TIANMA

TIANMA

40th 1983-2023

2023 AUTOMOTIVE
PRODUCT CATALOG

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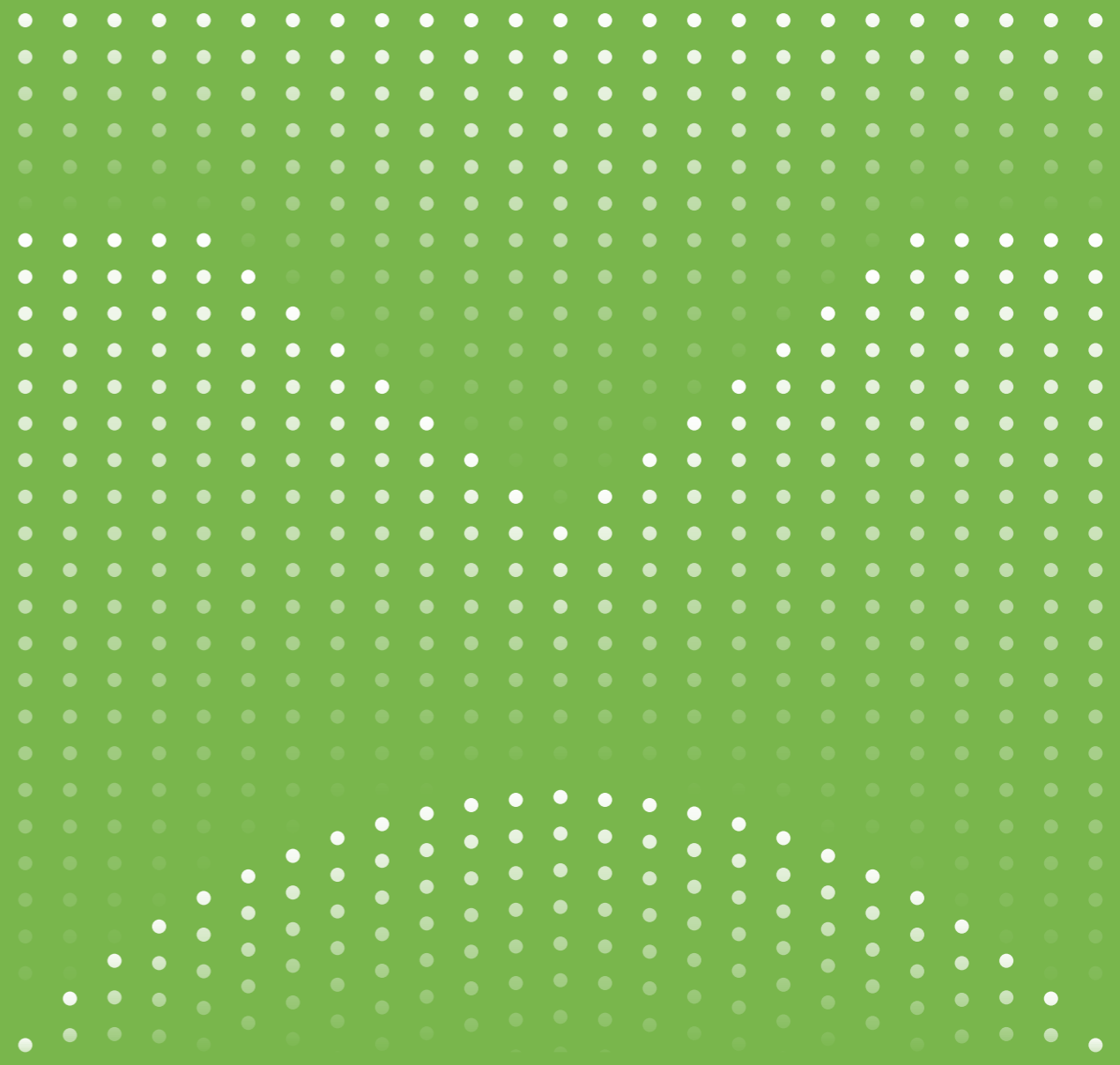
TO CREATE COLORFUL LIFE

About Tianma Automotive Business

Tianma Microelectronics Co., Ltd. (Tianma) specializes in providing state of the art display solutions and efficient sales and services worldwide. Tianma was established in 1983 and in 1995 was publicly listed on the Shenzhen Stock Exchange.
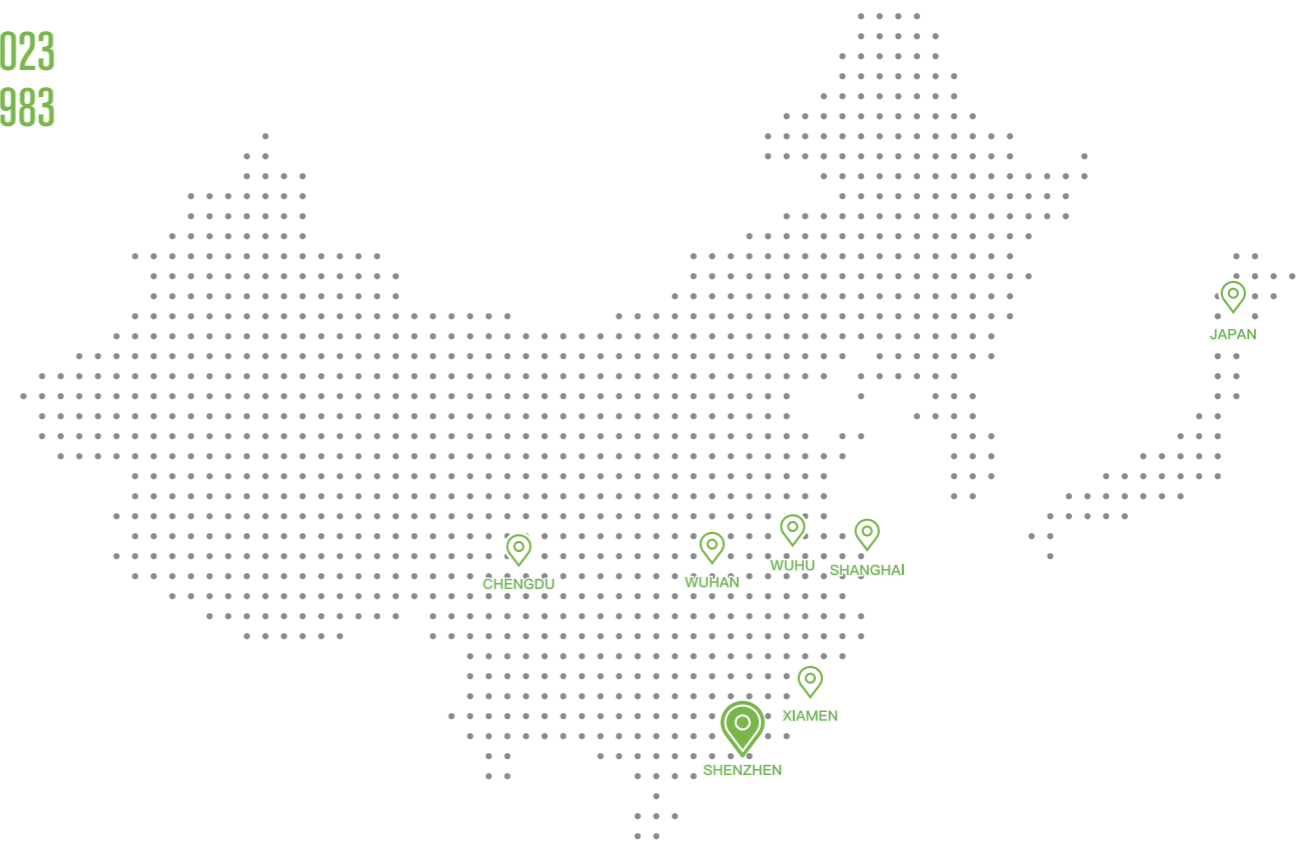
Tianma has been in the automotive market since the early 1990s. After more than 30 years of efforts, Tianma automotive display products are now widely used in most global OEM automotive brands. In 2020, Tianma's global automotive display shipments ranked No.1 WW and remained No.1 through 2021, in both factory-installed and cluster displays.

In the future, as vehicle network, autonomous driving, sharing and new energy vehicles are the general trend, Tianma will continue to expand automotive display performance, through increased research and development, enhanced automotive display technology and improved product quality, providing high-quality professional automotive display solutions for the global automotive markets.

Data source: Omdia

JAPAN

CHENGDU   WUHAN   WUHU   SHANGHAI

XIAMEN

SHENZHEN

Company History

1983	1995	1983-2003	2006	2008
ESTABLISHED IN SHENZHEN	PUBLICLY LISTED	SHENZHEN PM-LCD	SHANGHAI G4.5 TFT-LCD	CHENGDU G4.5 TFT-LCD

2008	2009	2010	2011	2011
WUHAN G4.5 TFT-LCD	SHANGHAI G5 TFT-LCD	SHANGHAI G4.5 OLED	XIAMEN G5.5 LTPS	JAPAN G2/G3 TFT-LCD

2013	2014	2015	2018	2019
SHANGHAI G5.5 AMOLED	XIAMEN G6 LTPS	WUHAN G6 LTPS AMOLED	WUHAN G6 LTPS AMOLED PHASE II	HUBEI YANGTZE RIVER NEW DISPLAY INDUSTRY INNOVATION CENTER FOUNDED

2020	2022	2022
XIAMEN G6 AMOLED	XIAMEN G8.6 a-Si/IGZO LCD	WUHU NEW DISPLAY MODULE PRODUCTION LINE

Flexible OLED Curved Display

Flexible OLED curved displays have broad application prospects in the smart mobile display segment, which use poly–imide flexible substrate, thin film encapsulation technology, supporting narrow border and ultra thin design.

⬓	Ultra thin
⊫	Free form
⌇	Ultra narrow border
⊏	Bending radius

Micro–LED

Micro–LED features miniature LED arrays, with each Micro–LED functioning as a pixel, individually driven to emit light. This enables modules to become more energy efficient, with high transmittance, high contrast, high brightness, narrow border and ultra–thin, etc.

