




# Product Specification

AU OPTRONICS CORPORATION

( ) Preliminary Specifications

(V) Final Specifications

Module	13.3”(13.26”)FHD16:9ColorTFT-LCDwithLEDBacklight design
ModelName	G133HAN02.0
Note (  )	<i>LEDBacklightwithdrivingcircuitdesign</i>

Customer	Date
Checked & Approvedby	Date
Note: This Specification is subject to change without notice.	

Approvedby	
SeanLin	<u>2019/2/15</u>
Preparedby	
CHTsai	<u>2019/2/15</u>
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## Record of Revision

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## 1. Handling Precautions

- 1) Since front polarizer is easily damaged, pay attention not to scratch it.
- 2) Be sure to turn off power supply when inserting or disconnecting from input connector.
- 3) Wipe off water drop immediately. Long contact with water may cause discoloration or spots.
- 4) When the panel surface is soiled, wipe it with absorbent cotton or other soft cloth.
- 5) Since the panel is made of glass, it may break or crack if dropped or bumped on hard surface.
- 6) Since CMOS LSI is used in this module, take care of static electricity and insure human earth when handling.
- 7) Do not open nor modify the Module Assembly.
- 8) Do not press the reflector sheet at the back of the module to any directions.
- 9) At the insertion or removal of the Signal Interface Connector, be sure not to rotate nor tilt the Interface Connector of the TFT Module.
- 10) After installation of the TFT Module into an enclosure (Notebook PC Bezel, for example), do not twist nor bend the TFT Module even momentarily. 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.
- 11) Small amount of materials having no flammability grade is used in the LCD module. The LCD module should be supplied by power complied with requirements of Limited Power Source (IEC60950 or UL1950), or be applied exemption.
- 12) Disconnecting power supply before handling LCD modules, it can prevent electric shock, DO NOT TOUCH the electrode parts, cables, connectors and LED circuit part of TFT module that a LED light bar build in as a light source of back light unit. It can prevent electrostatic breakdown.

## 2. General Description

G133HAN02.0 is a Color Active Matrix Liquid Crystal Display composed of a TFT LCD panel, a driver circuit, and LED backlight system. The screen format is intended to support the 16:9 FHD, 1920(H) x1080(V) screen and 16.2M colors with LED backlight driving circuit. All input signals are eDP (Embedded DisplayPort) interface compatible.

G133HAN02.0 is designed for industrial display applications.

## 2.1 General Specification

The following items are characteristics summary on the table at 25 °C condition:

Items	Unit	Specifications			
Screen Diagonal	[mm]	336.71			
Active Area	[mm]	293.472x165.078			
Pixels H x V		1920x3(RGB) x 1080			
Pixel Pitch	[mm]	0.1529 x 0.1529			
Pixel Format		R.G.B. Vertical Stripe			
Display Mode		Normally Black			
White Luminance (ILED=24mA) (Note: ILED is LED current)	[cd/m <sup>2</sup> ]	400 typ. ( <b>centerpoint</b> )			
Luminance Uniformity		1.25 max. (5 points)			
Contrast Ratio		800 typ			
Response Time	[ms]	27 typ / 35 Max			
Nominal Input Voltage VDD	[Volt]	+3.3 typ.			
Power Consumption	[Watt]	Logic Power max :0.8W @VDD 3.3V White pattern Backlight Power max :3.38W @ VLED 12V in			
Weight	[Grams]	280 max			
Physical Size <b>Include bracket</b>	[mm]		<b>Min.</b>	<b>Typ.</b>	<b>Max.</b>
		<b>Length</b>	<b>194.8</b>	<b>195.3</b>	<b>195.8</b>
		<b>Width</b>	<b>305.8</b>	<b>306.3</b>	<b>306.8</b>
		<b>Thickness</b>	-	-	<b>3.0(Panelside) 3.2(PCBAside)</b>
Electrical Interface		2 Lane eDP 1.2			



# Product Specification

AU OPTRONICS CORPORATION

Glass Thickness	[mm]	0.4
Surface Treatment		Anti-Glare
Support Color		16.2M colors
Temperature Range Operating Storage (Non-Operating)	[°C] [°C]	0 to +50 -20 to +60
RoHS Compliance		RoHS Compliance



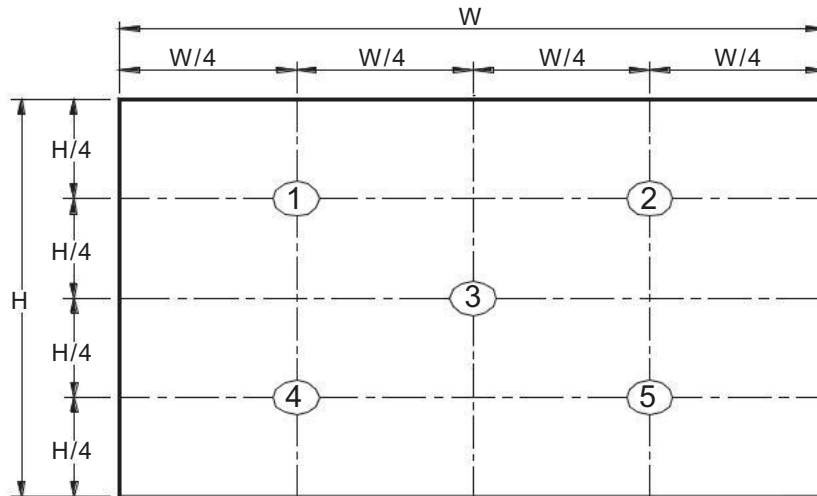
## 2.3 Optical Characteristics

The optical characteristics are measured under stable conditions at 25°C (Room Temperature) :

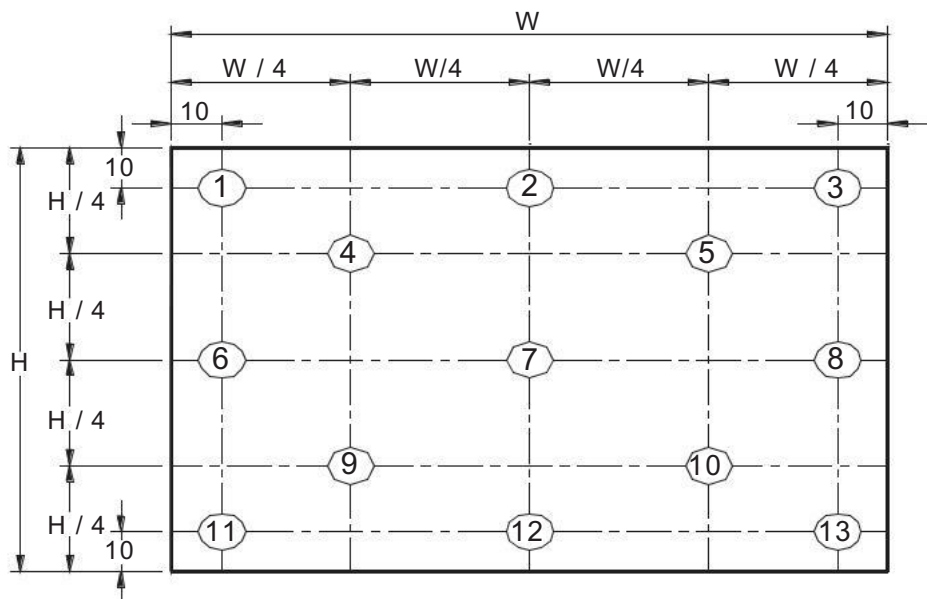
Item	Symbol	Conditions	Min.	Typ.	Max.	Unit	Note	
White Luminance ILED=20mA (Base Panel Only)		Centerpoint	-	400		cd/m <sup>2</sup>	1,4,5.	
Viewing Angle	θR θL	Horizontal(Right) CR=10(Left)	80 80	85 85	- -	degree	4,9	
	ψH ψL	Vertical(Upper) CR=10(Lower)	80 80	85 85	- -			
Luminance Uniformity	δ5P	5Points	-	-	1.25		1,3,4	
Luminance Uniformity	δ13P	13Points	-	-	1.6		2,3,4	
Contrast Ratio	CR		600	800	-		4,6	
Crosstalk	%				1.5		4,7	
Response Time	TRT	Rising+Falling	-	27	-			
Color/ Chromaticity Coordinates	Red	Rx	CIE1931	0.545	0.575	0.605	-	4
		Ry		0.305	0.335	0.365		
	Green	Gx		0.310	0.340	0.370		
		Gy		0.550	0.580	0.610		
	Blue	Bx		0.130	0.160	0.190		
		By		0.085	0.115	0.145		
	White	Wx		0.283	0.313	0.343		
		Wy		0.299	0.329	0.359		
NTSC	%		-	45	-			



**Note1:** 5 points position (Ref: Active area)



**Note2:** 13 points position (Ref: Active area)



**Note3:** The luminance uniformity of 5 or 13 points is defined by dividing the maximum luminance values by the minimum test point luminance

