

2017

Overview guide for OLED/LCD-TFT-TP Displays

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OLED Displays.

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1. General Scope.

DAU-Components Ltd are proud to Partner the National award winning **VISIONOX OLED Manufacturing Group**, with franchised rights for the UK – Ireland and European markets. Visionox Were instrumental in the formulation of the OLED international standards, in recognition of Their excellent technical and deep understanding of the OLED Industry.

Technological processes used within the product portfolio are:

- AMOLED and PMOLED.

Each commonly used in the **OLED Display Products**, the **OLED lighting products**, the **TFT-LCD/TP Products** and the **Flexible devices “classified as Future displays”** an area in which Visionox lead the Chinese OLED industry for technology and innovation.

See the below table (**Fig.1.**) for the expansion of the primary OLED manufacturing disciplines:

- OLED Display Product.
- OLED Lighting Product.
- TFT – LCD/TP.
- Future Display.

<i>OLED Display Product</i>	<i>OLED Lighting Product</i>	<i>TFT – LCD/TP</i>	<i>Future Display</i>
Mono Colour	OLED Panel and Modules	TFT Small-Medium	Transparent Display
Area Colour	Lamp	TFT Large	
Full Colour	YOJOY	Resistive Touch panel	
		Capacitive Touch panel	

Fig.1.

Our Supplier’s core competences extend to:

- Research and Design (R&D).
- Manufacturing technology – latest Hi-tech Equipment.
- Quality Management.
- Service and Support.
- Measurement and Test.

Quality assurance along with Quality control are at the forefront of the business ethos, with the mass production sites certified to the following Management systems:

- ISO9001: 2008. Management system.
- ISO14001: 2004. Environmental system.
- IECQ - QC080000: 2005. Hazardous Substance Process Management.

2. Abbreviations Table:

Abbreviations and their relevant meanings commonly used for OLED Displays within this short document are shown in Fig.2 below:

<i>Abbreviation</i>	<i>Description</i>
OLED	Organic Light Emitting Diode
PMOLED	Passive Matrix – Organic Light Emitting Diode.
AMOLED	Active Matrix – Organic Light Emitting Diode.
COG	Chip on Glass.
COF	Chip on Film
TAB	Tape Automated Bonding
LCD	Liquid Crystal Display
TFT	Thin Film Transistor
TP	Touch Panel
FPC	Flexible Printed Circuit.
OCA	Optical Clear Adhesive
OCR	Optical Clear Resin
CTP	Capacitive Touch Panel
ITO	Indium Tin Oxide
G+G	Glass to Glass
G+F	Glass to Film

Fig.2.

3. Summary of the product range.

The summary of the product range is divided into 4 primary segmentations – then into sub divisions.

- The *OLED Display Products* are divided into sub divisions as per the table in *Fig.1*.

Normal (Mono – Area - Full) narrow bezel, transparent, segment, flexible, round.

Attached is a reference to the standard product types available, this covers all three display types and there relevant technical specifications. *Fig.3*.

For more in-depth specifications, please request the specific data sheet.

OLED Display Product: Sub divisions:- varying in size: 0.49 to 3” inches.

- Mono Colour.
- Area Colour.
- Full Colour.







Product Code	Size	Pixels	Color			Mechanical Size(mm)				
			Mono	Area	Full	Thickness	Panel Size	A.A Size	Pixel Size	Bonding
 M00300	0.95	96x64			65K Full Colors	1.33	24.8*22.42	20.135*13.42	0.21*0.21	COG+FPC
 M00180	0.96	128x64		Yellow & Blue		1.3	26.7*19.26	21.74*11.2	0.17*0.17	COG+FPC
 M00470	0.68	96x32	White			1.3	19.8*12.8	16.3*5.42	0.17*0.17	COG+FPC
 M00531	0.91	128x32	White			1.335	30*11.5	22.384*5.584	0.175*0.175	COG+FPC
 M00040	0.95	96x64	Yellow White			1.3	24.8*22.42	20.14*13.42	0.21*0.21	COG+FPC
 M0019H	0.96	128x64	Blue White Amber			1.3	26.7*19.26	21.74*11.18	0.17*0.175	COG+FPC

Fig.3.

- The OLED Lighting Products are divided into three sub divisions as per the table in Fig.1.

Panel / Modules – Lamp - YOJOY.

Attached is a reference to the standard product types available, this covers all three display types and there relevant technical specifications. *Fig.4 – 5.*

For more in-depth specifications, please request the specific data sheet.