普通LED

Micro–LED

Precision in the scale of micron
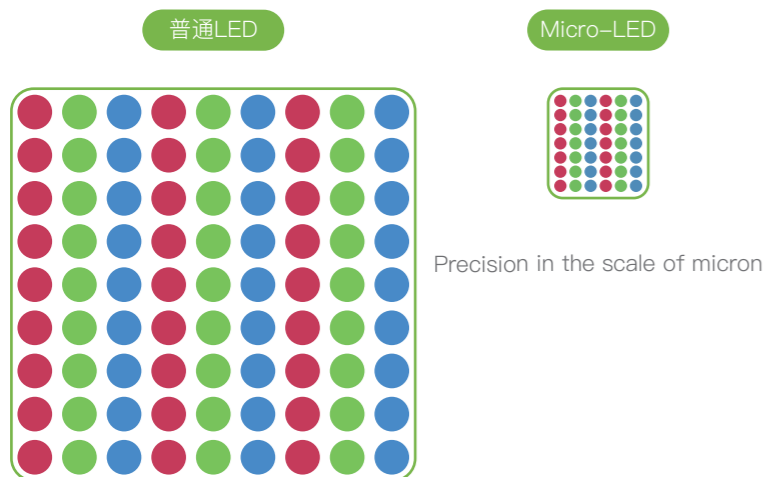
⬚	Seamless splicing
⊫	Narrow border
▦	High transparency

ARIES Display

In order to drive in high ambient light conditions and still meet the viewing requirements and expectations for both drivers and passengers, we use ARIES (advanced reflection invisible technology with embedded structure). The ARIES technology helps to achieve ultra–low reflection and improve contrast providing better overall display performance.

ARIES LCD

LCD
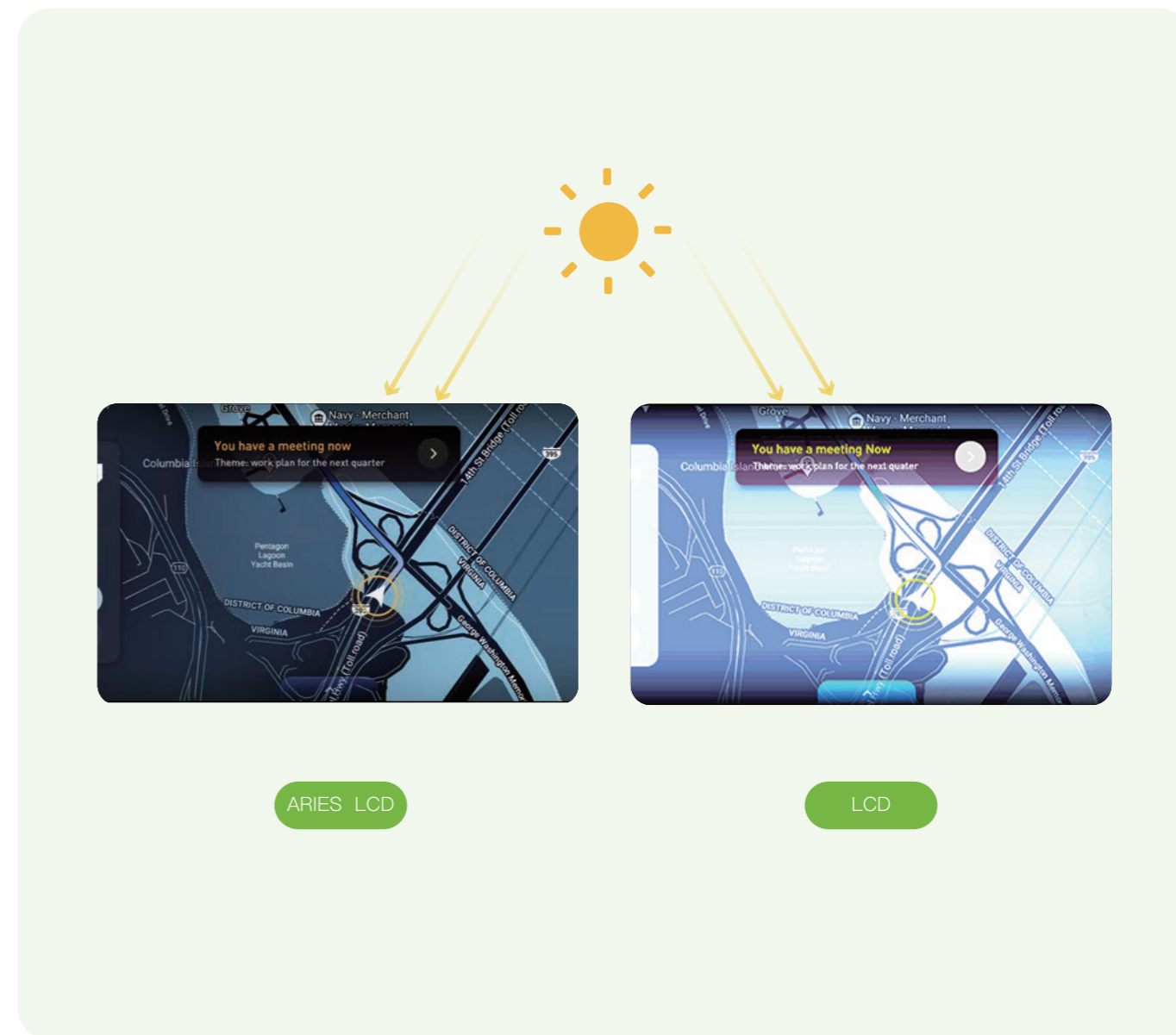
⬈	Super low reflectance < 0.6%
⬛	Seamless △E < 2

◑	High ambient contrast ratio (ACR)

＊ARIES: Advanced Reflection Invisible Technology with Embeded Structure

Local Dimming Solutions

· ACRUS Display

The LCD uses a dual – screen dimming technology, to help achieve a contrast ratio ≥ 100,000:1 and the true black effect.

Color panel CR = 1200:1

Monochrome Panel

ACRUS CR≥100,000:1

· Mini–LED

The display module consists of a TFT glass backplane with thousands of Mini–LEDs, a color conversion film and TFT–LCD to achieve high dynamic contrast, excellent display effect and low power consumption.