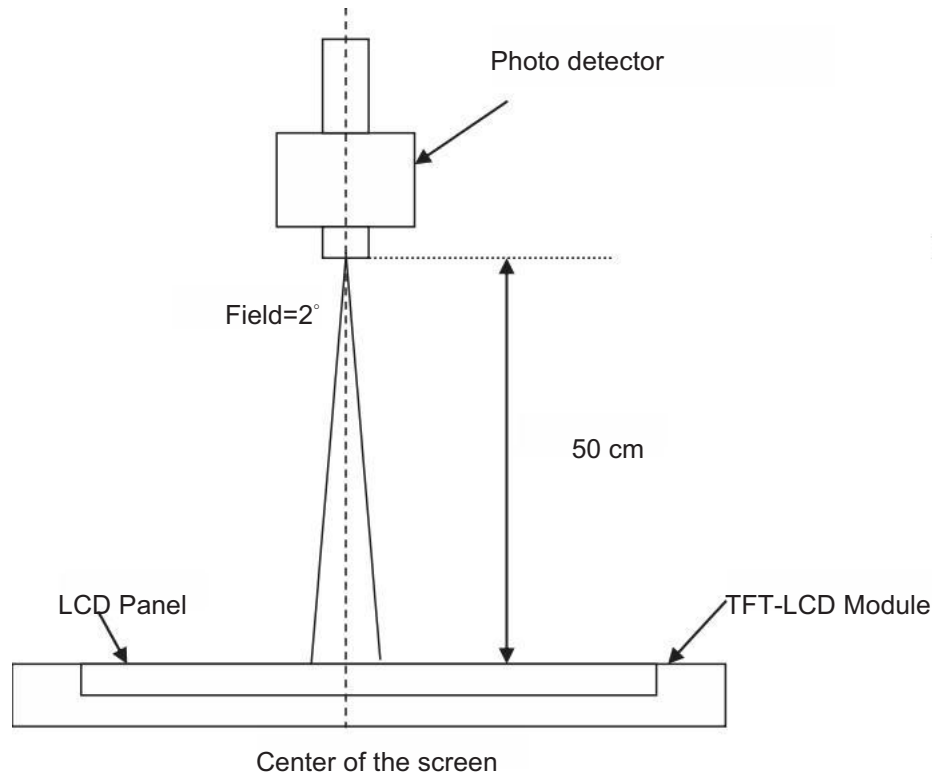
$$\delta_{w5} = \frac{\text{Maximum Brightness of five points}}{\text{Minimum Brightness of five points}}$$

$$\delta_{w13} = \frac{\text{Maximum Brightness of thirteen points}}{\text{Minimum Brightness of thirteen points}}$$

**Note4:** Measurement method

The LCD module should be stabilized at given temperature for 30 minutes to avoid abrupt temperature change during measuring. In order to stabilize the luminance, the measurement should be executed after lighting

Backlight for 30 minutes in a stable, windless and dark room, and it should be measured in the center of screen.



**Note5 :** Definition of Average Luminance of White ( $Y_L$ ):

Measure the luminance of gray level 63 at 5 points ,  $Y_L = [L (1)+ L (2)+ L (3)+ L (4)+ L (5)] / 5$

$L (x)$  is corresponding to the luminance of the point X at Figure in Note (1).

**Note6 :** Definition of contrast ratio:

Contrast ratio is calculated with the following formula.

$$\text{Contrast ratio (CR)} = \frac{\text{Brightness on the "White" state}}{\text{Brightness on the "Black" state}}$$

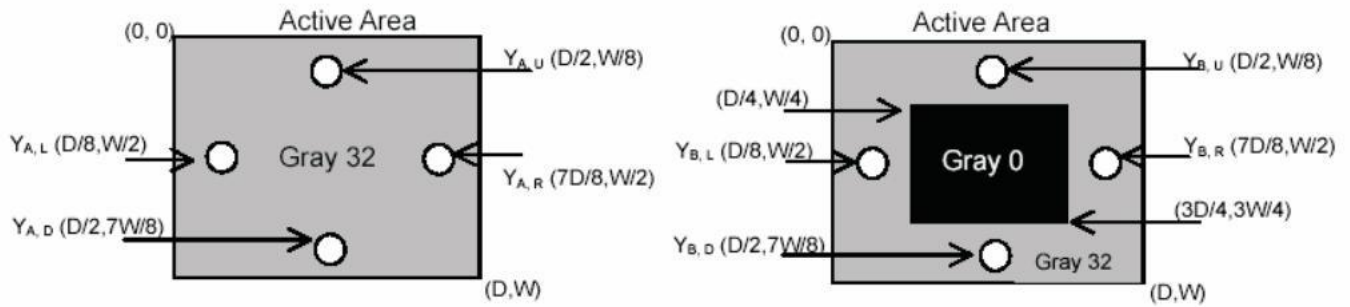
**Note7 :** Definition of Cross Talk (CT)

$$CT = | YB - YA | / YA \times 100 (\%)$$

Where

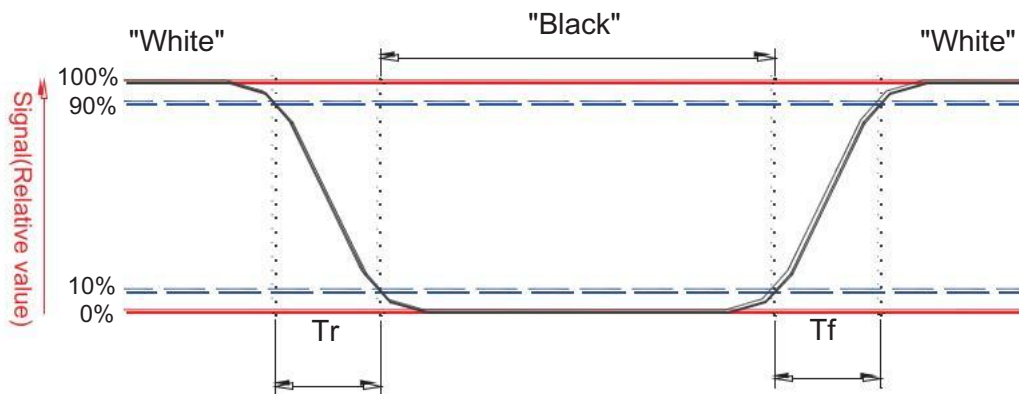
$YA$  = Luminance of measured location without gray level 0 pattern (cd/m<sup>2</sup>)

$YB$  = Luminance of measured location with gray level 0 pattern (cd/m<sup>2</sup>)



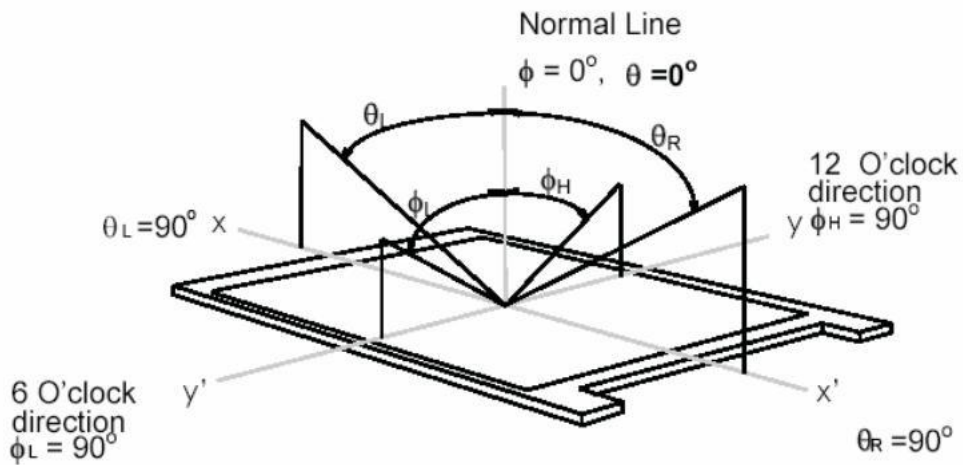
**Note8:** Definition of response time:

The output signals of BM-7 or equivalent are measured when the input signals are changed from "Black" to "White" (falling time) and from "White" to "Black" (rising time), respectively. The response time interval between the 10% and 90% of amplitudes. Refer to figure as below.



