MODEL NO.   :   TM150TDS50

ISSUED DATE: 2014/03/28

VERSION   :   1.4

□Preliminary Specification

■Final Product Specification

Customer :_____

Approved by	Notes

SHANGHAI AVIC Confirmed :

Prepared by	Checked by	Approved by
Fen He		Junliang Ding

This technical specification is subjected to change without notice

TABLE OF CONTENTS

RECORD OF REVISION

Rev	Issued Date	Description	Editor
1.0	2012-05-03	Preliminary Release	Pean Wu
1.1	2012-08-03	Page 26, update back drawing, add tape position on LED wire.	Pean Wu
1.2	2012-09-13	Page 19, correct product label " TM150TDS50-XXX" to "TM150TDS50"	Pean Wu
1.3	2012-12-03	Page 9, modify VDD max from 12.6V to 13.2V	Henry Xu
1.4	2014-03-28	Modify the Power supply current on page 9	Fen He

1. OUTLINE

1.1 STRUCTURE AND PRINCIPLE

TM150TDS50 module is composed of the amorphous silicon thin film transistor liquid crystal display (a-Si TFT LCD) panel structure with driver LSIs for driving the TFT (Thin Film Transistor) array and a backlight. The a-Si TFT LCD panel structure is injected liquid crystal material into a narrow gap between the TFT array glass substrate and a color-filter glass substrate.

Color (Red, Green, Blue) data signals from a host system (e.g. PC, signal generator, etc.) are modulated into best form for active matrix system by a signal processing board, and sent to the driver LSIs which drive the individual TFT arrays. The TFT array as an electro-optical switch regulates the amount of transmitted light from the backlight assembly, when it is controlled by data signals. Color images are created by regulating the amount of transmitted light through the TFT array of red, green and blue dots.

1.2 APPLICATIONS

• Monitor for industrial display

1.3 FEATURES

• a-Si TFT active matrix
• LVDS interface
• R.G.B input 8bit, 16.7 millions colors (6bit+HiFRC)
• R.G.B input 6bit selectable, 262K colors
• Resolution XGA (1024× 768 pixels)
• Wide viewing angle 80°/80°/ 80°/80° (L/R/U/D)
• High contrast ratio 600:1
• Module size 326.5 (H) ×253.5 (V) ×11.8 (D) mm
• Fast response time (Ton+ Toff= 8ms）
• High gamut (60%)
• Edge light type backlight (White-LED)
• Backlight driver circuit included
• RoHS compliance

2. GENERAL SPECIFICATIONS

Display area	304.128 (W) x 228.096 (V) mm (typ.)
Diagonal size of display	38.0 cm (15.0 inches)
Drive system	a-Si TFT active matrix
Display color	16.7 M colors (6bit+ HiFRC); 262K colors selectable
Pixel	1,024 (H) × 768V) pixels
Pixel arrangement	RGB vertical stripe
Dot pitch	0.099 (H) × 0.297(V) mm
Pixel pitch	0.297(H) × 0.297(V) mm
Module size	326.5mm (H)(typ.) ×253.5mm (V)(typ.) ×11.8 mm(D) (typ.)
Weight	1000 g (typ.)
Contrast ratio	600 :1 (typ.)
Viewing angle(U/D/L/R)	80°/ 80°/80°/80° (typ.)
Color gamut	60% (typ.)
Response time	8 ms (typ.)
Luminance	400 cd/m^2 (typ.)
Transmissive Mode	Normally White
Surface Treatment	Anti Glare
Signal system	LVDS 1 port
Power supply voltage	LCD panel: 3.3V LED backlight: 12V
Backlight	White-LED
Power consumption	12 W (max)

3. ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Rating	Unit	Remarks
Power Supply Voltage	VCC	-0.3 ~ +4.0	V	Ta = 25°C
Input voltage for signals	Vi	-0.3 ~ +4.0	V	Ta = 25°C
Storage temperature	Tst	-30 ~ +80	°C	Note 1
Operating temperature	Top	-20 ~ +70	°C	Note 1, 2
Absolute humidity	AH	≤ 70	g/m³	Ta > 50°C
Operating altitude	-	≤ 4,850	m	-20°C≤ Ta≤ 70°C
Storage altitude	-	≤ 13,600	m	-30°C≤ Ta≤ 80°C

Note1: Temperature and relative humidity range is shown in the figure below.

    (a) 90%RH Max. (Ta≤ 40°C)

    (b) Wet-bulb temperature should be39°C Max. (Ta> 40°C)

    (c) No condensation.

Note2: The temperature of panel display surface area should be -20°C Min and 80°C Max.

Relative Humidity（%RH）

4. BLOCK DIAGRAM

Note1: Relations between GND (Signal ground and LED driver ground) and FG (Frame ground) in

Note2: GND and FG must be connected to customer equipment's ground, and it is recommended that