LCD

Color conversion
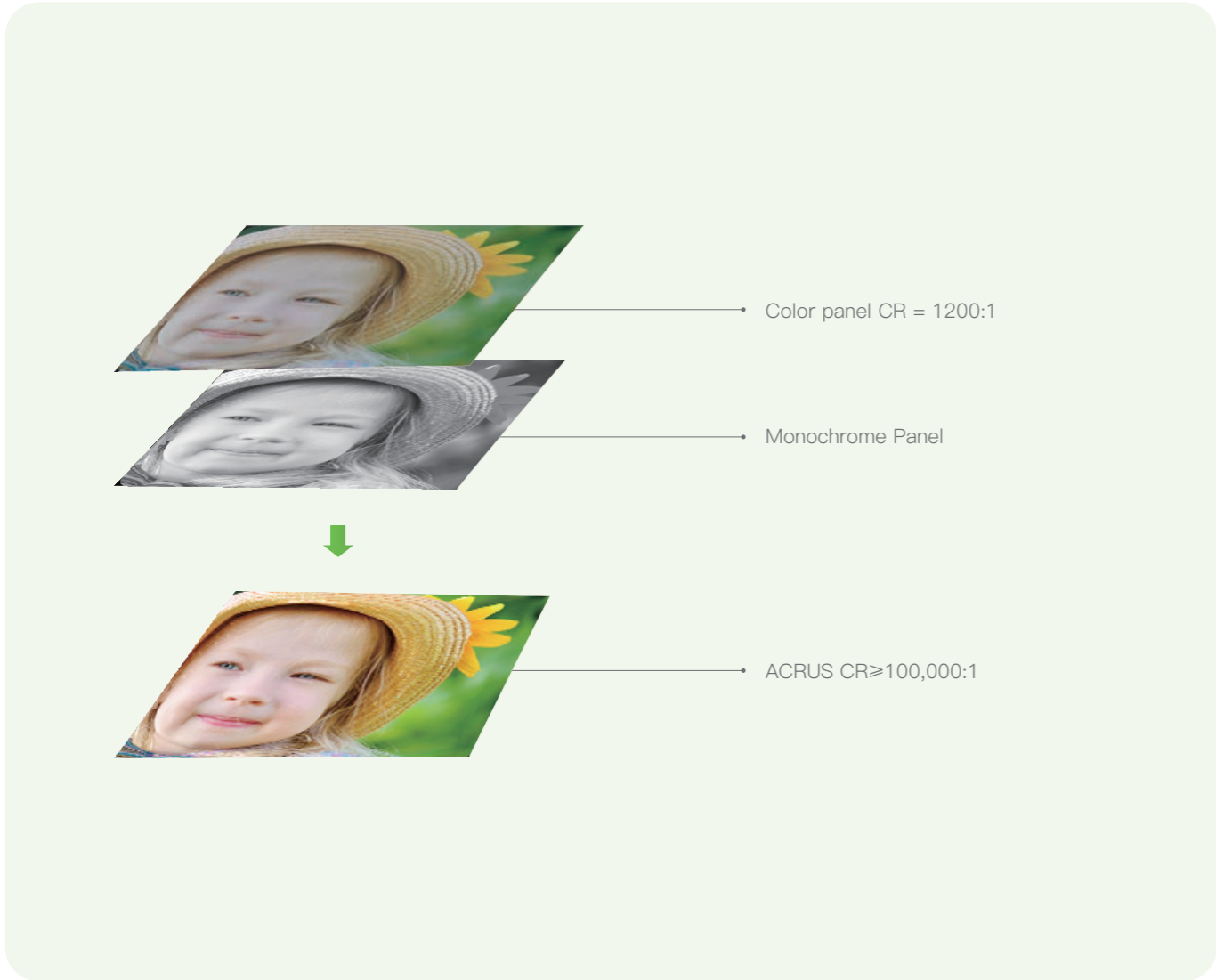
Mini–LED backplane

High contrast ratio ≥ 100,000:1

Local dimming

True black
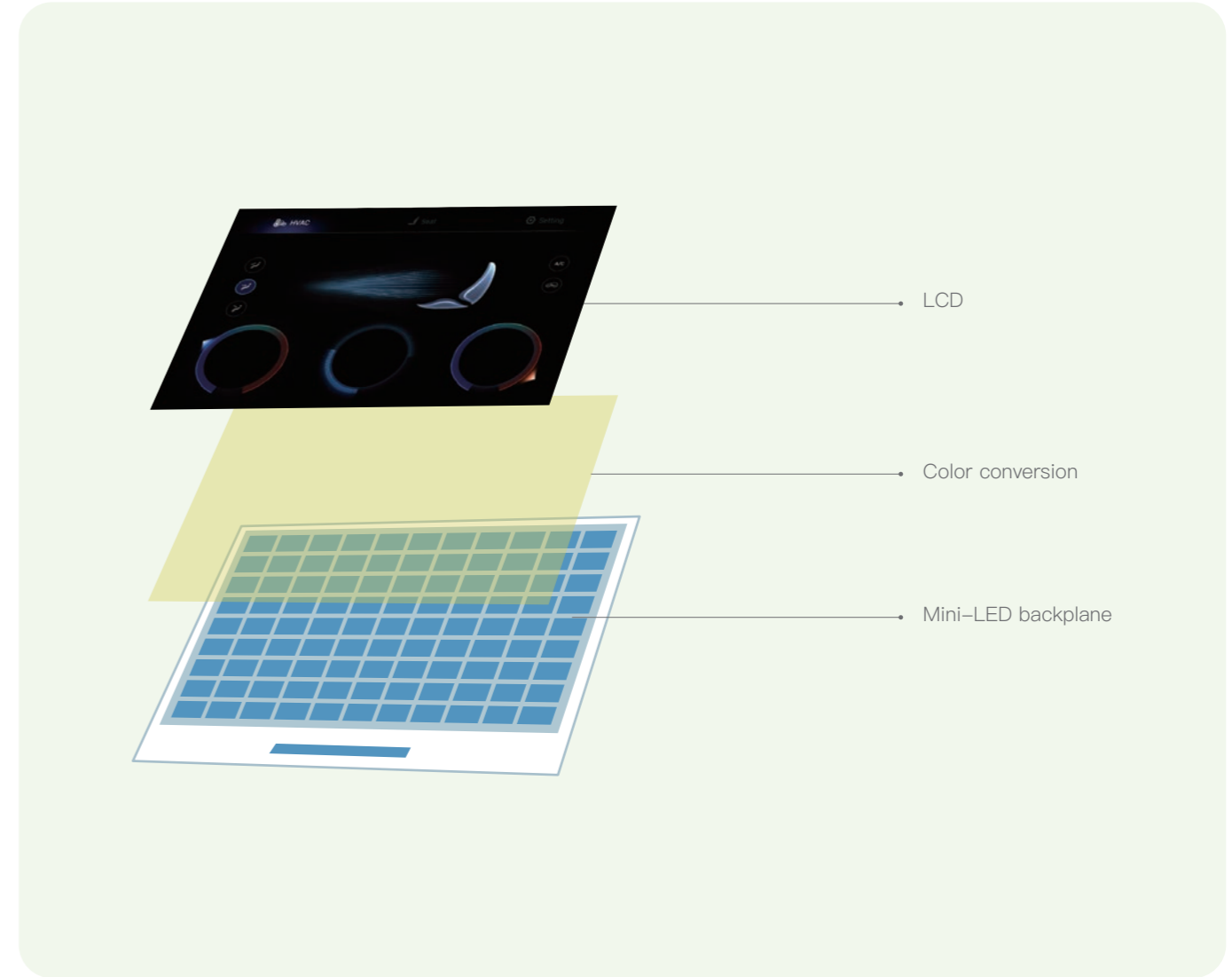
High dynamic contrast >100,000:1

High color gamut

Thousands of Mini–LED

Low power consumption: reduced by 70%

AM TFT glass substrate

Curved Display

Tianma's curved display technology enables various flexible curve radius design options for automotive displays. The curvature radius of the screen is R700~R3000, which is better suited to a person's viewing angle, and helps to meet the customized design requirements for next generations system integration. Ultra–high contrast ratio(>100,000:1), creating a perfect visual experience.

Screen Type		Curvature	
Single Curved Display			LCD / Backlight
Dua Curved Display			LCD / Backlight
Curved & Intergrated Display			LCD / Backlight
Curved & Freeform & Intergrated Display			LCD / Backlight
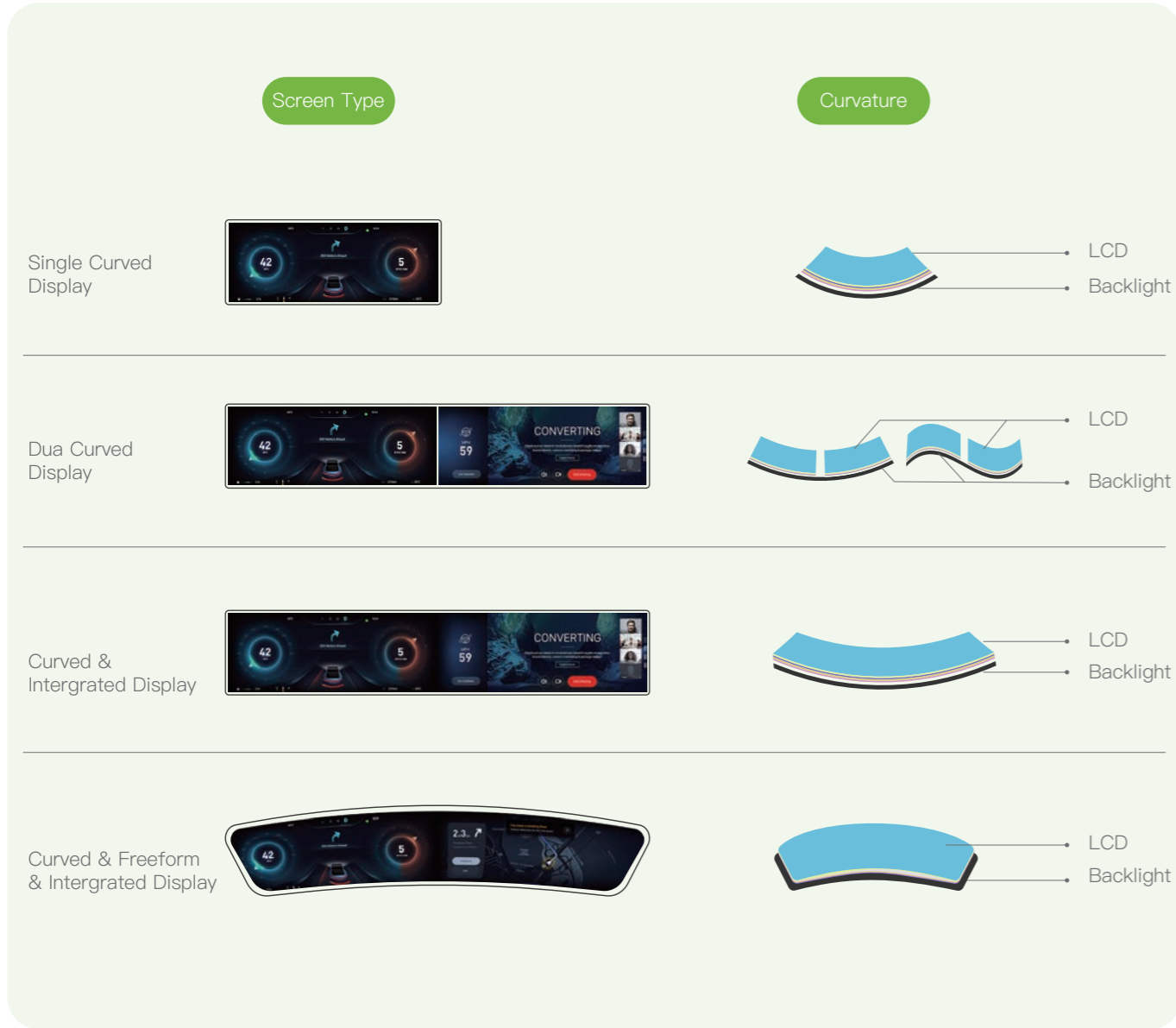
- High resolution 5432×932 (200 PPI)
- High dynamic contrast ratio >100,000:1
- Low reflectivity < 1.4% & Seamless ΔE < 2
- High color gamut >100%
- Full–screen multi–finger touch
- R700 (mm) ~ R3000 (mm)

Touch Solution

· TED

TED(Touch Embedded Display technology) is a solution that integrates both touch and display controller functions. The common electrode of the display is designed into a number of unit arrays to realize the technology of driving display and touch simultaneously by TDDI and only one FPC.

