



SHANTOU GOWORLD DISPLAY GERMANY GMBH

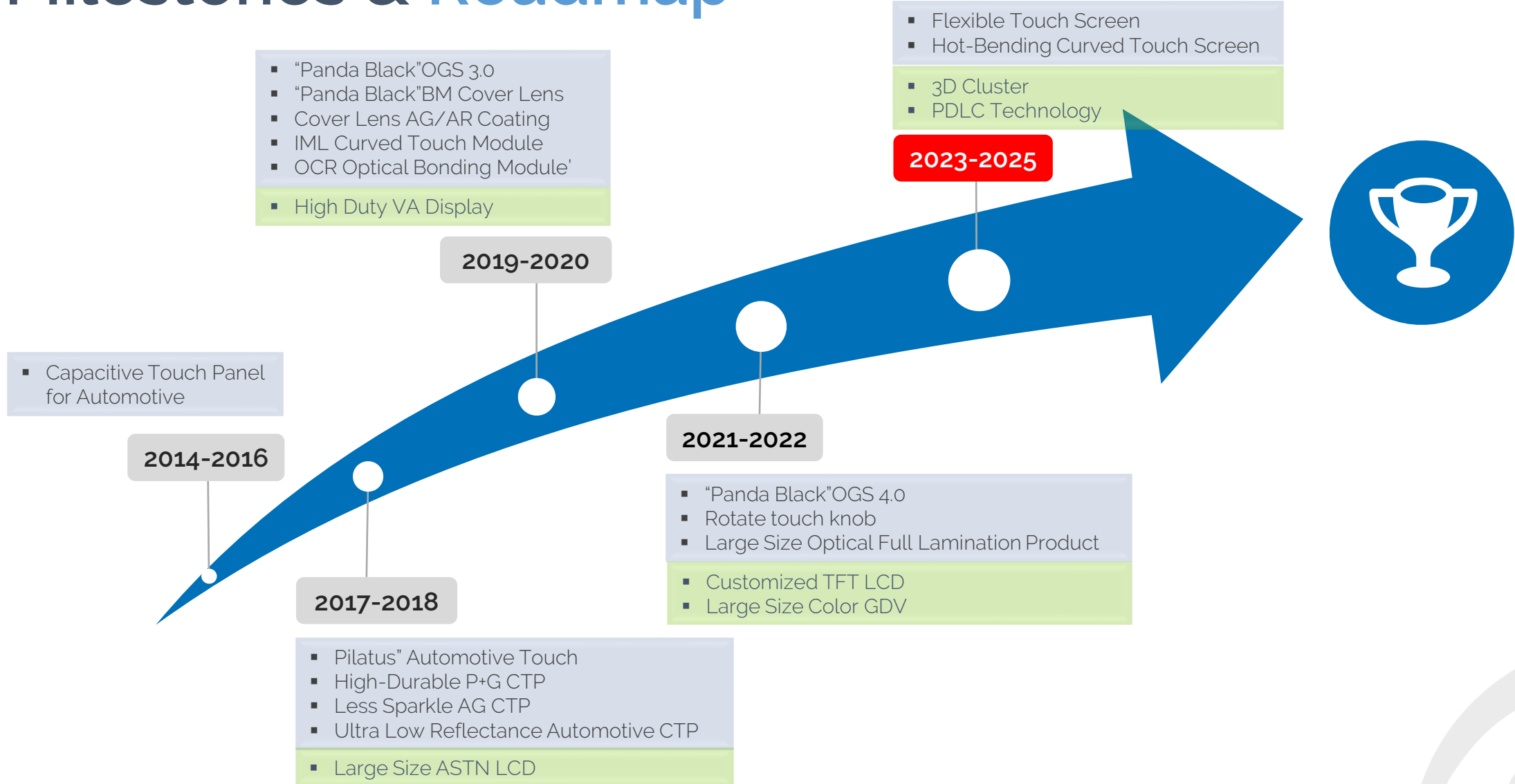
Your Partner for customer-specific LCD's, TFT-Displays
and Touch Panel Solutions

