Eric Bretschneider, Ph.D.

2622 Westwind Dr
Corinth, TX 76210

Phone: +1 (248) 766-4665
E-mail: eric@led.expert

Skills Summary

- Successful Management and Team building with personnel at levels ranging from Sr. Scientists and Engineers to Technicians/Operators. Maximum Department size >100; Budget >$25 million/yr.
- Strong New Product Development background; over 100 new SSL products taken from concept to manufacturing, including regulatory, Energy Star certification and DLC certification.
- Excellent communication skills sales and sale support experience as evidenced by development of new 8+ figure accounts for LED die, packages and applications. Proven ability to match customer demands/needs/desires with existing products.
- Comprehensive technical background in the full range of LED production technologies including MOCVD hardware/process, fabrication, LED chip/package test/reliability, optical design, thermal management, color conversion, SSL fixture/lamp design/integration and reliability.
- Direct Design and Development experience of LEDs (structures, die, packages) and SSL fixtures/components using TracePro and SolidWorks.

Employment

CTO; EB Designs & Technology Corinth, TX
2014 –

- Design and development of innovative solid-state lighting technology and designs, with a primary focus on optical design, thermal design and production/assembly technologies.
- Manage technology roadmap and draft IP disclosures/patent filings.
- Provide technical support and conduct research/technology development for clients in the field of solid state lighting. This work additionally includes serving as an expert witness.

Director of Engineering; HeathCo, LLC Bowling Green, KY
2013 – 2014

- Managed Engineering Department Staff (11 domestic, 14 international); Responsibilities included preparation and administration of the department budget ($3.5 million annual). The department was charged with developed advanced technology/products related to: Solid State Lighting, Sensors, Notifications and Control Products and included regulatory/certifications for UL, FCC, Energy Star and DLC.
- Developed technology, IP and product roadmaps for all three business units (Lighting, Sensors, Notifications). Provided solid state lighting technology support for The Chamberlain Group.
- Additional responsibilities included establishing career development paths and training goals for all members of the department.
- Key accomplishments:
  - Led team for product recall issue dating back to 2006. Reduced recall scope (# units) by >80% and financial exposure by >85% through detailed investigation and analysis of production records and analysis of excess and obsolete inventory.
  - Completed review for entire product portfolio to comply with new cUL bi-lingual language requirements. Project required warning requirement changes to physical components (tooling), warning labels, documents and packaging on >400 products.

Elec Tech International Zhuhai, Guangdong Province, P.R. China
Chief Engineer ETi Lighting Research Institute
VP Research & Development ETi Solid State Lighting
2011 – 2013

- Managed Engineering and R&D staff for newly formed vertically integrated LED company (107 Engineering, Scientists, Designers); responsibilities included preparation and administration of the department budget (>$25 million annual)
- Worked directly with President and CEO of the company to develop IP and product roadmaps for all LED based lighting products/projects for markets in the US, Europe, Japan and China.
- Key accomplishments:
  - Developed capability for fast turn functional prototypes (<2 weeks from concept to operating units). This was an improvement over the prior process that required 6+ weeks for a working prototype. Prior

to this the company lost ~50% of all opportunities that required functional prorotypes.
  - Supported product development and production ramps that enabled the company to increase sales from ~$10 million to >$40 million in one year.
  - Developed proprietary linear lamp technology capable of >1000 lumens/ft with a wall plug efficacy >100 lm/W, CRI>80 and L70>50,000 hrs (Ta = 25°C). Technology allows the same base units to be installed in fixtures as a replacement tube or used as individual luminaires with transverse spacing criteria ranging from 1.6 – 2.9.

Lighting Science Group Corporation Satellite Beach, FL
2010 - 2011 VP of Research

- Assembled and managed research and development teams for projects related to solid state lighting.
- Direct responsibility for design/development of customized photometric and radiometric characterization equipment.
- Direct responsibility for modeling and determining product and component lifetimes based on optical, thermal. mechanical and electrical analysis with respect to intended operating environments.
- Served as company representative on industry standards committees related to SSL technology (LM79, LM80, TM21, etc.)
- Key accomplishments:
  - Developed advanced LED models for product development and production control; including advanced color control schemes for multi-color applications. Methods capable of predicting average chromaticity to within combined $\Delta xy \leq 0.02$; production variation < 2 step MacAdam ellipse.
  - Developed and characterized wavelength conversion materials, methods and technology. Work included development of optics and materials for L-Prize entry.

