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Customer Approved Specification

To: Customer

Product Name: M101NWN8 R0

Document Issue Date: 2013/02/19

Customer	InfoVision Optoelectronics
<u>SIGNATURE</u>	<u>SIGNATURE</u>
_____	REVIEWED BY QA
_____	_____
_____	PREPARED BY FAE
_____	_____
Please return 1 copy for your confirmation with your signature and comments.	

- Note: 1. Please contact InfoVision Company before designing your product based on this product.
2. The information contained herein is presented merely to indicate the characteristics and performance of our products. No responsibility is assumed by IVO for any intellectual property claims or other problems that may result from application based on the module described herein.

FQ-7-30-0-009-03C



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1.0 General Descriptions

1.1 Introduction

The M101NWN8 is a color active matrix thin film transistor (TFT) liquid crystal display (LCD) that uses amorphous silicon TFT as a switching device. It is composed of a TFT LCD panel, a timing controller, voltage reference, common voltage, column driver, and row driver circuit. This TFT LCD has a 10.1-inch diagonally measured active display area with HD resolution (1,366 horizontal by 768 vertical) pixel arrays.

1.2 Features

- 10.1" TFT-LCD Panel
- LED Backlight System
- Supported HD 1,366x768 pixels resolution
- Compatible with ROHS standard

1.3 Product Summary

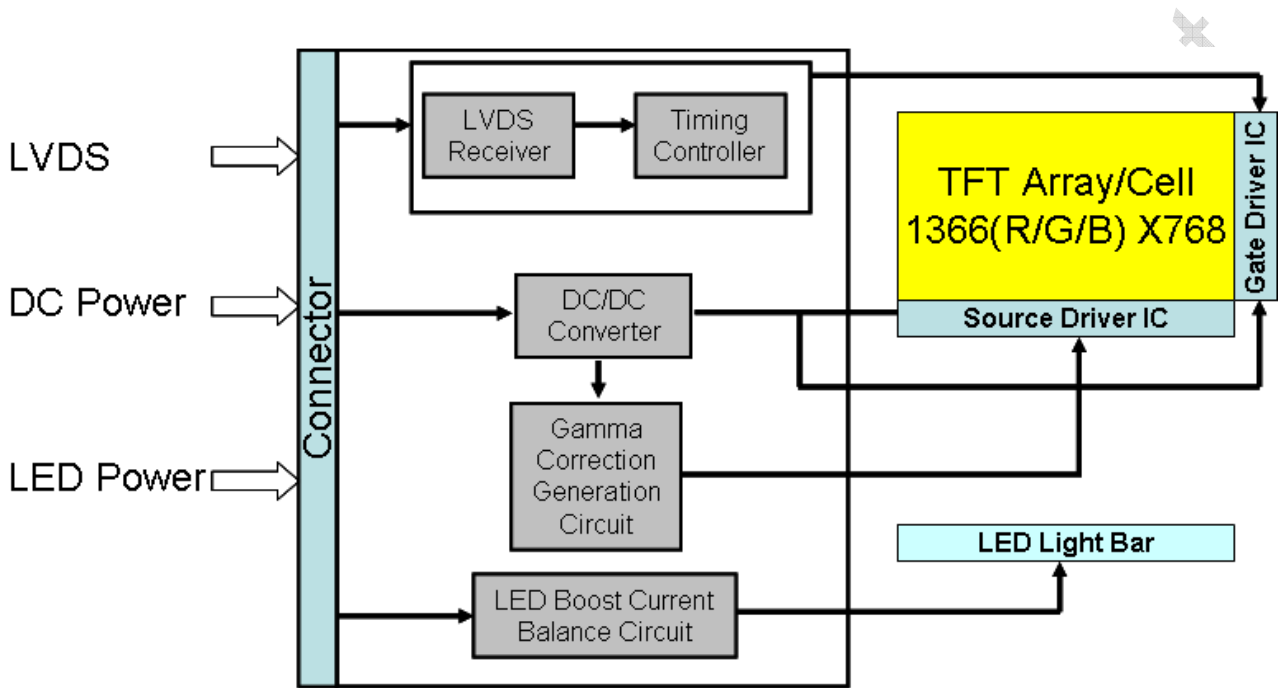
Items	Specifications	Unit
Screen Diagonal	10.1	Inch
Active Area	222.5214 (H) x 125.1072 (V)	mm
Pixels (H x V)	1,366 (RGB) x 768	-
Pixel Pitch	0.1629(H)x0.1629(V)	mm
Pixel Arrangement	R.G.B. Vertical Stripe	-
Display Mode	Normally White	-
White Luminance	200(typ.)(5 Points Average)	cd /m ²
Contrast Ratio	500 (typ.)	-
Response Time	8(typ.)	msec
Input Voltage	3.3	V
Power Consumption	2.6 (Black Pattern Max.)	W
Weight	170(Max.)	g
Outline Dimension(H x V x D)	243(typ.)x146.5(typ.)x3.6(max)	mm
Electrical Interface (Logic)	Single LVDS	-
Support Color	262 K(RGB 6-bit)	-
Optimum Viewing Direction	6 o'clock	-
Surface Treatment	Anti-Glare+ HC(3H)	-

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1.4 Functional Block Diagram

Figure 1 shows the functional block diagram of the LCD module.

Figure 1 Block Diagram





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2.0 Absolute Maximum Ratings

Table 1 Electrical Absolute Rating

Item	Symbol	Min.	Max.	Unit	Note
Logic Supply Voltage	V _{DD}	-0.3	4.0	V	(1),(2)
Logic Input Signal Voltage	-	-0.3	2.5	V	
Supply V _{LED} Voltage	V _{LED}	6	21	V	
LED Forward Current	I _F	-	20	mA	

Note (1) Permanent damage may occur to the LCD module if beyond this specification. Functional operation should be restricted to the conditions described under normal operating conditions.
 (2) Operating temperature 25°C, humidity 55%.

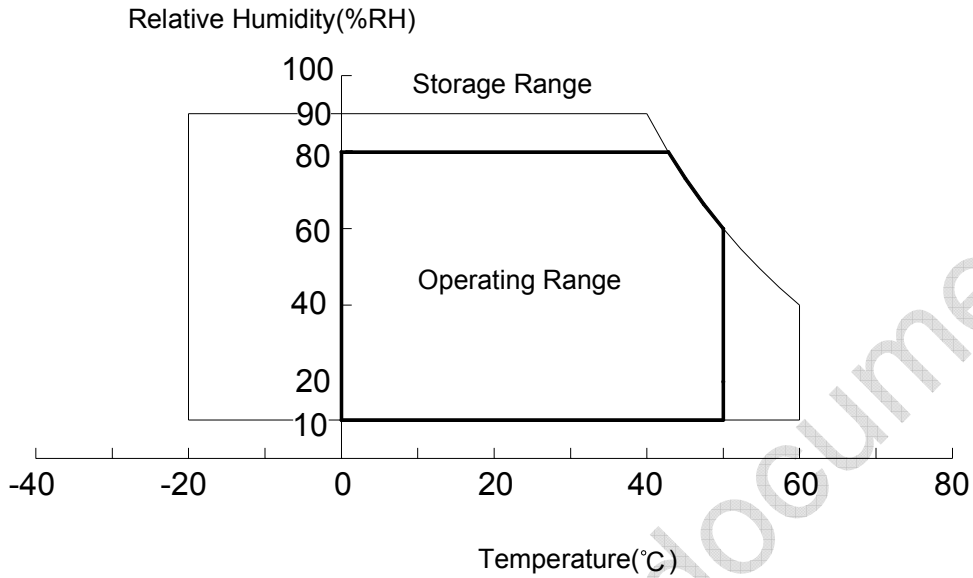
Table 2 Absolute Ratings of Environment

Item	Symbol	Min.	Max.	Unit	Conditions
Operating Temperature	TOP	0	50	°C	(1),(2),(3)
Operating Humidity	HOP	10	80	%RH	
Storage Temperature	TST	-20	60	°C	
Storage Humidity	HST	10	90	%RH	
Vibration(non-operating)	VB	-	1.5	G	(4)
Shock(non-operating)	Shock	-	220G	G	(5)

Note (1) Maximum Wet-Bulb should be 39 degree C. No condensation.
 (2) When you apply the LCD module for OA system. Please make sure to keep the temperature of LCD module is less than 60°C
 (3) Storage /Operating temperature

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Figure 2 Absolute Ratings of Environment of the LCD Module