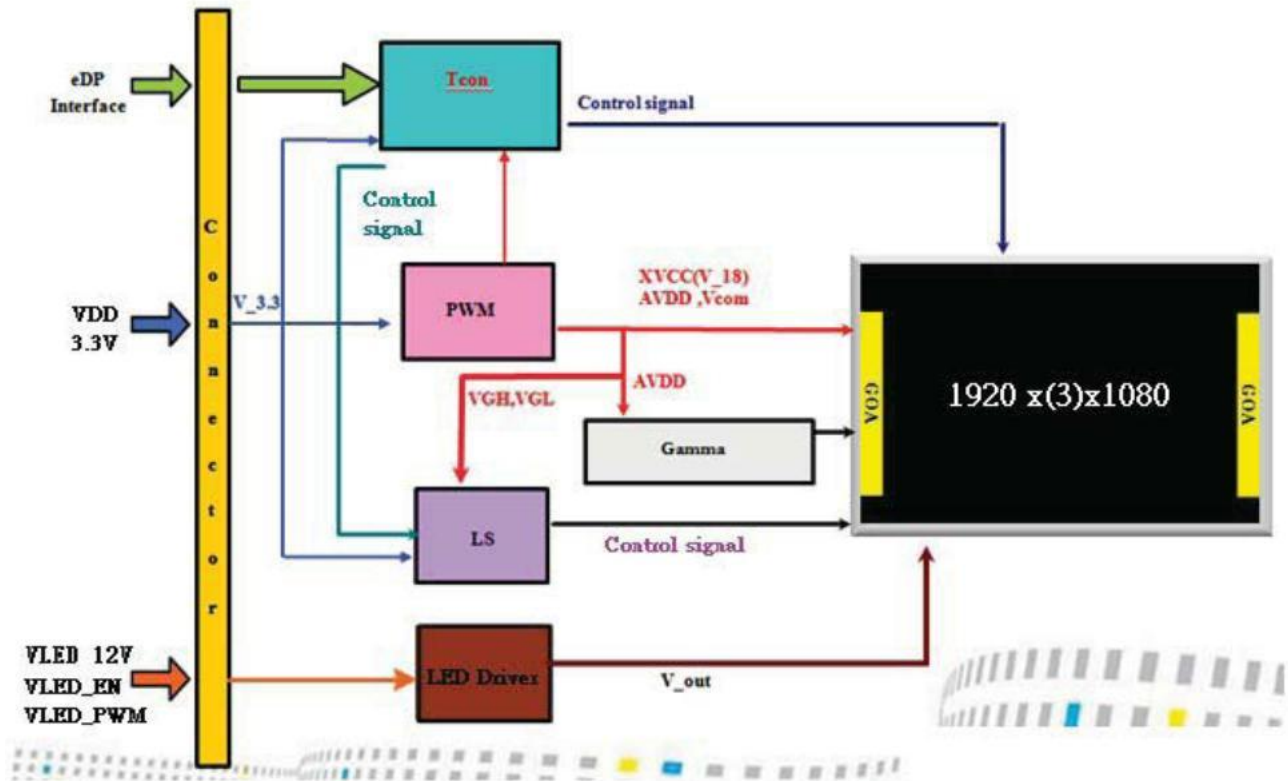
**Note9.** Definition of viewing angle

Viewing angle is the measurement of contrast ratio  $\geq 10$ , at the screen center, over a 180° horizontal and 180° vertical range (off-normal viewing angles). The 180° viewing angle range is broken down as follows; 90° ( $\theta$ ) horizontal left and right and 90° ( $\Phi$ ) vertical, high (up) and low (down). The measurement direction is typically perpendicular to the display surface with the screen rotated about its center to develop the desired measurement viewing angle.



## 3. Functional Block Diagram

### Schematic Block Diagram



## 4. Absolute Maximum Ratings

An absolute maximum rating of the module is as following:

### 4.1 Absolute Ratings of TFTLCD Module

Item	Symbol	Min	Max	Unit	Conditions
Logic/LCD Drive Voltage	VDD	-0.3	4	[Volt]	Note 1,2

### 4.2 Absolute Ratings of Environment

Item	Symbol	Min	Max	Unit	Conditions
Operating Temperature	TOP	0	+50	[°C]	Note 4
Operation Humidity	HOP	5	95	[%RH]	Note 4
Storage Temperature	TST	-20	+60	[°C]	Note 4

Storage Humidity	HST	5	95	[%RH]	Note 4
------------------	-----	---	----	-------	--------

Note 1: At Ta (25°C )

Note 2: Permanent damage to the device may occur if exceed maximum values

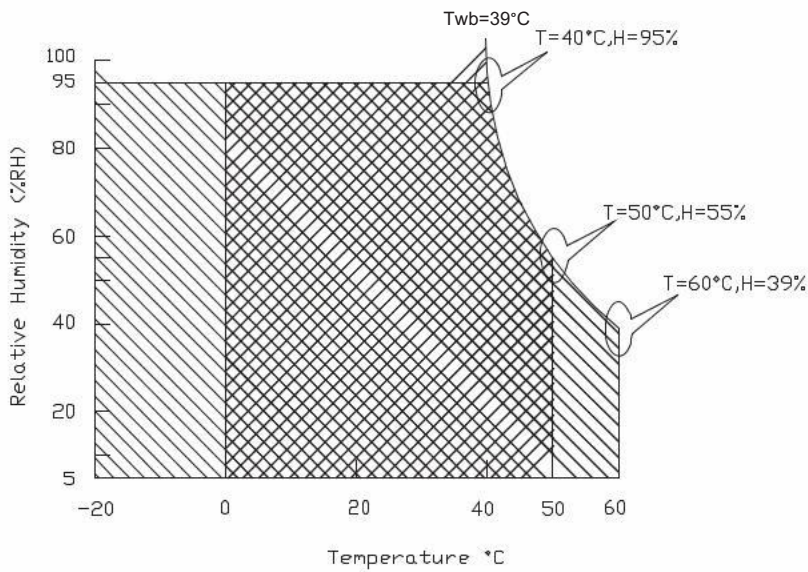
Note 3: LED specification refer to section 5.2

Note 4: For quality performance, please refer to AUO IIS (Incoming Inspection Standard).

Note 5: The packing material of system forbid to involve ammonium component

Note 6: The reliability test conditions of system do not exceed the verified conditions of TFT module

Note 7: Be sure the panel test condition do not exceed the component limitation of TFT module(TN Liquid crystal , for example)



## 5. Electrical Characteristics

### 5.1 TFTLCD Module

#### 5.1.1 Power Specification

Input power specifications are as follows:

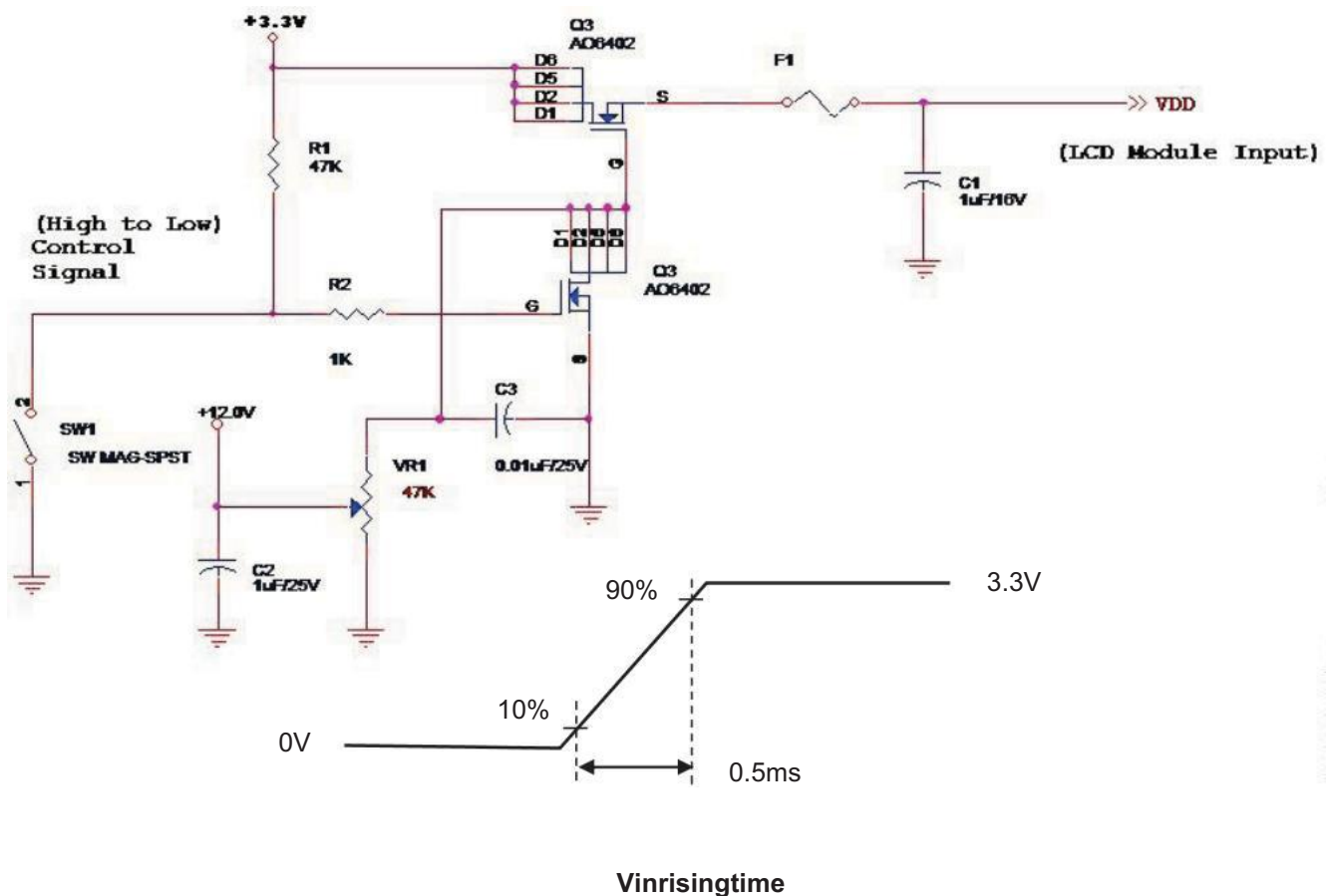
The power specification are measured under 25°C and frame frequency under 60Hz

