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CERT. No.: 282Q19070712006



CERT. No.: 282E19070712007

Product Specification

Model: TTY123CHT-01

12.3" TFT Display Module(1920*720)

This module uses RoHS material

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A. General Specifications

(1) Overview

The TTY123CHT-01 is a 12.3-inch LCM Cell with thin film transistors as active elements and contains 1920x720pixels. Each pixel is divided into red, green and blue dot, which are arrange in vertical stripe. The LCM is normally black mode, and can be applied to the transmission type display.

(2) General Specification

NO.	Item	Specification
1	Display resolution (pixel)	1920*RGB*720
2	Active area (mm)	292.032x109.512mm
3	Screen size (inch)	12.3"
4	Pixel pitc (mm)	0.1521*0.1521
5	Outline Dimension (mm)	310.0x128.0x10.3mm
6	Weight (g)	TBD
7	Surface treatment	HC/HC
8	Interface	LVDS
9	Shipment	LCM
10	Contrast ratio (Center)	1000
11	Response Time	20ms (typ) 25°C
12	White Luminance(Center)	700 cd/m2 (Typ)

B. Absolute Maximum Ratings

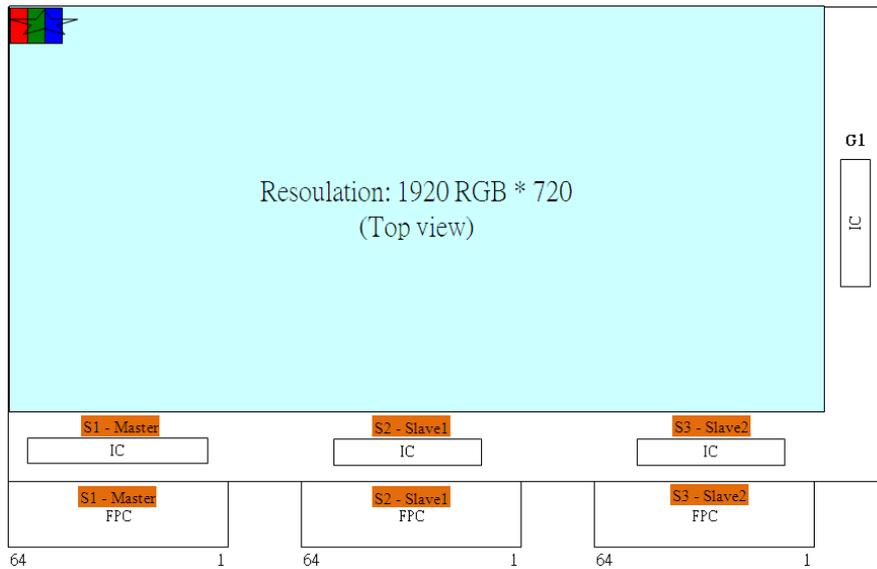
LCM					
Item	Symbol	Min	MAX	Unit	Remark
Power Supply Voltage 1	VCC1	-0.3	3.6	V	
Power Supply Voltage 2	VSP	-0.3	6.5	V	
Power Supply Voltage 3	VSN	-6.5	0.3	V	
Power Supply Voltage 5	VGH	-0.3	25	V	
Power Supply Voltage 6	VGL	-20	-0.3	V	

BL power output

Item	Symbol	Values			Unit	Remark
		Min.	Typ.	Max.		
Voltage for LED backlight	LED+		24.0	27.2	V	2
Current for LED backlight	LED1-		480	600	mA	1

C. Pin Assignment

(1) Structure:



(2) Connector Part No.:50 Pin. (XW 05202-500T-0W)

Pin no.	Symbol	Function
1	GND	Power Ground
2	NC	No connector
3	VCC	Digital Power
4	VCC	Digital Power
5	GND	Power Ground
6	GND	Power Ground
7	NC	No connector
8	NC	No connector
9	GND	Power Ground
10	ORXIN0-	Odd pixel negative LVDS differential clock input
11	ORXIN0+	Odd pixel positive LVDS differential clock input
12	ORXIN1-	Odd pixel negative LVDS differential clock input
13	ORXIN1+	Odd pixel positive LVDS differential clock input
14	ORXIN2-	Odd pixel negative LVDS differential clock input
15	ORXIN2+	Odd pixel positive LVDS differential clock input
16	ORXCLKIN-	Odd pixel negative LVDS differential clock input
17	ORXCLKIN+	Odd pixel positive LVDS differential clock input
18	ORXIN3-	Odd pixel negative LVDS differential clock input
19	ORXIN3+	Odd pixel positive LVDS differential clock input
20	ERXIN0-	Even pixel negative LVDS differential clock input
21	ERXIN0+	Even pixel positive LVDS differential clock input
22	ERXIN1-	Even pixel negative LVDS differential clock input
23	ERXIN1+	Even pixel positive LVDS differential clock input
24	ERXIN2-	Even pixel negative LVDS differential clock input
25	ERXIN2+	Even pixel positive LVDS differential clock input
26	ERXCLKIN-	Even pixel negative LVDS differential clock input
27	ERXCLKIN+	Even pixel positive LVDS differential clock input
28	ERXIN3-	Even pixel negative LVDS differential clock input