Out CELL

Touch Sensor

Cover Glass Glue   Glue   CF POL   CF Glass   LC   TFT Glass   POL

TED

FOG
TDDI   Touch Sensor
Cover Glass Glue   CF POL   CF Glass   LC   TFT Glass   POL
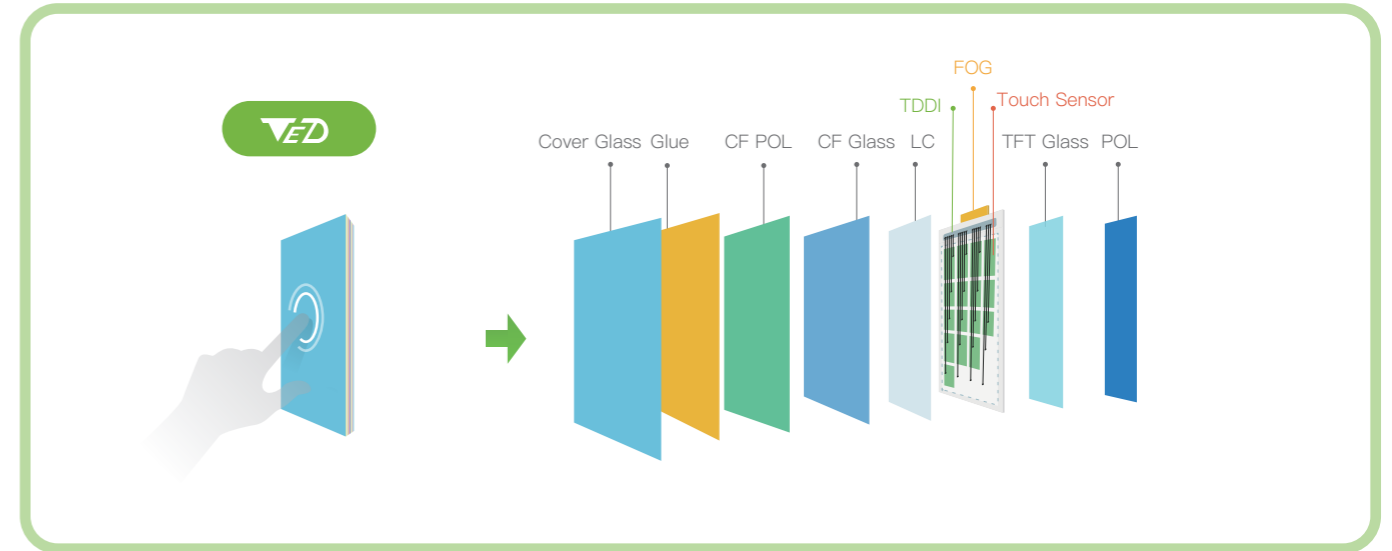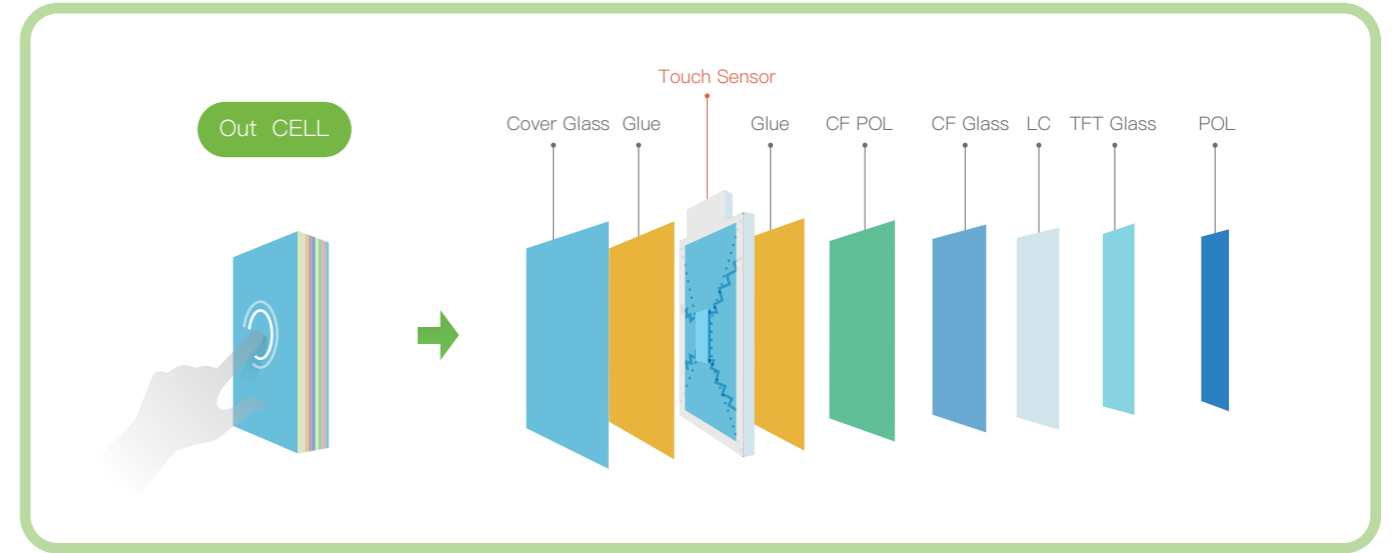
- Higher transmittance
- Super low reflectance
- High SNR & Good TP performance
- Super slim
- Narrow border

＊TED: Touch Embedded Display

Gesture Touch

Tianma gesture technology allows the user to operate with gesture in a space close to the display without touching. The technology detects changes in the electrostatic capacitance when the hand approaches with the electrical field generated between the transmitting electrodes and the receiving electrodes on the sensor substrate.

Electric field

Receiver   Transmitter

Touch

Gesture detection area

Click

Wave one hand
from side to side

Push forward
with one hand

Use two fingers
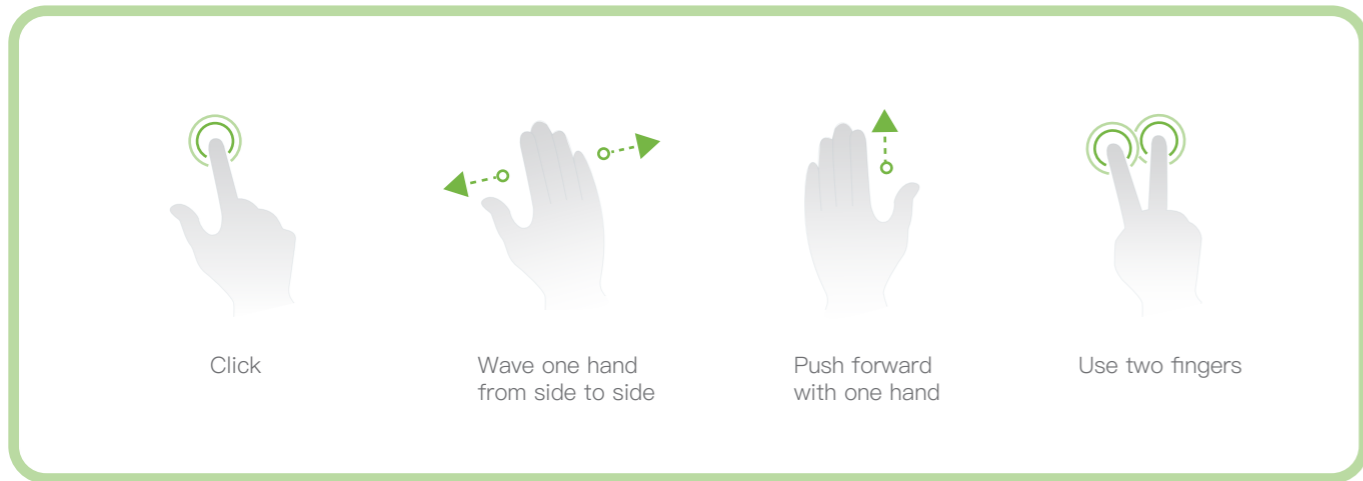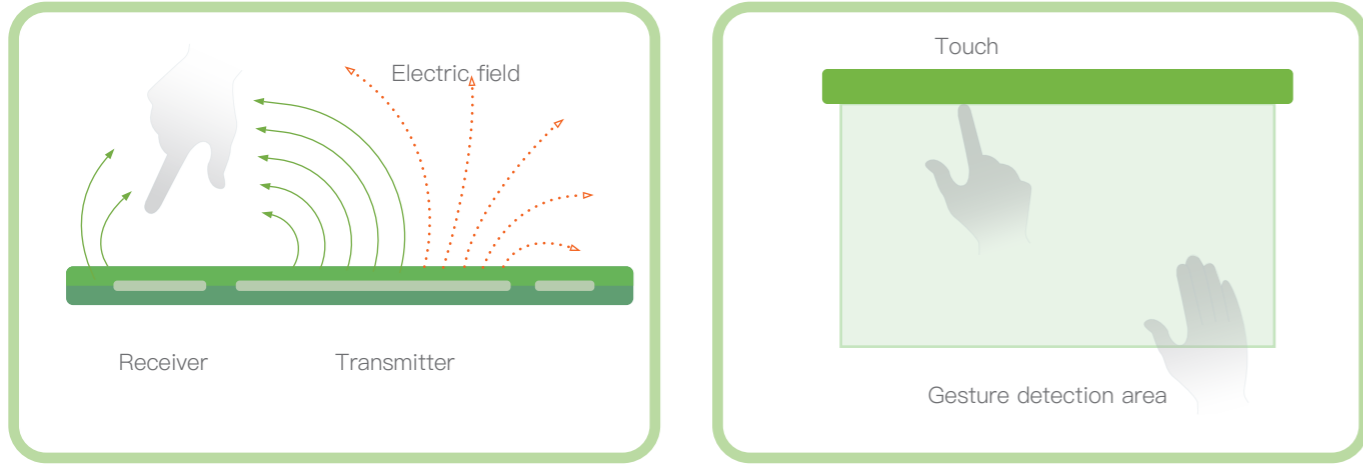
Detection distance : ~15cm

Gesture : Flick, Circular

Touch operation is available

Tactile Feedback

Tianma's tactile–feedback touchscreen features a capability of eyes–free interaction. Texture sensation is experienced when using the on–screen button by the electrostatic force,to locate the button with a user's finger and click sensation is presented by lateral motions when the user presses a button. This technology enhances safety during operating or driving a machine by reducing looking–away time.

