FOR MESSRS: DATE: .Mar 26th.2004

CUSTOMER

CUSTOMER'S SPECIFICATION

(42"SD V3.1)

107cm (42 Inch) Wide Plasma Display Module

MODEL : S42SD-YB03

(NTSC/PAL)

* This specification will be approved by both CUSTOMER and Samsung SDI Co.,Ltd.
* Please return one of this specification with your signature for approval.

Proposed by: Approved by:

Signature **Signature .**

General Manager. Yeonyong Choo

Quality Innovation Team,

PDP) Division,

Revision History

Revision	Date	Description Of Changes	Approval
1	AUGUST. 09. 2003	Newly established	
2	OCT. 16. 2003	Non-supply items(38p)	
3	**Nov. 12th 2003**	**- Display Performance(7p)** **- Gamma Chracteristic(14p)**	
4	Feb. 18 2004	- Power spec Update(25-26p)	
5	Feb. 23 2004	**- Absolute MaximumRatings(16p)**	

TABLE OF CONTENTS

1. DESCRIPTION

The S42SD-YB03 is a 42-inch wide full color plasma display module with a resolution of 852(H) × 480(V) pixels. The display module includes Display Panel, Panel driving electronics, Logic controller and Power supply .

2. FEATURES

- Wide aspect ratio(16:9) 42 inch diagonal display screen. The display area is 932.94㎜ wide and 532.80㎜ high.
- Slim and light weight. The display module is 66.1㎜ in depth and weights only 20.0㎏ include power supply.
- 16.77 million colors by combination of 8 bits R,G and B digital data
- High brightness, High contrast, Wide viewing angle. The screen has a white peak brightness of .Typical 1000cd/㎡(NTSC), contrast of Typical. 3000:1 and a viewing angle of greater than 160° comparable to that achievied with CRTs.

3. PRODUCT NAME AND MODEL NUMBER

- Product name : 42-inch Full Color Plasma Display Module3
  (Abbreviation : PDP Module3)
- Model number : S42SD-YB03

4. FUNCTION OUTLINE

- The plasma display module has APC(Automatic Power Control) function which restrict power consumption within certain value with regard to each display load ratio.

- The plasma display module is operated by following digital video signals; Vertical synchronous signal, Horizental synchronous signal, Enable signal and 8bits data signal of each R,G, and B color. All signals are based on LVDS level.

- The plasma display module is operated at 50HZ or 60Hz frame rate. It is required external frame rate conversion in order to display the other formats.

- The plasma display module requires several types of input voltage; voltage for driving logic board , FET in driving board, sustain, address, reset, scan and x-bias.

- The plasma display module is operated at progressive signal only. It is required external progressive scan conversion in order to display the other formats.

- The plasma display module requires 100~240V, 50/60Hz of input power voltage

5. BLOCK DIAGRAM

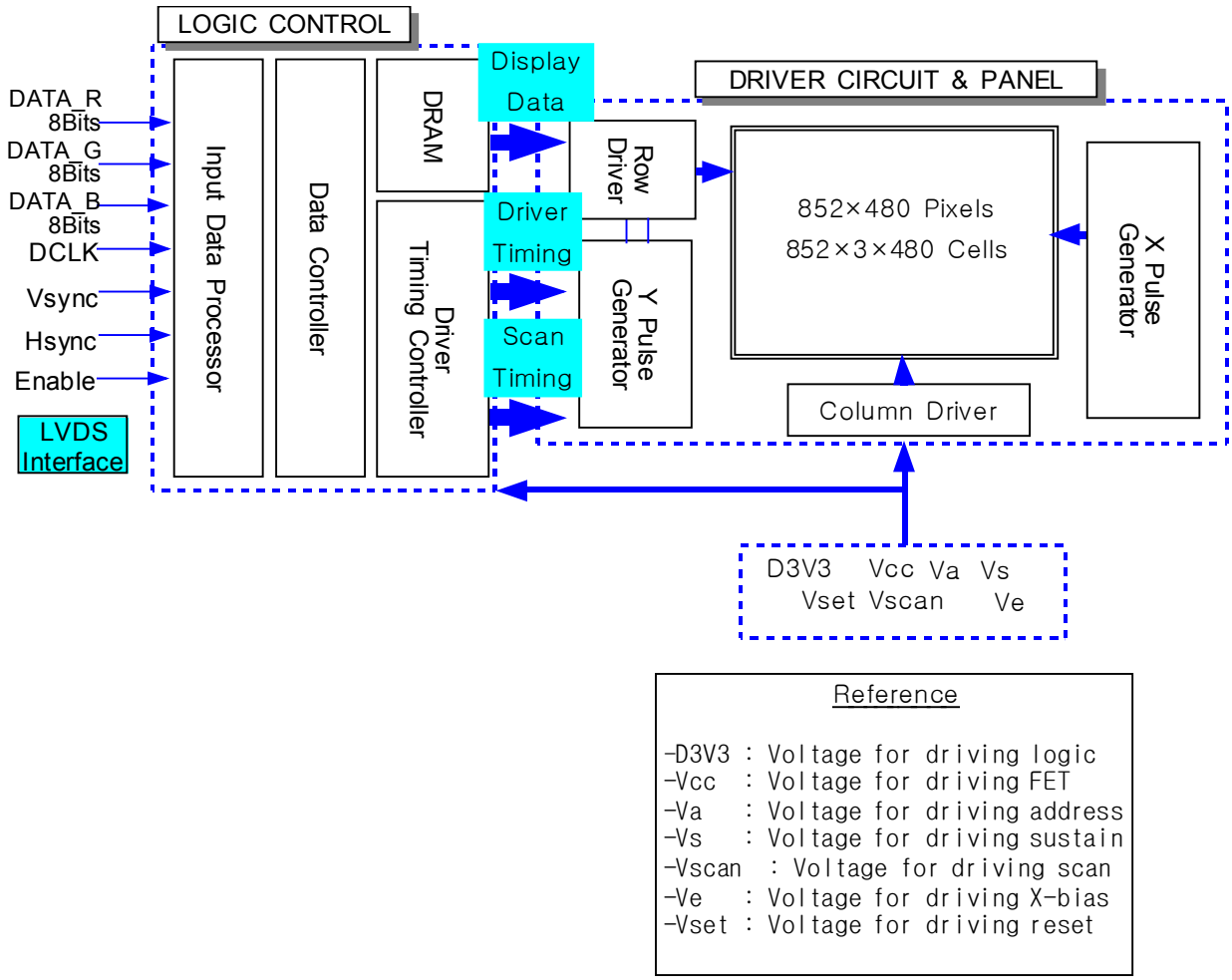


Figure-1. Block Diagram of Plasma Display Module3

6. DISPLAY CHARACTERISTICS

6.1 Display Performance

No	Item	Rating
1	Display Pixels	Horizontal 852 × Vertical 480 pixels (1 pixel = 1 R,G,B cells)
2	Display Cells	Horizontal 2,556 × Vertical 480 cells
3	Pixel Pitch	Horizontal 1.095× Vertical 1.110 ㎜
4	Cell Arrangement	R,G,B Matrix (refer to Figure-2)
5	Effective Display Size	Horizontal 932.940㎜ × Vertical 532.800㎜ [36.73 inch × 20.98 inch]
6	Number of Color	16.77 million colors
7	Peak Brightness *1	Typical 1000 cd/㎡(NTSC)
8	Contrast Ratio *2	Typical 3000 : 1
9	Chromaticity Coordinates (Typical Value)	White (100IRE) : X = 0.285±0.02 Y = 0.290±0.02
108	Viewing Angle *3	Over 160°

[Note]

* 1. Brightness and Color Coordinates are the value that measured with 1% load ratio white pattern . This Signal(LVDS) is supplied from Pattern Generator(VG-828). The condition for measurement is shown in Figure-3.
* 2. Contrast Ratio is calculated from the display brightness and the non-display brightness value, and display condition is shown in Figure-3.

* 3 .Viewing angle is the critical angle at which the brightness is reduced to 50% to the brightness perpendicular to the PDP unit.