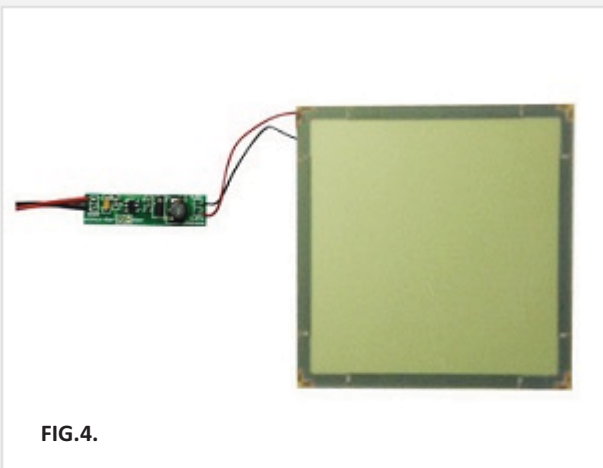


FIG.4.

Panel / Module

Module Code: VLM0020

Panel area: 85X85mm

Lighting area: 75X75mm

Thickness: 1.8mm

Panel brightness: 2000cd/m2

Life time: 10,000h

CCT: 3500-4000K

CRI: 85

Voltage: 12V

Current: 200mA




FIG.5.

Lamp

Name: RAZO

Design year: 2012

Height: 400mm

Light source : OLED

Panel Brightness: 3000cd/m2

0-100% dimmable

Voltage : 12V


Current : 2A

- The TFT – LCD / TP are divided into four sub divisions as per the table in Fig.1.

TFT-Small-Medium size. TFT–Large Size. Resistive Touch Panel. Capacitive Touch Panel.

Attached is a reference to the standard product types available, this covers all four display types and there relevant technical specifications. Fig.6 – 7. The TFT Large is currently not available along with the Capacitive Touch Panel.


There are a total of 8 standard small/medium size TFT, for more in-depth specifications, please request the specific data sheet. The below is a representation of what we can provide.



Product Code: KTM024BM01
 Diagonal Size: 2.4inch

specifications	
Diagonal Size	2.4 ''
Resolution	240*320
Product Code	KTM024BM01
Model Code	T8010
Module Size(mm)	42.72*59.46*3.0
Active Area(mm)	36.72*48.96
Luminance (nit)	180
Interface	MPU 18bit/CPU 18bit
Drive IC	SPFD5408B

Fig.6.



3.3inch Resistive TP

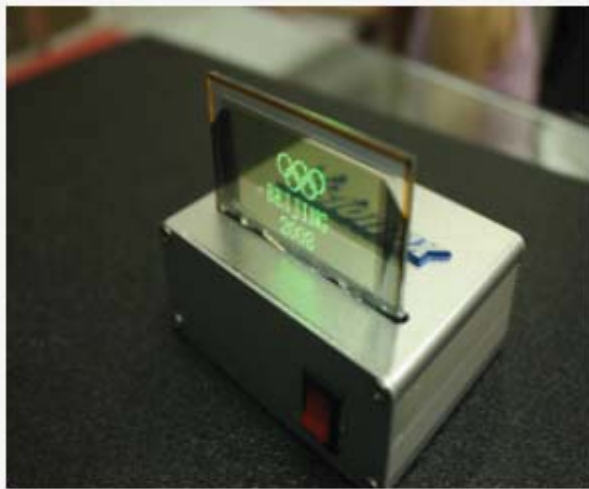
specifications	
Name	4 Wire Resistive Touch Panel
Diagonal Size	3.3"
Surface Hardness	3H
out Dimension(mm)	74.00*42.62
Memo	

Fig.7.

- The Future Displays are currently showing as one sub division as per the table in Fig.1.

Transparent Display Product.

Below is a brief overview of the future, a display that can be seen on both sides of the monitor with non- light emitting pixels in a highly transparent state. See Fig 8 – 9.



OLED Flexible Display

Fig .8.



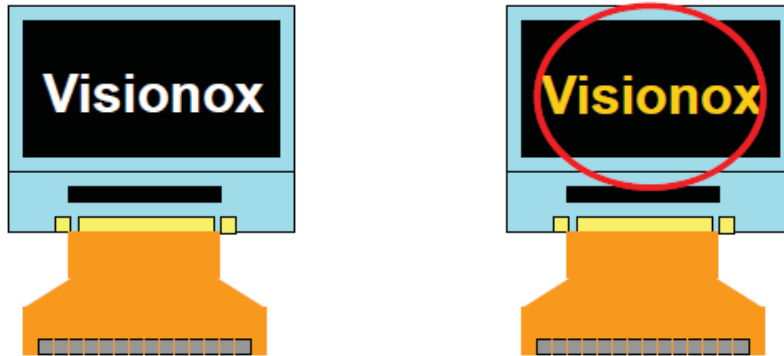
OLED Dual-side Display Product

Fig.9.