2008 – 2010 Product Development Manager

- Tasked with developing Solid State Lighting products including: optical, mechanical and thermal design, design and process FMEA, oversight of initial production, development of quality system documents and requirements for internal production and out-sourced components. Projects ranged from individual efforts to team of 10+ employees
- Served as the primary technical resource for all OEM customers.
- Managed group responsible for all product certifications and standards requirements including UL, FCC, CE, Energy Star and DLC as well as IES lighting requirements for outdoor products.
- Responsible for development, calibration and maintenance of photometric equipment in development and production areas.
- Key accomplishments:
  - Completed fast track development and launch of OEM SSL acorn retrofit product (<5 months). Product exceeded all customer requirements including: lumen output, efficacy, thermal resistance and size. Developed second generation product with >100% increase in light output with now cost increase.
  - Completed design of Streetlight family (4 products) in 4 month span. Products achieved >90 lumens/Watt efficacy at thermal stability with projected L_{70} lifetimes >80,000 hours at T_a=40°C (continuous).
  - Development replacement lamp family line (6 primary lamp types, 100+ variations). Product family included the first replacement LED lamps to achieve Energy Star certification. Product variations developed for LSG brand name and 3 OEM customers. Altogether the family accounted for >50% of the Energy Star certified LED lamps as of December 2011.

2004 - 2008 Toyoda Gosei North America Troy, MI
Sales Manager

- Primary responsibility for developing new and managing existing LED die and package customers for the Eastern region of North America. This required extensive communications with existing and potential customers to determine best fit products for their applications/requirements.
- Additional responsibility for search for and identifying new market opportunities for existing or newly developed products.
- Served as the primary technical resource for all customers in North/South America and Europe.
- Key accomplishments:
  - Secured two new 8 figure accounts in a new market niche. These customers designated as the only two priority customers for Toyoda Gosei world-wide. Sales ramped from $0 to >$100 million/yr in less

than 18 months.
  - Secured sole supplier status for LED backlights in Apple - 9.9" (iPad), 15.4", 17" and 22" displays. This was the culmination of an 18 month campaign with the Apple Display group to find the best fit product for their requirement and to train Apple personnel on potential technical barriers/issues with their application.
  - Addressed Microsoft concerns about blue light hazards related to development of a next generation optical mouse. After three months, I was able to conclusively show to Microsoft that it would be impossible for 14mil die products to present a photo-biological hazard under both IEC 62471 and IEC 60825.
  - Awarded business for all passenger lighting on the B787 Dreamliner. This award was made by Diehl which controls all lighting for Boeing, Airbus and Embraer and was achieved within 4 months of first contact with Diehl. At the time of first contact Diehl had no knowledge of Toyoda Gosei and had been working with 4 LED companies for over 12 months on the project.

2003 – 2004 Beeman Lighting Sarasota, FL
Director of Solid State Lighting Engineering

- Tasked with leading development of solid state lighting systems and materials with primary focus on chip on board applications and devices. Product lines included RGB landscape lighting and minimal environmental impact fixtures and novel display/artwork fixtures.
- Managed all IP issues (competitor analysis, IP roadmap, patentability analysis).
- Worked with existing and potential customers to ensure new products meet or exceed requirements and expectations.
- Key accomplishment
  - Developed RGB LED based landscape light with minimal environmental impact. This was accomplish by establishing a research project with FAU and included studies that conclusively showed the products had no impact on the behavior of sea turtle hatchlings.

2003 University of South Florida Tampa, FL
Intellectual Property Manager

- Managed IP portfolio of over 100 active patents and applications for University faculty/staff. Key portfolio items included: anti-cancer bioactive compounds, dendrimer synthesis and application technology, and spectral analysis of biological materials (blood analysis, surface and soluble protein analysis).
- Tasked with enhancing University reputation and revenue through negotiation of licensing agreements for IP
- Key accomplishments:
  - Negotiated license agreement for evaluation of new anti-cancer compounds derived from cold water tunicates.
  - Assembled team that included 3 corporate and 2 academic partners for the DARPA SUVOS program. This task was completed in one month and the resulting proposal was ranked 2nd overall out of a field of 34 entries and was noted by the reviewers as the only proposal to address each and every portion of the RFP.

