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Automotive Display Intelligence Service

Part of the Small & Medium Displays & Touch Interface Service Area Package

A comprehensive guide to monitoring the automotive display market, including megatrend analysis, design and technology trends, supplier performance, supply chain activity, business models, and market dynamics.

Automotive Display Intelligence Service
MSCD-101105

> "The automotive industry is undergoing a digital transformation powered by AI, leading to a future of software-defined vehicles. The industry is embracing display-based UIs for control and intelligent awareness, coupled with future in-cabin AI."

Stacy Wu
Senior Principal Analyst

OMDIA

Automotive Display Intelligence Service: Deliverables

MARKET TRACKERS

—Quarterly, Semi-annually—

Automotive Display Market Tracker
Automotive Display Design and Technology Tracker

DATABASES

—Quarterly, Semi-annually—

Automotive Display Shipment Databases
Automotive Display Supply Chain Databases
Automotive Display Design and Technology Car Model Supply Chain Database

REPORTS

—Monthly—

Automotive Display & Tier One Report

ANALYST INSIGHTS

—Ongoing—

Display Dynamic articles, which include analyst commentary on market shifts, technology and regional developments, vendors, events, and more

SPECIAL REPORTS

—Ad Hoc—

Special reports of instant analysis on industry happenings, incidents display events, automotive shows, and news announcement

ANALYST ACCESS

—Ongoing—

For prompt responses to urgent and unique questions

Automotive Display: Market Tracker

Automotive Display Market Tracker : Quarterly

Application market, supplier's competitive landscape, and tier one/OEM supply chain dynamics

Frequency: Quarterly

Deliverables
- Historical and +2 quarter rolling by display makers database Long term forecast database
- Panel shipment supply chain database
- Quarterly finding report

Research Focus
- In-depth key automotive display panel application specifications (size, resolution, technology, ASP, PPI)
- Comprehensive analysis about tier 2 (panel suppliers) suppliers' business situation, technology development and capabilities.
- Analysis of the tier 1's and car makers' display panel sourcing strategies

Contents
- Automotive Display Market short term and long term analysis (quarterly update)
- Tier one's Supply Chain and Sourcing Strategies Analysis (semi-annually update)
- Panel Suppliers' Competitive Landscape Analysis (semi-annually update)
- Panel supplier automotive business review (quarterly update)

MORE MARKET TRACKERS

Automotive Display Market
Short-term and long term analysis
Frequency: Quarter
- Instrument Cluster Display
- Head Up Display
- Center Stack Display
- Rear Seat Entertainment Display
- Rear View Mirror Display
- Other Monitor Display
- Whom supplies whom: supply chain review

Tier one's Supply Chain and Sourcing Strategies Analysis (semi-annually)
Frequency: Semi-annual
- Alpine
- Bosch
- Continental Automotive
- Denso
- Panasonic
- LG VC
- Hyundai Mobis
- Nippon Seiki
- Visteon

Panel Suppliers' Competitive Landscape Analysis (semi-annually)
Frequency: Semi-annual
- Corporate financial performance
- Business performance
- Product portfolio
- Customer coverage
- Capacity and technology strategies

Panel supplier automotive business review
Frequency: Quarter
- AU Optronics (AUO)
- BOE
- ChinaStar
- Giantplus
- Innolux
- Japan Display Inc. (JDI)
- LG Display (LGD)
- Sharp Display (Sharp)
- Samsung Display
- JDI
- Tianma
- Truly
- HKC Display

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Automotive Display: Market Tracker

Automotive Display Design and Technology Market Tracker : Semi-Annual

Analysis of automotive display technology development roadmap

Frequency: Semi-annually

Deliverables

- Over 150 pages of power point slides for in-depth design and technology analysis
- Over 10 new or concept car models analysis in Excel

Automotive cockpit design and development trends (The content is subject to change.)