Symble	Parameter	Min	Typ	Max	Units	Note
VDD	Logic/LCD Drive Voltage	3.0	3.3	3.6	[Volt]	Note 1
PDD	VDD Power	-	0.7	0.8	[Watt]	Note 2
IDD	IDD Current	-	231	242	[mA]	Note 2
IRush	Inrush Current	-	-	1500	[mA]	Note 3
VDDrp	Allowable Logic/LCD Drive Ripple Voltage	-	-	100	[mV] p-p	

Note 1 : Measure in panel VDD

Note 2 : Maximum Measurement Condition : White pattern at VDD: 3.3V driving voltage.

Note 3 : Measure Condition



## 5.1.2 Signal Electrical Characteristics

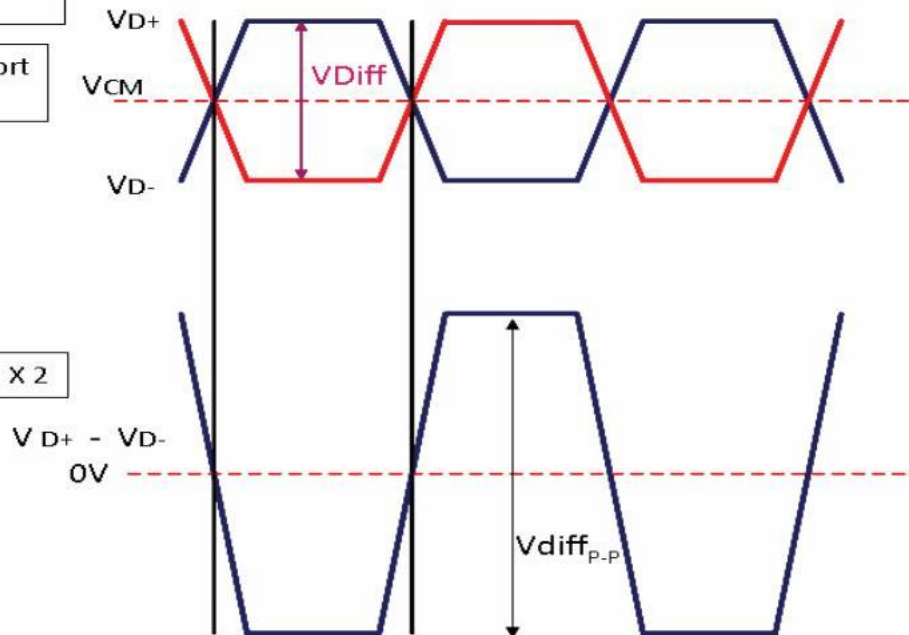
Signal electrical characteristics are as follows;

### DisplayPort main link signal:

Differential pair VD+, VD-  
Which is one Display port  
Main link

VCM of Display port  
Main link

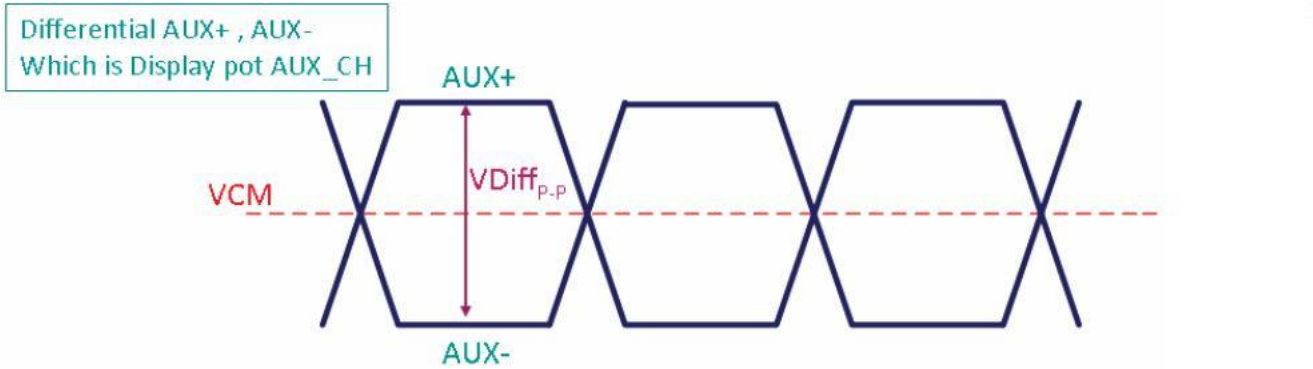
$$V_{diff_{P-P}} = [(V_{D+}) - (V_{D-})] \times 2$$



Display port main link					
		Min	Typ	Max	unit
VCM	RX input DC Common Mode Voltage		0		V
VDiff <sub>P-P</sub>	Peak-to-peak Voltage at a receiving Device	150		1380	mV



## DisplayPortAUX\_CHsignal:



Display port AUX_CH					
		Min	Typ	Max	unit
VCM	AUXDCCCommonModeVoltage		0		V
VDiff <sub>p-p</sub>	AUXPeak-to-peakVoltageatareceivingDevice	290		1380	mV

## DisplayPortVHPDsignal:

Display port VHPD					
		Min	Typ	Max	unit
VHPD	HPD Voltage	3	-	3.6	V



## 5.2 Backlight Unit

### 5.2.1 LED characteristics

Parameter	Symbol	Min	Typ	Max	Units	Condition
Backlight Power Consumption	PLED	-	-	3.38	[Watt]	(Ta=25°C), Note1
LED Life-Time	N/A	30,000	-	-	Hour	(Ta=25°C), Note2

**Note1:** Calculator value for reference  $P_{LED} = V_F$  (Normal Distribution) \*  $I_F$  (Normal Distribution) / Efficiency

**Note2:** The LED life-time define as the estimated time to 50% degradation of initial luminous.

### 5.2.2 Backlight input signal characteristics

Parameter	Symbol	Min	Typ	Max	Units	Remark
LED Power Supply	VLED (Note 1)	10.0	12.0	13.2	[Volt]	Define as Connector Interface (Ta=25°C)
LED Enable Input High Level	VLED_EN (Note 2)	2.2	-	5.5	[Volt]	
LED Enable Input Low Level		-	-	0.6	[Volt]	
PWM Logic Input High Level	VLED_PWM (Note 2)	2.2	-	5.5	[Volt]	
PWM Logic Input Low Level		-	-	0.6	[Volt]	
PWM Input Frequency	FPWM	200	1K	20K	Hz	
PWM Duty Ratio	Duty	1 (Note 3)	--	100	%	

**Note1:** Measured in panel VLED

**Note2:** Recommend system pull up/down resistor no bigger than 10kohm



## Product Specification

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AU OPTRONICS CORPORATION

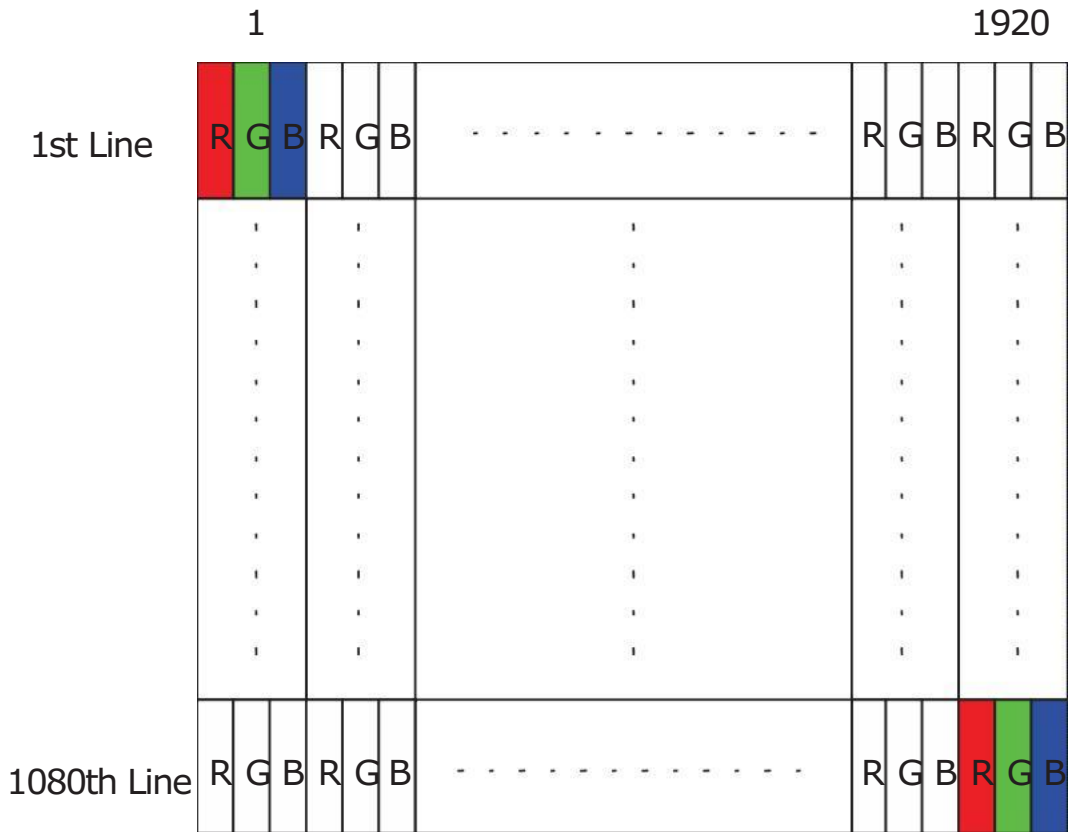
**Note3:** If the PWM duty ratio(min) is set between 5% to 1%, the PWM input frequency should be set below 1KHz .