Texture sensation   Click sensation

Living room   Bedroom   Dinning room

Tactile
when users push & release button

Rough & sticky
when sliding their finger

electrode

Friction on the surface is controlled by electrostatic forces between the electrodes and the fingers
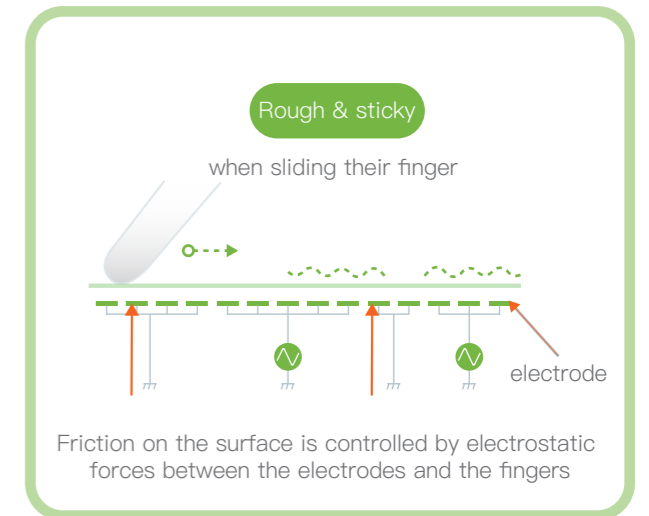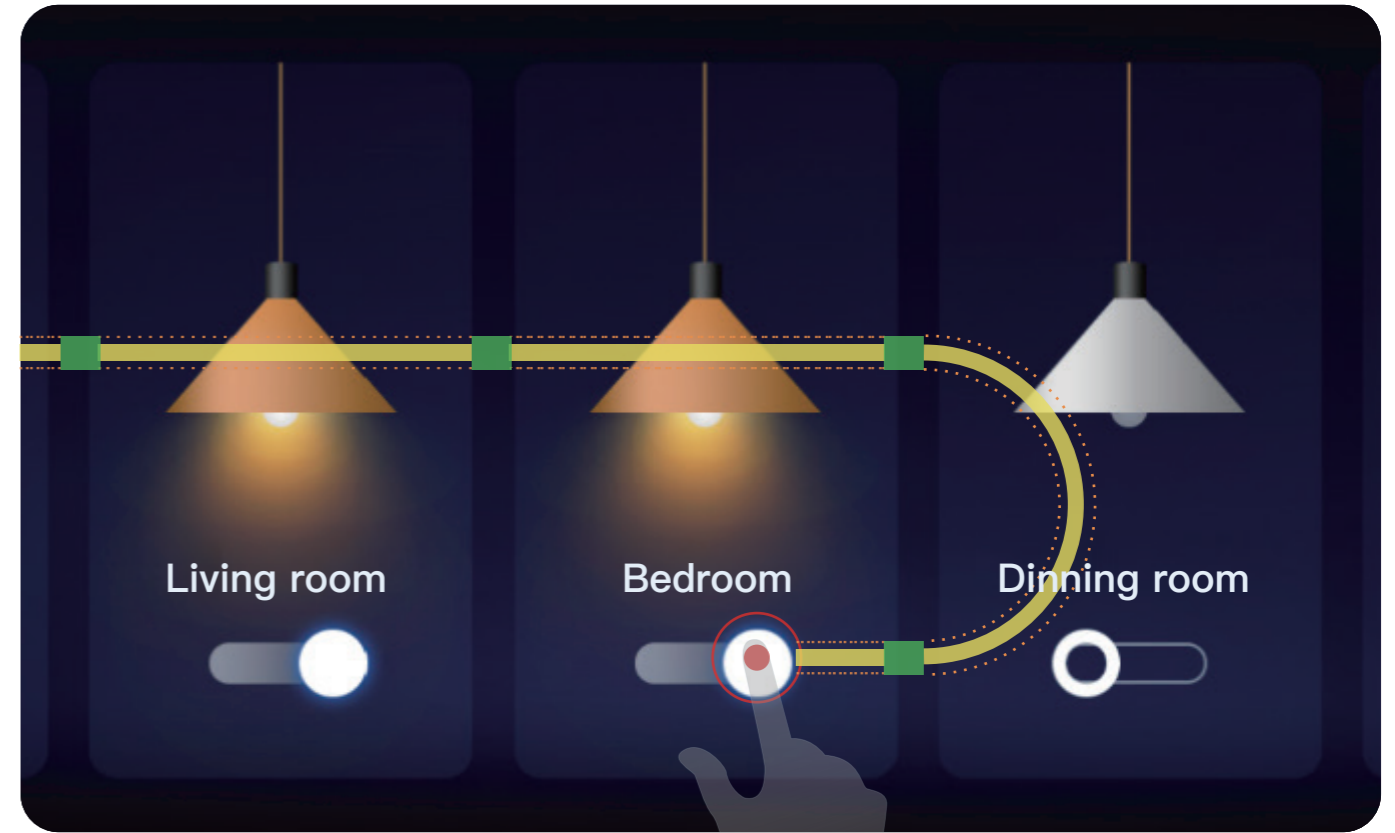
Knob on Display

Knob on Display is the physical embodiment of a control knob, placed on a display's touchscreen, supported by a virtual knob position and movement interface.

Privacy Display

To comply with driver's request for safe driving, display with privacy mode is required. To support this trend, a display works in privacy mode, but also in commom mode for convenience.

Common mode		Privacy mode
	0°	
	+30°	
	+60°	
	−30°	
	−60°	

18 Detents	Auto detection function
Push button function	
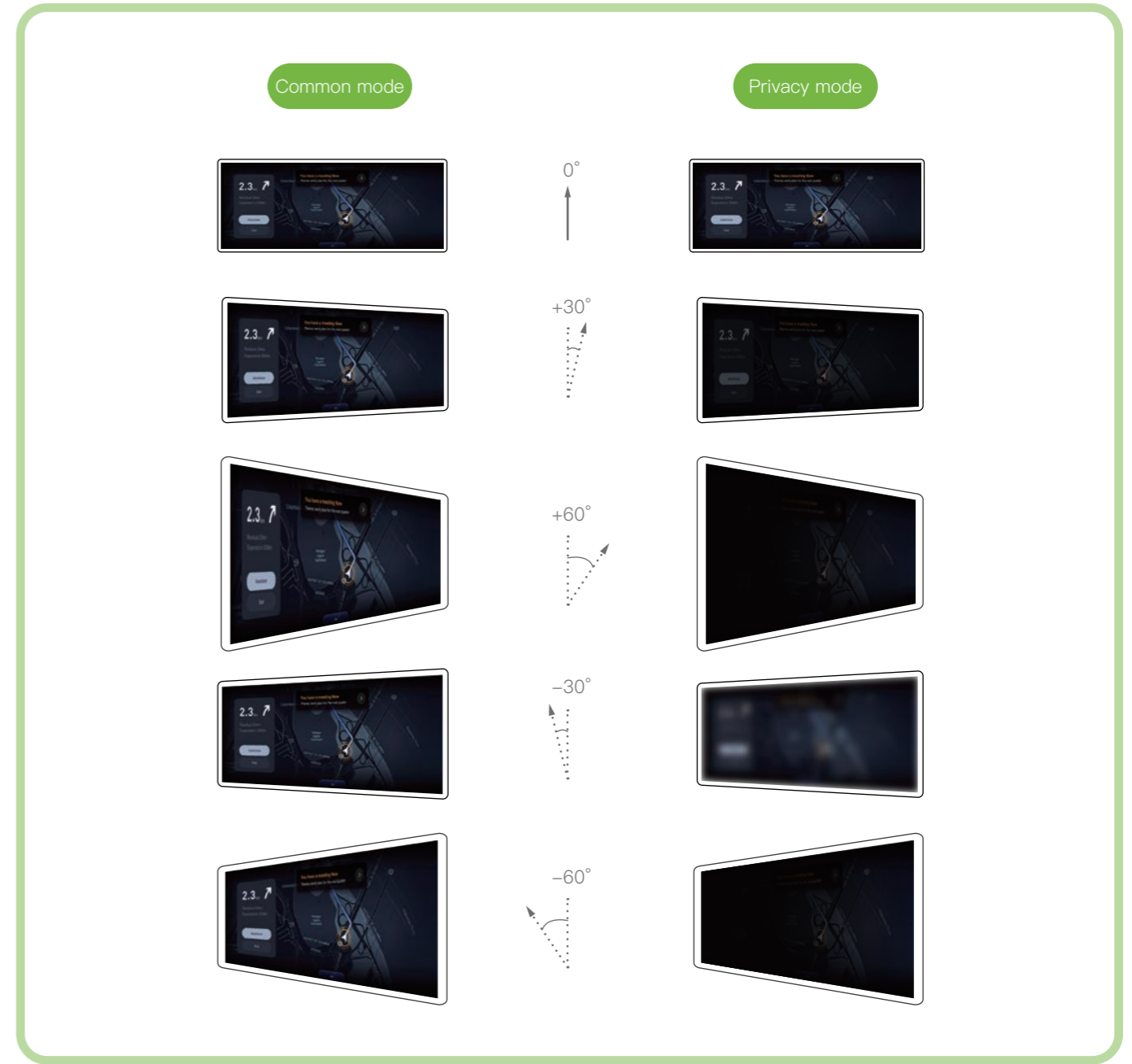
Driving safety	Sharing/private mode switchable

Acoustic Screen with Directed Audio

In order to create separate sound zones and individual sound fields for drivers and passengers, we developed this technology so that the screen becomes a sound generator with materials that control the direction and angle of sound production.

