

Raystar Introduction

曜凌光電股份有限公司

Your best partner of display solutions
OLED Display Manufacturer

• 2021- 03



Group Overview

Established

Oct 1998
Taiwan

Founder

Dr.
Venson
Liao

Group Capital

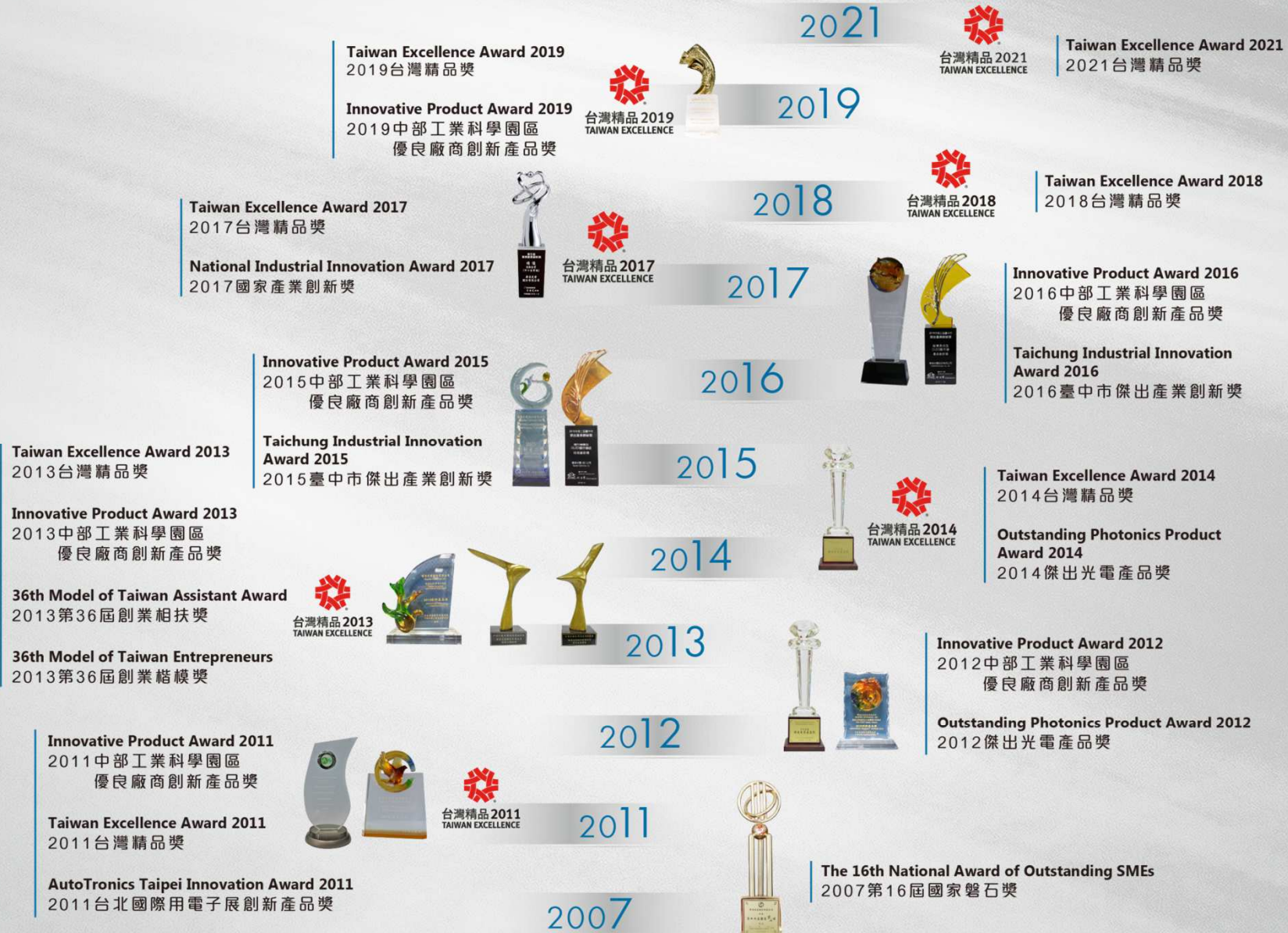
US\$ 43.37
Million

Location

- Taichung, Taiwan
- Los Angeles, USA
- Jiang Su, China
- Dongguan, China



Awards (Group)



Winstar Group Locations



LCM Facility
Dongguan, China



Branch
Hubei, China

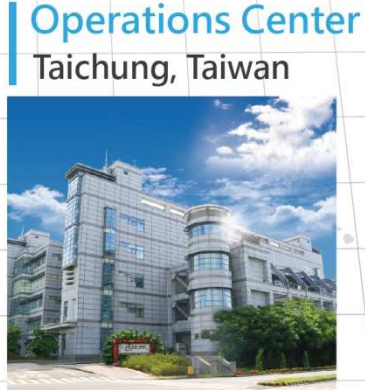


LCM Facility
Jiang Su, China

Subsidiary
Los Angeles, USA



Raystar
OLED Panel Facility
Taichung, Taiwan



Operations Center
Taichung, Taiwan

Jiang Su Manufacturing Facility - CS



Location : Chang Shu City, Jiang Su
Province, China

Capital : US\$ 3.87 Million

Backend Assembly for Industrial
COB / SMT / TAB of STN / TFT / OLED
Modules

Dept. : North China Sales Center,
R&D, QA



Printing Machine



Flow Soldering Machine



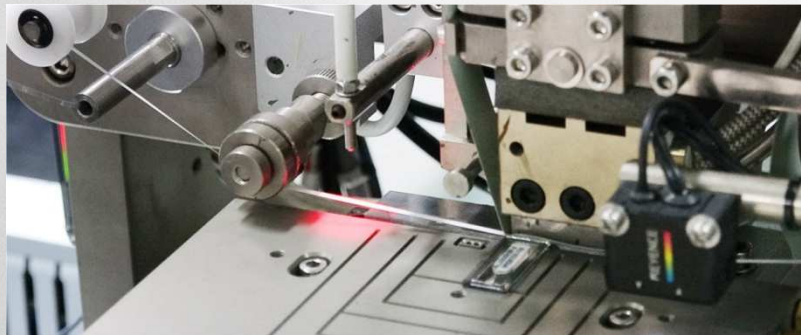
Automatic Optical Inspection Equipment (AOI)