- Automotive industry and display development stage
- Cockpit domain controller: the auto display game changer
- The Future of HMI: from Innovation to multimode Design
- Consumer electronic display and automotive supply chain ecosystem analysis
- Future consumer electronic display development trends
- AR/VR, projection display development trends

Automotive display design and technology roadmap

- Display technology roadmap
- Flat panel display development status

Automotive display design and technology development analysis

- Benefits and demand status
- Supply chain readiness status
- Pricing/cost trends
- Supply chain readiness status

- Topics including
  - Micro LED displays for automotive
  - LCD local dimming solutions (Mini LED BLU, Dual Cell, others)
  - AMOLED display
  - Long displays and cover lenses
  - In-Cell touch displays
  - Knob/rotary/camera integrated with displays
  - 3D touch for automotive
  - Transparent displays for automotive
  - Naked eye 3D displays for automotive
  - AR HUD and PHUD
  - Privacy view display
  - Semi-annual model features and supply chain tracking
  - New topics

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Automotive Display: Market Report

Automotive Display & Tier One Report

More than ever, the automotive display industry is undergoing rapid changes. The Industry Reports are designed to give clients prompt updates and insight around automotive displays.

Deliverables
- PowerPoint analysis report

Light vehicle market review and outlook
- Global
- US Market
- China Market
- EU Market

Automotive tier one activities watch
- Top tier one panel sourcing strategies
- Chinese Tier One Company Analysis

Car model supply chain information
- Selected two model's supply chain info

Market event watch
- Display roadshows, conferences, automotive tradeshow reports

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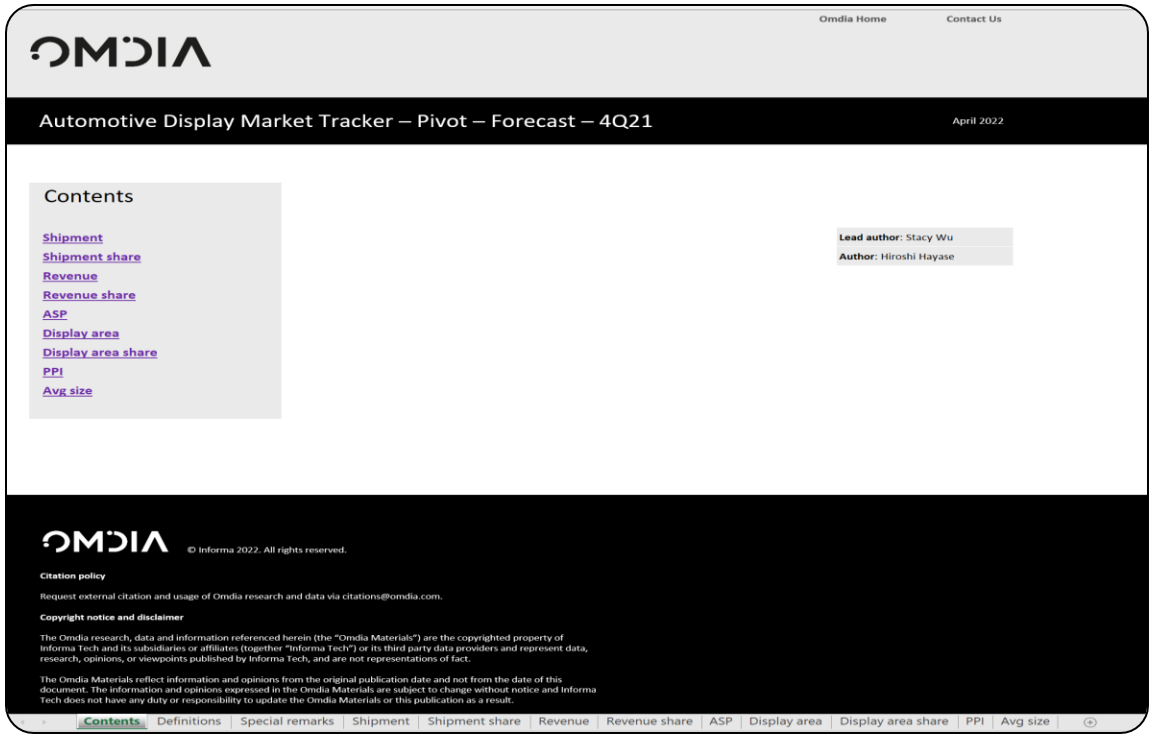
Automotive Display Market Tracker : Quarterly Database and Analysis



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Automotive Display Market Tracker – Pivot – Forecast – 4Q21

April 2022

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Shipment
Shipment share
Revenue
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Display area
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PPI
Avg size