4. Customisation of products.

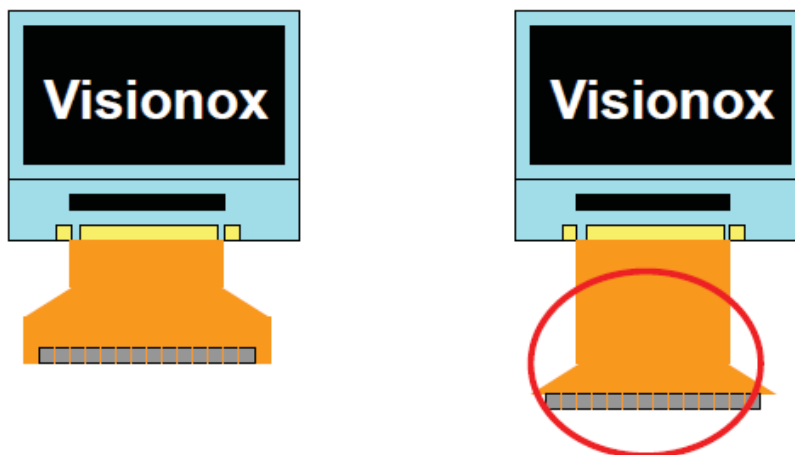
There are three different methods of customising products, each version will have an adverse effect on the development cycle and lead time.

- *To develop a new product: - This includes Panel + appointed colour + FPC.*
Development cycle: 60 – 90 days (3 months).
- *Partial custom change: - This includes changing a colour from an existing product.*



Development cycle: 30 – 60 days (2 months).

- *Partial custom change: - This includes changing a FPC from an existing product.*



Development cycle: 15 – 30 days (1 month).

5. OLED advantage Vs LCD

- *Self-emission lighting, (more lower consumption)*
- *High contrast ratio*
- *Wide viewing angle, (unlimited)*
- *Wide temperature range, (operation, $-40^{\circ}\text{C} \sim +80^{\circ}\text{C}$)*
- *Thinner thickness, min.0.96mm (with polarizer)*
- *Quick response time, (Microsecond level)*

6. New product introduction (already in mass production)

Narrow bezel

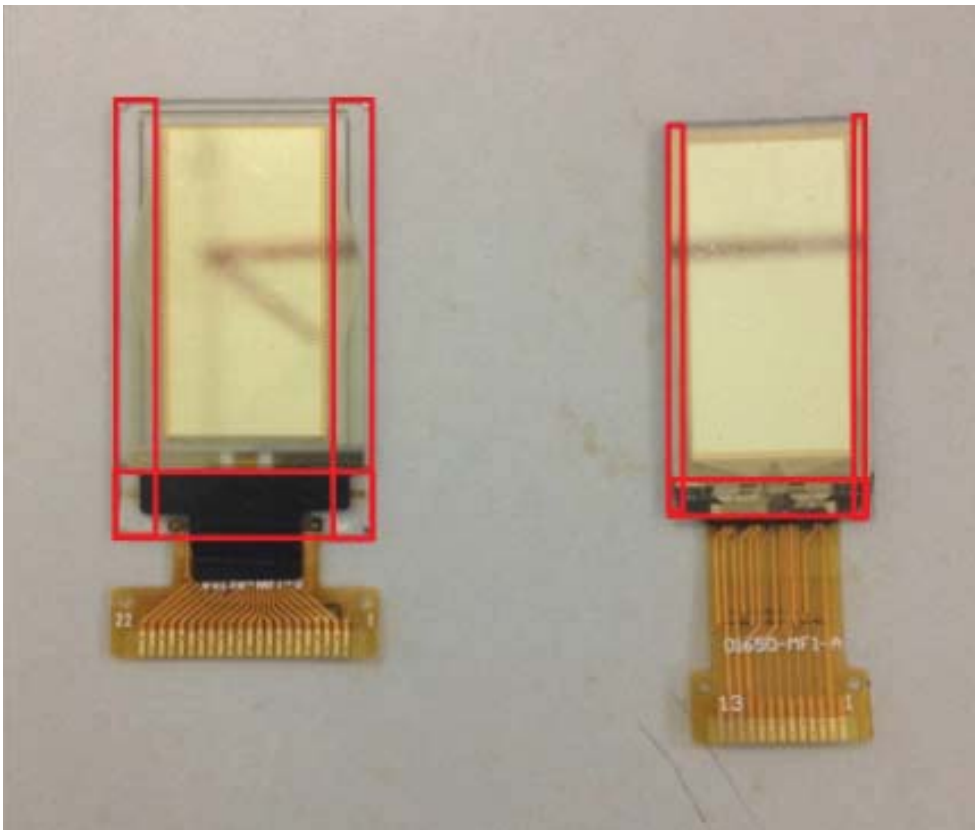


Fig.10.

