32, pp. 24744-24755, July, 2024.
6. Yi-Shan Lee, Tzu-Yang Chen, Yu-Ju Chen, Wei-Hong Kan, Xue-Wen Liu, and **Jin-Wei Shi,** "Photon-Number-Resolving Detection with Highly Efficient InGaAs/InAlAs Single-Photon Avalanche Diode," *Photonics,* vol. 11, no. 8, pp. 724, Aug., 2024. https://doi.org/10.3390/photonics11080724

(2023)

7. Chi-Wai Chow, You-Chia Chang, Sheng-I Kuo, Pin-Cheng Kuo, Ju-Wei Wang, Yin-He Jian, Zohauddin Ahmad, Po-Han Fu, **Jin-Wei Shi**, Ding-Wei Huang, Tun-Yao Hung, Yuan-Zeng Lin, Chien-Hung Yeh, Yang Liu, "Actively Controllable Beam Steering Optical Wireless Communication (OWC) Using Integrated Optical Phased Array (OPA)," *Journal of Lightwave Technology*, vol. 41, no. 4, pp. 1122-1128, 15 Feb. 15, 2023, doi: 10.1109/JLT.2022.3206843.
8. Naseem, Nan-Wei Chen, Syed Hasan Parvez, Zohauddin Ahmad, Sean Yang, H-S Chen, Hsiang-Szu Chang, Jack Jia-Sheng Huang, and **Jin-Wei Shi***, "Simultaneous enhancement of the bandwidth and responsivity in high-speed avalanche photodiodes with an optimized flip-chip bonding package," *Opt. Express* vol. 31, pp. 26463-26473, July, 2023.
9. **Jin-Wei Shi***, T.-C. Lu, F. Koyama, "Nanophotonics Pioneer: Prof. Dr. Dieter Bimberg "*Green Photonic Network: From VCSELs to Nanophotonics*". *Photonics*, vol. 10, pp. 976, Sep., 2023. https://doi.org/10.3390/photonics10090976
10. Zuhaib Khan, Min-Long Wu, Cheng-Wei Lin, Cheng-Chun Chen, Chia-Jui Chang, Tien- Chang Lu, Nikolay Ledentsov Jr., Nikolay Ledentsov and **Jin-Wei Shi*** "Miniaturized Vertical-Cavity Surface-Emitting Laser Array with a Novel Electrode Design for High-Speed, Low-Noise, and High-Brightness Performance," *Advanced Photonics Research,* vol. 4, pp. 2370022, Sep., 2023.
11. Yu-Xiang Lin, Zohauddin Ahmad, Sung-Yi Ou, Wei-Chih Su, Yan-Chieh Chang, Naseem, Jye-Hong Chen, Yung-Jr Hung, You-Chia Chang, Chia-Chien Wei, Tzyy-Sheng Horng, and **Jin-Wei Shi***, "A 4-D FMCW LiDAR With Ultra-High Velocity Sensitivity," in *Journal of Lightwave Technology*, vol. 41, no. 21, pp. 6664-6674, 1 Nov.1, 2023, doi: 10.1109/JLT.2023.3292139.

(2022)

12. Cheng-Yi Liu, Chun-Kai Huang, Yen-Yu Huang, Kun-Chieh Chang, Kun-Lin Yu, Chien-Hung Chiang, Chun-Guey Wu, Shih-Chang Lee, Wei-Yu Yen, Jinn-Kong Sheu, and **Jin-Wei Shi***, "Flexible multijunction solar cells embedded inside smart dust modules for outdoor applications to Smart Grids," *Applied Energy,* vol. 306, Part A, pp. 117970, Jan., 2022.
13. Y.-C. Zhao, Z. Ahmad, W.-M. Long, Z. Khan, N. Ledenstov Jr., M.- B. Sanayeh, T.-L. Pan, C.-C. Chen, C.-J. Chang, T.-C. Lu, N. N. Ledenstov and **J.-W. Shi*,** "Separated Electrodes for the Enhancement of High-Speed Data Transmission in Quasi-Single- Mode Vertical-Cavity Surface-Emitting Laser Arrays" *Optics Express,* vol. 30, no. 15, pp. 26690-26700, Jul. 2022.
14. Sheng-I Kuo, Ju-Wei Wang, Zohauddin Ahmad, Po-Han Fu, Hsin-Hung Lin, **Jin-Wei Shi**, Ding-Wei Huang, and You-Chia Chang, "Reconfigurable scan lens based on an actively controlled optical phased array," *Opt. Lett.* 47, 3676-3679 (2022)
15. Jie-Chen Shih, Zuhaib Khan, Yung-Hao Chang, and **Jin-Wei Shi***, "High-Brightness VCSEL Arrays with Inter-Mesa Waveguides for the Enhancement of Efficiency and High-Speed Data Transmission," *IEEE Journal of Selected Topics in Quantum Electronics* vol. 28, no. 1, pp. 1-11, Jan.-Feb. 2022.
16. Zuhaib Khan, Yong-Hao Chang, Te-Lieh Pan, Yaung-Cheng Zhao, Yen-Yu Huang, Chia-Hung Lee, Jui-Sheng Chang, Cheng-Yi Liu, Cheng-Yuan Lee, Chao-Yi Fang, and **Jin-Wei Shi***, "High-Brightness, High-Speed, and Low-Noise VCSEL Arrays for Optical Wireless Communication," in *IEEE Access*, vol. 10, pp. 2303-2317, 2022, doi: 10.1109/ACCESS.2021.3133436.
17. Zohauddin Ahmad, Sheng-I Kuo, You-Chia Chang, Rui-Lin Chao, Naseem, Yi-Shan Lee, Yung-Jr Hung, Huang-Ming Chen, Jyehong Chen, Chee Seong Goh, and **Jin-Wei Shi*** "Avalanche Photodiodes with Dual Multiplication Layers and Ultra-High Responsivity-Bandwidth Products for FMCW Lidar System Applications," *IEEE Journal of Selected Topics in Quantum Electronics* vol. 28, no. 2, pp. 1-9, March-April 2022, Art no. 3800709, doi: 10.1109/JSTQE.2021.3062637. **(Invited Paper)**
18. Yi-Shan Lee**,** Yan-Min Liao, Ping-Li Wu, Chi-En Chen, Yu-Jie Teng, Yu-Ying Hung and **Jin-Wei Shi***, "$In_{0.52}Al_{0.48}As$ Based Single Photon Avalanche Diodes with Stepped E-field in Multiplication Layers and High Efficiency Beyond 60 %," *IEEE Journal of Selected Topics in Quantum Electronics*, vol. 28, no. 2, pp. 1-7, March-April 2022, Art no. 3802107, doi: 10.1109/JSTQE.2021.3114130.
19. Naseem, Zohauddin Ahmad, Yan-Min Liao, Po-Shun Wang, Sean Yang, Sheng-Yun Wang, Hsiang-Szu Chang, H.-S. Chen, Jack Jia-Sheng Huang, Emin Chou, Yu-Heng Jan, and **Jin-Wei Shi***, "Avalanche Photodiodes with Composite Charge-Layers for Low Dark Current, High-Speed, and High-Power Performance," *IEEE Journal of Selected Topics in Quantum Electronics*, vol. 28, no. 2, pp. 1-10, March-April, 2022, Art no. 3801910, doi: 10.1109/JSTQE.2021.3111895.
20. **J.-W. Shi***, A. Beling, N. Nishiyama, "Special Issue on Advanced Ultra-High Speed Optoelectronic Devices," *Photonics* vol. 9, pp. 312, May, 2022. https://doi.org/10.3390/photonics9050312.

21. Yen-Yu Huang, Yung-Hao Chang, Yaung-Cheng Zhao, Zuhaib Khan, Zohauddin Ahmad, Chia-Hung Lee, Jui-Sheng Chang, Cheng-Yi Liu, and **Jin-Wei Shi***, "Low-Noise, Single-Polarized, and High-Speed Vertical-Cavity Surface-Emitting Lasers for Very Short Reach Data Communication," *IEEE/OSA Journal of Lightwave Technolog*y, vol. 40. no. 12, pp. 3845-3854, June, 2022.

22. Z. Ahmad, P.-S. Wang, Naseem, Y-C. Huang, Y.-C. Chang, Y.-C. Chang, Y.-S. Lee, and **Jin-Wei Shi*** "Avalanche photodiodes with multiple multiplication layers for coherent detection," *Sci Rep,* vol. vol. 12, pp. 16541, Oct., 2022. https://doi.org/10.1038/s41598-022-21041-6.

23. Nassem, Po-Shun Wang, Zohauddin Ahmad, Syed Hasan Parvez, Sean Yang, H.-S. Chen, Hsiang-Szu Chang, Jack Jia-Sheng Huang, and **Jin-Wei Shi**[1*], "Top-Illuminated Avalanche Photodiodes With Cascaded Multiplication Layers for High-Speed and Wide Dynamic Range Performance," in *Journal of Lightwave Technology*, vol. 40, no. 24, pp. 7893-7900, 15 Dec.15, 2022, doi: 10.1109/JLT.2022.3204743.

(2021)

24. Bohao Liu, Suparna Seshadri, Jhih-Min Wun, Nathan P. O'Malley, Daniel E. Leaird, Nan-Wei Chen, **Jin-Wei Shi**, and Andrew M. Weiner, "W-Band Photonic Pulse Compression Radar with Dual Transmission Mode Beamforming," *IEEE/OSA Journal of Lightwave Technolog*y, vol. 39, no. 6, pp. 1619-1628, March, 2021, doi: 10.1109/JLT.2020.3038846.

25 Y. -S. Lee, Naseem, P. -L. Wu, Y. -J. Chen and **J. -W. Shi,** "Neat Temporal Performance of InGaAs/InAlAs Single Photon Avalanche Diode With Stepwise Electric Field in Multiplication Layers," in *IEEE Access*, vol. 9, pp. 32979-32985, Feb., 2021, doi: 10.1109/ACCESS.2021.3060824.

26. Zohauddin Ahmad, Yan-Min Liao, Sheng-I Kuo, You-Chia Chang, Rui-Lin Chao, Naseem, Yi-Shan Lee, Yung-Jr Hung, Huang-Ming Chen, Jyehong Chen, Jiun-In Guo, and **Jin-Wei Shi*,** "High-Power and High-Responsivity Avalanche Photodiodes for Self-Heterodyne FMCW Lidar System Applications," in *IEEE Access*, vol. 9, pp. 85661-85671, June, 2021.

27. Naseem, Z. Ahmad, Y.-M. Liao, R.-L. Chao, P.-S. Wang, Y.-S. Lee, S. Yang, S.-Y. Wang, H.-S. Chang, H.-S. Chen, J. J.-S. Huang, E. Chou, Y.-H. Jan, and **J.-W. Shi***, "Avalanche Photodiodes with Dual Multiplication Layers for High-Speed and Wide Dynamic Range Performances," *Photonics*, vol. 8, no. 4, p. 98, Mar. 2021. **(Invited Paper)**

28. R. -L. Chao, Z. Ahmad, J. Chen, Y. Lai, Y. -J. Hung and **J. -W. Shi*,** "Microring Optical Phase-Shifters With Low Driving-Voltage, Low Insertion Loss, and Small Residual Amplitude Modulation," in *Journal of Lightwave Technology*, vol. 39, no. 24, pp. 7740-7747, 15 Dec.15, 2021, doi: 10.1109/JLT.2021.3098347.

(2020)

29. Zuhaib Khan, Jie-Chen Shih, Rui-Lin Chao, Tzong-Liang Tsai, Hsin-Chuan Wang, Gang-Wei Fan, Yu-Chen Lin, **Jin-Wei Shi***, "High-Brightness and High-Speed Vertical-Cavity Surface-Emitting Laser Arrays," *Optica,* vol. 7, no. 4, pp. 267-275, April, 2020.

30. Rui-Lin Chao, Z. Ahmad, J. Chen, Y. Lai and **Jin-Wei Shi***, "BJT-Type Optical Phase Shifter with Small Power Consumption and Fast Response Time on a Silicon Photonics Foundry Platform," in *IEEE Journal of Selected Topics in Quantum Electronics*, vol. 26, no. 2, pp. 1-7, March-April 2020, Art no. 8301107.

31. Zuhaib Khan, N. Ledenstov Jr., L. Chorchos, Jie-Chen Shih, Yung-Hao Chang, N.N. Ledenstov, and **Jin-Wei Shi***, "Single-Mode 940 nm VCSELs with Narrow Divergence Angles and High-Power Performances for Fiber and Free-Space Optical Communications," *IEEE Access*, vol. 8, pp. 72095-72101, 2020.

32. R. L. Chao, Z. Ahmad, J. Chen, Y. Lai and **J.-W. Shi*,** "Three-Port Optical Phase-Shifters and Modulators with Ultra-High Modulation Efficiency, Positive RF-Linking Gain, and Low Residual Amplitude Modulation," in *IEEE Access*, vol. 8, pp. 80836-80841, 2020.

33. **Jin-Wei Shi***, Zuhaib Khan, Ray-Hua Horng, Hsiao-Yun Yeh, Chun-Kai Huang, Cheng-Yi Liu, Jie-Chen Shih, Yung-Hao Chang, Jia-Liang Yen, and Jinn-Kong Sheu, "High-power and single-mode VCSEL arrays with single-polarized outputs by using package-induced tensile strain," *Optics Letters*, vol. 45, No. 17, pp. 4839-4842, Sep., 2020.

34. Po-Chou Pan, Dhiman Nag, Zuhaib Khan, Ching-Jung Chen, **Jin-Wei Shi**, Apurba Laha, and Ray-Hua Horng, "Effect of Thermal Management on the Performance of VCSELs," *IEEE Transactions on Electron Devices*, vol. 67, no. 9, pp. 3736-3739, Sept. 2020.

(2019)

35. Fu-Bang Chen, Kai-Lun Chi, Wei-Yu Yen, Jinn-Kong Sheu, Ming-Lun Lee, and **Jin-Wei Shi,** "Investigation on Modulation Speed of Photon-recycling White Light-emitting Diodes with Vertical-conduction Structure" *IEEE/OSA Journal of Lightwave Technology,* vol. 37, pp. 1225-1230, Feb., 2019.

36. Naseem, Zohauddin Ahmad, Rui-Lin Chao, Hsiang-Szu Chang, C.-J. Ni, H.-S. Chen, Jack Jia-Sheng Huang, Emin Chou, Yu-Heng Jan, and **Jin-Wei Shi***, "The enhancement in speed and responsivity of uni-traveling

carrier photodiodes with $GaAs_{0.5}Sb_{0.5}/In_{0.53}Ga_{0.47}As$ type-II hybrid absorbers," *Optics Express,* vol. 27, no. 11, pp. 15495-15504, May, 2019.

37. **Jin-Wei Shi***, Jiun-In Guo, Manabu Kagami, Paul Suni, and Olaf Ziemann, "Photonic technologies for autonomous cars: feature introduction," *Optics Express* vol. 27, pp. 7627-7628, March, 2019. (SCI)
38. N. Ledentsov Jr., M. Agustin, V.A. Shchukin, J.-R. Kropp, N.N. Ledentsov, Ł. Chorchos, J.P. Turkiewicz, Z. Khan, C.-L. Cheng, **J.-W. Shi,** N. Cherkashin, "Quantum dot 850 nm VCSELs with extreme high temperature stability operating at bit rates up to 25 Gbit/s at 150 °C," *Solid State Electronics*, vol. 155, pp. 150-158, March, 2019. (SCI)
39. Fan Jun Wei, Richard A. Mole, Sunil K. Karna, **Jin-Wei Shi**, Jinn-Kong Sheu, and Kung-Hsuan Lin, "Verification of complex acoustic mismatch model in sub-THz regime," *Appl. Phys. Lett.,* vol. 114, pp. 151106, April, 2019. (SCI)
40. Chen-Lung Cheng, N. Ledentsov Jr., Zuhaib Khan, Jia-Liang Yen, N. N. Ledentsov, and **Jin-Wei Shi*,** "Ultrafast Zn-Diffusion and Oxide-Relief 940 nm Vertical-Cavity Surface-Emitting Lasers under High-Temperature Operation," *IEEE J. of Sel. Topics in Quantum Electronics,* vol. 25, pp. 1700507, Nov./Dec., 2019.
41. Hao-Yi Zhao, Naseem, Andrew H. Jones, Rui-Lin Chao, Zohauddin Ahmad, Joe C. Campbell, and **Jin-Wei Shi*,** "High-Speed Avalanche Photodiodes with Wide Dynamic Range Performance," *Journal of Lightwave Technology*, vol. 37, no. 23, pp. 5945-5952, 1 Dec.1, 2019.