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www.goworld-lcd.de

Roadmap 2020/2025

Milestones & Roadmap



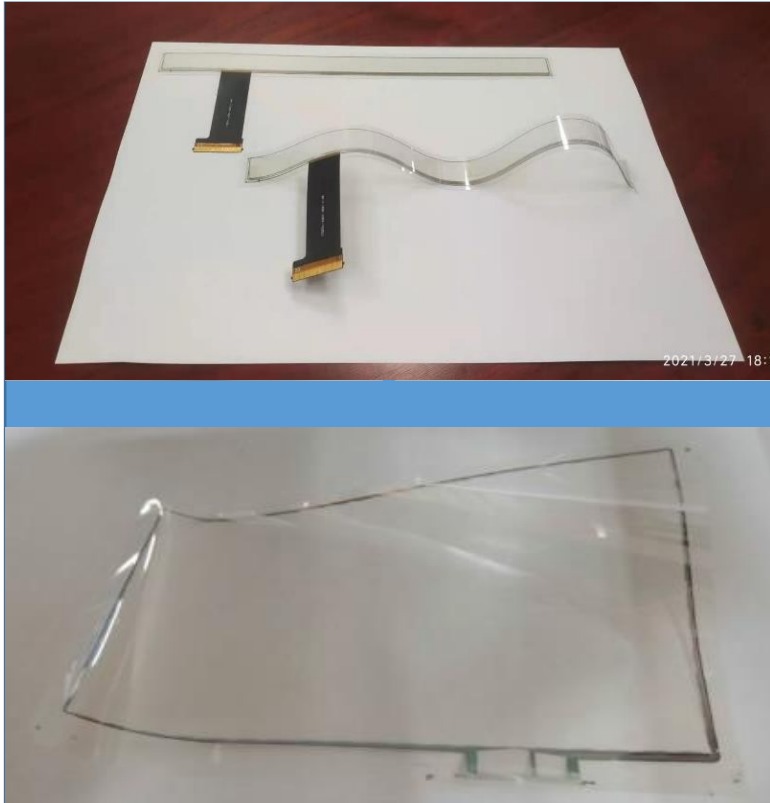
Our Automotive Customers

- Market leaders in Automobile



Flexible Touch Panel

- R 6.5mm, 200k times



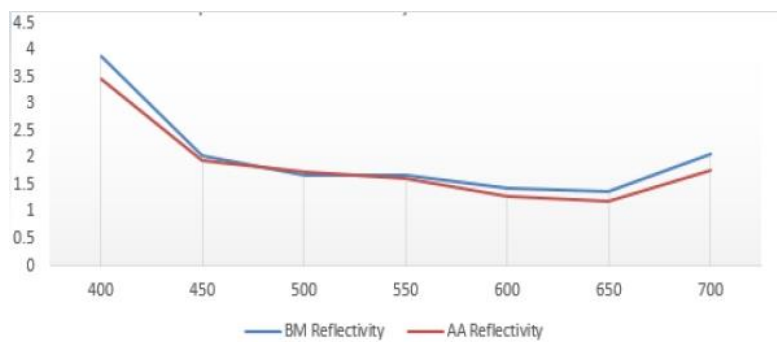
- Using PI substrate with higher reliability as PET
- Same sputtering process as glass CTP
- 17 applied patents

	PI
Minimum thickness	15μm
Bending test	R 6.5mm, 200k times
CTE	15
Transmission	>90%
Haze	<0,5%
ITO	No etch mark
Yellow index	YI (<1,2)
High low temperature	-40°C~95°C, 1000h
High temp/High humidity	85°C/85%, 1000h
Thermal shock	40°C~95°C, 240h
Square resistance	>20 Ohm



Panda Black

OGS and Cover Lens



- Using multilayer index matching to reduce reflection
- Optimized for TFT, OCR and surface treatment
- ΔE between BM and VA under 1,7%
- Reflection lower than 1,7%
- Using AR film from Dexerials
- $\Delta E < 1$ without AR film
- $\Delta E < 2$ with AR film