Effective distance

Ultrasonic beam

Analog acoustic wave with accumulation effect

High directivity beam

Ultrasonic beam
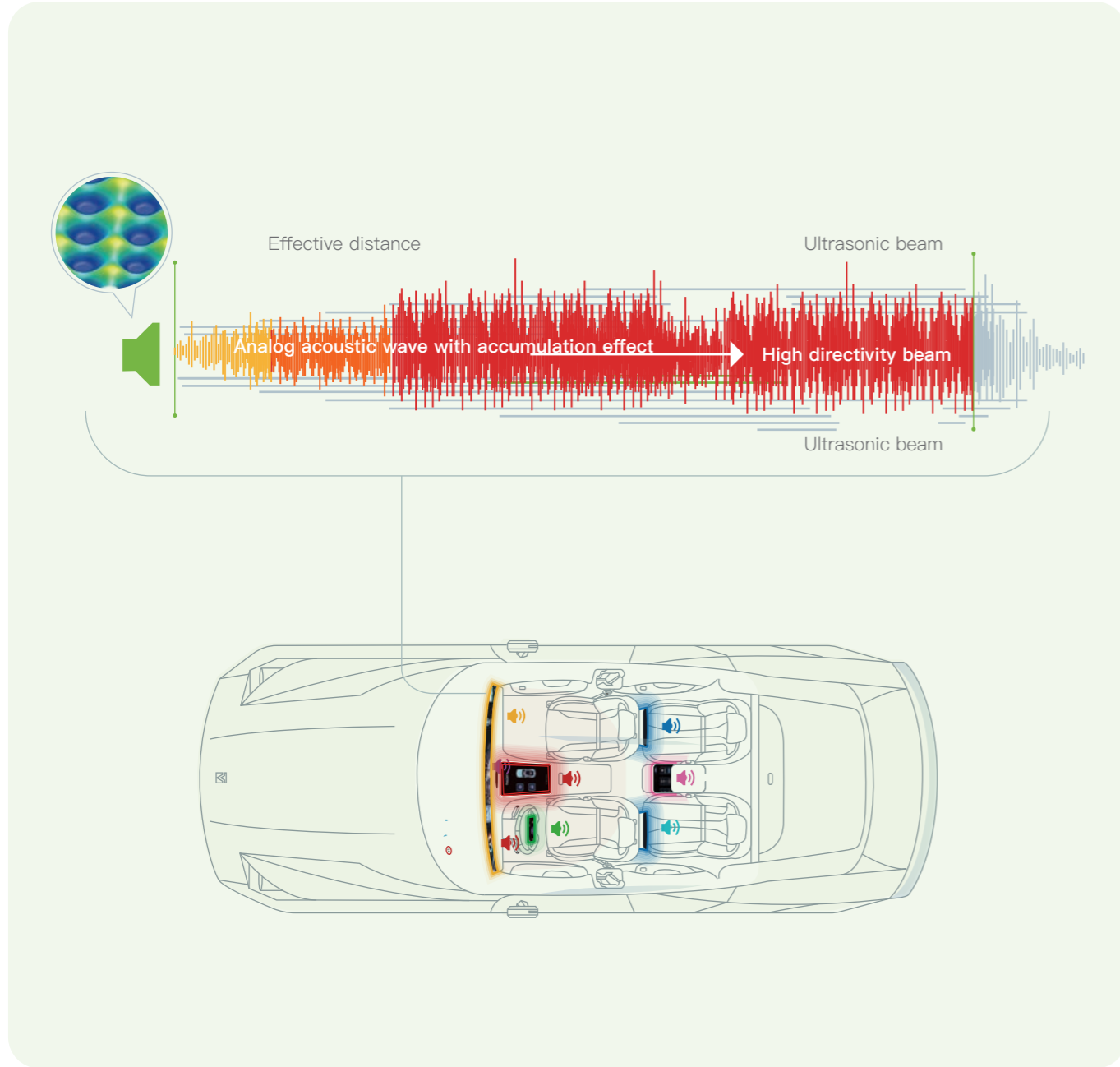
Perfect Sound Articulation

Strong penetration

Immersive experience

Advanced Light–dimmer Film

By using dichroic dye liquid crystal to modulate light, our technology not only effectively solves the problem of non–adjustable light transmission of glass, but can also have integrated touch function. It can be applied to front windshield, side window and roof area.

Transmission

Area and Shape

Touch integrated
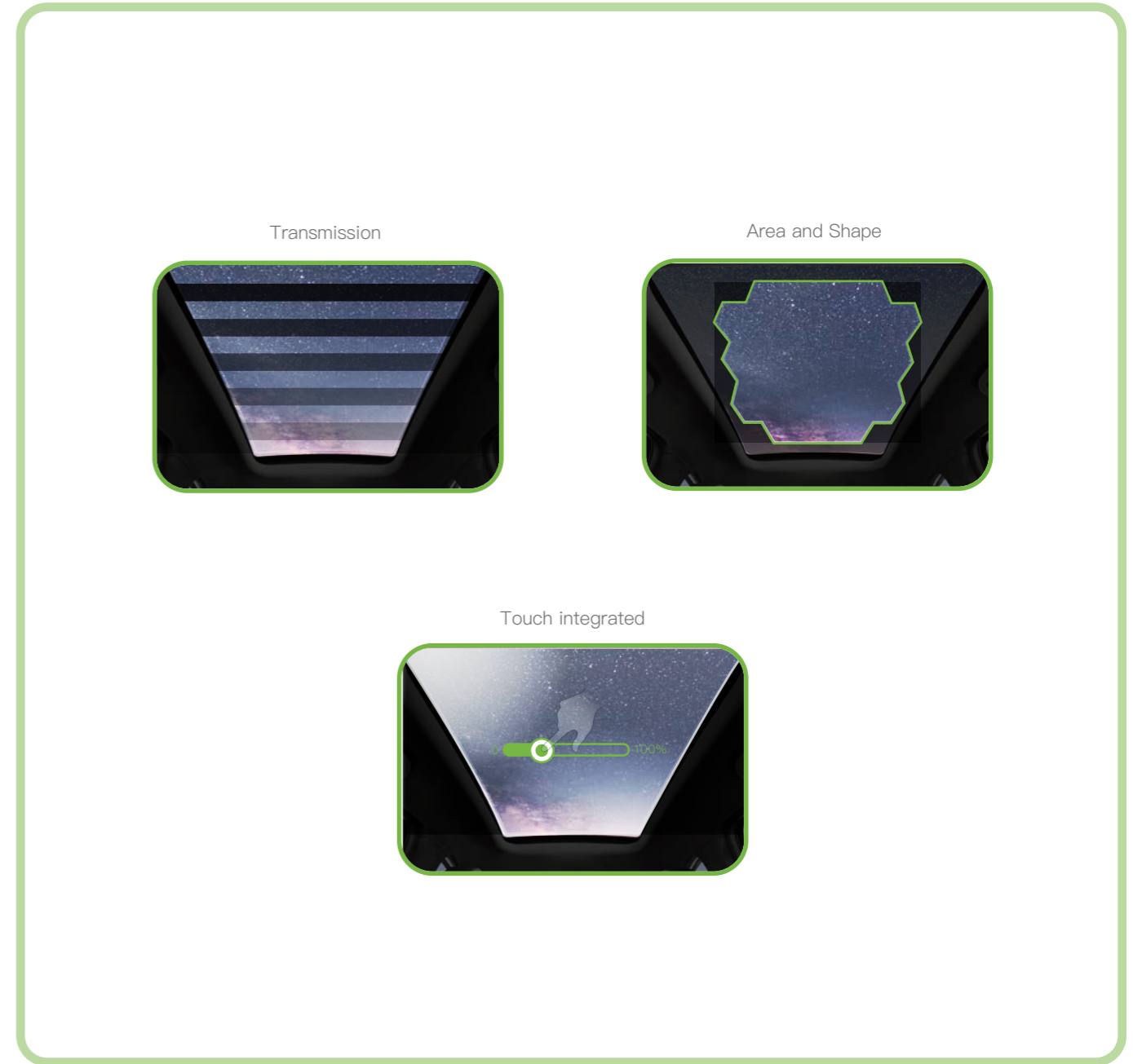
Adjustable transmission

Continuously tunable transmission

Customized area and shape

Fast response

High Visual Experience Technologies

| High resolution

PPI ~ 300

| True–black appearance

ΔE < 2

| High contrast ratio

>100,000:1

| Large size

15~30 inch

| High color gamut

~ 110 %

| Super narrow border

~ 2.5 mm(W/O CTP)
~ 3.0 mm(W CTP)

| High black uniformity

> 50 %(area scan)

| Fast gray to gray response

~ 18 ms

Super Fine TFT | Ultra Wide Screen | Multi-bonding Integrates Display | Curve | One-stop Touch Solution | Narrow Border | Freeform

Super Fine TFT | Super Low Reflection | High Resolution | Signal Feedback Anomaly | Narrow Border | Freeform

Smart Car Cockpit Display

Cluster Display

Full–LCD Cluster   Semi–LCD Cluster

Screen Size	27.0"	23.6"
Display Mode	TFT	TFT
Aspect Ratio	16:3	16:3
Resolution (piexl)	4032*756	3840*720
Display Color	16.7M	16.7M
Interface	eDP	2–ports LVDS
Operating Temperature	–30℃~+85℃	–30℃~+85℃
Storage Temperature	–40℃~+95℃	–40℃~+95℃
Features	4K ▢ ▢ ▣	TFT 4K ▢ ▢

Screen Size	12.3"	10.25"	10.25"	7.0"
Display Mode	TFT	TFT	TFT	TFT
Aspect Ratio	8:3	8:3	8:3	5:3
Resolution (piexl)	1920*720	1920*720	1280*480	1280*768
Display Color	16.7M	16.7M	16.7M	16.7M
Interface	2–ports LVDS	2–ports LVDS	1–port LVDS	1–port LVDS
Operating Temperature	–30℃~+85℃	–30℃~+85℃	–30℃~+85℃	–30℃~+85℃
Storage Temperature	–40℃~+95℃	–40℃~+95℃	–40℃~+95℃	–40℃~+95℃
Features	⎘ ▢ ▣ ▢	▢ ▢	▢	▢ ▢

Screen Size	Dual 12.3" on 1 Cover	Dual 10.25" on 1 Cover
Display Mode	TFT	TFT
Aspect Ratio	8:3	8:3
Resolution (piexl)	1920*720 + 1920*720	1920*720 + 1920*720
Display Color	16.7M	16.7M
Interface	2–ports LVDS	2–ports LVDS
Operating Temperature	–30℃~+85℃	–30℃~+85℃
Storage Temperature	–40℃~+95℃	–40℃~+95℃
Features	▢ ② ▣ ▢	▢ ▣

Screen Size	10.2"	9.2"	9.0"	8.9"	6.0"	5.7"
Display Mode	TFT	TFT	TFT	TFT	TFT	TFT
Aspect Ratio	11:3	15:3	12:3	12:3	11:3	12:3
Resolution (piexl)	1920*532	1920*384	1920*480	1920*480	1024*274	640*160
Display Color	16.7M	16.7M	16.7M	16.7M	16.7M	16.7M
Interface	LVDS	LVDS	LVDS	LVDS	LVDS	RGB
Operating Temperature	–30℃~+85℃	–30℃~+85℃	–30℃~+85℃	–30℃~+85℃	–30℃~+85℃	–30℃~+85℃
Storage Temperature	–40℃~+95℃	–40℃~+95℃	–40℃~+95℃	–40℃~+95℃	–40℃~+95℃	–40℃~+95℃