(2018)

42. Yi-Han Chen, Jhih-Min Wun, Song-Lin Wu, Rui-Lin Chao, Jack Jia-Sheng Huang, Yu-Heng Jan, H.-S. Chen, C.-J. Ni, Hsiang-Szu Chang, Emin Chou, and **Jin-Wei Shi***, "Top-Illuminated $In_{0.52}Al_{0.48}As$-Based Avalanche Photodiode with Dual Charge Layers for High-Speed and Low Dark Current Performances," *IEEE J. of Sel. Topics in Quantum Electronics,* vol. 24, No. 2, pp. 3800208, March/April., 2018.
43. J.-M. Wun, Y.-W. Wang, and **J.-W. Shi***, "Ultra-Fast Uni-Traveling Carrier Photodiodes with $GaAs_{0.5}Sb_{0.5}/In_{0.53}Ga_{0.47}As$ Type-II Hybrid Absorbers for High-Power Operation at THz Frequencies," *IEEE J. of Sel. Topics in Quantum Electronics,* vol. 24, No. 2, pp. 8500207, March,/April, 2018.
44. N. N. Ledentsov, V. A. Shchukin, V. P. Kalosha, N. N. Ledentsov Jr., J.-R. Kropp, M. Augustin, Ł. Chorchos, J. P. Turkiewicz, and **J.-W. Shi**, "Anti–waveguiding vertical–cavity surface–emitting laser at 850 nm: From concept to advances in high–speed data transmission," *Optics Express,* vol. 26, pp. 445-453, Jan., 2018.
45. N. Ledentsov Jr., M. Agustin , J.-R. Kropp, V. A. Shchukin, V. P. Kalosha, K. L. Chi, Z. Khan, **J.-W. Shi**, N. N. Ledentsov "Temperature stable oxide-confined 850 nm VCSELs operating at bit rates up to 25 Gbit/s at 150°C," *Proc. SPIE, Vertical-Cavity Surface Emitting Lasers XXII*, pp. 10552-24, Feb., 2018.
46. M. Agustin, N. Ledentsov Jr., J.-R. Kropp, V.A. Shchukin, V. P. Kalosha, K. L. Chi, **J.-W. Shi,** N. N. Ledentsov, "50 Gb/s NRZ data transmission over OM5 fiber in the SWDM wavelength range," *Proc. SPIE, Vertical-Cavity Surface Emitting Lasers XXII*, pp. 10552-1, Feb., 2018.
47. Rui-Lin Chao, Linjun Liang, **Jin-Wei Shi,** Tin Komljenovic, Jared Hulme, M. J. Kennedy, and J. E. Bowers, "Fully Integrated Photonic Millimeter-Wave Tracking Generators on the Heterogeneous III-V/Si Platform" *IEEE Photon. Technol. Lett.,* vol. 30, no. 10, pp. 919-922, May, 2018.
48. Nan-Wei Chen, Jhih-Min Wun, Hao-Chen Wang, Rui-Lin Chao, Chris Koh, C. H. Dreyfus and **Jin-Wei Shi***, "Design and Analysis of Waveguide-Coupled Photonic THz Transmitters with an Extremely Wide Fractional Bandwidth," *IEEE/OSA Journal of Lightwave Technology,* vol. 36, pp. 4235-4242, Oct., 2018. (Special Issue on Microwave Photonics)
49. Song-Lin Wu, Naseem, Jhih-Min Wun, Rui-Lin Chao, Jack Jia-Sheng Huang, N.-W. Wang, Yu-Heng Jan, H.-S. Chen, C.-J. Ni, Hsiang-Szu Chang, Emin Chou, and **Jin-Wei Shi*,** "High-Speed $In_{0.52}Al_{0.48}As$ Based Avalanche Photodiode with Top-Illuminated Design for 100 Gbit/sec ER-4 System," *IEEE/OSA Journal of Lightwave Technology,* vol. 36, pp. 5505-5510, Dec., 2018.
50. Zuhaib Khan, Jia-Liang Yen, Chen-Lung Cheng, Kai-Lun Chi, and **Jin-Wei Shi***, "Enhancing the Static and Dynamic Performance of High-Speed VCSELs by Zn-Diffused Shallow Surface Relief Apertures," *IEEE J. of Quantum Electronics,* vol. 54, pp. 2400706, Oct., 2018.

(2017)

51. **Jin-Wei Shi***, Chia-Chien Wei, Jason (Jyehong) Chen, N.N. Ledentsov, and Ying-Jay Yang, "Single-Mode 850 nm Vertical-Cavity Surface-Emitting Lasers with Zn-diffusion and Oxide-relief Apertures for > 50 Gbit/sec OOK and 4-PAM Transmission," *Proc. SPIE, Vertical-Cavity Surface Emitting Lasers XXI*, vol. 10122, pp. 101220F, Feb., 2017. **(Invited Paper)**
52. J. Hulme, M. J. Kennedy, Rui-Lin Chao, Linjun Liang, Tin Komljenovic, **Jin-Wei Shi**, Bogdan Szafraniec, Doug Baney, and J. E. Bowers, "Fully integrated microwave frequency synthesizer on heterogeneous silicon-III/V," *Optics Express,* vol. 25, no. 3, pp. 279613, Feb., 2017.

53. Jhih-Min Wun, Rui-Lin Chao, Yu-Wen Wang, Yi-Han Chen, and **Jin-Wei Shi***, "Type-II $GaAs_{0.5}Sb_{0.5}$/InP Uni-Traveling Carrier Photodiodes with Sub-THz Bandwidth and High-Power Performance under Zero-Bias Operation," *IEEE/OSA Journal of Lightwave Technology,* vol. 35, pp. 711-716, Feb., 2017.
54. J. Vinogradov, R. Kruglov, R. Engelbrecht, O. Ziemann, J.-K. Sheu, K.-L. Chi, J.-M. Wun, and **J.-W. Shi***, "GaN-Based Cyan Light Emitting Diode with up to 1 GHz Bandwidth for High-Speed Transmission over SI-POF" *IEEE Photonics Journal,* vol. 9, no. 3, pp. 7201707, June, 2017.
55. Rui-Lin Chao, **Jin-Wei Shi*,** Aditya Jain, Takako Hirokawa, Akhilesh S.P. Khope, Clint Schow, J. E. Bowers, Roger Helkey, and James F. Buckwalter, "Forward Bias Operation of Silicon Photonic Mach Zehnder Modulators for RF Applications," *Optics Express,* vol. 25, No. 19, pp. 23181-23190, Sep., 2017.
56. Jia-Liang Yen, Xin-Nan Chen, Kai-Lun Chi, Jason Chen, and **Jin-Wei Shi*,**"850 nm Vertical-Cavity Surface-Emitting Laser Arrays With Enhanced High-Speed Transmission Performance Over a Standard Multimode Fiber," *IEEE/OSA Journal of Lightwave Technology,* vol. 35, pp. 3242-3249, Aug., 2017.
57. Y. Wan, Z. Zhang, R.-L. Chao, J. Norman, D. Jung, C. Shang, Q. Li, M. J. Kennedy, **J.-W. Shi**, A. C. Gossard, K. M. Lau, and J. E. Bowers, "Monolithically Integrated InAs/InGaAs Quantum Dot Photodetectors on Silicon Substrates," *Optics Express,* vol. 25, no. 22, pp. 27715-27723, Oct., 2017.

(2016)

58. Jhih-Min Wun, Hao-Yun Liu, Yu-Lun Zeng , Shang-Da Yang, Ci-Ling Pan, Chen-Bin Huang, and **Jin-Wei Shi*,** "Photonic High-Power CW THz-Wave Generation by Using Flip-Chip Packaged Uni-Traveling Carrier Photodiode and Femtosecond Optical Pulse Generator," *IEEE/OSA Journal of Lightwave Technology,* vol. 34, pp. 1387-1397, Feb., 2016.
59. Kai-Lun Chi, Yi-Xuan Shi, Xin-Nan Chen, Jason (Jyehong) Chen, Ying-Jay Yang, J.-R Kropp, N. Ledentsov Jr., M. Agustin, N.N. Ledentsov, G. Stepniak, J. P. Turkiewicz, and **Jin-Wei Shi***, "Single-Mode 850 nm VCSELs for 54 Gbit/sec On-Off Keying Transmission Over 1 km Multi-Mode Fiber," *IEEE Photon. Technol. Lett.,* vol. 28, no. 12, pp. 1367-1370, June, 2016.
60. **Jin-Wei Shi***, Kai-Lun Chi, Jhih-Min Wun, J. E. Bowers, Ya-Hsuan Shih, and Jinn-Kong Sheu, "III-Nitride Based Cyan Light-Emitting Diodes with GHz Bandwidth for High-Speed Visible Light Communication," *IEEE Electron Device Lett.,* vol. 37, pp. 894-897, July, 2016.
61. Jhih-Min Wun, Yu-Wen Wang, Yi-Han Chen, J. E. Bowers, and **Jin-Wei Shi***, "GaSb Based p-i-n Photodiodes with Partially Depleted Absorbers for High-Speed and High-Power Performance at 2.5 μm Wavelength," *IEEE Trans. on Electron Device.* vol. 63, pp. 2796-2801, July, 2016.
62. Kai-Lun Chi, Dan-Hua Hsieh, Jia-Liang Yen, Xin-Nan Chen, Jason (Jyehong) Chen, Hao-Chung Kuo, Ying-Jay Yang, and **Jin-Wei Shi***, "850 nm VCSELs with P-type **δ**-Doping in the Active Layers for Improved High-Speed and High-Temperature Performance," *IEEE J. of Quantum Electronics,* vol. 52, pp. 2400607, Nov., 2016.

(2015)

63. **Jin-Wei Shi***, Kai-Lun Chi, Chi-Yu Li, and Jhih-Min Wun "Dynamic Analysis of High-Efficiency InP Based Photodiode for 40 Gbit/sec Optical Interconnect across a Wide Optical Window (0.85 to 1.55 μm)," *IEEE/OSA Journal of Lightwave Technology,* vol. 33, no. 4, pp. 921-927, Feb., 2015.
64. **J.-W. Shi***, C.-C. Wei, Jason (Jyehong) Chen, and Y.-J. Yang, "850 nm Zn-diffusion Vertical-Cavity Surface-Emitting Lasers with Oxide-Relief Structure for High-Speed and Energy-Efficient Optical Interconnects from Very-Short to Medium (2km) Reaches," *Proc. SPIE, Vertical-Cavity Surface Emitting Lasers XIX*, vol. 9002, pp. 9381-13, Feb., 2015. **(Invited Paper)**
65. I-Cheng Lu, Chia-Chien Wei, **Jin-Wei Shi,** Hsing-Yu Chen, Sheng-Fan Tsai, Dar-Zu Hsu, Zhi-Rui Wei, Jhih-Min Wun, and Jyehong Chen, "Optimization of mode numbers of VCSELs for small-cell backhaul applications," *Optics Communications*, vol. 347, pp. 81-87, March, 2015.
66. I-Cheng Lu, C.-C. Wei*, H.-Yu Chen, K.-Z. Chen, C.-H. Huang, K.-L. Chi, **J.-W. Shi**, F.-I. Lai, D.-H. Hsieh, H.-C. Kuo, Wei Lin, S.-W. Chiu, and J. (Jason) Chen, "Very High Bit-Rate Distance Product Using High-Power Single-Mode 850 nm VCSEL with Discrete Multi-Tone Modulation Formats Through OM4 Multi-Mode Fiber," *IEEE J. of Sel. Topics in Quantum Electronics,* vol. 21, no. 6, pp. 1701009, Nov.,/Dec., 2015.
67. Kai-Lun Chi, Jia-Liang Yen, Jhih-Min Wun, Jia-Wei Jiang, I-Cheng Lu, Jason (Jyehong) Chen , Ying-Jay Yang, and **Jin-Wei Shi***, "Strong Wavelength Detuning of 850 nm Vertical-Cavity Surface-Emitting Lasers for High-Speed (>40 Gbit/sec) and Low-Energy Consumption Operation," *IEEE J. of Sel. Topics in Quantum Electronics,* vol. 21, no. 6, pp. 1701510, Nov.,/Dec., 2015.

(2014)

68. Y. Li, A. Rashidinejad, J.-M. Wun, D. E. Leaird, **J.-W. Shi,** and A. M. Weiner, "Photonic Generation of W-band Arbitrary Waveforms with High Time-Bandwidth Products Enabling 3.9mm Range Resolution," *Optica,* vol. 1, no. 6, pp. 446-454, Dec., 2014
69. **Jin-Wei Shi*,** Chi-Yu Li, Kai-Lun Chi, Jhih-Min Wun, Yue-Ming Hsin , and Seldon D. Benjamin, "Large-Area p-i-n Photodiode with High-Speed and High-Efficiency Across a Wide Optical Operation Window (0.85 to 1.55 μm)" *IEEE J. of Sel. Topics in Quantum Electronics,* vol. 20, no. 6, pp. 3800807, Nov.,/Dec., 2014.

70. Jhih-Min Wun, Hao-Yun Liu, Cheng-Hung Lai, Yi-Shiun Chen, S.-D. Yang, Ci-Ling Pan, J. E. Bowers, C.-B. Huang, and **Jin-Wei Shi***, "Photonic High-Power 160 GHz Signal Generation by using Ultra-Fast Photodiode and a High-Repetition-Rate Femtosecond Optical Pulse Train Generator," *IEEE J. of Sel. Topics in Quantum Electronics,* vol. 20, no. 6, pp. 3803507, Nov.,/Dec., 2014.
71. J.-W. Lin, J.-M. Wun, **Jin-Wei Shi**, and C.-L. Pan, "All-Optical Generation and Switching of Few-Cycle Millimeter-Wave Pulses," *Journal of Infrared, Millimeter, and Terahertz Waves,* vol. 35, pp. 813-822, Oct., 2014.
72. Jia-Liang Yen, Kai-Lun Chi, Jia-Wei Jiang, Ying-Jay Yang, and **Jin-Wei Shi***, "Single-Mode Vertical-Cavity Surface-Emitting Lasers Array with Zn-Diffusion Aperture for High-Power, Single-Spot, and Narrow Divergence Angle Performance," *IEEE J. of Quantum Electronics,* vol. 50, pp. 787-794, Oct., 2014.
73. Jhih-Min Wun, Cheng-Hung Lai, Nan-Wei Chen, John E. Bowers, and **Jin-Wei Shi*** "Flip-Chip Bonding Packaged THz Photodiode With Broadband High-Power Performance," *IEEE Photon. Technol. Lett.,* vol. 26, no. 24, pp. 2462-2464, Dec., 2014.
74. J. Vinogradov, R. Kruglov, K.-L. Chi, **J.-W. Shi,** M. Bloos, S. Loquai, and O. Ziemann "GaN Light-Emitting Diodes for up to 5.5 Gb/s Short-Reach Data Transmission over SI-POF " *IEEE Photon. Technol. Lett.,* vol. 26, no. 24, pp. 2473-2475, Dec., 2014.
75. L. G. Yang, J. Y. Sung, C. W. Chow, C. H. Yeh, K. T. Cheng, **J. W. Shi**, and C. L. Pan, "Coding for stable transmission of W-band radio-over-fiber system using direct-beating of two independent lasers," *Optics Express,* vol. 22, No. 21, pp. 26092-26097, Oct, 2014.

(2013)

76. **Jin-Wei Shi***, Jhih-Cheng Yan, Jhih-Min Wun, Jason (Jyehong) Chen, Ying-Jay Yang, "Oxide-Relief and Zn-Diffusion 850 nm Vertical-Cavity Surface-Emitting Lasers with Extremely Low Energy-to-Data-Rate Ratios for 40 Gbit/sec Operations" *IEEE J. of Sel. Topics in Quantum Electronics,* vol. 19, pp. 7900208, March/April, 2013.
77. Jhih-Min Wun, Chia-Chien Wei, Jyehong Chen, Chee Seong Goh, S. Y. Set, and **Jin-Wei Shi***, "Photonic chirped radio-frequency generator with ultra-fast sweeping rate and ultra-wide sweeping range," *Optics Express,* vol. 21, No. 9, pp. 11475-11481, May, 2013.
78. Tzu-Fang Tseng, Jhih-Min Wun, Wei Chen, Sui-Wei Peng, **Jin-Wei Shi***, and Chi-Kuang Sun, "High-depth-resolution 3-dimensional radar-imaging system based on a few-cycle W-band photonic millimeter-wave pulse generator," *Optics Express,* vol. 21, No. 12, pp. 14109-14119, June, 2013.
79. K.-H. Lin, D.-H. Tsai, K.-J. Wang, S.-H. Chen, K.-L. Chi, **J.-W. Shi**, P.-C. Chen, and J.-K. Sheu, "Acoustic spectroscopy for studies of vitreous silica up to 740 GHz," *AIP Advances,* vol. 3, pp. 072126, July, 2013.
80. Kai-Lun Chi, Shu-Ting Yeh, Yu-Hsiang Yeh, Kun-Yan Lin, **Jin-Wei Shi***, Yuh-Renn Wu, M. L. Lee, and J.-K. Sheu, "GaN-Based Dual Color Light-Emitting-Diodes with P-Type Insertion Layer for Controlling the Ratio of Two-Color Intensities," *IEEE Trans. on Electron Device.* vol. 60, pp. 2821-2826, Sep., 2013.
81. **Jin-Wei Shi***, Zhi-Rui Wei, Kai-Lun Chi, Jia-Wei Jiang, Jhih-Min Wun, I-Cheng Lu, Jason (Jyehong) Chen, and Ying-Jay Yang, "Single-Mode, High-Speed, and High-Power Vertical-Cavity Surface-Emitting Lasers at 850 nm for Short to Medium Reach (2 km) Optical Interconnects," *IEEE/OSA Journal of Lightwave Technology,* vol. 31, pp. 4037-4044, Dec., 2013.
82. **Jin-Wei Shi*,** Ying-Hung Cheng, Jhih-Min Wun, Kai-Lun Chi, Yue-Ming Hsin , and Seldon D. Benjamin, "High-Speed, High-Efficiency, Large-Area p-i-n Photodiode for Application to Optical Interconnects from 0.85 to 1.55 μm Wavelengths," *IEEE/OSA Journal of Lightwave Technology,* vol. 31, pp. 3956-3961, Dec., 2013.
83. **Jin-Wei Shi***, Kai-Lun Chi, Jin-Hao Chang, Zhi-Rui Wei, Jia-Wei Jiang, and Ying-Jay Yang, "Single-Mode Vertical-Cavity Surface-Emitting Lasers Array with High-Power and Narrow Far-Field Divergence Angle" *IEEE Photonics Journal,* vol. 5, no. 6, pp. 1502508, Dec., 2013.