Dongguan Manufacturing Facility - VS

Location : Dongguan City, Guangdong
Province, China
Capital : US\$ 4.97 Million

Backend Assembly for COG STN / TFT / OLED
Modules

Dept. : South China Sales Center, R&D, QA





Raystar Optronics, Inc



Central Taiwan Science Park

Taichung, Taiwan

- ✓ Founded in 2007
- ✓ PMOLED Display Manufacturer
- ✓ Small to medium sized display.
- ✓ OLED modules, STN/FSTN LCM, TFT
- ✓ System Integrated Solution
- ✓ Smart Display
- ✓ Custom Solution





Raystar OLED Production lines



QC systems - ISO certificates



All product is RoHS & SVHC of
EU REACH compliance.



QC Facilities for OLED Panel



Automatic Glass Cutting



OLED PMT Inspection



**KLEIN K-8
Tri-stimulus CIE Colorimeter**



OLED Aging System



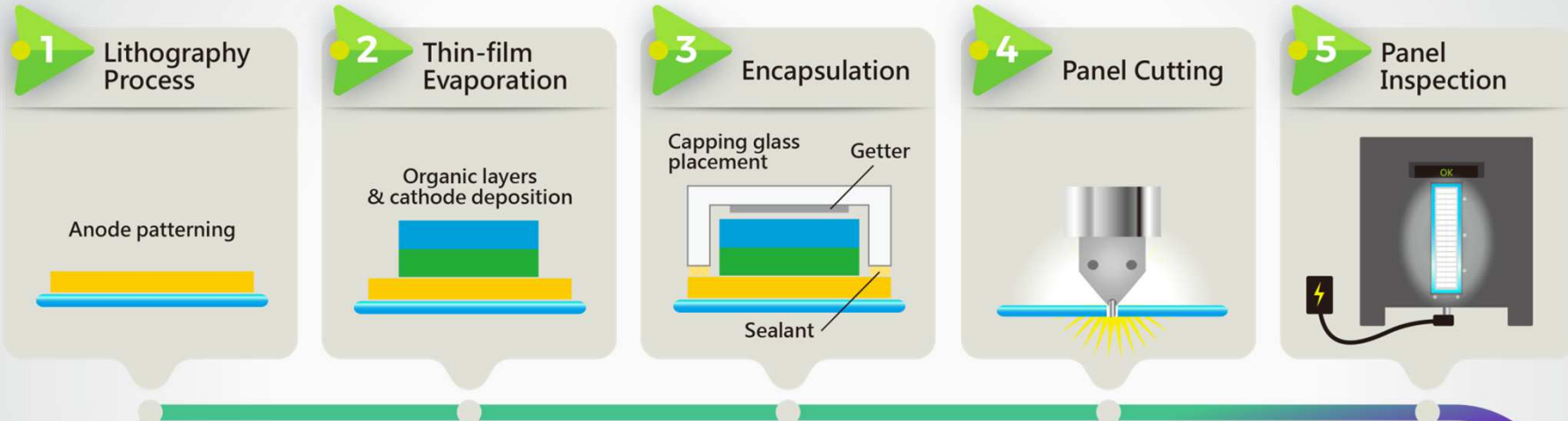
**TOPCON SR-3AR
Spectroradiometer**



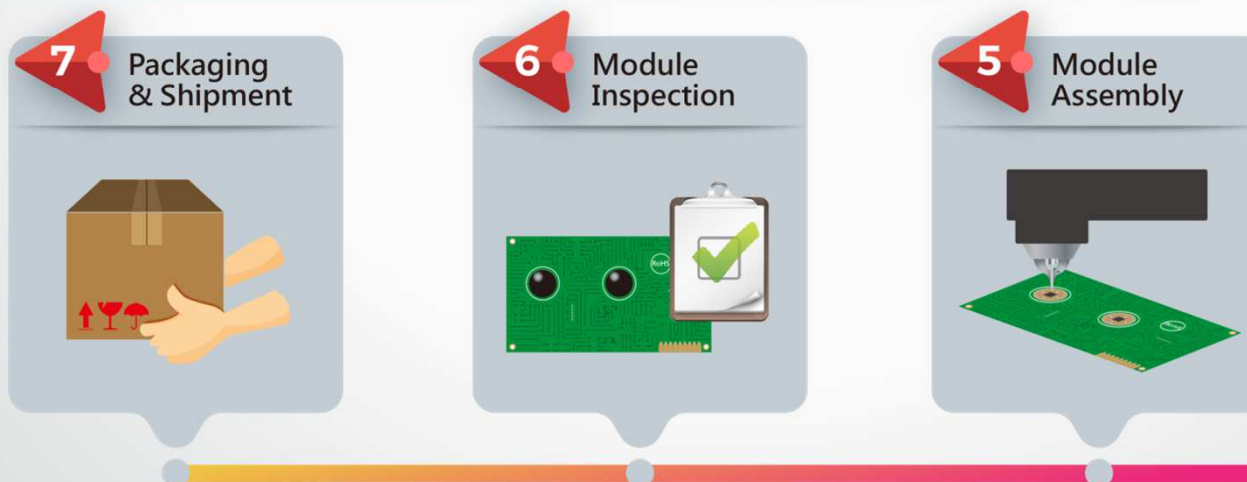
OLED Lifetime Tester

OLED Fabrication Flow

Panel Process in Taichung RAYSTAR



Module Assembly in Changshu WINSTAR (China)



