



Issued Date: Dec. 16, 2009 Model No.: V260B1-P12 **Approval** 

# TFT LCD Approval Specification MODEL NO.: V260B1-P12

Customer:	
Approved by:	
Note:	

Approved By	TV Head Division
Approved By	Chao-Chun Chung

Reviewed By	QA Dept.	Product Development Div.
	Hsin-Nan Chen	WT Lin

Propored By	LCD TV Marketing and	l Product Management Div.
Prepared By	CY Chang	Chi-Yao Lo



# **Approval**

**②** 

# - CONTENTS -

REVISION HISTORY	 3
1. GENERAL DESCRIPTION 1.1 OVERVIEW 1.2 CHARACTERISTICS 1.3 MECHANICAL SPECIFICATIONS	 4
2. ABSOLUTE MAXIMUM RATINGS 2.1 ABSOLUTE RATINGS OF ENVIRONMENT (BASED ON 2.2 ABSOLUTE RATINGS OF ENVIRONMENT (OPEN CELI 2.3 ELECTRICAL ABSOLUTE RATINGS (OPEN CELL)	5
3. ELECTRICAL CHARACTERISTICS 3.1 TFT LCD OPEN CELL	7
4. BLOCK DIAGRAM 4.1 TFT LCD OPEN CELL	8
5. INPUT TERMINAL PIN ASSIGNMENT 5.1 TFT LCD MODULE 5.2 BLOCK DIAGRAM OF INTERFACE	9
5.3 LVDS INTERFACE 5.4 COLOR DATA INPUT ASSIGNMENT	
6. INTERFACE TIMING 6.1 INPUT SIGNAL TIMING SPECIFICATIONS 6.2 POWER ON/OFF SEQUENCE	 14
7. OPTICAL CHARACTERISTICS 7.1 TEST CONDITIONS 7.2 OPTICAL SPECIFICATIONS	 17
8. PRECAUTIONS 8.1 ASSEMBLY AND HANDLING PRECAUTIONS 8.2 SAFETY PRECAUTIONS	 21
9. PACKING 9.1 PACKING SPECIFICATIONS 9.2 PACKING METHOD	 22
10. REGULATORY STANDARD 10.1 SAFETY	 24
11. DEFINITION OF LABELS 11.1 OPEN CELL LABEL 11.2 CARTON LABEL	 25
12. MECHANICAL DRAWING	 26



# **Approval**

**②** 

# **REVISION HISTORY**

Version	Date	Page (New)	Section	Description
Ver 2.0	Dec, 16, 2009			Approval Specification was first issued.



Issued Date: Dec. 16, 2009 Model No.: V260B1-P12

**Approval** 

# 1. GENERAL DESCRIPTION

#### 1.1 OVERVIEW

V260B1- P12 is a 26-inch TFT LCD cell with driver ICs and a 1-ch LVDS interface. The product supports 1366 x 768 WXGA mode and can display true 16.2M colors (6-bits+FRC colors). The backlight unit is not built in.

#### 1.2 CHARACTERISTICS

CHARACTERISTICS ITEMS	SPECIFICATIONS
Screen Diagonal [in]	26.0
Pixels [lines]	1366×768
Active Area [mm]	575.769×323.712
Sub -Pixel Pitch [mm]	0.1405(H) × 0.4215(V)
Pixel Arrangement	RGB vertical stripe
Weight [g]	TYP. 850
Physical Size [mm]	Please refer to 2D Drawing
Display Mode	TN, Normally White
Contrast Ratio	800:1 Typ. (Typical value measured at CMO's module)
Glass thickness (Array/CF) [mm]	0.7 / 0.7
Viewing Angle (CR>20)	+80/-80(H),+80/-70(V) Typ. (Typical value measured at CMO's module)
Color Chromaticity	R=(0.650, 0.328) G=(0.274,0.583) B=(0.150,0.094) W=(0.314,0.331) *Please refer to "color chromaticity" on p.16
Cell Transparency [%]	6.2%Typ. (Typical value measured at CMO's module)
Polarizer (CF side)	Anti-glare coating, 587.4(H) x 335.2(w). Hardness: 3H
Polarizer (TFT side)	587.4(H) x 335.2(w), Hardness: 3H

#### 1.3 MECHANICAL SPECIFICATIONS

Item	Min.	Тур.	Max.	Unit	Note
Weight		850		g	
I/F connector mounting position	The mounting in the screen center		(2)		

Note (1) Please refer to the attached drawings for more information of front and back outline dimensions.

