Product Specification

AU OPTRONICS CORPORATION

G173HW01 V0

() Preliminary Specification
(V) Final Specification

Module	17.3" FHD Color TFT-LCD
Model Name	G173HW01 V0

Customer	Date

Approved by

Checked & Approved by	Date
Vito Huang	2011/5/30

Prepared by

Vivian Huang	2011/5/30

Note: This Specification is subject to change without notice.

Audio Video Business Group /
AU Optronics corporation

2. General Description

G173HW01 V0 is a Color Active Matrix Liquid Crystal Display composed of a TFT-LCD panel, a LED driver circuit, and a LED backlight system. The screen format is intended to support the FHD (1920(H) x 1080(V)) screen and 16.7M colors (RGB 6-bits + HiFRC data). All input signals are LVDS interface compatible. Inverter card of backlight is not included.

2.1 Display Characteristics

The following items are characteristics summary on the table under 25 ℃ condition:

| Items	Unit	Specifications
Screen Diagonal	[mm]	17.3W (17.25)
Active Area	[mm]	381.888 (H) x 214.812 (V)
Pixels H x V		1920(x3) x 1080
Pixel Pitch	[mm]	0.1989 (per one triad) x 0.1989
Pixel Arrangement		R.G.B. Vertical Stripe
Display Mode		Normally White
White Luminance	[cd/m^2]	400 (Typ.)
Contrast Ratio		600 : 1 (Typ)
Optical ResponseTime	[msec]	40 (Typ, on/off)
Nominal Input Voltage VDD	[Volt]	3.3 V
Power Consumption	[Watt]	17 (Typ)
Weight	[Grams]	1080 (Typ)
Physical Size (H x V x D)	[mm]	403 (H) x 240 (V) x 12.5 (D) (Typ)
Electrical Interface		Dual channel LVDS
Surface Treatment		Hard-coating (3H), Glare treatment
Support Color		16.7M colors (RGB 6-bit data + HiFRC data)
Temperature Range (Ta) 　Operating 　Storage (Non-Operating)	[℃] [℃]	0 to +70 -20 to +70
RoHS Compliance		RoHS Compliance

2.2 Optical Characteristics

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

| Item	Unit	Conditions		Min.	Typ.	Max.	Note
Viewing Angle	[degree]	Horizontal (Right) CR = 10 (Left)		70 70	80 80	-	1
		Vertical (Up) CR = 10 (Down)		50 70	60 80	-	
Luminance Uniformity	[%]	13 Points		75	80	-	2, 3
Optical Response Time	[msec]	Rising		-	37	50	4, 5
		Falling		-	3	10	
		Rising + Falling		-	40	60	
Color / Chromaticity Coordinates (CIE 1931)		Red x		0.590	0.640	0.690	4
		Red y		0.296	0.346	0.396	
		Green x		0.264	0.314	0.364	
		Green y		0.574	0.624	0.674	
		Blue x		0.100	0.150	0.200	
		Blue y		0.004	0.054	0.104	
		White x		0.255	0.305	0.355	
		White y		0.268	0.318	0.368	
White Luminance (At LED=100mA)	[cd/m2]			320	400	-	4
Contrast Ratio				500	600	-	4
NTSC	%				72		

Optical Equipment: BM-5A, BM-7, PR880, or equivalent

Note 1: Definition of viewing angle

Viewing angle is the measurement of contrast ratio$\geq$10, or $\geq$5, 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° (θ) horizontal left and right and 90° (Φ) 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.
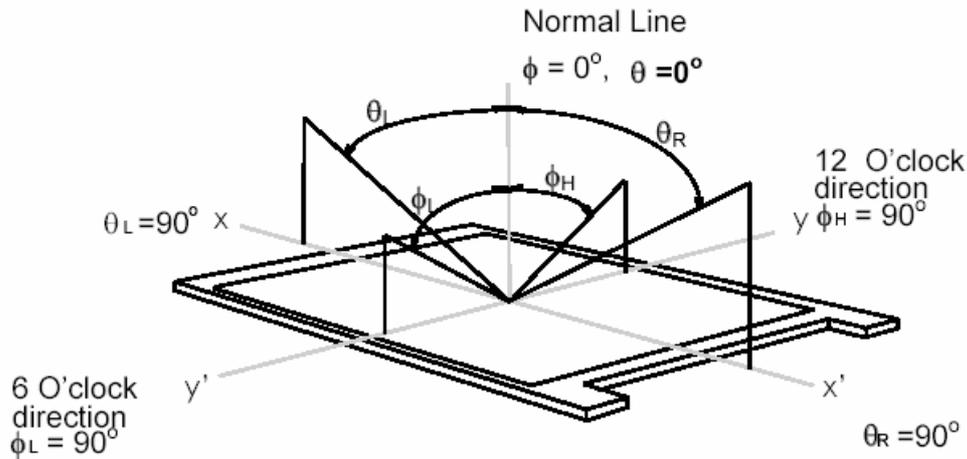
Note 2: 13 points position
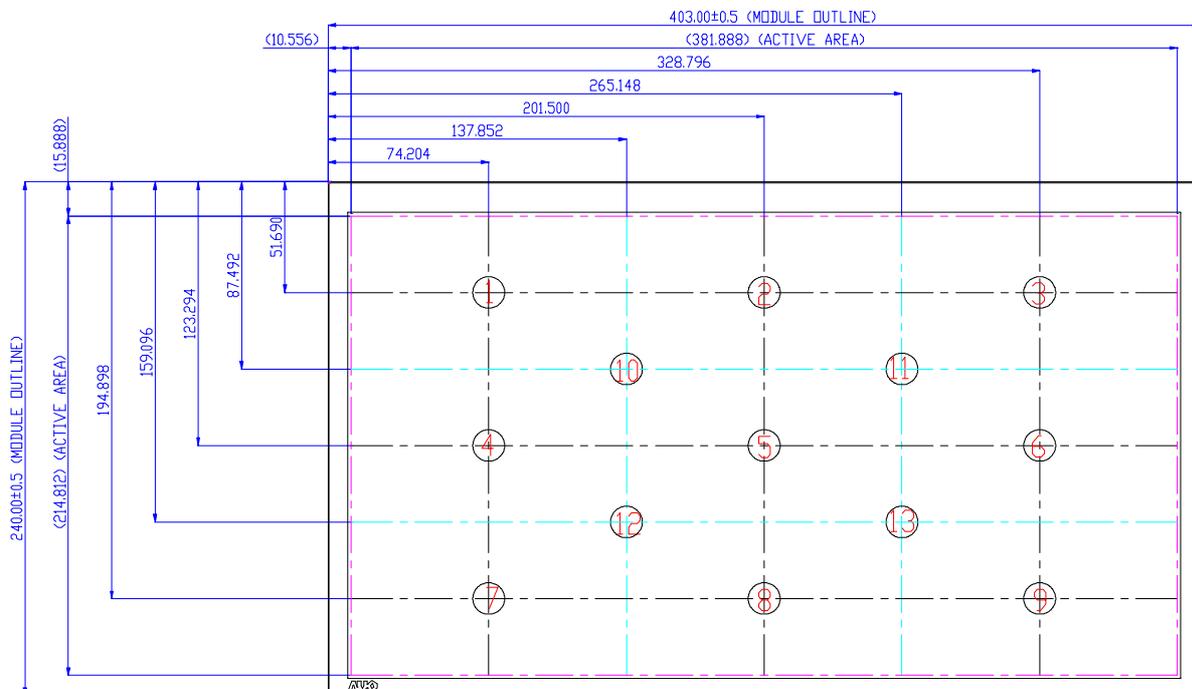
Note 3:

$$\delta_{W13} = \frac{\text{Minimum Luminance of 13 points}}{\text{Maximum Luminance of 13 points}}$$