Reliability Test



- ✓ Environmental Test
- ✓ Vibration Test
- ✓ ESD Test
- ✓ Burn-in Test

- ✓ Tensile Test
- ✓ Bonding Test
- ✓ Luminance Test
- ✓ PMT Test

OLED-COB, COG, COF

- ◆ Character – 8x2, 16x2, 20x2, 20x4, 40x2
- ◆ Graphic – 96x64, 128x32, 128x64, 256x64
- ◆ Icon/Segment – Custom Design-0.49"-6"

TFT Modules

- ◆ 0.96", 1.77", 2.4", 2.8", 3.5", 3.9", 4.3", 5", 5.2",
- ◆ 5.7", 7", 8", 10.2", 12.1", 12.3"

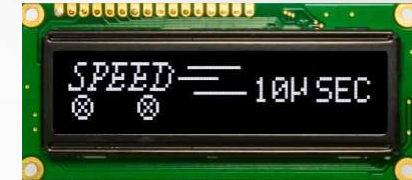
STN LCD modules

- ◆ Character (8x2, 16x2, 20x2, 24x2, 40x2)
- ◆ Graphic (duty 1/32 ~ 1/240)

COG STN modules

- ◆ Character (16x2, 20x2, 24x2)
- ◆ Graphic (128x64, 240x160, 320x240)

OLED



TFT



Character



Graphic



COG



Product Line - STN

▶ COG LCM



▶ VATN LCM



▶ Graphic LCM



▶ Character LCM



▶ LCD Panel



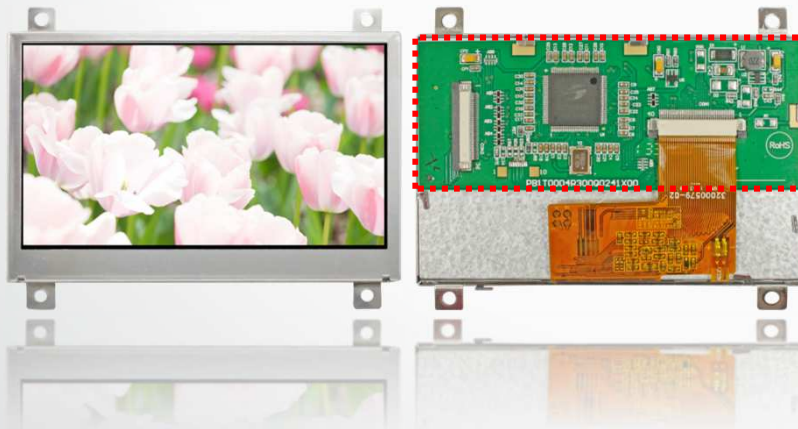
▶ TFT Panel Series



▶ Bar Type 5.2", 4.6", 3.9"



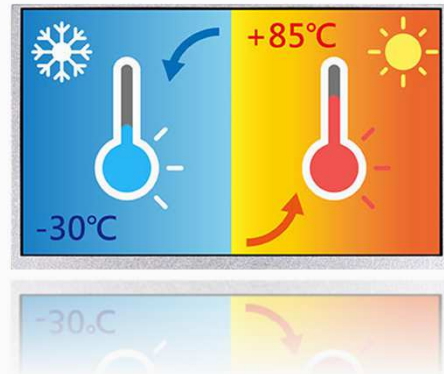
▶ TFT control board



▶ Mono TFT



► Wide Temp.