these grounds be connected together in customer equipment.
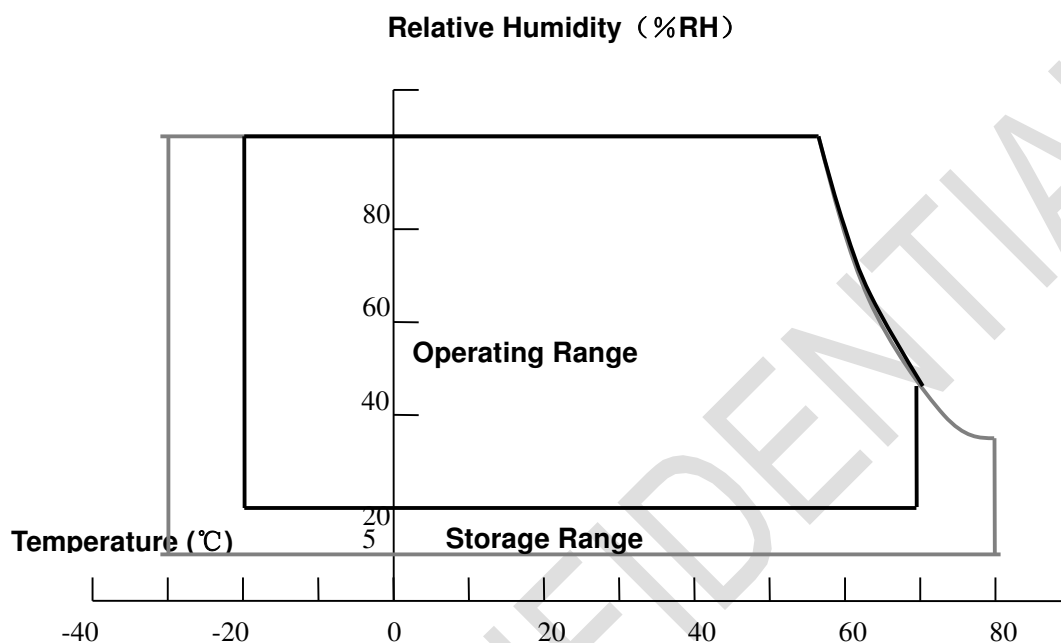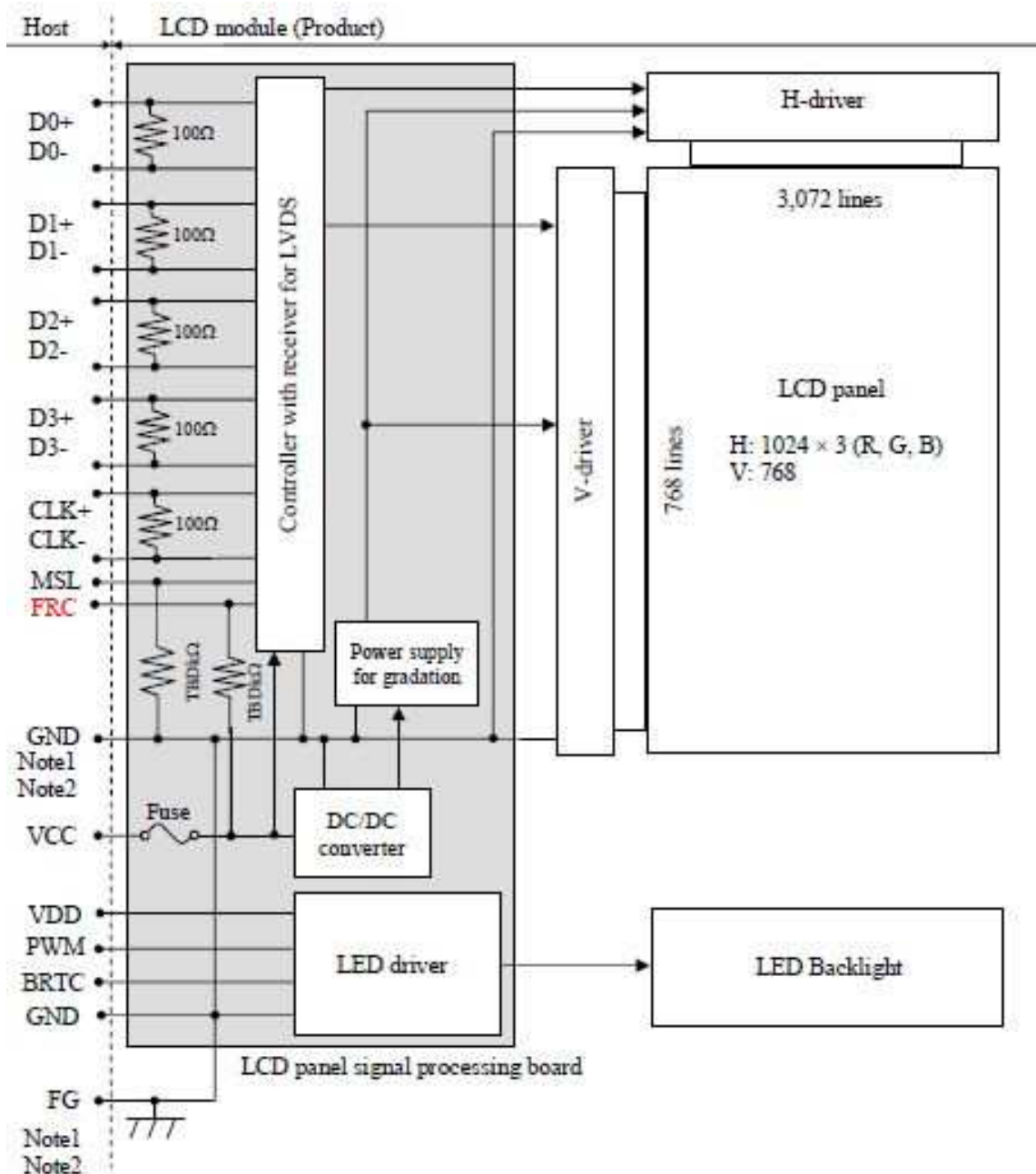
5. MECHANICAL SPECIFICATIONS

| Parameter	Specification	Unit
Module size	326.5± 0.5 (W) × 253.5 ± 0.5 (H) × 11.8 ± 0.3 (D)	mm
Display area	304.128 (W) x 228.096 (V) mm (typ.) [38cm (15.0 inches)]	mm
Weight	1000 g (typ.)	g

6. ELECTRICAL CHARACTERISTICS

6.1 DRIVING FOR LCD

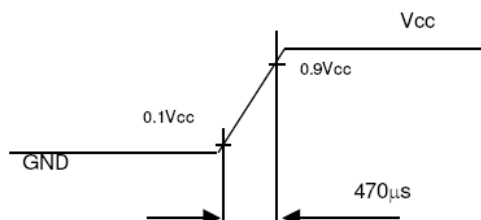| Parameter		Symbol	min.	typ.	max.	Unit	Remarks
Power supply voltage		VCC	3.0	3.3	3.6	V	-
Power supply ripple		Vp-p			200mV	V	Including spike noise
Power supply current		ICC	-	500	550	mA	at VDD = 3.3V Note 1
Permissible ripple voltage		VRP	-	-	100	mV	VDD
Differential input voltage		∣ Vid ∣	250		450	mV	
Differential input threshold voltage for LVDS receiver	High	VTH	-	-	100	mV	VCM = 1.25V
	Low	VTL	-100	-		mV	Note2
Input voltage width for LVDS receiver		Vi	0	-	1.90	V	-
Terminating resistor		RT	-	100	-	Ω	-
Rush current		I$_{rush}$	-	-	1.5	A	Note3
Input voltage for MSL signals	High	VFH	2.0		VCC	V	
	Low	VFL	0		0.4	V	

