

PREPARED BY : 制作人:CLM 日期: 2025-12-03	<b>EASYQUICK</b>  <b>TECHNOLOGY</b>  SPECIFICATION 深圳市全华顺电子科技有限公司	SPEC No: (规格型号: ) <b>EQT283EQC512L</b>
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		APPLICABLE DIVISION (适用范围)  <input checked="" type="checkbox"/> LCD DIVISION <input checked="" type="checkbox"/> 液晶模组

For **240\*320**TFT LCD Module Model No

# EQT283EQC512L

## SPEC

Customer side signature (客户方签名)

部门	签名	Acknowledge (承认人)	Date (日期)	Remarks (备注)
	<b>Structure</b> (结构)			
	<b>Electronics</b> (电子)			
	<b>Item</b> (项目)			
	<b>Quality</b> (品质)			

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(全华顺电子科技)

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## 1. Application (应用)

This data sheet is to introduce the specification of **EQT283EQC512L** active matrix **262K** color TFT LCD module.

Main color LCD module is controlled by Driver IC **GC9307N**.

If any problem occurs concerning the items not stated in this specification, it must be solved sincerely by both parties after deliberation.

As to basic specification of driver IC refer to the IC specification and handbook.

本规格书是为了介绍 **EQT283EQC512L** 有源矩阵 **262K** 彩色 TFT LCD 模块的规格。

主彩色液晶显示模块由驱动芯片 **GC9307N** 控制。

本规范未尽事宜如有问题，双方必须认真协商解决。

驱动 IC 的基本规格参照《IC 规格书》和相关《手册》

## 2. Construction and Outline (结构与大纲)

Construction: LCD panel, Driver (COG), FPC with electric components, **4** White LED lump, prism sheet, diffuser, light guide and reflector, plastic frame to fix them mechanically.

There shall be no scratches, stains, chips, distortions and other external drawbacks that may affect the display function.

In order to realize thin module structure, double-sided adhesive tapes are used to fix LCD panels. As these tapes do not guarantee to permanently fix the panels, LCD panel may rise from the module when shipped from factory.

So please make sure to design the system to hold the edges of LCD panel by the soft material such as sponge when LCD module is assembled into the cabinet.

结构:液晶面板，驱动或 COG，带电子元件的 FPC，**4** 个白光 LED 块，棱镜片，扩散器，导光器和反射器，塑料框架机械固定。

不应有可能影响显示功能的划痕、污迹、芯片、畸变等外部缺陷。

为了实现薄型模块结构，采用双面胶带固定液晶面板。由于这些胶带不能保证永久有效固定面板，LCD 面板在出厂时可能会从模块内移动。

所以在液晶模块组包装和进柜时，请务必将包装结构设计成用海绵等软材料支撑液晶面板的边缘。

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### 3. Mechanical Specification (参数规格)

No.	Item	Contents	Unit
1	Screen size (屏幕尺寸)	2.83	inch
2	Display mode (显示模式)	Normally black	/
3	View Angle (视角)	FULL VIEW	/
4	Display format (分辨率)	240×RGB×320	/
5	Outline Dimensions (外形尺寸)	48.5(W)×68.55(H)×2.3(D)	mm
6	Active area (显示范围)	43.2(H)×57.6(V)	mm
7	Pixel size(像素)	0.180 (H) x 0.180 (V)	mm
8	Interface type (接口类型)	MCU 16bit	/
9	Color Depth (颜色深度)	262K	/
10	Module power consumption (模组功耗)	TBD	W
11	Back light type (背光类型)	LED	/
12	Driver IC (驱动 IC)	<b>GC9307N</b>	/
13	Weight (重量)	TBD	G

Note 1: Not include FPCs & Bezel extrude stucture.