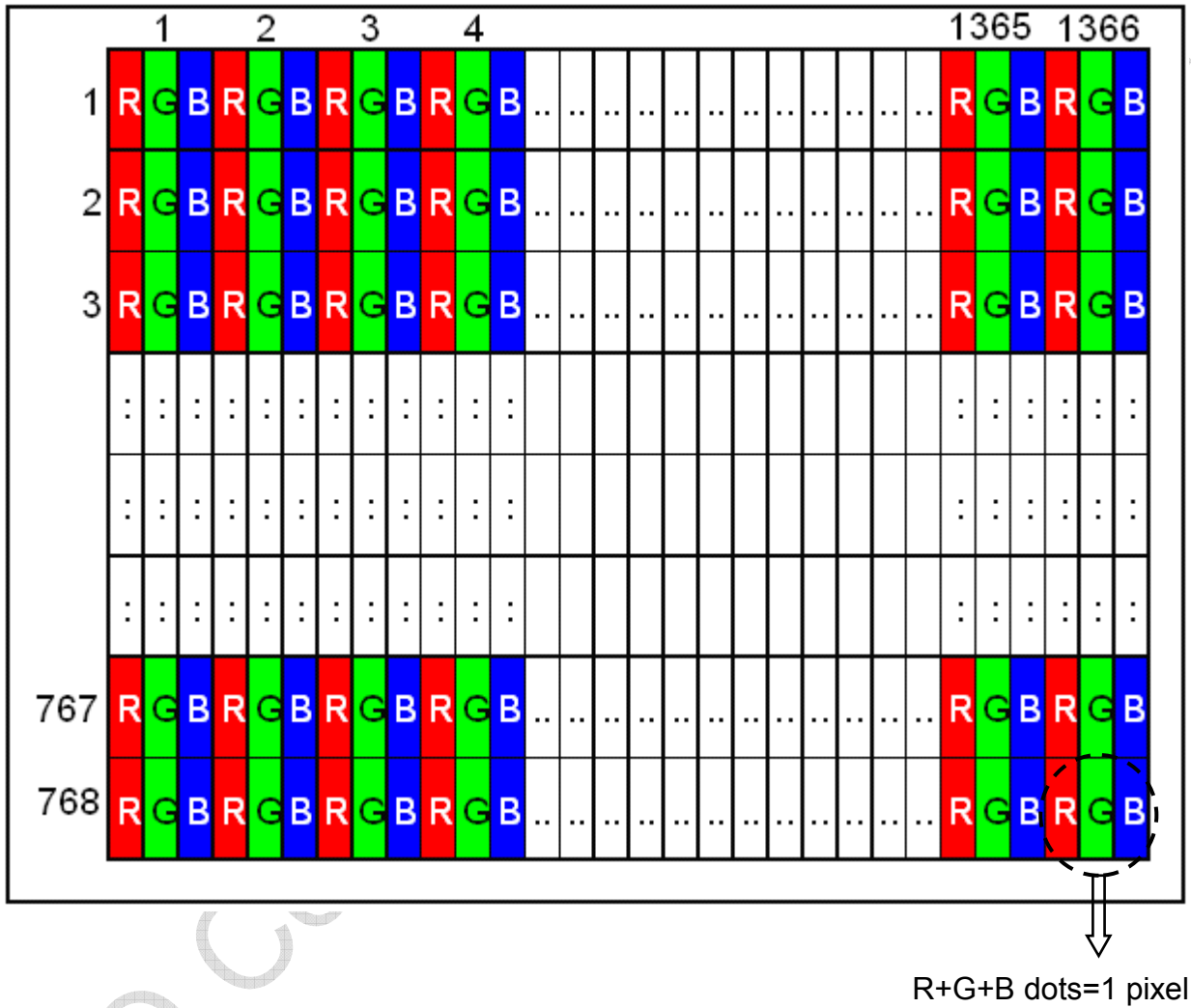
- (4) 10-500Hz, random vibration, 30min for X, Y, Z axis
- (5) 2ms, half sine wave, one time for X, Y, Z axis

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3.0 Pixel Format Image

Figure 3 shows the relationship of the input signals and LCD pixel format image.

Figure 3 Pixel Format





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4.0 Optical Characteristics

The optical characteristics are measured under stable conditions as following notes

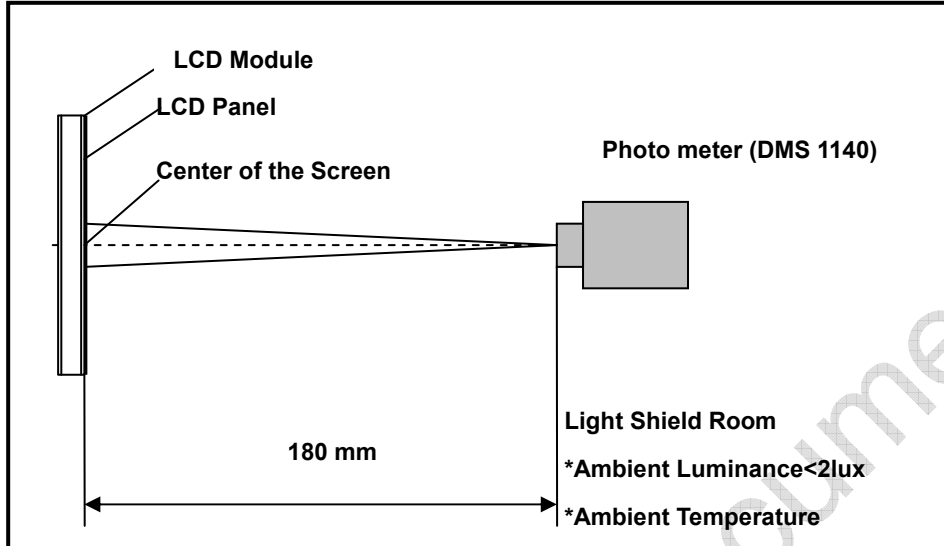
Table 3 Optical Characteristics

Item	Conditions		Min.	Typ.	Max.	Unit	Note
Viewing Angle (CR>10)	Horizontal	θ_L	40	45	-	degree	(1),(2),(3)
		θ_R	40	45	-		
	Vertical	θ_T	10	15	-		
		θ_B	30	35	-		
Contrast Ratio	Center		400	500	-	-	(1),(2),(4)
Response Time	Rising		-	3	-	ms	(1),(2),(5)
	Falling		-	5	-	ms	
	Rising + Falling		-	8	16	ms	
Color Chromaticity (CIE1931)	Red	x	Typ. -0.03	0.562	Typ. +0.03	-	(1),(2)
	Red	y		0.335			
	Green	x		0.334			
	Green	y		0.566			
	Blue	x		0.159			
	Blue	y		0.131			
	White	x		0.283		0.313	
White	y	0.299	0.329	0.359	-		
White Luminance	-		170	200	-	cd/m ²	(1),(2),(6)
Luminance	5Points		80	-	-	%	(1),(2),(7)
Uniformity	13Points		62.5	-	-		

Note (1) Measurement Setup:

The LCD module should be stabilized at given temperature(25°C) for 15 minutes to Avoid abrupt temperature change during measuring. In order to stabilize the luminance, the measurement should be executed after lighting backlight for 15 minutes in a windless room.

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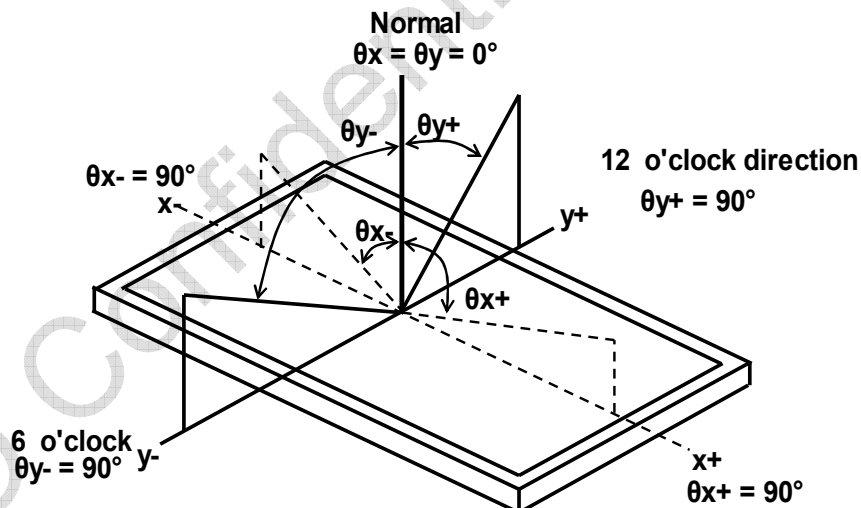
Figure 4 Measurement Setup


Note (2) The LED input parameter setting as:

V_LED: 12V ($\pm 0.1\text{V}$)

PWM_LED: duty 100 %

Note (3) Definition of Viewing Angle

Figure 5 Definition of Viewing Angle


Note (4) Definition Of Contrast Ratio (CR)