29	ERXIN3+	Even pixel positive LVDS differential clock input
30	GND	Power Ground
31	NC	No connector
32	RESETB	Global reset pin,active low.
33	STBYB	Standby mode,active low.
34	CA3	Cascade signal pin. Abnormal signal detection indicator. Combine HV/DE/Clock/STV/UEP detection result.
35	SCL(NC)	Serial interface clock input.(User NC)
36	SDA(NC)	Serial interface data input/output.(User NC)
37	CSB(NC)	Serial interface chip enable.(User NC)
38	GND	Power Ground
39	GND	Power Ground
40	NC	No connector
41	LEDA	LED power (Anode)
42	LEDA	LED power (Anode)
43	LEDA	LED power (Anode)
44	NC	No connector
45	LEDK1	Cathode 1
46	LEDK2	Cathode 2
47	LEDK3	Cathode 3
48	LEDK4	Cathode 4
49	NTC_A	NTC_Anode
50	NTC_K	NTC_Cathode

D. Optical specifications

Item	Symbol	Condition	Specification			Unit	Remark
			Min.	Typ.	Max.		
Response time	Tr+Tf	$\theta = 0^\circ$	-	20	-	ms	Note1
Contrast ratio	CR	$\theta = 0^\circ$	-	1100	-		Note 2
Luminance	cd/ m ²	$\theta = 0^\circ$	550	700			480mA
Life time	H		30000	50000			480mA
Viewing angle	Top	CR \geq 10	-	85	-	deg.	Note 3
	Bottom		-	85	-		
	Left		-	85	-		
	Right		-	85	-		
Color chromaticity (CF only with OC, light source is C light, CIE 1931)	Wx	$\theta = 0^\circ$	0.291	0.306	0.321	CIE	Note 4 Note 5
	Wy		0.313	0.328	0.343		
Color Gamut (CF only with OC, light source is C light, CIE 1931)	NTSC	CIE1931		76	-	%	
Cross talk	Ct	$\theta = 0^\circ$	-	-	2%	%	Note 6,7

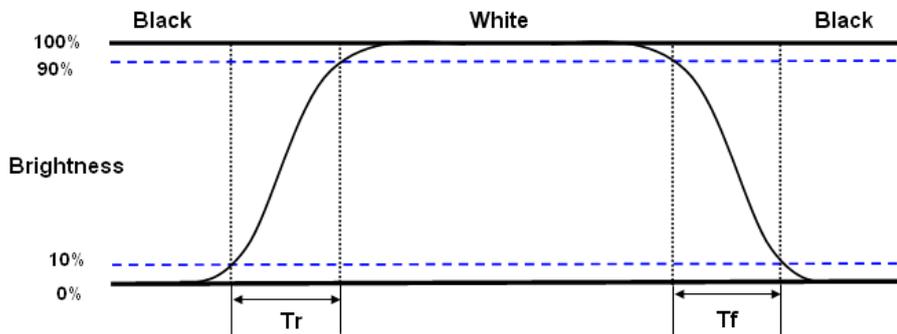
Test Condition :

1. The ambient temperature is 25°C.
2. The test systems refer to Note 4.

Note 1: Definition of response time:

The response time is defined as the LCD optical switching time interval between "White" state and "Black" state. Rise time is the time between photo detector output 10% to 90%. And fall time is the time

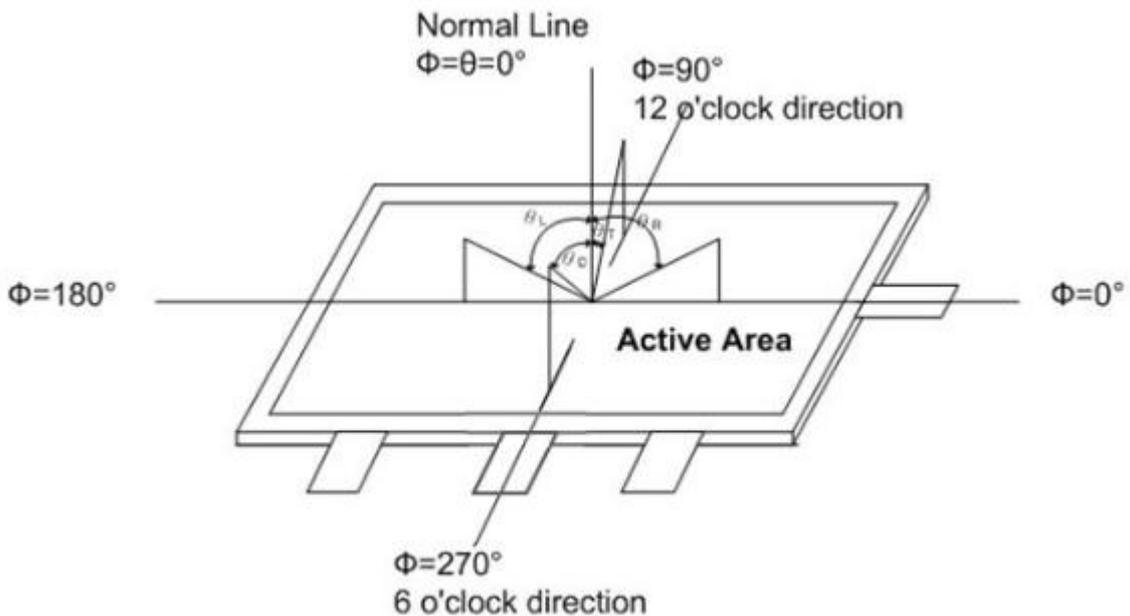
output intensity changed from 90% to 10%.