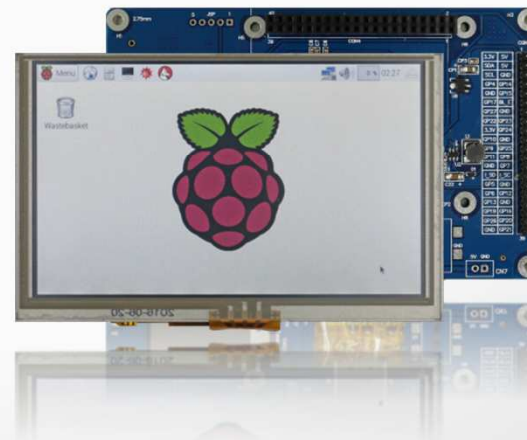
► Clever TFT



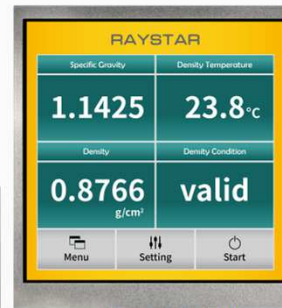
► High Brightness



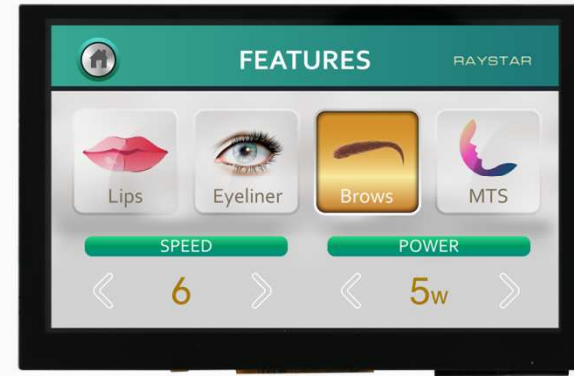
► HDMI TFT



▶ MIPI TFT



▶ LVDS TFT



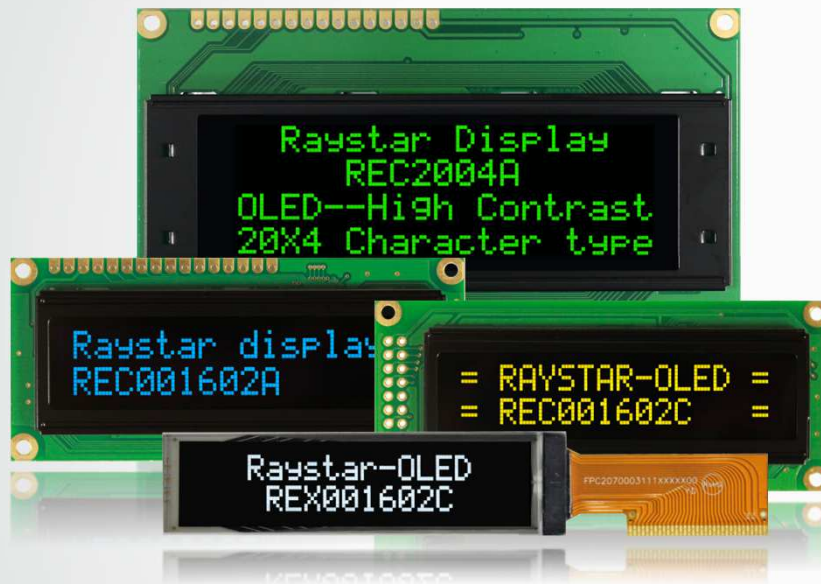
▶ IPS TFT

2022 TFT Product Roadmap

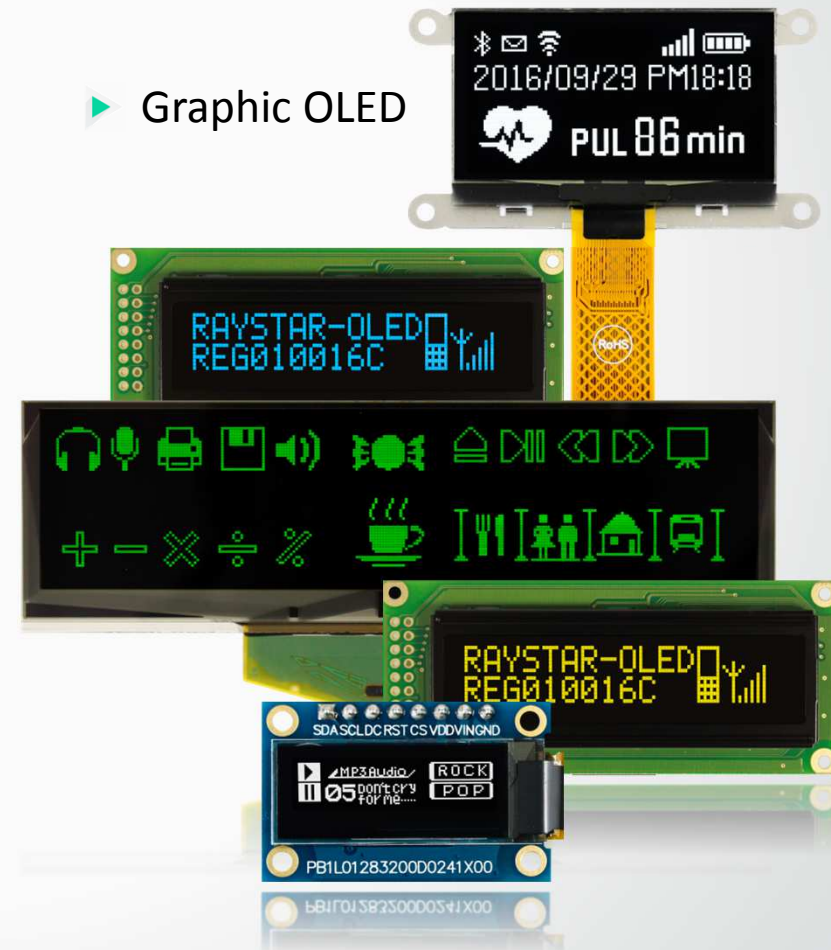
2022 Q1	2022 Q2	2022 Q3	2022 Q4
SPI TFT 2.0" (IPS) 240×320 Top: -20°C~+70°C	SPI TFT 1.3" Round(IPS) 240×240 Top: -20°C~+70°C	LVDS TFT 10.1" (IPS) 1920×1200 Top: -20°C~+70°C	MIPI TFT 7" (IPS) (Pending) 1200×1920 Top: -20°C~+70°C

TFT NTSC (Color Saturation) Technique Improvement

▶ Character OLED



▶ Graphic OLED



OLED Touch & Knob Solution



REX012864Q(2.7")



REX012864G(2.42")



REX025664D(3.55")



REX012864A(1.54")



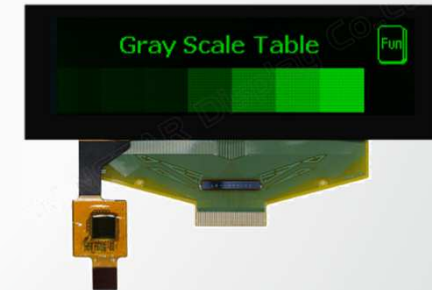
REP012832A (2.23")



REX012864J(1.54")

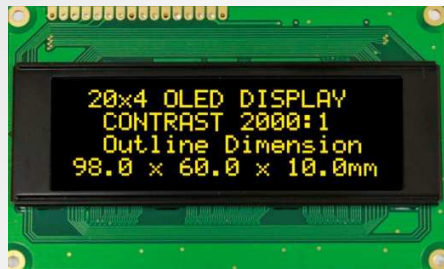


REX128128D
Knob option



RET025664B(3.12")

Product - OLED by Structure



COB(Chip on Board) Character



COB(Chip on Board) Graphic

- Pro: Easy to apply, Compatible to STN, Pattern DC to DC boost, 4 fonts included
- Con: Thickness