Base on OCR bonding unit
Color of TFT: L=28,65 / a=-0,46 / b=-0,29

	ΔL	Δa	Δb	ΔE
w/o AR film	0,35	0,25	0,47	0,64
with AR film	0,85	0,83	0,95	1,52

	BM	AA
Reflection	1.63	1.45
L*	13.43	12.29
a*	0.31	-0.61
b*	-4.72	-3.96
ΔE	1.65	1.65



Outdoor Application Products

- Marine, Motorcycle, E-bike, Charging point



- Readability in sunlight (Up to 1000nits)
- Anti water
- Salt Water Touch & Anti-erosion
- Anti UV
- High Reliability Standard

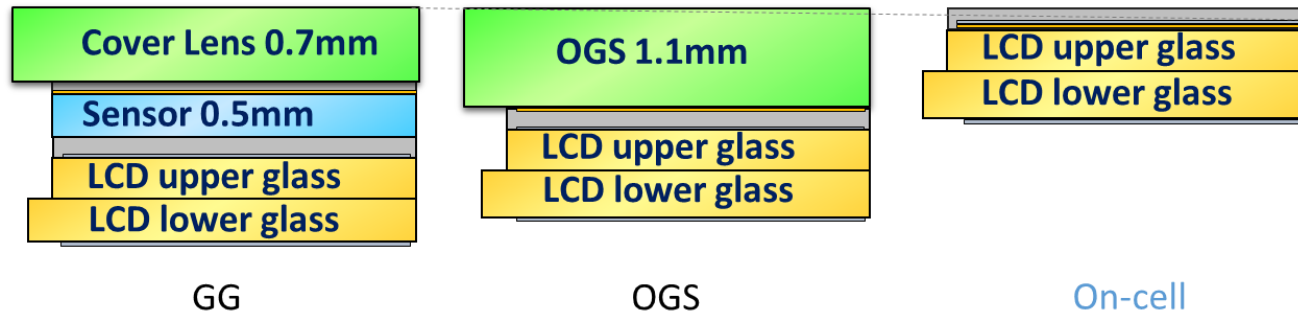
Item	condition
High Low Temperature Operation	-30°C~85°C, 1000h
High Low Temperature Storage	-40°C~90°C, 1000h
Damp Heat Operating	60°C*90%RH*500h
Salt Fog Test	5% salt solution at 35°C*168h
UV Exposure Test	1120 W/m ² * 10 cycles (10days)

Touch on-cell (Mono display)

- Thin – One chip solution

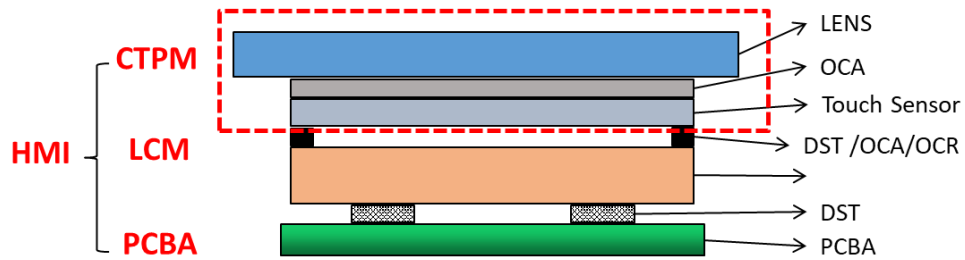


- Simple structure
- Low cost
- Button touch, linear and radial sliders



HMI

CTPM+LCM+PCBA (mini PC)



- Dual ARM CPU
- Main CPU 800MHz
- H.264 Decoder Up to 1080P
- Panel resolution up to 2160*1080
- Panel Interface: RGB/ MIPI/ LVDS/ CPU/ SPI
- CAN Bus Controller
- 2.5D Graphic Engine
- 128 Pins QFP
- COM: RS232;RS485
- Ethernet, USB, SD, Wifi
- Visual UI development



PDLC Display

- Polymer Dispersed Liquid Crystal Display



- Operating method : SW 64~100HZ 5V ;
- transmittance (OFF) $\geq 90\%$;
- Response time : $\leq 160\text{ms}$;
- Operation temperature : $-20^{\circ}\text{C} \sim +70^{\circ}\text{C}$; Storage: $-30^{\circ}\text{C} \sim +80^{\circ}\text{C}$;
- Cr=2 : 65/65/65/65 ;