Note 2: Definition of contrast ratio:

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

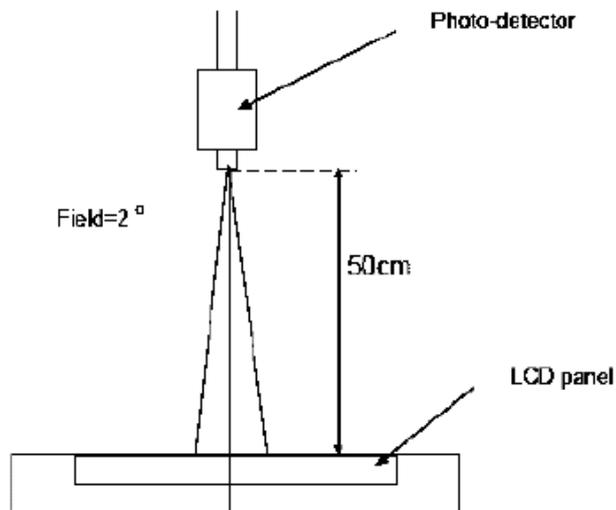
Note 3: Definition of viewing angle



Note 4: Optical characteristic measurement setup.

The LCD module should be stabilized at given temperature for 10 minutes to avoid abrupt temperature change during measuring. In order to stabilize the luminance, the measurement should be executed after lighting Backlight for 10 minutes in a windless

room.



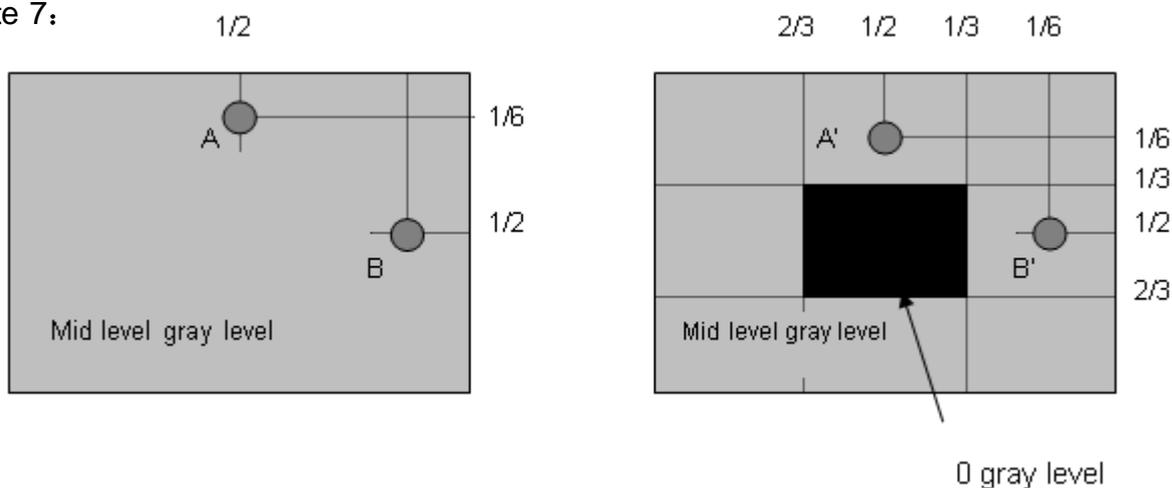
Note 5: Definition of color chromaticity (CIE1931)

Color coordinates measured at center point of LCD.

Note 6: Measuring Conditions:

The optical characteristics are determined after the unit has been 'ON' and stable at the maximum brightness, in a dark environment at an ambient temperature at $25^{\circ}\text{C} \pm 2^{\circ}\text{C}$. The electrical conditions include $V_{cc} = 3.3\text{ V}$, $f_v = 60\text{ Hz}$. Recommended measuring equipments for luminance and color is BM5A Colorimeter with a viewing cone of 2° or similar. The measuring distance should be about 30-50 cm from the LCD surface at normal unless otherwise specified. The (virtual) measuring spot should be 5mm in diameter. The CIE 1931 Standards shall be used. Viewing angle measurements should be done by the CS2000 EZ Color system or similar.

Note 7:



Unit: percentage of dimension of display area

$|L_A - L_{A'}| / L_A \times 100\% = 2\% \text{ max.}$, L_A and $L_{A'}$ are brightness at location A and A'

$|L_B - L_{B'}| / L_B \times 100\% = 2\% \text{ max.}$, L_B and $L_{B'}$ are brightness at location B and B'

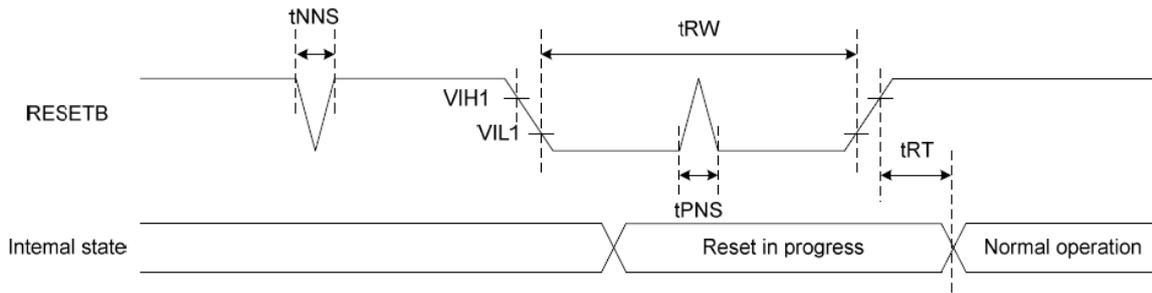
E. Electronic Specification

(1). Typical Operation Conditions

Parameter	Symbol	MIN	TYP	MAX	Unit	Remark
Analog Operating voltage	VCC1	-	3.3	-	V	
Analog Operating voltage	VSP	-	5.5	-	V	
Analog Operating voltage	VSN	-	-5.5	-	V	
Analog Operating voltage	VCOM	-	-0.92	-	V	
Analog Operating voltage	VGH	-	18.5	-	V	
Analog Operating voltage	VGL	-	-12.5	-	V	