The contrast ratio can be calculated by the following expression

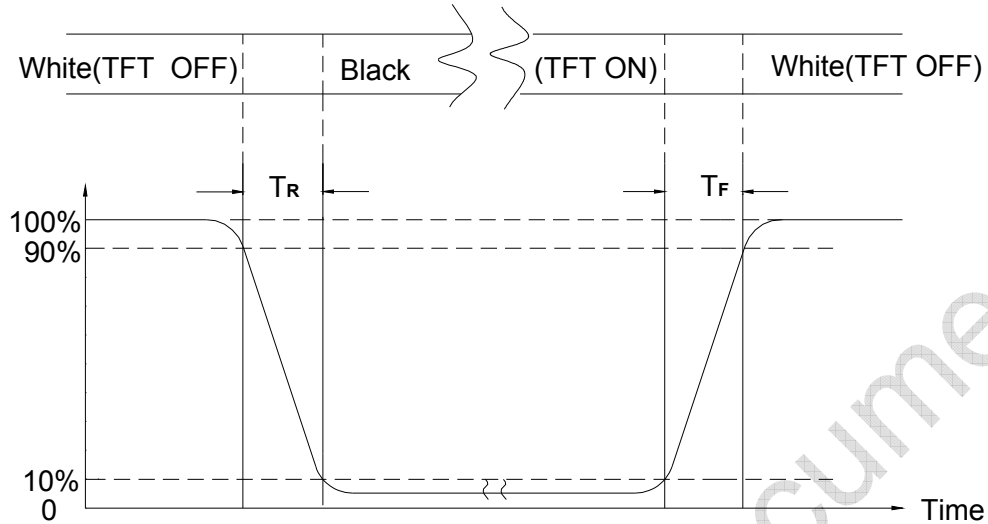
$$\text{Contrast Ratio (CR)} = L_{63} / L_0$$

L63: Luminance of gray level 63, L0: Luminance of gray level 0

Note (5) Definition Of Response Time (TR, TF)

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Figure 6 Definition of Response Time



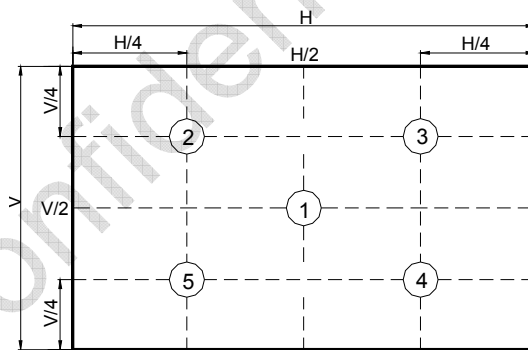
Note (6) Definition Of Luminance White

Measure the luminance of gray level 63 at center point (Ref: Active area)

$$\text{Display Luminance} = (L_1 + L_2 + L_3 + L_4 + L_5) / 5$$

H—Active area length V—Active area width L—Luminance

Figure 7 Measurement Locations Of 5 Points

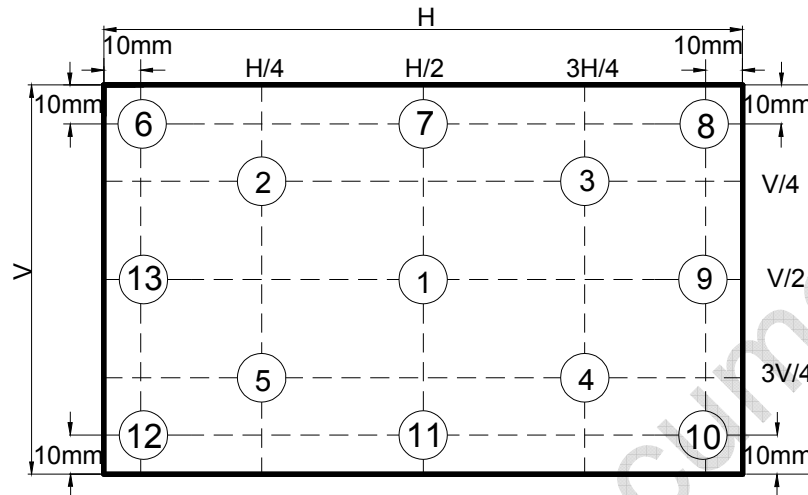


Note (7) Definition Of Luminance Uniformity (Ref: Active area)

Measure the luminance of gray level 63 at 13 points.

$$\text{UNF}(13\text{pts}) = \frac{\text{Min}(L_1, L_2, \dots, L_{13})}{\text{Max}(L_1, L_2, \dots, L_{13})}$$

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Figure 8 Measurement Locations Of 13 Points


5.0 Backlight Characteristics

5.1 Parameter Guideline Of LED Backlight

Table 4 Parameter Guideline for LED Backlight

Item	Symbol	Min.	Typ.	Max.	Units	Note
LED Input Voltage	V_{LED}	6	12	21	V	(2)
LED Power Consumption	P_{LED}	-	-	1.72	W	(2)
LED Forward Voltage	V_F	2.9	-	3.4	V	(2)
LED Forward Current	I_F	-	20	-	mA	
PWM Signal Voltage	V_{PWM_EN}	High	2.0	3.3	V	
		Low	0	-		
LED Enable Voltage	V_{LED_EN}	High	2.0	3.3	V	
		Low	0	-		
Input PWM Frequency	FPWM	200	-	1,000	Hz	
LED Life Time	LT	15,000	-	-	Hours	(1)(2)
Duty Ratio	PWM	5	-	100	%	(2)

Note (1) The LED life time define as the estimated time to 50% degradation of initial luminous.

Note (2) Operating temperature 25°C, humidity 55%.



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6.0 Electrical Characteristics

6.1 Interface Connector

Table 5 Connector Name / Designation

Manufacturer	STARCONN
Type / Part Number	111A40-0000RA-G3
Mating Receptacle/Part Number	111B40-1210TA-G3

Table 6 Signal Pin Assignment

Pin #	Signal Name	Description	Remarks
1	NC	No connection	
2	VDD	Power Supply, 3.3V(typ.)	
3	VDD	Power Supply, 3.3V(typ.)	
4	V EDID	DDC 3.3V power	
5	NC	No connection	Panel Self Test
6	Clk EEDID	DDC Clock	
7	DATA EEDID	DDC Data	
8	Rin0-	-LVDS differential data input	
9	Rin0+	+LVDS differential data input	
10	VSS	Ground-Shield	
11	Rin1-	-LVDS differential data input	
12	Rin1+	+LVDS differential data input	
13	VSS	Ground-Shield	
14	Rin2-	-LVDS differential data input	
15	Rin2+	+LVDS differential data input	
16	VSS	Ground-Shield	
17	ClkIN-	-LVDS differential clock input	
18	ClkIN+	+LVDS differential clock input	
19	VSS	Ground-Shield	
20	NC	No connection	
21	NC	No connection	
22	VSS	Ground-Shield	
23	NC	No connection	
24	NC	No connection	
25	VSS	Ground-Shield	
26	NC	No connection	
27	NC	No connection	



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28	VSS	Ground-Shield	
29	NC	No connection	
30	NC	No connection	
31	VSS_LED	Ground-LED	
32	VSS_LED	Ground-LED	
33	VSS_LED	Ground-LED	
34	NC	No connection	
35	PWM	System PWM Signal Input(+3.3V Swing)	
36	LED_EN	LED _enable pin(+3.3V Input)	
37	NC	No connection	
38	VLED	LED Power Supply 6V-21V	
39	VLED	LED Power Supply 6V-21V	
40	VLED	LED Power Supply 6V-21V	

Note: All input signals shall be low or Hi- resistance state when VDD is off.

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6.2 LVDS Receiver

6.2.1 Signal Electrical Characteristics For LVDS Receiver

The built-in LVDS receiver is compatible with (ANSI/TIA/TIA-644) standard.

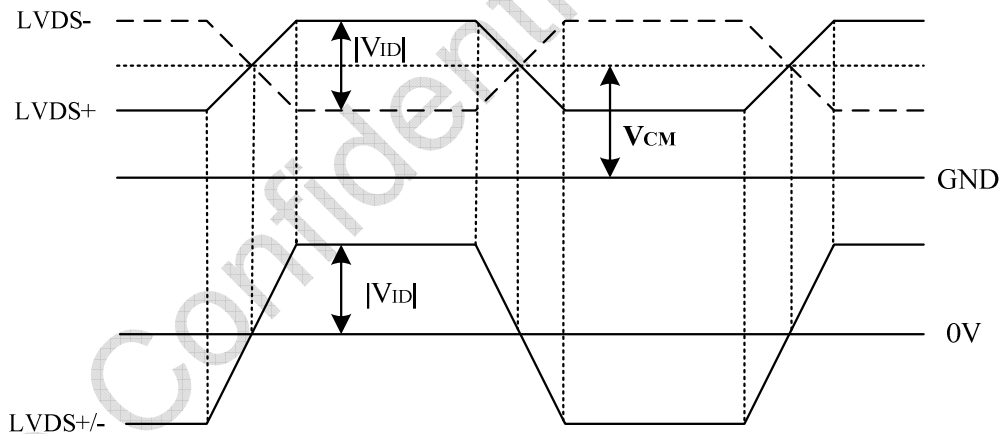
Table 7 LVDS Receiver Electrical Characteristics

Parameter	Symbol	Min.	Typ.	Max.	Unit	Conditions
Differential Input High Threshold	V_{th}	-	-	+100	mV	$V_{CM}=+1.2V$
Differential Input Low Threshold	V_{tl}	-100	-	-	mV	$V_{CM}=+1.2V$
Magnitude Differential Input Voltage	$ V_{ID} $	100	-	600	mV	-
Common Mode Voltage	V_{CM}	$ V_{ID} /2+0.6$	1.2	$1.8- V_{ID} /2$	V	-
Common Mode Voltage Offset	ΔV_{CM}	-	-	50	mV	$V_{CM}=+1.2V$

Note: (1) Input signals shall be low or Hi- resistance state when VDD is off.