6.2 Display Cell Arrangement

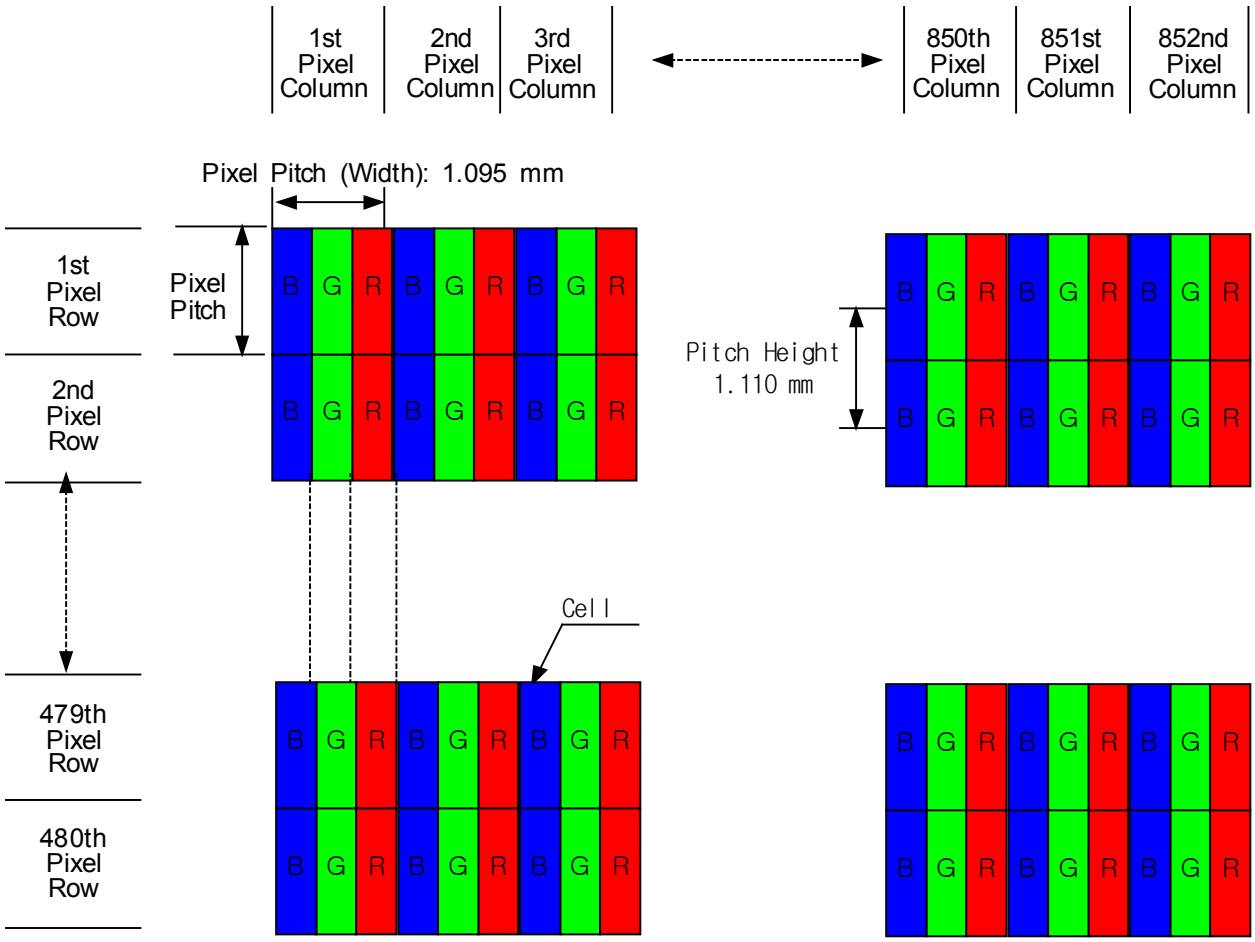


Figure-2. Display Cell Arrangement

6.3 Brightness Measurement Condition

(1) Display Pattern

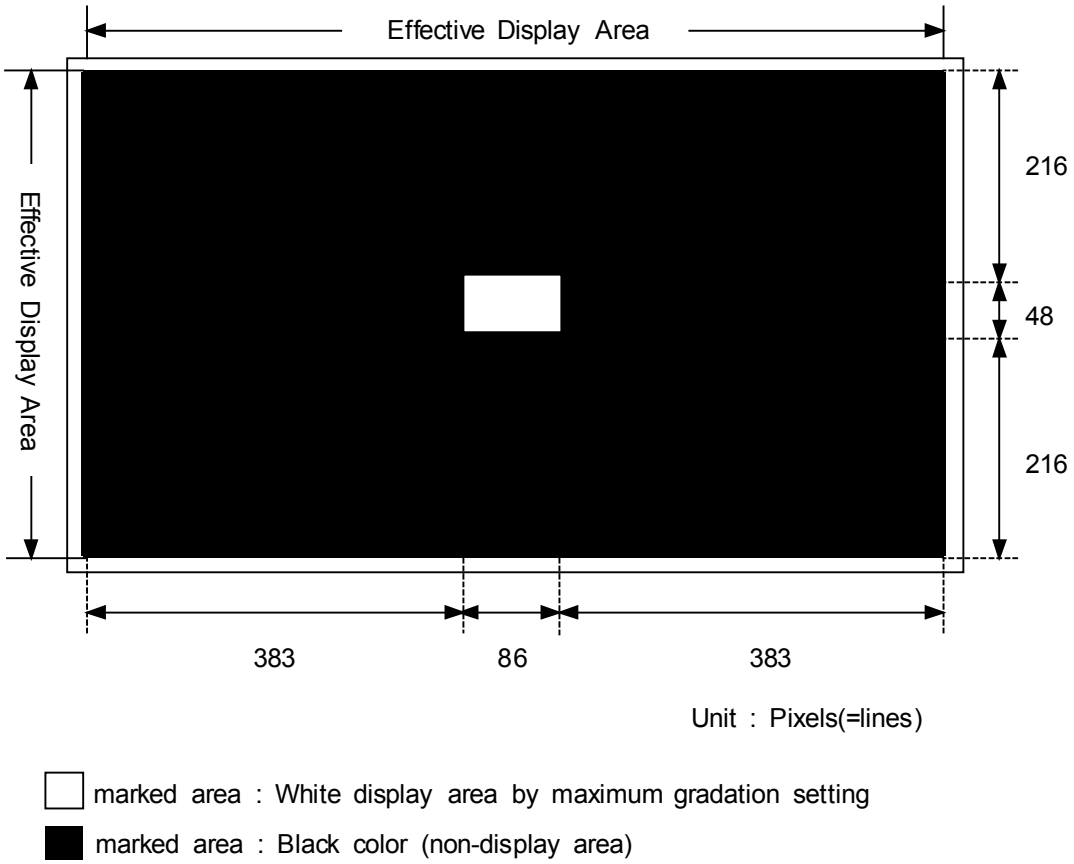


Figure-3. Display Pattern for Brightness & Contrast Ratio Measurement

(2) Display Area ratio : 1% white window

(3) Vsync : 16.7msec or 20msec

(4) Measuring equipment : MINOLTA CA-100+H

(5) Ambient Temperature : Room Temperature

(6) Ambient Light : dark Room (<2 lux)

[Note]

1. Measurement is done within 5 seconds after Power On. The temperature of panel before measurement is room temperature (25℃).

6.4 Contrast Measurement Condition

(1) Measurement point

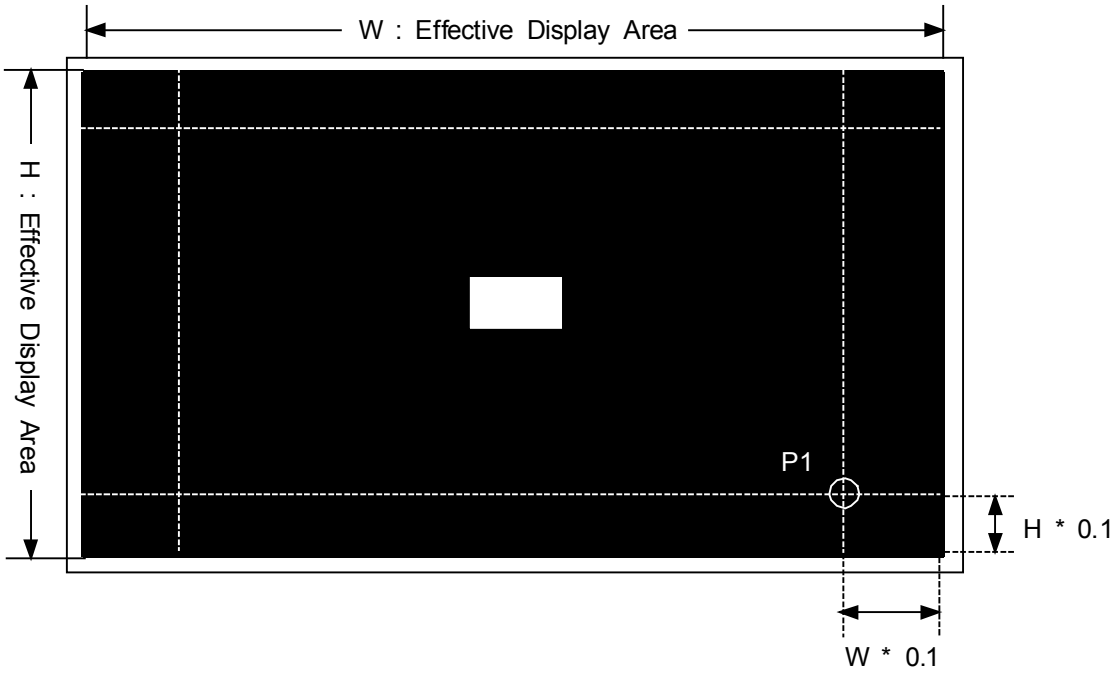


Figure-4. Measurement point

(2) Vsync : 16.7 msec or 20msec

(3) Measuring Equipment : MINOLTA CA-100+H
Pattern Generator(VG-828, LVDS Output).

(4) Contrast Calculation fomula

$$Contrast\ ratio = \frac{Brightness\ of\ 1\%\ white\ window\ Area\ at\ the\ center\ of\ the\ screen}{Brightness\ of\ black\ Area^{*1}}$$

[Note]

1. For mass production test purposes, it is recommended to measure just 1 point, P1 of Figure.-4 on display pattern of Figure.-3.

(5) Ambient Light : Dark Room (<2 lux)

6.5 Display Cell Defect Specification

In some cases, a panel may have defective cells that cannot be controlled.
These defective cells can be categorized into three types;
(1) Non-lighting cell defect : defect in which the cell is always off
(2) Non-extinguishing cell defect : defect in which the cell is always on
(3) Flickering cell defect : defect in which the cell is flickering

The display cell defect specifications define the allowed limits for display cell defects and are used as the criteria in determining weather a panel is shipped.