The brightness-duty characteristic might not be able to keep in it's linearity if the dimming control is operated in 1% to 5% range.

## 6. Signal Interface Characteristic

### 6.1 Pixel Format Image

Following figure shows the relationship of the input signals and LCD pixel format.



## 6.2 Integration Interface Requirement

### 6.2.1 Connector Description

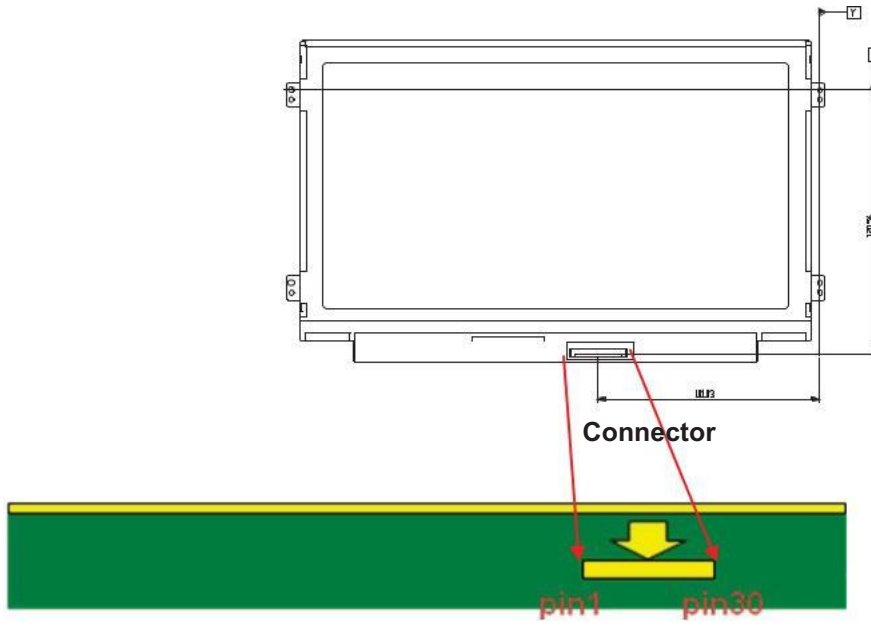
Physical interface is described as for the connector on module.

These connectors are capable of accommodating the following signals and will be following components.

Connector Name/Designation	For Signal Connector
Manufacturer	IPEX
Type / Part Number	IPEX 20765-030E-11A (0.5mm pitch)
Mating Housing/Part Number	IPX or compatible

### 6.2.2 Pin Assignment

Pin	Symbol	Description
1	NC	Reserved for LCD supplier
2	GND	High Speed Ground
3	Lane1_N	Complement Signal Link Lane 1
4	Lane1_P	True Signal Link Lane 1
5	GND	High Speed Ground
6	Lane0_N	Complement Signal Link Lane 0
7	Lane0_P	True Signal Link Lane 0
8	GND	High Speed Ground
9	AUX_CH_P	True Signal Auxiliary Channel
10	AUX_CH_N	Complement Signal Auxiliary Channel
11	GND	High Speed Ground
12	VDD	LCD logic power
13	VDD	LCD logic power
14	NC	LCD Panel Self Test Enable (Optional)
15	GND	LCD logic and driver ground
16	GND	LCD logic and driver ground
17	HPD	HPD Signal pin
18	BL_GND	LED Backlight ground
19	BL_GND	LED Backlight ground
20	BL_GND	LED Backlight ground
21	BL_GND	LED Backlight ground
22	VLED_EN	LED Backlight control on/off control
23	VLED_PWM	System PWM signal input for dimming
24	NC	Reserved for LCD supplier
25	NC	Reserved for LCD supplier
26	VLED	LED Backlight Power
27	VLED	LED Backlight Power
28	VLED	LED Backlight Power
29	VLED	LED Backlight Power
30	NC	Reserved for LCD supplier



**Note1:** Start from right side.

**Note2:** Input signals shall be low or High-impedance state when VDD is off.  
Internal circuit of **eDP** inputs are as following.

## 6.3 Interface Timing

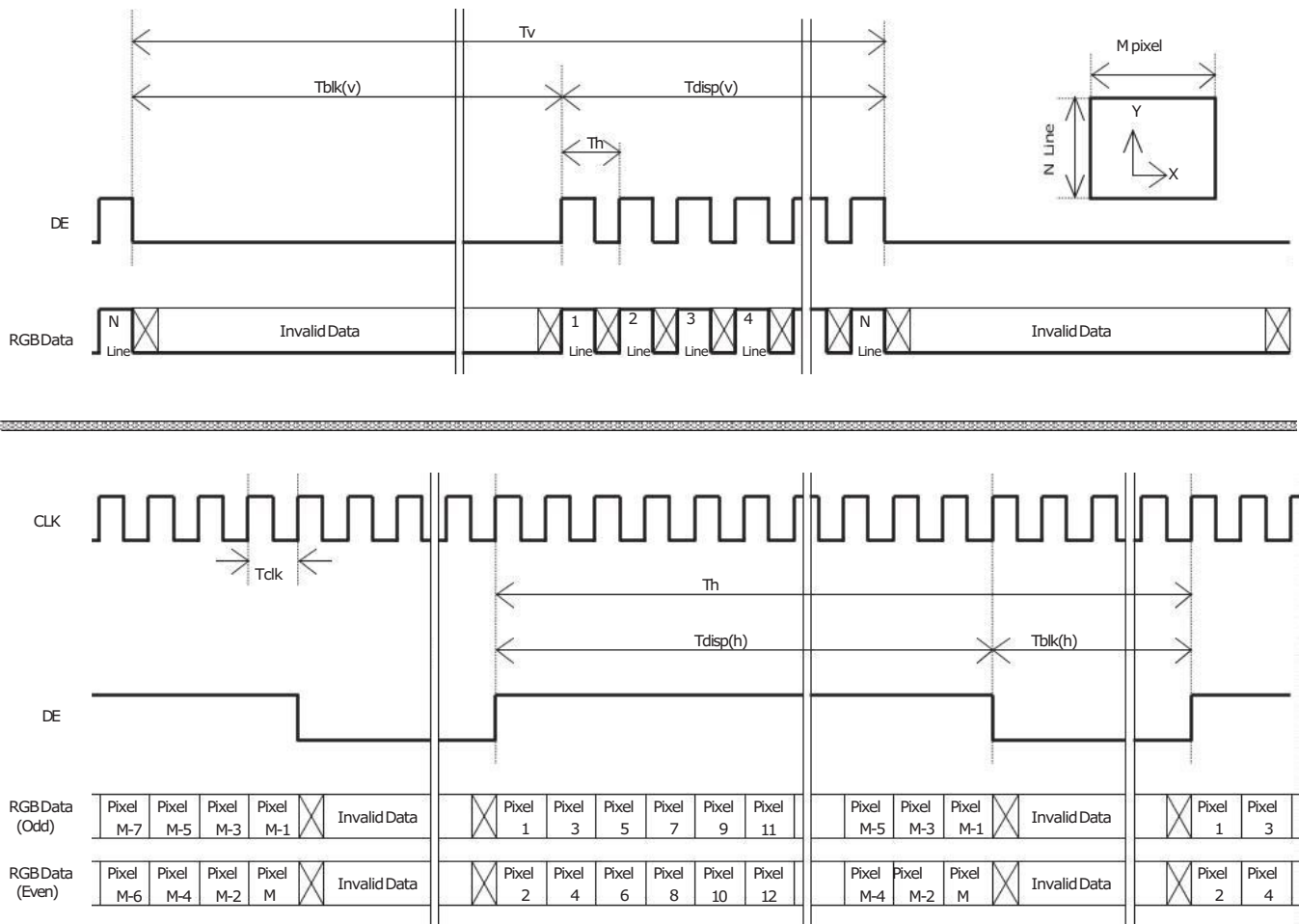
### 6.3.1 Timing Characteristics

Basically, interface timings should match the 1920x1080 /60Hz manufacturing guide line timing.