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Author: Hiroshi Hayase

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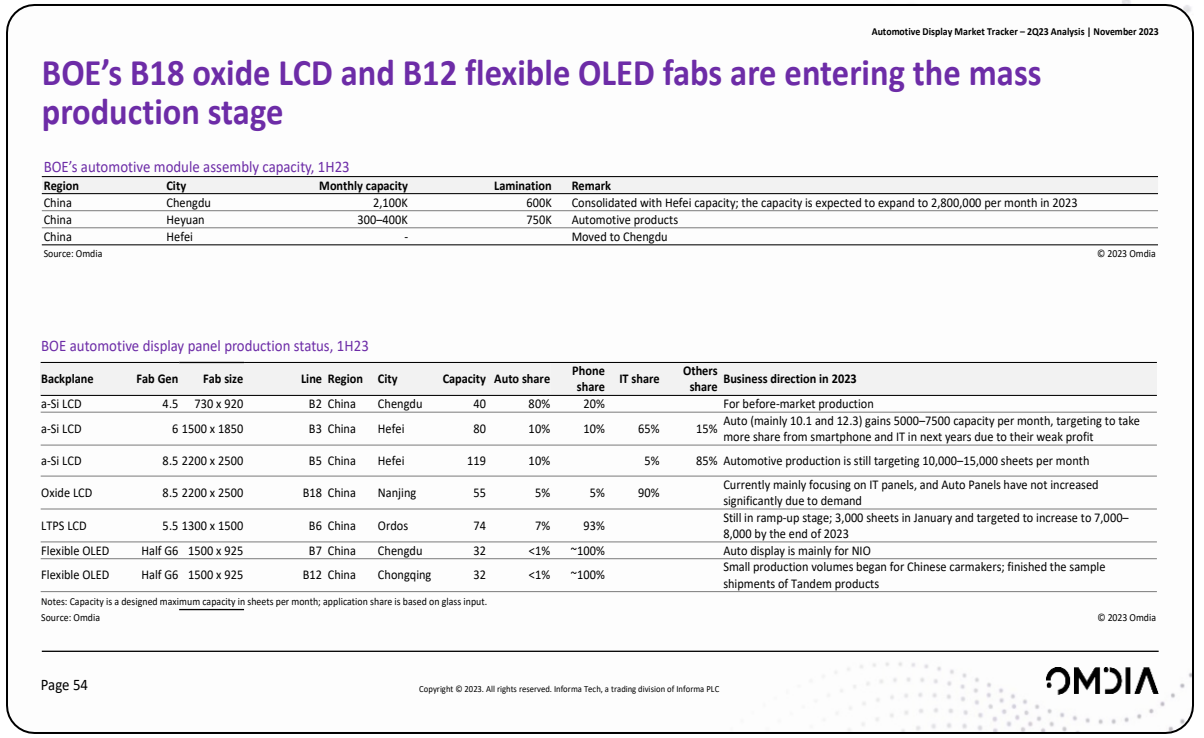

BOE's B18 oxide LCD and B12 flexible OLED fabs are entering the mass production stage

BOE's automotive module assembly capacity, 1H23

Region	City	Monthly capacity	Lamination	Remark
China	Chengdu	2,100K	600K	Consolidated with Hefei capacity; the capacity is expected to expand to 2,800,000 per month in 2023
China	Heyuan	300–400K	750K	Automotive products
China	Hefei	-		Moved to Chengdu

Source: Omdia

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BOE automotive display panel production status, 1H23

Backplane	Fab Gen	Fab size	Line	Region	City	Capacity	Auto share	Phone share	IT share	Others share	Business direction in 2023
a-Si LCD	4.5	730 x 920	B2	China	Chengdu	40	80%	20%			For before-market production
a-Si LCD	6	1500 x 1850	B3	China	Hefei	80	10%	10%	65%	15%	Auto (mainly 10.1 and 12.3) gains 5000–7500 capacity per month, targeting to take more share from smartphone and IT in next years due to their weak profit
a-Si LCD	8.5	2200 x 2500	B5	China	Hefei	119	10%		5%	85%	Automotive production is still targeting 10,000–15,000 sheets per month
Oxide LCD	8.5	2200 x 2500	B18	China	Nanjing	55	5%	5%	90%		Currently mainly focusing on IT panels, and Auto Panels have not increased significantly due to demand
LTPS LCD	5.5	1300 x 1500	B6	China	Ordos	74	7%	93%			Still in ramp-up stage; 3,000 sheets in January and targeted to increase to 7,000–8,000 by the end of 2023
Flexible OLED	Half G6	1500 x 925	B7	China	Chengdu	32	<1%	~100%			Auto display is mainly for NIO
Flexible OLED	Half G6	1500 x 925	B12	China	Chongqing	32	<1%	~100%			Small production volumes began for Chinese carmakers; finished the sample shipments of Tandem products

Notes: Capacity is a designed maximum capacity in sheets per month; application share is based on glass input.