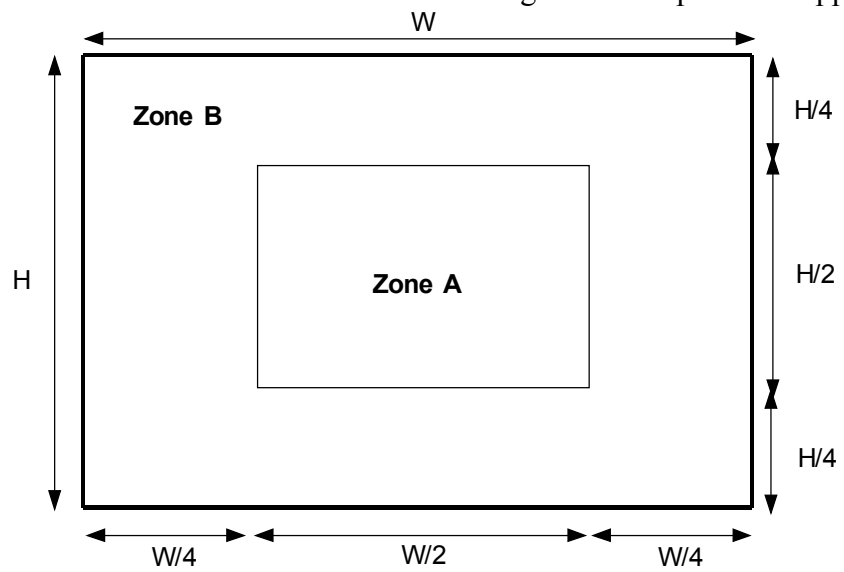


Figure-5. Measuring Area

Item	Specification	
	Number of cell defects	Distance between cell defects
Non-lighting cell defect	Zone A: 2 and less Zone B: 8 and less	Regardless of A and B zone, - Distance between the cells is over 15mm
Non-extinguishing cell defect	Zone A: 1 and less Zone B: 2 and less	
Flickering cell defect	Zone A: 1 and less Zone B: 2 and less	
Total defect	**Total number of cell defects in Zone A and B is less than 8**	

6.6 Brightness Variation Specification

The color-PDP uses ultraviolet light produced by gas discharge to illuminate phosphor. Uneven phosphor coating and inconsistent discharge characteristics cause slight difference in brightness among the sections in a panel.

Item	Definition	Specification
Full white brightness variation	The brightness is measured at 9 points (A1~A9 of Fig-6) on full white pattern. The full white brightness variation as then calculated from the following equations.	10% and less
Equation	$\frac{Max - \bar{x}}{\bar{x}} \times 100\%$ & $\frac{\bar{x} - Min}{\bar{x}} \times 100\%$	

The brightness variation specifications define the allowed limits for brightness differences and the criteria in determining whether a panel is shipped.

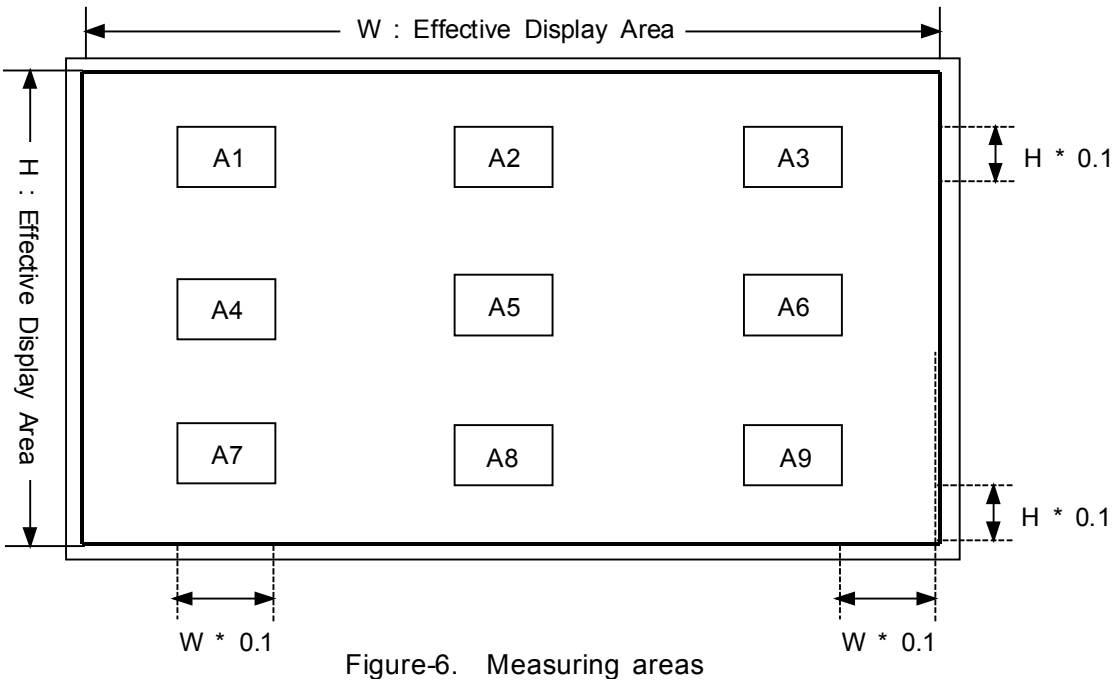


Figure-6. Measuring areas

6.7 Power consumption

6.7.1 APC (Automatic Power Control) Function

The PDP has an APC (Automatic Power Control) function for the panel driver power source. If the total display load ratio exceeds approximately 10%, total power consumption will not exceed certain level.
When the display load-ratio changes from low to high value, the power-consumption will be upper power consumption limit and gradually decreases until it reachs to the lower power consumption limit. (so called "SLOW-APC")

6.7.2 Power Consumption Specification

Power consumption	Power sources
280W ± 10% and less	AC 100V-240V 50/60Hz

[Note]

1. This is the case that the PDP Module includes SDI's Main SMPS.
2. It is measured on full screen white pattern with input gray-level 255 in module.
3. PAL and NTSC is same for Power consumption.
4. It is devised that the maximum power consumption is below 300W at all pattern of full white gray scale.

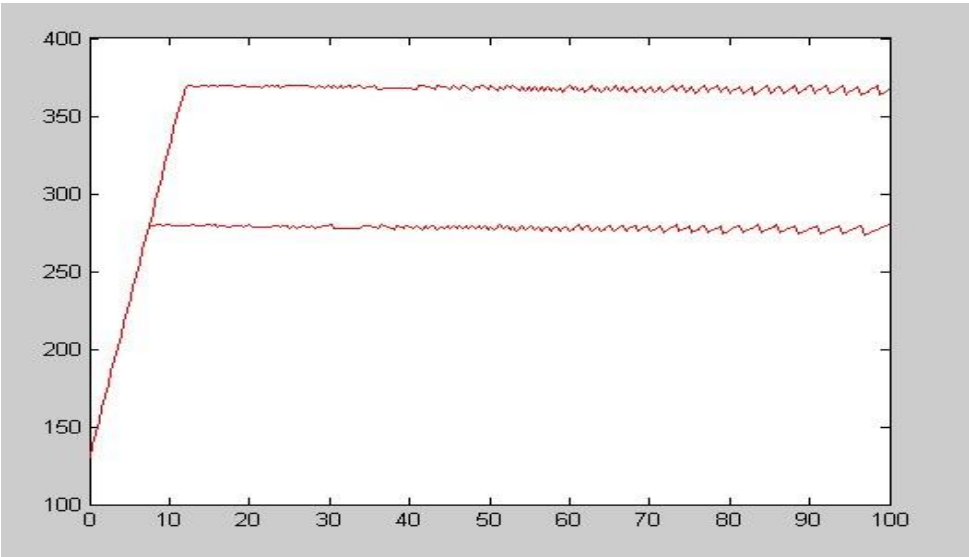


Figure-7. Display load ratio vs. Power consumption

6.8 Gamma characteristics

Our module is normally applied to the 2.2 curve

(refer to the below picture)

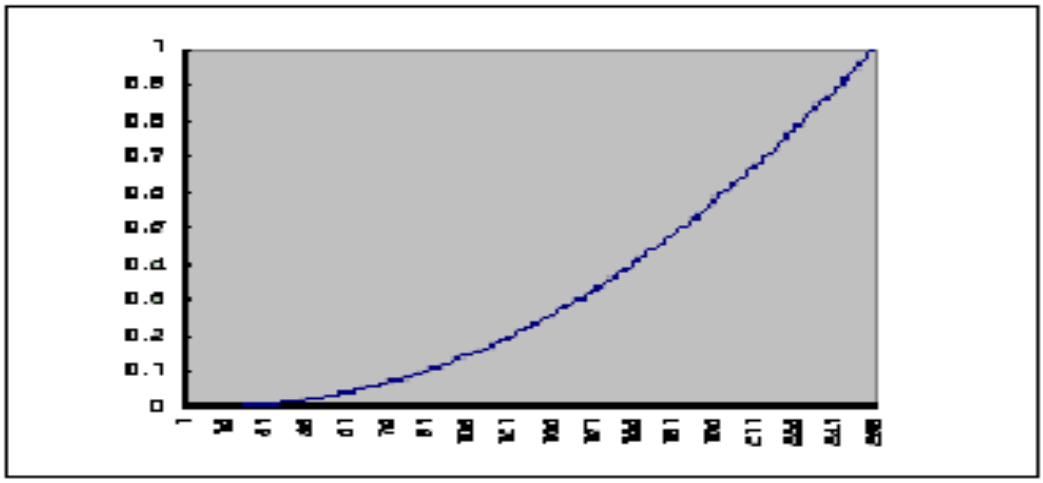
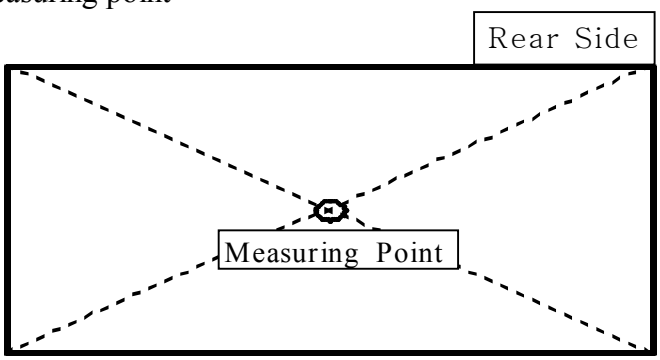


Figure-8. Gamma Curve

7. Sound Pressure Level Specification

7.1 Measurement Condition

(1) Background Noise Level : less than 20dBA
(2) Measuring Pattern : **Only Full-screen white window**
(3) Measuring Euipment : Sound level meter Type 2827 made by B&K
(4) Measuring Distance : 1m from the rear side of PDP Module
(5) Measuring point