Note 1: All black pattern

Note 2: Common mode voltage for LVDS receiver

Note 3: Measurement Conditions:
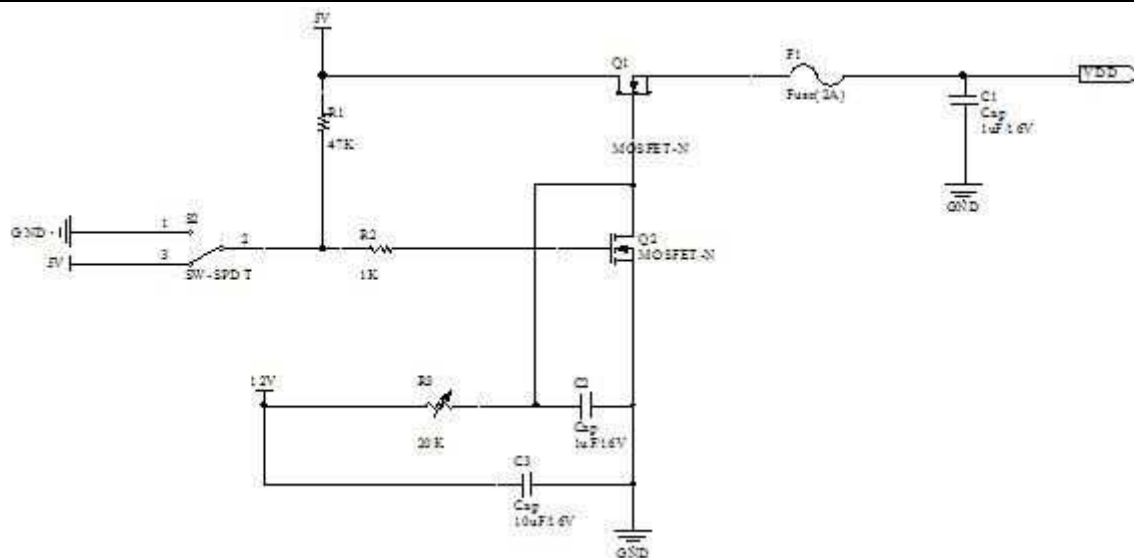
Vcc rising time is 470μs

(Ta=25°C)   Note1

6.2 DRIVING FOR BACKLIGHT

Parameter		Symbol	min.	typ.	max.	Unit	Remarks
Power supply voltage		VDD	10.8	12.0	12.6	V	
Power supply current		IDD	-	480	650	mA	At the max luminance control
Light bar life time		Hr	50000	-	-	Hour	Note1
Input voltage for PWM signal	High	VDFH1	2.0		5.0	V	
	Low	VDFL1	0		0.4	V	
Input voltage for BRTC signal	High	VDFH2	2.0		5.0	V	
	Low	VDFL2	0		0.4	V	
PWM frequency		fpwm	200		20K	Hz	
PWM pulse width		tPWH	10			us	

Note1: The operating lifetime is mean time to half-luminance. In case the product works under room temperature environment.

7. CONNECTIONS AND FUNCTIONS FOR INTERFACE PINS

7.1 LCD PINS

CN1 socket(Module side): 185083-20121 (P-TWO ELECTRIC TECHNOLOGY CO., LTD.)

Pin No.	Symbol	Signal	Description			Remarks
			Input data signal: 8bit		Input data signal: 6bit	
			MAP A	MAP B		
1	VCC	Power supply	Power supply			
2	VCC					
3	GND	Ground	Ground			-
4	GND					
5	D0-	Pixel data	R2-R7,G2	R0-R5,G0		
6	D0+					
7	GND	Ground	Ground			-
8	D1-	Pixel data	G3-G7,B2-B3	G1-G5,B0-B1		
9	D1+					
10	GND	Ground				
11	D2-	Pixel data	B4-B7,DE	B2-B5,DE		
12	D2+					
13	GND	Ground	Ground			
14	CLK-	Pixel clock	Pixel clock			
15	CLK+					
16	GND	Ground	Ground			
17	D3-	Pixel data	R0-R1, G0-G1, B0-B1	R6-R7, G6-G7, B6-B7	Ground	
18	D3+					
19	MSL	Selection of LVDS Input data map	High	Low or NC	High	-
20	FRC	Selection of the number of colors	Low		High or NC	

7.2 BACKLIGHT PINS

CN2: MSB24038P5 (Produced by STM) or equivalent.

Pin	Symbol	Description
1	VDD	12V
2	GND	Ground
3	BRTC	Back light ON/OFF control: 5V-On / 0V-Off
4	PWM	PWM Luminance control
5	NC	NC

7.3 POSITION OF PLUGS AND SOCKET

Insert direction
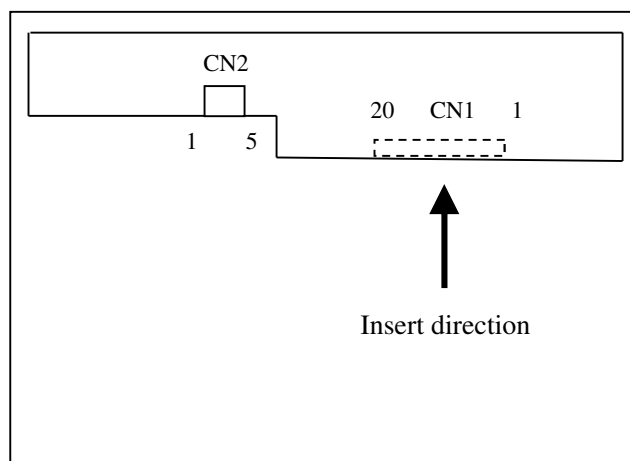
8. DISPLAY COLORS AND INPUT DATA INFORMATION

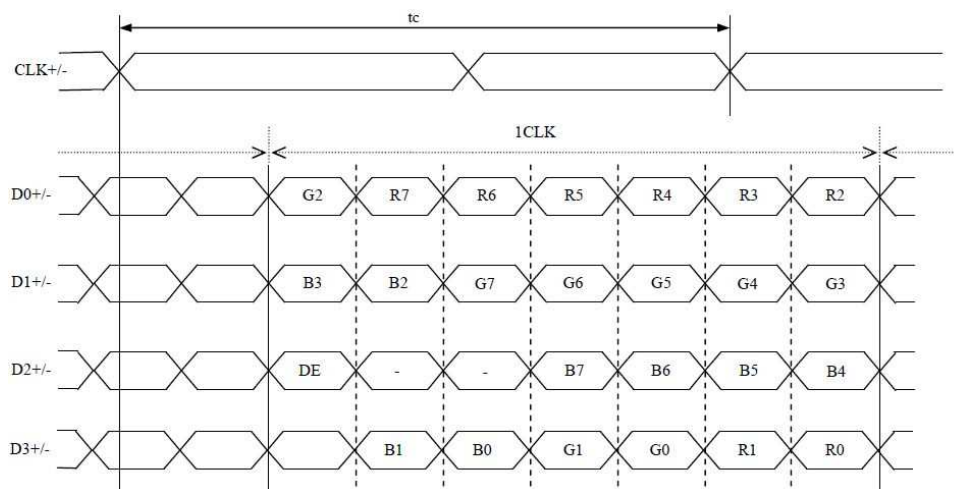### 8.1 DISPLAY COLORS AND DATA SIGNAL

This product can display in equivalent to 16,777,216 colors in 256 scales. Also the relation between display colors and input data signals is as the following table. And it can display in equivalent to 262,144 colors in 64 scales, without data signals R7, R6, G7, G6, B7, B6 in the following table.