(2) Connector mounting position





Issued Date: Dec. 16, 2009 Model No.: V260B1-P12

# Approval

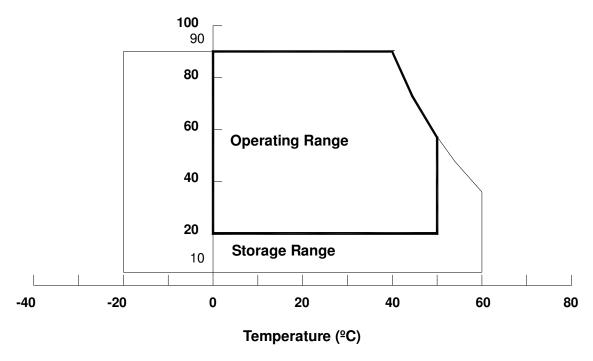
# 2. ABSOLUTE MAXIMUM RATINGS

## 2.1 ABSOLUTE RATINGS OF ENVIRONMENT (BASED ON CMO MODULE V260B1-L12)

Item	Symbol	Va	Unit	Note	
item	Syllibol	Min.	Max.	Offic	NOIE
Storage Temperature	T <sub>ST</sub>	-20	+60	ōC	(1), (3)
Operating Ambient Temperature	T <sub>OP</sub>	0	50	ōC	(1), (2), (3)
Altitude Operating	A <sub>OP</sub>	0	5000	М	(3)
Altitude Storage	A <sub>ST</sub>	0	12000	М	(3)

- Note (1) Temperature and relative humidity range is shown in the figure below.
  - (a) 90 %RH Max. (Ta  $\leq$  40  ${}^{\circ}$ C).
  - (b) Wet-bulb temperature should be 39  $^{\circ}$ C Max. (Ta > 40  $^{\circ}$ C).
  - (c) No condensation.

# **Relative Humidity (%RH)**



- Note (2) The maximum operating temperature is based on the test condition that the surface temperature of display area is less than or equal to 65 °C with LCD module alone in a temperature controlled chamber. Thermal management should be considered in your product design to prevent the surface temperature of display area from being over 65 °C. The range of operating temperature may degrade in case of improper thermal management in your product design.
- Note (3) The rating of environment is base on LCD module. Leave LCD cell alone, this environment condition can't be guaranteed. Except LCD cell, the customer has to consider the ability of other parts of LCD module and LCD module process.



Issued Date: Dec. 16, 2009 Model No.: V260B1-P12

**Approval** 

# 2.2 ABSOLUTE RATINGS OF ENVIRONMENT (OPEN CELL)

Storage Condition: With shipping package.

Storage temperature range: 25±5 ℃ Storage humidity range: 50±10%RH

Shelf life: a month

## 2.3 ELECTRICAL ABSOLUTE RATINGS

#### 2.3.1 TFT LCD MODULE

Item	Symbol	Va	lue	Unit	Note
item	Symbol	Min.	Max.	Offic	Note
Power Supply Voltage	Vcc	-0.3	13.0	V	(1)
Input Signal Voltage	VIN	-0.3	3.6	V	(1)

- Note (1) Permanent damage to the device may occur if maximum values are exceeded. Functional operation should be restricted to the conditions described under normal operating conditions.
- Note (2) No moisture condensation or freezing.
- Note (3) The control signals includes Backlight On/Off Control, Internal PWM Control and External PWM Control.



Issued Date: Dec. 16, 2009 Model No.: V260B1-P12

# **Approval**

## 3. ELECTRICAL CHARACTERISTICS

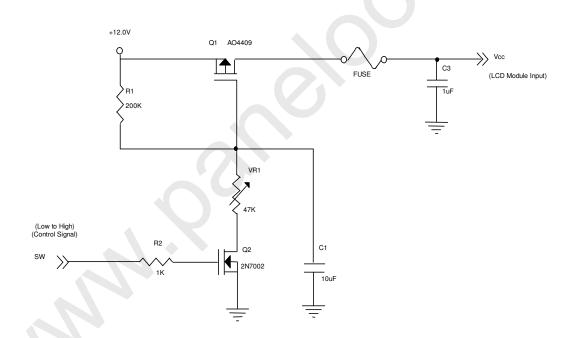
## 3.1 TFT LCD OPEN CELL

Ta = 25 ± 2 °C

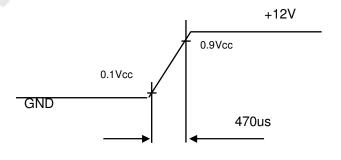
Parameter		Symbol		Value		Unit	Note	
		Syllibol	Min.	Тур.	Max.	o iii	NOIE	
Power Su	pply Voltage		$V_{CC}$	11.4	12.0	12.6	V	(1)
Power Su	pply Ripple Vo	Itage	$V_{RP}$	_	_	300	mV	
Rush Curi	rent		I <sub>RUSH</sub>	_	_	3.0	Α	(2)
		White			0.2	0.25	Α	
Power Su	pply Current	Black	I <sub>cc</sub>		0.5	0.55	Α	(3)
		Vertical Stripe			0.4	0.45	Α	
LVDC	Differential Input High Threshold Voltage		$V_{LVTH}$	+100	_	_	mV	
LVDS Interface	Differential In Threshold Vol		$V_{\text{LVTL}}$	_	_	-100	mV	
Common Inpu		ıt Voltage	$V_{LVC}$	1.125	1.25	1.375	V	
Terminating Resistor		R <sub>T</sub>		100		ohm		
CMOS	MOS Input High Threshold Voltage		V <sub>IH</sub>	2.7		3.3	V	
interface	Input Low Thr	eshold Voltage	$V_{IL}$	0		0.7	V	

Note (1) The module should be always operated within above ranges.