(2) All electrical characteristics for LVDS signal are defined and shall be measured at the interface connector of LCD.

Figure 9 Voltage Definitions



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Figure 10 Measurement System

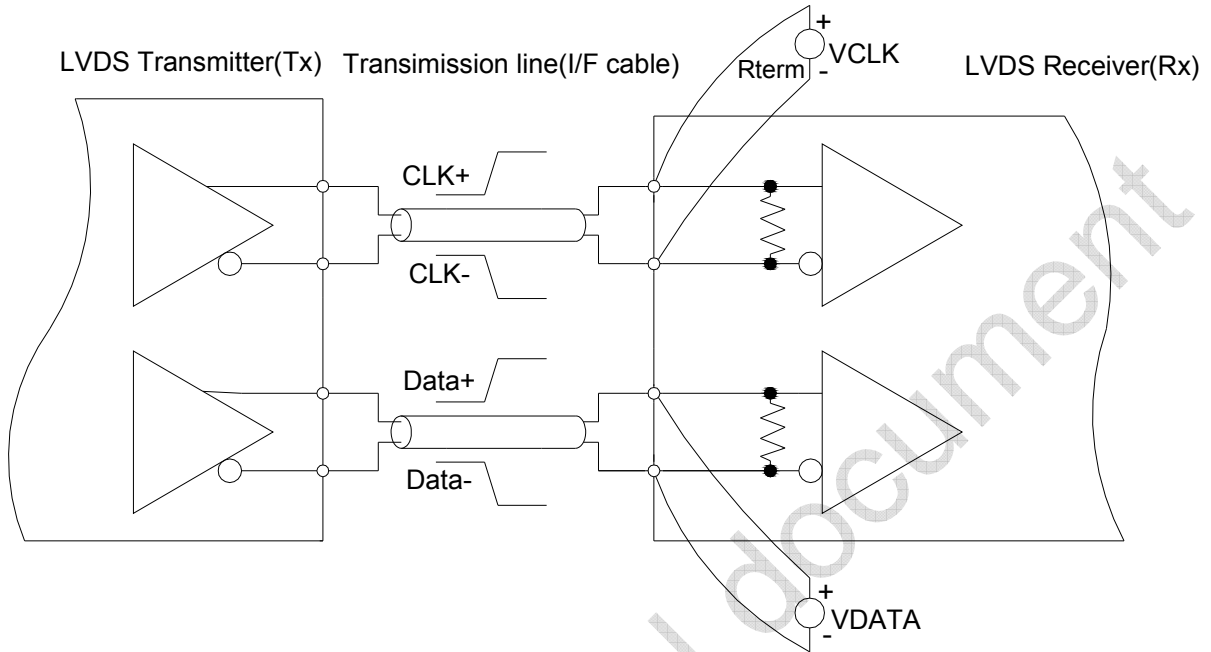
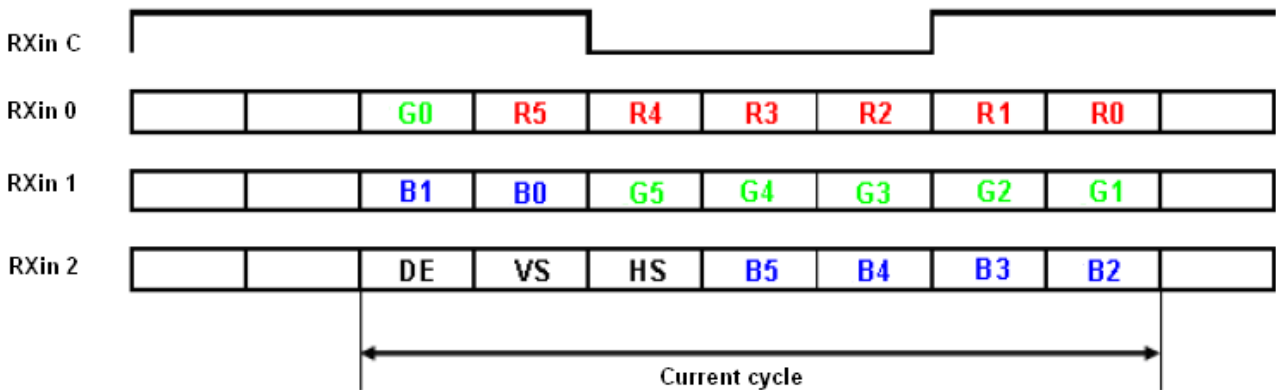


Figure 11 Data Mapping

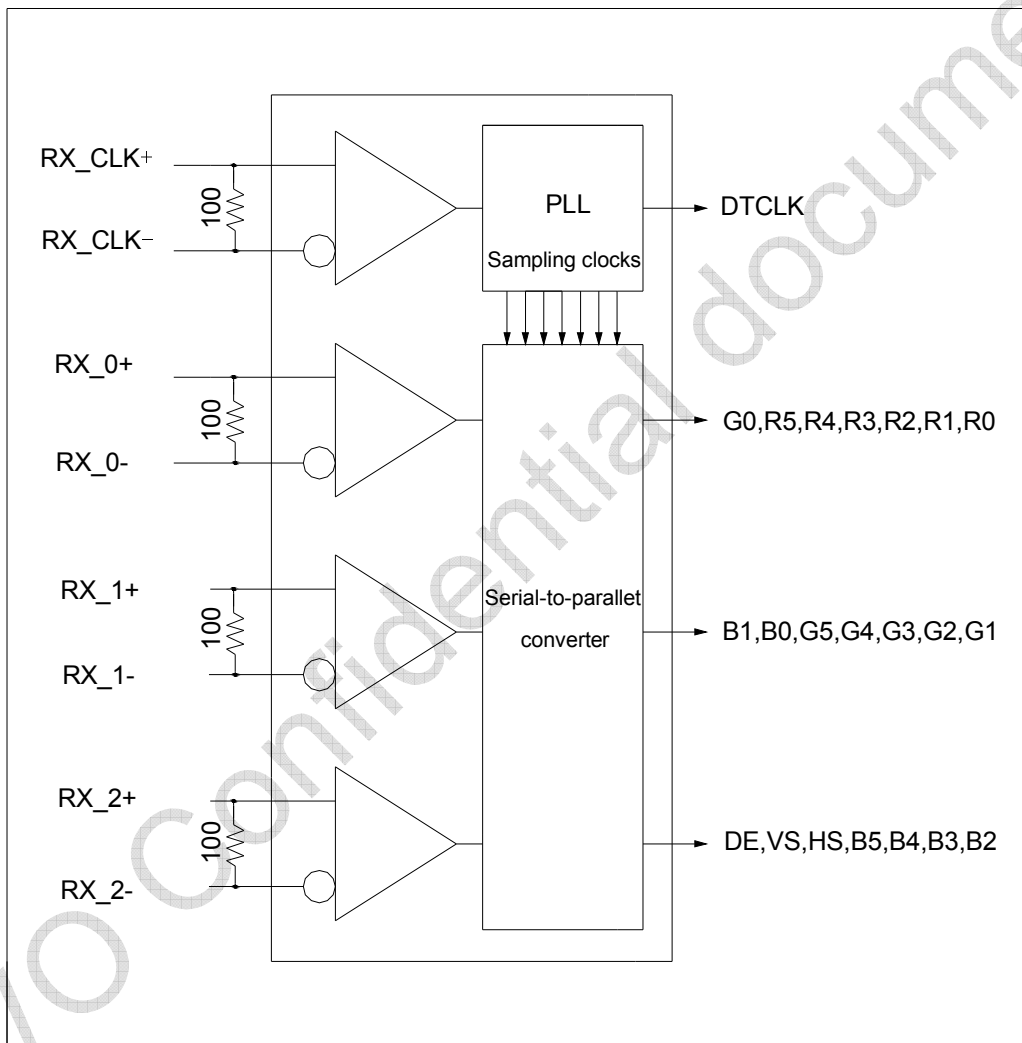


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6.2.2 LVDS Receiver Internal Circuit

Figure 12 LVDS Receiver Internal Circuit Shows the internal block diagram of the LVDS receiver. This LCD module equips termination resistors for LVDS link.