Parameter		Symbol	Min.	Typ.	Max.	Unit
FrameRate		-		60	-	Hz
Clockfrequency		$1/T_{Clock}$	68	70.5	75.9	MHz
Vertical Section	Period	TV	1100	1116	1150	$T_{Line}$
	Active	TVD	1080			
	Blanking	TVB	20	36	70	
Horizontal Section	Period	TH	1030	1052	1100	$T_{Clock}$
	Active	THD	960			
	Blanking	THB	70	92	140	

**Note1:**The above is as optimized setting

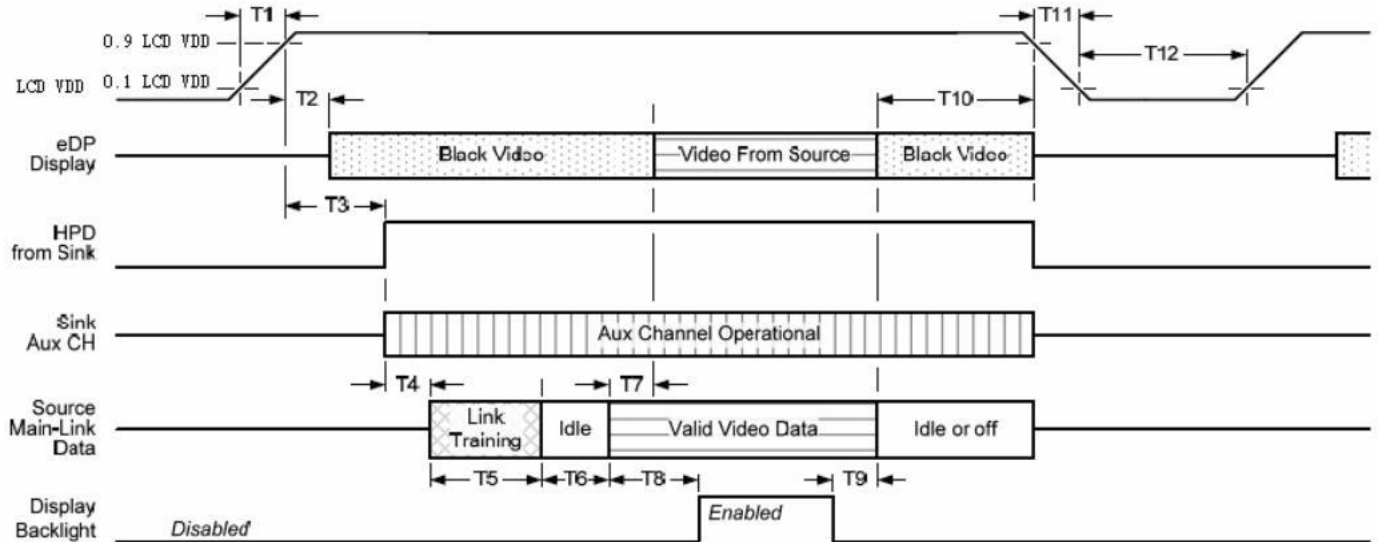
### 6.3.2 Timing diagram



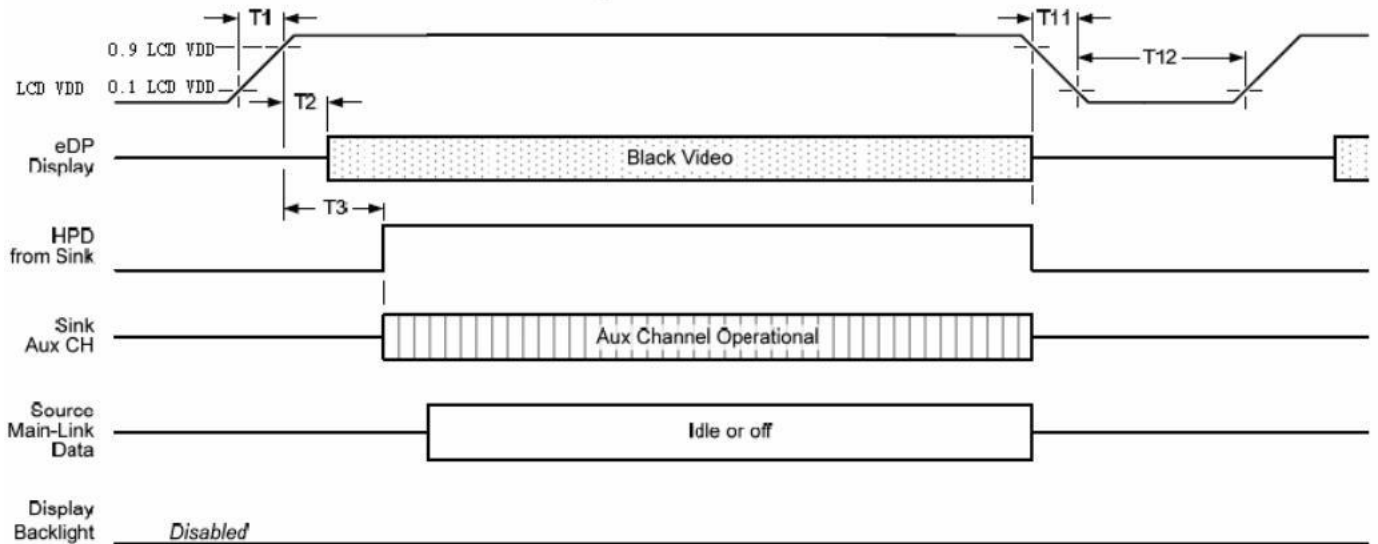
## 6.4 Power ON/OFF Sequence

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

### DisplayPort panel power sequence:



### DisplayPort AUX\_CH transaction only:





## DisplayPort panel power sequence timing parameter:

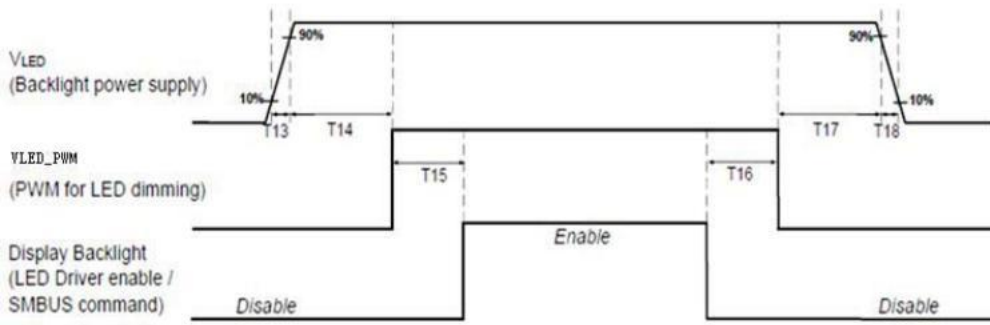
Timing parameter	Description	Reqd. by	Limits			Notes
			Min.	Typ.	Max.	
T1	power rail rise time, 10% to 90%	source	0.5ms		10ms	
T2	delay from LCDVDD to black video generation	sink	0ms		200ms	prevents display noise until valid video data is received from the source
T3	delay from LCDVDD to HPD high	sink	0ms		200ms	sink AUX_CH must be operational upon HPD high.
T4	delay from HPD high to link training initialization	source				allows for source to read link capability and initialize.
T5	link training duration	source				dependant on source link to read training protocol.
T6	link idle	source				Min accounts for required BS-Idle pattern. Max allows for source frame synchronization.
T7	delay from valid video data from source to video on display	sink	0ms		50ms	max allows sink validate video data and timing.
T8	delay from valid video data from source to backlight enable	source				source must assure display video is stable.
T9	delay from backlight disable to end of valid video data	source				source must assure backlight is no longer illuminated.
T10	delay from end of valid video data from source to power off	source	0ms		500ms	
T11	power rail fall time, 90% to 10%	source			10ms	
T12	power off time	source	500ms			

**Note1:** The sink must include the ability to generate black video autonomously. The sink must automatically enable black video under the following conditions:  
 -upon LCD VDD power on (with in T2 max)-when the "Novideostream\_Flag" (VB-ID Bit 3) is received from the source (at the end of T9).  
 -when no main link data, or invalid video data, is received from the source. Black video must be displayed within 64ms (typ) from the start of either condition. Video data can be deemed invalid based on MSA and timing information, for example.