White-paper reflective TN display

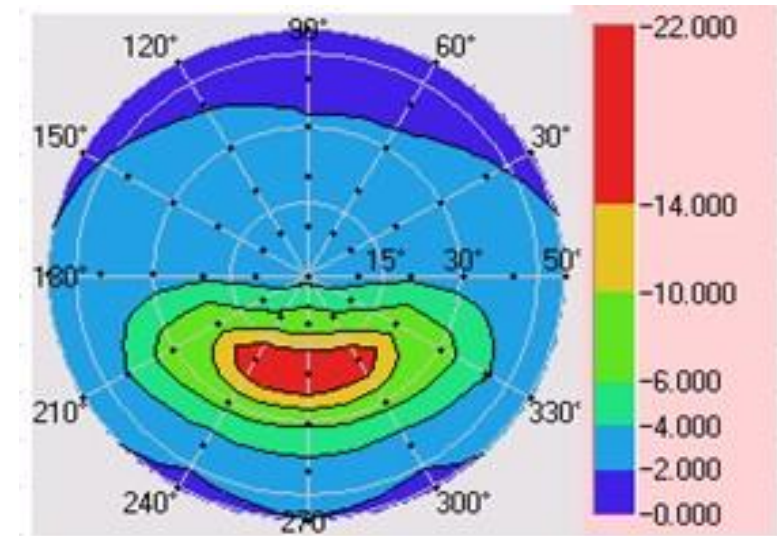
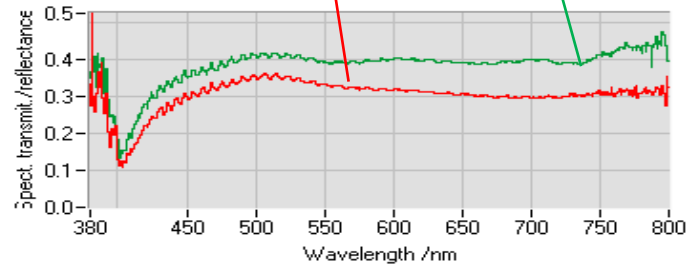
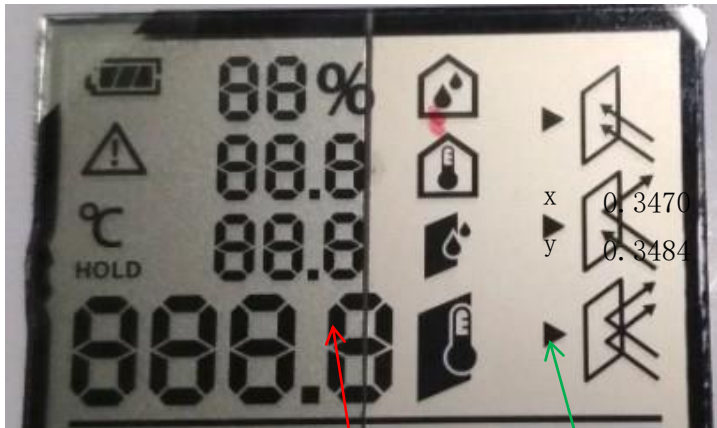
Normal TN-Reflective



white background TN-Reflective
with higher reflective ratio

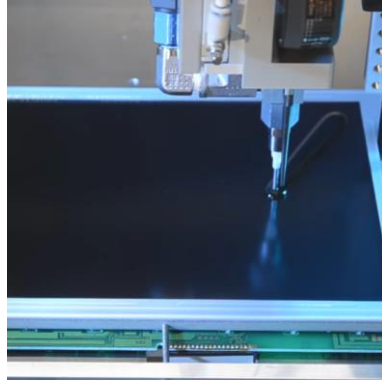
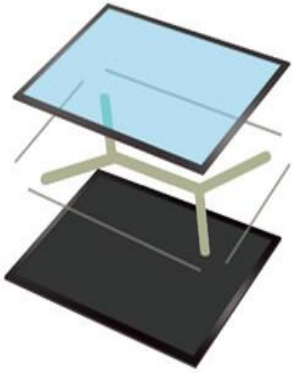
X 0,3350

