

Advanced Display

◀ Micro LED ▶

The Micro LED market is growth rapidly. Ennostar, with its comprehensive product lineup, offers high-quality, high-performance, and customized display solutions to meet diverse application needs.

Micro LED
improving
blue and green light efficiency

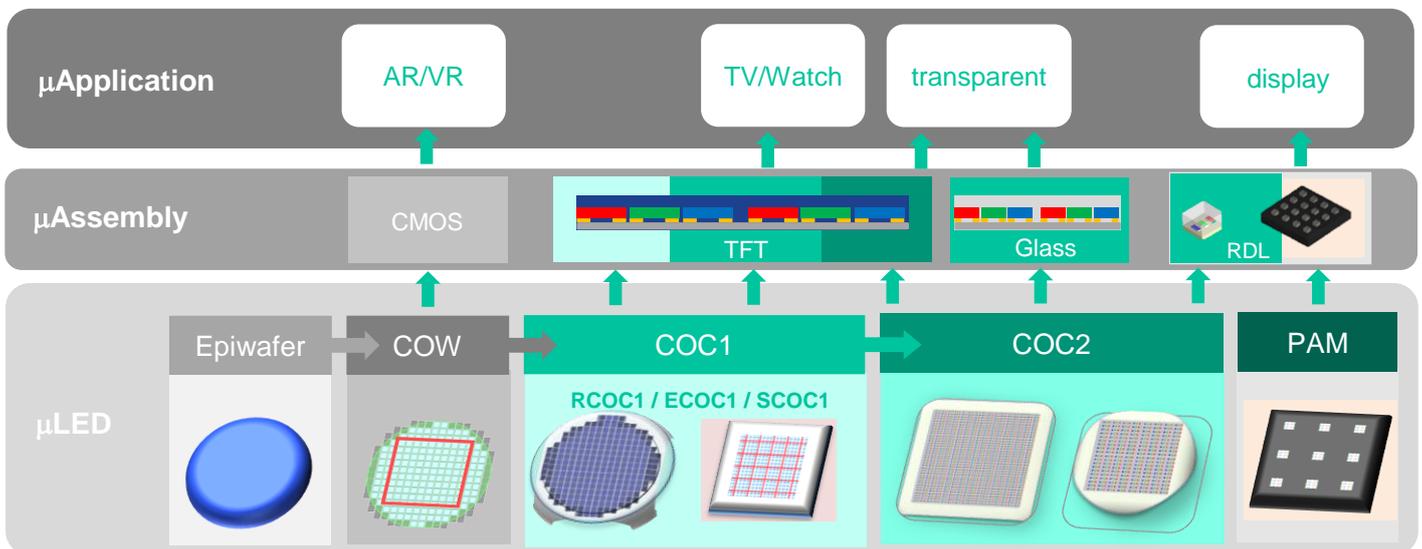
by **15%**

Micro LED
improving
Red light efficiency

by **90%**

With continuous performance improvements,
the size of **Micro LED** has decreased

by **40%**
compared to 2023.



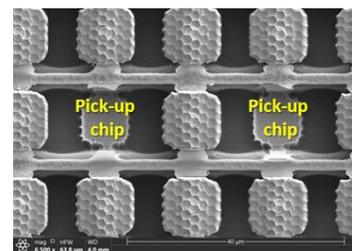
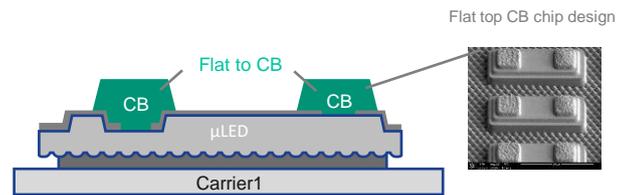
◀ COC1 Series ▶

■ Market Trends and Potential

In recent years, the Micro LED market has experienced rapid growth. Ennostar, with its comprehensive product line, offers high-quality, high-performance, and customized display solutions to meet diverse application needs