Note: $VGH + |VGL| < 32V$

(2). Reset timing

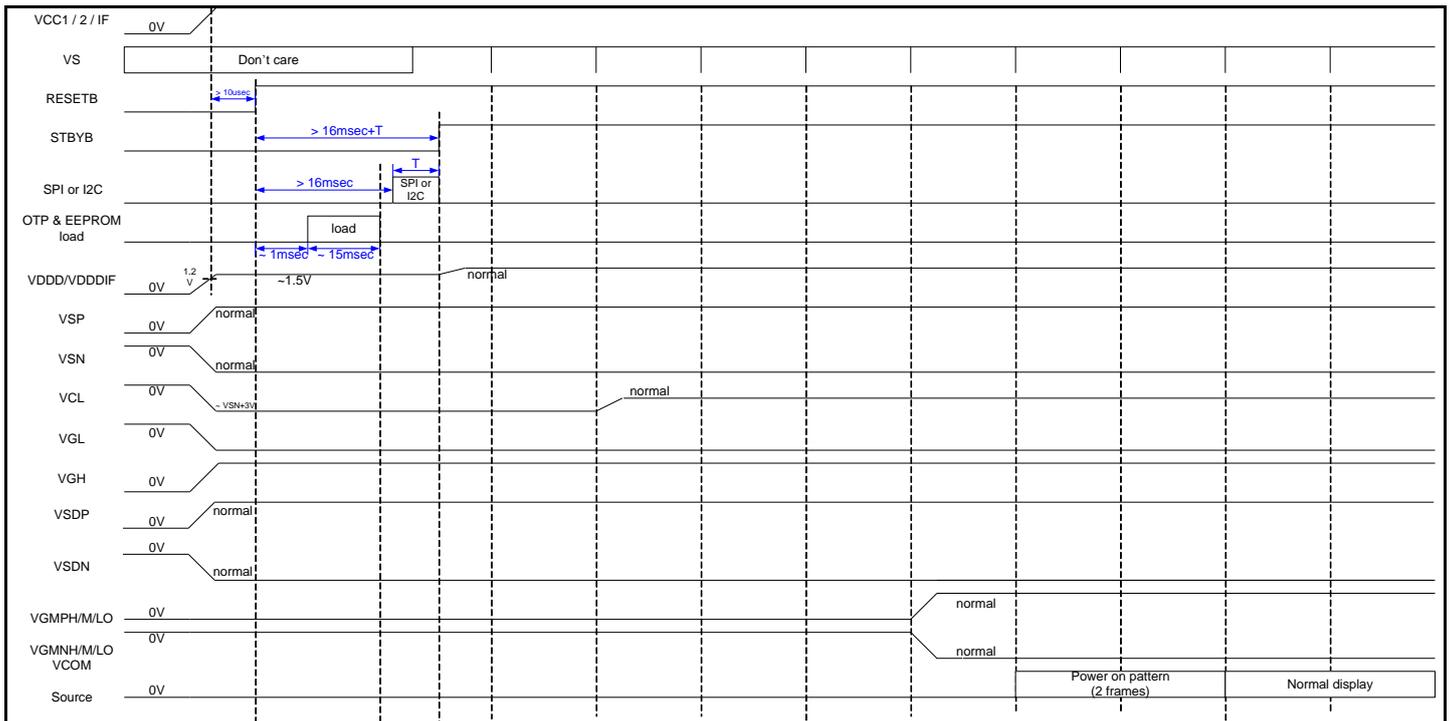


(VCC1=2.7 to 3.6V, GND=0V, TA=-40 to +95°C)