# Note (2) Measurement Conditions:



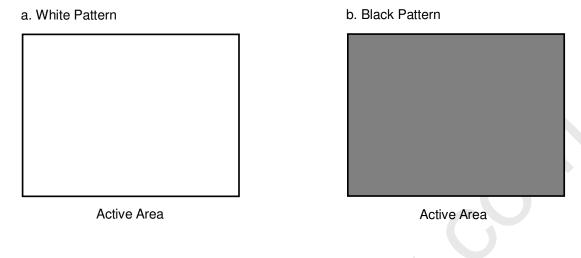
# Vcc rising time is 470us

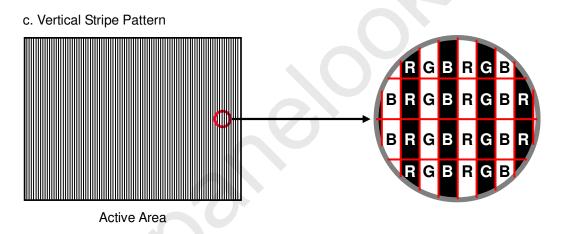




Issued Date: Dec. 16, 2009 Model No.: V260B1-P12 **Approval** 

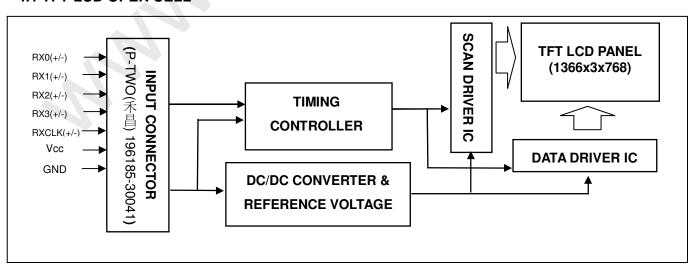
Note (3) The specified power supply current is under the conditions at Vcc = 12 V, Ta = 25  $\pm$  2  $^{\circ}$ C,  $f_v$  = 60 Hz, whereas a power dissipation check pattern below is displayed.





#### 4. BLOCK DIAGRAM

## 4.1 TFT LCD OPEN CELL





# **Approval**

## 5. INPUT TERMINAL PIN ASSIGNMENT

#### **5.1 TFT LCD MODULE**

## **CNF1 Connector Pin Assignment**

Pin No.	Symbol	Description	Note
1	VCC	Power supply: +12V	
2	VCC	Power supply: +12V	
3	VCC	Power supply: +12V	
4	VCC	Power supply: +12V	
5	GND	Ground	
6	GND	Ground	
7	GND	Ground	
8	GND	Ground	
9	SELLVDS	Select LVDS data format	(2)
10	NC	No connection	(3)
11	GND	Ground	
12	RX0-	Negative transmission data of pixel 0	
13	RX0+	Positive transmission data of pixel 0	
14	GND	Ground	
15	RX1-	Negative transmission data of pixel 1	
16	RX1+	Positive transmission data of pixel 1	
17	GND	Ground	
18	RX2-	Negative transmission data of pixel 2	
19	RX2+	Positive transmission data of pixel 2	
20	GND	Ground	
21	RXCLK-	Negative of clock	
22	RXCLK+	Positive of clock	
23	GND	Ground	
24	RX3-	Negative transmission data of pixel 3	
25	RX3+	Positive transmission data of pixel 3	
26	GND	Ground	
27	NC	No connection	(3)
28	NC	No connection	(3)
29	GND	Ground	
30	GND	Ground	

Note (1) CN2 Connector Part No.: P-TWO (禾昌) 196185-30041 or Equal.

Note (2) Ground or OPEN: Normal, High: JEIDA LVDS format

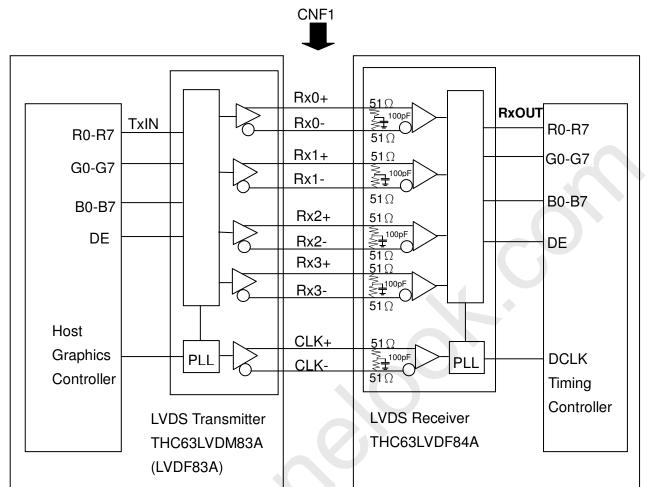
Please refer to 5.3 LVDS INTERFACE (Page 11)

Note (3) Reserved for internal use. Please leave it open.



# **Approval**

# **5.2 BLOCK DIAGRAM OF INTERFACE**



R0~R7: Pixel R Data G0~G7: Pixel G Data B0~B7: Pixel B Data

DE : Data Enable Signal

Note (1) The system must have the transmitter to drive the module.