备注 1: 不包括排线和面板构造

### 4. ABSOLUTE MAXIMUM RATINGS(绝对最高额定值)

Item	Symbol	Min.	Max.	Unit	Note
Power supply input voltage for TFT (TFT 电源输入电压)	VDD	-0.3	+4.6	V	
Operation temperature (运行温度)	Top	-20	+70	°C	
Storage temperature (储存温度)	Tst	-30	+80	°C	

## 5. ELECTRICAL CHARACTERISTICS (电气特性)

### 5.1 TFT DC CHARACTERISTICS(at Ta=25°C)

#### TFT 直流特性(at Ta=25°C)

Item	Symbol	Min.	Typ.	Max.	Unit	Note
Power supply input voltage (电源输入电压)	VDD	2.5	2.8	3.3	V	
I/O logic voltage (I/O 逻辑电压)	VDDIO	-	-	-	V	
Input voltage 'H' level (输入电压高水平)	VIH	0.7IOVCC	-	IOVCC	V	
Input voltage 'L' level (输入电压低水平)	VIL	VSS	-	0.3IOVCC	V	
Power supply current (电源电流)	IVDD	-	TBD	-	mA	
I/O logic voltage current (I/O 逻辑电压电流)	IVDDIO	-	TBD	-	mA	
TFT gate on voltage (TFT门打开电压) / Input positive voltage(输入正极电压)	VGH	-	-	-	V	
TFT gate off voltage (TFT门关闭电压) / Input Negative voltage(输入负极电压)	VGL	-	-	-	V	
Analog power supply voltage (模拟电源电压)	AVDD	-	-	-	V	
TFT input common mode voltage (TFT输入共模电压)	VCOM	-	-	-	V	Note1

Note1 : The value is just the reference value. The customer can optimize the setting value by the different D-IC

Vcom must be adjusted to optimize display quality, as Crosstalk and Contrast Ratio etc..

备注：该值只是参考值，应用于不同的驱动芯片需要优化设定值，VCOM 必须进行调整来优化显示质量，比如串扰、对比度等

## 5.2 LED back light (背光灯)

At main panel the back light uses 4 pcs edge light type white LED.

在背光的主面板用 4 颗白色 LED 灯

Table 4 (表 4)

Parameter (参数)	Symbol (样品)	Min. (最小值)	Typ. (标准值)	Max. (最大值)	Unit (单位)	Remark (备注)
LED Voltage (LED 电压)	VLED	11	12	13	V	
LED Current (LED 电流)	ILED	-	20	-	mA	
Power Consumption (电功率)	WLED	-	240	-	mW	
Connection Type(Serial/Parallel/Other) 连接类型(串联/并联/其他)	4S1P LEDs					

### Note:

\*4 pcs of LED

\*Please consider Allowable Forward Current on used temperature

\*4 颗灯

\* 请考虑允许范围内的正向电流的使用温度

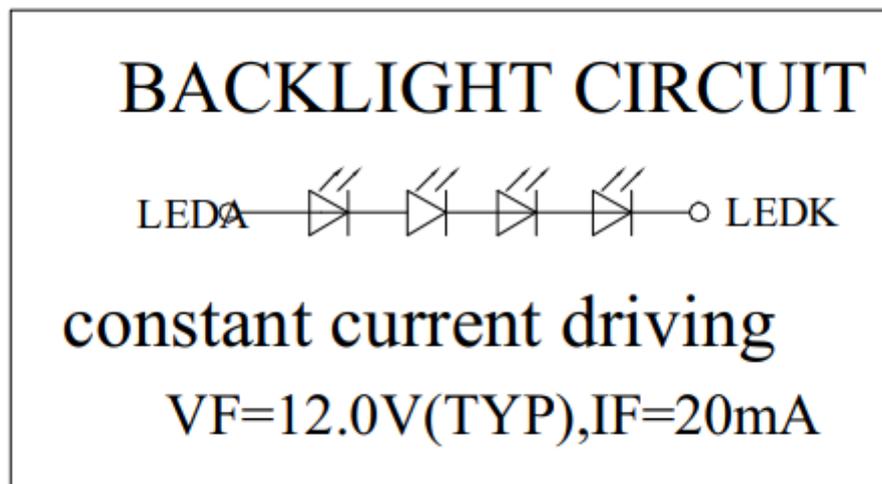


Fig.1\*Schematics drawing of lighting (绘制照明图 图.1)