COG Character
Chip on Glass



COG Graphic
Chip on Glass



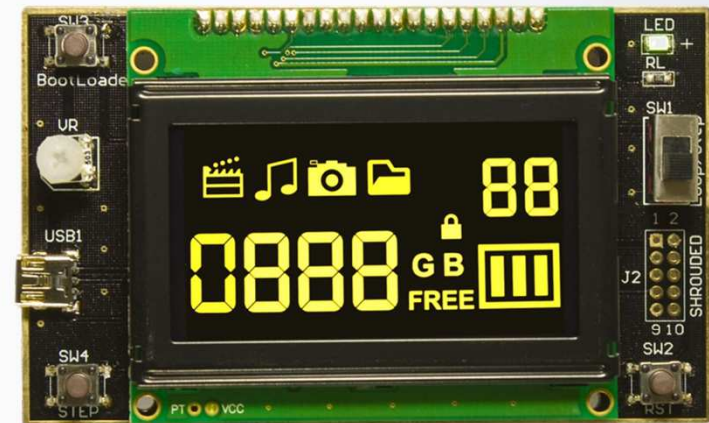
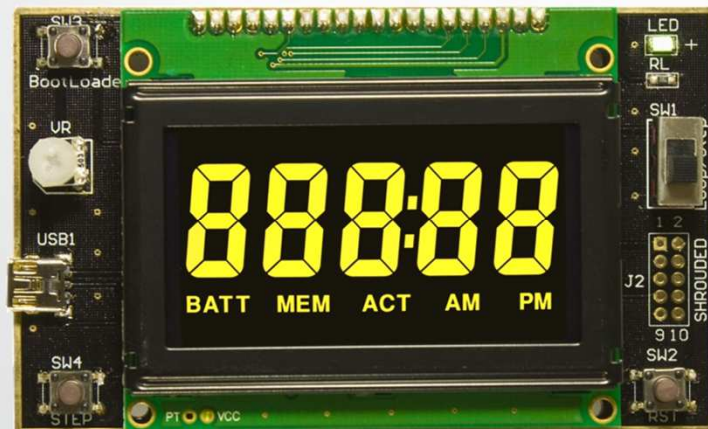
COF Graphic
Chip on Film

- Pro: Slim, Small Mechanical sizes, Custom, Prices
- Con: weak structure compared to COB

- Pro: size, Resolution
- Con: Prices

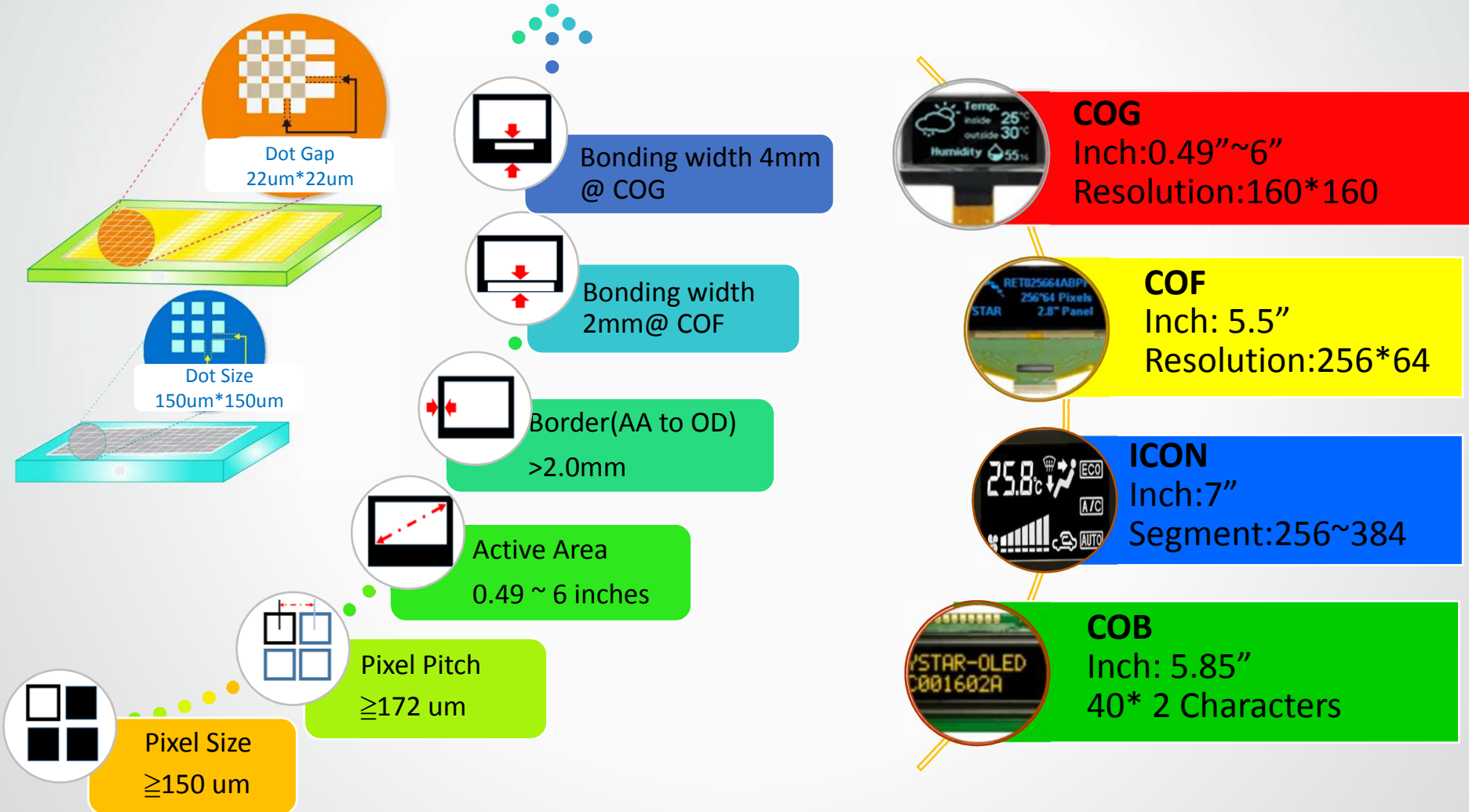
ICON / Segment Custom Overview

- Pro : Custom, Smooth Shape
- Con: NRE, Developing time



OLED Custom Design Rules

OLED Overview : Design Rule



Display Type	OLED	LCD	VFD
Built in Font ROM	4 types fonts in one IC	1 type fonts in one IC	2 types fonts in one IC