7.2 Sound Pressure Level *Typical 32dB

(1) Frequency Range : 50Hz ~ 8kHz
(2) Bandwidth : ⅓ Octave
(3) Weighting Filter : A-weighting network

[Note]

1. Sound Pressure Level is the overall level caculated from the individual band levels of 50Hz ~ 8kHz.

8. MECHANICAL CHARACTERISTICS

8.1 Mechanical Specifications

No	Item	Rating
1	Outer Dimensions	Width 1015㎜ × Height 613㎜ × Thickness 67.2㎜ (include with FPC, TCP COVER) *see Appendix (Mechanical Dimensions Drawing)
2	Weight	Approx. 21.0 kg

8.2 Mechanical Characteristics

No	Item	Rating
1	Vibration	Frequency : 10 ~ 55 Hz Sweep rate : 1 Octave/min. Stroke : x,y direction : 0.35mm z-direction : 0.175mm
2	Shock	Acceleration : less than 20G (X,Y-direction) less than 10G (Z-direction) Duration time : 11ms

[Note] Test Condition : Non- Packaging Operational

9. ENVIRONMENTAL CONDITION

9.1 Recommended Environment Condition

No.	Item	Rating	
1	Temperature	Operational	0 to 50℃
		Storage	-15 to 60℃
		Temperature Slope	1.5℃/minute max.
	* Maximum glass surface temperature must be kept less than 80℃		
2	Humidity	Operational	20 to 70 % RH (no condensation)
		Storage	20 to 75 % RH (no condensation)
3	Pressure	Operational	800 to 1114 hPa (Altitude : 0 to 2,000 m)
		Storage	600 to 1114 hPa (Altitude : 0 to 4,500 m)

9.2 Absolute Maximum Ratings

No.	Item	Rating	
1	Temperature	Operational	0 to 60℃
		Storage	-20 to 70℃
		Temperature Slope	1.5℃/minute max.
2	Humidity	Operational	5 to 85 % RH (no condensation)
		Storage	5 to 85 % RH (no condensation)
3	Pressure	Operational	700 to 1114 hPa (0~3,000m)
		Storage	300 to 1114 hPa (0~9,000m)

※ After testing (Temperature, Humidity, Pressure), the foundamental function and apperance should not be changed.

10. Interface Signal Specifications

10.1 Configuration Context

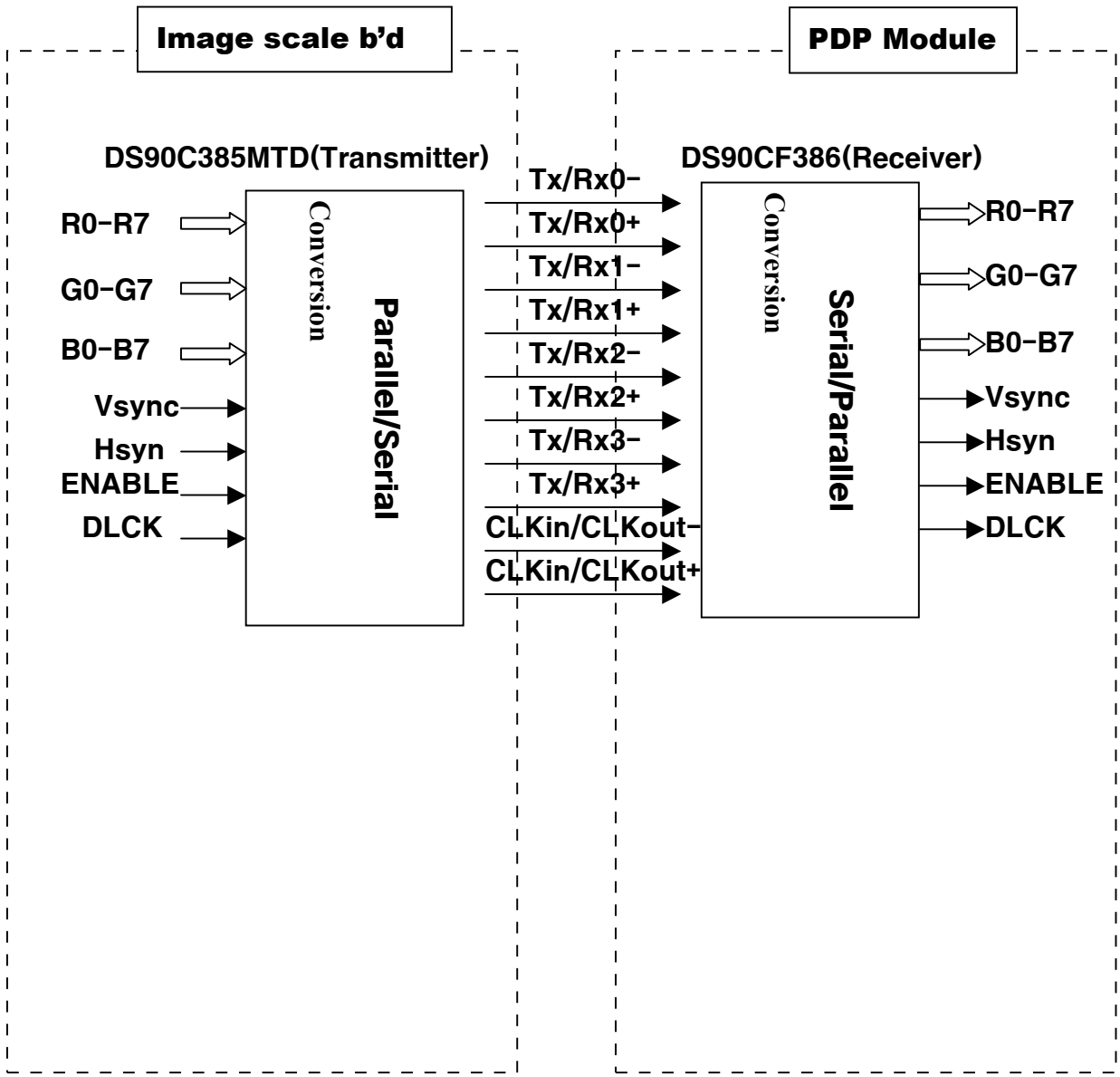


Figure-9. Interface Signal

10.2 Interface Function Specifications (input data and display processing)

- 852-dot data signals are input to this product to display data.
- The Video signal and control signal input section uses a low voltage differential signaling (LVDS) interface.

10.3 Input Signal Definition

No	Item	Signal name		C	Method	Definition
1	Display Signal	Video Signal	RXIN0- RXIN0+ RXIN1- RXIN1+ RXIN2- RXIN2+ RXIN3- RXIN3+	1 1 1 1 1 1 1 1	LVDS Differentials	Differential serial data signal. Input video and timing signals after differential serial conversation using a dedicated transceiver. The serial data signa is transmitted seven times faster than the base signal.
		Dot Clock	RXCLKIN- RXCLKIN+	1 1	LVDS Differential	Differential clock signal. Input the clock signal after differential conversation using a dedicated transceiver. The clock signal is transmitted at the same speed as the base signal.

10.4 LVDS Signal Definition and Function

A video signal (display data signal and control signal) is converted from parallel data to serial data with the LVDS transmitter and further converted into four sets of differential signals before input to this PDP module. These signals are transmitted seven times faster than dot clock signals. The dot clock signal is converted into one set of differential signals.
The LVDS signal definition and function as follows in Italic:

Interface Signal Function			
Symbol	I/O	Function	Remarks
RxIN0-	I	Display Data Signal: R0, R1, R2, R3, R4, R5, G0	LVDS signal
RxIN0+	I		LVDS signal
RxIN1-	I	Display Data Signal: G1, G2, G3, G4, G5, B0, B1	LVDS signal
RxIN1+	I		LVDS signal
RxIN2-	I	Display Data Signal: B2, B3, B4, B5, Hsync, Vsync, ENABLE	LVDS signal
RxIN2+	I		LVDS signal
RxIN3-	I	Display Data Signal and Control Signal: R6, R7, G6, G7, B6, B7	LVDS signal
RxIN3+	I		LVDS signal
RxCLKin-	I	Dot Clock Signal: CLK	LVDS signal
RxCLKin+	I		LVDS signal

10.5 Video Signal Definition and Function

The table below indicates the definition and functions of input video signals before LVDS conversion.

Interfaces Signal Functions		
Symbol	Function	Remarks
R7 to R0	8 bits red video signal (note 1)	Display data signal: R7: MSB*, R0: LSB**
G7 to G0	8 bits green video signal (note 1)	Display data signal: G7: MSB*, G0: LSB**
B7 to B0	8 bits blue video signal (note 1)	Display data signal: B7: MSB*, B0: LSB**
Hsync	Horizontal synchronous signal	This signal specifies the data period for one horizontal line. Control of the next line begins at the rising edge of Hsync.
Vsync	Vertical synchronous signal	Timing signal that controls the start of the screen. Control of the next screen begins at the rising edge of Vsync.
DCLK	Clock for video signal	Latch the video signal at falling edge.

[Note]
* MSB: Most Significant Bit (Highest Intensity Bit)
** LSB: Least Significant Bit (Lowest Intensity Bit)

10.6 Electrical Condition of Interface Signals

10.6.1 Maximum Ratings

Common conditions : Ta = 25℃, Vcc = 3.3V

Absolute Ratings						
Item			Parameter	Symbol	Ratings	Unit
Input Signals	LVDS	Rx0-/+,Rx1-/+,Rx2-/+, Rx3-/+,CLKin-/+	Input Voltage	Vi	-0.3~3.6	V

10.6.2 Electrical Characteristics

Common conditions : Ta =25℃, Vcc = 3.3V

Electrical Characteristics							
Signal	Item	Symbol	Conditions	Min.	Typ.	Max.	Unit
LVDS	Differential input High Threshold	V_{th}	V_{CM}=1.2V	-	-	100	㎷
	Differential input Low Threshold	V_{tl}	V_{CM}=1.2V	-100	-	-	㎷
	Input current	I_{in}	V_{IN}=+3.6/GND	-	-	±10.0	㎂

10.7 Video Signal Interface Timing Conditions

The table below indicates the conditions of input video signal before LVDS conversion. These conditions must be satisfied. Refer to figure of timing chart.