Super Fine TFT · Seamless · Signal Feedback Anomaly · Touch Embedded Display · Narrow Border

Super Fine TFT · Higher Transmittance · Adjustable Reflectivity · High Brightness · Signal Feedback Anomaly · Touch Embedded Display · Freeform · Wide Temperature · FOG

Center Information Display–Landscape

Screen Size	17.3"	15.6"	14.6"	12.8"&12.9"	12.3"	10.25"
Display Mode	TFT	TFT	TFT	TFT	TFT	TFT
Aspect Ratio	16:9	16:9	16:9	16:9	8:3	8:3
Resolution (piexl)	2880*1620	2560*1440 / 1920*1080	2560*1440 / 1920*1080	1920*1080	1920*720	1920*720
Display Color	16.2M	16.7M	16.7M	16.7M	16.7M	16.7M
Interface	eDP	2-ports LVDS	2-ports LVDS	2-ports LVDS	2-ports LVDS	2-ports LVDS
Operating Temperature	−30℃~+85℃	−30℃~+85℃	−30℃~+85℃	−30℃~+85℃	−30℃~+85℃	−30℃~+85℃
Storage Temperature	−40℃~+95℃	−40℃~+95℃	−40℃~+95℃	−40℃~+95℃	−40℃~+95℃	−40℃~+95℃
Features	(icons)	(icons)	(icons)	(icons)	(icons)	(icons)

Screen Size	10.1"	10.1"	9.0"	9.0"	8.0"	8.0"	8.0"
Display Mode	TFT	TFT	TFT	TFT	TFT	TFT	TFT
Aspect Ratio	16:10	16:9	15:9	16:9	15:9	16:9	15:9
Resolution (piexl)	1920*1200	1280*720	1280*768	1280*720	1280*768	1280*720	800*480
Display Color	16.7M	16.7M	16.7M	16.7M	16.7M	16.7M	16.7M
Interface	1-port LVDS	1-port LVDS	1-port LVDS	1-port LVDS	1-port LVDS	1-port LVDS	1-port LVDS
Operating Temperature	−30℃~+85℃	−30℃~+85℃	−30℃~+85℃	−30℃~+85℃	−30℃~+85℃	−30℃~+85℃	−30℃~+85℃
Storage Temperature	−40℃~+95℃	−40℃~+95℃	−40℃~+95℃	−40℃~+95℃	−40℃~+95℃	−40℃~+95℃	−40℃~+95℃
Features	(icons)	(icons)		(icons)		(icons)	

Center Information Display–Portrait

Screen Size	13.2"	10.4"	8.7"	8.4"
Display Mode	TFT	TFT	TFT	TFT
Aspect Ratio	3:4	3:4	3:4	3:4
Resolution (piexl)	1440*1920	960*1280	1024*768	1024*768
Display Color	16.7M	16.7M	16.7M	16.7M
Interface	1-port LVDS	1-port LVDS	1-port LVDS	1-port LVDS
Operating Temperature	−30℃~+85℃	−30℃~+85℃	−30℃~+85℃	−30℃~+85℃
Storage Temperature	−40℃~+95℃	−40℃~+95℃	−40℃~+95℃	−40℃~+95℃
Features	(icons)	(icons)	(icons)	(icons)

Head–up Display
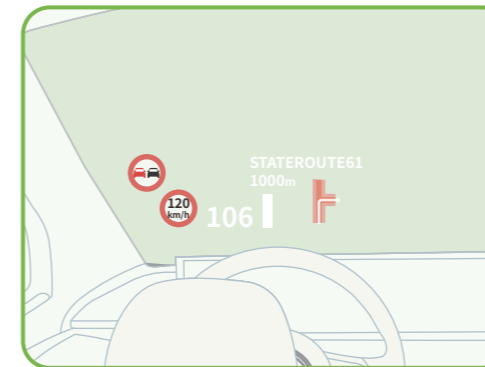
Screen Size	4.1"	3.14"	1.8"
Display Mode	TFT	TFT	TFT
Aspect Ratio	2:1	15:9	2:1
Resolution (piexl)	1280*640	800*480	480*240
Display Color	16.2M	16.2M	16.2M
Interface	LVDS	LVDS 18/24 Bits+SPI	RGB
Operating Temperature	−30℃~+85℃	−30℃~+85℃	−30℃~+85℃
Storage Temperature	−40℃~+95℃	−40℃~+95℃	−40℃~+95℃
Features	(icons)	(icons)	(icons)

Mirror Display

Screen Size	9.3"	9.3"	9.2"	8.6"
Display Mode	TFT	TFT	TFT	TFT
Aspect Ratio	24:5	25:5	25:5	25:5
Resolution (piexl)	1920*400	1600*320	1920*384	1280*260
Display Color	16.7M	16.7M	16.7M	16.7M
Interface	1-port LVDS	1-port LVDS	1-port LVDS	1-port LVDS
Operating Temperature	−30℃~+85℃	−30℃~+85℃	−30℃~+85℃	−30℃~+85℃
Storage Temperature	−40℃~+95℃	−40℃~+95℃	−40℃~+95℃	−40℃~+95℃
Features	(icons)	(icons)	(icons)	(icons)

	Super Fine TFT	Seamless	Signal Feedback Anomaly	One-stop Touch Solution	Touch Embedded Display	Narrow Border

Rear Seat Entertainment Display
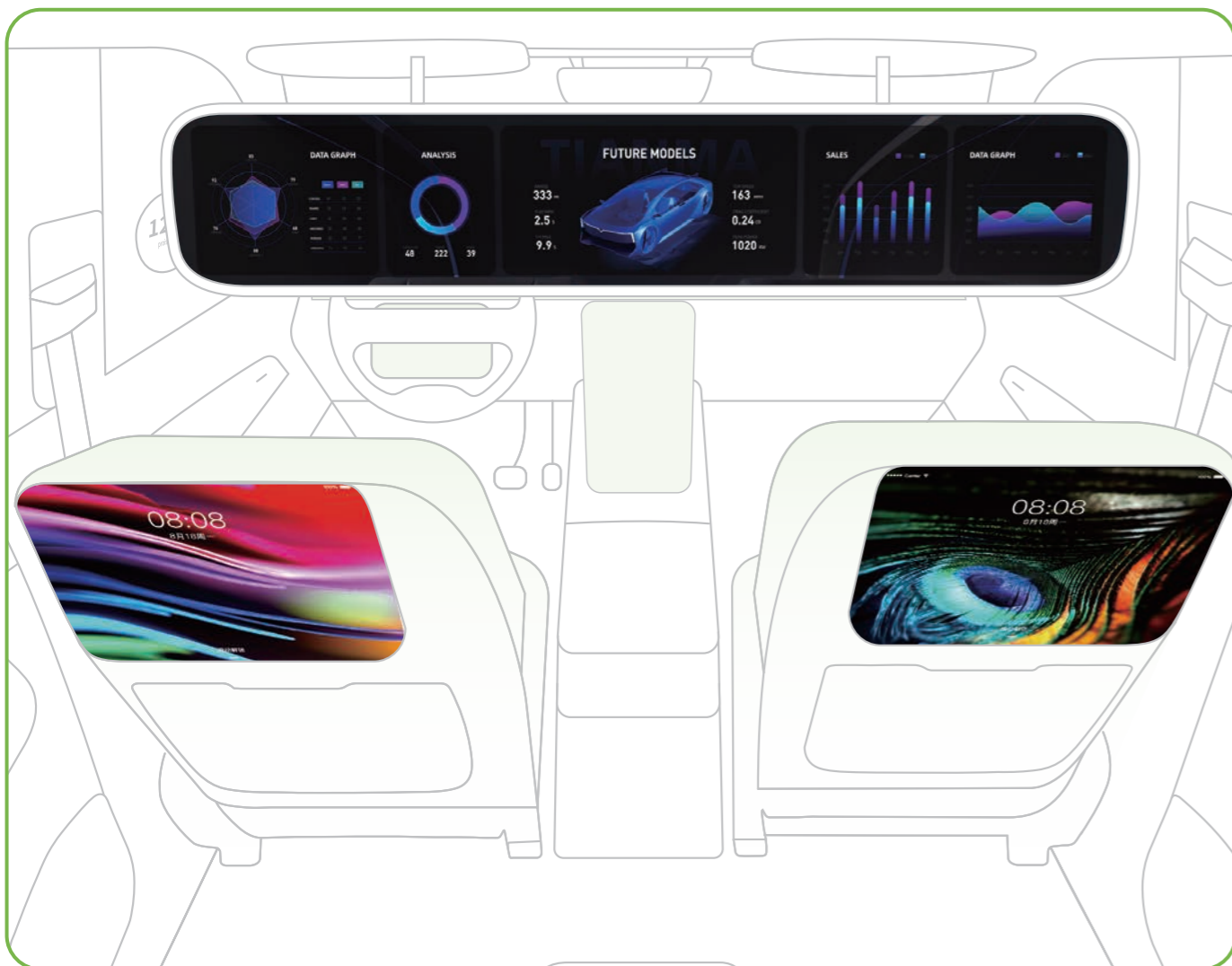
Screen Size	17.3"	15.6"	14.6"	10.1"	10.1"	9.0"	9.0"
Display Mode	TFT	TFT	TFT	TFT	TFT	TFT	TFT
Aspect Ratio	16:9	16:9	16:9	16:10	16:9	16:10	16:9
Resolution (piexl)	2880×1620	2560*1440/ 1920*1080	2560*1440/ 1920*1080	1280*800	1280*720	1280*800	1280*720
Display Color	16.2M	16.7M	16.7M	16.7M	16.7M	16.7M	16.7M
Interface	eDP	2-ports LVDS	2-ports LVDS	1-port LVDS	1-port LVDS	1-port LVDS	1-port LVDS
Operating Temperature Storage	–30℃~+85℃	–30℃~+85℃	–30℃~+85℃	–30℃~+85℃	–30℃~+85℃	–30℃~+85℃	–30℃~+85℃
Temperature	–40℃~+95℃	–40℃~+95℃	–40℃~+95℃	–40℃~+95℃	–40℃~+95℃	–40℃~+95℃	–40℃~+95℃
Features	🔲🖥	🔲🔊🖥✛	🔲🔊🖥✛	🔲🖥	🔲🖥	🔲	🔲🖥

EBN + TFT

Full TFT Display

TFT   Backlight

· The 3rd Generation Color Gradient EBN + TFT

Tianma can use EBN(Enhanced Black Nematic) + small size TFT technology to produce a display that is the same size as a traditional TFT display but much more cost effectively, with same performance and content.