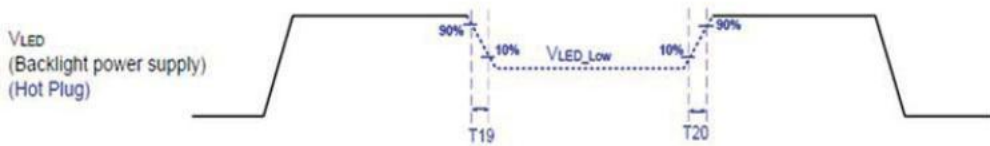
**Note2:** The sink may implement the ability to disable the black video function, as described in Note 1, above, for system development and debugging purpose.

**Note3:** The sink must support AUX\_CH polling by the source immediately following LCD VDD power on without causing damage to the sink device (the source can re-try if the sink is not ready). The sink must be able to respond to an AUX\_CH transaction with the time specified within T3 max.

## DisplayPort panel B/L power sequence timing parameter:



Note : When the adapter is hot plugged, the backlight power supply sequence is shown as below.



	Min (ms)	Max (ms)
T13	0.2	10
T14	0	-
T15	0	-
T16	0	-
T17	0	-
T18	0.2	10
T19	1 <sup>*</sup>	-
T20	1 <sup>*</sup>	-

Seamless change:  $T19/T20 = 5 \times T_{PWM}^*$

\* $T_{PWM} = 1/PWM \text{ Frequency}$

Note 1 : If T14, T15, T16, T17 < 10ms · The display garbage may occur. We suggest T14, T15, T16, T17 > 10ms to avoid the display garbage.

Note 2 : If T13 or T18 < 0.5ms · the inrush current may cause the damage of fuse. If T13 or T18 < 0.5ms · the inrush current  $I^2t$  is under typical melt of fuse Spec. · there is no mentioned problem.

## 7. Panel Reliability Test

### 7.1 Vibration Test

**Test Spec:**

- Test method: Non-Operation
- Acceleration: 1.5 G
- Frequency: 10 - 500Hz Random
- Sweep: 30 Minutes each Axis (X, Y, Z)

### 7.2 Shock Test

**Test Spec:**

- Test method: Non-Operation
- Acceleration: 220 G , Half sine wave
- Active time: 2 ms
- Pulse: X,Y,Z .one time for each side

### 7.3 Reliability Test

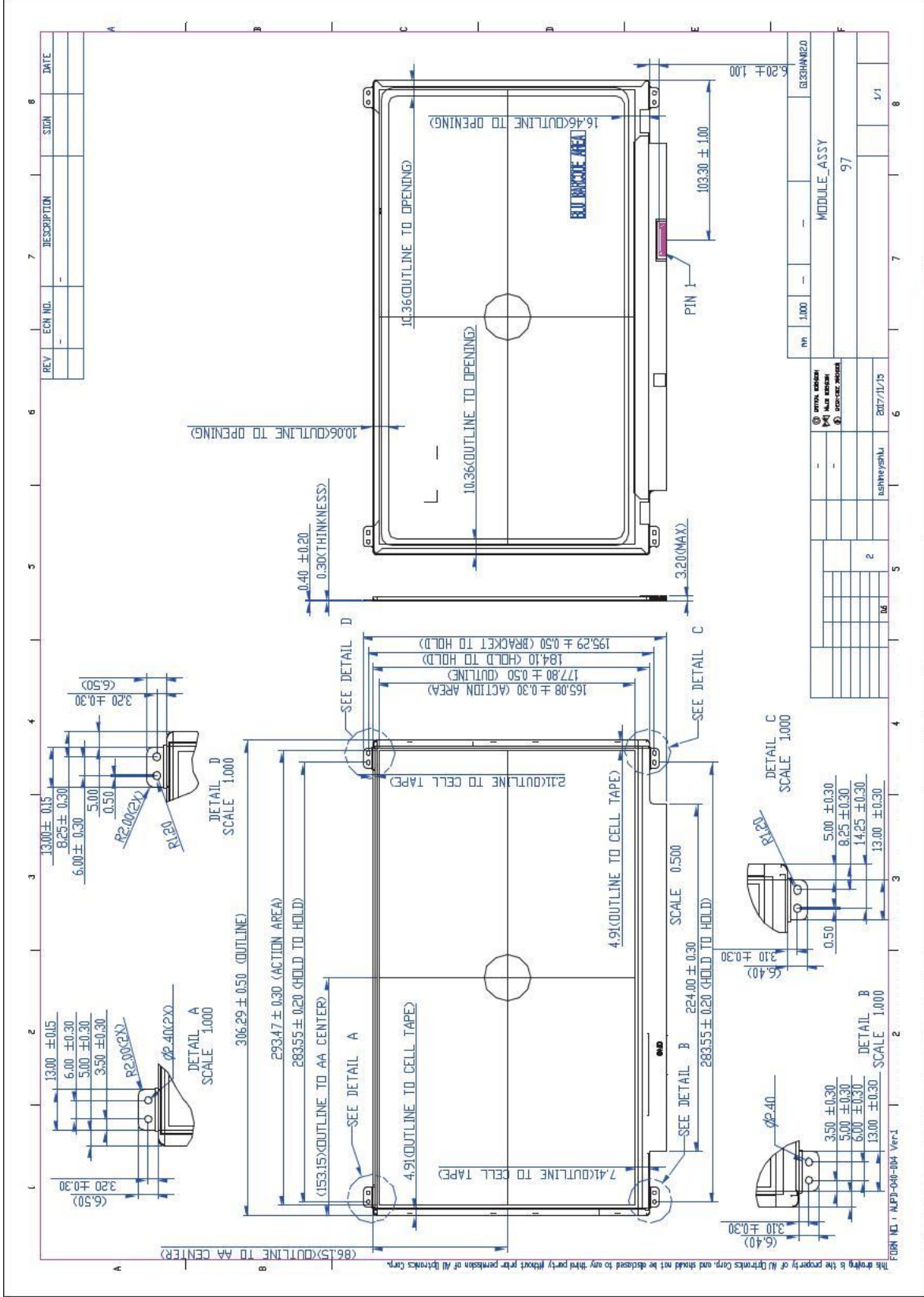
Items	Required Condition	Note
Temperature Humidity Bias	Ta=40°C ,90%RH,300h	
High Temperature Operation	Ta=50°C ,Dry,300h	
Low Temperature Operation	Ta=0°C ,300h	
High Temperature Storage	Ta=60°C ,300h	
Low Temperature Storage	Ta=-20°C ,250h	
Thermal Shock Test	Ta=-20°C (30min)~60°C (30min),100cycles condition.	
ESD	Contact:±8KV Air:±15KV	Note1

**Note1:** According to EN 61000-4-2 , ESD class B: Some performance degradation allowed. No data lost . Self-recoverable. No hardware failures.