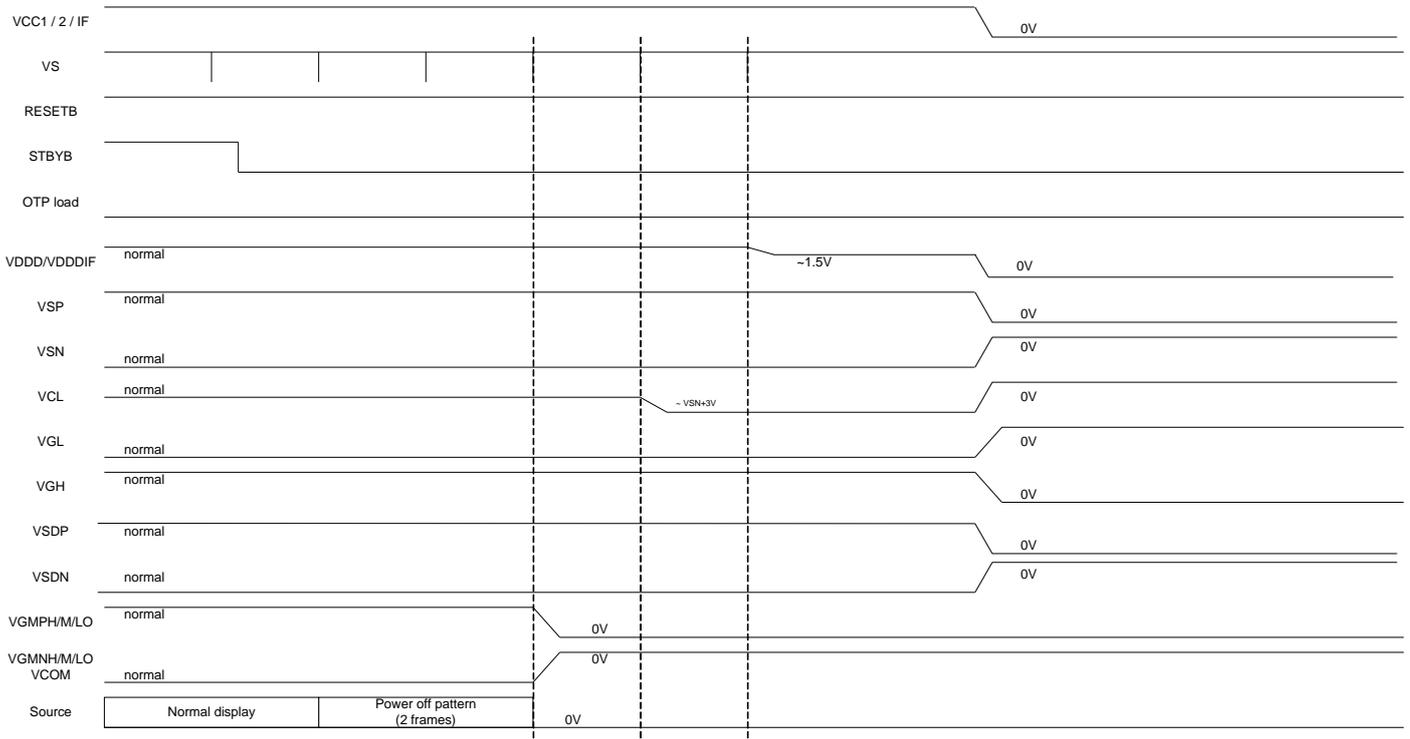
Signal	Paramete	Symbol	Spec.			Unit
			Min.	Typ.	Max.	
RESETB	Reset pulse width	t_{RW}	10	-	-	μs
	Reset complete time	t_{RT}	-	-	5	μs
	Negative spike noise width	t_{NNS}	-	-	100	ns

(3). Power on / off Sequence

Power On Sequence



Power Off Sequence

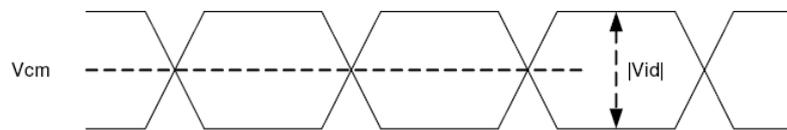


(4). Timing Characteristics

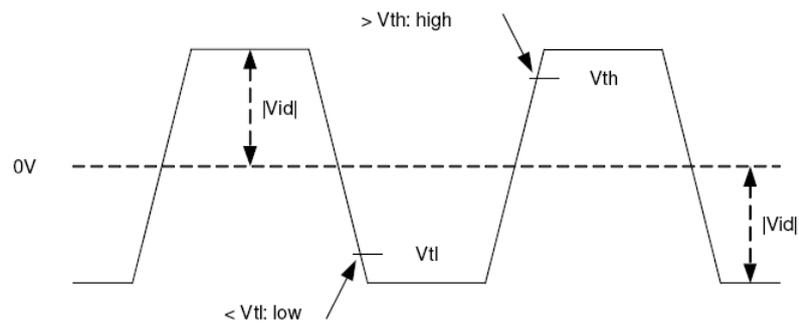
LVDS mode DC electrical characteristics

Parameter	Symbol	Condition	Spec.			Unit
			Min.	Typ.	Max.	
Differential input high Threshold voltage	V _{th}	V _{cm} =1.2V	+0.15	-	-	V
Differential input low threshold voltage	V _{tl}		-	-	-0.15	V
Differential input common Mode voltage	V _{CM}	-	1	1.2	1.7- V _{id} /2	V
LVDS input voltage	V _{INLV}		0.7		1.7	V
Differential input voltage	V _{id}	-	0.15	-	0.6	V
Differential input leakage Current	I _{Vleak}	-	-10	-	+10	μA

Single-ended:
 LVCLKP(R),
 LVCLKN(R),
 LVD[3:0]P(R),
 LVD[3:0]N(R)