Display colors		Data signal （0:Low level，1:High Level）																								
		R7	R6	R5	R4	R3	R2	R1	R0	G7	G6	G5	G4	G3	G2	G1	G0	B7	B6	B5	B4	B3	B2	B1	B0
Basic Color	Black	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Blue	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
	Red	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Magenta	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
	Green	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0
	Cyan	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Yellow	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0
	White	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Red grayscale	Black	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Dark	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	↕ :												:									:			
		1	1	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Bright	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Red	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Green grayscale	Black	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
	Dark	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
	↕ :												:									:			
		0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	1	0	0	0	0	0	0	0	0
	Bright	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0
	Green	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0
Blue grayscale	Black	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
	Dark	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
	↕ :												:									:			
		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	1
	Bright	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	0
	Blue	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1

8.2 DATA MAP

(1) LVDS Input data signal: 8bit, MAP A (MSL: High, FRC: Low)

CLK+/-								
D0+/-	G2	R7	R6	R5	R4	R3	R2	
D1+/-	B3	B2	G7	G6	G5	G4	G3	
D2+/-	DE	-	-	B7	B6	B5	B4	
D3+/-	B1	B0	G1	G0	R1	R0		

(2) LVDS Input data signal: 8bit, MAP B (MSL: Low or NC, FRC: Low)

CLK+/-							
D0+/-	G0	R5	R4	R3	R2	R1	R0
D1+/-	B1	B0	G5	G4	G3	G2	G1
D2+/-	DE	-	-	B5	B4	B3	B2
D3+/-	B7	B6	G7	G6	R7	R6	
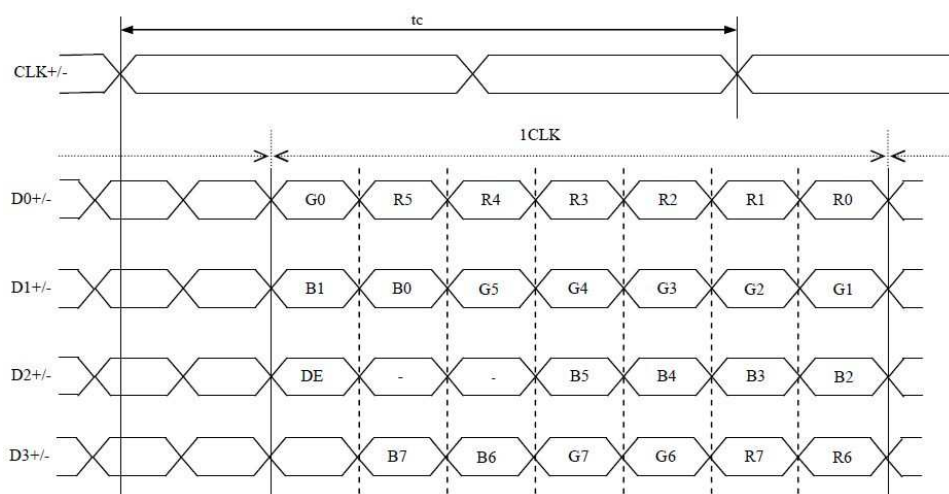
(3) Input data signal: 6bit (MSL: High, FRC: High or NC)

CLK+/-							
D0+/-	G0	R5	R4	R3	R2	R1	R0
D1+/-	B1	B0	G5	G4	G3	G2	G1
D2+/-	DE	-	-	B5	B4	B3	B2
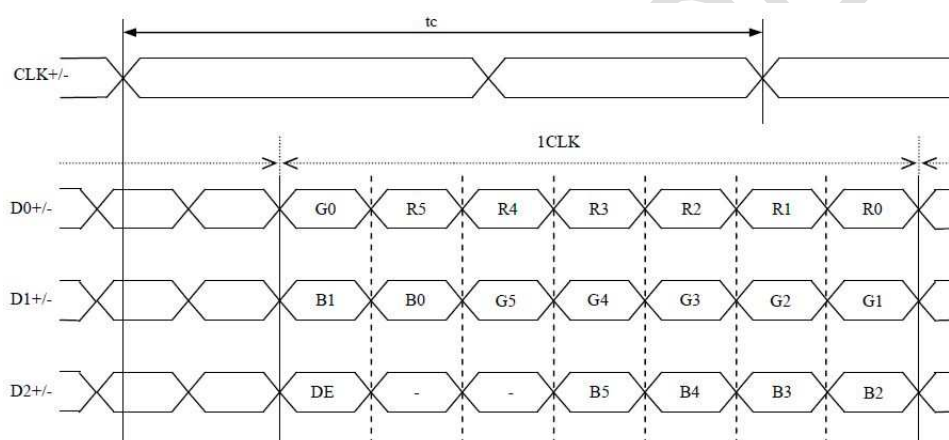
9. INTERFACE TIMING

9.1 TIMING CHARACTERISTICS

Parameter		Symbol	min.	typ.	max.	Unit	Remarks
Clock	Frequency	1/tc	50	65.0	81.25	MHz	15.384ns (typ.)
		tc	20	15.4	12.31	ns	
Horizontal signals	Cycle	th	16.54	20.68	25.77	μs	48.36kHz (typ.)
			1150	1344	1800	CLK	
	Display period	thd		1024			-
Vertical signals	Cycle	tv	13.1	16.67	20	ms	60.0Hz(typ.)
			776	806	1023	H	
	Display period	tvd		768			-