- Timing specification. in below chart(video input signal timing – Timing row) could be changed by customer's dot clock frequency. detailed specification will be decided after deliberation between customer & SDI. (if customer decide on dclk frequency to 26.074MHz(896X485), timing specification could be as follows : Tvhs = 485, Twv = 2, Tvh = 3, Thv = 2)

Video Input Signal Timing (NTSC/PAL)			
Symbol	**Timing (ref. dclk :27MHz)**	**Unit**	**Remarks**
Tvsync	Refer to 'Remark'	Hz	- PAL Normal Mode : 48 ~ 52Hz - PAL FF Mode : 52 ~ 55 Hz - NTSC Normal Mode : 58 ~ 62 Hz - NTSC FF Mode : 62 ~ 65 Hz - NTSC Mask Mode : above 65 Hz * FF Mode ☞ Reduction of luminance makes image darker than usual case. * Mask Mode ☞ Disregard of Vsync which is over than 65Hz. But image is still working on PDP module in this case because one of two unstable Vsync is recognized as effective Vsync for normal image data processing in PDP module.
Tvhs (1frame)	502	Hsync	NO. of Hsync in 1 Vsync(more than 485, changeable) * NTSC : Tvhs = 16.67 ms/(Thsync * dclk period)
Twv	more than 2	Hsync	Vsync on time
Tvh	14	Hsync	Vsync back porch (more than Twv, changeable)
Thv	8	Hsync	Vsync front porch (changeable) * Thv = Tvhs – Twv – 480Hsync
Thsync	896	Dclk	Hsync width
Twh	more than 5	Dclk	Hsync on time
Thc	27	Dclk	Hsync back porch (changeable)
Tch	17	Dclk	Hsync front porch(changeable) * Tch = Thsync – Thc – 852dclks
Tclk	27	MHz	Dot clock(DCLK) frequency (26.074~32.96MHz changeable)
Tsud	10	ns	Minimum Data setup time
Thd	10	ns	Minimum Data hold time

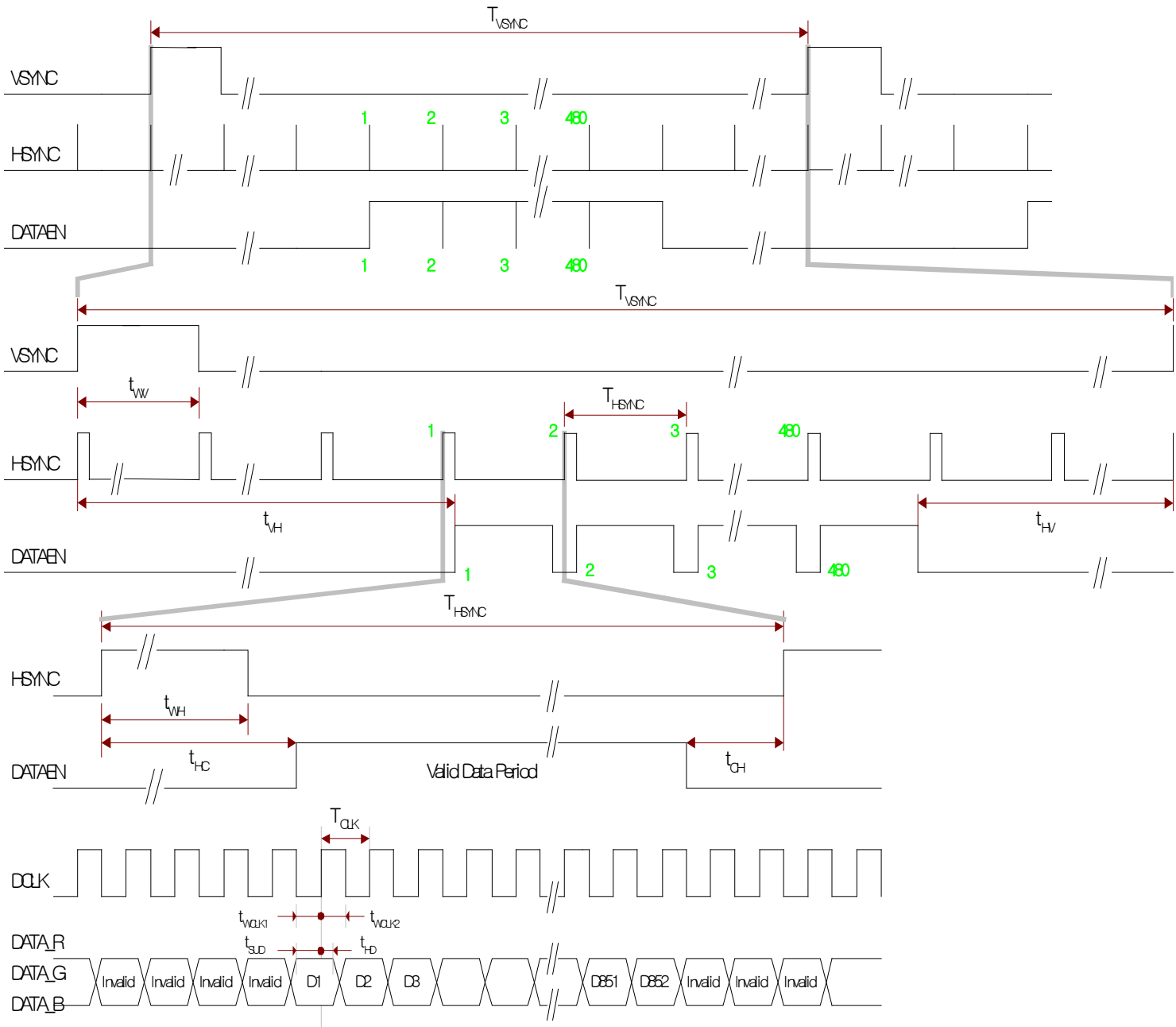


Figure-11. Video Input Signal Timing Chart

10.8 LVDS Interface Timing Conditions

This PDP module uses an LVDS interface for the signal input. For details of the input signal timing conditions, refer to the data sheets prepared by the LVDS transmitter IC maker. This PDP module uses National Semiconductor's DS90CF386.

10.9 LVDS Connection Specifications

Figure-12 shows the connection specifications and signal assignments of the LVDS interface IC.
Do not connect or disconnect the connector when the system power in on. Otherwise, the LVDS interface IC could be damaged.

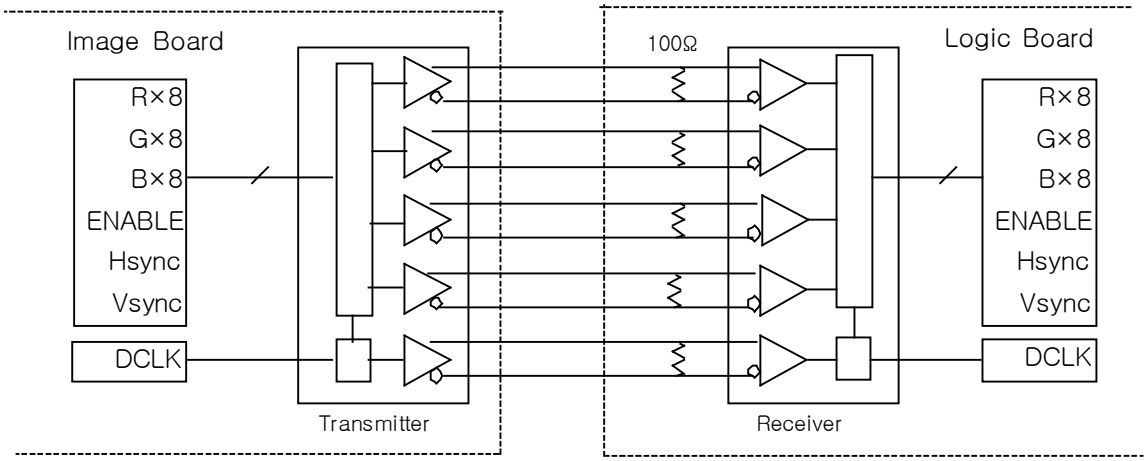


Figure-12. LVDS Interface Connection

10.10 Connector Specifications

Pin No.	Pin Name(LA03)
1	GND
2	GND
3	RxIN0-
4	RxIN0+
5	GND
6	GND
7	RxIN1-
8	RxIN1+
9	GND
10	GND
11	RxIN2-
12	RxIN2+
13	GND
14	GND
15	RxCLKIN-
16	RxCLKIN+
17	GND
18	GND
19	RxIN3-
20	RxIN3+
21	GND
22	NC
23	NC
24	NC
25	NC
26	GND
27	NC
28	GND
29	NC
30	GND
31	NC

1.LA03 connector is located in Logic Board.

2. Pin to Pin pitch of connector LA03 is 0.625mm.

3. Connector LA03(parts #:1554A-3141R) is supplied by UJU Electronics. This Item is compatible with FI-WE*P.HF(JAE, JAPAN)
   -. Module side connector: FI-WE*P.HF or 1554A-3141R.
   -. Matching connector: GT121-HS (housing), GT121-TS (contact)
   -. Connector supplier: FI-WE*P.HF(JAE, Japan Aviation Industry, JAPAN)
   -.1554A-3141R(UJU Electronics, KOEA)
   -. GT121-HS/TS(LG cable, KOREA)
   -. Fitting Cable: AWG#28 to 32 twist pair cable

4. The length of mating cable to LA03 is recommended to be not longer than 25.0cm.

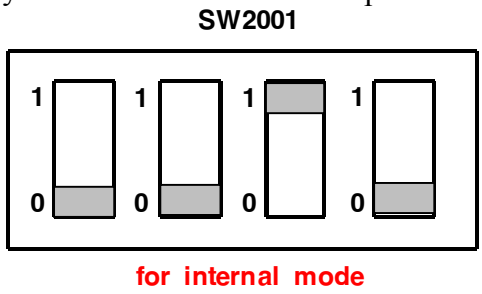
5. Pin numbering order : Right to Left view from component side of Logic Board.