(2012)

84. **J.-W. Shi*,** F.-M. Kuo, and J. E. Bowers, "Design and Analysis of Ultra-High Speed Near-Ballistic Uni-Traveling-Carrier Photodiodes under a 50 Ω Load for High-Power Performance," *IEEE Photon. Technol. Lett.,* vol. 24, pp. 533-535, April, 2012.
85. **Jin-Wei Shi***, Cheng-Yo Tsai, Chan-Shan Yang, Feng-Ming Kuo, Yue-Ming Hsin, J. E. Bowers, and Ci-Ling Pan, "GaAs/$In_{0.5}Ga_{0.5}P$ Laser Power Converter with Undercut Mesa for Simultaneous High-Speed Data Detection and dc Electrical Power Generation," *IEEE Electron Device Lett.,* vol. 33, pp. 561-563, April, 2012.
86. **J.-W. Shi*,** F.-M. Kuo, Nan-Wei Chen, S. Y. Set, C.-B. Huang, and J. E. Bowers, "Photonic Generation and Wireless Transmission of Linearly/Nonlinearly Continuously Tunable Chirped Millimeter-Wave Waveforms with High Time-Bandwidth Product at W-band," *IEEE Photonics Journal,* vol. 4, pp. 215-223, Feb., 2012.
87. Nan-Wei Chen, **Jin-Wei Shi***, Fong-Ming Kuo, Jeffery Hesler, Thomas W. Crowe, and John E. Bowers, "25 Gbits/sec Error-Free Wireless Link between Ultra-Fast W-Band Photonic Transmitter-Mixer and Envelop Detector," *Optics Express,* vol. 20, No. 19, pp. 21223-21234, Sep., 2012.

88. **Jin-Wei Shi** *, Feng-Ming Kuo, Daoxin Dai, and J. E. Bowers, "Si/Ge Avalanche Photodiodes Based Electrical Comb-Line Generators and Photoreceivers for Very-Fast Impulse Radio Wireless Linking," *IEEE Photon. Technol. Lett.,* vol. 24, No. 12, pp. 1069-1071, June, 2012.
89. Jhih-Min Wun, Che-Wei Lin, Wei Chen, J.-K. Sheu, Ching-Liang Lin, Yun-Li Li, John E. Bowers, **Jin-Wei Shi*,** Juri Vinogradov, Roman Kruglov, and Olaf Ziemann, "GaN Based Miniaturized Cyan Light Emitting Diodes on Patterned Sapphire Substrate with Improved Fiber Coupling for Very-High-Speed Plastic Optical Fiber Communication," *IEEE Photonics Journal,* vol. 4, No.5, pp. 1520-1529, Oct., 2012.
90. J.-W. Lin, C.-L. Lu, H.-P. Chuang, F.-M. Kuo, **J.-W. Shi**, C.-B. Huang, and C.-L. Pan, "Photonic Generation and Detection of W-band Chirped Millimeter-Wave Pulses for Radar," *IEEE Photon. Technol. Lett.,* vol. 24, No. 16, pp. 1437-1439, Aug., 2012.
91. **Jin-Wei Shi***, J. W. Lin, C.-B. Huang, F.-M. Kuo, Nan-Wei Chen, Ci-Ling Pan, and John E. Bowers, "Photonic Generation of Few-cycle Millimeter-Wave Pulse using a Waveguide Based Photonic-Transmitter-Mixer," *IEEE Photonics Journal,* vol. 4, No.4, pp. 1071-1079, Aug., 2012.
92. Kai-Lun Chi, **Jin-Wei Shi***, C.H. Jang, Pyry Kivisaari, Jani Oksanen, Jukka Tulkki, M.L. Lee, and J.K. Sheu, "Carrier Dynamics in High-Efficiency Blue GaN Light-Emitting Diodes under Different Bias Currents and Temperatures," *IEEE Photonics Journal,* vol. 4, pp. 1870-1880, Oct., 2012.
93. C.-W. Chow, L.-G. Yang, C.-H. Yeh, C.-B. Huang**, J.-W. Shi**, and C. L. Pan, "10 Gb/s optical carrier distributed network with W-band (0.1THz) short-reach wireless communication system," *Opt. Comm.* vol. 285, 4307-4311, July, 2012.

(2011)

94. **J.-W. Shi*,** H.-W. Huang, F.-M. Kuo, W.-C. Lai, M. L. Lee, and J.-K. Sheu, "Investigation of the Carrier Dynamic in GaN-Based Cascade Green Light-Emitting-Diodes Using the Very-Fast Electrical-Optical Pump-Probe Technique," *IEEE Trans. on Electron Device.* vol. 58, pp. 495-500, Feb., 2011.
95. F.-M. Kuo, M.-Z. Chou, and **J.-W. Shi***, "Linear-Cascade Near-Ballistic Uni-Traveling-Carrier Photodiodes with an Extremely High Saturation-Current-Bandwidth Product," *IEEE/OSA Journal of Lightwave Technology,* vol. 29, No. 4, pp. 432-438, Feb., 2011.
96. **J.-W. Shi,** C.-B. Huang, and C.-L. Pan, "Millimeter-wave Photonic Wireless Links for Very-High Data Rate Communication," *NPG Asia Materials*, vol. 3, No. 2, pp. 41-48, April, 2011**. (Invited review article)**
97. **J.-W. Shi***, F.-M. Kuo, and B.-R. Huang, "Zn-Diffusion InAs Photodiodes on a Semi-Insulating GaAs Substrate for High-Speed and Low Dark-Current Performance," *IEEE Photon. Technol. Lett.,* vol. 23, No. 2, pp. 100-102, Jan., 2011.
98. Nan-Wei Chen, Hsuan-Ju Tsai, Fon-Ming Kuo, and **Jin-Wei Shi,** "High-Speed W-Band Integrated Photonic Transmitter for Radio-Over-Fiber Applications," *IEEE Trans. Microwave Theory Tech.*, vol. 59, No. 4, pp. 978-986, April, 2011.
99. **J.-W. Shi*,** F.-M. Kuo, H.-W. Huang, J.-K. Sheu, C.-C. Yang, W.-C. Lai, M. L. Lee, "The Influence of a Piezoelectric Field on the Dynamic Performance of GaN-Based Green Light-Emitting-Diodes with a InGaN Insertion Layer," *IEEE Electron Device Lett.,* vol. 32, pp. 656-658, May, 2011.
100. **J.-W. Shi***, F.-M. Kuo, Chan-Shan Yang, S.-S. Lo, and Ci-Ling Pan, "Dynamic Analysis of Cascade Laser Power Converters for Simultaneous High-Speed Data Detection and Optical-to-Electrical dc Power Generation," *IEEE Trans. on Electron Device.* vol. 58, pp. 2049-2056, July, 2011.
101. F.-M. Kuo, C.-B. Huang, **J.-W. Shi*,** Nan-Wei Chen, H.-P. Chuang, John E. Bowers, and Ci-Ling Pan, "Remotely Up-converted 20 Gbit/s Error-Free Wireless On-off-keying Data Transmission at W-band using an Ultra-Wideband Photonic Transmitter-Mixer," *IEEE Photonics Journal,* vol. 3, no. 2, pp. 209-219, April, 2011.
102. J. W. Lin, H. P. Chuang, F.M. Kuo, C. H. Lin, T. A. Liu, **J.-W. Shi**, C. B. Huang, and Ci-Ling Pan "Enhanced Performance of Narrow-Band Millimeter-Wave Generation Using Shaped-Pulse-Excited Photonic Transmitters," *IEEE Photon. Technol. Lett.,* vol. 23, pp. 902-904, July, 2011.
103. **J.-W. Shi*,** F.-M. Kuo, Che-Wei Lin, Wei Chen, L.-J. Yan, and J.-K. Sheu, "Investigation of the Efficiency-Droop Mechanism in Vertical Red Light-Emitting Diodes Using a Dynamic Measurement Technique," *IEEE Photon. Technol. Lett.,* vol. 23, pp. 1585-1587, Nov., 2011.

(2010)

104. **J.-W. Shi***, W.-C. Weng, F.-M. Kuo, Ying-Jay Yang, S. Pinches, M. Geen, A. Joel, "High-Performance Zn-Diffusion 850-nm Vertical-Cavity Surface-Emitting Lasers With Strained InAlGaAs Multiple Quantum Wells," *IEEE Photonics Journal,* vol. 2, no. 6, pp. 960-966, Dec., 2010.
105. F.-M. Kuo, **J.-W. Shi,** H.-C. Chiang, H.-P. Chuang, H.-K. Chiou, C.-L. Pan, N.-W. Chen, H.-J. Tsai, and C.-B. Huang, "Spectral Power Enhancement in a 100-GHz Photonic Millimeter-Wave Generator Enabled by Spectral Line-by-Line Pulse Shaping," *IEEE Photonics Journal,* vol. 2, no. 5, pp. 719-727, Oct., 2010.
106. **J.-W. Shi***, F.-M. Kuo, Tzihong Chiueh, Hsiao-Feng Teng, Hsuan Ju Tsai, Nan-Wei Chen, and Mount-Learn Wu, "Photonic Generation of Millimeter-Wave White-Light at W-Band Using a Very-Broad-Band and High-Power Photonic Emitter," *IEEE Photon. Technol. Lett.,* vol. 22, pp. 847-849, June, 2010.

107. Shi-Hao Guol , Ming-Ge Chou , Ying-Jay Yang , Chi-Kuang Sun , and **Jin-Wei Shi*,** "GaAs-Based Transverse Junction Superluminescent Diodes with Strain-Compensated InGaAs/GaAsP Multiple-Quantum-Wells at 1.1μm Wavelength," *IEEE Photon. Technol. Lett.,* vol. 22, pp. 917-919, June, 2010.
108. **J.-W. Shi***, H.-W. Huang, F.-M. Kuo, J.-K. Sheu, W.-C. Lai, M. L. Lee, "Very-High Temperature (200℃) and High-Speed Operation of Cascade GaN Based Green Light Emitting Diodes with an InGaN Insertion Layer," *IEEE Photon. Technol. Lett.,* vol. 22, pp. 1033-1035, July, 2010.
109. Yu-Chieh Wen, Jia-Hong Sun, Christian Dais, Detlev Grützmacher, Tsung-Tsong Wu, **Jin-Wei Shi**, and Chi-Kuang Sun "Three-dimensional phononic nanocrystal composed of ordered quantum dots" *Appl. Phys. Lett,* vol. 96, pp. 123113, March, 2010.
110. F.-M. Kuo, Yu-Tai Li, **J.-W. Shi*,** Shao-Ning Wang, Nan-Wei Chen, and Ci-Ling Pan "Photonic Impulse-Radio Wireless Link at W-Band Using a Near-Ballistic Uni-Traveling-Carrier Photodiode-Based Photonic Transmitter-Mixer," *IEEE Photon. Technol. Lett.,* vol. 22, pp. 82-84, Jan., 2010.
111. **J.-W. Shi*,** F .-M. Kuo, C.-J. Wu, C. L. Chang, C. Y. Liu, C.-Y. Chen, and J.-I. Chyi, "Extremely High Saturation Current-Bandwidth Product Performance of a Near-Ballistic Uni-Traveling-Carrier Photodiode with a Flip-Chip Bonding Structure," *IEEE J. of Quantum Electronics,* vol. 46, pp. 80-86, Jan., 2010.
112. Yu-Tai Li, **J.-W. Shi*,** C.-Y. Huang, N.-W. Chen, S.-H. Chen, J.-I. Chyi, Yi-Chao Wang, Chan-Shan Yang, and Ci-Ling Pan "Characterization and Comparison of GaAs/AlGaAs Uni-Traveling Carrier and Separated-Transport-Recombination Photodiode Based High-Power Sub-THz Photonic-Transmitters," *IEEE J. of Quantum Electronics,* vol. 46, pp. 19-27, Jan., 2010.
113. C. W. Chow, F. M. Kuo, **J.-W. Shi,** C. H. Yeh, Y. F. Wu, C. H. Wang, Y. T. Li, C. L. Pan, "100 GHz ultra-wideband (UWB) fiber-to-the-antenna (FTTA) system for in-building and in-home networks," *Optics Express,* vol. 18, No. 2, pp. 473-478, Jan., 2010.

(2009)

114. Hsu-Liang Hsiao, Hsiao-Chin Lan, Chia-Chi Chang, Chia-Yu Lee, Siou-Ping Chen, Chih-Hung Hsu, Shuo-Fu Chang, Yo-Shen Lin, Feng-Ming Kuo, **Jin-Wei Shi,** and Mount-Learn Wu, "Compact and passive-alignment 4-channel × 2.5-Gbps optical interconnect modules based on silicon optical benches with 45° micro-reflectors," *Optics Express,* vol. 17, pp. 24250-24260, 21 Dec., 2009.
115. **J.-W. Shi*,** F.-M. Kuo, F.-C. Hong, and Y.-S. Wu "Dynamic Analysis of a Si/SiGe Based Impact Ionization Avalanche Transit Time Photodiode with an Ultra-high Gain-Bandwidth Product," *IEEE Electron Device Lett.,* vol. 30, pp. 1164-1166, Nov., 2009.
116. F.-M. Kuo, **J.-W. Shi*,** Shao-Ning Wang , Nan-Wei Chen, Po-Tsung Shih, Chun-Ting Lin, Wen-Jr Jiang, Er-Zih Wong, Jason (Jyehong) Chen, and Sien Chi "W-Band Wireless Data Transmission by the Integration of a Near-Ballistic Uni-Traveling-Carrier Photodiode (NBUTC-PD) with a Horn Antenna Fed by a Quasi-Yagi Radiator," *IEEE Electron Device Lett.,* vol., 30, pp. 1167-1169, Nov., 2009.
117. **J.-W. Shi*,** F.-M. Kuo, T.-C. Hsu, Ying-Jay Yang, Andrew Joel, Mark Mattingley, and J.-I. Chyi, "The Monolithic Integration of GaAs/AlGaAs Based Uni-Traveling-Carrier Photodiodes with Zn-Diffusion Vertical-Cavity Surface-Emitting Lasers with Extremely High Data-Rate/Power-Consumption Ratios" *IEEE Photon. Technol. Lett.*, vol. 21, pp. 1444-1446, Oct., 2009.
118. Pei-Hsun Wang, Yu-Chieh Wen, Shi-Hao Guol, Chih-Ming Lai, Hung-Cheng Lin, Peng-Ren Chen, **Jin-Wei Shi,** Jen-Inn Chyi, and Chi-Kuang Sun "Electrically manipulating the optical sensitivity function in quantum wells for nanoacoustic wave detection" *Appl. Phys. Lett,* vol. 95, pp. 143108, Oct., 2009.
119. Shou-Chien Huang, Wei-Kuo Huang, Yue-Ming Hsin, and **Jin-Wei Shi**, "Using Selective Zn- Diffusion to Enhance The Performance of The Photodiode in InP/InGaAs PD/HBT Integration," *Microwave and Optical Technology Letters,* vol. 51, pp. 2200-2202, Sep., 2009.
120. Shih-Yung Huang, Ray-Hua Horng, **Jin-Wei Shi,** Hao-Chung Kuo, and Dong-Sing Wuu "High-Performance InGaN-Based Green Resonant-Cavity Light-Emitting Diodes for Plastic Optical Fiber Applications" *IEEE/OSA Journal of Lightwave Technology*, vol. **27,** pp. 4084-4089, Sep., 2009.
121. **J.-W. Shi*,** F.-M. Kuo, Y.-S. Wu, Nan-Wei Chen, Po-Tsung Shih, Chun-Ting Lin, Wen-Jr Jiang, Er-Zih Wong, Jason (Jyehong) Chen, and Sien Chi, "W-Band Photonic Transmitter-Mixer Based on High-Power Near-Ballistic Uni-Traveling-Carrier Photodiodes for BPSK and QPSK Data Transmission under Bias Modulation" *IEEE Photon. Technol. Lett.*, vol. 21, pp. 1039-1041, Aug., 2009.
122. **J.-W. Shi***, Shi-Hao Guol, C.-S. Lin, J.-K. Sheu, K. H. Chang, W.-C. Lai, C.-H. Kuo, C.-J. Tun, and J.-I. Chyi, "The Structure of GaN-Based Transverse Junction Blue Light-Emitting Diode Array for Uniform Distribution of Injected Current/Carriers" *IEEE J. of Sel. Topics in Quantum Electronics,* vol. 15, pp. 1292-1297, July/Aug., 2009.
123. **J.-W. Shi***, C.-C. Chen, Y.-S. Wu, S.-H. Guol, and Ying-Jay Yang, "The Influence of Zn-Diffusion Depth on the Static and Dynamic Behaviors of Zn-Diffusion High-Speed Vertical-Cavity Surface-Emitting Lasers at a 850nm Wavelength," *IEEE J. Quantum, Electron.,* vol. 45, pp. 800-806, July, 2009.
124. Shi-Hao Guol, **J.-W. Shi*,** C.-S. Lin, J.-K. Sheu, K. H. Chang, W.-C. Lai, C.-H. Kuo, C.-J. Tun, and J.-I. Chyi "Array of GaN-Based Transverse Junction Blue Light-Emitting-Diodes (LEDs)," SPIE Photonic West 2009, pp. 7216-66, 2009.