RS0010 OLED COB IC

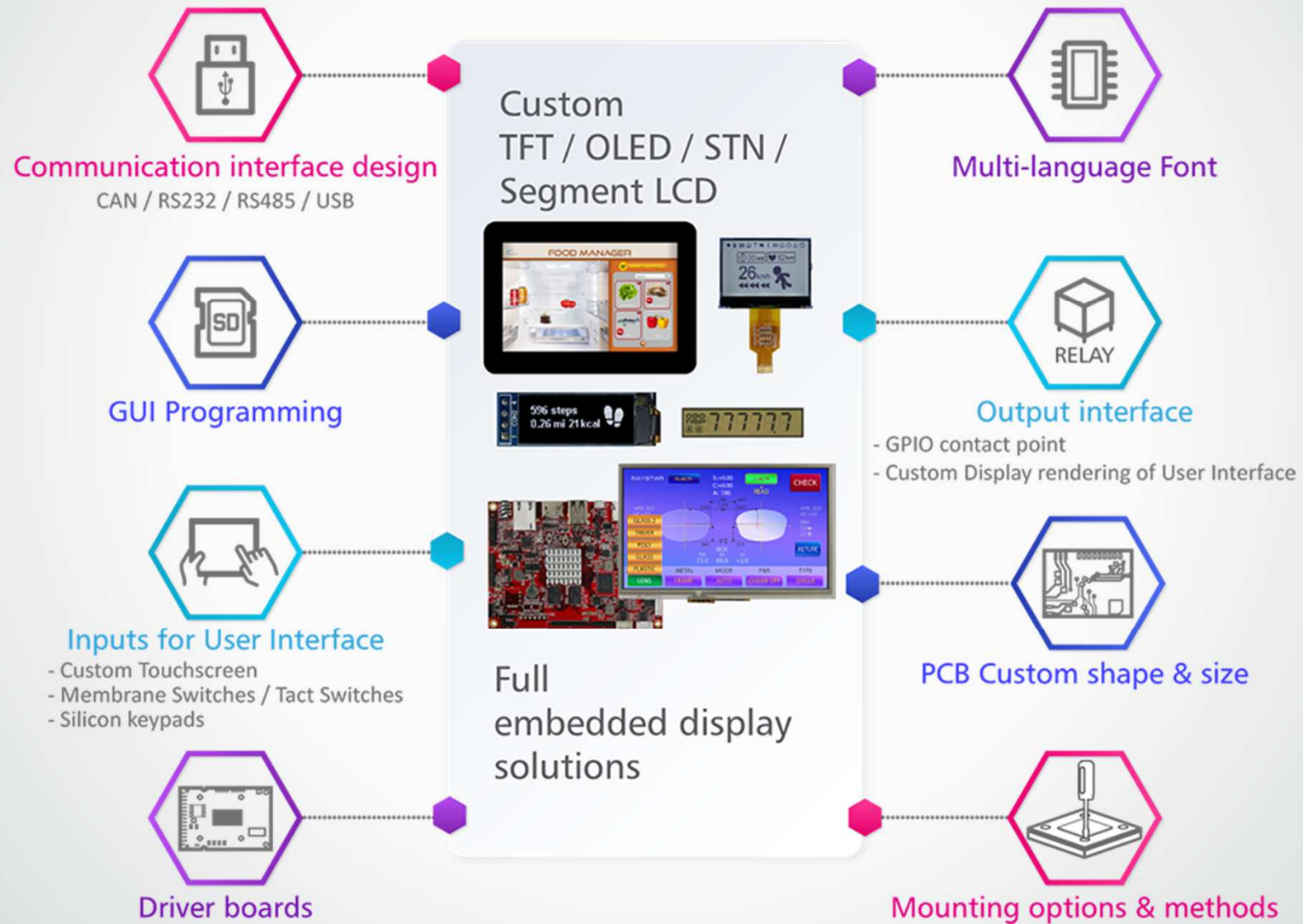
- ✓ Raystar Design only
- ✓ Pattern in Taiwan and USA
- ✓ Fonts available
 1. English Japanese font
 2. Western European I font
 3. Western European II font
 4. English Russian font



2022 OLED Product Roadmap

	2022 Q1	2022 Q2	2022 Q3	2022 Q4	2023 Q1	2023 Q2	2023 Q3
Change to competitive Driver IC							
Mono-chrome	0.95" 128*64 SSD1315 IC change Industrial	1.54" 128*64 CH1116 IC change Industrial	2.4" 128*64 CH1116 IC change Industrial	0.96" dual color 128*64 SSD1315 OD Shrink Consumer	5.77" 20ch * 2L Industrial		
	0.96" 128*64 ST7315 IC change Industrial	2.23" 128*32 CH1116 IC change Industrial	2.7" 128*64 CH1116 IC change Industrial				
Grayscale support	1.5" 128*128 CH1120 IC change Industrial	Φ 1.12" 128*128 CH1120 IC change Industrial	3.12" 256*64 SSD1362 Industrial	2.8" 256*64 SSD1362 Industrial	5.5" 256*64 SSD1362 Industrial	1.21" 160*64 SSD1362 Industrial	High resolution display Industrial
Touch Solution			0.96" In-cell Consumer				1.71" In-cell Consumer
PCB optional	REX012832G + PCB Industrial	REX064128A + PCB Industrial	REX128128G + PCB Industrial	REX009616B + PCB Industrial			
Multi-interface	REX025664D CAN protocol Industrial			UART/ Bluetooth/ USB Industrial			
				Completed	Confirm	Planning	