Y 0,3528



Technology Upgrade

In House developments



OCR Optical Bonding line

- OCR bonding for the big size LCD
- Gel like bonding
- Up to 30in Cover lens bonding
- Curved bonding



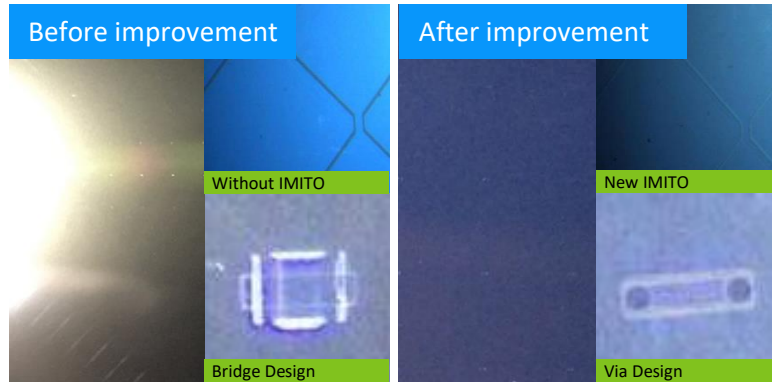
Large size bonding

- Full black for cluster and CID
- Uniformity black with & without TP
- Ultra low reflectance

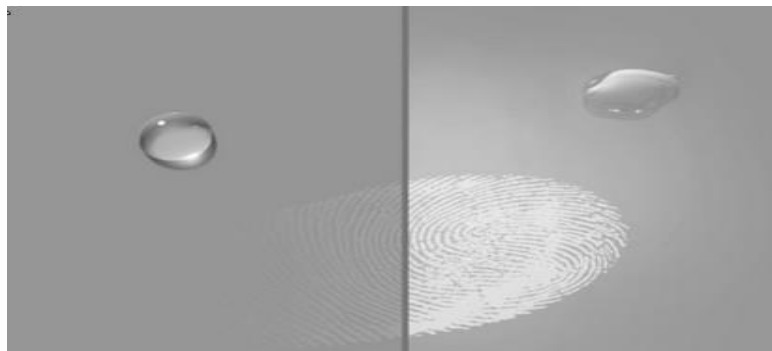


Technology Upgrade

In House developments



Note: Test light, HG-Q08, Distance:35cm, Luminance:50k lux;



With AF coating

Without AF coating

“Pilatus” automotive touch screen

- Bridge and ITO invisible technology
- no bridge reflection under strong light
- new index matching design reduce the reflectance between ITO pattern and gaps
- New bridge design reduces shining issue

AF and AR surface treatments

- Anti-fingerprint coating
- Excellent water and oil repellency for glass surface
- Ultra slippery
- Improve touch screen operability
- AR Coating greatly reduce CTP reflectance: from 9% to 2.0%min;
- Control the reflectance from 400-700nm;



Technology Upgrade

Developments with our partners



Hot Bending Cover glass

- R3000 glass radius
- Cold bending sensor glass bonding
- Up to 900mm wide
- Support for CPI film sensor for small bending radius