Figure 12 LVDS Receiver Internal Circuit





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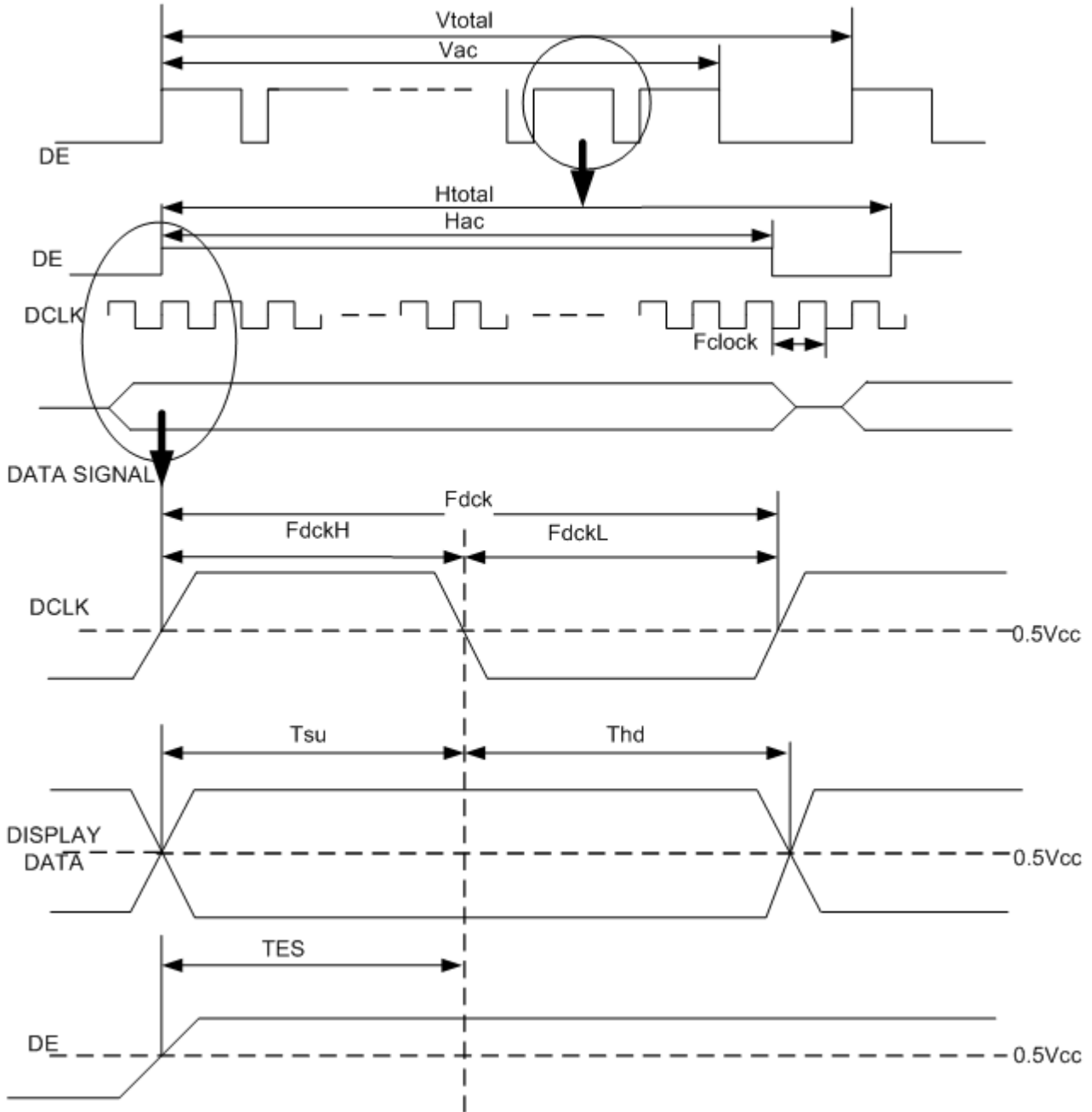
7.0 Interface Timings

7.1 Timing Characteristics

Table 8 Interface Timings

Parameter	Symbol	Unit	Min.	Typ.	Max.
LVDS Clock Frequency	Fdck	MHz	65.88	76.85	80
H Total Time	Htotal	Clocks	1,520	1,560	1,690
H Active Time	Hac	Clocks	1,366	1,366	1,366
V Total Time	Vtotal	Lines	788	821	850
V Active Time	Vac	Lines	768	768	768
Frame Rate	Vsync	Hz	55	60	65

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Figure 13 Timing Characteristics


Note: TES is data enable signal setup time.

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8.0 Power Consumption

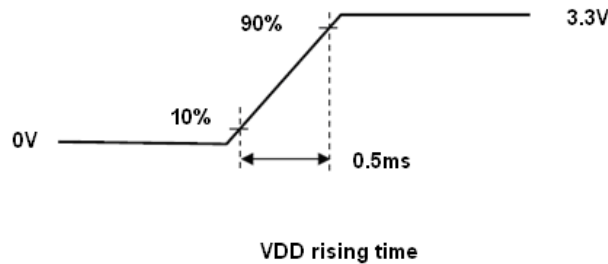
Input power specifications are as follows.

Table 9 Power Consumption

Item	Symbol	Min.	Typ.	Max.	Units	Note
Logic/LCD Drive Voltage	VDD	3.0	3.3	3.6	V	(2), (4)
VDD Current	Black Pattern IDD	-	-	0.3	A	
VDD Power	Black Pattern PDD	-	-	0.88	W	(3),(4)
LED Power Consumption	PLED	-	-	1.72	W	
Rush Current	Inrush	-	-	2.0	A	(1),(4)
Allowable Logic/LCD Drive Ripple Voltage	VDDrp	-	-	200	mV	(4)

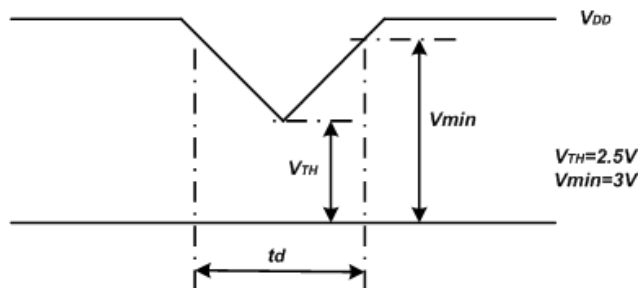
Note (1) Measure Condition

Figure 14 VDD rising time



Note (2) VDD Power Dip Condition

Figure 15 VDD Power Dip



If $V_{TH} < V_{DD} \leq V_{min}$, then $t_d \leq 10ms$; when the voltage return to normal our panel must revive automatically.

Note (3) $F_v=60Hz$, $V_{DD}=3.3V$, DC Current

Note (4) Operating temperature $25^{\circ}C$, humidity 55%.

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9.0 Power ON/OFF Sequence

VDD power on/off sequence is as follows. Interface signals are also shown in the chart. Signals from any system shall be Hi- resistance state or low level when VDD is off.