1998 – 2003 Uniroyal Optoelectronics Tampa, FL
Director of Intellectual Property, University Relations & Government Contracts (2001 – 2003)

- Concurrent assignment as Sr. Epi Scientist.
- Tasked with establishing IP roadmap and track patent landscape related to MOCVD growth, chip/package design and applications for LED technology.
- Reviewed all production and R&D activities to identify potential IP. This included drafting initial disclosures and working with external counsel for patent filings and responses to office actions. Activities with external counsel further included development of opinions of non-infringement.
- Oversight and management of a $3.4 million multi-campus research program.
- Monitor and track RFP notices for externally funded research related to the company's core technology development roadmap.
- Key accomplishments:
  - Developed opinions of non-infringement with external counsel for 10 LED patents that had been the subject of numerous infringement suits against Tier 1 LED companies.

- Assembled team that included 3 corporate and 2 academic partners for the DARPA SUVOS program. This task was completed in one month and the resulting proposal was ranked 2nd overall out of a field of 34 entries and was noted by the reviewers as the only proposal to address each and every portion of the RFP.

Team Leader, Epitaxial Materials & Characterization (1999 – 2001)

- Concurrent assignment as Sr. Epi Scientist.
- Oversaw start up and qualification of Epitaxial Growth & Characterization areas; role included training of Sr. Scientists, Engineers and Technicians for both areas in theory, application, process and maintenance procedures.
- Managed Epitaxial Growth & Characterization areas for production of InGaN and AlInGaP LED wafers. This included preparation and administration of the department budget (~$25 million annual) as well as setting department performance goals (total good wafers, wafer yield, performance improvements and unit production costs).
- Coordinate inventory levels with purchasing department to minimize value of inventory necessary to support production plan. Additionally negotiated key raw material specifications and prices.
- Served as Sr. member of Quality Team responsible for ISO9001 certification. Certification was achieved within a 12 month time span.
- Key accomplishments:
  - Completed process qualifications for all MOCVD systems within 3 months of CapEx delivery and established initial production yields 15% higher than the benchmark process transferred to UOE.
  - Managed departmental expansion and quality system efforts that allowed >250% increase in production capacity.
- Managed start up and qualification of Epitaxial Growth & Characterization areas; role included training of Engineers and technicians for both areas in theory, application, process and maintenance procedures.

Sr. Epi Scientist (1999 – 2003)

- Primary responsibility for MOCVD hardware and process modifications necessary to support performance improvements, yield enhancements and cost reductions.
- Served as primary technology liaison with customers and investors.
- Tasked with technical oversight of all photometric/radiometric characterization.
- Responsible for LED chip and package optical/thermal design including wavelength conversion materials.
- Key accomplishments:
  - Resolved gold corrosion issue in Fab area. Also eliminated transparent contact failure mechanism. Combined efforts increased fabrication yield by >30%.
  - Modified hardware and epitaxial growth process to increase throughput of Epitaxial Growth & Characterization areas by 80% (9 hour to 5 hour cycle time), while cutting unit cost by >30%. Also reduced surface and interfacial roughness by a factor of >3x while improving thickness uniformity from 4% to <2%, using DOE methods. Additional hardware modification increased throughput by another 20%.
  - Developed new test methods to verify performance of LED structures prior to Fabrication. Methods allowed verification of optical power to within 15% and wavelength within 2 nm prior to beginning of fabrication.

Staff Engineer (1998 – 1999)

- Designed/specified Epitaxial Growth & Characterization areas. This responsibility included specification and selection of all CapEx equipment for the Epitaxial Growth and Characterization areas and managing the construction, CapEx equipment installation and start up.
- Additional responsibilities included determining initial product cost and throughput based on installed CapEx tool base.
- Key accomplishments:
  - Implemented and validated new ammonia delivery system that allowed multiple MOCVD systems to draw from the same cylinder and eliminated downtime for cylinder changes. Implemented new exhaust management process for arsine/phosphine waste stream, extending maintenance interval by >300%.
  - Developed zero assumption cost and throughput models for LED facility. Cost estimate for 18 months post-start up proved accurate to within 10% of actual costs.