**Remark:** MTBF (Excluding the LED): 30,000 hours with a confidence level 90%

## 8. Mechanical Characteristics

### 8.1 Outline Dimension

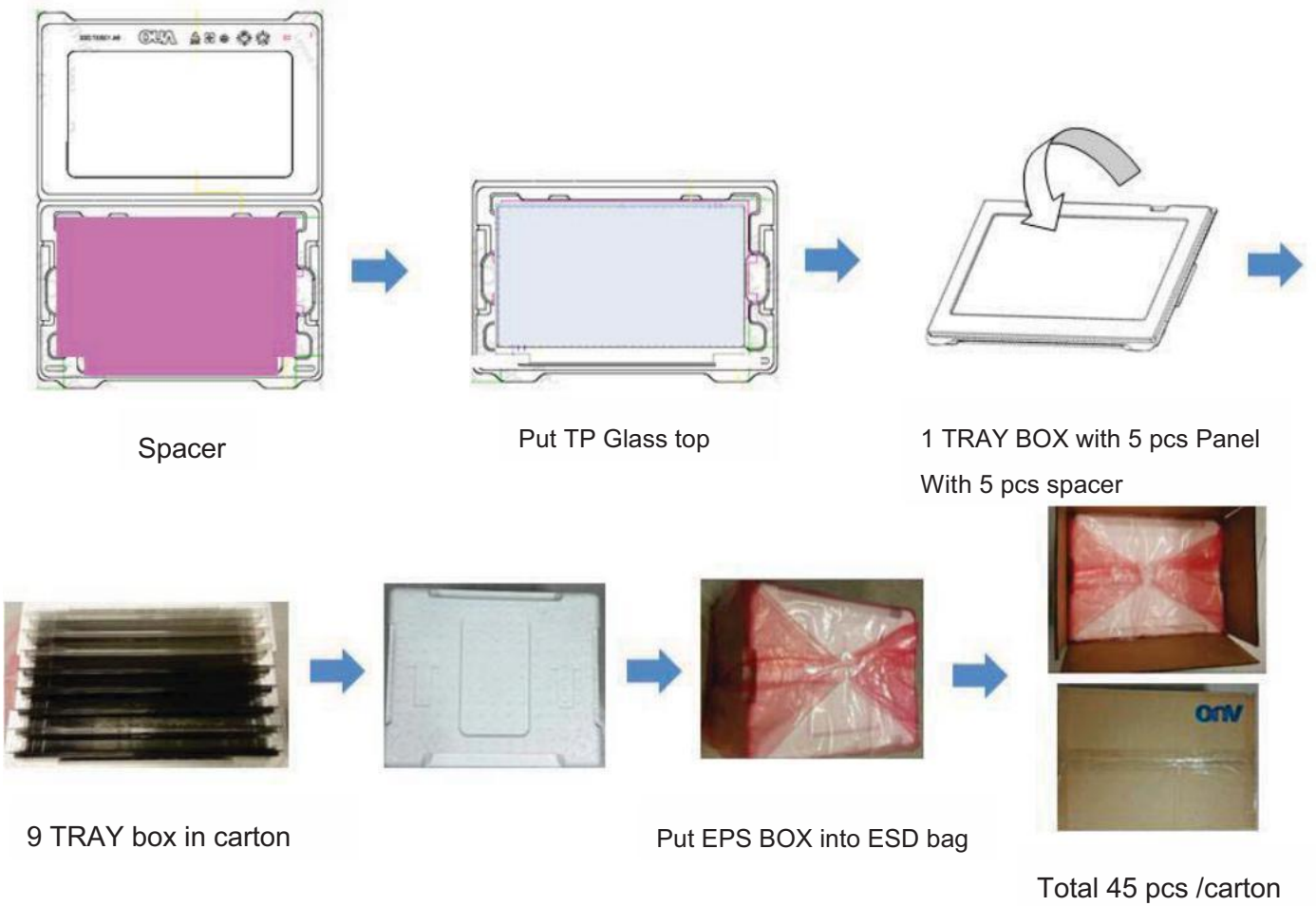


## 9. Shipping and Package

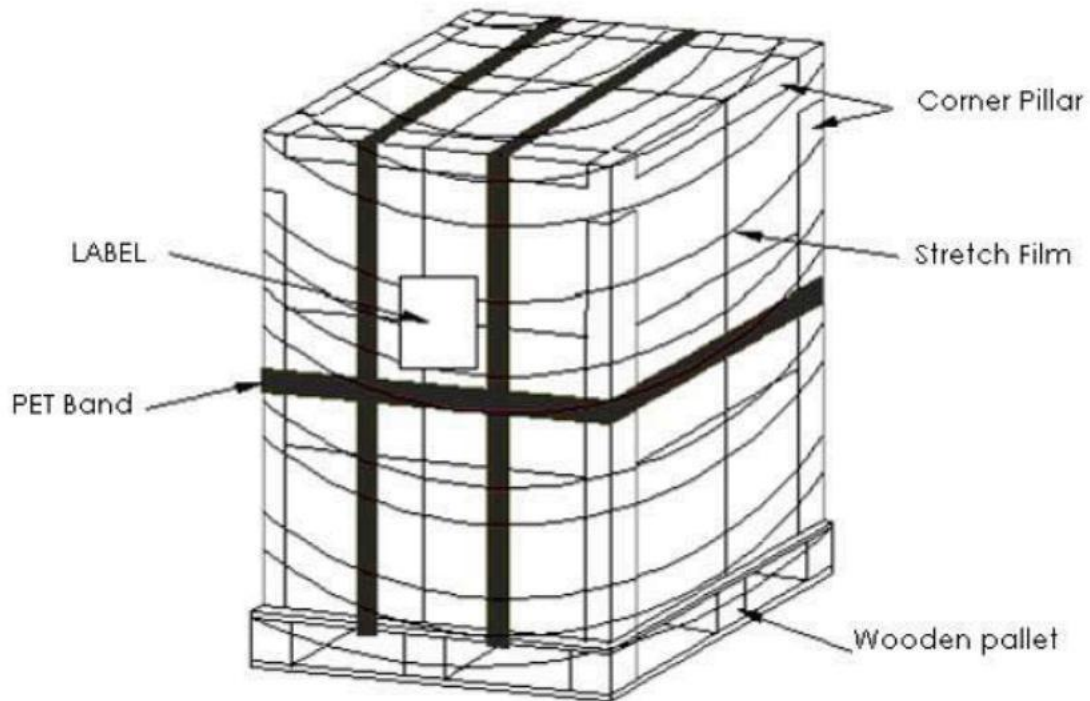
### 9.1 Shipping Label Format



### 9.2 Carton Package



### 9.3 Shipping Package of Palletizing Sequence



Item	Specification			Remark
	Q'ty	Dimension	Weight (kg)	
Packing Material	1	446(L)mm x 373(W)mm x 293(H)mm	1.4	TRAY +Box
Packing	45 pcs/carton	446(L)mm x 373(W)mm x 293(H)mm	11.8	with panel & cushion
Pallet	1	1150(L)mm x 910(W)mm x 132(H)mm	14	
Pallet after Packing	boxes/pallet	1150(L)mm x 910(W)mm x 1304(H)mm	300	24 carton

## 10. Appendix: EDID Description

Address	FUNCTION	Value
HEX		HEX
00	Header	00
01		FF
02		FF
03		FF
04		FF
05		FF
06		FF
07		00
08	EISA Manuf. Code LSB	06
09	Compressed ASCII	AF
0A	ProductCode	2D
0B	hexLSBfirst	20
0C	32-bit ser #	00
0D		00
0E		00
0F		00
10	Week of manufacture	00
11	Year of manufacture	1B
12	EDID Structure Ver.	01
13	EDID revision #	04
14	<b>Videoinputdef.</b> ( <i>digital/P, non-TMDS, CRGB</i> )	A0
15	<b>MaxHimagesize</b> ( <i>roundedto cm</i> )	1D
16	<b>MaxVimagesize</b> ( <i>roundedto cm</i> )	11
17	<b>DisplayGamma</b> ( <i>=(gamma*100)-100</i> )	78
18	<b>Featuresupport</b> ( <i>noDPMS, ActiveOFF, RGB, tmgBlk#1</i> )	02
19	Red/green low bits ( <b>Lower2:2:2:2bits</b> )	59
1A	Blue/white low bits ( <b>Lower2:2:2:2bits</b> )	B5
1B	Red x ( <b>Upper8bits</b> )	92
1C	Red y/ highER 8 bits	58
1D	Green x	58
1E	Green y	92
1F	Blue x	28
20	Blue y	1E
21	White x	50
22	White y	54
23	Established timing 1	00
24	Established timing 2	00
25	Established timing 3	00
26	Standard timing #1	01
27		01
28	Standard timing #2	01
29		01
2A	Standard timing #3	01
2B		01
2C	Standard timing #4	01

2D		01
2E	Standard timing #5	01
2F		01
30	Standard timing #6	01
31		01
32	Standard timing #7	01
33		01
34	Standard timing #8	01
35		01
36	Pixel Clock/10000 LSB	14
37	Pixel Clock/10000 USB	37
38	Horz active <b>Lower8bits</b>	80
39	Horz blanking <b>Lower8bits</b>	B8
3A	HorzAct:HorzBlk <b>Upper4:4bits</b>	70
3B	Vertical Active <b>Lower8bits</b>	38
3C	Vertical Blanking <b>Lower8bits</b>	24
3D	Vert Act : Vertical Blanking <b>(upper4:4bit)</b>	40
3E	HorzSync. Offset	10
3F	HorzSync.Width	10
40	VertSync.Offset : VertSync.Width	3E
41	Horz&Vert Sync Offset/Width <b>Upper2bits</b>	00
42	Horizontal Image Size <b>Lower8bits</b>	25
43	Vertical Image Size <b>Lower8bits</b>	A5
44	Horizontal & Vertical Image Size <b>(upper4:4bits)</b>	10
45	Horizontal Border <i>(zeroforinternalLCD)</i>	00
46	Vertical Border <i>(zeroforinternalLCD)</i>	00
47	Signal <i>(non-intr,norm,nostero,sepsync,negpol)</i>	18
48	Detailed timing/monitor	00
49	descriptor #2	00
4A		00
4B		00
4C		0F
4D		00
4E		00
4F		00
50		00
51		00
52		00
53		00
54		00
55		00
56		00
57		00
58		00
59		00
5A	Detailed timing/monitor	20
5B	descriptor #3	00
5C		00
5D		00



5E		00
5F	Manufacture	41
60	Manufacture	55
61	Manufacture	4F
62		0A
63		20
64		20
65		20
66		20
67		20
68		20
69		20
6A		20
6B		20
6C	Detailed timing/monitor	00
6D	descriptor #4	00
6E		00
6F		FE
70		00
71	Manufacture P/N	47
72	Manufacture P/N	31
73	Manufacture P/N	33
74	Manufacture P/N	33
75	Manufacture P/N	48
76	Manufacture P/N	41
77	Manufacture P/N	4E
78	Manufacture P/N	30
79	Manufacture P/N	32
7A	Manufacture P/N	2E
7B	Manufacture P/N	30
7C		20
7D		0A
7E	Extension Flag	00
7F	Checksum	08