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Mini LED ISD for Automotive: A Chip-to-Module Framework



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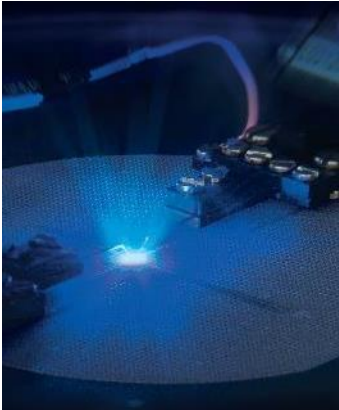
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▶ Ennostar : Together to Fulfill Customer Application Needs

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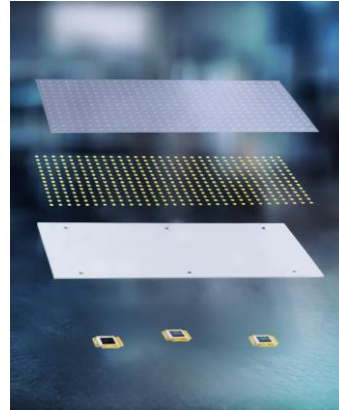
A vertically aligned platform enabling reliable, scalable applications.



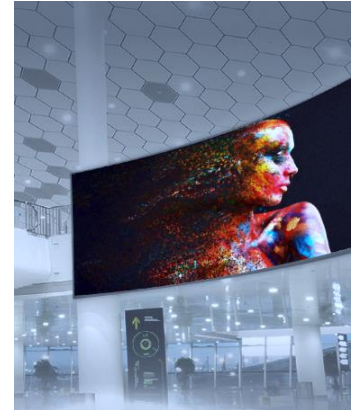
Epitaxial and Chip



Package



Module

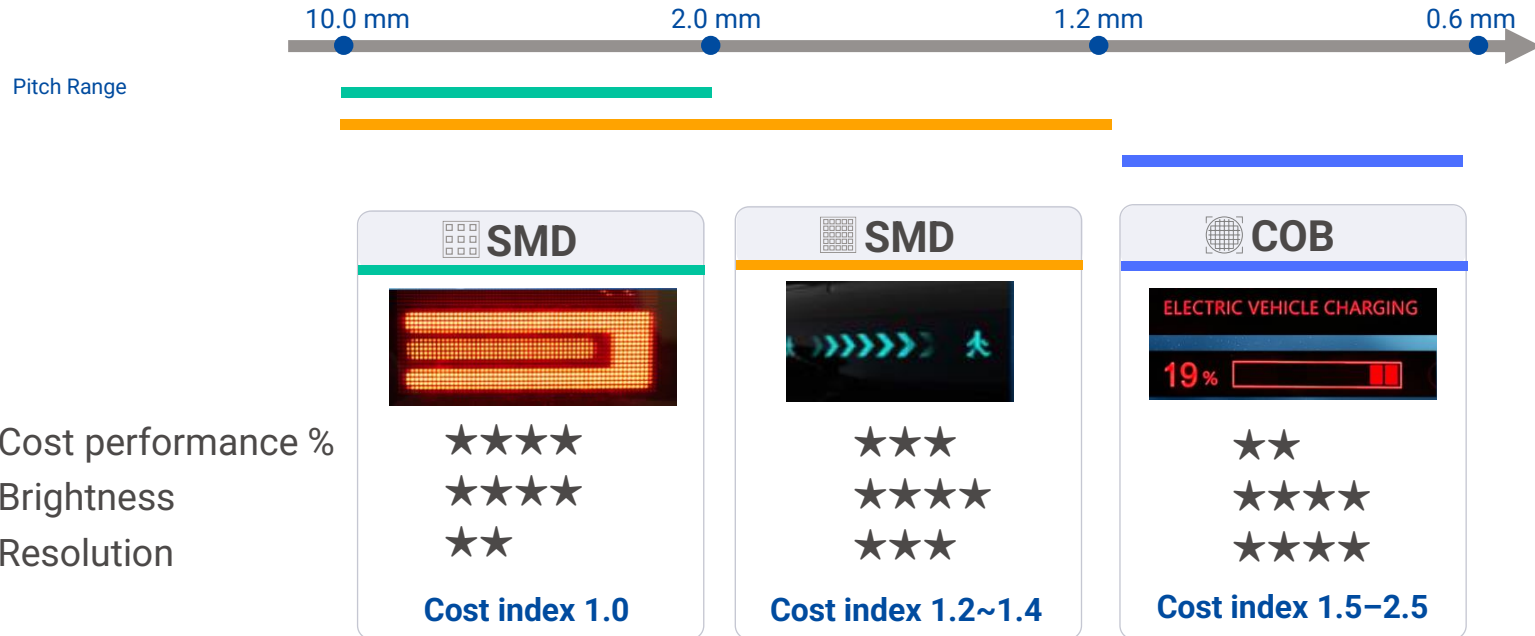


Solution

ISD Module Technologies: From Conventional LEDs to Fine-Pitch Mini LED

As pixel pitch decreases, performance improves—while system complexity increases.

Ennostar offers a complete tree-tier portfolio to address diverse ISD requirements.



▶ Mixed Resolution Architecture for Automotive ISD

Different ISD pitches involve trade-offs among resolution, brightness and cost.



Visibility & Efficiency | P4

- High brightness
- Cost efficiency
- Large-area signaling

mini-like | 4 mm | SMD

Dynamic Information | P2~P3

- Balanced resolution
