Wen-Sheng Zhao

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## Education and Working Experience

Sep. 2004 – Jul. 2008 Bachelor, Harbin Institute of Technology, Harbin, China

Sep. 2008 – Jul. 2013 Ph.D., Zhejiang University, Hangzhou, China

Aug. 2013 – Present Faculty member, Hangzhou Dianzi University, Hangzhou, China

## Research

* IC Interconnect and Packaging (Multiphysics, signal/power integrity, EMC)
* Microwave Components such as sensor, filter, and FSS
* 3D Integrated Circuit and Microsystem

## Professional Activities

* Senior Member, IEEE & Chinese Institute of Electronics (2018-present)
* Associate Editor, IEEE Access (2019-present)
* Editor, Microelectronics Journal (2020-present)
* Guest Editor, Micromachines (2021-present)

## Publication

**Books & Chapters**

1. H. Zhang, F. Che, T. Lin, and **W. Zhao**, Modeling, Analysis, Design and Tests for Electronics Packaging beyond Moore, Elsevier, ISBN: 978-0-08-102532-1, 2019.
2. 张恒运，车法星，林挺宇，**赵文生**，Modeling, Analysis, Design and Tests for Electronics Packaging beyond Moore（英文版，“十三五”国家重点图书），化学工业出版社，ISBN: 978-7-122-37952-8，2021.
3. **赵文生**，王高峰，尹文言，后摩尔时代集成电路新型互连技术，科学出版社，ISBN: 978-7-03-053418-7, 2017.
4. W.-Y. Yin, **W.-S. Zhao**, et al., "Electro-thermal modeling of carbon nanotube-based TSVs," Carbon Nanotube for Interconnects: Process, Design and Applications, pp. 247-281, Springer, 2017 (Chapter).
5. W.-Y. Yin and **W.-S. Zhao**, "Modeling and characterization of on-chip interconnects," Wiley Encyclopedia of Electrical and Electronics Engineering, Wiley, 2013 (Chapter).
6. **W.-S. Zhao**, et al., "Carbon-based interconnects for RF nanoelectronics," Wiley Encyclopedia of Electrical and Electronics Engineering, Wiley, 2012 (Chapter).