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## 6. Interface signals (接口信号)

### TFT Module Interface description (TFT 模块接口描述)

Interface No.	Name	I/O or connect to	Description
1	GND	P	Ground
2	VCC_3.3V	P	Power Supply for Analog, Digital System and Booster Circuit.
3	GND	P	Ground
4-19	DB15-DB0	I	18-bit parallel bi-directional data bus for MCU system and RGB interface mode
20	GND	P	Ground
21	MCU_RD	I	Read enable in 8080 MCU parallel interface.
22	MCU_WR	I	Write enable in MCU parallel interface.
23	MCU_RS	I	Display data/command selection pin in parallel interface.
24	MCU_CS	I	Chip select input pin
25	RESET	I	This signal will reset the device and it must be applied to properly initialize the chip. Signal is active low.
26	GND	P	Ground
27	MTP	/	NC
28	VCC_3.3	P	Power Supply for Analog, Digital System and Booster Circuit.
29	LEDPWM	O	Backlight control pin
30	NC	/	NC

## 7. AC CHARACTERISTICS (交流特性)

### 7.1 Display Parallel 18/16/9/8-bit interface Timing:

Figure90.

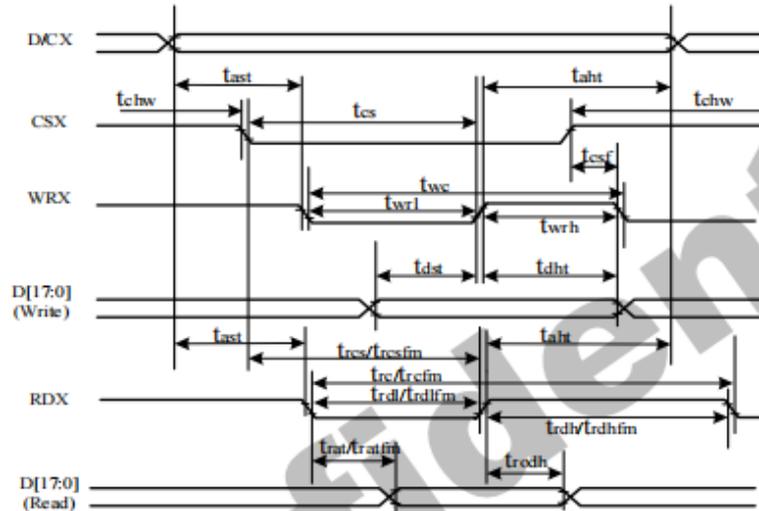


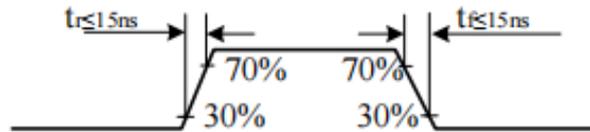
Table45.

Signal	Symbol	Parameter	min	max	Unit	Description
DCX	tast	Address setup time	0	-	ns	
	taht	Address hold time(Write/Read)	0	-	ns	
CSX	tchw	CSX "H" pulse width	0	-	ns	
	tcs	Chip Select setup time(Write)	15	-	ns	
	trcs	Chip Select setup time(Read ID)	45	-	ns	
	trcsfm	Chip Select setup time(Read FM)	355	-	ns	
	tcsf	Chip Select Wait time (Write/Read)	10	-	ns	
WRX	twc	Write Cycle	66	-	ns	
	twrh	Write Control pulse H duration	15	-	ns	
	twrl	Write Control pulse L duration	15	-	ns	
RDX(FM)	trcfm	Read Cycle (FM)	380	-	ns	
	trdhfm	Read Control H duration(FM)	180	-	ns	
	trdlfm	Read Control L duration(FM)	200	-	ns	
RDX(ID)	trc	Read Cycle (ID)	160	-	ns	
	trdh	Read Control H pulse duration	90	-	ns	
	trdl	Read Control L pulse duration	70	-	ns	
D[17:0], D[15:0], D[8:0]	tdst	Write data setup time	10	-	ns	For maximum CL=30pF For minimum
	tdht	Write data hold time	10	-	ns	
	trat	Read access time	-	40	ns	