Figure 16 Power Sequence

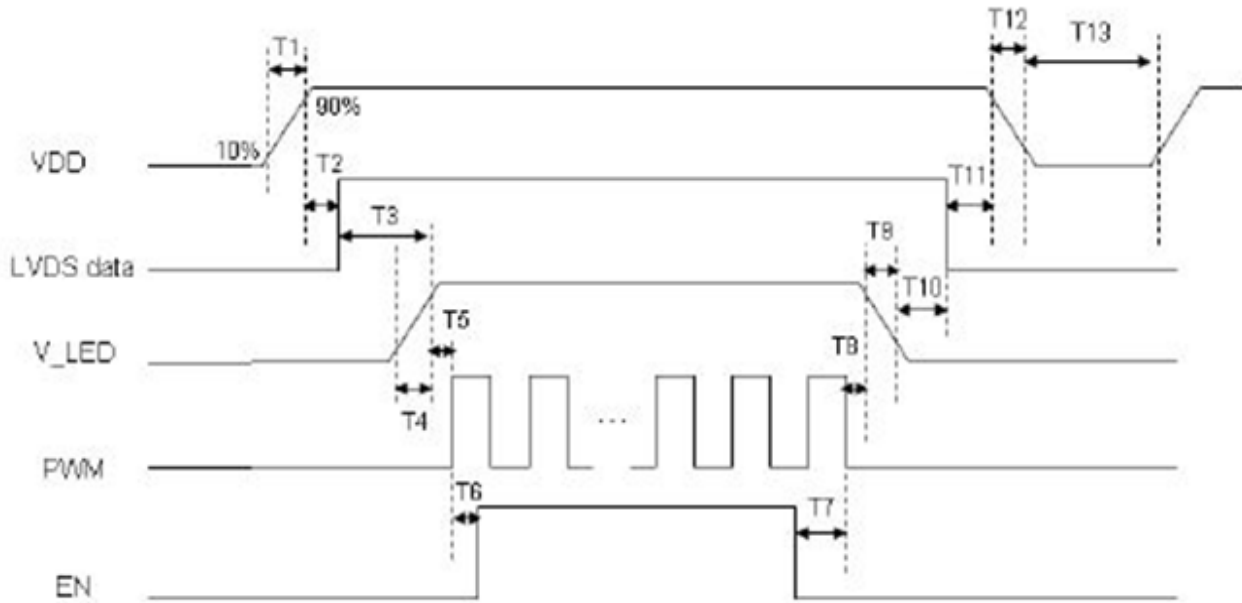


Table 10 Power Sequencing Requirements

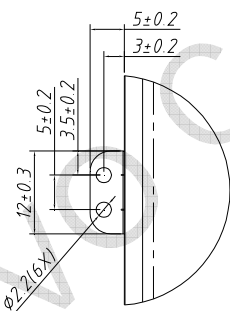
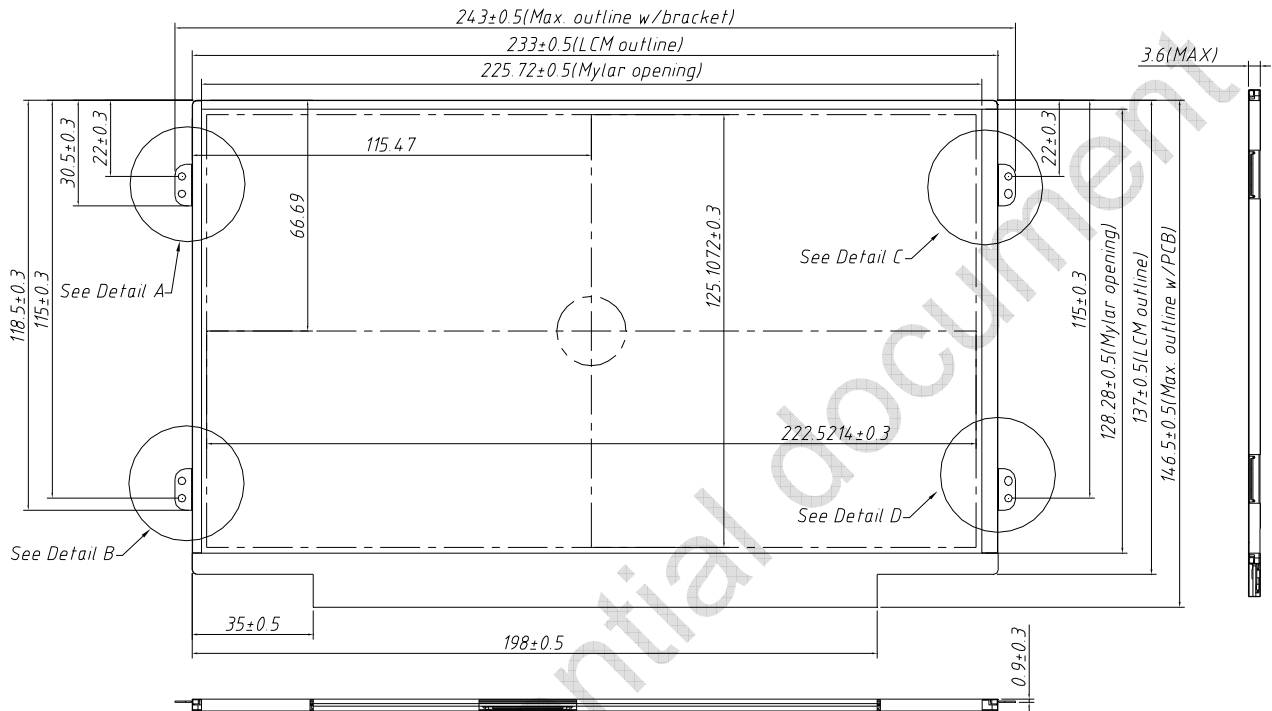
Parameter	Unit	min	Typ.	max
T1	ms	0.5	-	10
T2	ms	30	-	90
T3	ms	200	-	-
T4	ms	0.5	-	-
T5	ms	10	-	-
T6	ms	10	-	-
T7	ms	0	-	-
T8	ms	10	-	-
T9	ms		10	30
T10	ms	200	-	-
T11	ms	0	-	50
T12	ms	0.5	10	30
T13	ms	500	-	-

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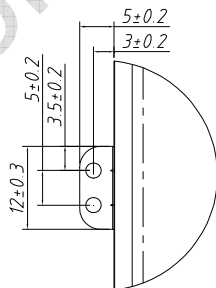
10.0 Mechanical Characteristics

10.1 Outline Drawing

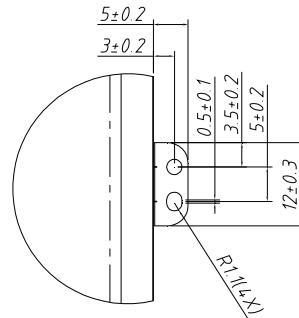
Figure 17 Reference Outline Drawing (Front Side)



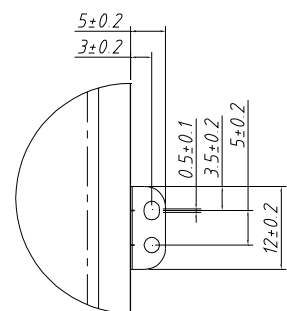
Detail A
Scale 2:1



Detail B
Scale 2:1

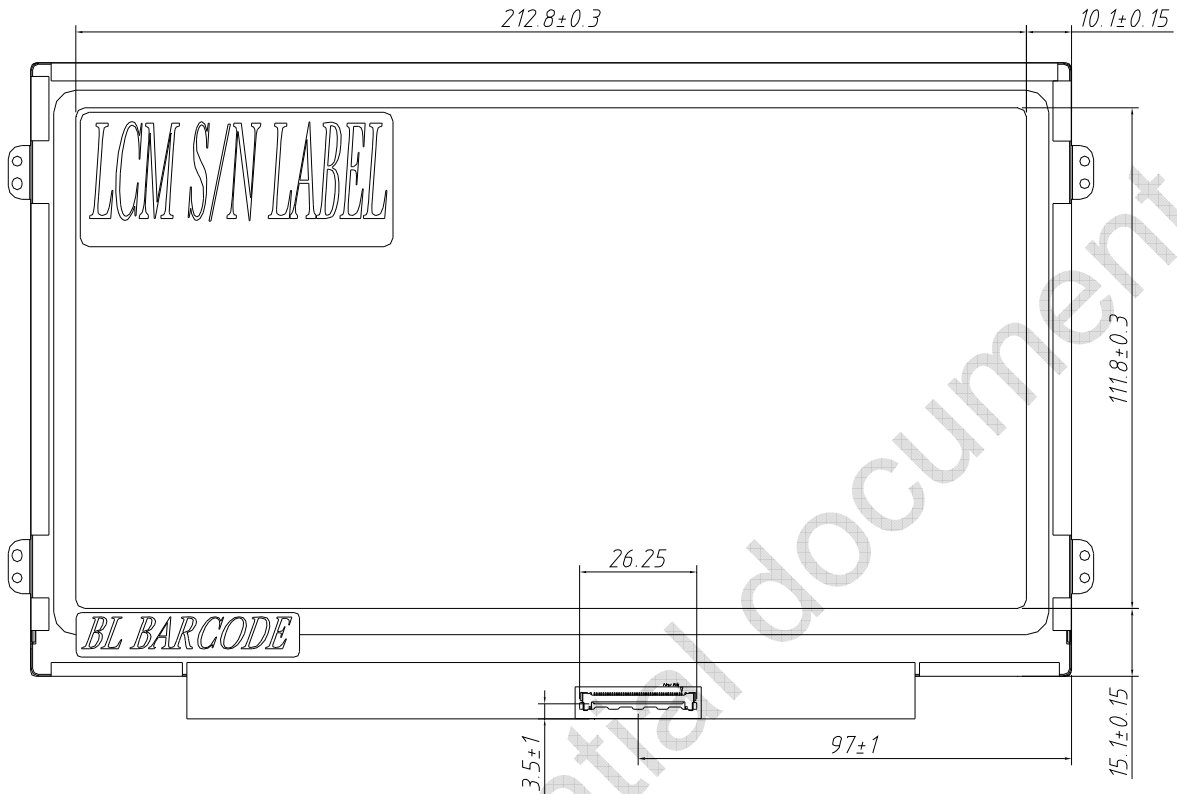


Detail C
Scale 2:1



Detail D
Scale 2:1

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Figure 18 Reference Outline Drawing (Back Side)

10.2 Dimension Specifications
Table 11 Module Dimension Specifications

Item	Min.	Typ.	Max.	Units
Width	242.5	243	243.5	mm
Height	146	146.5	147	mm
Thickness	-	-	3.6	mm
Weight	-	-	170	g