9.2 INPUT SIGNAL TIMING CHART
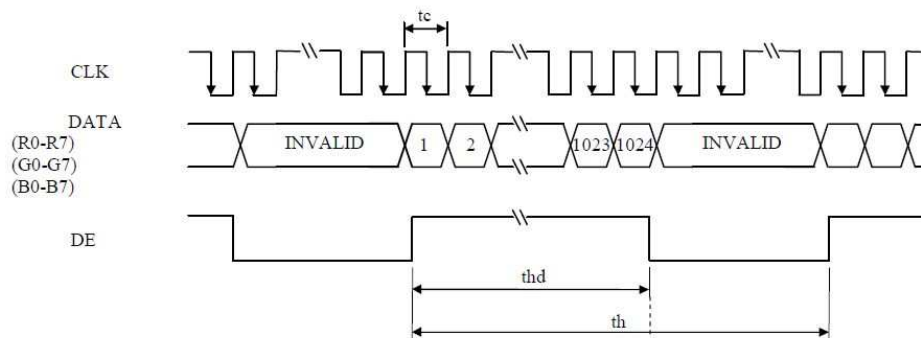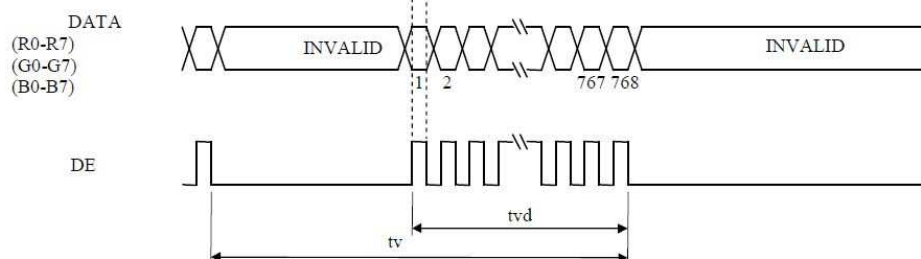
9.3 PIXEL DATA ALIGNMENT OF DISPLAY IMAGE

The following chart is the coordinates of per pixel

D(1,1)

R	G	B

D(1,1)	D(2,1)	D(3,1)	•••	D(1024,1)
D(1,2)	D(2,2)	D(3,2)	•••	D(1024,2)
D(1,3)	D(2,3)	D(3,3)	•••	D(1024,3)
•	•	•	•••	•
•	•	•	•••	•
•	•	•	•••	•
D(1,768)	D(2,768)	D(3,768)	•••	D(1024,768)

9.4 POWER SUPPLY VOLTAGE SEQUENCE

9.4.1 The sequence of backlight and power
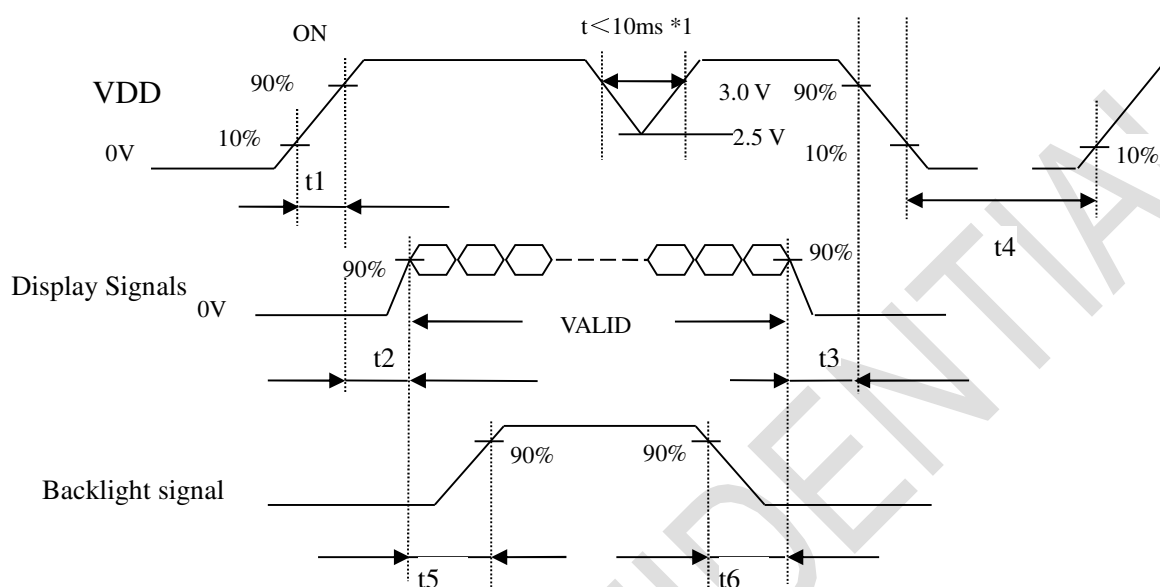
Timing Specifications:

t1 :0.5ms<t1 <10ms;

t2 :0.5 ms<t2 <50ms;

t3 :0ms<t3 <50ms;

t4 :t4 >1000ms;

t5 :t5 >200ms;

t6 :t6 >200ms;

10. OPTICS

10.1 Optical characteristics

Note1 ,Note2

| Parameter Note1		Condition	Symbol	min.	typ.	max.	Unit	Remarks
Luminance		White at center θR=0°, θL=0° θU=0°, θD=0°	L	350	400	-	cd/ m²	-
Contrast ratio		White/Black at center θR=0°, θL=0°, θU=0°, θD=0°	CR	400	600	-	-	Note3
Luminance uniformity		White θR=0°, θL=0°, θU=0°, θD=0	LU	-	1.25	1.33	-	Note4
Chromaticity	White	X coordinate	Wx	0.283	0.313	0.343	-	Note5
		Y coordinate	Wy	0.299	0.329	0.359	-	
	Red	X coordinate	Rx	0.601	0.631	0.661	-	
		Y coordinate	Ry	0.325	0.355	0.385	-	
	Green	X coordinate	Gx	0.314	0.344	0.374	-	
		Y coordinate	Gy	0.578	0.608	0.638	-	
	Blue	X coordinate	Bx	0.123	0.153	0.183	-	
		Y coordinate	By	0.057	0.087	0.117	-	
Color gamut		θR=0°, θL=0°, θU=0°, θD=0 At center,against NTSC	C	50	60	-	%	
Response time		White to black	Ton	-	3	5	ms	Note6
		Black to white	Toff	-	5	7	ms	
		Ton+ Toff	-	-	8	12	ms	
Viewing angle	Right	CR≥10	θR	70	80	-	°	Note7
	Left	CR≥10	θL	70	80	-	°	
	Up	CR≥10	θU	70	80	-	°	
	Down	CR≥10	θD	70	80	-	°	

Note1: The values in upper table are only initial characteristics.