D[7:0]	tratfm	Read access time	-	340	ns	CL=8pF
	trod	Read output disable time	20	80	ns	

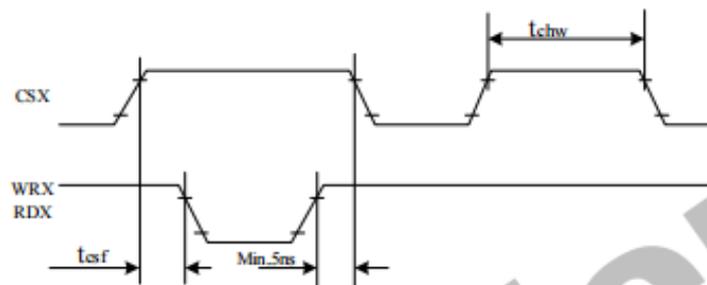
Note:  $T_a = -30$  to  $70$  °C,  $IOVCC=1.65V$  to  $3.3V$ ,  $VCI=2.5V$  to  $3.3V$ ,  $VSS=0V$

Figure91.



CSX timings :

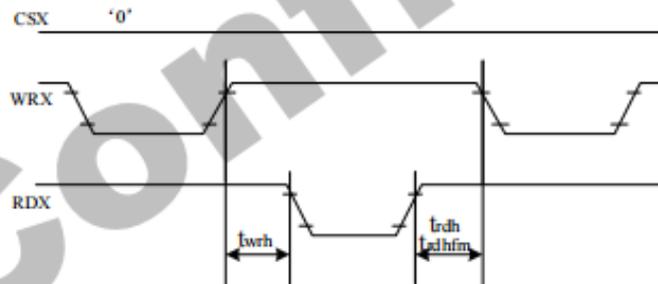
Figure92.



Note: Logic high and low levels are specified as 30% and 70% of  $IOVCC$  for Input signals.

Write to read or read to write timings:

Figure92.



Note: Logic high and low levels are specified as 30% and 70% of  $IOVCC$  for Input signals.

## 8. POWER SEQUENCE (电源时序)

IOVCC and VCI can be applied in any order.

VCI and IOVCC can be power down in any order.

During power off, if LCD is in the Sleep Out mode, VCI and IOVCC must be powered down minimum 120msec after RESX has been released.

During power off, if LCD is in the Sleep In mode, IOVCC or VCI can be powered down minimum 0msec after

RESX has been released.

CSX can be applied at any timing or can be permanently grounded. RESX has priority over CSX.