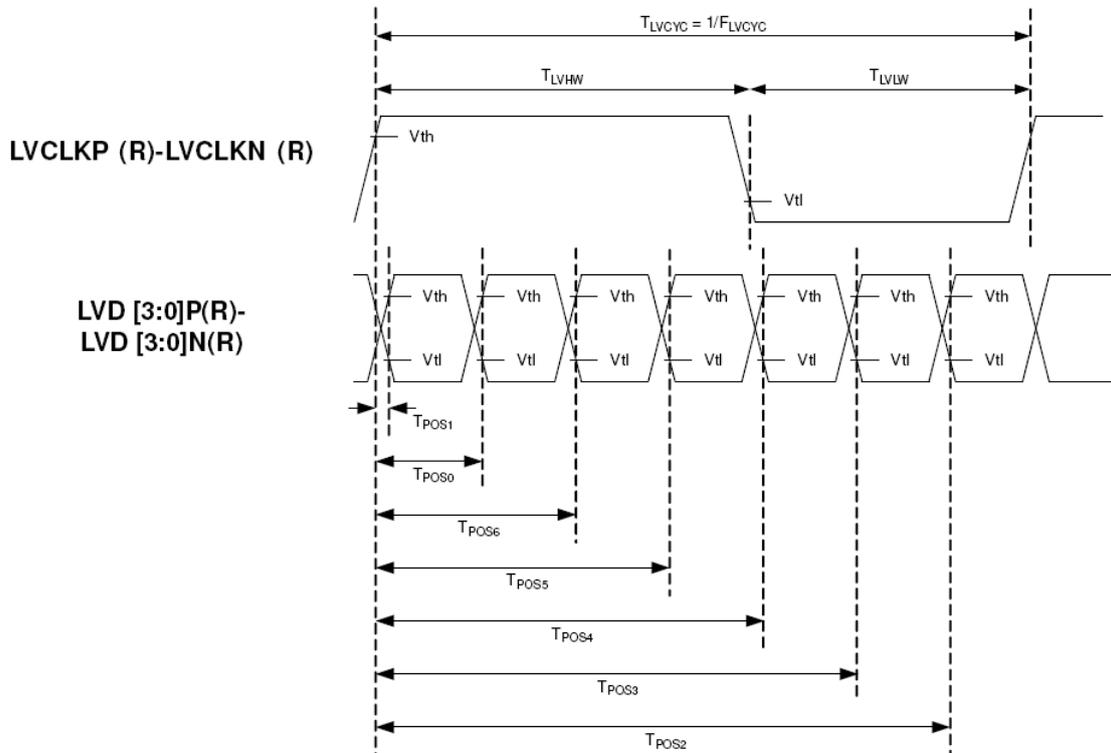


Differential:
 LVCLKP(R)-LVCLKN(R),
 LVD[3:0]P(R)-
 LVD[3:0]N(R)

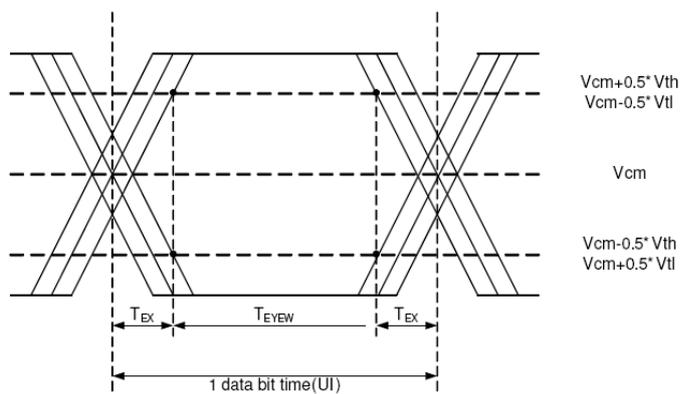


LVDS mode AC electrical characteristics

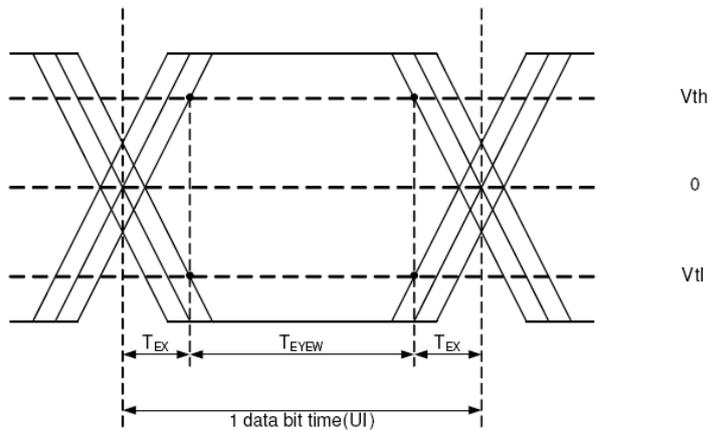
Parameter	Symbol	Min.	Spec.		Unit
			Typ.	Max.	
Clock frequency	F _{LVCYC}	20		85	MHz
Clock period	T _{LVCYC}	11.76			ns
1 data bit time	UI		1/7		T _{LVCYC}
Clock high time	T _{LVCH}		4		UI
Clock low time	T _{LVCL}		3		UI
Position 1	T _{POS1}	-0.2	0	0.2	UI
Position 0	T _{POS0}	0.8	1	1.2	UI
Position 6	T _{POS6}	1.8	2	2.2	UI
Position 5	T _{POS5}	2.8	3	3.2	UI
Position 4	T _{POS4}	3.8	4	4.2	UI
Position 3	T _{POS3}	4.8	5	5.2	UI
Position 2	T _{POS2}	5.8	6	6.2	UI
Input eye width	T _{EYEW}	0.6	-	-	UI
Input eye border	T _{EX}	-	-	0.2	UI
LVDS wake up time	T _{ENLVDS}	-	-	150	ms