125. Shi-Hao Guol , Jr-Hung Wang , Yu-Huei Wu, Wei Lin , Ying-Jay Yang , Chi-Kuang Sun , Ci-Ling Pan , and **Jin-Wei Shi***, "Bipolar Cascade Superluminescent Diodes at the 1.04-μm Wavelength Regime," *IEEE Photon. Technol. Lett.*, vol. 21, pp. 328-330, March, 2009.

126. F.-M. Kuo, Y.-S. Wu, and **J.-W. Shi*,** "Near-Ballistic Unitraveling-Carrier Photodiode-Based V-band Optoelectronic Mixers With Low Upconversion Loss and High Operation Current Performance Under Optical IF Signal Injection," *IEEE Electron Device Lett.,* vol. 30, pp. 21-23, Jan., 2009.

(2008)

127. Shi-Hao Guol, Jr-Hung Wang, Yu-Huei Wu, Wei Lin, Ying-Jay Yang, Chi-Kuang Sun, and **Jin-Wei Shi***, "Transverse-junction superluminescent diodes at the 1.1μm wavelength regime," *Optics Express,* vol. 16, no. 21, pp. 16860-16866, 2008.

128. **J.-W. Shi***, P-.Y. Chen, C.-C. Chen, J.-K. Sheu, W.-C. Lai, Yun-Chih Lee, Po-Shen Lee, Shih-Pu Yang, and Mount-Learn Wu, "Linear Cascade GaN Based Green Light Emitting Diodes with Invariant High-Speed/Power Performance under High-Temperature Operation," *IEEE Photon. Technol. Lett.*, vol. 20, pp. 1896-1898, Dec., 2008.

129. Y.-S. Wu, Nan-Wei Chen, and **J.-W. Shi***, "A W-Band Photonic Transmitter/Mixer Based on High-Power Near-Ballistic Uni-Traveling-Carrier Photodiode (NBUTC-PD)," *IEEE Photon. Technol. Lett.*, vol. 20, pp. 1799-1801, Nov., 2008.

130. Yu-Tai Li, **J.-W. Shi***, C.-Y. Huang, N.-W. Chen, S.-H. Chen, J.-I. Chyi, and Ci-Ling Pan, "Characterization of Sub-THz Photonic-Transmitters Based on GaAs/AlGaAs Uni-Traveling Carrier Photodiodes and Substrate-Removed Broadband Antennas for Impulse-Radio Communication," *IEEE Photon. Technol. Lett.,* vol. 20, pp.1342-1344, Aug., 2008.

131. **J.-W. Shi***, Y.-S. Wu, F.-C. Hong, and W.-Y. Chiu, "Separate Absorption Charge Multiplication Heterojunction Phototransistors with the Bandwidth Enhancement Effect and Ultra-High Gain-Bandwidth Product under Near Avalanche Operation," *IEEE Electron Device Lett.,* vol. 29, pp. 714-717, July, 2008.

132. **J.-W. Shi***, C.-C. Chen, Y.-S. Wu, S.-H. Guol, and Ying-Jay Yang, "High-Power and High-Speed Zn-Diffusion Single Fundamental-Mode Vertical-Cavity Surface-Emitting Lasers at 850nm Wavelength," *IEEE Photon. Technol. Lett.,* vol. 20, pp.1121-1123, July, 2008.

133. Y.-S. Wu, and **J.-W. Shi***, "Dynamic Analysis of High-Power and High-Speed Near-Ballistic Unitraveling Carrier Photodiodes at W-Band," *IEEE Photon. Technol. Lett.*, vol. 20, pp. 1160-1162, July, 2008.

134. **J.-W. Shi*,** Y.-S. Wu, and Y.-S. Lin, "Near-Ballistic Uni-Traveling-Carrier Photodiode Based V-band Optoelectronic Mixers with Internal Up-Conversion-Gain, Wide Modulation Bandwidth, and Very High Operation Current Performance," *IEEE Photon. Technol. Lett.*, vol. 20, pp. 939-941, June, 2008.

135. **J.-W. Shi*,** C.-C. Chen, C.-K. Wang, C.-S. Lin, J.-K. Sheu, W.-C. Lai, C.-H. Kuo, C.-J. Tun, T.-H. Yang, F.-C. Tsao, and J.-I. Chyi "Phosphor-Free GaN-Based Transverse Junction White Light-Emitting Diodes with Re-grown n-type Regions" *IEEE Photon. Technol. Lett.,* vol. 20, pp. 449-451, March, 2008.

136. **J.-W. Shi***, J.-K. Sheu, C.-H. Chen, G.-R. Lin, and W.-C. Lai, "High-Speed GaN-based Green Light Emitting Diodes with Partially n-doped Active Layers and Current-Confined Apertures," *IEEE Electron Device Lett.,* vol. 29, pp. 158-160, Feb., 2008.

(2007)

137. **J.-W. Shi***, L.-C. Yang, C.-C. Chen, Y.-S. Wu, S.-H. Guol, and Ying-Jay Yang, "Minimization of Damping in the Electrooptic Frequency Response of High-Speed Zn-Diffusion Single-Mode Vertical-Cavity Surface-Emitting Lasers" *IEEE Photon. Technol. Lett.,* vol. 19, pp. 2057-2059, Dec., 2007.

138. K.-H. Lin, C.-M. Lai, C.-C. Pan, J.-I. Chyi, **J.-W. Shi**, S.-Z. Sun, C.-F. Chang, and C.-K. Sun, "Spatial manipulation of nanoacoustic waves with nanoscale spot sizes," *Nature Nanotechnology* vol. 2, pp. 704-708, Nov., 2007.

139. Y.-S. Wu, **J.-W. Shi***, P.-H. Chiu, and Wei Lin "High-Performance Dual-Step Evanescently-Coupled Uni-Traveling-Carrier Photodiodes" *IEEE Photon. Technol. Lett.,* vol. 19, pp. 1682-1684, 2007.

140. **J.-W. Shi***, J.-K. Sheu, C.-K. Wang, C.-C. Chen, C.-H. Hsieh, J.-I. Chyi, and W.-C. Lai, "Linear Cascade Arrays of GaN Based Green Light Emitting Diodes for High-Speed and High-Power Performance" *IEEE Photon. Technol. Lett.,* vol. 19, pp. 1368-1370, Sep., 2007.

141. Yu-Tai Li, **J.-W. Shi***, Ci-Ling Pan, C.-H. Chiu, W.- S. Liu, Nan-Wei Chen, C.-K. Sun, and J.-I. Chyi, "Sub-THz Photonic-Transmitters Based on Separated-Transport-Recombination Photodiodes and a Micromachined Slot Antenna" *IEEE Photon. Technol. Lett.,* vol. 19, pp. 840-842, June, 2007.

142. **J.-W. Shi***, Y.-S. Wu, Z.-R. Li, and P.-S. Chen, "Impact-Ionization-Induced Bandwidth-Enhancement of a Si/SiGe-Based Avalanche Photodiode Operating at a Wavelength of 830nm with a Gain-Bandwidth Product of 428GHz" *IEEE Photon. Technol. Lett.,* vol. 19, pp. 474-476, April, 2007.

143. N.-W. Chen, C.-T. Chuang, and **Jin-Wei Shi**, "A W-Band Linear Tapered Slot Antenna on Rectangular-Grooved Silicon Substrate" *IEEE Antennas and Wireless Propagation Lett.,* vol. **6**, pp. 90-92, 2007.

144. **J.-W. Shi***, A.-C. Shiao , C.-C. Chu, and Y.-S. Wu "Dual-Depletion-Region Electro-Absorption Modulator with Evanescently-Coupled Waveguide Wavelength for High-Speed (>40GHz) and Low Driving-Voltage Performance" *IEEE Photon. Technol. Lett.,* vol. 19, pp. 345-347, March, 2007.

145. W.-Y. Chiu, **J.-W. Shi***, Y.-S. Wu, F.-H. Huang, Wei Lin, and Y.-J. Chan "The Monolithic Integration of a Wavelength-Demultiplexer with Evanescently-Coupled Uni-Traveling-Carrier Photodiodes" *IEEE Photon. Technol. Lett.,* vol. **19**, pp.1433-1435, 2007.

(2006)

146. **J.-W. Shi***, H.-Y. Huang, C.-K. Wang, J.-K. Sheu, W.-C. Lai, Y.-S. Wu, C.-H. Chen, J.-T. Chu, H.-C. Kuo, Wei-Ping Lin, Tsung-Hsun Yang, and J.-I. Chyi "Phosphor-Free GaN-Based Transverse Junction Light Emitting Diodes for the Generation of White Light" *IEEE Photon. Technol. Lett.,* vol. 18, pp. 2593-2595, Dec., 2006.

147. **J.-W. Shi***, T.-J. Hung, Y.-Y. Chen, Y.-S. Wu, Wei Lin, and Ying-Jay Yang, "InP-Based Transverse Junction Light-Emitting Diodes for White-Light Generation at Infrared Wavelengths," *IEEE Photon. Technol. Lett.*, vol. 18, pp. 2053-2055, Oct., 2006.

148. **J.-W. Shi*,** Y.-T. Li, C.-L. Pan, M. L. Lin, Y. S. Wu, W. S. Liu, and J.-I. Chyi, "Bandwidth enhancement phenomenon of a high-speed GaAs-AlGaAs based unitraveling carrier photodiode with an optimally designed absorption layer at an 830nm wavelength" *Appl. Phys. Lett,* vol. 89, pp.053512 2006.

149. **J.-W. Shi*,** H.-Y. Huang, J.-K. Sheu, C.-H. Chen, Y.-S. Wu, and W.-C. Lai, "The improvement in Modulation Speed of GaN-Based Light-Emitting Diode (LED) by Use of n-Type Barrier Doping for Plastic Optical Fiber (POF) Communication" *IEEE Photon. Technol. Lett.,* vol. **18**, pp. 1636-1638, Aug., 2006.

150. **J.-W. Shi***, P.-H. Chiu, F.-H. Huang, Y.-S. Wu, Ja-Yu Lu, C.-K. Sun, and C.-W. Liu, P.-S. Chen "Si/SiGe-Based Edge-Coupled Photodiode with Partially P-Doped Photo-absorption Layer for High Responsivity and High-Power Performance" *Appl. Phys. Lett,* vol. 88, pp.193506 2006.

151. Y.-S. Liao, **J.-W. Shi**, Y.-S. Wu, H.-C. Kuo, M. Feng, and G.-R. Lin, "Optically heterodyne diagnosis of a high-saturation-power undoped InP sandwiched InGaAs p-i-n photodiode grown on GaAs" *Optic Express* vol. 14, pp. 5031-5037, June, 2006.

152. W.-K. Huang, S.-C. Huang, H.-W. Chung, Y.-M. Hsin, **J.-W. Shi,** Y.-C. Kao, and J.-M. Kuo, "37-GHz Bandwidth Monolithically Integrated InP HBT/Evanescently Coupled Photodiode" *IEEE Photon. Technol. Lett.,* vol. 18, pp. 1267-1269, June, 2006.

153. W.-Y. Chiu, **J.-W. Shi***, W.-K. Wang, Y.-S. Wu, Y.-J. Chan, Y.-L. Huang, and R. Xuan, "Leaky-Wave Photodiodes with a Partially p-Doped Absorption Layer and a Distributed-Bragg-Reflector (DBR) for High-Power and High-Bandwidth-Responsivity Product Performance" *IEEE Photon. Technol. Lett.,* vol. 18, pp. 1323-1325, June, 2006.

154. Y.-S. Wu, **J.-W. Shi***, and P.-H. Chiu "Analytical Modeling of a High-Performance Near-Ballistic Uni-Traveling-Carrier Photodiode at a 1.55μm Wavelength," *IEEE Photon. Technol. Lett.,* vol. 18, pp. 938-940, April, 2006.

155. **Jin-Wei Shi***, J.-L. Yen, C.-H. Jiang, K.-M. Chen, T.-J. Hung, and Ying-Jay Yang, "Vertical-Cavity Surface-Emitting Lasers (VCSELs) with High-Power and Single-Spot Far-Field Distributions at 850nm Wavelength by use of Petal-Shaped Light-Emitting Apertures" *IEEE Photon. Technol. Lett.,* vol. 18, March, 2006.

156. **J.-W. Shi***, H.-Y. Huang, J.-K. Sheu, S.-H. Hsieh, Y.-S. Wu, Ja-Yu Lu, F.-H. Huang, W.-C. Lai, "Nitride Based Photodiode at a 510nm Wavelength for Plastic Optical Fiber Communication," *IEEE Photon. Technol. Lett.,* vol. 18, pp. 283-285, Jan., 2006.

(2005)

157. **J.-W. Shi***, Y.-S. Wu, S.-H. Hsieh, H.-C. Hsu, F.-H. Huang, Y.-J. Chan, Ja-Yu Lu, C.-K. Sun, C.-C. Hong, "High-Power and High-Responsivity Photodiode for Long-Haul and Short-Reach Fiber Communication" SPIE Optic East 2005 (**Invited Paper,** Optic East, Oct. 2005).

158. W.-Y. Chiu, F.-H. Huang, Y.-S. Wu, D.-M. Lin, Y.-J. Chan, S.-H. Chen, J.-I. Chyi, and **J.-W. Shi,** "Improvement of Mesa-Sidewall Leakage Current Using Benzocyclobuten Sidewall Process in InGaAs/InP MSM Photodetector," Japanese Journal of Applied Physics (Brief Communication), vol. 44, No. 4B, pp. 2586-2587.

159. **J.-W. Shi***, C.-A. Hsieh, A.-C. Shiao, Y.-S. Wu, F.-H. Huang, S.-H. Chen, Y.-T. Tsai , and J.-I. Chyi, "Demonstration of a Dual-Depletion-Region Electro-Absorption Modulator at 1.55μm Wavelength for High-Speed and Low-Driving-Voltage Performance," *IEEE Photon. Technol. Lett.,* vol. 17, pp. 2068-2070, Oct., 2005.

160. **J.-W. Shi*,** C.-Y. Wu, Y.-S. Wu, P.-H. Chiu, and C.-C. Hong, "High-Speed, High-Responsivity, and High-Power Performance of Near- Ballistic Uni-Traveling-Carrier Photodiode at 1.55μm Wavelength," *IEEE Photon. Technol. Lett.,* vol.17, pp. 1929-1931, Sep., 2005.

161. **J.-W. Shi***, H.-C. Hsu, F.-H. Huang, W.-S. Liu, J.-I. Chyi, Ja-Yu Lu, Chi-Kuang Sun, and Ci-Liang Pan, "Separated-Transport-Recombination p-i-n Photodiode for High-speed and High-power Performance," *IEEE Photon. Technol. Lett,* vol. 17, pp. 1722-1724, Aug., 2005.

162. **Jin-Wei Shi***, C.-H. Jiang, K.-M. Chen, Y.-J. Yang, J.-L. Yen, "Single-mode vertical-cavity surface-emitting laser with ring-shaped light-emitting aperture,"*Appl. Phys. Lett.,* vol. **87**, pp. 031109-1-3, July, 2005.

163. Y.-S. Wu, **J.-W. Shi***, J.-Y. Wu, F.-H. Huang, Y.-J. Chan, Y.-L. Huang, and R. Xuan "High Performance Evanescently Edge Coupled Photodiodes with Partially p-Doped Photo-absorption Layer at 1.55 μm Wavelength" *IEEE Photon. Tech. Lett* vol. **17***,* pp.878-880, April, 2005.