Note (2) LVDS cable impedance shall be 50 ohms per signal line or about 100 ohms per twist-pair line when it is used differentially.





# **Approval**

#### **5.3 LVDS INTERFACE**

	SIG	3NAL	TRANSMITTER THC63LVDM83A		INTERFACE CONNECTOR			ECEIVER 063LVDF84A	TFT CONTROL INPUT		
	SELLVD= L or OPEN	SELLVDS =H	PIN	INPUT	Host	TFT-LCD	PIN	OUTPUT	SELLVD= L or OPEN		
	R0	R2	51	TxIN0			27	Rx OUT0	R0	R2	
	R1	R3	52	TxIN1			29	Rx OUT1	R1	R3	
	R2	R4	54	TxIN2	TA OUT0+	Rx 0+	30	Rx OUT2	R2	R4	
	R3	R5	55	TxIN3			32	Rx OUT3	R3	R5	
	R4	R6	56	TxIN4			33	Rx OUT4	R4	R6	
	R5	R7	3	TxIN6	TA OUT0-	Rx 0-	35	Rx OUT6	R5	R7	
	G0	G2	4	TxIN7			37	Rx OUT7	G0	G2	
	G1	G3	6	TxIN8			38	Rx OUT8	G1	G3	
	G2	G4	7	TxIN9			39	Rx OUT9	G2	G4	
	G3	G5	11	TxIN12	TA OUT1+	Rx 1+	43	Rx OUT12	G3	G5	
	G4	G6	12	TxIN13			45	Rx OUT13	G4	G6	
	G5	G7	14	TxIN14			46	Rx OUT14	G5	G7	
	В0	B2	15	TxIN15	TA OUT1-	Rx 1-	47	Rx OUT15	В0	B2	
	B1	B3	19	TxIN18			51	Rx OUT18	B1	В3	
24	B2	B4	20	TxIN19			53	Rx OUT19	B2	B4	
bit	В3	B5	22	TxIN20			54	Rx OUT20	В3	B5	
	B4	B6	23	TxIN21	TA OUT2+	Rx 2+	55	Rx OUT21	B4	B6	
	B5	B7	24	TxIN22			1	Rx OUT22	B5	В7	
	DE	DE	30	TxIN26			6	Rx OUT26	DE	DE	
	R6	R0	50	TxIN27	TA OUT2-	Rx 2-	7	Rx OUT27	R6	R0	
	R7	R1	2	TxIN5			34	Rx OUT5	R7	R1	
	G6	G0	8	TxIN10			41	Rx OUT10	G6	G0	
	G7	G1	10	TxIN11			42	Rx OUT11	G7	G1	
	B6	B0	16	TxIN16	TA OUT3+	Rx 3+	49	Rx OUT16	В6	B0	
	B7 (	B1	18	TxIN17			50	Rx OUT17	В7	B1	
	RSVD 1	RSVD 1	25	TxIN23			2	Rx OUT23	NC	NC	
	RSVD 2	RSVD 2	27	TxIN24	TA OUT3-	Rx 3-	3	Rx OUT24	NC	NC	
	RSVD 3	RSVD 3	28	TxIN25			5	Rx OUT25	NC	NC	
		DCLK	31	TxCLK IN	TxCLK OUT+	RxCLK IN+	26	RxCLK OUT	DC	CLK	
					TxCLK OUT-	RxCLK IN-					

R0~R7: Pixel R Data (7; MSB, 0; LSB)

G0~G7: Pixel G Data (7; MSB, 0; LSB)

B0~B7: Pixel B Data (7; MSB, 0; LSB)

DE: Data enable signal

Notes (1) RSVD (reserved) pins on the transmitter shall be "H" or "L".



**Approval** 

## **5.4 COLOR DATA INPUT ASSIGNMENT**

The brightness of each primary color (red, green and blue) is based on the 8-bit gray scale data input for the color. The higher the binary input, the brighter the color. The table below provides the assignment of color versus data input.

										ı		Da	ata	Sigr	nal										
		Red					Green					Blue													
		R7	R6	R5	R4	R3	R2	R1	R0	G7	G6	G5	G4	G3	G2	G1	G0	В7	B6	B5	В4	ВЗ	B2	B1	ВО
	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
	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	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	0	0	0	0	0	0	0	0
Basic	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
Colors	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
	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
	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(0) / Dark	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ì	Red(1)	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Gray	Red(2)	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Scale	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
Of	:	:	:	:	:	:	:	:	:	:	:	• .	•	:	:	:	:	:	:	:	:	:	:	:	:
Red	Red(253)	1	1	1	1	1	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
i ieu	Red(254)	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(255)	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(0) / Dark	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Green(1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Gray	Green(2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
Scale	:	:	:	:		:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
Of	:	4	:			:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
Green	Green(253)	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	1	0	0	0	0	0	0	0	0
areen	Green(254)	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(255)	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(0) / Dark	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(1)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Gray	Blue(2)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
Gray Scale Of	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:
Blue	Blue(253)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	1
Diue	Blue(254)	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(255)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1