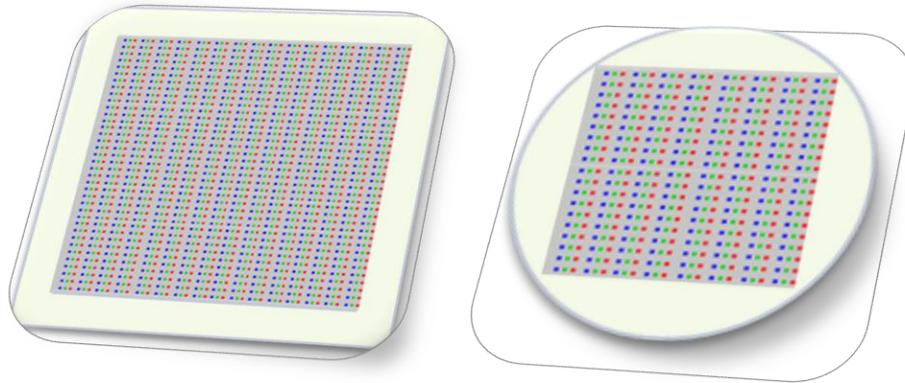
■ Technical Highlights

- RCOC1 : Suitable for laser mass transfer and repair
- ECOC1 : The world's first Micro LED sorting technology, capable of rearranging 4-inch wafers into 6-inch wafers or larger square sizes, reducing the number of mass transfers.
- SCOC1 : Suitable for Stamp mass transfer carriers, with a pitch of less than 3μm, facilitating more small-pitch applications.



✦ Sustainable Development Goals (SDGs)





■ Market Trends and Potential

With the widespread application of Micro LED technology in transparent displays and AR applications, this technology provides customers with efficient and flexible Micro LED carriers, further promoting the realization of innovative displays and interactive experiences.

■ Technical Highlights

- Wavelength Uniformity
- RGB three-color integration can be achieved on the same carrier, meeting diverse needs.
- Optimized design based on pixel pitch and arrangement area.
- Suitable for laser mass transfer, achieving high-efficiency and high-precision Micro LED processes and carrier transfers.

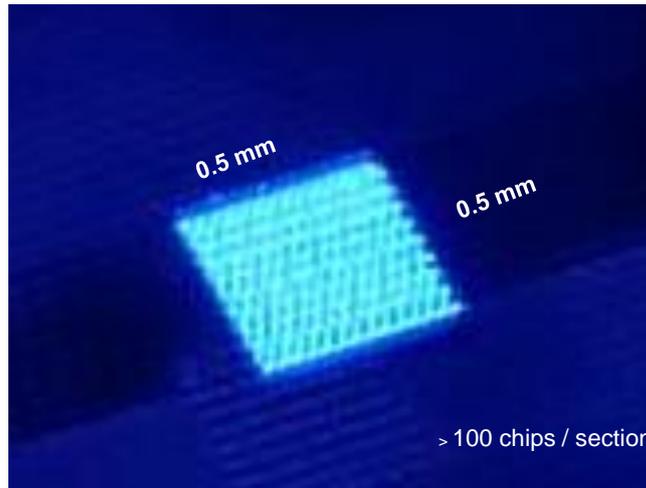
Customers can choose according to their needs (COC2: suitable for those with mass transfer equipment / PAM: suitable for those without mass transfer equipment).

✦ Sustainable Development Goals (SDGs)





μPPA



■ Market Trends and Potential

Current Micro LED products are all tested using Electroluminescence (EL). In response to market demands, Ennostar has pioneered a rapid burn-in test and EL full testing technology for Micro LED chips, helping customers improve yield rates.

■ Technical Highlights

- Ennostar's self-developed MEMS vertical probing Technology
- Reducing the full-point EL testing time for COW by 1/18, decreasing customer aging test time by 1/120, and reducing customer burn-in test space setup costs by 1/225.
- Providing over 14 times chip data compared to traditional technology, even achieving 100% testing efficiency.

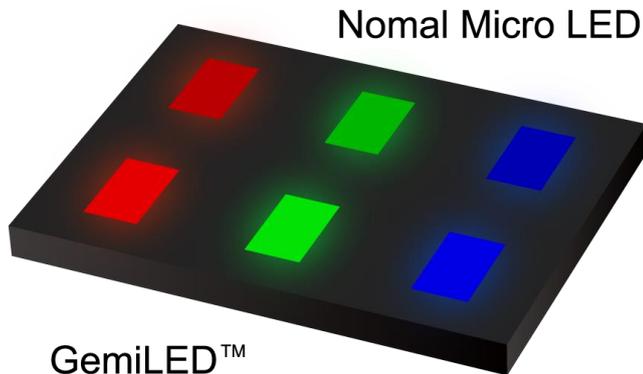


✦ Sustainable Development Goals (SDGs)