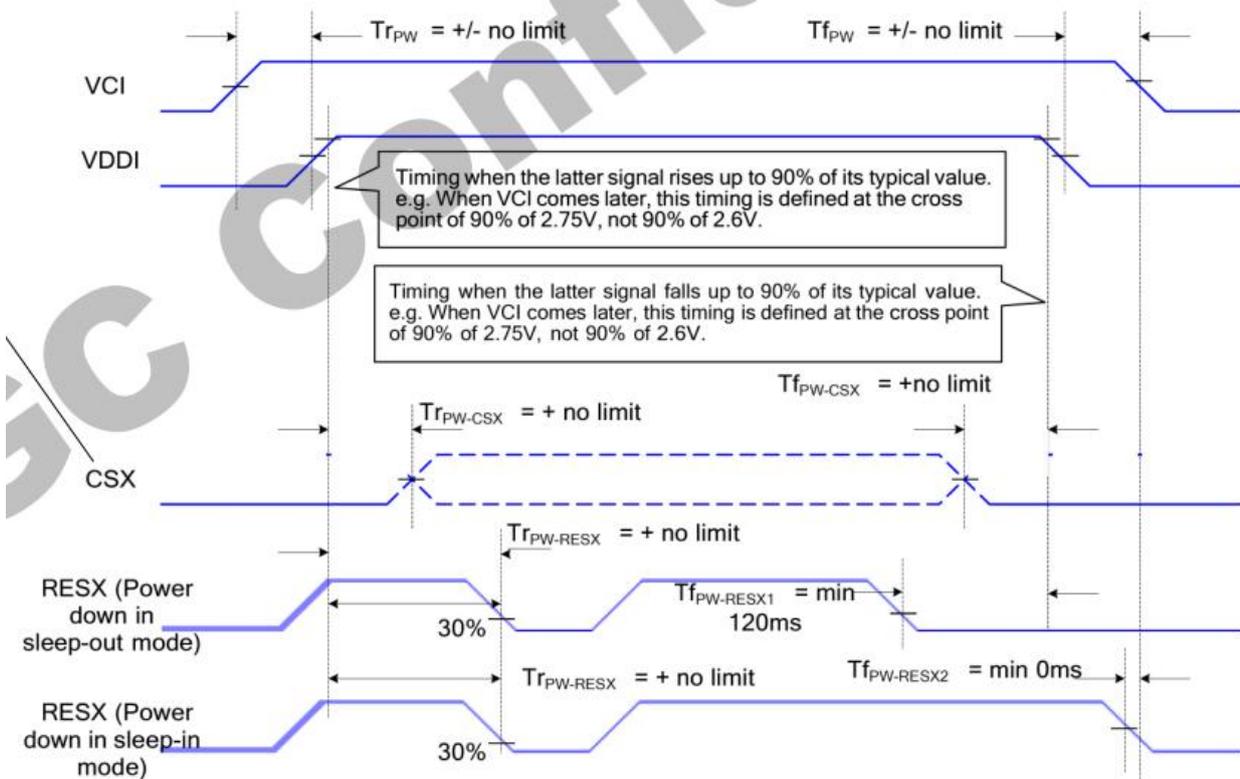
Note 1: There will be no abnormal visible effects on the display panel during the Power On/Off Sequences.

Note 2: There will be no abnormal visible effects on the display between end of Power On Sequence and before receiving Sleep Out command. Also between receiving Sleep In command and Power Off Sequence.

Note 3: If RESX line is not held stable by host during Power On Sequence as defined in the sequence below, then it will be necessary to apply a Hardware Reset (RESX) after Host Power On Sequence is complete to ensure correct operation.

Otherwise function is not guaranteed.

The power on/off sequence is illustrated below



## 9. Optical Characteristics (光学特征)

Item 项目		Symbol (样品)	Condition (条件)	Min. (最小值)	Typ.(标准值)	Max. (最大值)	Unit (单位)	Remark (备注)
Response time (响应时间)	Rise (上升)	Tr +Tf	$\theta=0^\circ$	-	30	40	ms	Note 1 FIG.1
	+Fall (下降)							
Luminance (亮度)		Br	$\theta=0^\circ$	300	380	-	Cd/m <sup>2</sup>	Note 3 FIG.2
Luminance uniformity (亮度均匀性)		YU	$\theta=0^\circ$	-	80	-	%	Note 4 FIG.2
Contrast ratio (对比度)		CR	$\theta=0^\circ$	600	800	-	-	Note 2 FIG.2
Viewing angle(with Polarizer) (视角)	Top (顶部)		CR $\geq$ 10	80	-	-	degree	Note 6 FIG.3
	Bottom (底部)			80	-	-		
	Left (左边)			80	-	-		
	Right (右边)			80	-	-		
White Chromaticity (白色色度)		X	CIE	0.285	0.315	0.345	-	Note 5 FIG.2
		Y		0.306	0.336	0.366	-	CIE1931
NTSC (色彩饱和度)			-	-	60	-	%	Note 5 FIG.2

### Note1. Definition of response time

The response time is defined as the LCD optical switching time interval between "White" state and "Black" state. Rise time ( $T_{ON}$ ) is the time between photo detector output intensity changed from 90% to 10%.