6. Reserved for factory use only. This pin should be disconnected in case of customer's use.

[Note]

1 : If using a long cable, applied voltage may be dropped because of its resistance. Specified voltage should be applied correctly at the input of the module side connector.

If you want to use the internal pattern in module for test, you have to set hardware slide



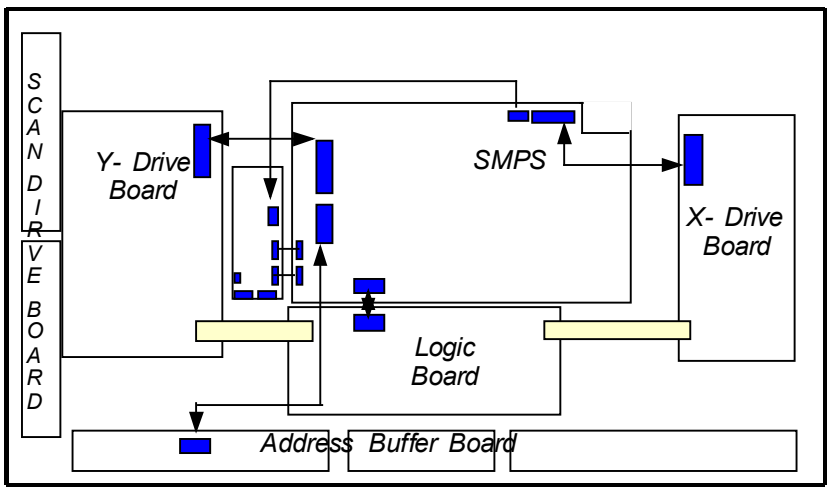
What means each switch is follow

- First option switch from left side : Don't Care
- Second option switch from left side : External/Internal Selection (On:External, Off:Internal)
- Third option switch from left side : Internal Dot Clock Selection (On:Internal, Off:N.C)
- Fourth option switch from left side : External Dot Clock Selection (On:External, Off:N.C)

*(b): Customers can set these values considering their specifications

11. SMPS SPECIFICATIONS

11.1 Connector Location



[Note]

1. Layout Schematic is viewed from back side of PDP Module.
2. The Output Power for Image board is separated from Main SMPS.
3. The Power for Image board is output by DC link Voltage boosted through PFC.
4. The Input Power Connector in Y-Drive Board is named as "SY".
5. The Input Power Connector in X-Drive Board is named as "SX".
6. The Input Power Connector in Logic Board is named as "SL".
7. The Input Power Connector in Address Buffer Board is named as "BUFFER"..

11.2 DC outputs for Image Scaler Board

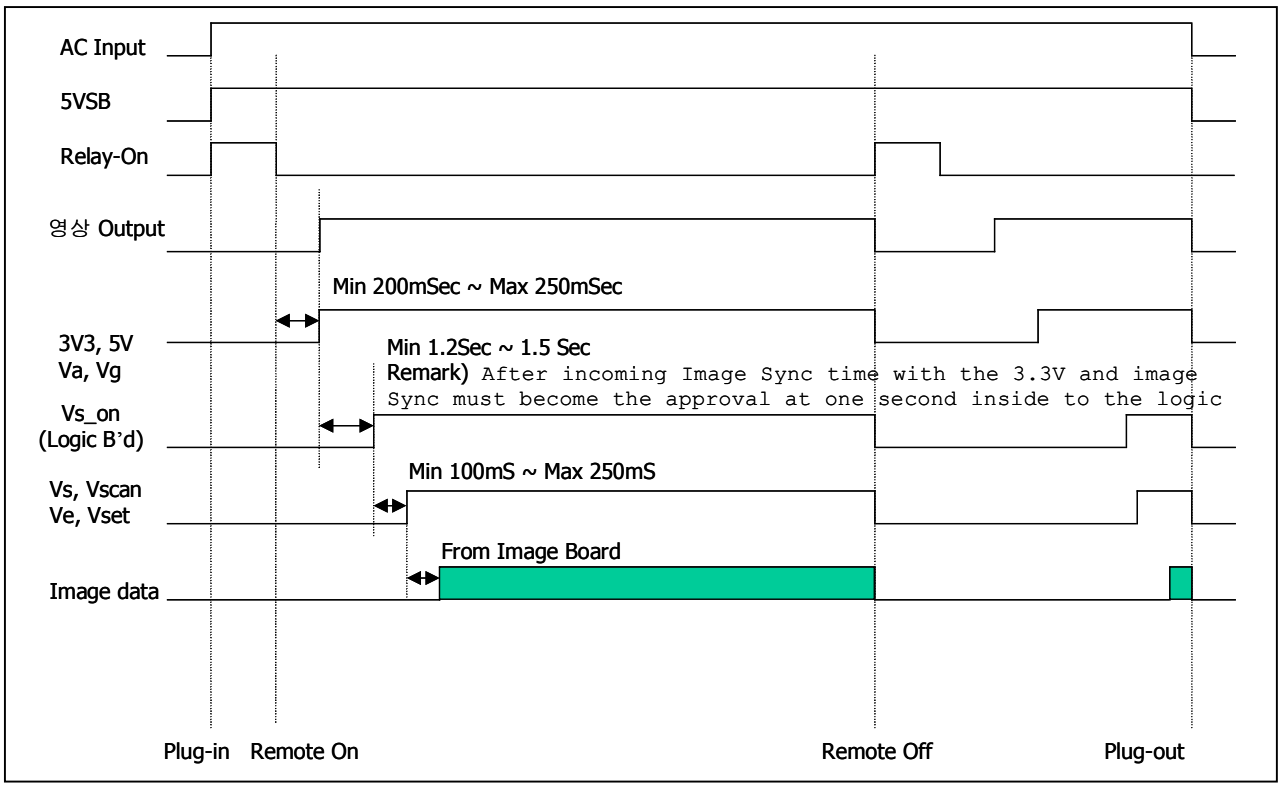
Name	Voltage [V]	Ripple [mVpp]	Current[A]			Remarks
			Min.	Typ.	Max.	
D3V3	3.3	100	1.0	1.0	1.5	
D6V	6.0	100	0.7	1.4	2.0	
Vaudio	12.0	100	0.0	2.0	3.5	
Vfan	12.0		0.0	-	1.0	Same with Vaudio
Vt	33.0	-			0.001	Voltage for Tunner
5VSB	5.0	100	0.1	-	1.0	
A6V	6.0	100	0.1	-	1.0	
A12V	12.0	200	0.1		1.0	

11.3 Pin assignment of connectors for Power Supply

: IMAGE BOARD Output Connector & Pin Assignment(USER ONLY)

Location Num.	CN9003	CN9004	CN9005
Function	AUDIO	IMAGE_D	DC_LINK
Pin Num.	10 Pin	11 Pin	5 Pin
Connector Type	MOLEX 35313-10P	MOLEX 35313-11P	Molex 35313-0510
Pin No.	Pin Name	Pin Name	Pin Name
1	A6V	D6V	PFC
2	GND	GND	N.C
3	A12V	D3V3	0V
4	GND	D3V3	0V
5	Vamp	GND	DC-Vcc
6	Vamp	GND	
7	GND	(12V)	
8	GND	Relay_ON	
9	33Vt	GND	
10	GND	5VSB	
11		THERM_DET	

