

2DLIGHT

A NOVEL, COMPACT GaN LED SOURCE ENABLING DYNAMIC SPATIAL CONTROL OF LIGHT TOWARDS HIGH BRIGHTNESS AND HIGH RESOLUTION ILLUMINATION

+ WHAT IS 2DLIGHT?

2DLight is a preliminary demonstration of micro-LED array technology allowing spatial and dynamic control of the light flux without any moving part.

2DLight projects the emitted light on the scene to be illuminated:

- White light is obtained by color conversion of blue light
- Spatial and intensity control of source offers optimization of light distribution and power consumption

+ APPLICATIONS

Depending on design of the LED array, driving circuit and optical system, this versatile technology addresses several application fields:

- **Automotive lighting:** glare-free headlamps — illumination is dynamically controlled to avoid glare
- **Smart general lighting for indoors and outdoors:** light on demand - illumination is shaped as needed
- **Informative lighting:** projection from lighting points — displaying information by dynamic control of contrast

+ WHAT'S NEW?

This monolithic LED array has several novel features:

- Architecture based on common cathode interpixel design and individually connected anodes > uniform electro-optical characteristics
- Self-aligned technological approach for patterning of emitting areas > minimizes interpixel footprint > minimal efficiency droop enabling maximum emission output per chip
- Full trench GaN pixelation and edge n-GaN contacting > minimizes interpixel footprint > avoids optical crosstalk
- Scalable process for low pitch / high definition / high resolution arrays
- Full integrated solution compatible with various hybridization technologies
- Opportunity for low cost pixelation front-end technology

HOW DO WE WORK TOGETHER? INDUSTRIAL PARTNERSHIP

- Design of technology demonstrator according to customer system specifications
- Realization of customized LED-array demonstrator
- Technology transfer/licencing

+ WHAT'S NEXT?

In the near future we will work on:

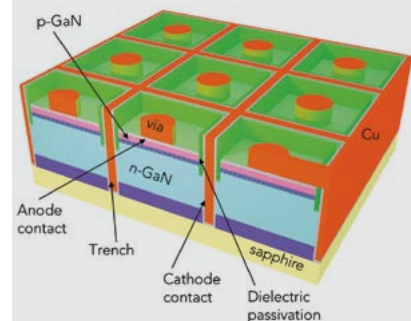
- Pixelation and hybridization of high resolution-array onto available active driver ASIC
- Light-extraction enhancement and color-conversion development compatible with low pixel pitch
- Development of high-power output driver

The generic pixelation technology is also compatible with micro-display applications.*

**"Process and characterization of high resolution GaN/InGaN LED arrays at 10 μ m pitch for μ display applications", L. DUPRE, Opto, Session 15, Thursday 2 Feb., 3:15 p.m., Paper 10104-71*

KEY FACTS:

- >95% emitting area (4 μ m interpitch 182 μ m pitch)
- >self-aligned patterning
- 2 photolithography front-end levels before hybridization
- Patents pending on:
 - array architecture
 - pixelation process and integration
 - low-pitch hybridization approaches



INTERESTED IN THIS TECHNOLOGY?

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