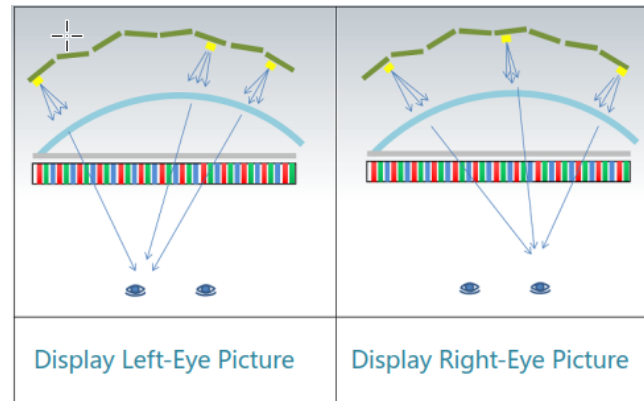
Technology Upgrade

Developments with our partners



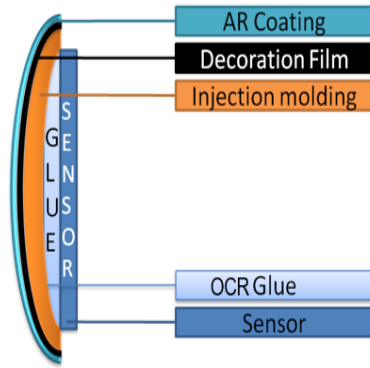
3D display

- 3D Resolution : 1920(RGB)×540
- 3D Refresh Frequency : 120 Hz
- Best View Distance in 3D mode : 60-100cm
- View Angle in 3D Mode : $\pm 15^\circ$
- Contrast Rate : 1000 : 1
- Response time : $\leq 5\text{ms}$



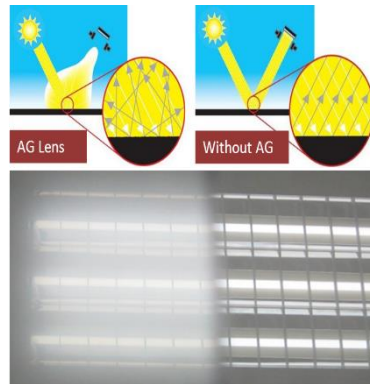
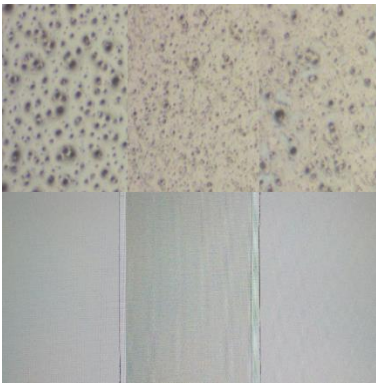
Technology Upgrade

Developments with our partners



IML Curve Cover Lens

- Cold shaping
- Achieve 135-180° angle
- Suitable for optical bonding



Less Sparkle AG Cover

- Less Sparkle through Moth-eye treatment (hexagonal pattern coating)
- Less Sparkle by reducing the surface glare
- Haze: $\leq 20\%$
- Surface Roughness: $< 0.1\mu\text{m}$
- Transmission: $\geq 87\%$



New available Products

LCD - Developments

High Duty VA Display

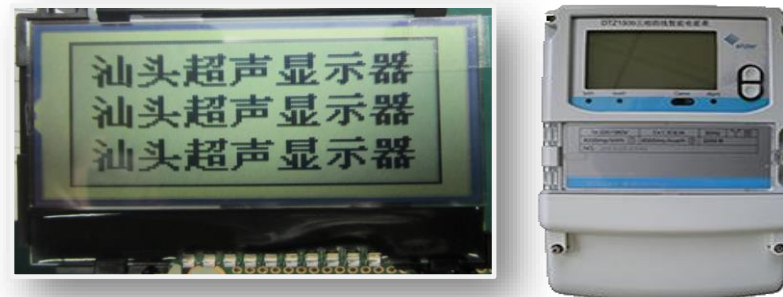
- Driving: up to 128*128 (1/128 duty)
- Contrast: Vertical view >50:1
- Response: <300ms

Large size ASTN LCD

- for outdoor application
- VA area: 9.51in
- Contrast: 150:1

High Cost-Effective Ammeter LCD Module

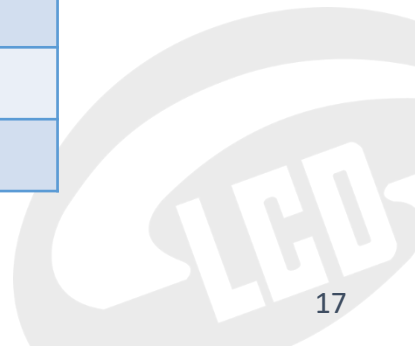
- Reliability: 60°C *90% RH*1000H
- High temperature storage: 90°C, 500H
- Low temperature storage: -40°C, 1000H
- Radiation: 1120W/m²