11.4 Power Applying Sequence



12. Others

12.1 Mechanical Dimensions Drawing

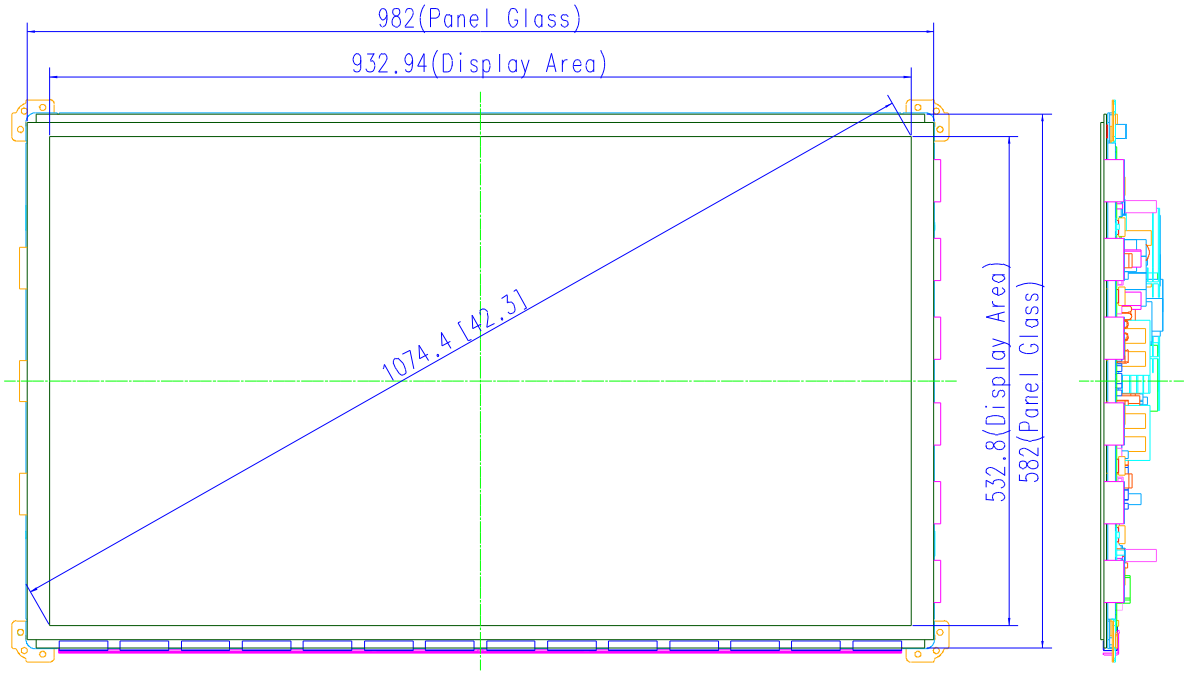


Figure-17. Mechanical Dimension of Front Side

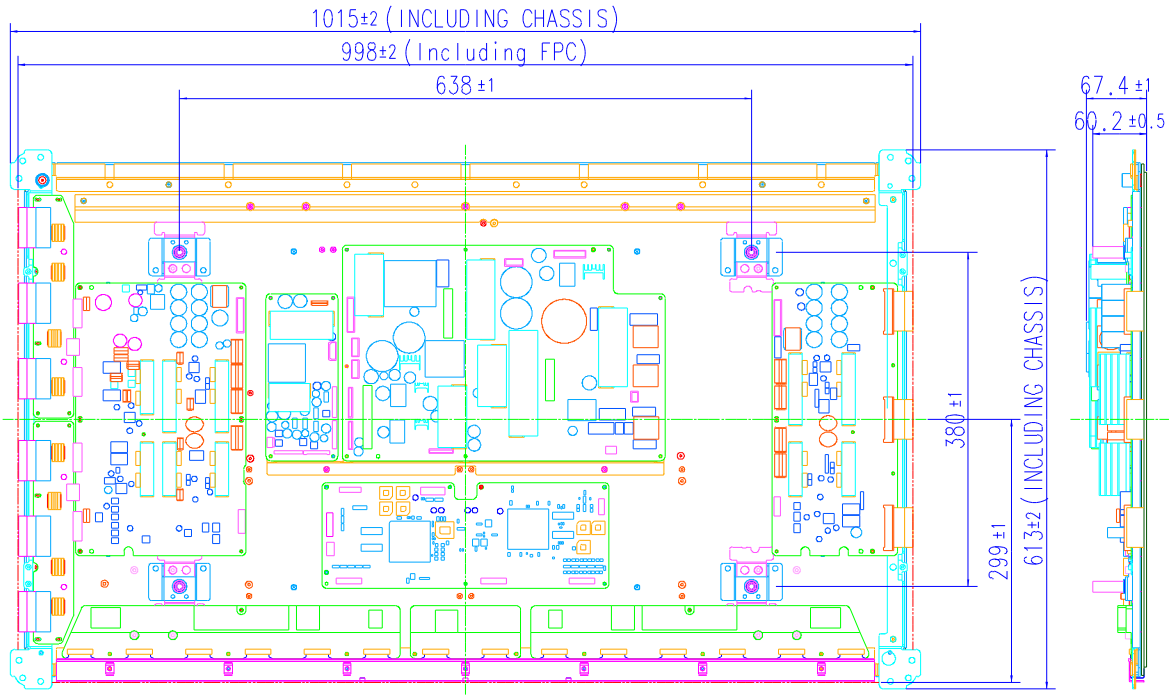
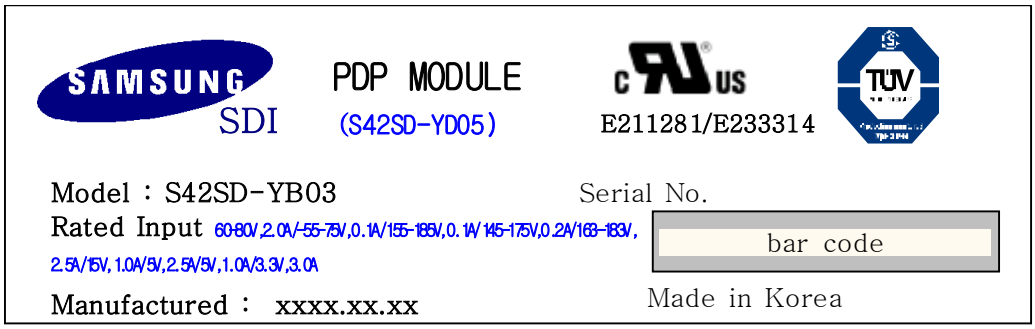


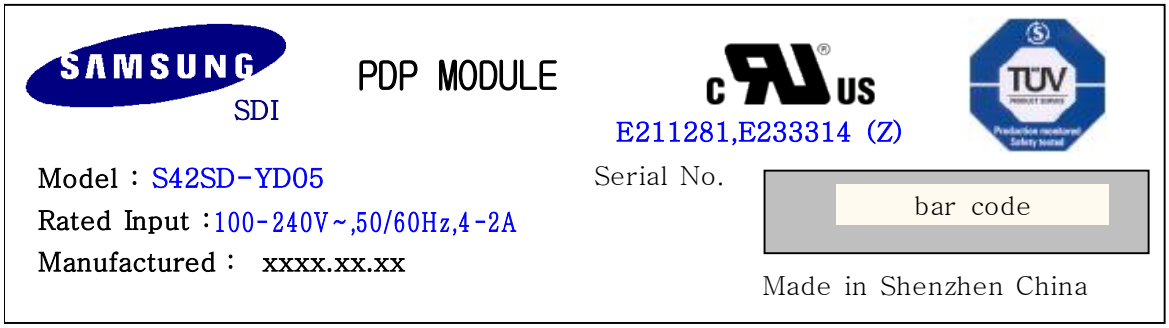
Figure-18. Mechanical Dimension of Rear Side

12.2 Label

12.2.1 Types of Label

(1) Label for the PDP Module





(2) Label for power specification

☐ NTSC			☑ NTSC/PAL		
Va	Vsc	Vs	Ve	Vset	
VSB	D5V	D15V	VAUDIO	VFAN	

13.2.2 Label Location

To be determined

12.3 Serial No.

1 2 1 3 0 5 1 0 0 0 0 1

Serial No : 0001~9999
Date : 01~31
Month : 01~12
Year : 0 (2000) ~ 9 (2009)
Line No : 1 ~ 9 (0 : Pilot Line)
Type : 02~48 (ex.42SD V3 : 12) (Step of even)

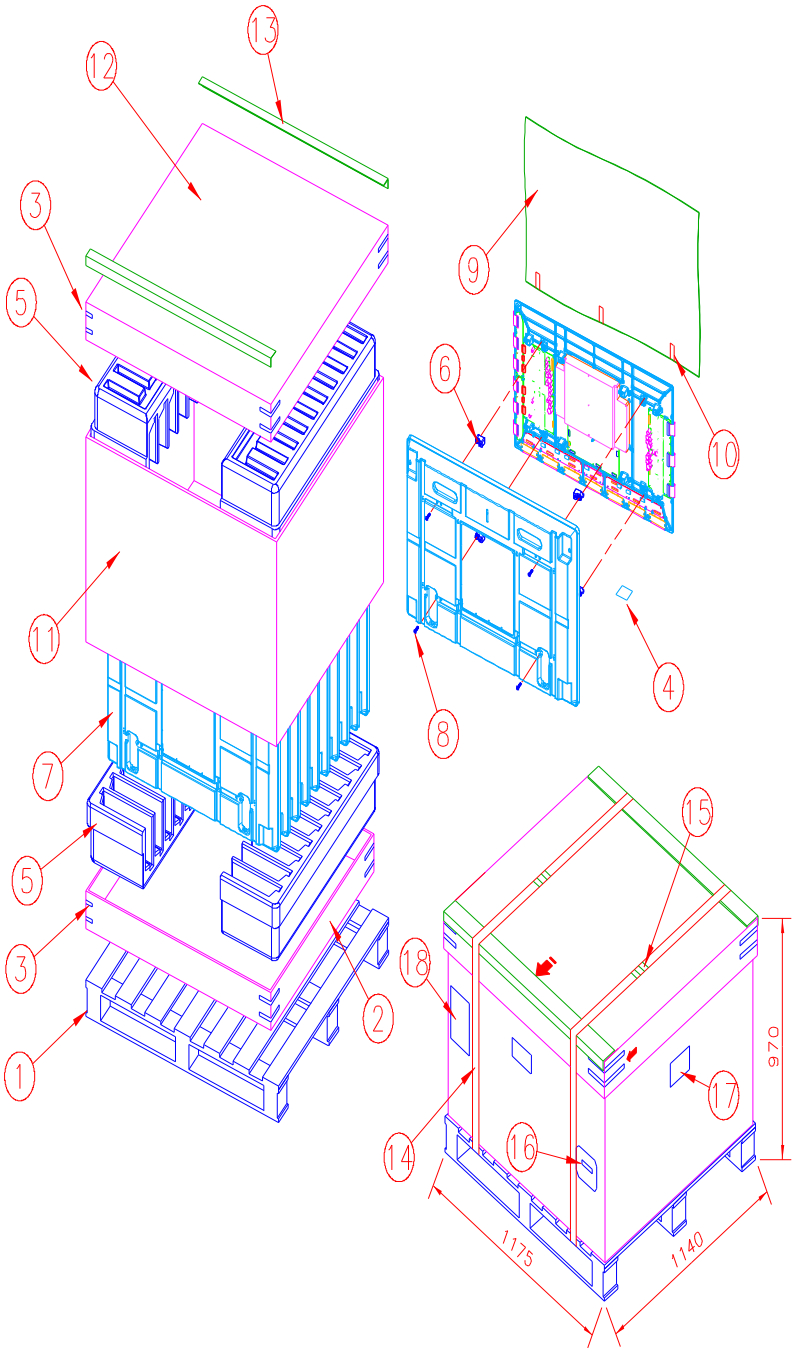
13. PACKING(This items can be changed next version a little bit)

13.1 Packing Dimension and Parts List

- Number of Module in 1 package: 10 Modules
- Packing dimensions (W*L*H): 1175*1140* 970 (mm) (Including Pallet :145mm)
- Weight: 270 ± 5 (Kg)

13.2 Packing Assembly Drawing

NO	Item
1	PALLET
2	PACKING-COVER,BOT
3	TAPE-FILAMENT
4	CHEMICALS
5	CUSHION-SET
6	SPACER-HOLDER,P
7	PACKING-MODULE
8	SCREW-ASS'Y MACH
9	BAG-ANTISTATIC
10	TAPE-ACETATE
11	PACKING-BOX-CENTER
12	PACKING-COVER
13	GUIDE-PACK
14	BAND-PP
15	LOCKER-BAND,CLIP
16	LABEL-SHOCKWATCH
17	LABEL-INSPECTION
18	TRACEABILITY



14. RELIABLITY

14.1 MTBF Value

Mean Time Between Failure is dependent on overall PDP module design.