1996 – 1998 Emcore Corporation Somerset, NJ
Process Engineer

- Responsible for installation, materials demonstration and production process qualification and transition into manufacturing of MOCVD systems in an ISO9000 manufacturing environment (6 systems in 18 months).
- Tasked with identifying cost reduction and throughput/yield enhancements for epitaxial growth processes.
- Member of internal Quality System audit team.
- Key accomplishments:
  - Developed MOCVD Tool Qualification Procedure for benchmarking and qualifying all MOCVD systems installed for internal corporate use as well as at customer locations world wide.
  - Completed Manufacturing Readiness Review for AlGaAs/Ge solar cell process in ~25% of standard time. Resulted in 3 year, $15 million supply contract for company.
  - Scaled up and transferred of InSb magneto resistor process to a higher throughput system (single wafer D-180 to five wafer E-300). Increased wafer yield by from 65% to >95%.
  - Developed industry's first comprehensive cost and throughput model for epitaxial growth processes. The model typically allowed cost reductions of 10-20% and throughput increases of >10%.

1990 AT&T Bell Labs Holmdel, NJ
Visiting Researcher

- Designed and built custom MOCVD/Mass spec system. System allowed tracking of precursor molecules, reaction intermediates and products over 12+ orders of magnitude of concentration.
- Implemented program to evaluate novel precursors for use in growth and doping of III-V and II-VI compound semiconductors. Data used to determine reaction and decomposition mechanisms for metal-organic sources. Successfully identified grow conditions for novel carbon doping source (norbornadiene) for III-V materials.

1989 Shell Oil Norco, LA
Process Engineer

- Developed and implemented new system for determining optimal time to clean heat exchangers on crude oil distillation column based on global economic metrics of unit and detailed process simulations.
- System exceeded system cost savings target of $50,000/year by ~3 orders of magnitude. Project resulted in corporate-wide savings of >$50 million/year. Cumulative corporate savings exceed $1 billion.

Education

Ph.D. in Chemical Engineering University of Florida 1997
BSE in Chemical Engineering Tulane University 1989

- Graduate work focused on development of optoelectronic devices, including novel silicon based visible LEDs and sulfide based TFELD structures.
- Developed the world's first crystalline silicon based visible light LED. Utilized DOE methods to identify process conditions to allow first growth of epitaxial silicon on ZnS epi layers.
- Tested and verified efficacy of novel precursors for p-type doping of ZnSe materials in LED structures.
- Responsible for modification, operation and maintenance of MOCVD system for growth of wide bandgap compound semiconductor materials.
- Trained incoming post docs and graduate students in theory, operation and maintenance of MOCVD systems. Group comprised ~20 students and 6 post docs.

References

Available on request

Curricula Vitae

University of Florida, Department of Chemical Engineering Advisory Board
Member 1998 –
Chair 2007 – 2009

Professional Societies:

- SPIE
- OSA
- Materials Research Society

DOCKET ALARM

Explore Litigation Insights

Docket Alarm provides insights to develop a more informed litigation strategy and the peace of mind of knowing you're on top of things.

Real-Time Litigation Alerts

Keep your litigation team up-to-date with **real-time alerts** and advanced team management tools built for the enterprise, all while greatly reducing PACER spend.

Our comprehensive service means we can handle Federal, State, and Administrative courts across the country.

Advanced Docket Research

With over 230 million records, Docket Alarm's cloud-native docket research platform finds what other services can't. Coverage includes Federal, State, plus PTAB, TTAB, ITC and NLRB decisions, all in one place.

Identify arguments that have been successful in the past with full text, pinpoint searching. Link to case law cited within any court document via Fastcase.

Analytics At Your Fingertips

Learn what happened the last time a particular judge, opposing counsel or company faced cases similar to yours.

Advanced out-of-the-box PTAB and TTAB analytics are always at your fingertips.

API

Docket Alarm offers a powerful API (application programming interface) to developers that want to integrate case filings into their apps.

LAW FIRMS
Build custom dashboards for your attorneys and clients with live data direct from the court.

Automate many repetitive legal tasks like conflict checks, document management, and marketing.

FINANCIAL INSTITUTIONS
Litigation and bankruptcy checks for companies and debtors.

E-DISCOVERY AND LEGAL VENDORS
Sync your system to PACER to automate legal marketing.