Source: Omdia

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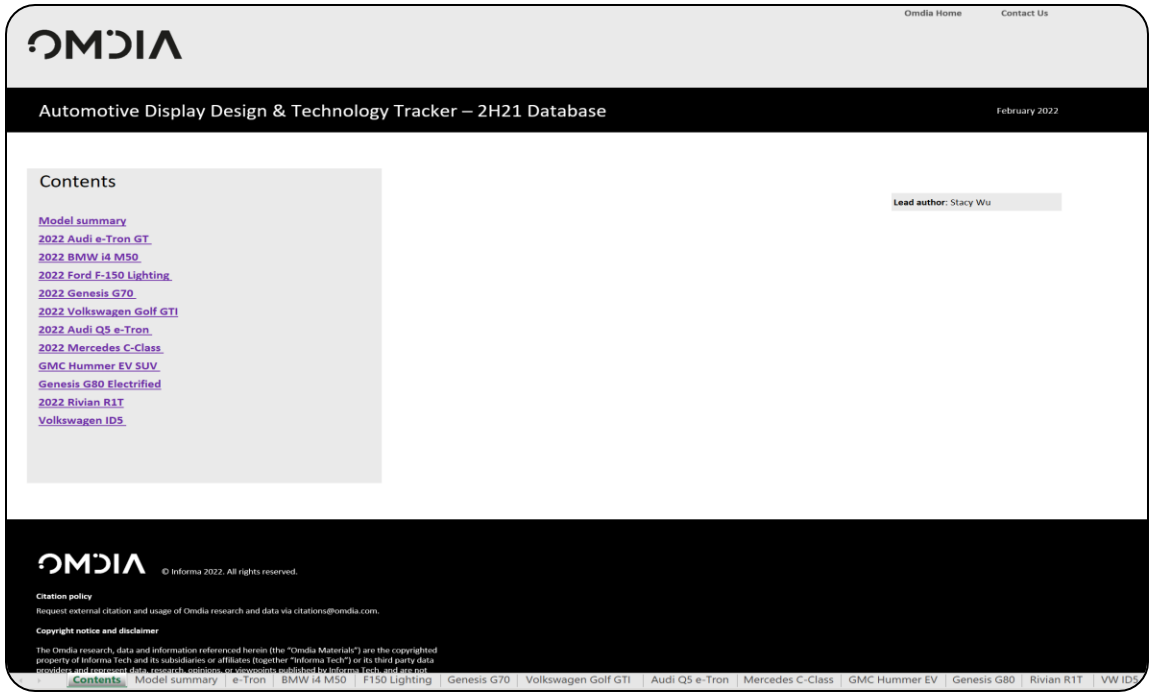
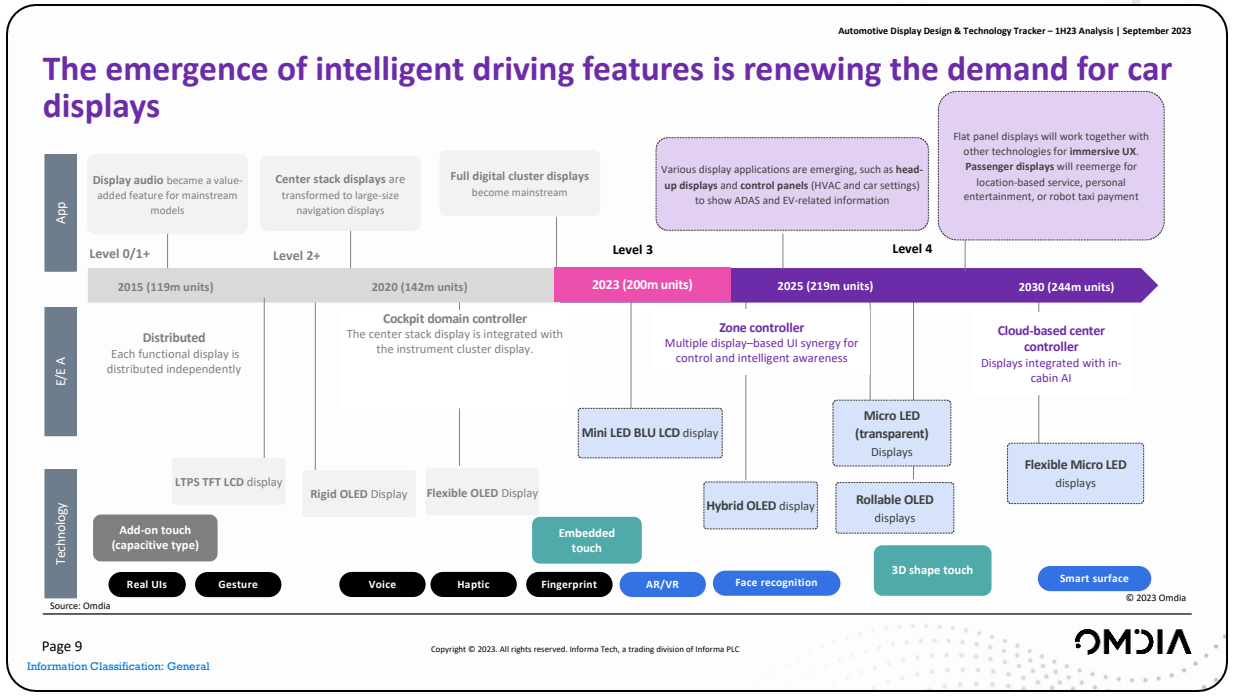
Automotive Display Design and Technology Market Tracker : Semi-annual, Database and Analysis