**Journal articles**

1. Y.-H. Fang, **W.-S. Zhao**\*, et al., "An AMC-based liquid sensor optimized by particle-ant colony optimization algorithms," *IEEE Sensors Journal*, 2022.
2. J. Xu, Y. Sun, J. Liu, Y.-D. Wei, **W.-S. Zhao**, et al., "Fabrication and high-frequency characterization of low-cost fan-in/out WLP technology with RDL for 2.5D/3D heterogeneous integration," *Microelectronics Journal*, vol. 119, p. 105332, 2022.
3. **W.-S. Zhao**, et al., "Swarm intelligence algorithm based optimal design of microwave microfluidic sensors*," IEEE Transactions on Industrial Electronics*, vol. 69, no. 2, pp. 2077-2087, 2022.
4. P.-W. Zhu, X. Wang\*, **W.-S. Zhao**\*, et al., "Design of H-shaped planar displacement microwave sensors with wide dynamic range," *Sensors and Actuators A: Physical*, vol. 333, p. 113311, 2022.
5. B.-X. Wang, **W.-S. Zhao**\*, et al., "Optimal design of planar microwave microfluidic sensors based on deep reinforcement learning," *IEEE Sensors Journal*, vol. 21, no. 24, pp. 27441-27449, 2021.
6. W.-J. Wu, **W.-S. Zhao**\*, et al., “A temperature-compensated differential microstrip sensor for microfluidic applications,” *IEEE Sensors Journal*, vol. 21, no. 21, pp. 24075-24083, 2021.
7. D.-W. Wang, **W.-S. Zhao**\*, et al., "A hybrid streamline upwind finite volume-finite element method for semiconductor continuity equations," *IEEE Transactions on Electron Devices*, vol. 68, no. 11, pp. 5421-5429, 2021.
8. J.-H. Zhu, D.-W. Wang\*, **W.-S. Zhao**\*, et al., "A proposal of vertical MOSFET and its electrothermal analysis for monolithic 3-D ICs," *Electronics*, vol. 10, no. 18, p. 2241, 2021.
9. P. Zhang, D.-W. Wang\*, **W.-S. Zhao**\*, et al., "Multiphysics analysis and optimal design of compressible micro-interconnect for 2.5D/3D heterogeneous integration," *Electronics*, vol. 10, no. 18, p. 2240, 2021.
10. W.-J. Wu, **W.-S. Zhao**\*, et al., "Ultrahigh-sensitivity microwave microfluidic sensors based on complementary electric-LC and split-ring structures," *IEEE Sensors Journal*, vol. 21, no. 17, pp. 18756-18763, 2021.
11. H.-Y. Gan, **W.-S. Zhao**\*, et al., "High-Q active microwave sensor based on microstrip complementary split-ring resonator (MCSRR) structure for dielectric characterization," *ACES Journal*, vol. 36, no. 7, pp. 922-927, 2021.
12. Y.-H. Ma, L.-H. Ruan, J. Wang\*, **W.-S. Zhao**\*, et al., "Spatial selected spin filtering effect in Z-shaped MoS2 nanoribbon," *IEEE Access*, vol. 9, pp. 106784-106789, 2021.
13. B.-X. Wang, **W.-S. Zhao**\*, et al., "Sensitivity optimization of differential microwave sensors for microfluidic applications," *Sensors and Actuators A: Physical*, vol. 330, p. 112866, 2021.
14. H. Jiang, X. Qi, Q. Wang, K. Xu, S. Chen, L. Wu, F. Zhu, **W. Zhao**, et al., "High-precision dielectric sensor system based on balanced CSRR-SIW resonators," *International Journal of RF and Microwave Computer-Aided Engineering*, vol. 31, no. 7, p. e22696, 2021.
15. Q.-H. Hu, **W.-S. Zhao**\*, et al., "Electrical modeling of carbon nanotube-based shielded through-silicon vias for three-dimensional integrated circuits," *International Journal of Numerical Modelling: Electronic Networks, Devices and Fields*, vol. 34, no. 2, p. e2842, 2021.
16. T. Wang, J. Zou, G. P. Puccioni, **W. Zhao**, et al., "Methodological investigation into the noise influence on nanolasers' large signal modulation," *Optics Express*, vol. 29, no. 4, pp. 5081-5097, 2021.
17. Q. Liu, **W.-S. Zhao**, et al., "RFID-based bidirectional wireless rollover sensor for intelligent wheelchair," *Microwave and Optical Technology Letters*, vol. 63, no. 2, pp. 504-509, 2021.
18. Q.-H. Hu, **W.-S. Zhao**\*, et al., "On the applicability of two-bit carbon nanotube through-silicon via for power distribution networks in 3-D integrated circuits," *IET Circuits, Devices & Systems*, vol. 15, no. 1, pp. 20-26, 2021.
19. L.-C. Fan, **W.-S. Zhao**\*, et al., "An ultrahigh sensitivity microwave sensor for microfluidic applications," *IEEE Microwave and Wireless Components Letters*, vol. 30, no. 12, pp. 1201-1204, 2020.
20. Q. Liu, **W.-S. Zhao**, et al., "Broadband T-bar fed slot antenna array with stable horizontally polarized omnidirectional radiation," *International Journal of RF and Microwave Computer-Aided Engineering*, vol. 30, no. 11, p. e22427, 2020.
21. **W.-S. Zhao**, et al., "Modeling of carbon nanotube-based differential through-silicon vias in 3-D ICs," *IEEE Transactions on Nanotechnology*, vol. 19, pp. 492-499, 2020.