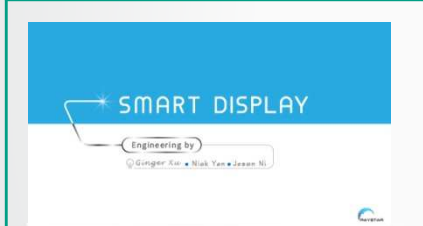
System Integrated Solution



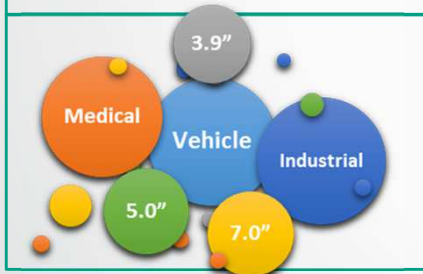
Smart Display Introduction



- A product that integrates display and MCU with UI bundled



- With user friendly SW app. to design your own UI



- Multi-options for panel size and default scenarios

Features of Smart Display

Design without writing a line of code. Speed up the time to market



Design the UI by Dragging Objects Instead of **CODING ALL DAY LONG**



Design for Multi-pages by your own

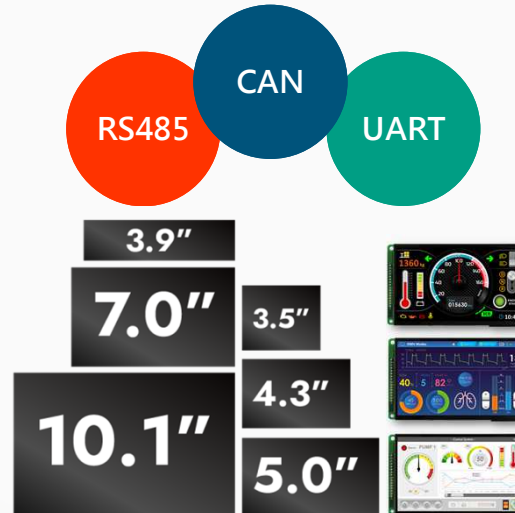


Simulate directly without HW device needed



Wealth and flexible application coverage

- Multi-HOST choice
- Multi-Display Size
- Default 3 types of scenario format

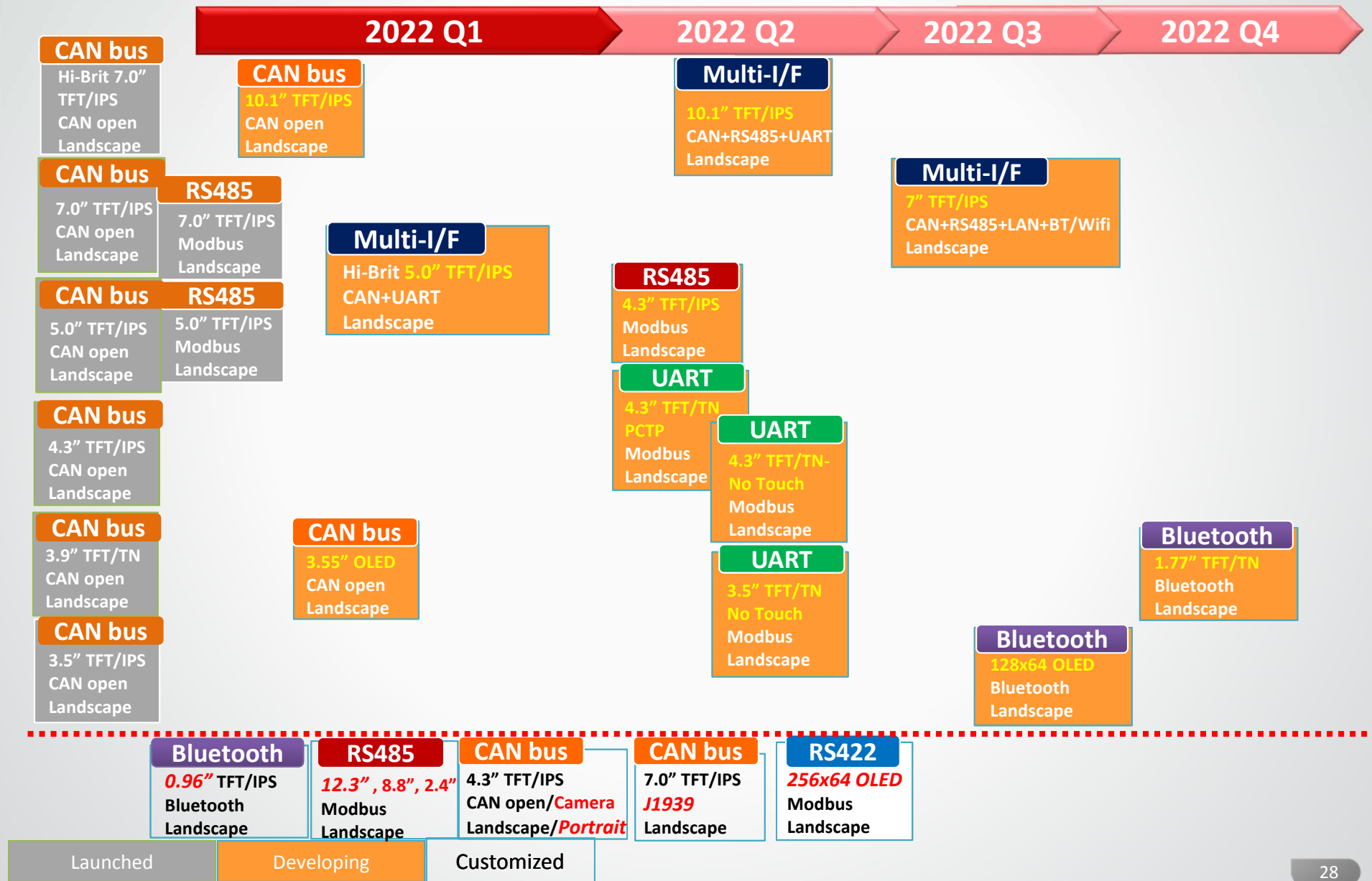


Raystar can help!

