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#### 张凯 ZHANG KAI 教授

所属学院:	机电工程学院
导师类别:	硕士生导师
科研方向:	微电子 / 第三代半导体封装
	石墨烯制备及应用
	LED封装及车灯散热设计
硕士招生学院:	机电工程学院

#### 一、个人简述（限300字）

张凯博士于香港科技大学获得哲学博士学位，曾任西安交通大学副教授，香港科技大学副研究员、访问学者，承担科研与中英文教学工作。现任广东工业大学“百人计划”特聘教授。在半导体先进封装、LED固态照明封装及散热管理、石墨烯纳米材料及新能源应用、车灯设计及散热，微电子制造工艺及可靠性分析等领域拥有十几年专业经验。主持广东省科技计划项目、香港创新科技署粤港科技合作项目、大学与产业合作项目等，获得企业及政府有关经费资助。参与研发机构、科研平台建设，参与筹建香港科技大学佛山LED工程中心。参与成立初创公司，并获得天使投资。具有丰富的科研、技术转移及产业合作经验。发表美国、中国专利共10个，著作2本（各一章），国际学术论文50多篇。

#### 二、学科领域

先进半导体封装、LED固态照明封装及散热管理，石墨烯、纳米材料及其在新能源中的应用，LED车灯设计及散热，有限元、分子动力学仿真等

#### 三、教育背景

2003.08-2008.08 香港科技大学，机械工程，获哲学博士学位；  
1993.09-1996.06 西安交通大学，热能工程，获工学硕士学位；  
1987.09-1991.07 西安交通大学，电厂热能动力工程，获工学学士学位。

#### 四、工作经历

2016.08-至今 广东工业大学，“百人计划”特聘教授  
2008.09-2016.07 香港科技大学，副研究员 / 访问学者  
2002.08-2016.07 西安交通大学，副教授  
1996.07-2002.07 西安交通大学，讲师  
1991.07-1993.08 西安交通大学，辅导员

#### 五、学术兼职

国际著名期刊审稿人：Carbon, Thermochemica Acta, Computational Materials Science, Journal of Experimental Nanoscience, International Journal of Heat and Mass Transfer, IEEE transactions on Components, Packaging and Manufacturing Technology, Journal of Nanomaterials等

#### 六、主要荣誉

1. 第12届电子封装技术国际会议 (ICEPT)，飞利浦杰出论文奖，
2. 第7届电子封装技术国际会议 (ICEPT)，飞利浦最佳论文奖，
3. 第55届电子元件技术国际会议 (ECTC)，摩托罗拉 / IEEE 元件封装与制造技术学会 CPMT 研究生奖。

#### 七、代表性论文

1. Bo Zhao, Yi-Tao Xu, Sheng-Yun Huang, Kai Zhang, et al, "3D RGO frameworks wrapped hollow spherical SnO<sub>2</sub>-Fe<sub>2</sub>O<sub>3</sub> mesoporous nano-shells: Fabrication, characterization and lithium storage properties", Electrochimica Acta, Vol.202, pp. 186-

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2. Bo Zhao, Tao Wang, Li Jiang, Kai Zhang, et al, "NiO mesoporous nanowalls grown on RGO coated nickel foam as high performance electrodes for supercapacitors and biosensors", *Electrochimica Acta*, Vol.192, pp.205-215, 2016
  3. Kai Zhang, Jie Li, et al, "Highly Thermal Conductive Transparent Die Attach Material for LEDs", 17th Electronic Packaging Technology Conference (EPTC), Singapore, 2-4 Dec., 7412390, 2015, oral presented
  4. Sheng-Yun Huang, Bo Zhao, Kai Zhang, et al, "Enhanced reduction of graphene oxide on recyclable copper foils to fabricate graphene films with superior thermal conductivity", *Scientific Reports* 5, Article number: 14260, 2015
  5. Zhaoli Gao, Xinfeng Zhang, Kai Zhang, et al, "Growth of Vertically Aligned Carbon Nanotube Arrays on Al Substrates Through Controlled Catalyst Diffusion", *The Journal of Physical Chemistry C*, Vol. 119, pp.15636-15642, 2015
  6. Hu-Ming Ren, Kai Zhang, et al, "Preparation and performance of Ag-coated Cu flakes filled epoxy as electrically conductive adhesives", *Journal of Solid State Lighting*, Vol.1, Article No.10, 2014
  7. Sheng-Yun Huang, Kai Zhang, et al, "Facile synthesis of flexible graphene-silver composite papers with promising electrical and thermal conductivity performances", *RSC Adv.*, Vol.4, pp.34156-34160, 2014
  8. Zhihua Cao, Kai Zhang, et al, "High Performance Phase Change Thermal Interface Materials Based on Porous Graphitic Carbon Spheres-Paraffin Wax Composite", 64th IEEE Electronic Components and Technology Conference (ECTC), pp. 464-469, San Diego, CA, USA, 27-30 May, 2014
  9. Xinfeng Zhang, Kai Zhang, et al, "Highly conductive die attach adhesive from percolation control and its applications in light emitting device thermal management", *Appl. Phys. Lett.*, Vol.102, 014101, 2013
  10. Kai Zhang, Xinfeng Zhang, et al, "Thermal improvement of die attach by using PDMS-grafted particles as filler and Its application in solid state lighting", 14th IEEE International Conference on Thermal, Mechanical and Multi-Physics Simulation and Experiments in Microelectronics and Microsystems (EuroSimE), pp.146-152, Wroclaw, Poland, 14-17 April, 2013, oral presented
  11. Kai Zhang, Xinfeng Zhang, et al, "Thermal Improvement of Die Attach with Iodine Treatment and Its Application in Solid State Lighting", 13th IEEE International Conference on Thermal, Mechanical and Multi-Physics Simulation and Experiments in Microelectronics and Microsystems (EuroSimE), pp.231-234, Cascais, Portugal, 16-18 April, 2012, oral presented
  12. Kai Zhang, David G.W. Xiao, et al, "Novel Cooling Solutions for LED Solid State Lighting", 12th International Conference on Electronic Packaging Technology and High Density Packaging (ICEPT&HDP), pp.1128-1132, Shanghai, China, 8-11 Aug., 2011, oral presented, [Award: Philips Outstanding Paper](#)
  13. Kai Zhang, Haibo Fan, et al, "Thermal Performance of LED Packages for Solid State Lighting with Novel Cooling Solutions", 12th IEEE International Conference on Thermal, Mechanical and Multi-Physics Simulation and Experiments in Microelectronics and Microsystems (EuroSimE), pp.121, Linz, Austria, 18-20 April, 2011, oral presented, [Keynote](#)
  14. Zhaoli Gao, Kai Zhang, et al, "Fabrication of carbon nanotube thermal interface material on aluminum alloy substrates with low pressure CVD", *Nanotechnology*, Vol.22, 265611, 2011
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21. Kai Zhang, Matthew M.F. Yuen, N. Wang, J.Y. Miao, David G.W. Xiao, H.B. Fan, "Thermal Interface Material with Aligned CNT and Its Application in HB-LED Packaging", 56th IEEE Electronic Components and Technology Conference (ECTC), pp.177-182, San Diego, CA, USA, 30 May-2 June, 2006, oral presented
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#### 八、主要著作