Note 4: 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.
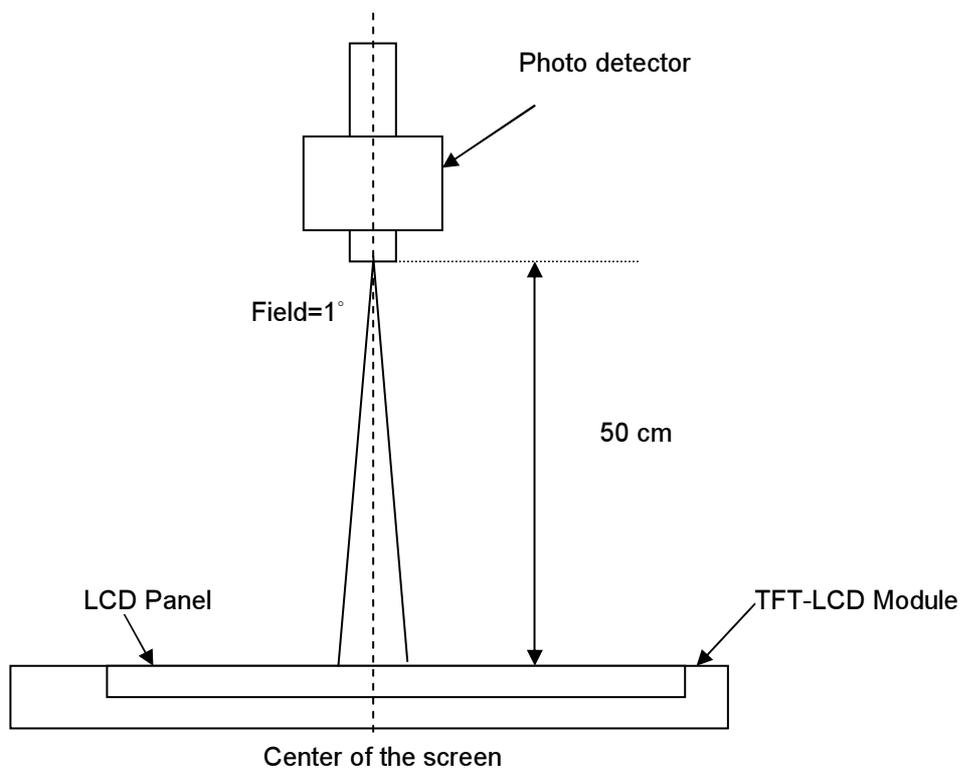
Note 5: Definition of response time:

The output signals of photo detector are measured when the input signals are changed from "Full Black" to "Full White" (rising time), and from "Full White" to "Full Black" (falling time), respectively. The response time is interval between the 10% and 90% of amplitudes. Please refer to the figure as below.
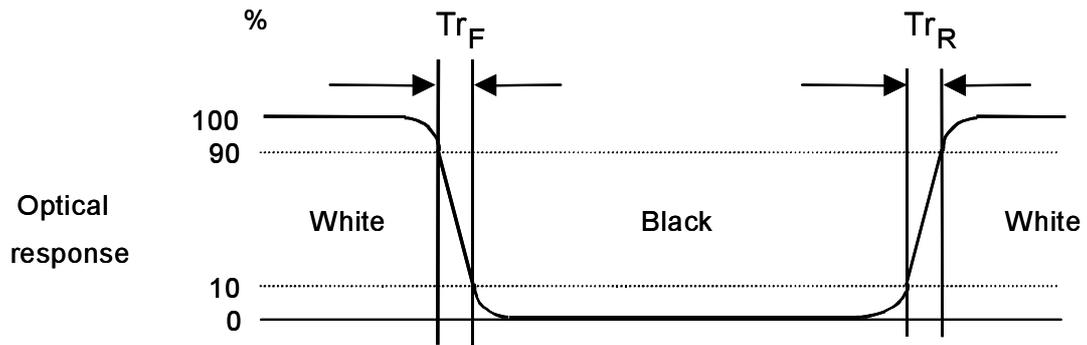
3. Functional Block Diagram

The following diagram shows the functional block of the 17.3 inches Color TFT-LCD Module:
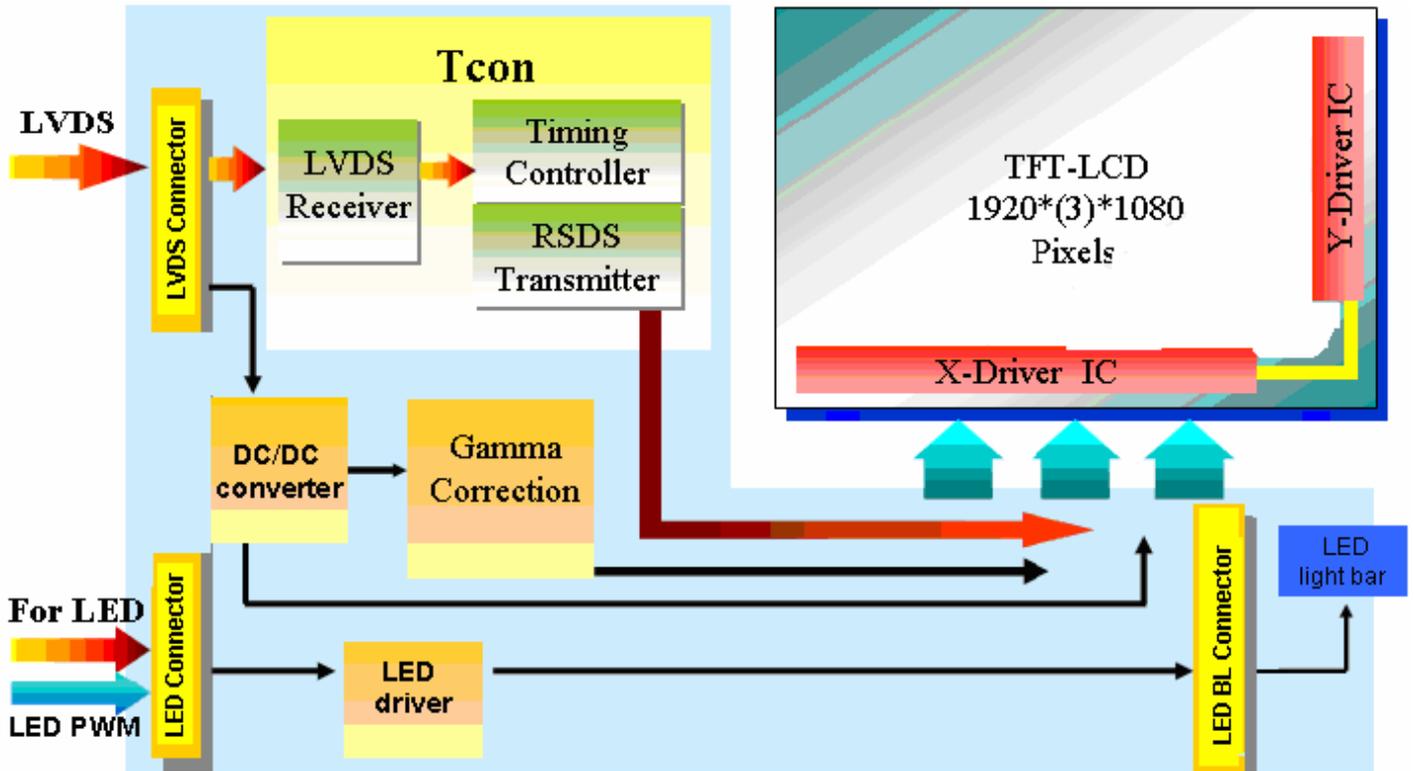
4. Absolute Maximum Ratings