(2004)

164. **J.-W. Shi***, Z. Pei, F. Yuan, Y.-M. Hsu, Chee-Wee Liu, S.C. Lu, and M. -J. Tsai "Performance Enhancement of High-Speed SiGe Based Hetero-junction Phototransistor with Side-Wall Terminal"*, Appl. Phys. Lett,* vol. 85, pp. 2947-2949, Oct., 2004.

165. D. Lasaosa, **J.-W. Shi**, D. Pasquariello, K.-G. Gan, M.-C. Tien, H.-H. Chang, S.-W. Chu, C.-K. Sun, Y.-J. Chiu, and J. E. Bowers, "Traveling-Wave Photodetectors with High Power-Bandwidth and Gain-Bandwidth Product Performance" *IEEE Journal of Sel. Topics in Quantum Electronics,* vol. 14, pp.728-741, July/Aug., 2004

166. F. Yuan, **J.-W. Shi**, Z. Pei, and C. W. Liu, "Mextram Modeling of Si/SiGe Heterojunction Phototransistors" *IEEE Trans. on Electron Device.* vol. 51, pp.870-876, June, 2004.

167. **J.-W. Shi*** and C.-W. Liu, "Design and Analysis of Separate-Absorption-Transport-Charge-Multiplication Traveling-Wave Avalanche Photodetectors "*IEEE/OSA Journal of Lightwave Technology*, vol. 22, pp.1583-1590, June, 2004.

168. Z. Pei, **J.-W. Shi**, Y.-M. Hsu, F. Yuan, C. S. Liang, S. C. Lu, W. Y. Hsieh, M.-J. Tsai, and C. W. Liu, "Bandwidth Enhancement in an Integratable SiGe Phototransistors by Removal of Excess Carriers" *IEEE Electron Device Lett.,* vol. 25, pp. 286-288, May, 2004.

169. **J.-W. Shi**, Yen-Hung Chen, Kian-Giap Gan, Yi-Jen Chiu, John E. Bowers, Ming-Chun Tien, Tzu-Ming Liu, and Chi-Kuang Sun "Nonlinear Behaviors of Low-Temperature-Grown GaAs Based Photodetectors around 1.3 μm Telecommunication Wavelength" *IEEE Photon. Tech. Lett.,* vol. **16,** pp. 242-244, Jan., 2004.

(Before 2004)

170. I-Hsiu Chen, Francois Bresson, Shi-Wei Chu, Ming-Chun Tien, **J.-W. Shi,** and Chi-Kuang Sun, "Three-Dimensional Electric Field Visualization Utilizing Electric-Field-Induced-Second-Harmonic-Generation in Nematic Liquid Crystals" *Optics Lett.,* vol. 28, pp. 1338-1340, Aug., 2003.

171. Chi-Kuang Sun, Yen-Hung Chen, **Jin-Wei Shi,** Yi-Jen Chiu, Kian-Giap Gan, and John E. Bowers "Electron relaxation and transport dynamics in low-temperature-grown GaAs under 1eV optical excitation" *Appl. Phys. Lett.,* vol. 83, pp.911-913, Aug., 2003.

172. **J.-W. Shi**, S.-W. Chu, M.-C. Tien, C.-K. Sun, Y.J. Chiu, and John E. Bowers, "Edge-Coupled Membrane THz Photonic Transmitter Based on Metal-Semiconductor-Metal Traveling-Wave Photodetectors" *Appl. Phys. Lett,* vol. 80, pp.5108-5110, Dec., 2002.

173. **J.-W. Shi** and C.-K. Sun, " Theory and Design of a Tapered Line Distributed Photodetector," *IEEE/OSA Journal of Lightwave Technology* vol. 20, pp.1942-1950, Nov., 2002.

174. **J.-W. Shi,** K. G. Gan, Y.-H. Chen, C.-K. Sun, Y. J. Chiu, and John. E. Bowers, "Ultra-High Power-Bandwidth Product and Nonlinear Photo-Conductance Performances of Low-Temperature-Grown GaAs Based Metal-Semiconductor-Metal Traveling-Wave Photodetectors" *IEEE Photon. Tech. Lett.*, vol. 14, pp.1587-1589, Nov., 2002.

175. K. G. Gan, **J.-W. Shi**, Y. H. Chen, Y. J. Chiu, C. -K Sun, and John E. Bowers, "Ultra-High Power-Bandwidth-Product Performance of Low-Temperature-Grown-GaAs Based Metal-Semiconductor-Metal Traveling-Wave Photodetetcors" *Appl. Phys. Lett.,* vol. 80, pp. 4054-4056, May, 2002.

176. **J.-W. Shi**, Y.-H. Chen, K.-G. G, Y.-J. Chiu, C.-K. Sun, and John. E. Bowers, "High Speed and High Power Performances of LTG-GaAs Based Metal-Semiconductor-Metal Traveling–Wave-Photodetectors in 1.3 μm wavelength regime," *IEEE Photon. Tech. Lett.*, vol. 14, pp. 363-365, March, 2002.

177. **J.-W. Shi**, K. G. Gan, Y. J. Chiu, Y.-H. Chen, C.-K. Sun, Y. J. Yang, and John. E. Bowers, "Metal-Semiconductor-Metal Traveling-Wave-Photodetectors" *IEEE Photon. Techno. Letters,* vol. 13, pp. 623-625. June, 2001.)

178. **J.-W. Shi** and C.-K. Sun, "Design and Analysis of Long Absorption Length Traveling Wave Photodetector," *IEEE/OSA Journal of Lightwave Technology,* vol. 18, pp. 2176-2187, Dec., 2000.

International Conference Papers

(2024)

1. M. -L. Wu, C. -W. Lin and **J. -W. Shi***, "Single-Mode VCSEL with Zn-Diffusion Apertures and Strong Immunity Against Optical Feedback for Improved Data Transmission," *2024 Optical Fiber Communications Conference and Exhibition (OFC)*, San Diego, CA, USA, 2024, pp. 1-3.
2. **Jin-Wei Shi*,** "Inhibition of Spatial Hole Burning Effect in Single-Mode Zn-Diffusion VCSEL for High-Power and High-Speed Performances," *GCOPTIC 2024,* Berlin, Germany, 2024. **(Invited Talk)**

3. Yu-Xiang Lin, Chia-Chien Wei, You-Chia Chang, Tzyy-Sheng Horng, and **Jin-Wei Shi*,** "Flip-Chip Bonded Avalanche Photodiode with Cascaded Multiplication-Layers for 4-D FMCW LiDAR Applications with Ultra-High Velocity Sensitivity," *2024 Microoptics Conference (MOC)*, Kaohsiung, Taiwan, 2024.
4. Cheng-Wei Lin, Zhe-Wei Hsu, Jian-Wei Tung, and **Jin-Wei Shi***, "Miniaturized VCSEL Array with Zn-Diffusion Apertures for High-Speed and High-Brightness Performances," *2024 Microoptics Conference (MOC)*, Kaohsiung, Taiwan, 2024.
5. C. -W. Lin, Z. -W. Hsu, J. -W. Tung and **J. -W. Shi*,** "Suppression of Spatial Hole Burning Effect in Single-Mode VCSEL by Using Zn-Diffusion Optical Aperture," *2024 IEEE Photonics Conference (IPC)*, Rome, Italy, 2024, pp. 1-2, doi: 10.1109/IPC60965.2024.10799882.
6. J. Wang, H. Lin, S. Kuo, Z. Ahmad, P. Hsieh, C. Hsu, **J. Shi,** and Y. Chang, "Chip-scale Confocal Laser-scanning Microscope Based on Optical Phased Array," in *2024 Conference on Lasers and Electro-Optics Pacific Rim (CLEO-PR)*, Technical Digest Series (Optica Publishing Group, 2024), paper Th1D 2.
7. Y. -K. Wu, C. -C. Kuo, P. -S. Lin and **J. -W. Shi*,** "Avalanche Photodiodes with High-Speed and High-Power Tolerant Performances for 50G PON Applications," *2024 IEEE Photonics Conference (IPC)*, Rome, Italy, 2024, pp. 1-2, doi: 10.1109/IPC60965.2024.10799794.

(2023)

8. Z. Ahmad et al., "Enhanced Velocity Sensitivity in 4-D FMCW LiDAR by Use of Avalanche Photodiode with Cascaded Multiplication Layer*," Proc. Opt. Fiber Commun. Conf. (OFC)*, Mar. 2023, Paper M3F.2.
9. Naseem *et al*., "Enhancement of Bandwidth-Responsivity Product in High-Speed Avalanche Photodiodes with Optimized Flip-Chip Bonding Package for Coherent Detection," *2023 Optical Fiber Communications Conference and Exhibition (OFC)*, San Diego, CA, USA, 2023, pp. 1-3, doi: 10.1364/OFC.2023.W2A.8.
10. P. -S. Wang *et al*., "In0.52Al0.48As Based Single Photon Avalanche Diodes with Multiple M-Layers for High-Efficiency and Fast Temporal Responses," *2023 Optical Fiber Communications Conference and Exhibition (OFC)*, San Diego, CA, USA, 2023, pp. 1-3, doi: 10.1364/OFC.2023.W1A.7.
11. Y. -C. Chang, Y. -X. Lin, Z. Ahmad, C. -C. Wei, Y. -C. Chang and **J. -W. Shi*,** "Avalanche Photodiode with Multiple Multiplication-Layers and Flip-Chip Bonding Package for 4-D FMCW LiDAR Applications," *2023 IEEE Photonics Conference (IPC)*, Orlando, FL, USA, 2023, pp. 1-2, doi: 10.1109/IPC57732.2023.10360573.
12. Y. -C. Huang, N. -W. Chen, Y. -K. Wu, Naseem and **J. -W. Shi***, "Near-Ballistic Uni-Traveling-Carrier Photodiodes with Undercut Collector for Enhancements in THz Output Power and Responsivity," *2023 IEEE Photonics Conference (IPC)*, Orlando, FL, USA, 2023, pp. 1-2, doi: 10.1109/IPC57732.2023.10360727.

(2022)

13. P. Kuo, S. Kuo, J. Wang, Y. Jian, Z. Ahmad, P. Fu, Y. Chang, **J. Shi**, D. Huang, Y. Liu, C. Yeh, and C. Chow, "Actively Steerable Integrated Optical Phased Array (OPA) for Optical Wireless Communication (OWC)," in *Optical Fiber Communication Conference (OFC) 2022*, paper M1C.7, March 2022.
14. Yi-Shan Lee and **Jin-Wei Shi***, "High-performances dual M-layers avalanche photodiodes from single-photon detection to high saturation output current," Proc. SPIE 12089, Advanced Photon Counting Techniques XVI, 120890F (30 May 2022); https://doi.org/10.1117/12.2622625 **(Invited Paper)**
15. Zuhaib Khan, Min-Long Wu, Yaung-Cheng Zhao, Cheng-Chun Chen, Chia-Jui Chang, Tien-Chang Lu, and **Jin-Wei Shi***, "Improvement in High-Speed Data Transmission of Coupled Cavity VCSEL Arrays at 850 nm using Separated Electrodes," *2022 IEEE Photonics Conference (IPC)*, Vancouver, Canada, 2022, ME3.2.
16. Naseem, Syed Hasan Parvez, Zohauddin Ahmad, and **Jin-Wei Shi*,** "High-Speed Avalanche Photodiodes with Composite Charge Layer and Flip-Chip Bonding Package for 106 Gbit/sec Transmission," *2022 IEEE Photonics Conference (IPC)*, Vancouver, Canada, 2022, WE1.3.
17. Zohauddin Ahmad, Po-Shun Wang, Naseem, You-Chia Chang, and **Jin-Wei Shi***, "Influences of Charge Layer Doping Density in Avalanche Photodiode with Multiple M-Layers Facilitating Higher Saturation Current and Responsivity for FMCW Lidar Applications," *2022 IEEE Photonics Conference (IPC)*, Vancouver, Canada, 2022, WE1.4.
18. Chi-En Chen, Qi-Xian Wu, Wei-Hong Kan, Yu-Jie Teng, Yi-Shan Lee, and **Jin-Wei Shi***, "Photon-number Resolving Detection Based on High Efficiency InGaAs/InAlAs Single Photon Avalanche Diode," *2022 IEEE Photonics Conference (IPC)*, Vancouver, Canada, 2022, ThF1.5.

(2021)

19. Z. Ahmad, Y.-M. Liao, Sheng-I Kuo, You-Chia Chang, Rui-Lin Chao, Naseem, Yi-Shan Lee, and **Jin-Wei Shi***, "Dual M-Layers avalanche photodiode with extremely wide dynamic ranges and Ultra-High Bandwidth-Responsivity Product Performances in FMCW Lidar Systems," *Optical Fiber Communications Conference*, (*OFC'2021*), F2C.7, June, 2021.
20. Naseem, S. Yang, S.-Y. Wang, H.-S. Chang, H.-S. Chen, J.J.-S Huang, E. Chou, Y.-H. Jan, and **J.-W. Shi***," High-Speed and High Saturation Power Avalanche Photodiode for Coherent Communication," *Optical Fiber*

Communications Conference, (*OFC'2021*), F2C.5, June, 2021.

21. Zuhaib Khan, Lukasz Chorchos, Yong-Hao Chang, N. Ledenstov Jr., Yen-Yu Huang, Yaung-Cheng Zhao and **Jin-Wei Shi***, "High-Power, Low-Noise, and High-Speed 850 nm VCSEL Arrays with for Optical Wireless Transmission," *Optical Fiber Communications Conference*, (*OFC'2021*), Tu5C.5, June, 2021.
22. **Jin-Wei Shi*** "High-Performances Dual M-Layers Avalanche Photodiodes from Single-Photon Detection to High Saturation Output Power," *2021 IEEE Photonics Conference (IPC)*, Virtual Conference, 2021**. (Invited Paper)**

(2020)

23. Naseem, Hsiang-Szu Chang, Rui-Lin Chao, Jack Jia-Sheng Huang, Yu-Heng Jan, H.-S. Chen, C.-J. Ni, Emin Chou, and **Jin-Wei Shi*,** "Uni-Traveling Carrier Photodiodes with Type-II $GaAs_{0.5}Sb_{0.5}/In_{0.53}Ga_{0.47}As$ Hybrid Absorbers Integrated with Substrate Lens in 400 Gbit/sec DR-4 System," *Proc. OFC 2020, San Diego,* CA, USA, March, 2020, pp. W4G.5.
24. Yi-Yu Lin, Chun-Jui Chen, Hong-Minh Nguyen, Chun-Yen Chuang, Chia Chien Wei, Jyehong Chen, and **Jin-Wei Shi**, "Reduction in Complexity of Volterra Filter by Employing l_0-Regularization in 112-Gbps PAM-4 VCSEL Optical Interconnect" *Proc. OFC 2020, San Diego,* CA, USA, March, 2020, pp. Th2A.51.

(2019)

25. Chen-Lung Cheng, N. Ledentsov Jr., M. Agustin, J.-R. Kropp, N. N. Ledentsov, Z. Khan, and **Jin-Wei Shi*,** "Ultra-Fast Zn-Diffusion/Oxide-Relief 940 nm VCSELs," *Proc. OFC 2019, San Diego,* CA, USA, March, 2019, pp. W3A.2.
26. Chun-Yen Chuang, Wei-Fan Chang, Chia-Chien Wei, Ching-Ju Ho, Cheng-Yu Huang, **Jin-Wei Shi**, Lindor Henrickson, Young-Kai Chen, and Jyehong Chen, "Sparse Volterra Nonlinear Equalizer by Employing Pruning Algorithm for High-Speed PAM-4 850-nm VCSEL Optical Interconnect," *Proc. OFC 2019, San Diego,* CA, USA, March, 2019, pp. M1F.2.
27. R. Chao, Z. Ahmad, J. Chen and **J. Shi*,** "PNP-Type Optical Phase-Shifter with Low Power Consumption and Fast Switching Time on Silicon Photonics Foundry Platform," *2019 IEEE Photonics Conference (IPC)*, San Antonio, TX, USA, 2019, pp. 1-2.
28. Z. Ahmad, R. Chao, Y. Hung, J. Chen, C. Wei and **J. Shi***, "High-Speed Electro-Absorption Modulated Laser at 1.3 μm Wavelength Based on Selective Area Growth Technique," *2019 IEEE Photonics Conference (IPC)*, San Antonio, TX, USA, 2019, pp. 1-2
29. Z. Khan, J. Shih, C. Cheng and **J. Shi***, "High-Power and Highly Single-Mode Zn-Diffusion VCSELs at 940 nm Wavelength," *2019 IEEE Photonics Conference (IPC)*, San Antonio, TX, USA, 2019, pp. 1-2.
30. H. Zhao, N. Naseem, A. H. Jones, J. C. Campbell and **J. Shi***, "High-Speed and Wide Dynamic Range Avalanche Photodiode for Coherent Lidar Application," *2019 IEEE Photonics Conference (IPC)*, San Antonio, TX, USA, 2019, pp. 1-2.