22. L. Dong, Z. Xu, W. Xuan, H. Yan, C. Liu, **W.-S. Zhao**, et al., "A characterization of the performance of gas sensor based on heater in differential gas flow rate environments," *IEEE Transactions on Industrial Informatics*, vol. 16, no. 10, pp. 6281-6290, 2020.
23. H.-Y. Gan, **W.-S. Zhao**\*, et al., "Differential microwave microfluidic sensor based on microstrip complementary split-ring resonator (MCSRR) structure*," IEEE Sensors Journal*, vol. 20, no. 11, pp. 5876-5884, 2020.
24. P.-W. Liu, **W.-S. Zhao**\*, et al., "Optimal repeater insertion for nano-interconnects in current-mode signaling scheme," *IET Micro & Nano Letters*, vol. 15, no. 5, pp. 308-312, 2020.
25. D.-W. Wang, **W.-S. Zhao**, et al., "Fully coupled electrothermal simulation of resistive random access memory (RRAM) arrays," *Science China: Information Sciences*, vol. 63, no. 8, p. 189401, 2020.
26. Q.-H. Hu, **W.-S. Zhao**\*, et al., "Modeling and characterization of differential multi-bit carbon nanotube through-silicon vias," *IEEE Transactions on Components, Packaging and Manufacturing Technology*, vol. 10, no. 3, pp. 534-537, 2020.
27. **W.-S. Zhao**, et al., "Microwave planar sensors for fully characterizing magneto-dielectric materials," *IEEE Access*, vol. 8, pp. 41985-41999, 2020.
28. F. Jiang, **W.-S. Zhao**\*, et al., "Mini-review: Recent progress in the development of MoSe2 based chemical sensors and biosensors," *Microelectronics Engineering*, vol. 225, p. 111279, 2020.
29. H.-Y. Gan, **W.-S. Zhao**\*, et al., "A CSRR-loaded planar sensor for simultaneously measuring permittivity and permeability," *IEEE Microwave and Wireless Components Letters*, vol. 30, no. 2, pp. 219-221, 2020.
30. W. Li, **W.-S. Zhao**\*, et al., "Optimal repeater insertion for horizontal and vertical graphene nanoribbon interconnects," *International Journal of Numerical Modelling: Electronic Networks, Devices and Fields*, vol. 33, no. 2, p. e2696, 2020.
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32. L.-C. Fan, **W.-S. Zhao**\*, et al., "A high-Q active substrate integrated waveguide based sensor for fully characterizing magneto-dielectric (MD) materials," *Sensors and Actuators A: Physical*, vol. 301, no. 111778, 2020.
33. L. Dong, Z. Qiao, H. Wang, W. Yang, **W. Zhao**, et al., "The gas leak detection based on a wireless monitoring system," *IEEE Transactions on Industrial Informatics*, vol. 15, no. 12, pp. 6240-6251, 2019.
34. D.-W. Wang, **W.-S. Zhao**\*, et al., "Parallel simulation of fully coupled electrothermal processes in large-scale phase-change memory (PCM) arrays," *IEEE Transactions on Electron Devices*, vol. 66, no. 12, pp. 5117-5125, 2019.
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38. K. Fu, J. Zheng, **W.-S. Zhao**\*, et al., "Analysis of transmission characteristics of copper/carbon nanotube composite through-silicon via interconnects," *Chinese Journal of Electronics*, vol. 28, no. 5, pp. 920-924, 2019.
39. J.-W. Pan, K. Fu, Q. Liu, **W.-S. Zhao**\*, et al., "Modelling of crosstalk in differential through-silicon vias for three-dimensional integrated circuits," *IET Microwaves, Antennas & Propagation*, vol. 13, no. 10, pp. 1529-1535, 2019.
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41. **W.-S. Zhao**, et al., "Mini-review: Modeling and performance analysis of nanocarbon interconnects," *Applied Sciences*, vol. 9, no. 11, p. 2176, 2019.
42. Z.-H. Cheng, **W.-S. Zhao**\*, et al., "Modelling and delay analysis of on-chip differential carbon nanotube interconnects," *IET Micro & Nano Letters*, vol. 14, no. 5, pp. 505-510, 2019.
43. D.-W. Wang, W. Chen, **W.-S. Zhao**\*, et al., "An improved algorithm for drift diffusion transport and its application on large scale parallel simulation of resistive random access memory arrays," *IEEE Access*, vol. 7, pp. 31273-31285, 2019.
44. **W.-S. Zhao**, et al., "Repeater insertion to reduce delay and power in copper and carbon nanotube-based nanointerconnects," *IEEE Access*, vol. 7, pp. 13622-13633, 2019.
45. D.-W. Wang, W. Chen, **W.-S. Zhao**\*, et al., "Fully coupled electro-thermal simulation of large RRAM arrays in the 'thermal-house'," *IEEE Access*, vol. 7, pp. 3897-3908, 2019.
46. K. Fu, **W.-S. Zhao**\*, et al., "A compact passive equalizer design for differential channels in TSV-based 3-D ICs," *IEEE Access*, vol. 6, pp. 75278-75292, 2018.
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53. **W.-S. Zhao**, et al., "Vertical graphene nanoribbon interconnects at the end of the roadmap," *IEEE Transactions on Electron Devices*, vol. 65, no. 6, pp. 2632-2637, 2018.
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