Absolute maximum ratings of the module are as following:

4.1 Absolute Ratings of TFT LCD Module

Item	Symbol	Min	Max	Unit
Logic/LCD Drive Voltage	Vin	-0.3	+3.6	[Volt]

4.2 Absolute Ratings of Environment

Item	Symbol	Min	Max	Unit
Operating Temperature	TOP	0	+70	[℃]
Operation Humidity	HOP	5	95	[%RH]
Storage Temperature	TST	-20	+70	[℃]
Storage Humidity	HST	5	95	[%RH]

Note: Maximum Wet-Bulb should be 39□ and no condensation.
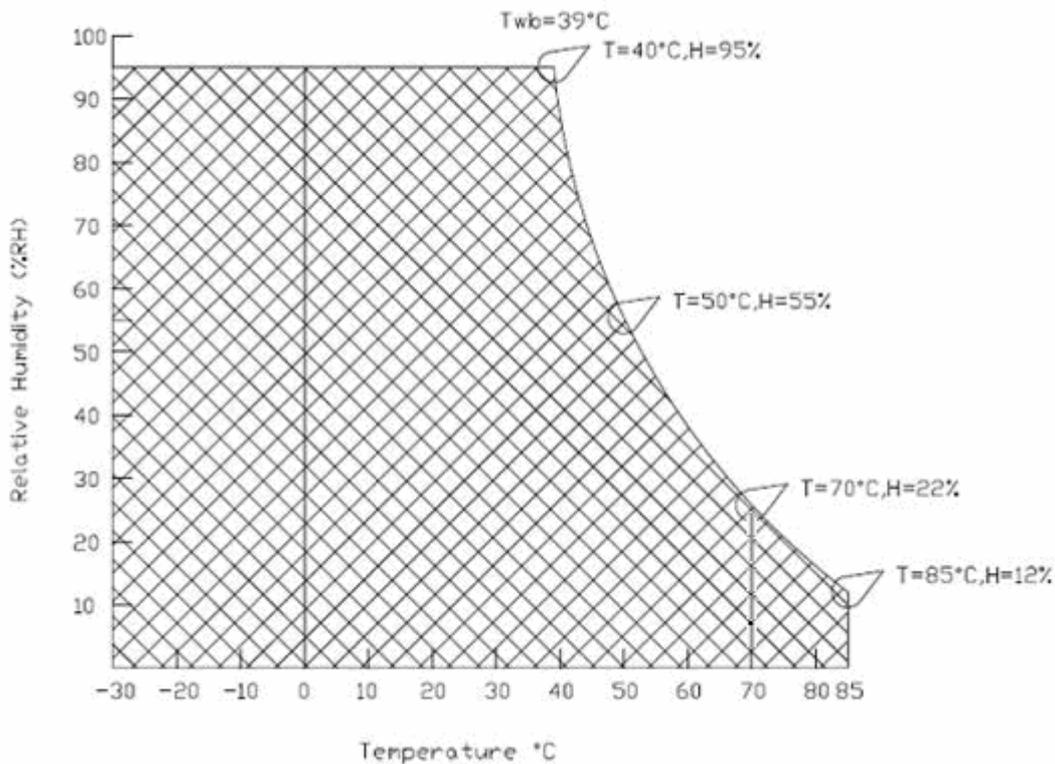
5. Electrical characteristics

5.1 TFT LCD Module

5.1.1 Power Specification

Input power specifications are as follows:

Symble	Parameter	Min.	Typ.	Max.	Unit	Condition
VDD	Logic/LCD Drive Voltage	3.0	3.3	3.6	[Volt]	±10%
IDD	Input Current	-	1200	1400	[mA]	VDD= 5.0V, All Black Pattern At 75Hz, +30%
PDD	VDD Power	-	5	6	[Watt]	VDD= 5.0V, All Black Pattern At 75Hz , Note 1
IRush	Inrush Current	-	-	2000	[A]	Note 2
VDDrp	Allowable Logic/LCD Drive Ripple Voltage	-	-	100	[mV] p-p	VDD= 3.3V, All Black Pattern At 75Hz

Note 1: The variance of VDD power consumption is ±30%.

Note 2: Measurement conditions:
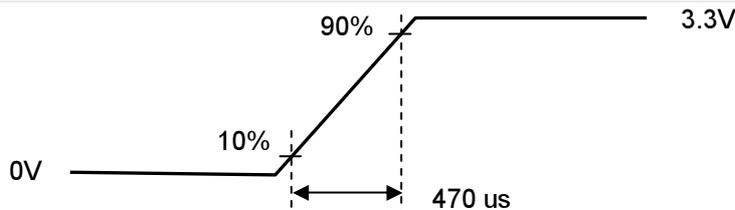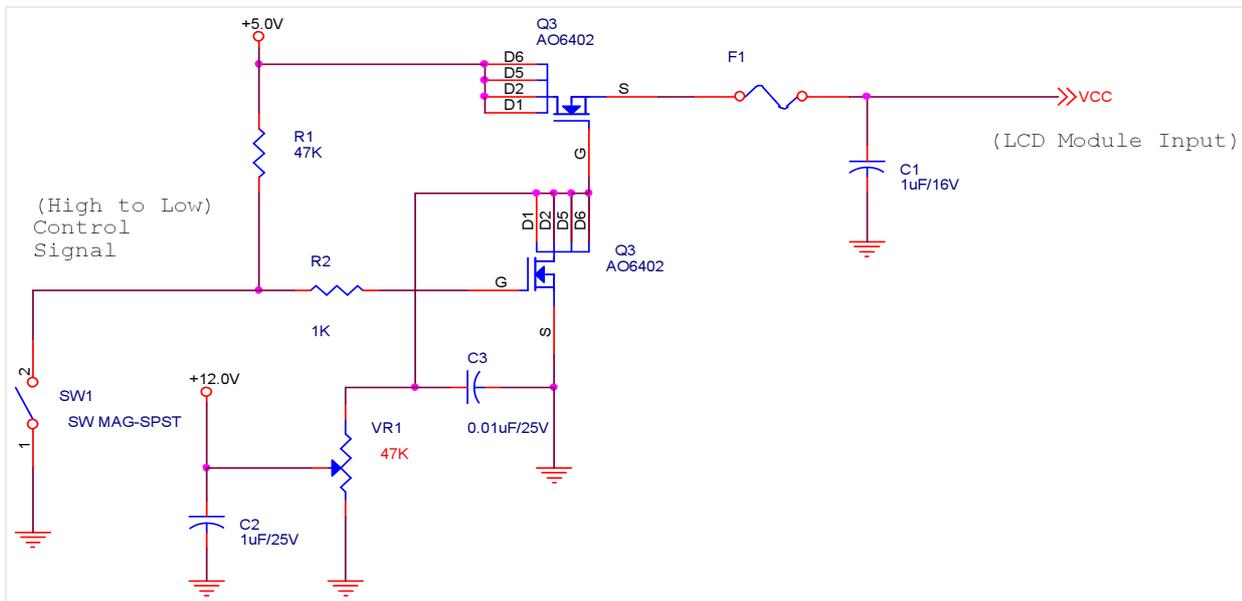
Vin rising time