Note2: All measurement conditions are as follows.

     Ta= 25°C, VDD= 3.3V, VCC=12V, 100% brightness,

     With typical timing characteristics.

     Optical characteristics are measured after 30minutes light-on time in the dark room. Also measurement method for luminance is as follows.
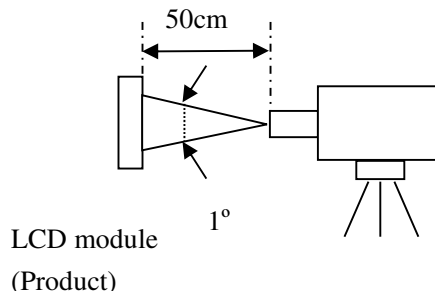
Luminance Meter (TOPCON   BM-5A)

Spectroradiometer(TOPCON   SR-3)

Note 3: See **"10.2 Definition of contrast ratio".**

Note 4: See **"10.3 Definition of luminance uniformity".**

Note 5: CIE 1931 Chromaticity Diagram Standard.

Note 6: See **"10.4 Definition of response time".**

Note 7: See **"10.5 Definition of viewing angle".**

10.2 Definition of contrast ratio

The contrast ratio is calculated by using the following formula.

$$\text{Contrast ratio (CR)} = \frac{\text{Luminance of white screen}}{\text{Luminance of black screen}}$$

10.3 Definition of luminance uniformity

The luminance uniformity is calculated by using the following formula.

$$\text{Luminance uniformity (LU)} = \frac{\text{Maximum luminance from ① to ⑨}}{\text{Minimum luminance from ① to ⑨}}$$

The luminance is measured at near the 9 points shown below.
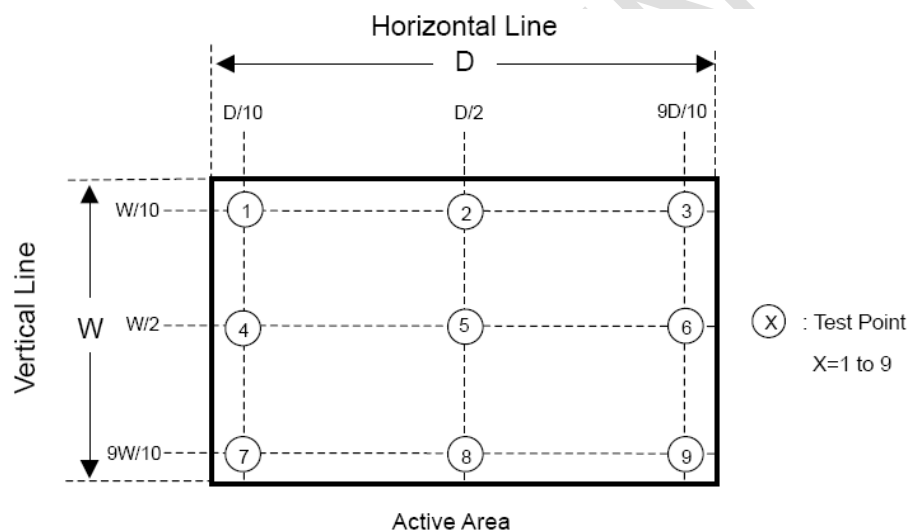
10.4 Definition of response times

Response time is measured, the luminance changes from "white" to "black", or "black" to "white" on the same screen point, by photo-detector. Ton is the time it takes the luminance change from 90% down to 10%. Also Toff is the time it takes the luminance change from 10% up to 90%. (See the following diagram.)

Normal axis (Perpendicular)
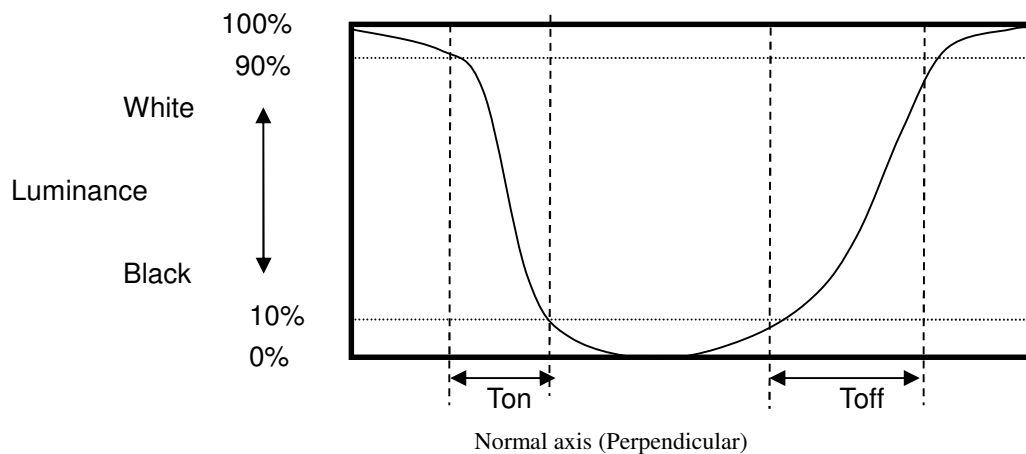
10.5 Definition of viewing angles
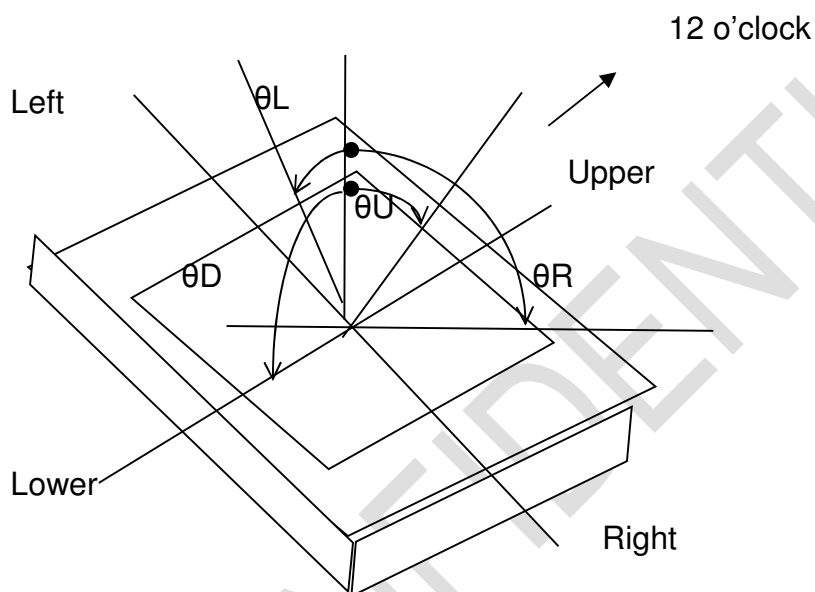
11. MARKINGS

The various markings are attached to this product. See "11.2 INDECATION LOCATIONS" for attachment positions.