ICON display.

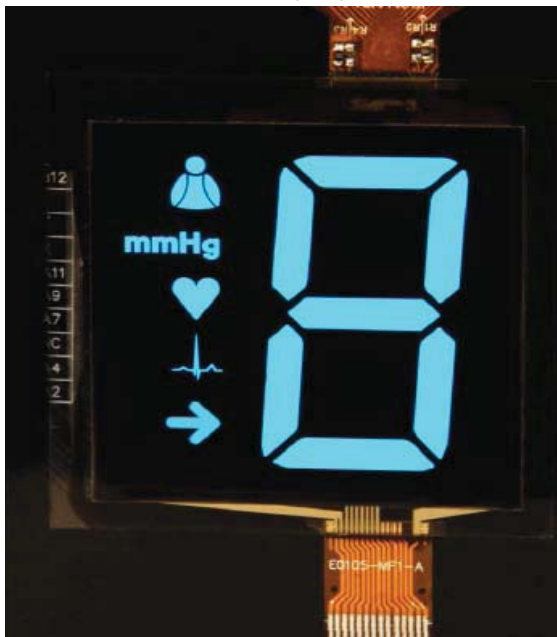


Fig .11.

Round OLED.



Fig .12.

ON-CELL TP (Thickness, 1.2mm)

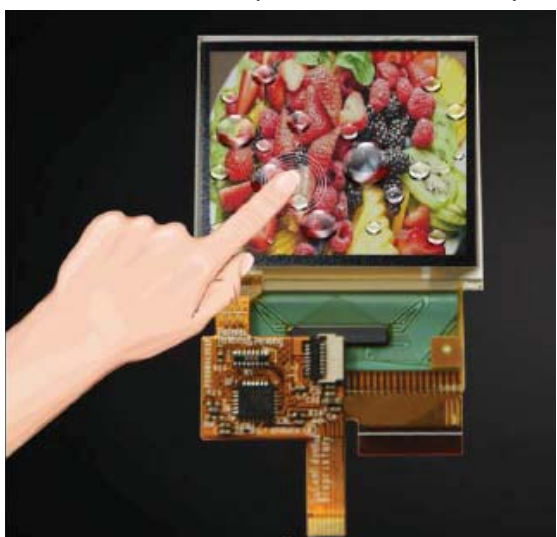


Fig .13.

Transparent

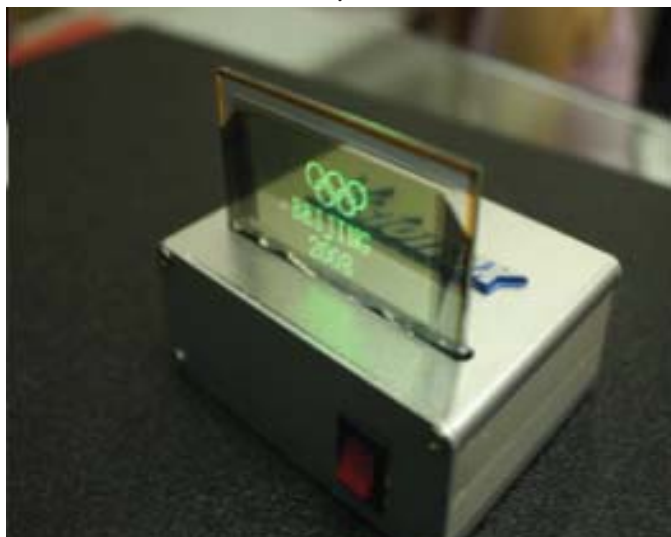


Fig .14.

Our partner "Visionox" can provide the total solution for OLED+CTP or TFT+CTP, depending on the customer's requirements.

7. Electrical and Mechanical specs.

The electrical and mechanical specs will vary with each product type – OLED and LCD/TFT/TP, below is an *indicator* of what to find on the respective datasheet.

