Advanced Technology for LEDs (LE)

Oral Presentation

Nov. 9, 2011 (Wed.)

LE 1 (Advanced Technology for LEDs 1)

Ara

Chairs: Prof. Xiaobing Luo (Huazhong University of Science and Technology, China) 09:10-10:20
Dr. Jong Hyeob Baek (Korea Photonics Technology Institute, Korea)

LEIS1 09:10-09:40 Invited Speech
Improved Light Output of GaN-based Light Emitting Diodes by Introducing Current Blocking Layers
Sang Youl Lee[1,2], Hyunsoo Kim[3], June-O Song[2], Tae-Yeon Seong[1]
[1]Korea University, Korea, [2]LG Innotek, Korea, [3]Chonbuk National University, Korea

LE515 09:40-10:00
Improvement in Driving Efficiency and Luminance Uniformity of LED Lighting Systems using a RLC Regulation and a Snubber
Myoung-Sung Moon, Oh-Soon Kwon, Joong-Hee Lee, Ja-Soon Jang
Yeungnam University, Korea

LE1208 10:00-10:20
New Approaches for Blocking Surface Leakage Current of High Power Light-emitting Diodes
Sei-Min Kim[1], Seon-Ho Jang[1], Jin-Cheol Kim[1], Jong-Hyeob Baek[2], Ja-Soon Jang[1]
[1]Yeungnam University, Korea, [2]Korea Photonics Technology Institute, Korea

Nov. 9, 2011 (Wed.)

LE 2 (Advanced Technology for LEDs 2)

Ara

Chairs: Prof. Xiaobing Luo (Huazhong University of Science and Technology, China) 10:40-12:00
Dr. Jong Hyeob Baek (Korea Photonics Technology Institute, Korea)

LEIS2 10:40-11:10 Invited Speech
Thermal Annealing Effects on InGaN/GaN Quantum Wells during the Growth of p-GaN in a Light-emitting Diode
Horng-Shyang Chen, Chih-Yen Chen, Kuang-Yu Chen, Wen-Ming Chang, Che-Hao Liao, Jeng-Jie Huang, Yu-Feng Yao, Yean-Woei Kiang, Chih-Chung Yang
National Taiwan University, Taiwan

LEIS3 11:10-11:40 Invited Speech
New Processing of LED Phosphors
Kenji Toda
Niigata University, Japan

LE1074 11:40-12:00
Effect of Defects on the Luminescence in Semipolar InGaN/GaN Quantum Wells on Planar and Patterned M-plane Sapphire Substrate
Seung-A Lee, Jong-Jin Jang, Kwan-Hyun Lee, Jung-Hwan Hwang, Joo-Chul Jung, Ok-Hyun Nam
Korea Polytechnic University, Korea

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Nov. 10, 2011 (Thu.)

LE 3 (Advanced Technology for LEDs 3)

Ballroom 2

Chairs: Prof. Hyunsoo Kim (Chonbuk National University, Korea)
Dr. Jaehee Cho (Rensselaer Polytechnic Institute, USA)

09:10-10:20

LEIS4 09:10-09:40 Invited Speech
Color-tunable Light-emitting Diodes
H. W. Choi
The University of Hong Kong, Hong Kong

LE1206 09:40-10:00
Enhancement of Photon Extraction in ZnO-nanorod Embedded GaN-based LEDs
Seon-Ho Jang, Sei-Min Kim, Jong-Sun Lee, Jin-Chul Kim, Min-Jung Park, Ja-Soon Jang
Yeungnam University, Korea

LE1615 10:00-10:20
Two-dimensional Local Dimming Technique for Edge-type Light Emitting Diode Backlight Units
Soonsung Lee, Meehyun Lim, Woonbong Hur, Haewook Han
POSTECH, Korea

Nov. 10, 2011 (Thu.)