Glass Process Capabilities

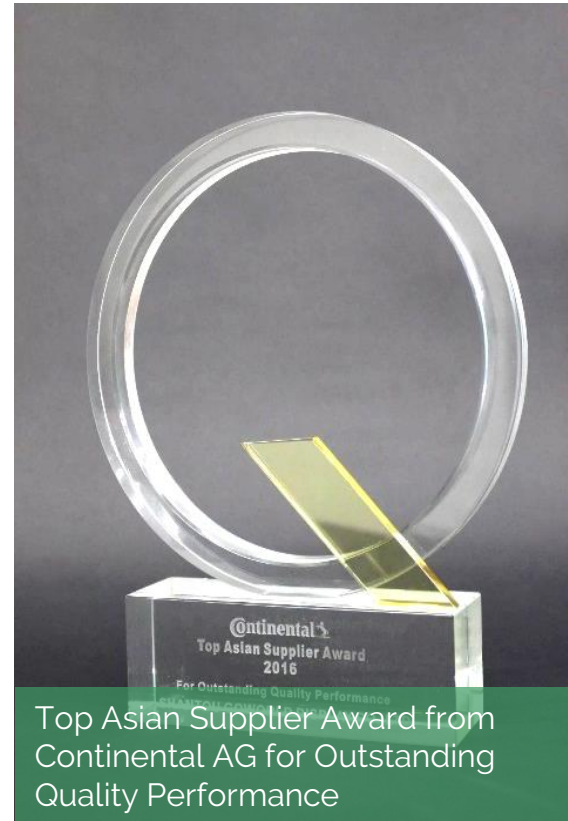
- Summary

Raw material	Soda lime	Aluminum silicate	550x650 mm / 370x920mm
Surface Treatment	AG Coating	Etching Sub-supplier	AG gloss: 40-100 AG haze: 3-30
	AR Coating	Coating	In-house
	AFP	Spaying/Coating	In-House
Cutting	CNC	In-house	
	Laser cutting	In-house	Top Film
Edge Treatment	Grinding	In-house	>15"
	Etching	Sub-supplier	
Printing	Screen printing	Ink Printing sub-supplier BM in house	
Lamination	Dry bonding	In-House	
	Wet bonding	In-House	Gel like bonding, Up to 30in
	Polarizer/Films	In-House	



Awards

- Recognition of excellent performances and good relationship

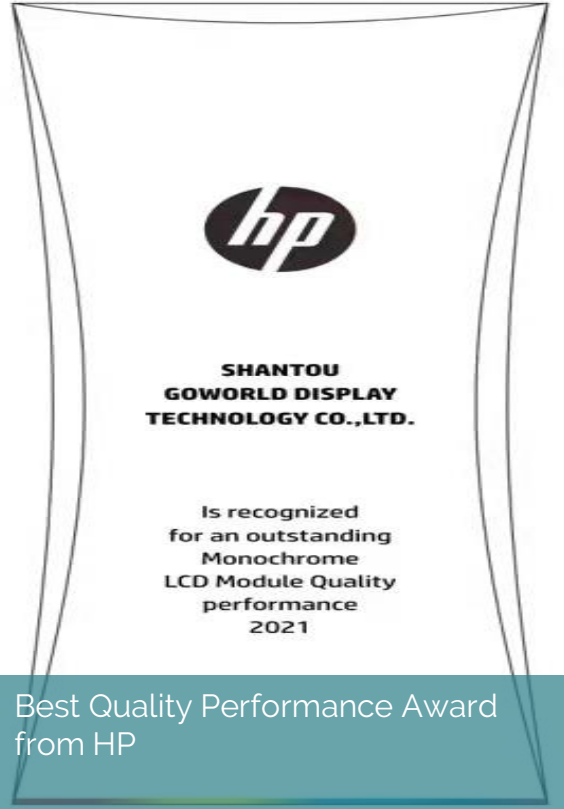


Awards

- Recognition of excellent performances and good relationship



Best Quality Award from
Huizhou Foryou General Electronics
Co., Ltd



Best Quality Performance Award
from HP



Contact

Get in touch with us

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