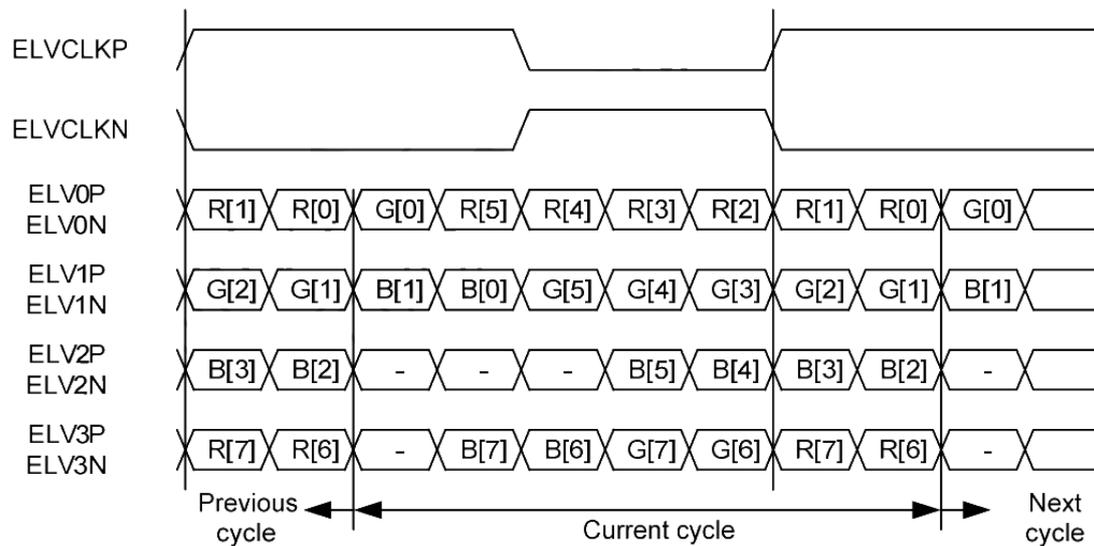
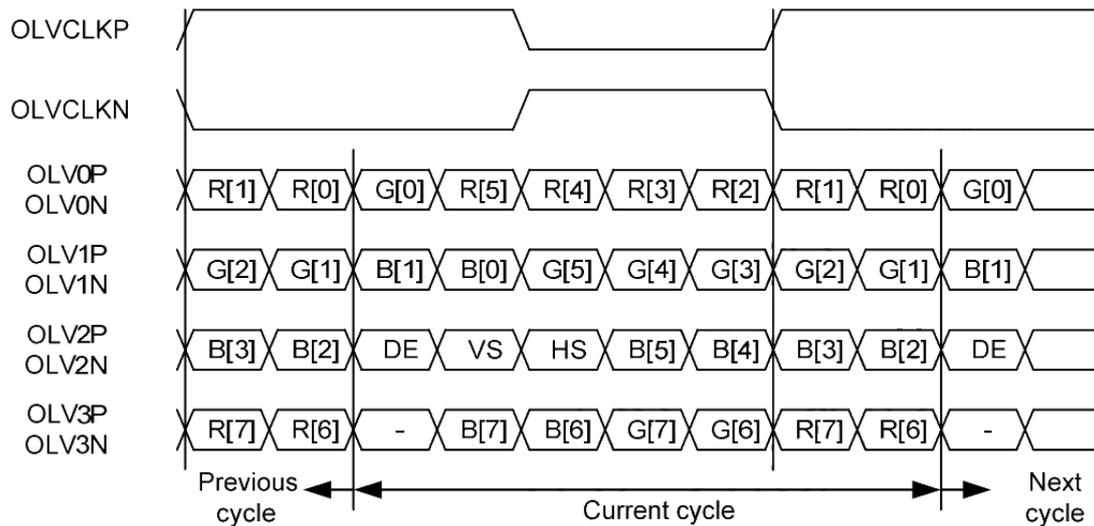
**Single-ended:
LVD [3:0]P,
LVD [3:0]N**



Differential:
LVD[3:0]P-LVD[3:0]N



2-port LVDS signals, VESA format, 8-bit mode



(VCC1=VCC2=VCCIF=2.7V to 3.6V, VSS1=VSS2=VSSA=0V, T_{OP}=-40~95°C)

Parameter	Symbol	Condition	Spec.			Unit
			Min.	Typ.	Max.	
Clock frequency	F _{CLK}	-	-	-	400	KHz
Clock high time	T _{HIGH}	-	600	-	-	ns
Clock low time	T _{LOW}	-	1300	-	-	ns
SDA and SCL rise time	T _R	-	-	-	300	ns
SDA and SCL fall time	T _F	-	-	-	300	ns
Start condition hold time	T _{HD:STA}	-	600	-	-	ns
Start condition setup time	T _{SU:STA}	-	600	-	-	ns
Data input hold time	T _{HD:DAT}	-	0	-	-	ns
Data input setup time	T _{SU:DAT}	-	100	-	-	ns
Stop condition setup time	T _{SU:STO}	-	600	-	-	ns
Output valid from clock	T _{AA}	-	-	-	900	ns
Bus free-time	T _{BUF}	Time the bus must be free before a new transmission can start	1300	-	-	ns
Input filter spike suppression	T _{SP}	SDA and SCL pins	-	-	50	ns

F. Reliability Assurance Specification

Test Item	Test Condition	Judgment	Remark
High Temp. Storage	85°C, 120hrs, Storage	NOTE 1	NOTE 2 NOTE 3 NOTE 4
Low Temp. Storage	-30°C, 120hrs, Storage	NOTE 1	
High Temp. Operation	80°C, 120hrs, Operating	NOTE 1	
Low Temp. Operation	-20°C, 120hrs, Operating	NOTE 1	
Thermal Shock Test	-30°C(0.5hrs)<->85°C(0.5hrs), 100cycles	NOTE 1	
High Temp& Hum Operation	60°C, 90%RH, 120hrs, Operating	NOTE 1	
ESD	Contact=±8 Kv, Air=±15 Kv, 1sec, 8point, 10 times/point class B(R=330Ω · C=150pF)	NOTE 5	NOTE 5

Note1: Criteria: Normal display image with no function defect and no line defect. Mura defect Judged by 5% ND filter.