LE 4 (Advanced Technology for LEDs 4)

Ballroom 2

Chairs: Prof. Hyunsoo Kim (Chonbuk National University, Korea)
Dr. Jaehee Cho (Rensselaer Polytechnic Institute, USA)

10:40-12:10

LEIS5 10:40-11:10 Invited Speech
Study of Patterned Graded-refractive-index Layers to Enhance Light-extraction Efficiency of GaInN LEDs
Jaehee Cho[1], Ahmed N. Noemaun[1], E. Fred Schubert[1], Gi Bum Kim[2], Cheolsoo Sone[2], Jong Kyu Kim[3]
[1]Rensselaer Polytechnic Institute, USA, [2]Samsung LED, Korea, [3]Pohang University of Science and Technology, Korea

LE1568 11:10-11:30
Fabrication of 2D Photonic Crystal Layers by Reversal Nanoimprint of TiO_2 Nanoparticles and Atomic Layer Deposition
Yun-Sik Choi[1], Eun-Jin Her[1], Kilbock Lee[1], Ki-Young Ko[2], Jinho Ahn[1]
[1]Hanyang University, Korea, [2]Korea Institute of Patent Information, Korea

LE1515 11:30-11:50
Improved Phosphor Conversion Efficiency of White LEDs by using Conductive Color Selective Filters Made of Indium-tin-oxide
Hyoeun Kim, Haidang Ngo, Sameer Chhajed, Jong Kyu Kim
POSTECH, Korea

LE1648 11:50-12:10
Effects of Ga-doped MgZnO Transparency Conductive Oxide Film Appied to GaN-based LEDs
Young-Woong Lee, Seon-Ho Jang, Sei-Min Kim, Ja-Soon Jang
Yeungnam University, Korea

Nov. 10, 2011 (Thu.)

LE 5 (Advanced Technology for LEDs 5)

Ballroom 2

Chairs: Prof. Anthony H.W. Choi (The University of Hong Kong, Hong Kong) 15:00-16:10
Prof. Han-Youl Ryu (Inha University, Korea)

LEIS6 15:00-15:30 Invited Speech
A Novel Method for Geometry Control of Phosphor Layer for High-power LED by Package Structure
Xiaobing Luo, Huai Zheng, Shan Yu, Sheng Liu
Huazhong University of Science and Technology, China

LE1646 15:30-15:50
Different Nanorod Structure Controlled by Surface Condition of ITO
Jong-Sun Lee, Seon-Ho Jang, Sei-Min Kim, Ja-Soon Jang
Yeungnam University, Korea

LE1462 15:50-16:10
Fabrication for Free Standing GaN by Wet Etching Method using H2SO4/H3PO4
Do Hyung Kim[1], K. Anil[1], Soon Jae Yu[1], Yong Gon Yi[2], Seok Beom Yoon[3], Min-Sup Kang[4]
[1]Sunmoon University, Korea, [2]Lite Co., Ltd., Korea, [3]Kongju National University, Korea, [4]Anyang University, Korea

Nov. 10, 2011 (Thu.)

LE 6 (Advanced Technology for LEDs 6)

Ballroom 2

Chair: Prof. Anthony H.W. Choi (The University of Hong Kong, Hong Kong) 16:30-17:30

LE1316 16:30-16:50
Effect of Strain-relief Layers below InGaN/GaN Multiple-quantum Wells on the Efficiency Droop of Blue Light-emitting Diodes
H. Y. Ryu[1], K. S. Jeon[2], M. G. Kang[2], E. Lee[2], J. H. Sung[2], J. Jeon[2], Y. H. Choi[2]
[1]Inha University, Korea, [2]LG Electronics Advanced Research Institute, Korea

LE1218 16:50-17:10
Will the Hotspot Location in the High Power Phosphor-converted White Light Emitting Diode Shift?
Run Hu, Xiaobing Luo, Sheng Liu
Huazhong University of Science and Technology, China

LE1369 17:10-17:30
Effect of Gold Wire Bonding Angle on the Uniformity and Consistency of High Power LED
Bulong Wu, Huai Zheng, Xiaobing Luo, Sheng Liu
Huazhong University of Science and Technology, China

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Poster Presentation

Nov. 8, 2011 (Tue.)

LEP 1 (Advanced Technology for LEDs) Poster Presentation 1 Lobby 8F

Chair: Dr. Jong Hyeob Baek (Korea Photonics Technology Institute, Korea) 14:00-15:30

LE1473 **Epitaxial Lateral Overgrowth on the Air Void Embedded SiO_2 Mask for InGaN Light-emitting Diodes**
Sang-Mook Kim, Kwang Cheol Lee, Ahn Su Chang, Eunmi You, Jong Hyeob Baek
Korea Photonics Technology Institute (KOPTI), Korea

LE1432 **Effective Barrier Height and Carrier Transport Mechanism of ITO Ohmic Contact to p-type GaN for LED Applications**
Yunju Choi, Youngjun Park, Hyunsoo Kim
Chonbuk National University, Korea