(2018)

31. Bohao Liu, Jhih-Min Wun, Nathan P O'Malley, D. E. Leaird, Nan-Wei Chen, **Jin-Wei Shi***, and Andrew M. Weiner, "Extremely Wide Bandwidth Microwave Photonic Phase Shifter for W-band Chirped Monopulse Radar," *Proc. OFC 2018, San Diego,* CA, USA, March, 2018, pp. Th3G.6.
32. W.-J. Huang, W.-F. Chang, C.-C. Wei, J.-J. Liu, Y.-C. Chen, K.-L. Chi, C.-L. Wang[1], **J.-W. Shi**, J. Chen,"93% Complexity Reduction of Volterra Nonlinear Equalizer by l_1-Regularization for 112-Gbps PAM-4 850-nm VCSEL Optical Interconnect," *Proc. OFC 2018, San Diego,* CA, USA, March, 2018, pp. M2.D.7.
33. Kai-Lun Chi, Zheng-Ting Xie, M. Agustin, J.-R. Kropp, N. N. Ledentsov, Kuo-Feng Tseng, Ling-Gang Yang, and **Jin-Wei Shi***, "Zn-Diffusion/Oxide-Relief 940 nm VCSELs with Excellent High-Temperature Performance for 50 Gbit/sec Transmission," *Proc. OFC 2018, San Diego,* CA, USA, March, 2018, pp. W1I.5.
34. Zuhaib Khan, Chen-Lung Cheng, Kai-Lun Chi, and **Jin-Wei Shi***, "Shallow Surface Reliefs on Zn-Diffusion VCSELs for High-Speed and High-Power Single-Mode Performances," *IEEE Photonic Society Meeting 2018, Reston,* VA, USA, Oct., 2018, pp. WP33.
35. Jhih-Min Wun , Nan-Wei Chen, and **Jin-Wei Shi***, "THz Photonic Transmitters with Type-II Hybrid Absorber UTC-PDs and Dual-Ridged Horn Antennas for High-Power and Extremely wide Fractional Bandwidth Performances," *IEEE Photonic Society Meeting 2018, Reston,* VA, USA, Oct., 2018, pp.TuE 3.3.

(2017)

36. L. Liang, J. Hulme, R.-L. Chao, T. Komljenovic, **Jin-Wei Shi***, S. Jian, and John E. Bowers, "A Direct Comparison between Heterogeneously Integrated Widely-Tunable Ring-Based Laser Designs," *Proc. OFC 2017, Los Angeles,* CA, USA, March, 2017, pp. W1E.1.
37. Jun-Jie Liu, Kai-Lun Chi, Chia-Chien Wei, Tien-Chien Lin, Chun-Yen Chuang, and Xin-Nan Chen, **Jin-Wei Shi***, and Jyehong Chen, "High Bit-Rate Distance Product of 128 Gbps·km 4-PAM Transmission over 2-km OM4 fiber Using an 850-nm VCSEL and a Volterra Nonlinear Equalizer," *Proc. OFC 2017, Los Angeles,* CA, USA, March, 2017, pp. W3G.5.

38. **Jin-Wei Shi***, Rui-Lin Chao, Jared Hulme, Tin Komljenovic, and J. E. Bowers, "Fully Integrated Photonic Microwave/Millimeter-Waves Frequency Tracking Synthesizer on Heterogeneous III-V/Si Platform," *Proc. ICO-24, Tokyo,* Japan, July, 2017. pp. Tu1G-01. **(Invited Talk)**
39. **Jin-Wei Shi*** and J.-K. Sheu, "The Development of High-Speed III-Nitride Based Light-Emitting Diode for Visible Light and Plastic Optical Fiber Communications," *IEEE Photonic Society Meeting 2017, Orlando,* FL, USA, Oct., 2017, pp. 63-64. **(Invited Talk)**
40. Kai-Lun Chi, Zheng-Ting Xie, and **Jin-Wei Shi***, "High-Speed Zn-Diffusion/Oxide-Relief VCSELs with Stable High-Temperature Performance at 940 nm Wavelength," *IEEE Photonic Society Meeting 2017, Orlando,* FL, USA, Oct., 2017, pp. 73-74.

(2016)

41. Jhih-Min Wun, Yu-Lun Zeng, and **Jin-Wei Shi*,** "$GaAs_{0.5}Sb_{0.5}$/InP UTC-PD with Graded-Bandgap Collector for Zero-Bias Operation at Sub-THz Regime," *Proc. OFC 2016, Anaheim*, CA, USA, March, 2016, pp. Tu2D.4.
42. Kai-Lun Chi, Xin-Nan Chen, Jia-Liang Yen, Wei Lin, Shi-Wei Chiu, Jason (Jyehong) Chen, Hao-Chung Kuo, Ying-Jay Yang, and **Jin-Wei Shi***, "Strong Enhancements in Static/Dynamic Performances of High-Speed 850 nm Vertical-Cavity Surface-Emitting Lasers with P-type δ-Doping in Highly Strained Active Layers," *Proc. OFC 2016, Anaheim*, CA, USA, March, 2016, pp. Tu3D.3.
43. Kai-Lun Chi, Xin-Nan Chen, Jye-Hong Chen, J. E. Bowers, and Ying-Jay Yang, and **Jin-Wei Shi*,** "Strong Enhancements in Output Power and High-Speed Data Transmission Performances by Using Parallel Oxide-Relief/Zn-Diffusion 850 nm VCSELs," in Technical Digest of International Semiconductor Laser Conference, paper TuD6, Kobe, Japan, Sep., 2016.
44. **Jin-Wei Shi***, "High-Power and Ultra-Fast Photodiodes at THz Regime," JSAP Invited paper, 2016.
45. Rui-Lin Chao, Jhih-Min Wun, Yu-Wen Wang, Yi-Han Chen, J. E. Bowers, and **Jin-Wei Shi***, "High-Speed and High-Power GaSb Based Photodiode for 2.5 μm Wavelength Operations," *IEEE Photonic Society Meeting 2016, Waikoloa,* Hawaii, USA, Oct., 2016, pp. Tul2.4.
46. **Jin-Wei Shi*,** Kai-Lun Chi, Jhih-Min Wun, J.-E. Bowers, and J.-K. Sheu, "GaN Based Cyan Light-Emitting Diodes with GHz Bandwidth," *IEEE Photonic Society Meeting 2016, Waikoloa,* Hawaii, USA, Oct., 2016, pp. WG2.2.
47. **Jin-Wei Shi***, N.N. Ledentsov, Jason (Jyehong) Chen, "High-speed and Single-Mode 850 nm VCSELs for 54 Gbit/sec OOK Transmission Over 1 km Multi-Mode Fiber," *IEEE Photonic Society Meeting 2016, Waikoloa,* Hawaii, USA, Oct., 2016, pp. WG2.4.
48. J. Hulme, **Jin-Wei Shi**, M. J. Kennedy, Tin Komljenovic, Bogdan Szafraniec, Doug Baney, and John E. Bowers, "Fully integrated heterodyne microwave generation on heterogeneous silicon-III/V," *Int. Topical Meeting on Microwave Photon., Long Beach,* CA, USA, Nov., 2016, pp. ThM 2.4.
49. J. Hulme, M. J. Kennedy, Rui-Lin Chao, Tin Komljenovic, **Jin-Wei Shi**, and J. E. Bowers, "Heterogeneously Integrated InP Based Evanescently-Coupled High-Speed and High-Power p-i-n Photodiodes on Silicon-on-Insulator (SOI) Substrate," *Int. Topical Meeting on Microwave Photon., Long Beach,* CA, USA, Nov., 2016, pp. WM1.6.

(2015)

50. Jhih-Min Wun, Hao-Yun Liu, Yu-Lun Zeng, C.-B. Huang, Ci-Ling Pan, and **Jin-Wei Shi*,** "High-Power THz-Wave Generation by Using Ultra-Fast (315 GHz) Uni-Traveling Carrier Photodiode with Novel Collector Design and Photonic Femtosecond Pulse Generator," *Proc. OFC 2015, Los Angeles,* CA, USA, March, 2015, pp. M3C.3
51. Kai-Lun Chi, Jia-Wei Jiang , Jia-Liang Yen, I-Cheng Lu, H.-C. Kuo, Jason (Jyehong) Chen, Ying-Jay Yang, Chia-Chien Wei, and **Jin-Wei Shi***, "Energy Efficient 850 nm Vertical-Cavity Surface-Emitting Lasers with Extremely Low Driving-Current Density for >40 Gbit/sec Error-Free Transmissions from RT to 85℃," *Proc. OFC 2015, Los Angeles,* CA, USA, March, 2015, pp. M2D.6

(2014)

52. Jhih-Min Wun, Yi-Shiun Chen, Cheng-Hung Lai, Hao-Yun Liu, C.-B. Huang, Ci-Ling Pan, and **Jin-Wei Shi***, "Strong Enhancement in Saturation Power of Sub-THz Photodiode by Using Photonic Millimeter-Wave Femtosecond Pulse Generator," *Proc. OFC 2014, San Francisco*, CA, USA, March, 2014, pp. Tu2A.5
53. I-Cheng Lu, Chia-Chien Wei, Hsing-Yu Chen, Pei-Yu Chung, Peng-Hao Huang, Jia-Wei Jiang, Kai-Lun Chi, **Jin-Wei Shi***, Jyehong Chen, "Nonlinear Compensation for 980 nm High Power, Single-Mode VCSELs for Energy Efficient OM 4 Fiber Transmission," *Proc. OFC 2014, San Francisco*, CA, USA, March, 2014, pp. Th4G.5
54. Kai-Lun Chi, Jia-Wei Jiang, Ying-Jay Yang, and **Jin-Wei Shi***, "Single-Mode 850 nm VCSELs Array with High-Power, Single-Lobe Pattern, and Narrow Divergence Angle," in Technical Digest of Conference on Lasers and Electro-Optics, paper SF1G.5, San Jose, CA, USA, June 2014
55. A. Rashidinejad, Yihan Li, Jhih-Min Wun, Daniel Leaird, **Jin-Wei Shi**, and Andrew Weiner, "Photonic Generation and Wireless Transmission of W-band Arbitrary Waveforms with High Time-Bandwidth Products," in Technical Digest of Conference on Lasers and Electro-Optics, paper SM1G.1, San Jose, CA, USA, June 2014.

56. Yihan Li, A. Rashidinejad, Jhih-Min Wun, Daniel Leaird, **Jin-Wei Shi,** Andrew Weiner, "High Resolution Unambiguous Ranging Based on W-band Photonic RF-Arbitrary Waveform Generation," in Technical Digest of Conference on Lasers and Electro-Optics, paper SM1G.2, San Jose, CA, USA, June 2014.
57. **Jin-Wei Shi***, Chi-Yu Li, Kai-Lun Chi, Jhih-Min Wun, and Seldon D. Benjamin, "Large-Area InP Based Photodiode Operated at 850 nm Wavelengths with High Efficiency and High Speed for 40 Gbit/sec Transmission," *IEEE Photonic Society Meeting 2014, San Diego,* CA, USA, Oct., 2014, pp. 198-199.

(2013)

58. T.-F. Tseng, J.-M. Wun, W. Chen, S.-W. Peng, **J.-W. Shi***, and C.-K. Sun, "High-resolution 3-dimensional radar imaging based on a few-cycle W-band photonic millimeter-wave pulse generator," *Proc. OFC 2013, Anaheim*, CA, USA, March, 2013, pp. OTu2H.5.
59. Jhih-Min Wun, **Jin-Wei Shi***, Jhih-Cheng Yan, Jason (Jyehong) Chen , Ying-Jay Yang, "Oxide-Relief and Zn-Diffusion 850 nm Vertical-Cavity Surface-Emitting Lasers with Extremely Small Power Consumption and Large Bit Rate-Distance Product for 40 Gbit/sec Operations," *Proc. OFC 2013, Anaheim*, CA, USA, March, 2013, pp. OM3K.6
60. I-Cheng Lu, **Jin-Wei Shi**, Hsing-Yu Chen, Chia-Chien Wei, Sheng-Fan Tsai, Dar-Zu Hsu, Zhi-Rui Wei, Jhih-Min Wun, and Jyehong Chen, "Ultra Low Power VCSEL for 35-Gbps 500-m OM4 MMF Transmission Employing FFE/DFE Equalization for Optical Interconnects," *Proc. OFC 2013, Anaheim*, CA, USA, March, 2013, pp. JTh2A.75.
61. I-Cheng Lu, Hsing-Yu Chen, Chia-Chien Wei, **Jin-Wei Shi**, Sheng-Fan Tsai, Dar-Zu Hsu, Zhi-Rui Wei, Jhih-Min Wun, and Jyehong Chen, "106 fJ/(bit▪km) 2-km OFDM OM4 MMF Transmission for Energy Efficient Optical Interconnects," *Proc. OFC 2013, Anaheim*, CA, USA, March, 2013, pp. JW2A.78
62. K.-H. Lin, D.-H. Tsai, K.-J. Wang, S.-H. Chen, K.-L. Chi, **J.-W. Shi**, P.-C. Chen, and J.-K. Sheu, "THz acoustic attenuation of silica studied by ultrafast acoustic phonon spectroscopy," in Technical Digest of Conference on Lasers and Electro-Optics, paper JTh2A.40, San Jose, CA, USA, June 2013.
63. Kai-Lun Chi, Shu-Ting Yeh, Yu-Hsiang Yeh, Kun-Yan Lin, **Jin-Wei Shi***, Yuh-Renn Wu, Jinn-Kong Sheu, "GaN-Based Dual Color LEDs with P-Type Insertion Layer for Balancing Two-Color Intensities," in Technical Digest of Conference on Lasers and Electro-Optics, paper CF1M.5, San Jose, CA, USA, June 2013
64. Shu-Ting Yeh, Kai-Lun Chi , **Jin-Wei Shi,** and Yuh-Renn Wu, "Numerical Study on the Optimization of a GaN-Based Dual Color Light-Emitting Diode with P-Type Insertion Layer for Balancing Two-Color Intensities," *The 10th International conferences on nitride semiconductor*, National Harbor, MD, Aug. 2013.
65. **Jin-Wei Shi*,** Ying-Hung Cheng, Jhih-Min Wun, Kai-Lun Chi , Yue-ming Hsin, and Seldon D. Benjamin, "High-Speed, High-Efficiency, and Large-Area p-i-n Photodiode for Operations from 850 to 1550 nm Optical Wavelengths," *IEEE Photonic Society Meeting 2013, Bellevue,* WA, USA, Sep., 2013, pp. WA2.4.
66. **Jin-Wei Shi***, Jhih-Min Wun, Feng-Wei Lin, and J. E. Bowers, "Ultra-Fast (325 GHz) Near-Ballistic Uni-Traveling-Carrier Photodiodes with High Sub-THz Output Power under a 50 Ω Load," *IEEE Photonic Society Meeting 2013, Bellevue,*WA, USA, Sep., 2013, pp. WA2.3.

(2012)

67. D. Dai, **J.-W. Shi*,** F.-M. Kuo, and J. E. Bowers, "Si/Ge Avalanche Photodiode Based Electrical Comb Generator for Photonic Ultra-Wideband (UWB) Wireless Communication with Very-High Data Rate", " *Proc. OFC 2012, Los Angele*, CA, USA, March, 2012, pp. OTh1E.6 (EI)
68. F.-M. Kuo, **J.-W. Shi***, Nan-Wei Chen, Jeffery Hesler, and J. E. Bowers, "25 Gbit/s Error-Free Wireless On-off-keying Data Transmission at W-band using Ultra-Fast Photonic Transmitter-Mixers and Envelop Detectors", " *Proc. OFC 2012, Los Angele*, CA, USA, March, 2012, pp. OTh1E.5 (EI)
69. F.-M. Kuo, Nan-Wei Chen, Hsuan-Ju Tsai, **J.-W. Shi***, and J. E. Bowers, "High-Power Photonic Transmitter-Mixers with Integrated Wilkinson Power Combiner for Wireless Communication with High Data Rate (15 Gbps) at W-band," *Proc. OFC 2012, Los Angele*, CA, USA, March, 2012, pp. OTh1E.7 (EI).
70. **J.-W. Shi***, F.-M. Kuo, Nan-Wei Chen, Chee-Seong Goh, Dexiang Wang, Sze-Yun Set, and J. E. Bowers, "Photonic Generation, Wireless Transmission, and Detection of Continuously Tunable Chirped Millimeter-Wave Waveforms with Ultra-High Compression Ratio at W-band," *Proc. OFC 2012, Los Angele*, CA, USA, March, 2012, pp. JW2A.72 (EI).
71. F.-M. Kuo, **J.-W. Shi***, D. Dai, and J. E. Bowers, "The Incorporation of Photonic Transmitter-Mixer with Si/Ge Based Electrical Comb Line Generator for W-band Ultra-Wideband (UWB) Wireless Data Transmission," *Proc. OFC 2012, Los Angele*, CA, USA, March, 2012, pp. JW2A.75 (EI)
72. **J.-W. Shi***, Che-Wei Lin, Wei Chen, J. E. Bowers, J.-K. Sheu, Ching-Liang Lin, Yun-Li Li, Juri Vinogradov, and Olaf Ziemann, "Very High-Speed GaN-Based Cyan Light Emitting Diode on Patterned Sapphire Substrate for 1 Gbps Plastic Optical Fiber Communication," *Proc. OFC 2012, Los Angele*, CA, USA, March, 2012, pp. JTh2A.18 (EI).
73. **Jin-Wei Shi***, "High-Power Near-Ballistic Uni-Traveling Carrier Photodiode with Ultra-Fast Switching Characteristic for Millimeter-Wave over Fiber Wireless Communication," *Proc. OFC 2012, Los Angele*, CA, USA, March, 2012, pp. OW3G.3 (EI) (Invited Paper).