Note2: All tests above are practiced at module type.

Note3: All the cosmetic specification is judged before the reliability stress. Only a single item of these tests shall be executed on a single panel, no more one test item shall be executed on a single panel.

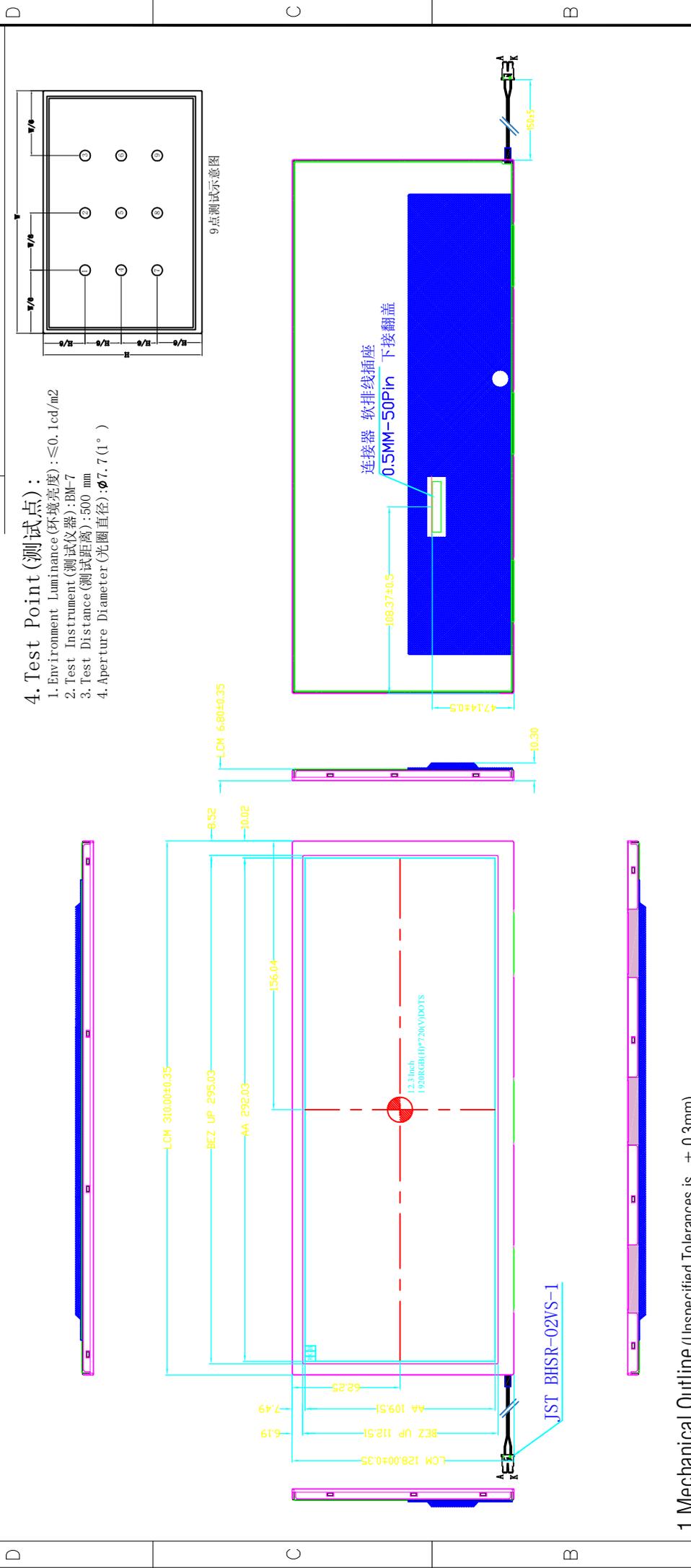
Note4: Evaluation should be tested after storage at room temperature for more than two hours.

Note5: ClassB:Temporary degradation or loss of function or performance which is self-recoverable.

Note6: a. The IS must be disappeared by 5% ND Filter.

b. After 5min, IS can't be seen by human eyes.

G. Mechanical Drawings



1. Mechanical Outline (Unspecified Tolerances is $\pm 0.3\text{mm}$)

2. Electrical-Optical Characteristics ($T_a=25^\circ\text{C}$)

Item	Symbol	MIN.	TYP.	MAX.	Unit	Condition
Forward Voltage	VF		27.0	29.7	V	定电流 IF=480mA
Dominant Wave Length	X	0.27	0.31	0.345		
	Y	0.26	0.31	0.36		
Uniformity	Avg	70			%	
Module Luminance	Lv	550	700		cd/m^2	

Operating Temperature: $-30\sim+85^\circ\text{C}$ Storage Temperature: $-40\sim+95^\circ\text{C}$

TYPE	TTY123CJT-01	DITING MODE	A2	DATE	20200824
CUSTOM NO		EDITION	MM	APPROVED	
CUSTOM MODEL	12.31920x720	UNIT	1:1	CHEC	
CUST Drawing		PAGE	1/1	DESIGNED	