LE1402 **Growth and Characterization of Very Thin Al-doped ZnO Grown on c-plane Sapphire Substrate by using Atomic Layer Deposition**
Ki-Hyun Kim, Ki-Wook Kim, Min-Jae Shin, Sung-Nam Lee
Korea Polytechnic University, Korea

LE1400 **Effect of Anisotropic Crystallinity on the Electrical Properties of Semipolar (11-22) GaN Grown on m-plane Sapphire**
Na-Bil-Re Kan, Min-Jae Shin, Dong-Sub Oh, Sung-Nam Lee
Polytechnic University, Korea

LE1398 **Optical Improvement of GaN-based Light Emitting Diodes by Interfacial Si Treatment in InGaN/GaN Quantum Well Structure**
Sangjun Park, Sangwon Lee, Sung-Nam Lee
Korea Polytechnic University, Korea

LE1334 **Study of GaInP Quantum Dots according to the Growth Thickness**
Hwa Sub Oh[1], Sang Mook Kim[1], Kwang Cheol Lee[1], June Mo Park[1], Ho Seong Ryu[1], Hyung Joo Lee[2], Young Jin Kim[2], In Kyu Jang[2], Jong Hyeob Baek[1]
[1]Korea Photonics Technology Institute (KOPTI), Korea, [2]AUK Incorporation, Korea

LE1285 **High Efficiency GaN Vertical Light-Emitting Diodes with Buried Current Blocking Layer and Reflective Cr/Al-based N-type Electrodes**
Tak Jeong, Seung Whan Kim, Jong Hyeob Baek
Korea Photonics Technology Institute, Korea

LE1223 **Carrier Transport Mechanism at the Interface between Metals and p-type III-nitrides Having Different Surface Electronic Structure**
Seon-Ho Jang, Sei-Min Kim, Ja-Soon Jang
Yeungnam University, Korea

LE1180 **Nano-Patterned Electrode with Bi-layer Transparent Conducting Oxide by Wet Process for GaN-based LEDs**
Semi Oh[1], Soohaeng Cho[2], Sang-Woo Kim[3], Kyoung-Kook Kim[1]
[1]Korea Polytechnic University, Korea, [2]Yonsei University, Korea, [3]Sungkyunkwan University, Korea

LE1178 **Enhancement of Light-extraction Efficiency of GaN-based LEDs by Random-textured ITO Electrode**
Semi Oh[1], Soohaeng Cho[2], Joon-Ho Oh[3], Tae-Yeon Seong[3], Kyoung-Kook Kim[1]
[1]Korea Polytechnic University, Korea, [2]Yonsei University, Korea, [3]Korea University, Korea

LE1176 **Surface Morphology of ZnO Thin Film Controlled by Citric Acid Solution for Light-extraction Structure of GaN-based LED**
Semi Oh, Hyun-Jun Choi, Kyoung-Kook Kim
Korea Polytechnic University, Korea

LE1171 **Compare with Light- Extraction Efficiency as Control of ZnO-nanorod Diameter on GaN-based LED**
Semi Oh[1], Hodol Yoo[2], Kyung-Sik Shin[2], Sang-Woo Kim[2], Kyoung-Kook Kim[1]
[1]Korea Polytechnic University, Korea, [2]Sungkyunkwan University, Korea

LE1046 **Electrical Characteristics and S-parameter of Schottky Diodes Fabricated on p-type GaN**
Youngjun Park[1], Sung-Nam Lee[2], Kwang-Soon Ahn[3], Hyunsoo Kim[1]
[1]Chonbuk National University, Korea, [2]Korea Polytechnic University, Korea, [3]Yeungnam University, Korea

LE1027 **Electrical Characteristics of Mg-doped InAlN Evaluated from Transfer Length Method**
Seongjun Kim[1], Jae-Hyun Ryou[2], Russell D. Dupuis[2], Hyunsoo Kim[1]
[1]Chonbuk National University, Korea, [2]Georgia Institute of Technology, USA

LE958 **Crystal Structures and Luminescence Properties of Eu^{2+} - Activated $CaAlSi_2N_5$ Nitride Phosphor**
Jun-Myung Song, Joo-Seok Park, Sung-Soon Park, Bo-Yun Jang
Korea Institute of Energy Research, Korea

LE847 **Carrier Transport and Effective Barrier Height of Low Resistance Ni/Ag/Pt Contact to Highly Mg-doped p-GaN**
Youngjun Park, Yunju Choi, Hyunsoo Kim
Chonbuk National University, Korea

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Nov. 10, 2011 (Thu.)