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Automotive Display & Tier One Report: Monthly and Analysis

Visteon: Tianma, JDI, and Truly together hold more than 50% of the market share

Visteon auto display suppliers by application, 1H23

Application	Panel maker	Unit	Share
Center stack display	BOE	835	32.7%
	Sharp	670	26.3%
	Truly	326	12.8%
	China Star	210	8.2%
	Japan Display	185	7.3%
	Tianma	133	5.2%
	Innolux	85	3.3%
	AUO	78	3.1%
	HannStar	28	1.1%
Center stack display Sum		**2,550**	**100.0%**
Control panel	Truly	89	59.7%
	Sharp	60	40.3%
Control panel Sum		**149**	**100.0%**
Head-up display	Kyocera	35	50.0%
	Japan Display	35	50.0%
Head-up display Sum		**70**	**100.0%**
Instrument cluster	Tianma	1,818	39.8%
	Japan Display	1,355	29.7%
	Truly	685	15.0%
	HannStar	337	7.4%
	BOE	149	3.3%
	China Star	100	2.2%
	Kyocera	80	1.8%
	Innolux	25	0.5%
	GiantPlus	10	0.2%
	AUO	6	0.1%
Instrument cluster Sum		**4,565**	**100.0%**
Passenger display	BOE	26	100.0%
Passenger display Sum		**26**	**100.0%**
Grand Total		**7360**	**100**

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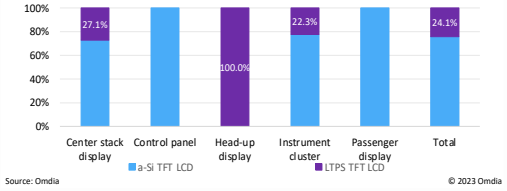
Visteon auto display purchase by technology, 1H23



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Visteon auto display suppliers by technology, 1H23

Panel maker	a-Si TFT LCD	LTPS TFT LCD	Total	Units
Tianma	34.8%	0.5%	26.5%	1951
Japan Display	8.0%	63.6%	21.4%	1575
Truly	19.7%	0.0%	14.9%	1100
BOE	17.6%	1.6%	13.7%	1010
Sharp	8.8%	13.5%	9.9%	730
HannStar	6.5%	0.0%	5.0%	365
China Star	0.0%	17.4%	4.2%	310
Kyocera	1.4%	2.0%	1.6%	115
Innolux	2.0%	0.0%	1.5%	110
AUO	1.1%	1.4%	1.1%	84
GiantPlus	0.2%	0.0%	0.1%	10
Grand Total	**100.0%**	**100.0%**	**100.0%**	**7,360**