- Clear contrast

mini-like | 2-3 mm | SMD

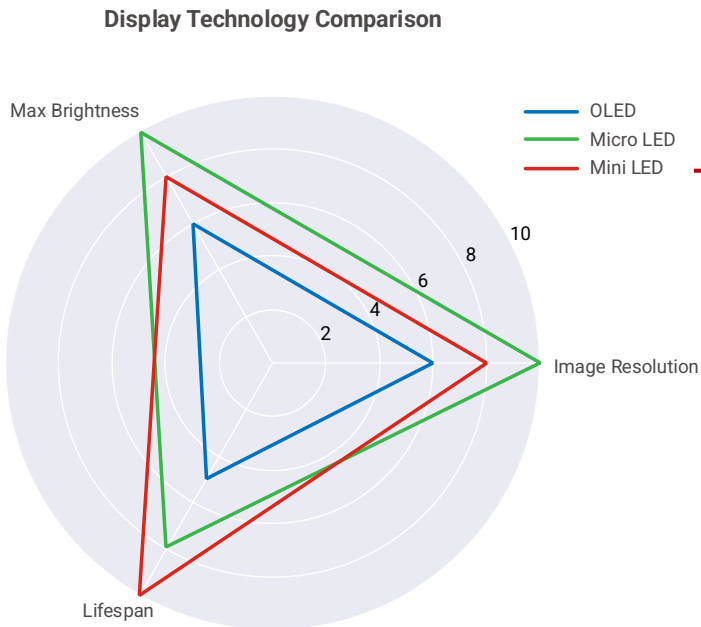
Precision Messaging | P1

- High resolution
- Sharp edges
- Fine animation

i-mini < 1 mm | COB

▶ A Practical Solution for Exterior ISD

Mini LED represents the most **Commercially Viable and Technically Mature** solution for current-generation ISD.



Mini LED Key Features

- ☀️ **High Brightness**
- 📺 **High Resolution**
- 🛡️ **High Reliability**
- 💰 **Scalable Cost Structure**
- 👁️ **Image Quality**

Vertical Integration: From LED Chips to Automotive ISD Modules

LED Product for Auto COB – Blue (Wd 450nm)

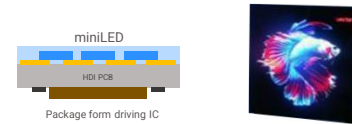


LED Product for Auto COB – Super Red (Wd 630nm)



Ennostar vertically integrates from mini LED chip manufacturing to automotive-grade ISD module, enabling system-level performance, reliability, and scalability.

i-mini Display Module



Automotive-Grade by Design



Multi-color Flexibility

- White/ SR/ RGB/ Cyan for ISD



Automotive-grade Reliability

- AEC-Q compliant design & validation



Manufacturing Stability

- Unmanned automated factory

Ennostar

Website



Linkedin



Bright Innovation · Sustainable Future