LEP 2 (Advanced Technology for LEDs) Poster Presentation 2 Lobby 8F

Chair: Prof. Ja Soon Jang (Yeungnam University, Korea) 13:30-15:00

LE835 **Comparative Study of Crystal Quality and Optical Property of InGaN/GaN Quantum Wells Grown on Polar (0001) and Semipolar (11-22) GaN Templates**
Ki-Ryong Song, Min-Jae Shin, Dong-Sub Oh, Sung-Nam Lee
Korea Polytechnic University, Korea

LE832 **Forward and Reverse Bias-induced Electrical and Optical Properties of GaN-based Blue Light Emitting Diodes**
Sangwon Lee, Sung-Nam Lee
Korea Polytechnic University, Korea

LE829 **Enhanced Optical Property of UV Nanopillar Light Emitting Diode using Chemical Treatment**
Dae-Woo Jeon[1,2], Lee-Woon Jang[1], Ju-Won Jeon[1], Myoung Kim[1], Jae-Woo Park[1], Seong-Ran Jeon[2], Seung-Jae Lee[2], Jin-Woo Ju[2], Jong Hyeob Baek[2], In-Hwan Lee[1]
[1]Chonbuk National University, Korea, [2]Korea Photonics Technology Institute, Korea

LE820 **Luminescent Enhancement of Yellow Phosphors Coated with Low-crystalline Titania**
Hyeong Seok Lee[1,2], Sang Man Koo[2], Jung Whan Yoo[1]
[1]Korea Institute of Ceramic Engineering and Technology, Korea, [2]Hanyang University, Korea

LE775 **Optical and Electrical Characterizations of ZnO Film Grown on c-plane Sapphire by using Atomic Layer Deposition**
Ki-Wook Kim, Ki-Hyun Kim, Kyung-Joo Sun, Sung-Nam Lee
Korea Polytechnic University, Korea

LE761 **Study of Optical and Crystal Properties of InGaN/GaN Quantum Well on Epitaxial Lateral Overgrown Semipolar (11-22) GaN Template**
Min-Jae Shin, Ki-Ryoung Song, Dong-Sub Oh, Sung-Nam Lee
Korea Polytechnic University, Korea

LE760 **Electrical Characteristics of Ti/Al Contacts to N-Polar n-GaN Grown by MBE**
Joon-Woo Jeon[1], Woongsun Yum[1], Myoung-Jae Choi[1], Se-Yeon Jung[1], Gon Namgoong[2], Tae-Yeon Seong[1]
[1]Korea University, Korea, [2]Old Dominion University, USA

LE736 **Reliability Characteristics of White GaN-based Light-emitting Diodes with Dual Degradiation Kinetics**
Eunjin Jung, Hyunsoo Kim
Chonbuk National University, Korea

LE728 **A New Boost Type Control Method for High Dimming Frequency and Fast Response Time of the Inductor Current in the LED Lightings**
O-Soon Kwon, Myoung-Sung Moon, Joong-Hee Lee, Ja-Soon Jang
Yeungnam University, Korea

LE721 **Electroluminescent Characteristics of Blue GaN-based Light-emitting Diodes Fabricated with Emission Wavelengths of 429-467 nm**
Eunjin Jung, Seongjun Kim, Hyunsoo Kim
Chonbuk National University, Korea

LE522 **Carrier Transport Mechanisms of Hybrid ZnO Nanorod-polymer LEDs**
Dong Ick Son, Byoung Wook Kwon, Dong Hee Park, Jeong-Do Yang, Won Kook Choi
Korea Institute of Science and Technology, Korea

LE495 **Internal Efficiency Enhancement of GaN-based Light Emitting Diodes with Nano Gray Scale GaN/$In_xGa_{1-x}N$ Multiple Quantum Wells**
Sang Hyun Jung[1,2], Ho Kwan Kang[1], Keun Man Song[1], Jeong-gun Lee[1], Jae Jin Lee[2], Chul Gi Ko[1]
[1]Korea Advanced Nano Fab. Center, Korea, [2]Ajou University, Korea