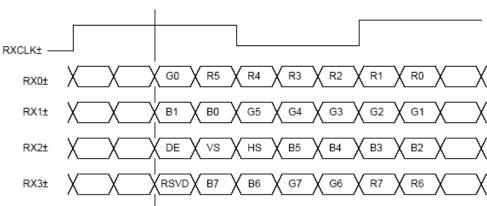
Note (1) 0: Low Level Voltage, 1: High Level Voltage



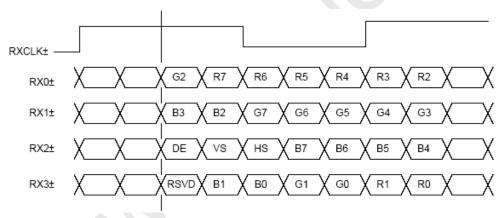
Issued Date: Dec. 16, 2009 Model No.: V260B1-P12 **Approval** 

## 5.5 LVDS INTERFACE

## $SELLVDS = L \text{ or Open} \quad (VESA)$



#### SELLVDS = H (JEIDA)



R0~R7: Pixel R Data (7; MSB, 0; LSB)

G0~G7: Pixel G Data (7; MSB, 0; LSB)

B0~B7: Pixel B Data (7; MSB, 0; LSB)

DE: Data enable signal

Notes(1) RSVD(reserved)pins on the transmitter shall be "H" or "L".



**Approval** 

## 6. INTERFACE TIMING

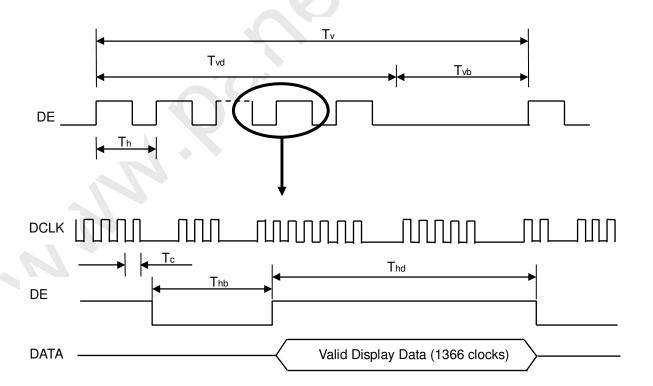
#### **6.1 INPUT SIGNAL TIMING SPECIFICATIONS**

The input signal timing specifications are shown as the following table and timing diagram.

			•		0 0		
Signal	Item	Symbol	Min.	Тур.	Max.	Unit	Note
	Frequency	1/Tc	60	76	82	MHz	
LVDS Receiver Clock	Input cycle to	Trcl		_	200	ps	
	cycle jitter						
LVDS Receiver Data	Setup Time	Tlvsu	600	_	_	ps	
LVD3 Neceivei Data	Hold Time	Tlvhd	600	_	_	ps	
	Frame Rate	Fr5	47	50	53	Hz	
	Tame nate	Fr6	57	60	63	Hz	
Vertical Active Display Term	Total	Tv	778	806	888	Th	Tv=Tvd+Tvb
	Display	Tvd	768	768	768	Th	-
	Blank	Tvb	10	38	120	Th	-
	Total	Th	1442	1560	1936	Tc	Th=Thd+Thb
Horizontal Active Display Term	Display	Thd	1366	1366	1366	Tc	-
	Blank	Thb	76	194	570	Tc	-

Note (1) Since this module is operated in DE only mode, Hsync and Vsync input signals should be set to low logic level. Otherwise, this module would operate abnormally.