The 3rd Generation Color Gradient EBN +TFT Technology

Optical bonding
EBN Backlight TFT PCB
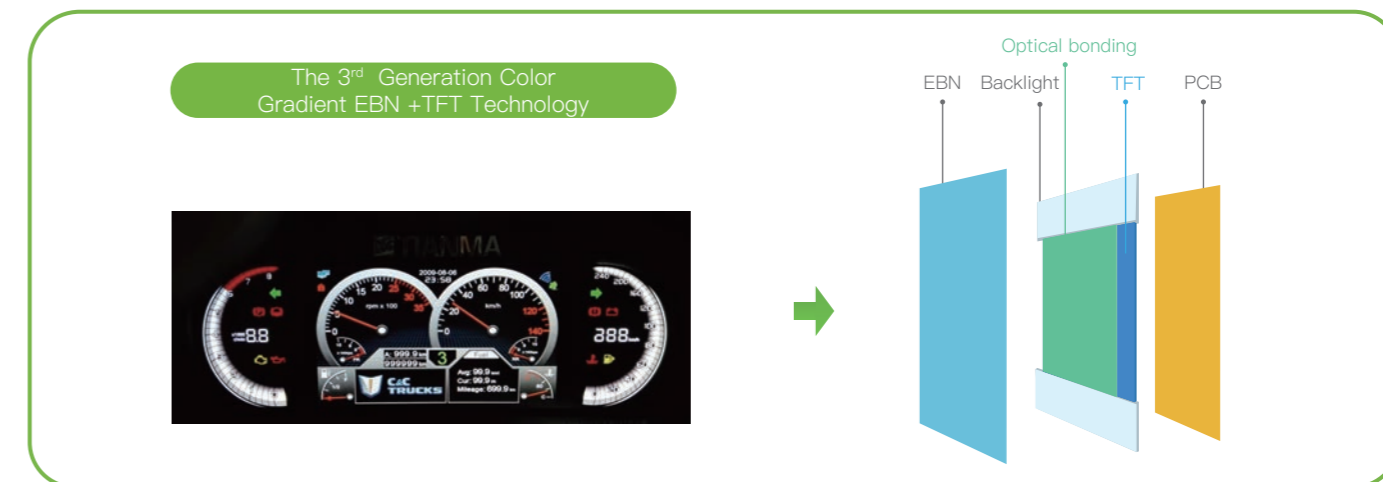
· The 3rd Generation Color Gradient EBN + Touch Oncell

EBN(Enhanced Black Neurotic)+Touch Oncell technology intergrates touch functions and is thinner and more cost effective than the traditional external TP.

The 3rd Generation Color Gradient EBN + Touch Oncell Technology

Touch Sensor EBN Backlight

EBN

Duty	1/1	1/2	1/4	1/4	1/9
Bias	1/1	1/2	1/3	1/3	1/4
Available Backlight	Mono	Mono	Mono	Mono	Mono
CR(at −30℃)	1000:1	1000:1	1000:1	1000:1	900:1
CR(at 22℃)	2000:1	1800:1	1500:1	1500:1	1000:1
CR(at 85℃)	1000:1	1000:1	1000:1	1000:1	1000:1
Ton+Toff(−30℃)(s)	1.5	3.5	9	4	9
Ton+Toff(22℃)(ms)	25	110	100	50	100
Ton+Toff(85℃)(ms)	10	20	20	20	30
Color/Background	Black	Black	Black	Black	Black
Transmittance(%)	20%	18%	13	10	12
Operation Temperature	−30℃~+85℃	−30℃~+85℃	−30℃~+85℃	−30℃~+85℃	−30℃~+85℃
Storage Temperature	−40℃~+95℃	−40℃~+95℃	−40℃~+95℃	−40℃~+95℃	−40℃~+95℃
Vertical(CR>100)	−40°/+60°	−30°/+60°	−25°/+60°	−25°/+50°	−15°/+38°
Horizontal(CR>100)	−60°/+60°	−60°/+60°	−60°/+60°	−60°/+50°	−30°/+30°

Duty	1/16	1/32	WEBN(1/4−static)	DEBN(1/4−static)
Bias	1/5	1/6	1/3	1/3
Available Backlight	Mono	Mono	Mono	Mono
CR(at −30℃)	600:1	200:1	600:1	1000:1
CR(at 22℃)	800:1	300:1	800:1	1000:1
CR(at 85℃)	600:1	200:1	600:1	1000:1
Ton+Toff(−30℃)(s)	11	15	8	7
Ton+Toff(22℃)(ms)	100	250	90	40
Ton+Toff(85℃)(ms)	30	40	20	10
Color/Background	Black	Black	Black	Black
Transmittance(%)	10	7	5	7
Operation Temperature	−30℃~+85℃	−30℃~+85℃	−30℃~+85℃	−30℃~+85℃
Storage Temperature	−40℃~+95℃	−40℃~+95℃	−40℃~+90℃	−40℃~+90℃
Vertical(CR>100)	−20°/+60°	−18°/+60°	> −70°/ > +70°	−20°/+60°
Horizontal(CR>100)	−50°/+49°	−45°/+40°	> −70°/ > +70°	−50°/+40°

TN

Duty	4	4
Bias	3	3
Available Backlight	Mono	Mono
CR(at −30℃)	Transflective NW	Transflective NW
CR(at 22℃)	8.4:1	5.5:1
CR(at 85℃)	8.6:1	10:1
Ton+Toff(−30℃)(s)	3.5:1	7:1
Ton+Toff(22℃)(ms)	3.5	5.8
Ton+Toff(85℃)(ms)	0.08	0.12
Color/Background	White	White
Transmittance(%)	10	15
Operation Temperature	−30℃~+85℃	−30℃~+85℃
Storage Temperature	−40℃~+95℃	−40℃~+105℃
Vertical(CR>100)	60°/−15°	60°/−15°
Horizontal(CR>100)	60°/−60°	60°/−60°

Duty	4	4
Bias	3	3
Available Backlight	Mono	Mono
CR(at −30℃)	Transmissive NB	Transmissive NB
CR(at 22℃)	44:1	30:1
CR(at 85℃)	100:1	100:1
Ton+Toff(−30℃)(s)	13:1	22:1
Ton+Toff(22℃)(ms)	2	4
Ton+Toff(85℃)(ms)	0.066	0.092
Color/Background	Red	Amber
Transmittance(%)	18	23
Operation Temperature	−30℃~+85℃	−30℃~+85℃
Storage Temperature	−40℃~+95℃	−40℃~+105℃
Vertical(CR>100)	60°/−40°	60°/−40°
Horizontal(CR>100)	60°/−60°	60°/−60°

ASTN

Duty	66	88	136
Bias	6	10	11
Available Backlight	Mono	Mono	Mono
CR(at –30℃)	Transflective NW	Transmissive NB	Transmissive NB
CR(at 22℃)	6.6:1	22:1	16:1
CR(at 85℃)	7:1	80:1	45:1
Ton+Toff(–30℃)(s)	2.5:1	20:1	18:1
Ton+Toff(22℃)(ms)	6.3	9.5	8
Ton+Toff(85℃)(ms)	187	450	280
Color/Background	White	Dark–Blue/Black	Dark–Blue/Black
Transmittance(%)	15	12	21
Operation Temperature	–30℃~+85℃	–30℃~+85℃	–30℃~+85℃
Storage Temperature	–40℃~+90℃	–40℃~+90℃	–40℃~+90℃
Vertical(CR>100)	43°/–49°	45°/–20°	40°/–25°
Horizontal(CR>100)	45°/–49°	–42°/40°	–28°/35°

Duty	33	65	124
Bias	9	7	11
Available Backlight	Mono	Mono	Mono
CR(at –30℃)	Transmissive NB	Transflective NW	Transflective NW
CR(at 22℃)	22:1	6.5:1	5.5:1
CR(at 85℃)	70:1	6.7:1	4.8:1
Ton+Toff(–30℃)(s)	20:1	2.2:1	2:1
Ton+Toff(22℃)(ms)	5.6	8	10
Ton+Toff(85℃)(ms)	300	217	227
Color/Background	Dark–Blue/Black	White	White
Transmittance(%)	18	17	8.8
Operation Temperature	–30℃~+85℃	–30℃~+85℃	–30℃~+85℃
Storage Temperature	–40℃~+90℃	–40℃~+90℃	–40℃~+90℃
Vertical(CR>100)	40°/–18°	34°/–47°	35°/–37°
Horizontal(CR>100)	–41°/42°	39°/–45°	33°/–34°

FSTN

Duty	64	128
Bias	9	12
Available Backlight	Mono	Mono
Display Mode	Transflective NW	Transflective NW
CR(at 22℃)	7:1	5:1
Ton+Toff(22℃)(ms)	280	360
Color/Background	White	White
Transmittance(%)	17	16
Operation Temperature	–30℃~+85℃	–30℃~+85℃
Storage Temperature	–40℃~+90℃	–40℃~+90℃
Vertical(CR>2)	39°/–44°	30°/–39°
Horizontal(CR>2)	–34°/33°	–28°/40°

Duty	160	240
Bias	11	16
Available Backlight	Mono	Mono
Display Mode	Transflective NW	Transflective NW
CR(at 22℃)	4.5:1	3.5:1
Ton+Toff(22℃)(ms)	350	500
Color/Background	White	White
Transmittance(%)	15	15
Operation Temperature	–30℃~+85℃	–30℃~+85℃
Storage Temperature	–40℃~+90℃	–40℃~+90℃
Vertical(CR>2)	32°/–32°	30°/–30°
Horizontal(CR>2)	–43°/38°	–35°/25°