11.1 PRODUCT LABEL

Product label   UL Mark

TM150TDS50   ROHS ← ROHS Mark

Lot number ← LOT NO: 1121A109C15001   MADE IN CHINA ← Country of manufacture

OEM number Note 1 ← OEM NO: TM5XG10A55SA1SA19CF0001   Note2

Note1: The meaning of OEM number

•Example: TM5XG10A55SA1SA19CF0001

__TM5XG10A55SA1SA1__   __9CF__   __0001__

AVIC internal code   **Date code**   **S/N**

Date code:

1st Character Year Codes

Month	2010	2011	2012	2013	2014	2015	2016	2017	2018	So on
Code	0	1	2	3	4	5	6	7	8	

2nd Character Month Codes

Month	January	February	March	April	May	June	July	August	September	October	November	December
Code	1	2	3	4	5	6	7	8	9	A	B	C

3rd Character Day Codes

Day	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11st
Code	1	2	3	4	5	6	7	8	9	A	B
Day	12nd	13rd	14th	15th	16th	17th	18th	19th	20th	21st	22nd
Code	C	D	E	F	G	H	I	J	K	L	M
Day	23rd	24nd	25st	26nd	27rd	28th	29th	30th	31st		
Code	N	O	P	Q	R	S	T	U	V		

Note2: Do not attach anything such as label and so on, on the product label! In case repair the product, AVIC needs the contents of product label such as the lot number, inspection date and so on, to identify the warranty period with individual product. If AVIC cannot decipher the contents of product label, such repair shall be entitled to charge. Also AVIC may give a new lot number to reconditioned products.

11.2 INDICATION LOCATIONS

Product rear side

Disposal method marking   Barcode label   Product label
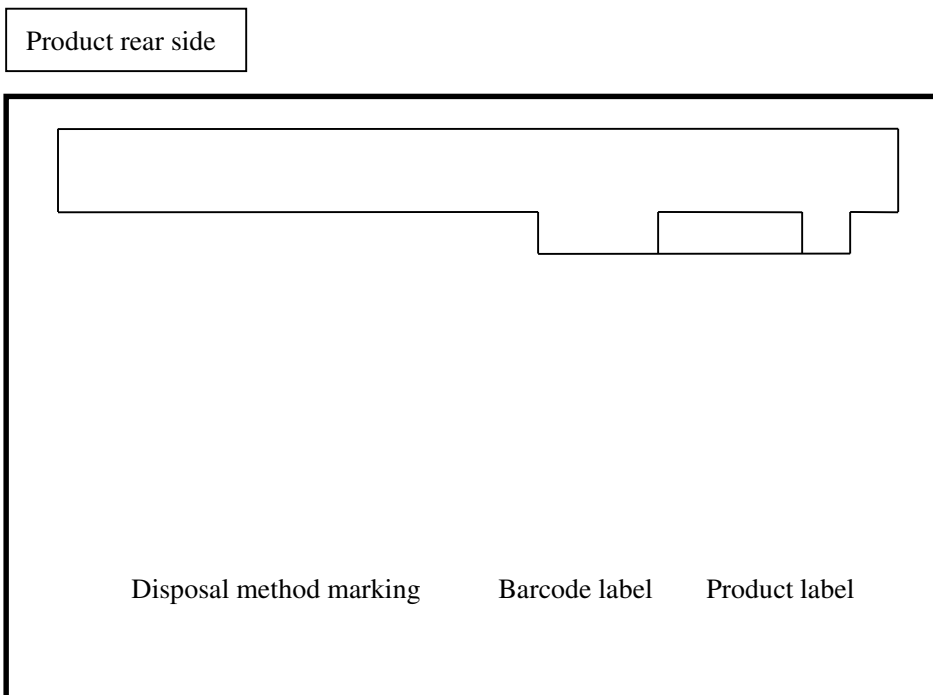
12. PACKING, TRANSPORTATION AND DELIVERY

AVIC will pack products to deliver to customer in accordance with AVIC packing specifications, and will deliver products to customer in such a state that products will not suffer from a damage during transportation .The delivery conditions are as follows.

12.1 PACKING

(1) Packing box

14 products are packed up with the maximum in a packing box (See "**12.5 OUTLINE FIGURE FOR PACKING** ").

Products are put into a plastic bag for prevention of moisture with cushion, and then the bag is sealed up with heat sealing.

The type name and quality are shown on outside of the packing box, either labeling or printing.

(2) Pallet Packing (See"**12.5 OUTLINE FIGURE FOR PACKING** ")

① Packing boxes are tired on a cardboard pallet. (8 boxes×4 tiers maximum)

② Cardboard sleeve and top cap are attached to the packing boxes, and then they are fixed by a band.