# INPUT SIGNAL TIMING DIAGRAM

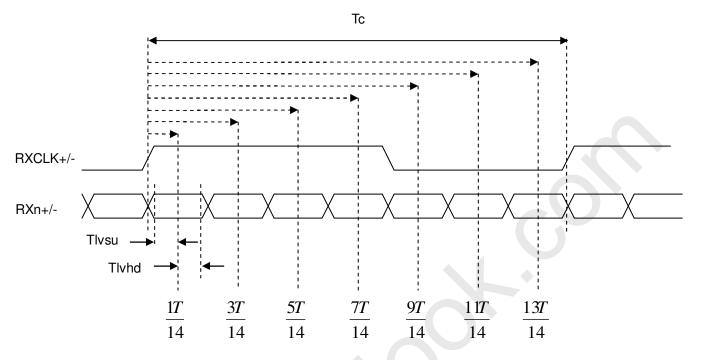






**Approval** 

# LVDS RECEIVER INTERFACE TIMING DIAGRAM



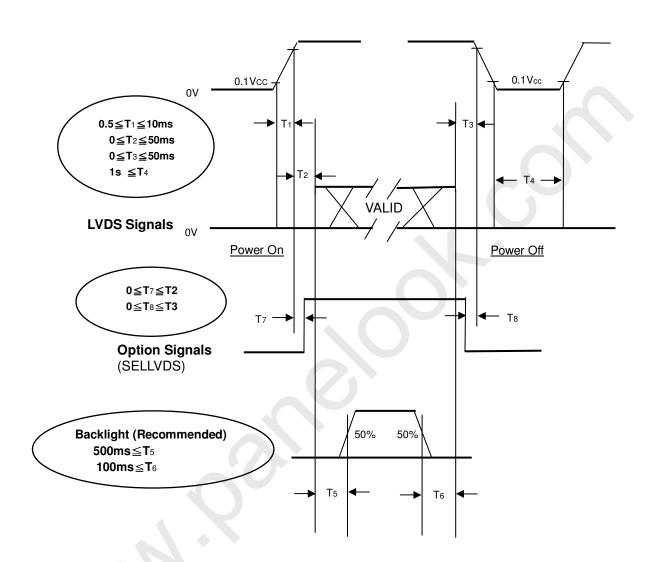




# Approval

## 6.2 POWER ON/OFF SEQUENCE

To prevent a latch-up or DC operation of LCD module, the power on/off sequence should be as the



Power ON/OFF Sequence

- Note (1) The supply voltage of the external system for the module input should follow the definition of Vcc.
- Note (2) Apply the lamp voltage within the LCD operation range. When the backlight turns on before the LCD operation or the LCD turns off before the backlight turns off, the display may momentarily become abnormal screen.
- Note (3) In case of Vcc is in off level, please keep the level of input signals on the low or high impedance. If T2<0,that maybe cause electrical overstress failure.
- Note (4) T4 should be measured after the module has been fully discharged between power off and on period.
- Note (5) Interface signal shall not be kept at high impedance when the power is on.





**Approval** 

# 7. OPTICAL CHARACTERISTICS

## 7.1 TEST CONDITIONS

Item	Symbol	Value	Unit		
Ambient Temperature	Ta	25±2	°C		
Ambient Humidity	На	50±10	%RH		
Supply Voltage	$V_{CC}$	12.0	V		
Input Signal	According to typical value	alue in "3. ELECTRICAL (	CHARACTERISTICS"		
Lamp Current ( High side )	l <sub>L</sub>	$7.5$ mA $\pm$ $0.5$	mA		
Oscillating Frequency (Inverter)	F <sub>W</sub>	58±3	KHz		
Frame rate		60	Hz		

## 7.2 OPTICAL SPECIFICATIONS

The relative measurement methods of optical characteristics are shown as below. The following items should

be measured under the test conditions described in 7.1 and stable environment shown in Note (5).

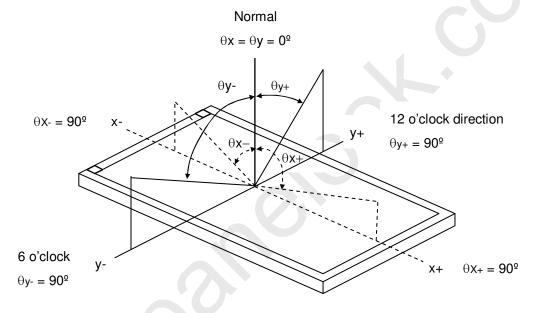
Item		Symbol	Condition	Min.	Тур.	Max.	Unit	Note	
	Red	Rcx			0.650		-		
	ried	Rcy			0.328		-		
	Green	Gcx	0 00 0 00		0.274		-		
Color		Gcy	$\theta_x=0^\circ, \theta_Y=0^\circ$ Viewing Angle at Normal		0.583		-	(0) (5)	
Chromatici	ty Blue	Всх	Direction		0.150	]	-	(0),(5)	
	Dide	Всу	Standard light source "C"		0.094		-		
	White	Wcx			0.314		-		
	VVIIILE	Wcy			0.331		-		
Center Trai	Center Transmittance		$\theta_x=0^\circ,  \theta_Y=0^\circ$	-	6.2	-	%	(1),(7)	
Contras	Contrast Ratio		with CMO module		800	-		(1),(3)	
Response Time		T <sub>R</sub>	$\theta_{x}=0^{\circ}, \ \theta_{Y}=0^{\circ}$	-	3	-	ms	(4)	
riespons	SC TILLIC	$T_{F}$	with CMO Module@60Hz	-	5	-	ms	(4)	
White Variation		δW	$\theta_x$ =0°, $\theta_Y$ =0° with CMO module	-	-	1.3	-	(1),(6)	
	Horizontal	$\theta_x$ +	þ	-	80	-			
Viewing Angle	Vertical	$\theta_{x}$ -	CR≥10	-	80	-	Deg.	(1),(2)	
		$\theta_{Y}$ +	With CMO module	-	80	-	Deg.	(1),(2)	
	Vortical	$\theta_{Y}$ -		-	70	-			



Issued Date: Dec. 16, 2009 Model No.: V260B1-P12 Approval

- Note (0) Light source is the standard light source "C" which is defined by CIE and driving voltage are based on suitable gamma voltages. The calculating method is as following:
  - 1. Measure Module's and BLU's spectrum. White is without signal input and R,G,B are with signal input. BLU(for V260B1-L12) is supplied by CMO.
  - 2. Calculate cell's spectrum.
  - 3. Calculate cell's chromaticity by using the spectrum of standard light source "C".
- Note (1) Light source is the BLU which is supplied by CMO and driving voltage are based on suitable gamma voltages.
- Note (2) Definition of Viewing Angle ( $\theta x$ ,  $\theta y$ ):

Viewing angles are measured by Autronic Conoscope Cono-80.