74. Chi-Wai Chow, C. Yeh, C. Huang, **Jin-Wei Shi**, C.-L. Pan, "Optical Carrier Distributed Network with 0.1 THz Short-reach Wireless Communication System," *Proc. OFC 2012, Los Angele*, CA, USA, March, 2012, pp. OTu2H.2 (EI).
75. **Jin-Wei Shi*,** H.-W. Huang, F.-M. Kuo, M. L. Lee, and J.- K. Sheu, "The Development of GaN Based High-Speed Green and Cyan Light Emitting Diodes for Plastic Optical Fiber Communication," *Proc. International Conference on Plastic Optical Fiber 2012,* Atlanta, Georgia, Sep., 2012, (Invited)
76. **Jin-Wei Shi***, Jhih-Min Wun, Cheng-Yo Tsai, and J. E. Bowers, "Mushroom-Mesa GaAs/$In_{0.5}Ga_{0.5}P$ Based Laser Power Converter for Simultaneous 10 Gbit/sec Data Detection and DC Electrical Power Generation," *IEEE Photonic Society Meeting 2012, San Francisco,* CA, USA, Sep., 2012, pp. TuL4.
77. **Jin-Wei Shi***, "Ultra-Fast Near-Ballistic Uni-Traveling Carrier Photodiode for Photonic Few-Cycle Sub-THz Pulse Generation and Wireless Communication," *IEEE Photonic Society Meeting 2012, San Francisco,* CA, USA, Sep., 2012, pp. TuL1. (Invited)
78. Jhih-Min Wun, **Jin-Wei Shi*,** Cheng-Yo Tsai, and Yue-Ming Hsin, "Undercut GaAs/$In_{0.5}Ga_{0.5}P$ High-Speed Laser Power Converter for Simultaneous 10 Gbit/sec Data Detection and Efficient dc Electrical Power Generation," *2012 International Conference on Solid State Devices and Materials,* Kyoto, Japan, A-6-5, 2012.
79. Jhih-Min Wun and **Jin-Wei Shi*,** "Waveguide Based Photonic-Transmitter-Mixer at W-band for Photonic Generation of Few-cycle Millimeter-Wave Pulses," *2012 International Conference on Solid State Devices and Materials,* Kyoto, Japan, A-6-6, 2012.

(2011)

80. F.-M. Kuo, S.-S. Lo, Ci-Ling Pan, and **J.-W. Shi*** "Cascade Laser Power Converter for Simultaneous 10 Gbps Data Detection and Efficient Optical-to-Electrical DC Power Generation," *Proc. OFC 2011, Los Angele*, CA, USA, March, 2010, pp. JThA028. (EI) (C).
81. C.-B. Huang, **J.-W. Shi***, F.-M. Kuo, H.-P. Chuang and Ci-Ling Pan, "Green and High-Power Photonic Millimeter-Wave (MMW) Generator for Remote Generation at 124-GHz, " *Proc. OFC 2011, Los Angele*, CA, USA, March, 2010, pp. OThG6. (EI) (C)
82. **J.-W. Shi***, W.-C. Weng, F.-M. Kuo, J.-I. Chyi, S. Pinches, M. Geen, and A. Joel, "Oxide-Relief Vertical-Cavity Surface-Emitting Lasers with Extremely High Data-Rate/Power-Dissipation Ratios, " *Proc. OFC 2011, Los Angele*, CA, USA, March, 2010, pp. OThG2. (EI) (C)
83. F.-M. Kuo, **J.-W. Shi***, Nan-Wei Chen, C.-B. Huang, H.-P. Chuang, Hsuan-Ju Tsai, and Ci-Ling Pan, "20-Gb/s Error-Free Wireless Transmission Using Ultra-Wideband Photonic Transmitter-Mixer Excited with Remote Distributed Optical Pulse Train, " *Proc. OFC 2011, Los Angele*, CA, USA, March, 2010, pp. OWT5. (EI) (C)
84. **J.-W. Shi***, F.-M. Kuo, Mark Rodwell, and J. E. Bowers, "Ultra-High Speed (270 GHz) Near-Ballistic Uni-Traveling-Carrier Photodiode with Very-High Saturation Current (17 mA) under a 50 Ohm Load," *IEEE Photonic Society Meeting 2011, Arlington,* VA, USA, Oct., 2011, pp. MC 2.
85. **J.-W. Shi***, C.-W. Lin, W. Chen, M.-L. Lee, J.-K. Sheu, "Investigation of the Efficiency-Droop Mechanism in a GaN Based Blue Light-Emitting Diodes Using a Very-Fast Electrical-Optical Pump-Probe," *IEEE Photonic Society Meeting 2011, Arlington,* VA, USA, Oct., 2011, pp. ThF5.
86. F.-M. Kuo, **J.-W. Shi***, Jung-Hsing Huang, Nan-Wei Chen, Mark Rodwell, and J. E. Bowers "High-Power Photonic Transmitter-Mixer with Ultra-Wide O-E (50 GHz) and IF (26 GHz) Modulation Bandwidths for Wireless Data Transmission," *Int. Topical Meeting Microwave Photon.,* Singapore, Oct., 2011, pp. 2137.
87. Jim-Wein Lin, Hsiu-Po Chuang, Feng-Ming Kuo, Cheng-Han Lin, Tze-An Liu, **Jin-Wei Shi**, Chen-Bin Huang, Ci-Ling Pan, "Power-Enhanced Narrow-Band Sub-THz Generation by Use of a Photonic Transmitter and Shaped Optical Pulses," in Proc, *Conf. on Lasers Electro-Opt.*, (*CLEO/QELS'2011,)* Baltimore, Maryland, USA, May, 2011, pp. CMW6. (EI)

(2010)

88. **J.-W. Shi*,** F.-M. Kuo, Hsuan-Ju Tsai, Y.-M. Hsin, Nan-Wei Chen, H.-C. Chiang, H.-P. Chuang, C.-B. Huang, and Ci-Ling Pan, "20-Gb/s On-off-keying Wireless Data Transmission by Using Bias Modulation of NBUTC-PD Based W-Band Photonic Transmitter-Mixer," *Int. Topical Meeting Microwave Photon.,* Montreal, Quebec, Canada, Oct., 2010, pp. WE3-3 (C).
89. **Jin-Wei Shi*,** H.-W. Huang, F.-M. Kuo, M. L. Lee, and J.- K. Sheu, "High-Speed (340MHz) and High-Temperature (200℃) Operation of Cascade Green Light Emitting Diodes with InGaN Insertion Layer for POF Communication," *Proc. International Conference on Plastic Optical Fiber 2010,* Japan, Yokohama, Oct., 2010. (C)
90. F.- M. Kuo, Ho Yen-Lin, **Jin-Wei Shi***, Nan-Wei Chen, Wen-Jr Jiang, Chun-Ting Lin, Jason (Jyehong) Chen, Ci-Ling Pan, and Sien Chi, "12.5-Gb/s Wireless Data Transmission by Using Bias Modulation of NBUTC-PD Based W-Band Photonic Transmitter-Mixer," *Proc. OFC 2010, San Diego*, CA, USA, March, 2010, pp. OThF7. (EI) (C)
91. F.-M. Kuo, **Jin-Wei Shi***, Hsuan Ju Tsai, Nan-Wei Chen, and Mount-Learn Wu, "Optoelectronic Generation of Millimeter-Wave White-Light at W-Band with Very-Fast Sweeping Rate by Use of High-Power and Broadband Photonic Emitters," *Proc. OFC 2010, San Diego*, CA, USA, March, 2010, pp. JWA51. (EI) (C)

92. C. W. Chow, F. M. Kuo, **J. W. Shi,** C. H. Yeh, Y. F. Wu, and C. L. Pan, "100 GHz Ultra-wideband Wireless System for the Fiber to the Antenna Networks," *Proc. OFC 2010, San Diego*, CA, USA, March, 2010, pp. OThF1 . (EI) (C)
93. **Jin-Wei Shi***, H.-W. Huang, F.-M. Kuo, M. L. Lee, and J.- K. Sheu, "Very-High Temperature (200°C) Operation of GaN-Based Cascade Green Light Emitting Diode for Plastic Optical Fiber Communication," *Proc. OFC 2010, San Diego*, CA, USA, March, 2010, pp. JWA42. (EI) (C)
94. **J.-W. Shi***, F.-M. Kuo, and M.-Z. Chou, "A Linear Cascade Near-Ballistic Uni-Traveling-Carrier Photodiodes with Extremely High Saturation-Current Bandwidth Product (6825mA-GHz, 75mA/91GHz) under a 50 Ω Load," *Postdeadline Papers OFC 2010, San Diego*, CA, USA, March, 2010, PDP 6. (EI) (C)
95. **J.-W. Shi***, F.-M. Kuo, B.-R. Huang, D. Lubyshev, J. M. Fastenau and W. K. Liu "InAs Photodiode on Semi-Insulating GaAs Substrate with Zn-Diffusion Guard-Ring for High-Speed and Low Dark Current Performance," *IEEE Photonic Society Meeting 2010, Denver,* Colorado, USA, Nov., WK4. (EI) (C)
96. **J.-W. Shi***, Z.-Y. Wu, and F.-M. Kuo, "Planar InAlAs Based Separated Absorption, Transport, Charge, and Multiplication Avalanche Photodiode with Large Area and Bandwidth-Enhancement Effect under High-Sensitivity Operation," *IEEE Photonic Society Meeting 2010, Denver,* Colorado, USA, Nov., TuC2. (EI) (C)

(2009)

97. F.-M. Kuo, Yu-Tai Li, **J.-W. Shi***, Shao-Ning Wang, Nan-Wei Chen, and Ci-Ling Pan "Photonic Impulse-Radio Wireless 2.5Gbit/sec Data Transmission at W-Band Using Near-Ballistic Uni-Traveling-Carrier Photodiode (NBUTC-PD) Based Photonic Transmitter," *IEEE Lasers and Electro-Optics Society 2009(LEOS/2009) Annual Meeting,* ThW4, 2009 (EI) (C)
98. F.-M. Kuo, T.-C. Hsu, and **J.-W. Shi***, "Strong Bandwidth-Enhancement Effect in High-Speed GaAs/AlGaAs Based Uni-Traveling Carrier Photodiode under Small Photocurrent and Zero-Bias Operation," *IEEE Lasers and Electro-Optics Society 2009(LEOS/2009) Annual Meeting,* TuB3, 2009
99. Yu-Tai Li, Chan-Shan Yang, Ci-Ling Pan, **Jin-Wei Shi***, C.-Y. Huang, N.-W. Chen, S.-H. Chen, J.-I. Chyi; "Distinct Dynamic Behaviors of High-Power Photonic-Transmitters Based on Uni-Traveling Carrier and Separated-Transport-Recombination Photodiodes," in Proc, *Conf. on Lasers Electro-Opt.*, (*CLEO/QELS'2009) 2009*, JWA20. (EI) (C)
100. S.-H. Guol, M.-L. Lee, C.-S. Lin, J.-K. Sheu, Y.-S. Wu, C.-K. Sun, C.-H. Kuo, C.-J. Tun, **J.-W. Shi***, "The Bandwidth-Efficiency Product Enhancement of GaN Based Photodiodes by Launching a Low-Temperature-Grown Recombination Center in Photo-Absorption Region," in Proc, *Conf. on Lasers Electro-Opt.*, (*CLEO/QELS'2009) 2009*, CFK5. (EI) (C)
101. Shi-Hao Guol, Ming-Ge Chou, Jr-Hung Wang, Ying-Jay Yang, Chi-Kuang Sun, **Jin-Wei Shi*** "GaAs-Based Transverse Junction Superluminescent Diode at 1.1 μm Wavelength Region," in Proc, *Conf. on Lasers Electro-Opt.*, (*CLEO/QELS'2009) 2009*, JTuD22. (EI) (C)
102. Po-Tsung Shih, Chun-Ting Lin, Wen-Jr Jiang, Er-Zih Wong, Jason (Jyehong) Chen, Sien Chi, Y.-S. Wu, F.-M. Kuo, Nan-Wei Chen, and **J.-W. Shi***, "W-Band Vector Signal Generation via Optical Millimeter-Wave Generation and Direct Modulation of NBUTC-PD," *Proc. OFC 2009, San Diego*, CA, USA, March, 2009, pp. OWP4. (EI) (C)
103. F.-M. Kuo, T.-C. Hsu, and **J.-W. Shi*** "A GaAs/AlGaAs Based Uni-Traveling-Carrier Photodiode for 10Gbit/sec Optical Interconnect at 850nm Wavelength with Zero Electrical Power Consumption," *Proc. OFC 2009, San Diego*, CA, USA, March, 2009, pp. OWX5. (EI) (C)
104. **J.-W. Shi***, F.-M. Kuo, F.-C. Hong, Y.-S. Wu, D. J. F. Fulgoni, L. J. Nash, and M. J. Palmer, "A Si/SiGe Based Impact Ionization Avalanche Transit Time Photodiode with Ultra-high Gain-Bandwidth Product (690GHz) for 10-Gb/s Fiber Communication," *Proc. OFC 2009, San Diego*, CA, USA, March, 2009, pp. OMR2. (EI) (C)
105. Y.-S. Wu, F.-M. Kuo, Shao-Ning Wang, Nan-Wei Chen, **J.-W. Shi***, Po Tsung Shih, Chun-Ting Lin, Wen-Jr Jiang, Er-Zih Wong, Jason (Jyehong) Chen, and Sien Chi, "A W-Band Photonic Transmitter-Mixer Based on High-Power Near-Ballistic Uni-Traveling-Carrier Photodiode (NBUTC-PD) for 1.25-Gb/s BPSK Data Transmission under Bias Modulation," *Proc. OFC 2009, San Diego*, CA, USA, March, 2009, pp. OWX3 . (EI) (C)
106. Shi-Hao Guol, **J.-W. Shi***, C.-S. Lin, J.-K. Sheu, K. H. Chang, W.-C. Lai, C.-H. Kuo, C.-J. Tun, and J.-I. Chyi "Array of GaN-Based Transverse Junction Blue Light-Emitting-Diodes (LEDs)," SPIE Photonic West 2009, pp. 7216-66, 2009. (EI) (C)

(2008)

107. F.-M. Kuo, Y.-S. Wu, and **J.-W. Shi*** "High-Power Near-Ballistic Uni-Traveling-Carrier Photodiode Based Photonic Millimeter-Wave (W-band) Generator with Internal Up-Conversion Gain," *IEEE Lasers and Electro-Optics Society 2008(LEOS/2008) Annual Meeting,* TuZ 3, 2008. (EI) (C)
108. **J.-W. Shi***, P.-Yu. Chen, C.-C. Chen, S.-H. Guol, J.-K. Sheu and W.-C. Lai "High-Speed and High-Power GaN-Based Cascade Green Light Emitting Diode Arrays for in-car Data Communication," *IEEE Lasers and Electro-Optics Society 2008(LEOS/2008) Annual Meeting,* ThAA3 , 2008 (EI) (C)

109. Shi-Hao Guol , Jr-Hung Wang , Yu-Huei Wu, Wei Lin , Ying-Jay Yang , Chi-Kuang Sun , Ci-Ling Pan, and **Jin-Wei Shi***, "GaAs-based Bipolar Cascade Light-Emitting-Diodes and Superluminescent-Diodes at the 1.04-um Wavelength Regime," *IEEE Lasers and Electro-Optics Society 2008(LEOS/2008) Annual Meeting,* WV2 , 2008 (EI) (C)

110. **J.-W. Shi***, Y.-S. Wu, and W.-Y. Chiu "High-Speed and High-Power InP Based Photodiode for the Applications of Microwave Photonics," in Proc., *OSA/AOE 2008,* FG4 ***(Invited paper)*** (EI) (C)

111. Yu-Tai Li, Ci-Ling Pan, **J.-W. Shi*,** Cheng-Yu Huang, Nan-Wei Chen, Shu-Han Chen, J.-I. Chyi, "Sub-THz Photonic-Transmitters Based on GaAs/AlGaAs Uni-Traveling Carrier Photodiode and Micromachined Circular Disk Monopole Antenna for Ultra-wideband Communication," in Proc, *Conf. on Lasers Electro-Opt.*, (*CLEO/QELS'2008) 2008*, CThD5. (EI) (C)