And fall time ( $T_{OFF}$ ) is the time between photo detector output intensity changed from 10% to 90%.

For additional information see FIG1.

### Note2. Definition of contrast ratio

Contrast ratio(Cr) is defined mathematically by the following formula.

For more information see FIG.2.

Contrast ratio=  $\frac{\text{Luminance measured when LCD on the "White" state}}{\text{Luminance measured when LCD on the "Black" state}}$

Measured at the center area of the LCD

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**Note3.Definition of surface luminance**

Surface luminance is the luminance with all pixels displaying white.

For more information see FIG.2.

$L_v$  = Average Surface Luminance with all white pixels(P1,P2,P3, .....Pn)

**Note4.Definition of luminance uniformity**

The luminance uniformity in surface luminance is det-ermined by measuring luminance at each test position 1 through n, and then dividing the maximum luminance of n points luminance by minimum luminance of n points luminance.For more information see FIG.2.

$$Y_u = \frac{\text{Minimum surface luminance with all white pixels (P1,P2,P3,.....,Pn)}}{\text{Maximum surface luminance with all white pixels (P1,P2,P3,.....,Pn)}}$$

**Note5. Definition of color chromaticity (CIE1931)**

CIE (x,y) chromaticity,The x,y value is determined by screen active area center position P5.For more information see FIG.2.

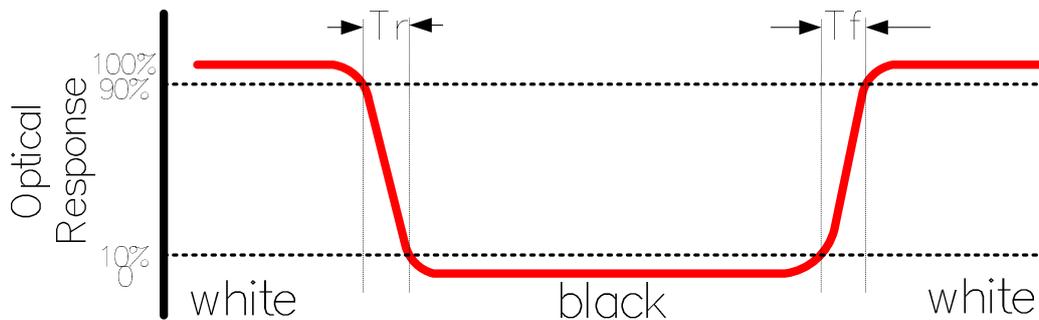
**Note6. Definition of viewing angle**

Viewing angle is the angle at which the contrast ratio is greater than 10. angles are determined for the horizontal or x axis and the vertical or y axis with respect to the z axis which is normal to the LCD surface.

For more information see FIG.3.

For viewing angle and response time testing, the testing data is base on Autronic-Melchers's ConoScope or DMS series Instruments or compatible. For contrast ratio, Surface Luminance, Luminance uniformity and CIE,the testing data is base on TOPCON's BM-5or BM-7 photo detector or compatible.

**FIG.1. The definition of response Time**



**FIG.2. Measuring method for contrast ratio, surface luminance, luminance uniformity, CIE (x,y) chromaticity**

H,V : Active area

Light spot size  $\varnothing = 1.5\text{mm}$  (BM-7)50cm distance or compatible distance from the LCM surface to detector lens.

Test spot position : see Figure a.

measurement instrument : TOPCON's luminance meter BM-7 or compatible ,see Figure b.