LE407 **New Metallization Schemes for Vertical-structure LEDs**
Seon-Young Moon[1,2], Ho-Won Jang[1]
[1]Korea Institute of Science and Technology (KIST), Korea, [2]Yonsei University, Korea

LE395 **Growth of High Quality GaN Epitaxial Layer with AlN Buffer on Silicon Substrate by HVPE**
Heui Bum Ryu[1], Juan Wang[1], Won Jae Lee[1], Hyun Hee Hwang[2], Young Jun Choi[2], Hae Yong Lee[2]
[1]Dong-Eui University, Korea, [2]LumiGNtech Co., Ltd, Korea

LE378 **Effects of Carrier Transport Layers on Electrical and Optical Properties of Quantum Dot Light Emitting Diodes**
Min-Ji Jo, Dae-Gyu Moon
Soonchunhyang University, Korea

LE256 **Rapid Chemical Lift Off of (11-22) Semipolar GaN using Periodic Triangular Cavity**
Dae-Woo Jeon[1,2], Seung-Jae Lee[1], Tak Jeong[1], Jong Hyeob Baek[1] Jae-Woo Park[2], Lee-Woon Jang[2], Myoung Kim[2], In-Hwan Lee[2], Jin-Woo Ju[1]
[1]Korea Photonics Technology Institute, Korea, [2]Chonbuk National University, Korea

LE227 **Reduced Structural Anisotropy of (11-22) Semipolar GaN by using Epitaxial Lateral Overgrowth**
Dae-Woo Jeon[1,2], Seung-Jae Lee[1], Tak Jeong[1], Jong Hyeob Baek[1], In-Hwan Lee[2], Jin-Woo Ju[1]
[1]Korea Photonics Technology Institute, Korea, [2]Chonbuk National University, Korea

LE115 **Study on Reliability of LED Packages with Different Types of Bonding Adhesives**
Je-Min Kim, Byung-Jin Ma
KETI, Korea

Advanced Technology for LEDs

LE52 **Effects of Surface Morphology of ZnO Seed Layers on Growth of ZnO Nanorods Prepared by Hydrothermal Method and Their Annealing Effects**

Kwang Gug Yim[1], Min Su Kim[1], Do Yeob Kim[1], Soaram Kim[1], Giwoong Nam[1], Su Min Jeon[2], Dong-Yul Lee[3], Jin Soo Kim[4], Jong Su Kim[5], Jae-Young Leem[1]

[1]Inje University, Korea, [2]MagnaChip Semiconductor Ltd., Korea, [3]Samsung LED Co., Ltd., Korea, [4]Chonbuk National University, Korea, [5]Yeungnam University, Korea

LE50 **Influence of Growth Temperature on Structural and Optical Properties of ZnO Thin Films on Porous Silicon Grown by Plasma-assisted Molecular Beam Epitaxy**

Min Su Kim[1], Kwang Gug Yim[1], Soaram Kim[1], Giwoong Nam[1], Dong-Yul Lee[2], Jin Soo Kim[3], Jong Su Kim[4], Jeong-Sik Son[5], Jae-Young Leem[1]

[1]Inje University, Korea, [2]Samsung LED Co., Ltd., Korea, [3]Chonbuk National University, Korea, [4] Yeungnam University, Korea, [5]Kyungwoon University, Korea

LE46 **Effects of Cadmium Content on Optical Parameters of $Cd_xZn_{1-x}O$ Thin Films Grown by Sol-Gel Method**

Min Su Kim[1], Do Yeob Kim[1], Kwang Gug Yim[1], Soaram Kim[1], Giwoong Nam[1], Dong-Yul Lee[2], Jin Soo Kim[3], Jong Su Kim[4], Jae-Young Leem[1]

[1]Inje University, Korea, [2]Samsung LED Co., Ltd., Korea, [3]Chonbuk National University, Korea, [4]Yeungnam University, Korea

LE1251 **Scribing Technique for InGaN/GaN/Al_2O_3(S) LED using H_2SO_4/H_3PO_4 Wet Etching**

Do Hyung Kim[1], K. Anil[1], Soon Jae Yu[1], Yong Gon Yi[2], Ju-Ok Seo[3], Tae-Su Han[4]

[1]Sunmoon University, Korea, [2]Lite Co., Ltd., Korea, [3]Heesung Electronics, Korea, [4]Korea Lift College, Korea