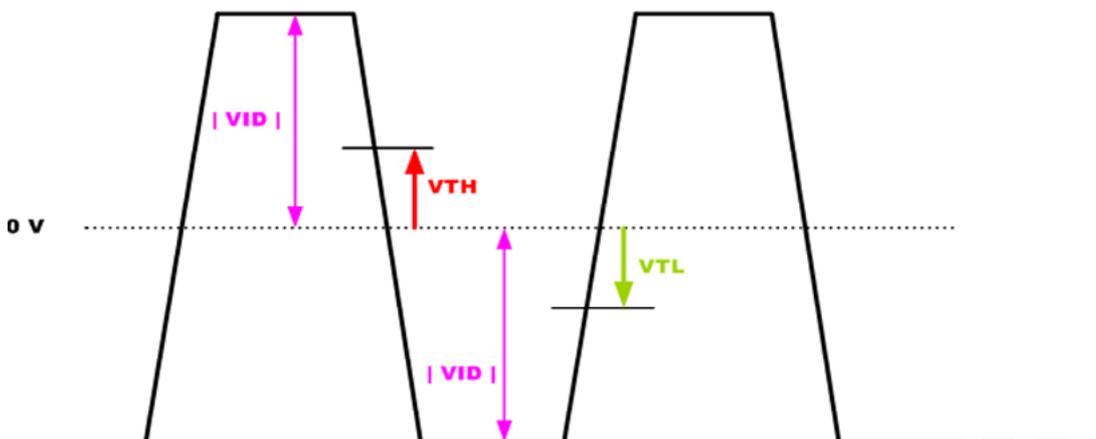| Symbol	Item	Min.	Typ.	Max.	Unit	Remark
VTH	Differential Input High Threshold	-	-	100	[mV]	VCM=1.2V
VTL	Differential Input Low Threshold	-100	-	-	[mV]	VCM=1.2V
∣VID∣	Input Differential Voltage	100	400	600	[mV]	
VICM	Differential Input Common Mode Voltage	1.125	-	1.375	[V]	VTH/VTL=+-100mV

5.1.2 Signal Electrical Characteristics

Input signals shall be low or Hi-Z state when VDD is off.

Note: LVDS Signal Waveform.
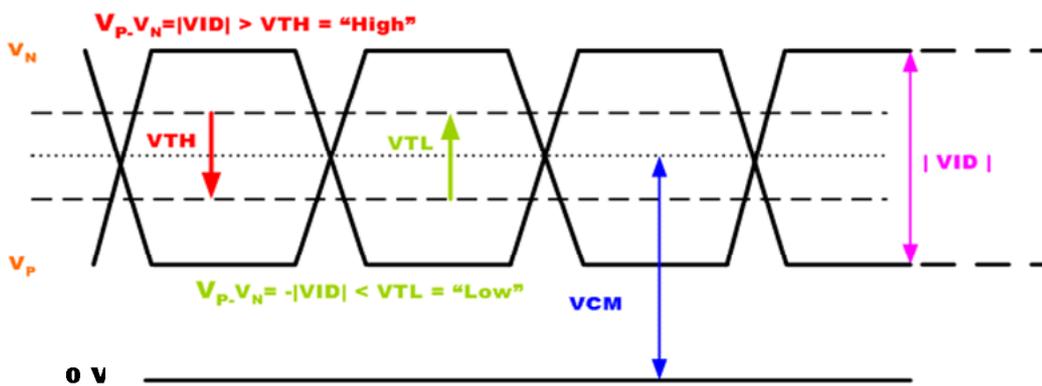
5.2 Backlight Unit

Following characteristics are measured under a stable condition using a inverter at 25℃ . (Room Temperature):

Symbol	Parameter	Min.	Typ.	Max.	Unit	Remark
VCC	Input Voltage	10.8	12	13.4	[Volt]	
I$_{VCC}$	Input Current	-	0.99	-	[A]	100% PWM Duty
P$_{VCC}$	Power Consumption	-	12	15	[Watt]	100% PWM Duty
F$_{PWM}$	Dimming Frequency	200	-	20K	[Hz]	
	Swing Voltage	3	3.3	5.5	[Volt]	
	Dimming duty cycle	5	-	100	%	
I$_F$	LED Forward Current	-	100	-	[mA]	Ta = 25℃
V$_F$	LED Forward Voltage	-	(3.3)	(3.7)	[Volt]	I$_F$ = 100mA, Ta = 0℃
		-	3.2	3.6	[Volt]	I$_F$ = 100mA, Ta = 25℃
		-	(3.1)	(3.5)	[Volt]	I$_F$ = 100mA, Ta = 70℃
P$_{LED}$	LED Power Consumption	-	(10.24)	11.52	[Watt]	
LED Life Time		50,000	-	-	Hrs	I$_F$=100mA, Ta= 25℃

Note 1: Ta means ambient temperature of TFT-LCD module.

Note 2: VCC, I$_{VCC}$, P$_{VCC}$ are defined for LED backlight.(100% duty of PWM dimming)

Note 3: I$_F$, V$_F$ are defined for one channel LED. There are four LED channel in back light unit.

Note 4: If G173HW01 V0 module is driven by high current or at high ambient temperature & humidity condition. The operating life will be reduced.

Note 5: Operating life means brightness goes down to 50% initial brightness. Minimum operating life time is estimated data.