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Automotive Display & Tier One Report | DEC 2023

Panasonic Holdings has decided to sell its automotive business to Apollo Global

- On November 17, Panasonic Holdings made an announcement stating that it plans to sell a section of its automotive systems business to investment funds that are managed by U.S. entities. A memorandum of understanding has already been signed between Apollo Global Management, a private equity firm, and a subsidiary of Apollo.
- Additionally, Panasonic mentioned the possibility of listing the business in the future. Panasonic further stated in a press release that the parties involved will continue to have exclusive discussions with the aim of concluding the agreement details by March 31, 2024. Panasonic emphasized the need for continuous investment in the automotive systems business to ensure sustainable growth for the company, especially considering the rapid shift to electric cars and evolving vehicle architecture.

Panasonic Automotive Business Performance

Overview

(yen: billions)	FY3/24 2Q	YoY (year-on-year)
Sales	367.2	114% (109%) *1
Adjusted operating profit (% to sales)	8.7 (2.4%)	+8.6
Other income/loss	0.9	+2.9
Operating profit (% to sales)	9.6 (2.6%)	+11.5

*1: In real terms excluding the effect of exchange rates

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Panasonic auto display suppliers by application, 1H23

Application	Panel maker	Unit	Share
Center stack display	IVO	915	32.6%
	LG Display	600	21.4%
	Sharp	460	16.4%
	AUO	322	11.5%
	Innolux	242	8.6%
	Samsung	160	5.7%
	Tianma	100	3.6%
	HannStar	9	0.3%
Center stack display Sum		**2,808**	**100.0%**
Head-up display	Innolux	165	55.9%
	AUO	130	44.1%
Head-up display Sum		**295**	**100.0%**
Instrument cluster	Tianma	104	100.0%
Instrument cluster Sum		**104**	**100.0%**
Passenger display	AUO	11	100.0%
Passenger display Sum		**11**	**100.0%**
Grand Total		**3,218**	**100.0%**

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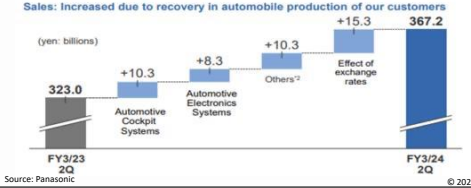
Sales: Increased due to recovery in automobile production of our customers



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Analyst Insight

Display Dynamics – March 2022: Cover glass surface treatment for automotive monitor applications

Analyst Opinion | 11 Mar 2022 | Calvin Hsieh

Selecting AG or AR surface treatment depends on the environment. AR treatment is suitable for directional light beams such as in an indoor environment. AG treatment is better when the ambient lights reach the surface in a random way (such a...

Display Dynamics – February 2022: Sharp announces the start of discussions to consolidate Sakai Display Products Corporation

Analyst Opinion | 1 Mar 2022 | Alex Kang

With full acquisition of stakes in SDP, Sharp expects to expand its TV set business and to see synergy with its existing fabs. Sharp also expects to be prioritized for panels produced at SIO fabs where a majority of shares are owned by SDP.

Display Dynamics – February 2022: BOE and China Star raised 1Q22 utilization rates

Analyst Opinion | 22 Feb 2022 | Alex Kang

BOE and China Star raised their 1Q22 utilization rates to ease their cost burden from low utilization and expand their market share. Despite the increase in utilization, shipments will dip, and panel manufacturers' inventories will rise.

Display Dynamics – January 2022: Automotive displays at CES 2022

Analyst Opinion | 20 Jan 2022 | Stacy Wu

A summary of show highlights from CES 2022 for automotive displays.

Display Dynamics – January 2022: Display driver ICs versus wafer foundry nodes and applications

Analyst Opinion | 11 Jan 2022 | David Hsieh

Large-area LCD driver ICs are mostly made with the 110nm to 300nm process node of 8-inch wafers, while smartphone LCDs and OLED driver ICs are mostly made with the 28nm to 90nm process node of 12-inch wafers.