112. Y.-S. Wu, C.-C. Chu, **J.-W. Shi***, J. M. Kuo and Y. C. Kao, "Optoelectronic Mixer with Low Up-conversion Loss and Wide Up-conversion Bandwidth by Use of Flip-Chip Bonding Near-Ballistic Uni-Traveling-Carrier Photodiode and Coupled-Line Filter," *Proc. OFC 2008, San Diego*, CA, USA, Feb., 2008, pp. JThA38. (EI) (C)

(2007)

113. Shi-Hao Guol , **Jin-Wei Shi*** , Yueh-Yi Chen, Jr-Hung Wang, Wei Lin, Ying-Jay Yang, Chi-Kuang Sun, "Flatten and Invariant Broadband Spectra of Transverse Junction Light-Emitting Diodes under a Large Range of Bias Current at 1.06μm Wavelengths" Conference Proceeding of *IEEE Lasers and Electro-Optics Society 2007(LEOS/2007) Annual Meeting,* WU3 , 2007. (EI) (C)

114. **J.-W. Shi***, Shi-Hao Guol, J.-K. Sheu, W.-C. Lai, C.-K. Wang, C.-H. Chen, Cheng-Huang Kuo, and J.-I. Chyi "Phosphor-Free GaN-Based Cascade Transverse Junction Light Emitting Diode Arrays for the High-Power Generation of White-Light" Conference Proceeding of *IEEE Lasers and Electro-Optics Society 2007(LEOS/2007) Annual Meeting,* WU2 , 2007. (EI) (C)

115. **J.-W. Shi***, Y.-S. Wu, and Wei-Yu Chiu, "High-Speed and High-Power 40GHz InP Based Photodiode for Microwave Photonic Applications" *2007 Asia-Pacific Microwave Photonics Conference,* Korea, Technical Digest, p.3-6, (2007) **(Invited Paper)** (EI) (C)

116. **J.-W. Shi***, Yu-Tai Li, Ci-Ling Pan, C.-H. Chiu, W.- S. Liu, and J.-I. Chyi, "Characterization of a Sub-THz Photonic Transmitter Based on a Separated-Transport-Recombination Photodiode", *Conference on Laser and Electro-Optics (CLEO/QELS'2007)*, USA, OSA Technical Digest, CMY1, 2007 (EI) (C)

117. Y.-S. Wu, **J.-W. Shi***, Z.-L. Li, "Si/SiGe-Based Photodiode on a Standard Silicon Substrate for 10-Gbit/s Short-Reach Fiber Communication at 830nm Wavelength" *Conference on Laser and Electro-Optics (CLEO/QELS'2007)*, USA, OSA Technical Digest, CMY4, 2007 (EI) (C)

118. **J.-W. Shi***, A.-C. Shiao, C.-C. Chu, and Y.-S. Wu, "Evanescently-Coupled Dual-Depletion-Region Traveling-Wave Electroabsorption Modulator with High-Speed and Low-Driving-Voltage Performance" *Optical Fiber Communication (OFC 2007)*, USA, OWH2, (2007) (EI) (C)

119. Y.-S. Wu, P.-H. Chiu, and **J.-W. Shi***, "High-Speed and High-Power Performance of a Dual-Step Evanescently-Coupled Uni-Traveling-Carrier Photodiode at a 1.55μm Wavelength" *Optical Fiber Communication (OFC 2007)*, USA, OThG1, (2007) (EI) (C)

(2006)

120. W. Y. Chiu, W. K. Wang, Y. S. Wu, F. H. Huang, D. M. Lin, Y. J. Chan, and **J. W. Shi***, "InP/InGaAs Leaky Waveguide Photodiode with a Partially p-Doped Absorption Layer and a Distributed-Bragg-Reflector for High-Power and High-Bandwidth-Responsivity Product Performance" *2006 International Conference on Solid State Devices and Materials,* Kanagawa, Japan, B-9-1, 2006. (EI) (C)

121. Y.-S. Wu, D. M. Lin, F. H. Huang, W. Y. Chiu, **J. W. Shi***, and Y. J. Chan, "A Size-Dependent Equivalent-Circuit Model of High Performance Near-Ballistic-Transport Photodiode" *2006 International Conference on Solid State Devices and Materials,* Kanagawa, Japan, P-6-9, 2006. (EI) (C)

122. **J.-W. Shi***, T.-J. Hung, Y.-S. Wu, and Y.-J. Yang, "InP Based White-Light Transverse Junction Light-Emitting-Diodes with Record-Wide (~580nm) Optical Bandwidth Performance" *The 11th Optoelectronics and Communications Conference,* Kaohsiung, Taiwan, 6C 1-3, 2006. (EI) (C)

123. **J.-W. Shi***, Y.-T. Li, M.L. Lin, Y.-S. Wu, W.-S. Liu, J.-I. Chyi, and C.-L. Pan, "Demonstration of a High-Speed GaAs-AlGaAs Based Unitraveling Carrier Photodiode with Improved Design of Absorption Layer" *The 11th Optoelectronics and Communications Conference,* Kaohsiung, Taiwan, 5C2-4, 2006. (EI) (C)

124. **J.-W. Shi***, Yu-Tai Li, Ci-Ling Pan, M.-L. Lin, Y.-S. Wu, W.- S. Liu, and J.-I. Chyi, "Separated-Transport-Recombination p-i-n Photodiode (STR-PD) with High-Speed and High-Power Performance under Continuous-Wave (CW) Operation" *Conference on Laser and Electro-Optics (CLEO/QELS'2006)*, USA, OSA Technical Digest, 2006. (EI) (B)

125. H.-Y. Huang, **J.-W. Shi***, Y.-S. Wu, J.-I. Chyi, J.-K. Sheu, W.-C. Lai, G.-R. Lin, and Ci-Ling Pan, "Modulation-Speed Enhancement of a GaN Based Green Light-Emitting-Diode (LED) by Use of n-type Barrier Doping for Plastic Optical Fiber (POF) Communication" *Conference on Laser and Electro-Optics (CLEO/QELS'2006)*, USA, OSA Technical Digest, 2006. (EI) (B)

126. W.-Y. Chiu, **J.-W. Shi***, W.-K. Wang, Y.-S. Wu, Y.-J. Chan, Y.-L. Huang, and R. Xuan, "Photodiode with Partially Depleted Absorber, Leaky Optical Waveguide, and Distributed-Bragg-Reflector (DBR) for High-Power and High-Bandwidth-Responsivity Product Performance" *Optical Fiber Communication (OFC 2006)*, USA, OFI3, (2006) (EI) (B)
127. Y.-S. Wu, **J.-W. Shi***, and P.-H. Chiu, "Analysis of High-Performance Near-Ballistic Uni-Traveling-Carrier Photodiode at a 1.55um Wavelength" *Optical Fiber Communication (OFC 2006)*, USA, OFI2, (2006) (EI) (B)
128. **J.-W. Shi***, A.-C. Shiao, C.-A. Hsieh, Y.-S. Wu, F.-H. Huang, S.-H. Chen, and J.-I. Chyi, "Dual-Depletion-Region Electro-Absorption Modulator at 1.55μm Wavelength for High-Speed and Low-Driving-Voltage Performance" *Optical Fiber Communication (OFC 2006)*, USA, OWC3 (2006) (EI) (B)
(2005)
129. Wei-Yu Chiu, Wen-Kai Wang, Yen-Shian Wum, Fan-Hsiu Huang, Dong-Ming Lin, Yi-Jen Chan and **Jin-Wei Shi***, "InP/InGaAs Partially p-Doped Photodiode with Leaky Optical Waveguide and Distributed Bragg Reflectors for High-Saturation-Current and High-Bandwidth-Responsivity Product" International Conference on Solid State Devices and Materials, Kobe, pp. 740-741 (2005) (EI) (B)
130. Y.-S. Wu, D.-M. Lin, F.-H. Huang, W. Y. Chiu, **J.-W. Shi***, and Y.-J. Chan, "A Bias-Dependent Equivalent-Circuit Model of High Performance Evanescently Coupled Photodiode with Partially P-Doped Absorption Layer" 2005 International Conference on Solid State Devices and Materials, Kobe, pp. 344-345, (2005) (EI) (B)
131. C.-H. Jiang, **J.-W. Shi***, J.-L. Yen, K.-M. Chen, and Ying-Jay Yang, "Single-Mode Vertical-Cavity-Surface-Emitting-Laser (VCSEL) with Ring Shaped Microcavity and Low Divergence Angle Performance," *Conference on Laser and Electro-Optics (CLEO/QELS'2005)*, USA, OSA Technical Digest, JTUC83, 2005. (EI) (B)

132. **J.-W. Shi*,** Y.-S. Wu, S.-H. Hsieh, H.-C. Hsu, F.-H. Huang, Y.-J. Chan, Ja-Yu Lu, C.-K. Sun, C.-C. Hong, "High-Power and High-Responsivity Photodiode for Long-Haul and Short-Reach Fiber Communication" SPIE Optic East 2005 (Invited Paper, Optic East, Oct. 2005). (B)
133. Y.-S. Wu, **J.-W. Shi***, J.-Y. Wu, F.-H. Huang, Y.-J. Chan, Y.-L. Huang, and R. Xuan, "Design and Demonstration of High-Power and High-Speed Evanescently Coupled Photodiodes with Partially p-Doped Photo-absorption Layer" *Conference on Laser and Electro-Optics (CLEO/QELS'2005)*, USA, OSA Technical Digest, CMGG1, 2005. (EI) (B)

134. **J.-W. Shi*,** C.-Y. Wu, S.-H. Hsieh, H.-C. Hsu, F.-H. Huang, "High Responsivity and High Power Performance of Si/SiGe Based Avalanche Photodiode for 10-Gb/s Short-Reach Fiber Communication," *Conference on Laser and Electro-Optics (CLEO/QELS'2005)*, USA, *Postdeadline, CPDA5,2005* (EI) (B)

Invited Book Chapters and Editors

1. Book Chapter 16, High-Speed, High-Power, and High Responsivity Photodiode for Radio-Over-Fiber (ROF) Communication "Optical Fiber, New Developments", ISBN 978-953-7619-50-3, In-Tech, Dec., 2009.
2. Book Chapter 22: High-Speed Si/Ge Based Photodiodes for Optical Interconnect Applications "Integrated Microsystems: Electronics, Photonics and BioNanotechnology) " Wiley, NJ, USA. ISBN-10: 0470641908, ISBN-13: 978-0470641903
3. Book Editor: "Photodiodes - Communications, Bio-Sensings, Measurements and High-Energy Physics," ISBN 978-953-307-277-7, In-Tech, Sep., 2011.
4. Book Chapter 6, High-Speed Photodidoes and Laser Power Converters for the Applications of Green Optical Interconnect "High-Speed Photonics Interconnects", ISBN 978-1-4665-1603-8, CRC Press, May, 2013.
5. Book Chapter 3, Ultrawide-Band Sub-THz Photonic Wireless Links "Microwave Photonics," ISBN 978-1-4665-0286-4, CRC Press, April, 2013.

Invited Magazine

1. **J.-W. Shi*** and Y.-S. Wu, "The Applications of High-Performance Photodetectors to Long-Haul and Short-Reach Fiber Communication" *Electronic Monthly,* Vol. 135, pp. 214-226, Oct., 2006. (電子月刊 2006 十月號)

Invited papers.

2. **Jin-Wei Shi*,** J.-K. Sheu, W.-C.Lai, Ying-Jay Yang, and J.-I. Chyi, "Visible and infrared light-emitting diodes provide stable broadband output," SPIE Newsroom, pp. 10.1117/2.1200708.0695 , 2007 **(Invited)**
3. **Jin-Wei Shi*** "The missing link between wireless and optical networks," *Compound Semiconductor,* vol. 18, No. 2, pp. 26-31, March, 2012. **(Invited)**
4. **Jin-Wei Shi***, Zhi-Rui Wei, Jhih-Min Wun, Jason Chen and Ying-Jay Yang, "Green laser for short-reach data transmission at 25Gbit/sec," SPIE Newsroom, pp. 10.1117/2.1201301.004604, Jan., 2013 **(Invited)**
5. Jhih-MinWun and **Jin-Wei Shi*,** "Ultrafast photodiodes under forward-bias conditions," SPIE Newsroom, pp. 10.1117/2.1201702.006827, March, 2017 **(Invited)**

Intellectual Property for Dual Charge Layers APD: (For 10G PON APD with state-of-the-art SEN) Transferred to Source Photonics and LandMark Optoelectronics Corporation

(12) **United States Patent**
Shi

(10) **Patent No.: US 9,466,751 B1**
(45) **Date of Patent: Oct. 11, 2016**

(54) **AVALANCHE PHOTODIODE HAVING ELECTRIC-FIELD CONFINEMENT BY MESAS**

(71) Applicant: **National Central University**, Taoyuan (TW)

(72) Inventor: **Jin-Wei Shi**, Taoyuan (TW)

(73) Assignee: **NATIONAL CENTRAL UNIVERSITY**, Taoyuan (TW)

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CPC H01L 31/1075; H01L 31/107; H01L 31/02027
USPC 257/84, 186, 438; 438/34
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

2002/0117697 A1* 8/2002 Tanaka H01L 31/02161 257/288
2008/0274573 A1* 11/2008 Shi H01L 27/153 438/34
2009/0315073 A1* 12/2009 Shi H01L 31/02027 257/185
2010/0163925 A1* 7/2010 Ishibashi H01L 31/1075 257/186
2011/0164645 A1* 7/2011 Shi H01S 5/0261 372/50.11
2011/0241150 A1* 10/2011 Ishibashi H01L 31/1075 257/438
2013/0082286 A1* 4/2013 Finkelstein H01L 31/0336 257/84
2013/0154045 A1* 6/2013 Ishibashi H01L 31/1075 257/438

* cited by examiner

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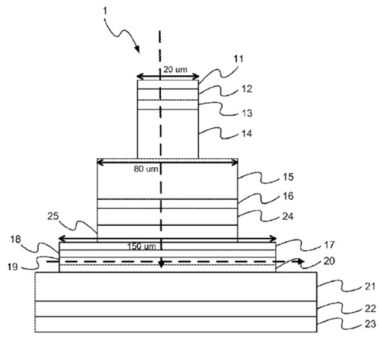
(57) **ABSTRACT**

A novel photodetecting device having field confined by mesas is provided. The device is an avalanche photodiode (APD) of indium aluminum arsenide (InAlAs). The device has epitaxial layers with a multiplication layer at bottom as a cathode. Hence, the strongest electric field is confined inside the bottom of the device to avoid surface breakdown. Double mesa is used to confine the electric field of the multiplication layer. Furthermore, a composite multiplication layer with supper thin thickness and wide bandgap is used to reduce the tunneling dark current. Hence, the thickness of equivalent multiplication layer can be reduced to enhance sensitivity.

14 Claims, 6 Drawing Sheets



Intellectual Property for Zn-diffusion VCSEL: (For proximity sensor module in the Apple iPhone) Transferred to Unikorn Semiconductor Corporation in Mass Production

I474569

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審查人員：王人毅

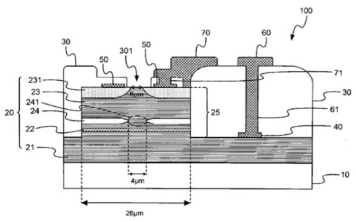
申請專利範圍項數：15 項 圖式數：4 共 24 頁

(54)名稱

可調控光學模態之垂直共振腔面射型雷射

(57)摘要

一種可調控光學模態之垂直共振腔面射型雷射，具有經由蝕刻程序沿著側壁處部分去除 VCESL 之鋁複合層而形成一在發光區上方或下方之下切結構(Undercut Structure)，以及經由摻雜擴散製程將分佈式布拉格反射鏡(DBR)頂部中央區域周圍不同組成之多晶層(Multi-Layer)選擇性地呈非序排列(Disorder)為單一組成之單晶層(Single Layer)而形成一低反射率之擴散結構，俾使該分佈式布拉格反射鏡成為可控制光學模態數目之 DBR 反射鏡。因此，具有優越之動態性能，包括低功耗、最大之運轉速度及高資料傳輸速率與功率消耗之比值，可實現極大 D-係數(~13.5 GHz/mA$^{1/2}$)、在 34 Gbit/s 操作之最低能量與資料比率(EDR：140 fJ/bit)、以及無誤差傳輸在 0.8 公里之 OM4 多模光纖在 25 Gbit/s 操作之最低能量與資料距離比(EDDR：175.5 fJ/bit.km)。



第 1 圖

100・・・本裝置
10・・・基板
20・・・外延層結構
21・・・第一分佈式布拉格反射鏡
22・・・發光區
23・・・第二分佈式布拉格反射鏡
231・・・擴散結構
24・・・下切結構
241・・・電流侷限區域
25・・・凸型平台式結構
30・・・隔絕層
301・・・光源射出孔
40・・・N 型接面
50・・・P 型接面
60・・・N 型金屬電極
61・・・貫穿孔洞
70・・・P 型金屬電極
71・・・貫穿孔洞