Note 6: LED lifetime is definition: brightness is decreased to 50% of the initial value. LED lifetime is restricted under normal condition, ambient temperature = 25℃ and LED operating IF = 100mA.
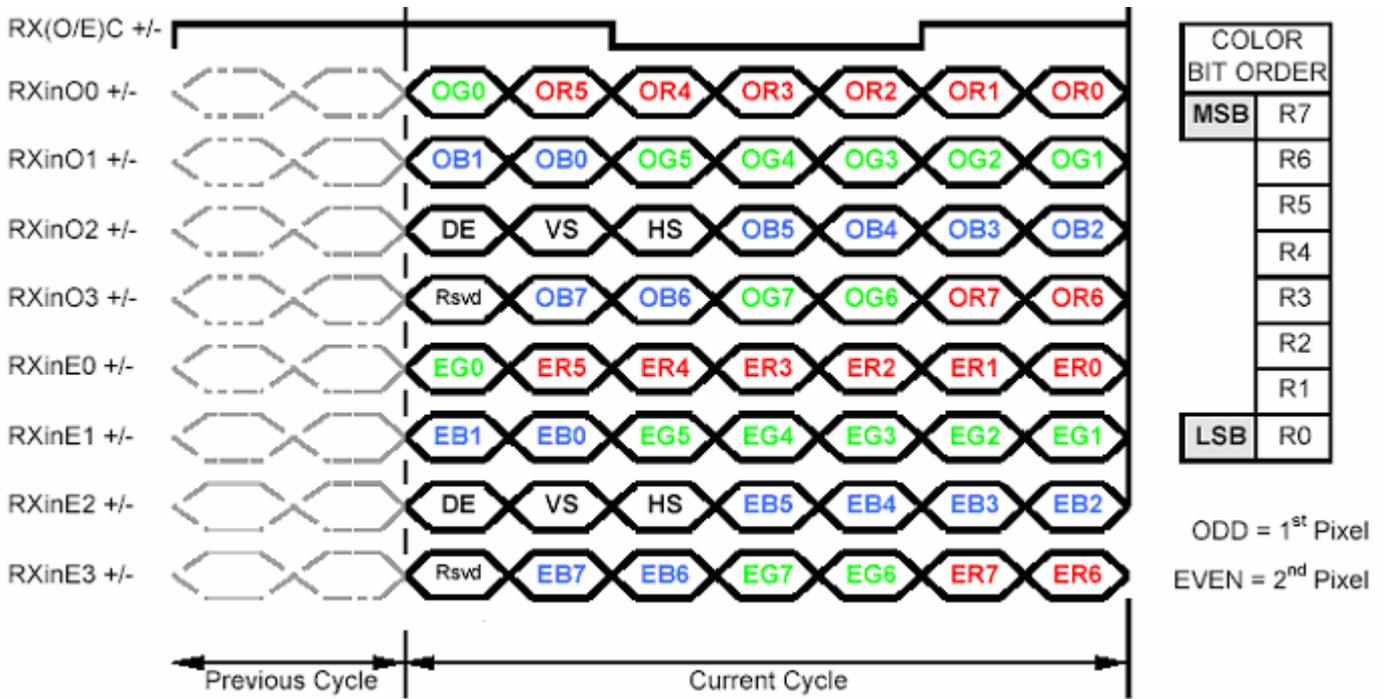
6. Signal Characteristic

6.1 Pixel Format Image

Following figure shows the relationship of the input signals and LCD pixel format.
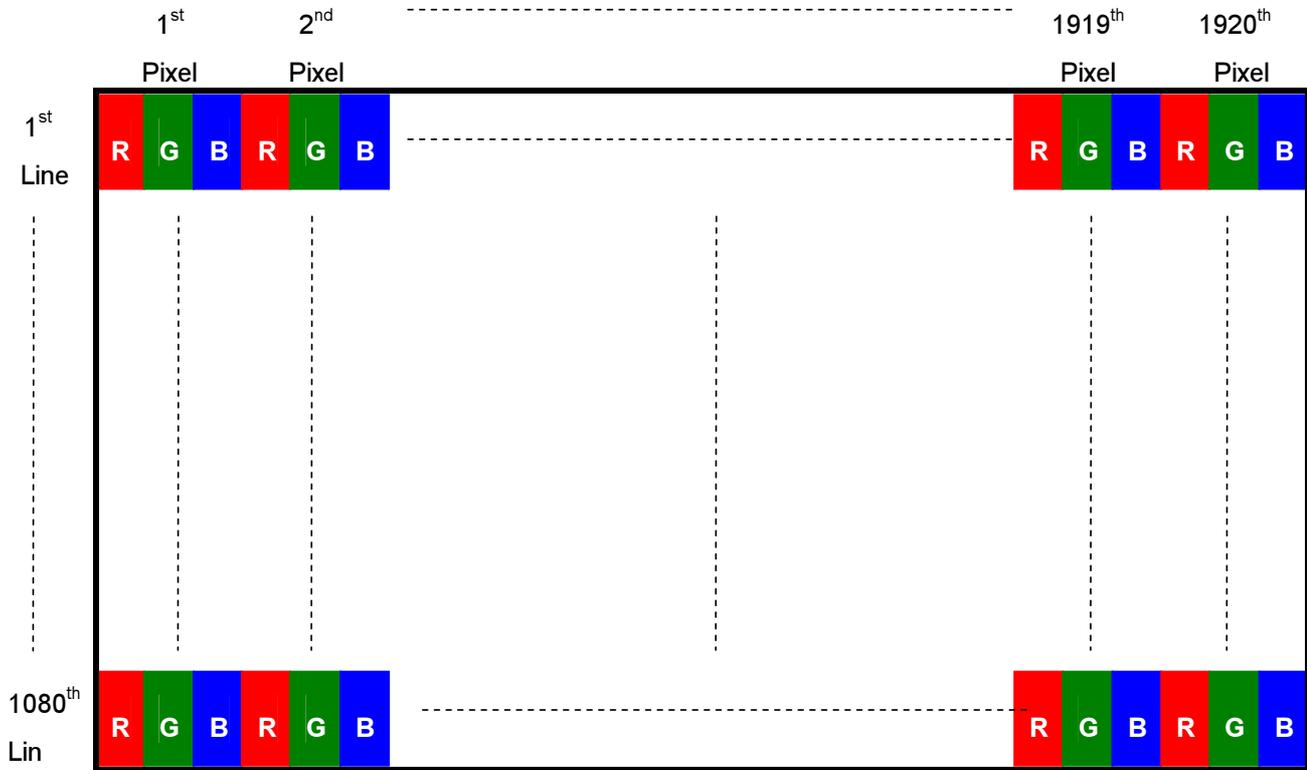
6.2 The Input Data Format

Note1: Normally, DE, VS, HS on EVEN channel are not used.
Note2: 8-bit in

6.3 Signal Description

The module using a pair of LVDS receiver SN75LVDS82(Texas Instruments) or compatible. LVDS is a differential signal technology for LCD interface and high speed data transfer device. Transmitter shall be SN75LVDS83(negative edge sampling) or compatible. The first LVDS port(RxOxxx) transmits odd pixels while the second LVDS port(RxExxx) transmits even pixels.