1. Kai Zhang, Matthew M.F. Yuen, "Thermal stresses in LED packages for solid state lighting" in book "Encyclopedia of Thermal Stresses", published by Springer, pp.5378-5394, 2013
2. H Fan, Kai Zhang, Matthew M.F. Yuen, "Thermal Conductivity of Carbon Nanotube Under External Mechanical Stresses and Moisture by Molecular Dynamics Simulation", in book "Molecular Modeling and Multiscaling Issues for Electronic Material Applications", published by Springer, pp.93-99, 2012

#### 九、科研项目

1. 广东省科技计划工业高新技术领域项目, 第三代半导体封装高温固晶材料及关键技术的研发, 2017A010106005, 2017.9.1-2020.8.31, 80万, 主持
2. 广东省科技计划粤港联合创新领域项目, 第三代半导体封装整体散热关键技术的研发, 2017A050506053, 2017.10.1-2019.9.30, 50万, 主持
3. 广东工业大学“百人计划”(特聘教授)项目, 220418106, 电子封装、第三代半导体系统及新型材料研究, 2016/08-2021/07, 100万, 主持
4. 香港创新科技署大学与产业合作计划项目, UIM/241, 高导热性能固晶材料及其在LED照明系统中的应用, 2013/6/1-2015/8/15, 312.8万元港币, 主持
5. 香港政府大学教育资助委员会(UGC)项目, RPC10EG22, 3D Packaging with Silicon Chip Carriers and Through Silicon Vias for System-in-Package, 2010/6/1-2012/5/31, 49.9万元港币, 参与
6. 香港创新科技署粤港科技合作计划项目, GHP/035/07GD, 大功率LED封装材料和制造技术, 2008/9/1-2010/8/31, 457.9万元港币, 主持
7. 美国电子元件与技术国际会议(ECTC)“Motorola-IEEE/CPMT电子封装”研究生奖金项目, IEEE06/07.EG01, Carbon Nanotube Thermal Interface Material and Its Application in High Brightness LED Packages, 2006/5/1-2008/4/3, 16.4万元港币

#### 十、知识产权

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2. 张昱, 崔成强, 张凯, 高健, 陈云, 贺云波, 陈新, 一种互连技术, 2017.06.20, 201710471203.2
3. 崔成强, 张昱, 张凯, 高健, 陈云, 贺云波, 陈新, 一种银键合丝的制备方法, 2017.06.05, 201710413850.8
4. 张昱, 崔成强, 张凯, 陈云, 高健, 贺云波, 陈新, 一种互连材料及其制备方法, 2017.06.20,

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5. Matthew M.F. Yuen, Kai Zhang, US patent 8890312: Heat Dissipation Structure with Aligned Carbon Nanotube Arrays and Methods for Manufacturing and Use, 2014
6. Matthew M. F. Yuen, Xinfeng Zhang, Kan Kan Yeung, Zhaoli Gao, Kai Zhang, Min Zhang, Huansu Xu, US patent US20140110049: Three-Dimensional Interconnected Porous Graphene-Based Thermal Interface Materials, 2014
7. Matthew M.F. Yuen, Kai Zhang, Hong Kong patent HK 1115231:具有排列整齐的碳纳米管阵列的散热结构及其制造和应用, Heat dissipation structure with aligned carbon nanotube arrays and method for manufacturing same and use thereof, 2014
8. Matthew M.F. Yuen, Kai Zhang, Chinese patent 200710106382.6: 具有排列整齐的碳纳米管阵列的散热结构及其制造和应用, 2007

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