Display Dynamics – January 2022: Displays at CES 2022

Analyst Opinion | 6 Jan 2022 | David Hsieh

The highlights of CES 2022 are QD OLED TV, QD OLED monitor, foldable notebook OLED, new OLED TV panel sizes (42-inch and 97-inch), and transparent OLED, among others.

Display Dynamics – March 2022: Cover glass surface treatment for automotive monitor applications

ANALYST OPINION | 11 MAR 2022 | CALVIN HSIEH

This Analyst Opinion is included in

DOWNLOAD

Contents

Key findings

Figures & Downloads

Figure 1: Optical bonding with lower reflection and increased safety

Figure 2: Major surface coatings for cover glass

Selecting AG or AR surface treatment depends on the environment. AR treatment is suitable for directional light beams such as in an indoor environment. AG treatment is better when the ambient lights reach the surface in a random way (such as in the outdoors).

Key findings

- The cost of cover glass material (such as soda lime or aluminosilicate) influences the touch module average selling price (ASP). Cover glass finishing (including form factor, strengthening, bonding, and surface coating) could influence the touch module ASP when the display size is bigger.
- Selecting anti-glare (AG) or anti-reflection (AR) surface treatment depends on the environment. AR treatment is suitable for directional light beams such as in an indoor environment. AG treatment is better when the ambient lights reach the surface in a random way (such as in the outdoors).

Embedded touch (in-cell and on-cell touch) is rising in automotive monitor applications owing to some advantages. First, in terms of business, panel makers are aggressive in approaching car OEMs or tier-one suppliers directly. Second, in terms of process, embedded touch sensor structures like one glass solution (OGS) can help reduce the use of adhesive materials and the number of bonding layers. Third, in terms of cost,

Display Dynamics – November 2021: TCL China Star announced a new roadmap and new products for its mini LED and micro LED displays

ANALYST OPINION | 18 NOV 2021 | DAVID HSIEH

This Analyst Opinion is included in

DOWNLOAD

Contents

Key findings

LCD with mini LED backlight

Mini LED and micro LED display

Appendix

Figures & Downloads

Figure 1: TCL China Star's 10.95-inch MLED tablet PC LCD module

Figure 2: TCL China Star's 17.3-inch 4K MLED gaming notebook PC LCD module with mini LED backlight

Figure 3: TCL China Star's 49-inch 5K MLED gaming curved monitor module with mini LED backlight

TCL China Star showcased 10.95-, 17.3-, and 49-inch mini LED backlight LCDs; 1.37-, 6.24-, and 7.1-inch mini LED displays; and 75- and 120-inch micro LED display modules.

Key findings

- TCL China Star revealed 10.95-, 17.3-, and 49-inch mini LED backlight LCDs; 1.37-, 6.24-, and 7.1-inch mini LED displays; and 75- and 120-inch micro LED display modules.

At the recent China Star Display Tech-Ecosystem Conference (DTC) in November 2021, the company announced a new mini LED and micro LED display roadmap. It also announced a series of new mini LED backlight panels and micro LED displays.

Omdia believes there are two aspects to TCL China Star's strategy:

- Introduce mini LED backlight to the current LCD module for the high-end market
- Develop mini LED and micro LED displays for the direct-view display market

Related Content: Small & Medium Displays & Touch Interface Service Area Coverage

Service Area Package:

Small & Medium Displays & Touch Interface

- Small Medium Display Market Tracker
- Small Medium Display Supply Chain Tracker
- OLED Display Market Tracker
- Smartphone Display Intelligence Service
- Automotive Display Market Tracker
- Automotive Display Intelligence Service
- Touch Display Module Interface Intelligence Service

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Industry's most comprehensive research including critical information on small & medium displays and display user interface markets. Based on unparalleled primary research methodology, Omdia provide detailed parameters and insight analysis on the market outlook, display ASPs, technology trend, supply chain and much more.

Service area coverage include: Small & medium displays with emphasis on Smartphone, Tablet PC, Smartwatch and emerging applications; Automotive displays including CSD, ICD and HUD; Display-based user interface including touch for IT /CE and commercial applications, fingerprint sensing on display and cover lens).

Omdia helps subscribers to identify critical market trends with our proprietary database and insights helping to create better business plan and strategy.

Intelligence Service /Tracker | Spotlight service | One-off Report | 2024 Planned Product

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