PIN #	SIGNAL NAME	DESCRIPTION
1	RxOIN0-	Negative LVDS differential data input (Odd data)
2	RxOIN0+	Positive LVDS differential data input (Odd data)
3	RxOIN1-	Negative LVDS differential data input (Odd data)
4	RxOIN1+	Positive LVDS differential data input (Odd data)
5	RxOIN2-	Negative LVDS differential data input (Odd data, H-Sync,V-Sync,DSPTMG)
6	RxOIN2+	Positive LVDS differential data input (Odd data, H-Sync,V-Sync,DSPTMG)
7	VSS	Power Ground
8	RxOCLKIN-	Negative LVDS differential clock input (Odd clock)
9	RxOCLKIN+	Positive LVDS differential clock input (Odd clock)
10	RxOIN3-	Negative LVDS differential data input (Odd data)
11	RxOIN3+	Positive LVDS differential data input (Odd data)
12	RxEIN0-	Negative LVDS differential data input (Even data)
13	RxEIN0+	Positive LVDS differential data input (Even data)
14	VSS	Power Ground
15	RxEIN1-	Negative LVDS differential data input (Even data)
16	RxEIN1+	Positive LVDS differential data input (Even data)
17	VSS	Power Ground
18	RxEIN2-	Negative LVDS differential data input (Even data)
19	RxEIN2+	Positive LVDS differential data input (Even data)
20	RxECLKIN-	Negative LVDS differential clock input (Even clock)
21	RxECLKIN+	Positive LVDS differential clock input (Even clock)
22	RxEIN3-	Negative LVDS differential data input (Even data)
23	RxEIN3+	Positive LVDS differential data input (Even data)
24	VSS	Power Ground
25	VSS	Power Ground
26	VSS	Power Ground
27	VSS	Power Ground
28	VDD	+3.3V Power Supply
29	VDD	+3.3V Power Supply
30	VDD	+3.3V Power Supply

Note1: Start from left side

Connector

1   30

RxOIN0-   VDD
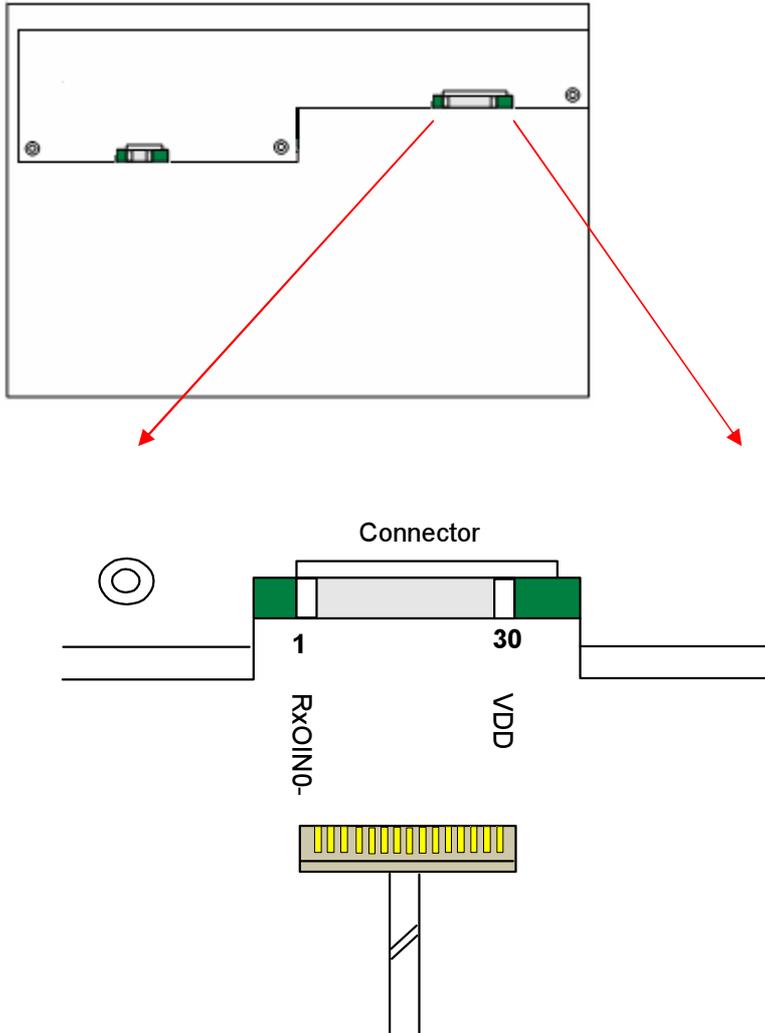
Note2: Input signals of odd and even clock shall be the same timing.

Note3: Please follow PSWG.

6.4 Interface Timing

6.4.1 Timing Characteristics

Basically, interface timings should match the 1920X1080 / 60Hz manufacturing guide line timing.

| Parameter		Symbol	Min.	Typ.	Max.	Unit
Frame Rate		-	50	60	-	Hz
Clock frequency		$1/T_{Clock}$	50	74.9	85	MHz
Vertical Section	Period	T_V	1088	1130	1680	T_{Line}
	Active	T_{VD}		1080		
	Blanking	T_{VB}	8	50	-	
Horizontal Section	Period	T_H	990	1050	-	T_{Clock}
	Active	T_{HD}		960		
	Blanking	T_{HB}	30	90	-	