# Note (3) Definition of Contrast Ratio (CR):

The contrast ratio can be calculated by the following expression.

Contrast Ratio (CR) = L255 / L0

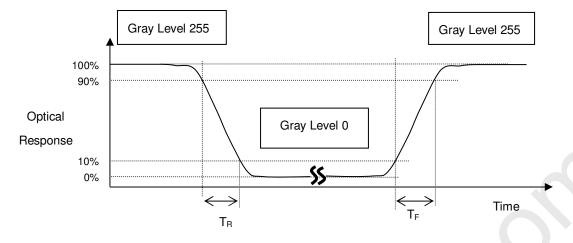
L255: Luminance of gray level 255

L 0: Luminance of gray level 0

CR = CR (5), where CR (X) is corresponding to the Contrast Ratio of the point X at the figure in Note (6).

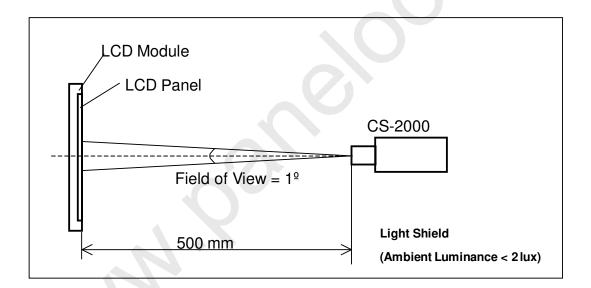


Issued Date: Dec. 16, 2009 Model No.: V260B1-P12 **Approval** 



## Note (5) Measurement Setup:

The LCD module should be stabilized at given temperature for 1 hour to avoid abrupt temperature change during measuring. In order to stabilize the luminance, the measurement should be executed after lighting Backlight for 1 hour in a windless room.



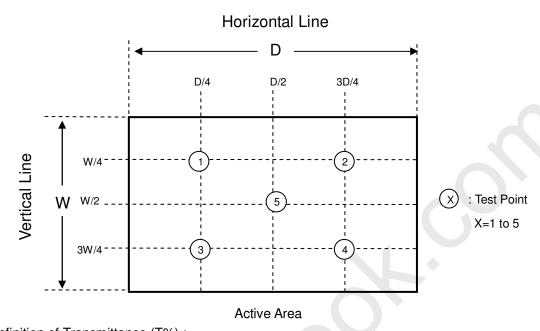
Note (6) Definition of White Variation ( $\delta W$ ):



**Approval** 

Measure the luminance of gray level 255 at 5 points

 $\delta W = Maximum [L (1), L (2), L (3), L (4), L (5)] / Minimum [L (1), L (2), L (3), L (4), L (5)]$ 



Note (7) Definition of Transmittance (T%):

Module is without signal input.



Issued Date: Dec. 16, 2009 Model No.: V260B1-P12

# Approval

#### 8. PRECAUTIONS

#### 8.1 ASSEMBLY AND HANDLING PRECAUTIONS

- (1) Do not apply rough force such as bending or twisting to the product during assembly.
- (2) To assemble backlight or install module into user's system can be only in clean working areas. The dust and oil may cause electrical short or worsen the polarizer.
- (3) It's not permitted to have pressure or impulse on the module because the LCD panel will be damaged.
- (4) Always follow the correct power sequence when the product is connecting and operating. This can prevent damage to the CMOS LSI chips during latch-up.
- (5) Do not pull the I/F connector in or out while the module is operating.
- (6) Use a soft dry cloth without chemicals for cleaning, because the surface of polarizer is very soft and easily scratched.
- (7) It is dangerous that moisture come into or contacted the product, because moisture may damage the product when it is operating.
- (8) High temperature or humidity may reduce the performance of module. Please store this product within the specified storage conditions.
- (9) When ambient temperature is lower than 10°C may reduce the display quality. For example, the response time will become slowly.

#### **8.2 SAFETY PRECAUTIONS**

- (1) If the liquid crystal material leaks from the panel, it should be kept away from the eyes or mouth. In case of contact with hands, skin or clothes, it has to be washed away thoroughly with soap.
- (2) After the product's end of life, it is not harmful in case of normal operation and storage.