Measure instrument: Vernier caliper

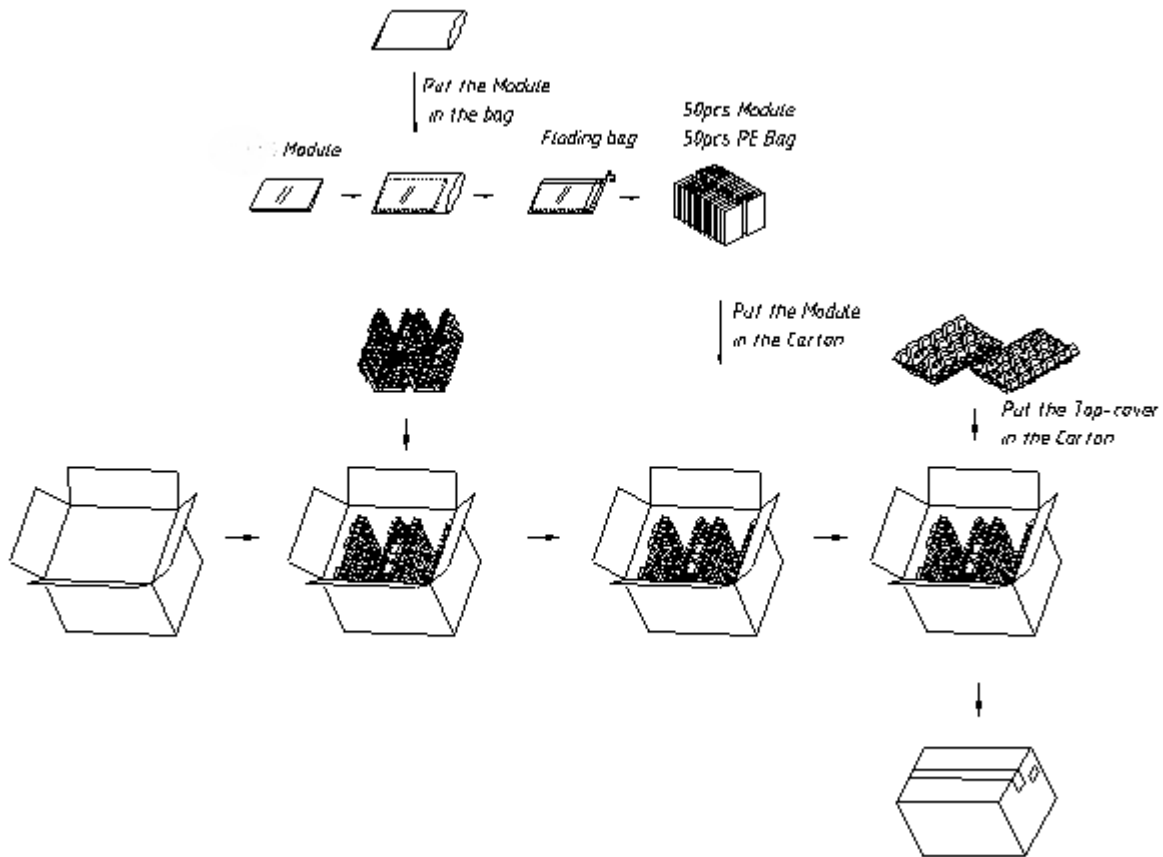


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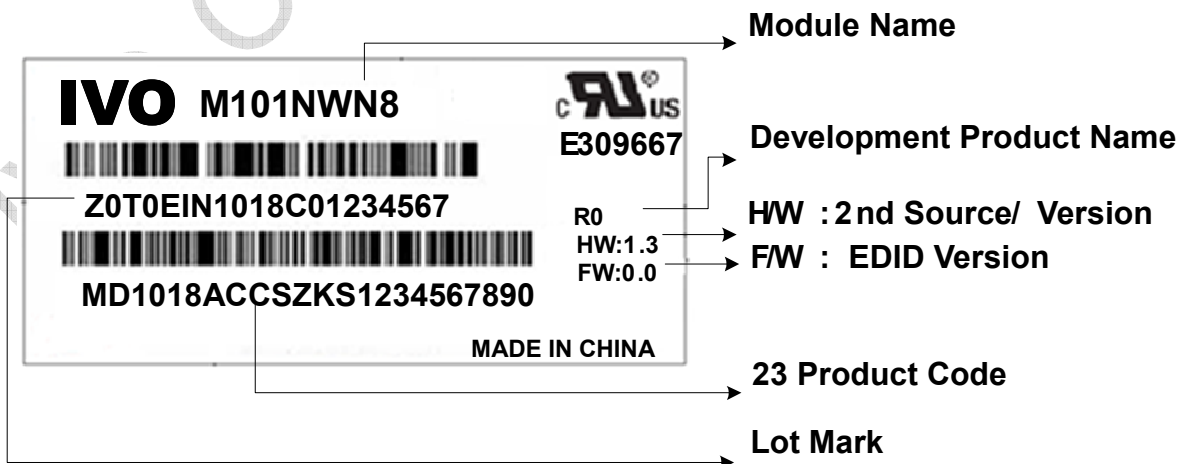
11.0 Package Specification

The outside dimension of carton is 472(L)mm*382(W)mm*340(H)mm

Figure 19 Packing Method



12.0 Lot Mark





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12.1 Lot Mark

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----	----	----	----	----

code 1,2,4,5,6,7,8,9,10,11,16: IVO internal flow control code.

code 3: Production location.

code 12: Production year.

code 13: Production month.

code 14,15: Production date.

code 17,18,19,20: Serial number.

Note (1) Production Year

Year	2,006	2,007	2,008	2,009	2,010	2,011	2,012	2,013	2,014	2,015
Mark	6	7	8	9	A	B	C	D	E	F

Note (2) Production Month

Month	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct	Nov.	Dec.
Mark	1	2	3	4	5	6	7	8	9	A	B	C

12.2 23 Product Barcode

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
---	---	---	---	---	---	---	---	---	----	----	----	----	----	----	----	----	----	----	----	----	----	----

code 1,2: Manufacture District.

code 3,4,5,6,7: IVO internal module name.

code 8,9,10,13,16: IVO internal flow control code.

code 11,12: Cell location Suzhou defined as "SZ".

code 14,15: Module line kunshan defined as "KS".

code 17,18,19 : Year, Month, Day Refer to Note(1) and Note(2) of Lot Mark.

code 20~23 : Serial Number.

13.0 General Precaution

13.1 Use Restriction

This product is not authorized for use in life supporting systems, aircraft navigation control systems, military systems and any other application where performance failure could be life-threatening or otherwise catastrophic.

13.2 Handling Precaution

- (1) Please mount LCD module by using mounting holes arranged in four corners tightly.
- (2) Do not disassemble or modify the module. It may damage sensitive parts inside LCD module, and may cause scratches or dust on the display. IVO does not warrant the module, if customers disassemble or modify the module.
- (3) If LCD panel is broken and liquid crystal spills out, do not ingest or inhale liquid Crystal, and do not contact liquid crystal with skin. If liquid crystal contacts mouth or eyes, rinse out with water immediately. If liquid crystal contacts skin or cloths, wash it off



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immediately with alcohol and Rinse thoroughly with water.

- (4) Disconnect power supply before handling LCD module
- (5) Refrain from strong mechanical shock and /or any force to the module.
- (6) Do not exceed the absolute maximum rating values, such as the supply voltage variation, input voltage variation, variation in parts' parameters, environmental temperature; etc otherwise LCD module may be damaged. It's recommended employing protection circuit for power supply.
- (7) Do not touch, push or rub the polarizer with anything harder than HB pencil lead. Use fingerstalls of soft gloves in order to keep clean display quality, when Persons handle the LCD module for incoming inspection or assembly.
- (8) When the surface is dusty, please wipe gently with absorbent cotton or other soft Material. When cleaning the adhesives, please use absorbent cotton wetted with a little Petroleum benzene or other adequate solvent.
- (9) Wipe off saliva or water drops as soon as possible. If saliva or water drops Contact with polarizer for a long time, they may causes deformation or color Fading.
- (10) Protection film must remove very slowly from the surface of LCD module to Prevent from electrostatic occurrence.
- (11) Because LCD module uses CMOS-IC on circuit board and TFT-LCD panel, it is Very weak to electrostatic discharge, Please be careful with electrostatic Discharge .Persons who handle the module should be grounded through adequate methods.
- (12) Do not adjust the variable resistor located on the module.

13.3 Storage Precaution

- (1) Please do not leave LCD module in the environment of high humidity and high temperature for a long time.
- (2) The module shall not be exposed under strong light such as direct sunlight. Otherwise, Display characteristics may be changed.
- (3) The module should be stored in a dark place. It is prohibited to apply sunlight or fluorescent light in storage.