Note : DE mode only

6.4.2 Timing Diagram
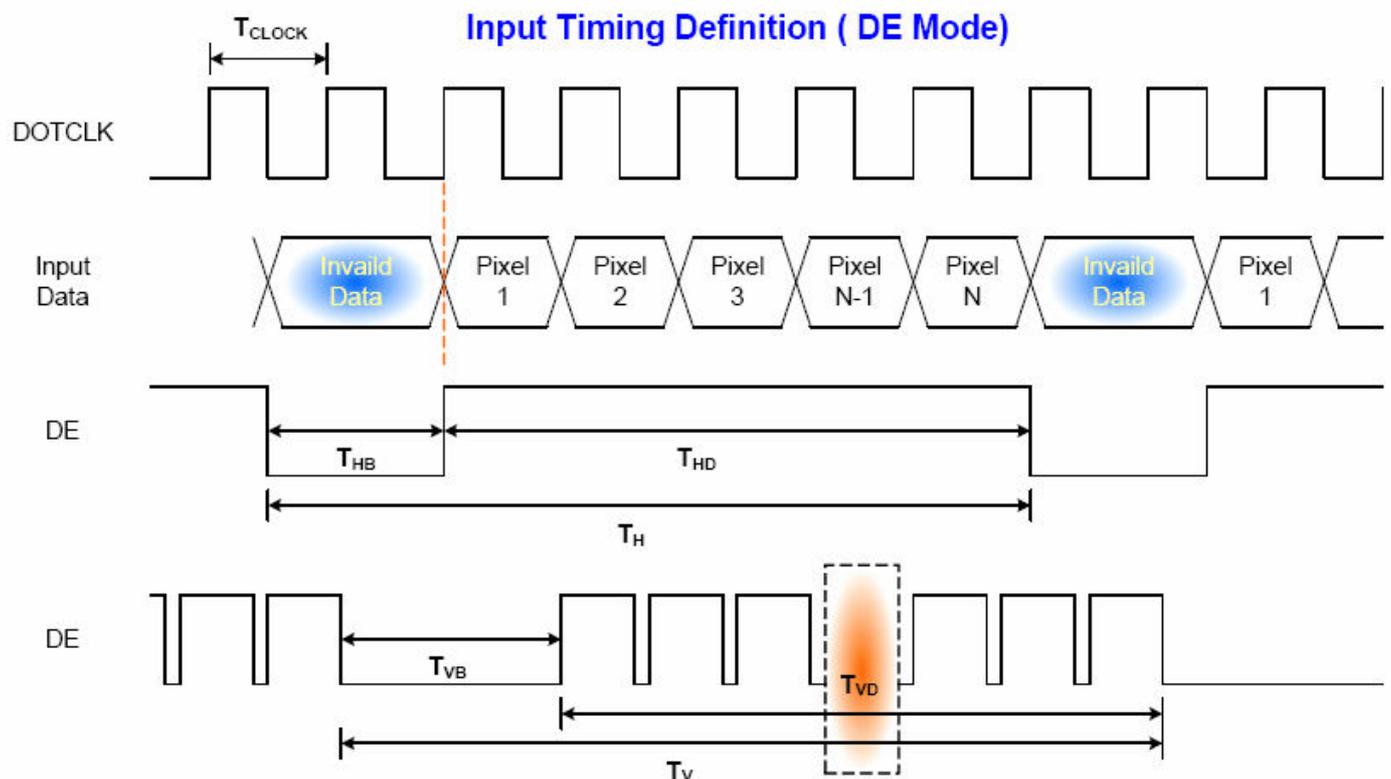
6.5 Power ON/OFF Sequence

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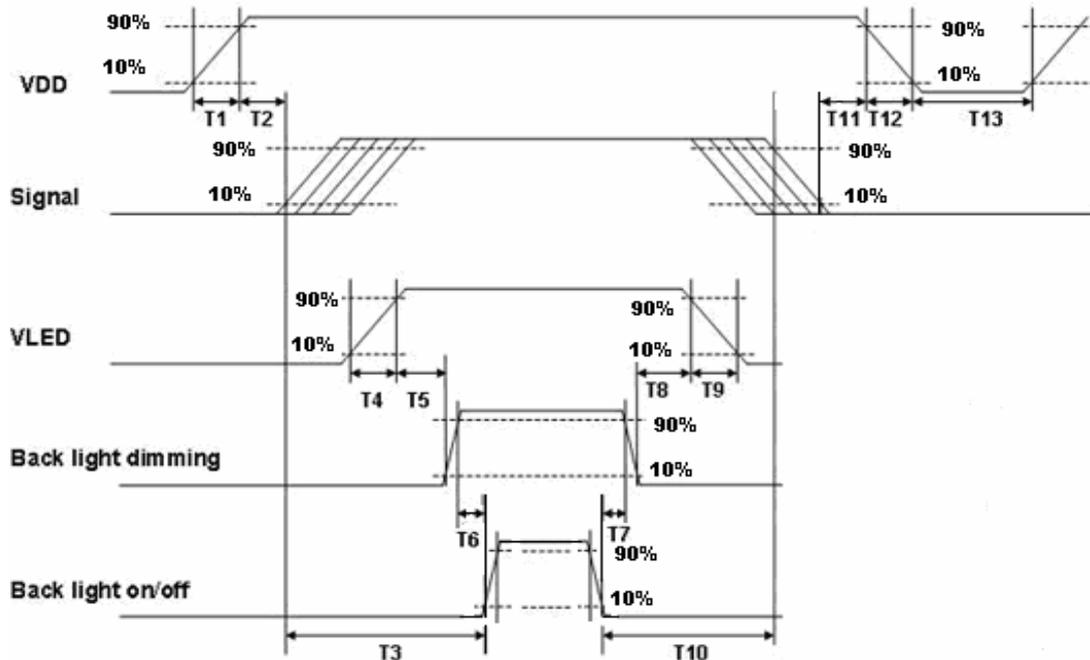
Power Sequence Timing

Parameter	Value			Units
	Min.	**Typ.**	**Max.**	
T1	0.5	-	10	
T2	0	-	50	
T3	200	-	--	
T4	0.5	-	10	
T5	10	-	-	
T6	10	-	-	
T7	0	-	-	ms
T8	10	-	-	
T9	-	-	10	
T10	110	-	-	
T11	0		50	
T12	0		10	
T13	500	-	-	

7. Connector & Pin Assignment

Physical interface is described as for the connector on module.These connectors are capable of accommodating the following signals and will be following components.

7.1 TFT LCD Module

7.1.1 Connector

Connector Name / Designation	Interface Connector / Interface card
Manufacturer	HRS
Type Part Number	MDF76TW-30S-1H
Mating Type Part Number	MDF76-30P-1C

7.1.2 Pin Assignment

Pin#	Signal Name	Pin#	Signal Name
1	RxOIN0-	2	RxOIN0+
3	RxOIN1-	4	RxOIN1+
5	RxOIN2-	6	RxOIN2+
7	VSS	8	RxOCLKIN-
9	RxOCLKIN+	10	RxOIN3-
11	RxOIN3+	12	RxEIN0-
13	RxEIN0+	14	VSS
15	RxEIN1-	16	RxEIN1+
17	VSS	18	RxEIN2-
19	RxEIN2+	20	RxECLKIN-
21	RxECLKIN+	22	RxEIN3-
23	RxEIN3+	24	VSS
25	VSS	26	VSS
27	VSS	28	VDD
29	VDD	30	VDD

7.2 Backlight Unit

Physical interface is described as for the connector on module. These connectors are capable of accommodating the following signals and will be following components.

7.2.1 Connector

Connector Name / Designation	Lamp Connector / Backlight lamp
Manufacturer	HRS
Type Part Number	DF14A-6P-1.25H
Mating Type Part Number	DF14-6S-1.25C

7.2.2 Pin Assignment

Pin No.	Symbol	Description
Pin1	VLED	12V input
Pin2	VLED	12V input
Pin3	GND	GND
Pin4	GND	GND
Pin5	On/OFF	3.3-5V:ON, 0V:OFF
Pin6	Dimming	PWM

8. Reliability Test

Environment test conditions are listed as following table.

Items	Required Condition	Note
Temperature Humidity Bias (THB)	Ta= 50℃, 80%RH, 240hours	
High Temperature Operation (HTO)	Ta= 70℃, 240hours	
Low Temperature Operation (LTO)	Ta= 0℃, 240hours	
High Temperature Storage (HTS)	Ta= 70℃, 240hours	
Low Temperature Storage (LTS)	Ta= -20℃, 240hours	
Vibration Test (Non-operation)	Acceleration: 1.5 G Wave: Random Frequency: 10 - 200 - 10 Hz Sweep: 30 Minutes each Axis (X, Y, Z)	
Shock Test (Non-operation)	Acceleration: 50 G Wave: Half-sine Active Time: 20 ms Direction: ±X, ±Y, ±Z (one time for each Axis)	
Drop Test	Height: 60 cm, package test	
Thermal Shock Test (TST)	-20℃/30min, 60℃/30min, 50 cycles	1
ESD (Electro-Static Discharge)	Contact Discharge: ± 8KV, 150pF(330Ω) 1sec, 8 points, 25 times/ point.	2
	Air Discharge: ± 15KV, 150pF(330Ω) 1sec 8 points, 25 times/ point.	

Note 1: The TFT-LCD module will not sustain damage after being subjected to 100 cycles of rapid temperature change. A cycle of rapid temperature change consists of varying the temperature from -20℃ to 60℃, and back again. Power is not applied during the test. After temperature cycling, the unit is placed in normal room ambient for at least 4 hours before power on.