12.2 INSPECTION RECORD SHEET

Inspection record sheets are included in the packing box with delivery products to customer. It is summarized to a number of products for pass/fail assessment.
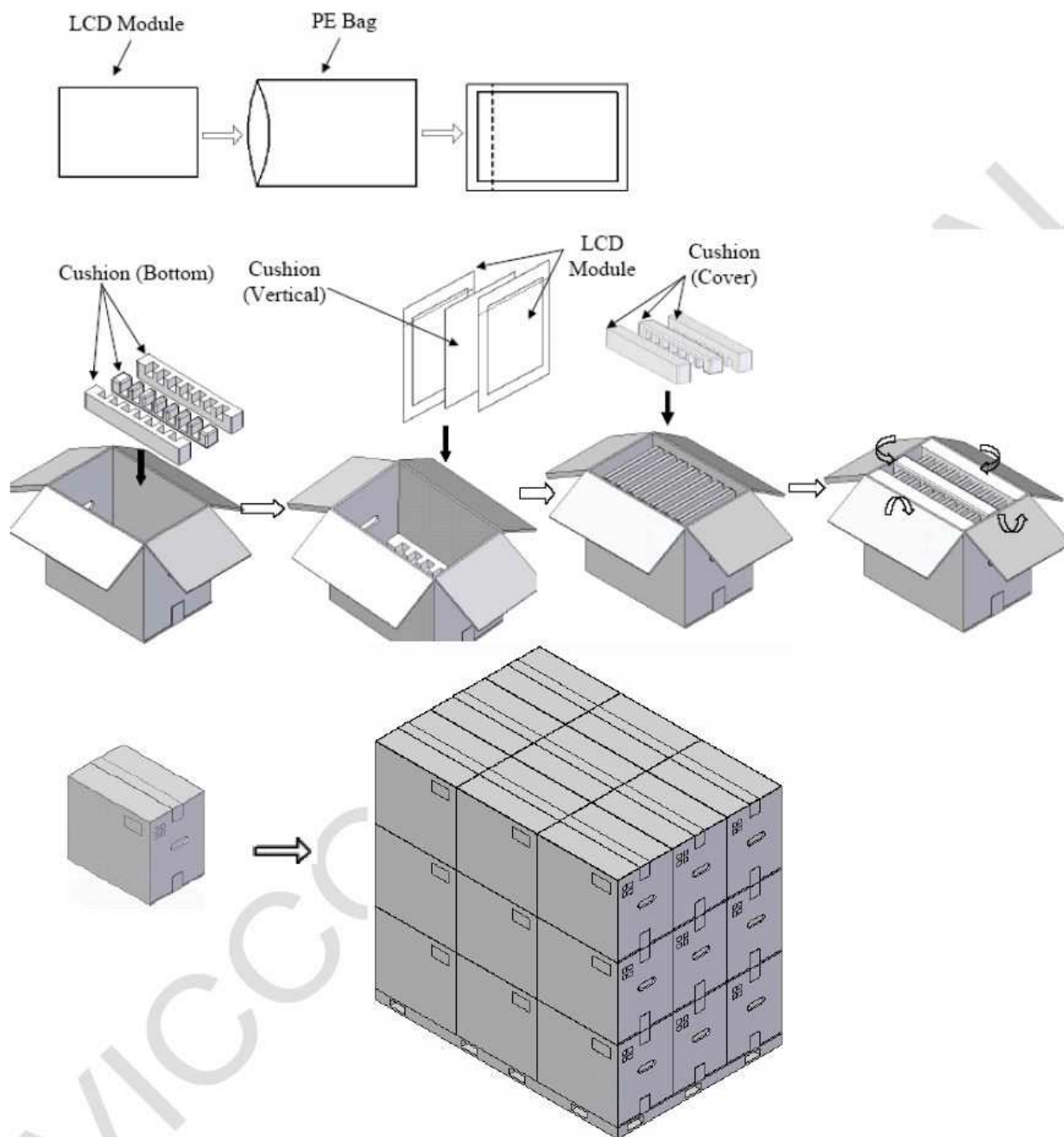
12.3 TRANSPORTATION

The product is transported by vehicle, aircraft or shipment in the state of pallet packing.

12.4 SIZE AND WEIGHT FOR PACKING BOX

Parameter	Packing box	Unit
Size	378（L）x368（W）x315.5（H）（typ.）	mm
Weight	1（typ.）	kg
Total weight	14.6（typ.） (with 14 products)	kg

12.5 OUTLINE FIGURE FOR PACKING

13. PRECAUTIONS

13.1 ATTENTIONS

13.1.1 Handling of the product

① Take hold of both ends without touch the circuit board when customer pulls out products (LCD modules) from inner packing box. If customer touches it, products may be broken down or out of adjustment, because of stress to mounting parts.

② Do not hook cables nor pull connection cables such as flexible cable and so on , for fear of damage.

③ If customer puts down the product temporarily, the product puts on flat subsoil as a display side turns down.

④ Take the measures of electrostatic discharge such as earth band, ionic shower and so on, when customer deal with the product, because products may be damaged by electrostatic.

⑤ The torque for mounting screws must never exceed 0.34N-m. Higher torque values might result in distortion of the bezel.

⑥ The product must be installed using mounting holes without undue stress such as bends or twist (See outline drawings).And do not add undue stress to any portion (such as bezel flat area) except mounting hole portion.

⑦ Bends or twist described above and undue stress to any portion except mounting hole portion may cause display un-uniformity.

⑧ Do not press or rub on the sensitive display surface .If customer clean on the panel surface, AVIC recommends using the cloth with ethanolic liquid such as screen cleaner for LCD.

⑨ Do not push-pull the interface connectors while the product is working, because wrong power sequence may break down the product.

⑩ Do not bend or unbend the lamp cable at the near part of the lamp holding rubber, to avoid the damage for high voltage side of the lamp. This damage may cause a lamp breaking and abnormal operation of high voltage circuit.

13.1.2 Environment

① Do not operate or store in high temperature, high humidity, dewdrop atmosphere or corrosive gases. Keep the product in antistatic pouch in room temperature, because of avoidance for dusts and sunlight, if customer stores the product.

② In order to prevent dew condensation occurring by temperature difference, the product packing box must be opened after leave under the environment of an unpacking room temperature enough. Because a situation of dew condensation occurring is changed by the environment temperature and humidity, evaluate the leaving time sufficiently. (Recommendation leaving time: 6 hour or more with packing state)

③ Do not operate in a high magnetic field .Circuit boards may be broken down by it.

④ This product is not designed as radiation hardened.

⑤ Use an original protection sheet on the product surface (polarizer). Adhesive type protection

sheet should be avoided, because it may change color or properties of the polarizer.

13.3.3 Characteristics

The following items are neither defects nor failures.

① Optical characteristics (e.g. luminance, display uniformity, etc.) gradually is going to change depending on operating time.

② Do not display the fixed pattern for a long time because it may cause image sticking .Use a screen saver, if the fixed pattern is displayed on the screen.

③ The display color may be changed by viewing angle because of the use of condenser sheet in the backlight.

④ Optical characteristics may be changed by input signal timings.

⑤ The interference noise of input signal frequency for this product and luminance control frequency of customer's backlight PWM signal may appear on a display. Set up luminance control frequency of backlight so that the interference noise doses not appear.

13.2 Other

① All GND and VCC terminals should be used without a non-connected line.

② Do not disassemble a product or adjust volume without permission of AVIC.

③ Pay attention not to insert waste materials inside of products, if customer uses screw nails.

④ Pack the product with original shipping package, because of avoidance of some damages during transportation, when customer returns it to AVIC for repair and so on.

⑤ Not only the module but also the equipment should be packed and transported as the module becomes vertical .Otherwise, there is the fear that a display dignity decreases by an impact or vibrations.

14. OUTDRAWING

195.1

134.4

37.9

63.3

LABEL AREA