GemiLED™



Wavelength (nm)	R:620
	G:530
	B: 455
Array Panel Size (inch)	1.38 Micro-LED Array

Market Trends and Potential

- With breakthroughs in Micro LED manufacturing technology (such as transfer technology and yield control), the high-voltage connection technology of GemiLED™ will rapidly become widespread, and play as a key role to produce low-power-consumption and high-resolution displays.
- Improvement of high-voltage connection technology will reduce the demand for driver ICs and other material, which can lower the cost of end products and further enhance market competitiveness.

Technical Highlights

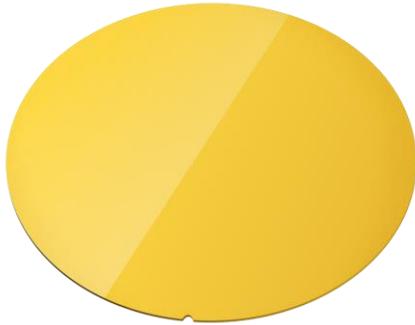
- **High-voltage series connection technology:**
 1. Reduces power consumption or increases brightness.
 2. Achieves higher efficiency and energy savings.
- **Simplified driver ICs and wiring:**
 1. Enables smaller display modules.
 2. Maintains performance and display quality.

✦ Sustainable Development Goals (SDGs)





Blue/Green 6" GaN on Si LED



Wavelength (nm)	G: 530 B: 455
Wafer Size (inch)	6

Market Trends and Potential

- **Si-based LED technology:**

1. Great potential for high-brightness, low-power-consumption displays and backlight modules.
2. Solution for the growing demand of high pixel density and real-time display such as AR/VR/XR equipment.

- **LED on Silicon (LEDoS):**

1. Applying to monolithic array process combining with CMOS backplane technology.
2. Integrating semiconductor and display technologies for next-generation display products.

Technical Highlights

- Green LEDoS EPI wafers can fill the gap in the market for Green LEDoS EPI wafers, providing more color options.
- High ability of process integration for miniaturization and lightweight requirements.

✦ Sustainable Development Goals (SDGs)



Micro LED Transparent Display



Chip size (µm)	20 x 40
Backplane	TFT
Color	RGB
Resolution (pixel)	1,280 x 720
Transmittance(%)	>55
Brightness (nits)	1000
Color gamut	>110% NTSC

Market Trends and Potential

- Micro LED transparent displays offer high brightness, low power consumption, and long lifespan, enabling diverse applications like commercial showcases and store glass walls for interactive product information.
- In smart buildings, transparent displays are used in windows and glass curtain walls, combining shading, energy-saving, and aesthetic functions to meet modern architectural needs

Technical Highlights

- Transmittance exceeds 55%.
- Brightness can reach up to 1,000 nits.

✦ Sustainable Development Goals (SDGs)



P0.9375mm RGB Micro LED



Pitch (mm)	0.9375
Resolution (pixel)	1080 x 1920
Display size (inch)	81

Market Trends and Potential

Ennostar is pioneering "low-carbon process" wafer-level packaging technology, and it integrates Micro LED and Micro IC into a single 0202 RGB package. The patented i-Pixel® driving method evolves from passive to active (called i-Pixel+™), and it fully utilizes the low energy consumption characteristics of LEDs.

Technical Highlights

- Ennostar's technology provides high brightness and high contrast, with no color shift at wide viewing angles. It also features a wide color gamut and excellent low-gray uniformity.
- The low energy consumption design significantly enhances energy efficiency.

✦ Sustainable Development Goals (SDGs)



AR Glasses



Wavelength (nm)	G: 530 B: 455
-----------------	---------------

Wafer Size (inch)	6
-------------------	---

Market Trends and Potential

Integrating voice control and gesture recognition functions, it provides navigation, positioning, and augmented reality, becoming an essential multifunctional tool for daily life and various professional fields. In the future, with AI smartphones and systems, it can analyze and provide data more quickly and accurately, helping users improve data analysis speed. °

Technical Highlights

- For the AR field, it brings an ultra-small full-color AR optical engine with a volume of only 1cc, achieving a design and appearance indistinguishable from regular glasses.

✦ Sustainable Development Goals (SDGs)