Note 2: According to EN61000-4-2, ESD class B: Some performance degradation allowed. No data lost. Self-recoverable. No hardware failures.
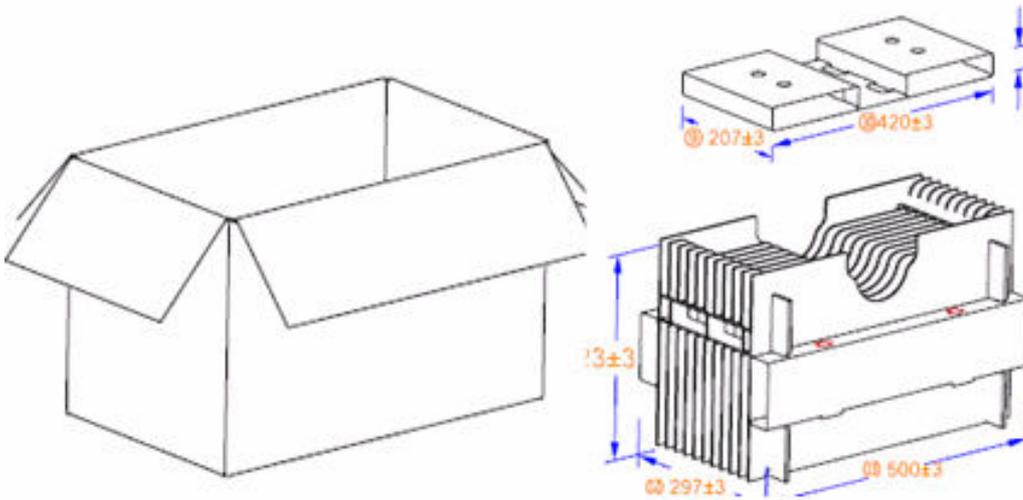
9. Shipping Label

Manufactured Week
Manufactured end of Year

Manufactured 11/18
Model No: G173HW01 V.0
AU Optronics
MADE IN CHINA (S1)

XXXXXXXXXXXX-XXXXXX

23

90

Manufactured Country (factory buildings)
1. CHINA (S1)
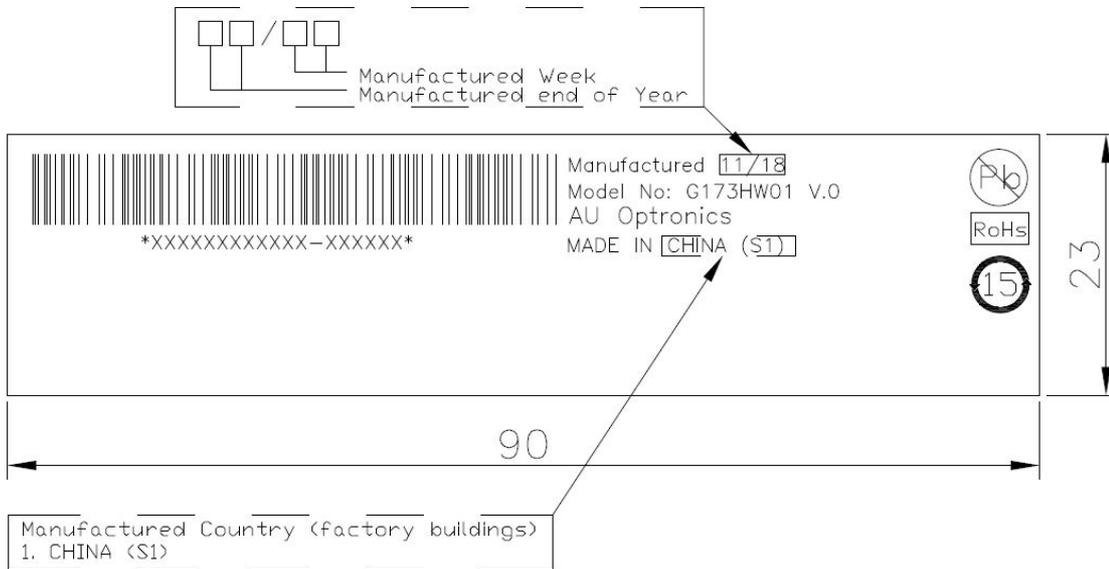
Unit: mm

10. Packing Form

10.1 Packaging material

FILM PROTECT
BAG ANTI-STATIC
TAPE
TAPE CREPED PAPER
PACKING CARTON
LABEL SPEC
LABEL CARTON.
CUSHION PACKING

10.2 External packaging material required

‧Carton : 524mm*321mm*360mm, weight　(carton + cushion): 1250g

· Pallet : 1140mm*980mm*140mm

· Stretch film : 500mm (W)*300M (L)

· Corner angle : L type fiber board

· PET band : 19mm (W)

· Label : 220mm*200mm
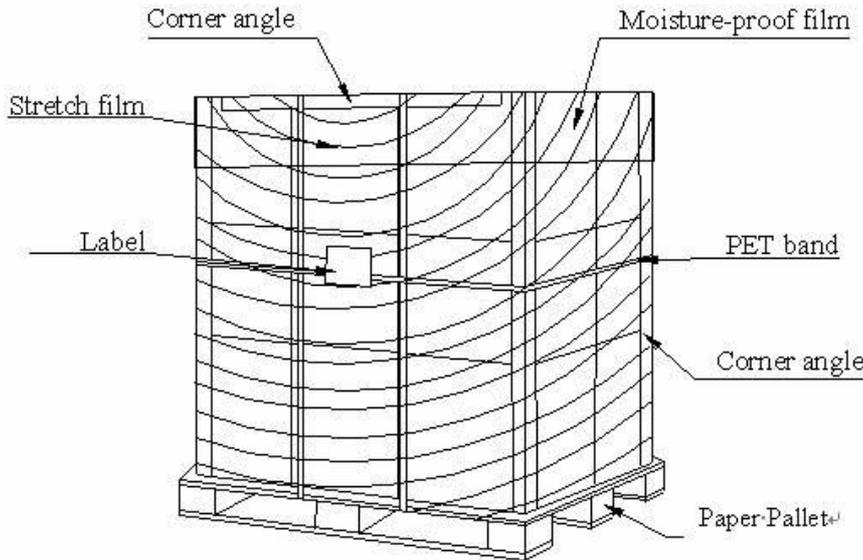
10.3 Palletizing sequence

	pcs / box	box / layer	layer / pallet	pcs / pallet
Shipping by air	10	2*3	3	180
Shipping by sea	10	2*3	3	180

Product Specification

AU OPTRONICS CORPORATION

10.4 Packing instruction

Product

Tape creped paper

Bag Anti-Static

1 carton puts
10 pcs panels

Packing

11. Outline Drawing

AU OPTRONICS CORPORATION

Shipping

BLU

LED CONNECTOR:
HRS DF14A-6P-1.25H(56)

LVDS CONNECTOR:
HRS MDF76TW-30S-1H

SCALE 0.800

APPEARANCE DRAWING

97.17G03.000

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