**Approval** 

## 9. PACKAGING

# 9.1 PACKING SPECIFICATIONS

- (1) 15 LCD TV Panels / 1 Box
- (2) Box dimensions: 804 (L) X 565 (W) X 363 (H)
- (3) Weight: approximately 25 Kg (15 panels per box)

## 9.2 PACKING METHOD

Figures 9-1 and 9-2 are the packing method

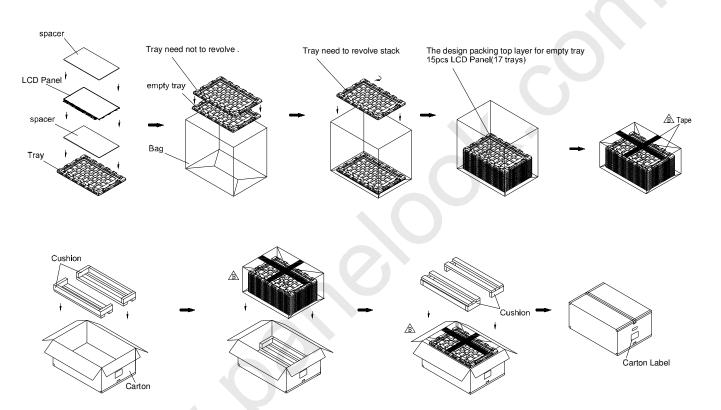


Figure.9-1 packing method

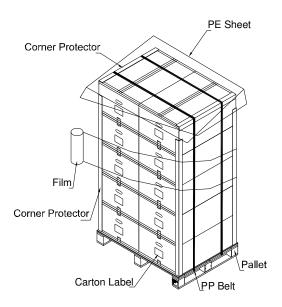


Issued Date: Dec. 16, 2009 Model No.: V260B1-P12



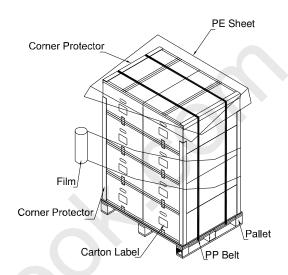
# Sea Transportation

Corner Protector:L1650\*50\*50mm L800\*50\*50mm Pallet:L1150\*W840\*H140mm Pallet Stack:L1150\*W840\*H1960mm Gross:265kg



# Air Transportation

Corner Protector:L1250\*50\*50mm L800\*50\*50mm Pallet:L1150\*W840\*H140mm Pallet Stack:L1150\*W840\*H1597mm Gross:215kg





Issued Date: Dec. 16, 2009 Model No.: V260B1-P12 **Approval** 

# 10. REGULATORY STANDARDS

# **10.1 SAFETY**

Regulatory	Item	Standard
	UL	UL 60950-1: 2003
Information Technology equipment	cUL	CAN/CSA C22.2 No.60950-1-03
	CB	IEC 60950-1:2001
	UL	UL 60065: 2003
Audio/Video Apparatus	cUL	CAN/CSA C22.2 No.60065-03
	CB	IEC 60065:2001



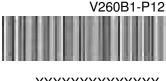


**Approval** 

# 11. DEFINITION OF LABELS

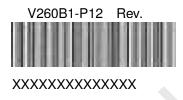
#### 11.1 OPEN CELL LABEL

The barcode nameplate is pasted on each open cell as illustration for CMO internal control.



XXXXXXXXXXXXX

The barcode nameplate is pasted on Protector Film of each open cell as illustration for CMO internal control.



#### 11.2 CARTON LABEL

The barcode nameplate is pasted on each box as illustration, and its definitions are as following explanation



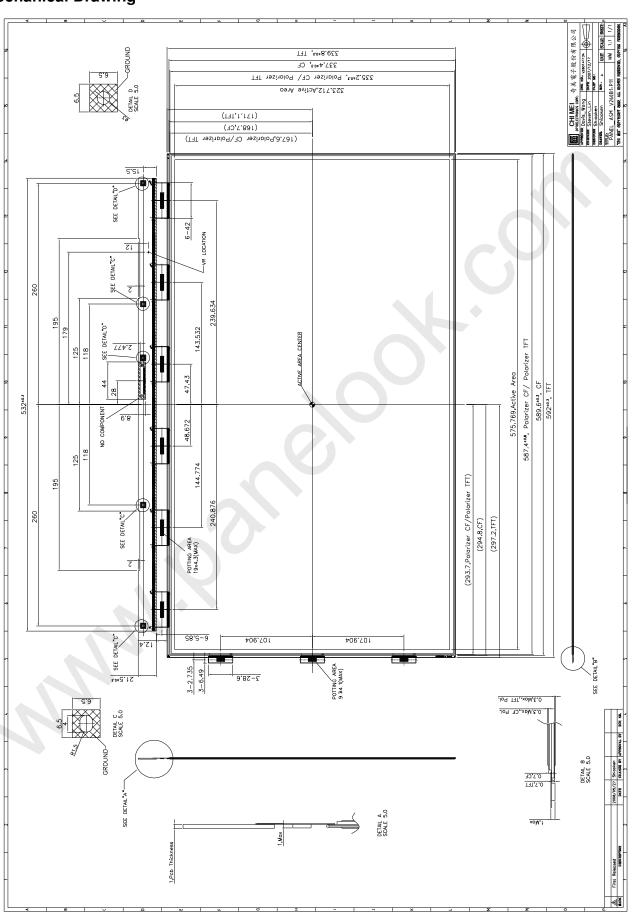
(a) Model Name: V260B1- P12(b) Carton ID: CMO internal control

(c) Quantities: 15



Issued Date: Dec. 16, 2009 Model No.: V260B1-P12 **Approval** 

# 12. Mechanical Drawing



26