OLED: - lighting panel is a low voltage constant-current device.

Product Optical Electric parameters.

Items	Unit	Value	Reference
Voltage	V	5-6	DC diode device
Current	mA	170	@1000cd/m ² , without out-coupling film
		200	@2000cd/m ² , with out-coupling film
Reverse Breakdown Voltage	V	~18	Reference only, reverse use is prohibited

Mechanical: - represented as product spec.

Items	Unit	Value	Reference
Total area	mm	73X42	
Lighting Area	mm	30X60	
Thickness	mm	1.8	Could be thinner

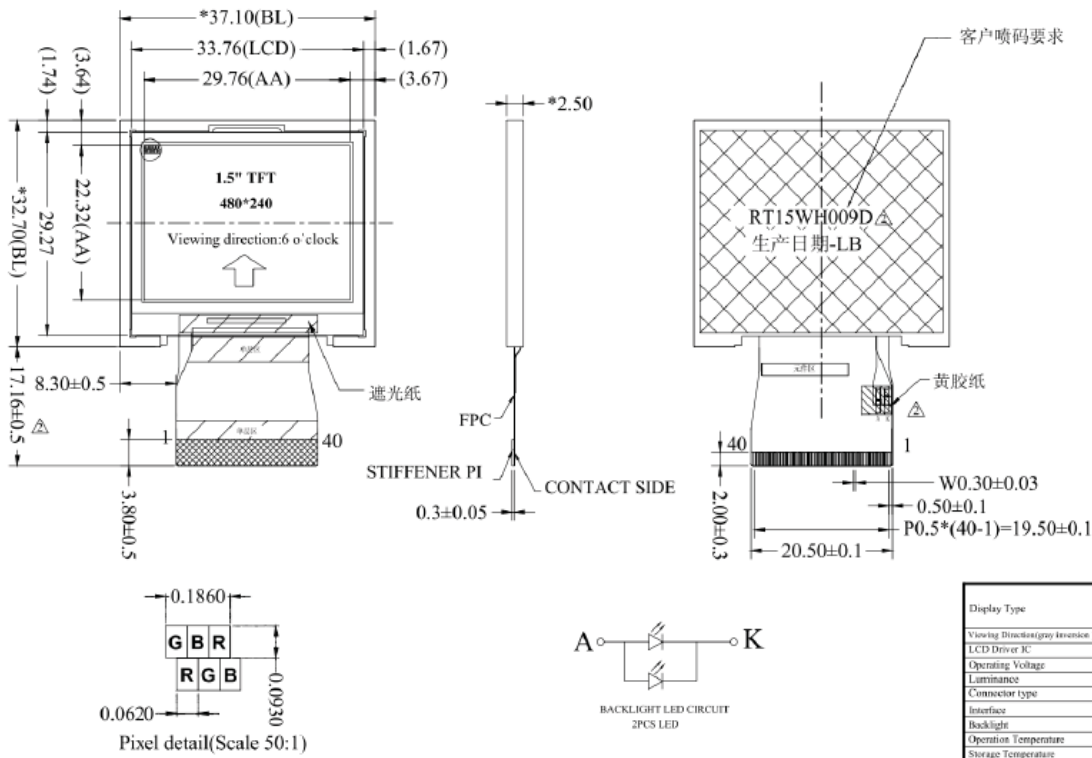
LCD/TFT: - Combination of the two technologies.

Typical Electrical Characteristics:

Item	Symbol	Min.	Max.	Unit
Logic Supply Voltage	IOVCC	-0.5	6	V
Analog Supply Voltage	VCC	-0.5	6	V
Operating Temperature	TOP	-10	60	°C
Storage Temperature	TST	-20	70	°C
Storage Humidity	HD	20	90	%RH

Item	Symbol	Min.	Typ.	Max.	Unit	Remark
I/O Supply Voltage	IOVCC	1.8	3.3	3.6	V	-
Input High Voltage	VIH	0.7IOVCC	-	IOVCC	V	-
Input Low Voltage	VIL	GND	-	0.3IOVCC	V	-
Output High Voltage	VOH	IOVCC-0.4	-	IOVCC	V	-
Output Low Voltage	VOI	GND	-	IOVCC+0.4	V	-
I/O Leak Current	ILI	-1	-	1	uA	-

Mechanical drawing:



8. Quality Control Specifications:

The quality control specifications are split into 4 sections, for details of these control features refer to the actual relevant datasheet.

9. Precautions for operations and storage:

Precautions for the operations and storage are split into 4 sections, again details of these features refer to the actual relevant datasheet.