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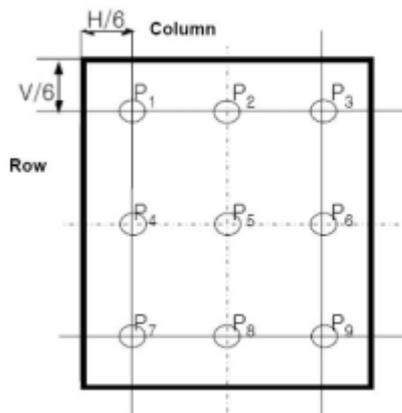


Figure a

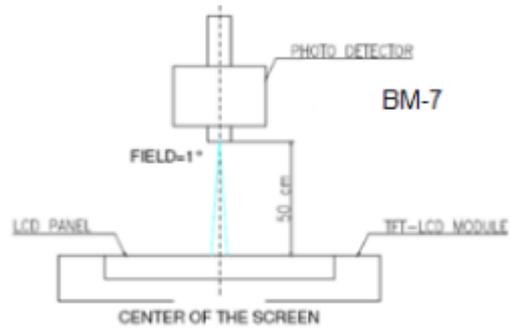
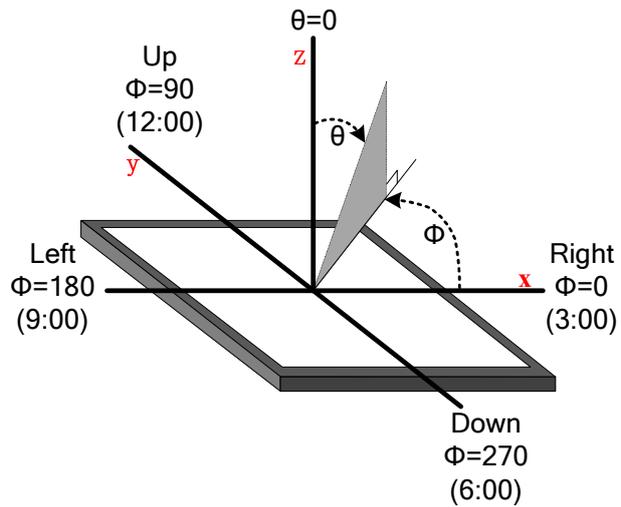


Figure b

FIG.3. The definition of viewing angle





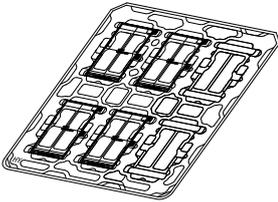
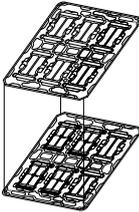
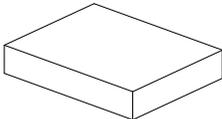
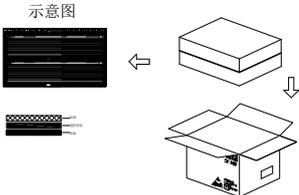
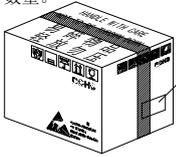
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## 11.Packaging Specification (包装规格)

- 1.1 Package quantity in one Box : TBD PCS
- 1.2 Box Size : TBD mm \* TBD mm \* TBD mm
- 1.3 1 BOX = TBD CARTON
- 1.4 1 CARTON = TBD (Full tray) + TBD (dummy / top tray) =TBD tray
- 1.5 1 TRAY = TBD PCS LCM

注：此为示意图

<p>(1) 模块平放入吸塑盘内， 每盘放6PCS产品</p> 	<p>(2) 吸塑盘交叉叠放</p> 	<p>(3) 十盘加一个空盘共10x6=60pcs 吸塑盘交叉叠放后用胶袋和胶 纸打包</p> <p>叠放次序 B C A C B C A</p> 
<p>(4) 真空包装 将打包好的产品装进包装袋并抽真空密封，</p> 	<p>(5) 产品装箱 先在纸箱底下放一个纸板，让后放一小包产品进去， 在放一个纸板在上面，最后在放一个纸板在上面， 二包叠加装箱</p> <p>示意图</p> 	<p>(6) 封箱 外箱标签中须体现供应 商名称、EQ料号及包装 数量。</p>  <p>外箱标签贴于侧面</p> <p>数量：2x60=120 PCS/箱</p>