We can also customize your own display if the above doesn't meet your requirement



Smart Display Product Roadmap



Manufactured Part No.

TFT
1,820 items



OLED
1,688 items



STN
10,415 items



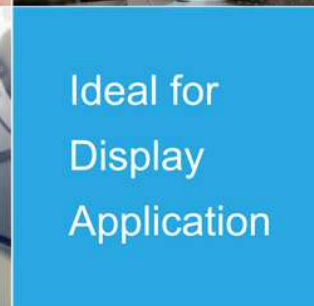
Total : 13,923 module part numbers

- ✓ Wide range of OLED / TFT / STN products
- ✓ More than 13,000 part numbers in Standard & Custom products
- ✓ Low MOQ and NRE cost

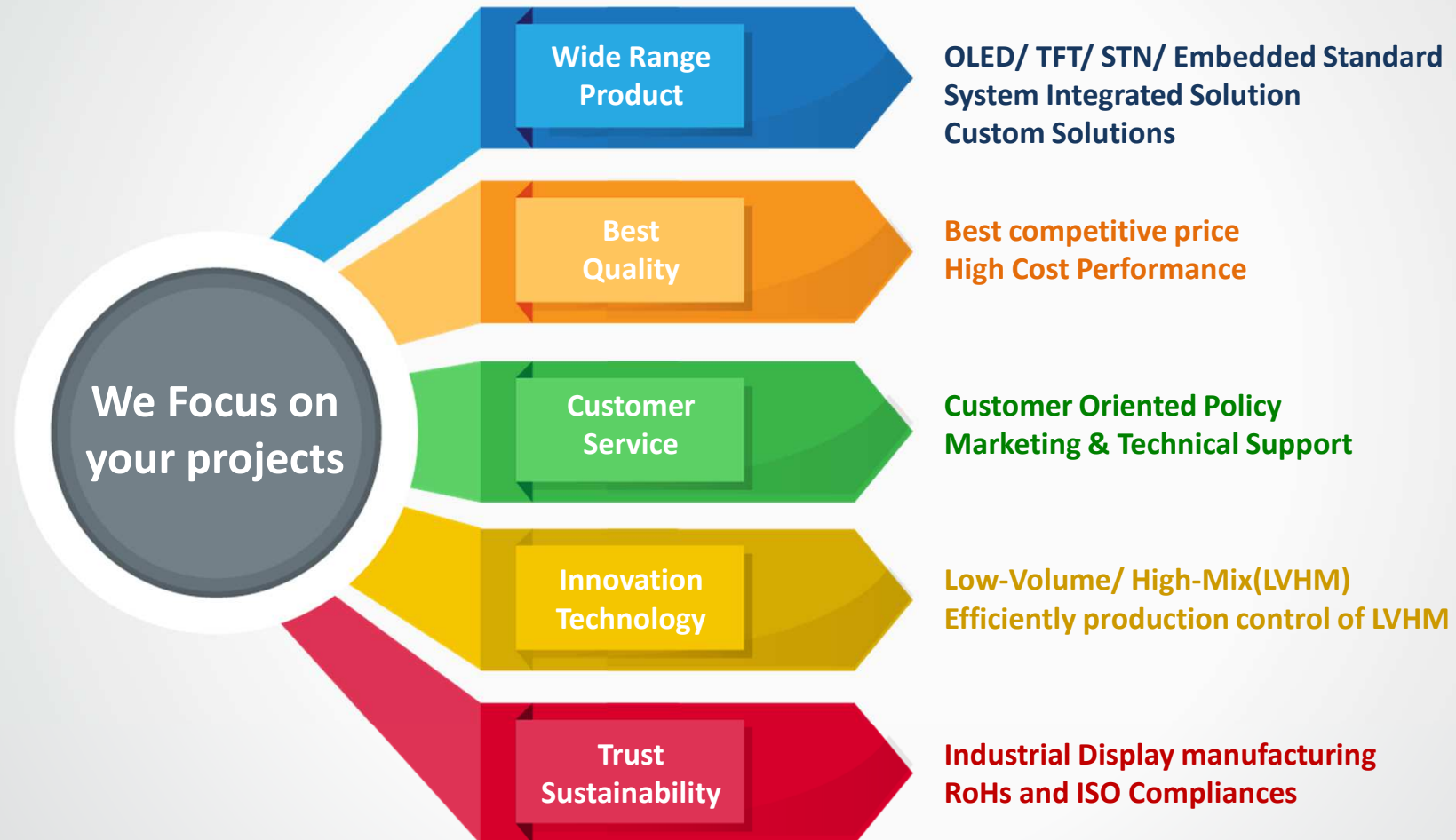
Main Applications

- ▶ Industrial Machine
- Security System
- Telecom Product
- White Goods
- Audio System
- Medical device/Equipment

- ▶ POS System
- Cloud / IoT
- Intelligent Technology
- Wearable Device
- Smart Home
- 3D Printing
- Meter device
- Energy System / Equipment



Why RAYSTAR



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