13.4 Operation Precaution

- (1) Do not connect or disconnect the module in the "Power On" condition.
- (2) Power supply should always be turned on/off by 9.0 "Power on/off sequence"
- (3) Module has high frequency circuits. Sufficient suppression to the electromagnetic interference should be done by system manufacturers. Grounding and shielding methods may be important to minimize the interference.
- (4) After installation of the TFT Module into an enclosure, do not twist nor bend the TFT Module even momentary. At designing the enclosure, it should be taken into consideration that no bending/twisting forces are applied to the TFT Module from outside. Otherwise the TFT Module may be damaged.

13.5 Others

- (1) Ultra-violet ray filter is necessary for outdoor operation.



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- (2) Avoid condensation of water which may result in improper operation or disconnection of electrode.
- (3) If the module keeps displaying the same pattern for a long period of time, the image may be "sticked" to the screen.
- (4) This module has its circuitry PCB's on the rear side and should be handled carefully in order not to be stressed.

13.6 Disposal

When disposing LCD module, obey the local environmental regulations.



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14.0 EDID Data Structure

Table 12 EDID Table Format

Address (Decimal)	Address (HEX)	Field Name & Comments	Value (HEX)	Value (BIN)	Value (DEC)
0	0	Header	00	00000000	0
1	1	Header	FF	11111111	255
2	2	Header	FF	11111111	255
3	3	Header	FF	11111111	255
4	4	Header	FF	11111111	255
5	5	Header	FF	11111111	255
6	6	Header	FF	11111111	255
7	7	Header	00	00000000	0
8	8	manufacture code	26	00100110	38
9	9	manufacture code	CF	11001111	207
10	0A	Product Code	FA	11111010	250
11	0B	Product Code	03	00000011	3
12	0C	LCD module Serial No –("0" if not used)	01	00000001	1
13	0D	LCD module Serial No –("0" if not used)	00	00000000	0
14	0E	LCD module Serial No –("0" if not used)	00	00000000	0
15	0F	LCD module Serial No –("0" if not used)	00	00000000	0
16	10	Week of manufacture	00	00000000	0
17	11	Year of manufacture	16	00010110	22
18	12	EDID Structure Ver. # = 1	01	00000001	1
19	13	EDID revision # = 3	03	00000011	3
20	14	Video I/P definition = Digital I/P (80h)	80	10000000	128
21	15	Max H image size = (Rounded to cm)	16	00010110	22
22	16	Max V image size = (Rounded to cm)	0D	00001101	13
23	17	Display Gamma	78	01111000	120
24	18	Feature support (no DPMS, Active off, RGB, timing BLK 1)	0A	00001010	10
25	19	Red/Green Low bits (RxRy/GxGy)	21	00100001	33
26	1A	Blue/White Low bits (BxBY/WxWy)	D0	11010000	208
27	1B	Red X Rx	94	10010100	148
28	1C	Red Y Ry	58	01011000	88
29	1D	Green X Gx	56	01010110	86



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30	1E	Green Y Gy	8F	10001111	143
31	1F	Blue X Bx	27	00100111	39
32	20	Blue Y By	1F	00011111	31
33	21	White X Wx	50	01010000	80
34	22	White Y Wy	54	01010100	84
35	23	Established timings 1 (00h if not used)	00	00000000	0
36	24	Established timing 2 (00h if not used)	00	00000000	0
37	25	Manufacturer's timings (00h if not used)	00	00000000	0
38	26	Standard timing ID1 (01h if not used)	01	00000001	1
39	27	Standard timing ID1 (01h if not used)	01	00000001	1
40	28	Standard timing ID2 (01h if not used)	01	00000001	1
41	29	Standard timing ID2 (01h if not used)	01	00000001	1
42	2A	Standard timing ID3 (01h if not used)	01	00000001	1
43	2B	Standard timing ID3 (01h if not used)	01	00000001	1
44	2C	Standard timing ID4 (01h if not used)	01	00000001	1
45	2D	Standard timing ID4 (01h if not used)	01	00000001	1
46	2E	Standard timing ID5 (01h if not used)	01	00000001	1
47	2F	Standard timing ID5 (01h if not used)	01	00000001	1
48	30	Standard timing ID6 (01h if not used)	01	00000001	1
49	31	Standard timing ID6 (01h if not used)	01	00000001	1
50	32	Standard timing ID7 (01h if not used)	01	00000001	1
51	33	Standard timing ID7 (01h if not used)	01	00000001	1
52	34	Standard timing ID8 (01h if not used)	01	00000001	1
53	35	Standard timing ID8 (01h if not used)	01	00000001	1
54	36	Timing Descriptor #1	05	00000101	5
55	37	Pixel Clock 1366*768@60Hz	1E	00011110	30
56	38	Horizontal Active (lower 8 bits)	56	01010110	86
57	39	Hor. blanking (lower 8 bits)	C2	11000010	194
58	3A	Horizontal Active/Horizontal blanking (upper4:4 bits)	50	01010000	80
59	3B	Vertical active(lower 8 bits)	00	00000000	0
60	3C	Vertical blanking(lower 8 bits)	35	00110101	53
61	3D	Vertical Active : Vertical Blanking (upper4:4 bits)	30	00110000	48
62	3E	Horizontal Sync Offset	30	00110000	48
63	3F	Horizontal Sync Pulse Width	20	00100000	32



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64	40	Vertical Sync Offset , Sync Width	3C	00111100	60
65	41	Horizontal Vertical Sync Offset/Width upper 2 bits	00	00000000	0
66	42	Horizontal Image Size	DF	11011111	223
67	43	Vertical image Size	7D	01111101	125
68	44	Horizontal Image Size / Vertical image size	00	00000000	0
69	45	Horizontal Border = (0 for Notebook LCD)	00	00000000	0
70	46	Vertical Border = (0 for Notebook LCD)	00	00000000	0
71	47	Non-interlaced, Normal, no stereo, Separate sync, H/V pol. Negatives,	19	00011001	25
72	48	Timing Descriptor #2	47	01000111	71
73	49	Pixel Clock 1366*768@40Hz	14	00010100	20
74	4A	Horizontal Active (lower 8 bits)	56	01010110	86
75	4B	Hor. blanking (lower 8 bits)	F0	11110000	240
76	4C	Horizontal Active/Horizontal blanking (upper4:4 bits)	50	01010000	80
77	4D	Vertical active(lower 8 bits)	00	00000000	0
78	4E	Vertical blanking(lower 8 bits)	28	00101000	40
79	4F	Vertical Active : Vertical Blanking (upper4:4 bits)	30	00110000	48
80	50	Horizontal Sync Offset	30	00110000	48
81	51	Horizontal Sync Pulse Width	20	00100000	32
82	52	Vertical Sync Offset , Sync Width	3C	00111100	60
83	53	Horizontal Vertical Sync Offset/Width upper 2 bits	00	00000000	0
84	54	Horizontal Image Size	35	00110101	53
85	55	Vertical image Size	AE	10101110	174
86	56	Horizontal Image Size / Vertical image size	10	00010000	16
87	57	Horizontal Border = (0 for Notebook LCD)	00	00000000	0
88	58	Vertical Border = (0 for Notebook LCD)	00	00000000	0
89	59	Non-interlaced, Normal, no stereo, Separate sync, H/V pol. Negatives,	19	00011001	25
90	5A	Detailed timing/monitor descriptor#3	00	00000000	0
91	5B	Flag	00	00000000	0
92	5C	Flag	00	00000000	0
93	5D	FE (hex) defines ASCII string	FE	11111110	254



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94	5E	Flag	00	00000000	0
95	5F	Manufacture I	49	01001001	73
96	60	Manufacture n	6E	01101110	110
97	61	Manufacture f	66	01100110	102
98	62	Manufacture o	6F	01101111	111
99	63	Manufacture V	56	01010110	86
100	64	Manufacture i	69	01101001	105
101	65	Manufacture s	73	01110011	115
102	66	Manufacture i	69	01101001	105
103	67	Manufacture o	6F	01101111	111
104	68	Manufacture n	6E	01101110	110
105	69	New line character indicates end of ASCII string	0A	00001010	10
106	6A		20	00100000	32
107	6B		20	00100000	32
108	6C	Detailed timing/monitor descriptor #4	00	00000000	0
109	6D		00	00000000	0
110	6E		00	00000000	0
111	6F	FE (hex) defines ASCII string	FE	11111110	254
112	70	Flag	00	00000000	0
113	71	Manufacture P/N	4D	01001101	77
114	72	Manufacture P/N	31	00110001	49
115	73	Manufacture P/N	30	00110000	48
116	74	Manufacture P/N	31	00110001	49
117	75	Manufacture P/N	4E	01001110	78
118	76	Manufacture P/N	57	01010111	87
119	77	Manufacture P/N	52	01010010	82
120	78	Manufacture P/N	38	00111000	56
121	79	Manufacture P/N	20	00100000	32
122	7A	Manufacture P/N	52	01010010	82
123	7B	Manufacture P/N	30	00110000	48
124	7C	New line character indicates end of ASCII string	20	00100000	32
125	7D		0A	00001010	10
126	7E	Extension Flag = 00	00	00000000	0
127	7F	Checksum	26	00100110	38