MTBF : 20,000hours (environmental temperature : 25℃)

※ Condition : 25℃, Used moving Picture Signal

14.2 Expected Service Life

#1. Definition

The expected service life is defined by the following two categories.
And the life time is defined by the reached time either (1) or (2).

(1) The white color brightness level becomes half (50%) of its initial value, which is determined by the phosphor characteristics.

(2) The number of display cell defects increases to double the specification value, which is depending on the discharge characteristics.

#2. Test condition and life time

The expected service life time differs with display conditions as below.

(1) Full screen white color display

Life time : 30,000 hours

- Test condition : 8Hr/Day

14.3 Disclaimer

This Specification stipulates the final and comprehensive requirements for the respective products hereof. Beyond this Specification, it is the responsiblity of the customer to explicitly disclose any additional requirements, information or reservations regarding these requirements to Samsung SDI prior to implementation, where any and all disclosures of the customer shall be with an authorized representative of Samsung SDI in writing. Samsung SDI shall not be responsible for safety, performance, functionality or compatibility of the system with which the Samsung SDI-supplied components are intergrated unless such features have been expressly communicated and described in the Specification. SAMSUNG SDI MAKES NO GUARANTY OR WARRANTY, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, TO ANY PARTY. Moreover, any party should do their own due diligence regarding these requirements prior to implementation.

15. WARNING / CAUTION / NOTICE

TO PREVENT POSSIBLE DANGER, DAMAGE, AND BODILY HARM, PLEASE CONSIDER AND OBSERVE ALL WARNINGS AND CAUTIONS CONTAINED IN THIS PARAGRAPH.

15.1 Warning

If you do not consider the following warnings, it could result in death or serious injury

(1) The S42SD-YB03 Module is controlled by high voltage about 350V. If you need to handle the Module during operation or just after power-off, you must take proper precautions against electric shock and must not touch the drive circuit portion and metallic part of S42SD-YB03 Module within 5 minutes. The capacitors in the drive circuit portion remain temporarily charged even after the power is turned off. After turning off the power, you must be sure to wait at least one minute before touching the Module. If the remain voltage is strong enough, it could result in electric shock.

(2) Do not use any other power supply voltage other than the voltage specified in this product specifications. If you use power voltage deviated from the specifications, it could result in product failure.

(3) Do not operate or install under the deviated surroundings from the environmental specification set for the below; in moisture, rain or near water-for example, bath tub, laundary tub, kitchen sink; in a wet basement; or near a swimming pool; and also near fire or heater - for example, near or over radiator or heat resistor; or where it is exposed to direct sunlight; or somewhere like that. If you use the S42SD-YB03 Module in places mentioned above, it could result in electric shock, fire hazard or product failure.

(4) If any foreign objects (e.g. water, liquid and metallic chip or dust) entered the S42SD-YB03 Module, the power supply voltage to the S42SD-YB03 Module must be turned off immediately. Also, never push objects of any kind into the S42SD-YB03 Module as they may touch dangerous voltage point or make short circuits that could result in fire hazard or electric shock.

(5) If smoke, offensive smell or unusual noise should come from the S42SD-YB03 Module, the power supply voltage to the S42SD-YB03 Module must be turned off immediately. Also, when the S42SD-YB03 screen fails to display any picture after the power-on or during operation, the power supply must be turned off immediately. Do not continue to operate the S42SD-YB03 Module under these conditions.

(6) Do not disconnect or connect the S42SD-YB03 Module's connector while the power supply is on, or immediately after power off. Because the S42SD-YB03 Module is operated by high voltage, and the capacitors in drive circuit remain temporarily charged even after the power is turned off. If you need to disconnect or reconnect it, you have to wait at least one minute after power off.

(7) Do not disconnect or connect the power connector by a wet hand. The voltage of the product may be strong enough to cause an electric shock.

(8) Do not damage the power cable of the S42SD-YB03 Module, also do not modify it.

(9) When the power cable or connector is damaged or frayed, do not use it.

(10) When the power connector is covered with dust, please wipe it out with a dry cloth before the power on.

15.2 Caution

If you do not consider the following cautions, it may result in personal injury or damage facilities.

(1) Do not set the S42SD-YB03 Module on an unstable place, vibrating place and inclined place. The S42SD-YB03 Module may fall or collapse, and it may cause serious injury to a person, and serious damage to the product.

(2) If you need to remove the S42SD-YB03 Module to another place, you must turn off the power supply and detach the interface cable and power cable from the S42SD-YB03 Module beforehand, and watch your steps not to step on the cables during the operation. If the cables are damaged during the transport, it may result in fire hazard or electric shock. Also if the S42SD-YB03 Module is dropped or fallen, it may cause a serious injury to a person.

(3) When you draw or insert the S42SD-YB03 's cable, you must turn off the power supply and do it (with) holding the connector. If you focibly draw the cable, the electric wire in the cable can be exposed or broken. It may result in fire hazard or electric shock.

(4) When you carry the S42SD-YB03 Module, it should be done with at least two workers in order to avoid any unexpected accidents.

(5) The S42SD-YB03 Module has a glass-plate. If the S42SD-YB03 Module is inflicted with excessive stress - for example; shock, vibration, bending or heat-shock, the glass plate could be broken. It may result in a personal injury. Also, do not press or strike the glass surface.

(6) If the glass panel was broken, do not touch it with bare hand. It may result in a cut injury.

(7) Do not place any object on the glass panel. It may be the cause of the scratch or break of
   A. the glass panel.

(8) Do not place any object on the S42SD-YB03 Module. It may result in a personal injury due to fall or drop.

15.3 Notice

When you apply the S42SD-YB03 Module to your system or handle it, you must make sure to follow the notices set forth below.

□ ***Notice to your system design***

(1) The S42SD-YB03 Module radiates the infrared rays of between 800 and 1000 ㎚. It may bring an error in operating the IR-remote controller or another electric system. Please consider (to) providing the IR absorb filter in your system, and evaluating it.

(2) The S42SD-YB03 Module has a high-voltage switching circuit and a high-speed clock circuit. Therefore, you have to apply and evaluate the EMC consideration of your system.

(3) The S42SD-YB03 Module has a glass plate. In your mechanical design, please (consider to) avoid any excessive shock and stress to the glass surface. Also be careful not to demage the tip-tube at the corner of glass plate. If the glass plate and tip-tube are demaged, the S42SD-YB03 &Module may fail.

(4) In your system, for your safety, please have the remaining voltage of the S42SD-YB03 Module leaked immediately after power-off.

(5) As the S42SD-YB03 Module generates heat during operation, please make sure the well-radiation and well-ventilation are provided for your system design. The S42SD-YB03 Module may be defected by the usage out of the specified ambient temperature.

(6) The ventilation design in your system should have a back-cover that is able to prevent moisture and dust from getting into the inside of the electric circuit, because the S42SD-YB03 Module has high-density electric parts with high-voltage. If the driver circuit has condensation or dusts, it may cause a short circuit or dielectric breakdown.

(7) If the S42SD-YB03 Module displays a fixed pattern on the screen for are extended period of time, it could make the differences in Luminance and chromaticity between fixed pattern area and other areas. It is because the Luminance of the fixed pattern area becomes lower than the other areas due to the degration of the phosphor, but this phenomenon is not a failure. On the other hand, when the display pattern is changed, the illunminated areas may maintaintheir Luminance temporarily (for few minutes). This phenomenon is a characteristic from color S42SD-YB03 itself due to the activation of the discharge surface in the S42SD-YB03 panel, which is normal. If you have an intention of displaying the fixed pattern, the screen-saver technic should be applied to your systems in order to minimize the image retention.

(8) The S42SD-YB03 Module is not intended for the equipments which require extremely high reliability such as aerospace equipments, nuclear control systems or medical equipments for life support.

(9) Based on the requirements of the safty standard (UL, EN etc.), be sure to add the filter thatcome up to the impact test to the glass pate.

□ ***Notice to the operation and handling of the S42SD-YB03 Module***

(1) To prevent defect or failure, please check the cable connections and power-supply condition before power-on.

(2) The S42SD-YB03 Module is controlled by high voltage. Not only during operation but also immediately after power-off, do not disconnect or reconnect the S42SD-YB03 Module's connector because it may result in failure. If you need to disconnect or reconnect, you have to wait at least one minute after power-off.

(3) The S42SD-YB03 Module is equipped with various protection circuits that automatically stop the Module operation, if an interface signal or the power voltage becomes abnormal during operation. If the S42SD-YB03 Module stops suddenly during operation, please check the conditions of input signal or power source before restarting.

(4) For the protection of the circuit, if an abnormal situation is occured, the high output voltage will be shut down by (watching) the internal input voltage (Vs/ Va/ Vcc). In this case, the Module power resetting is necessary to recover. There are also fuses in the Vs and Va power supply system to prevent smoking and firing by the excessive current. The protecting function of the address driver of keeping a supervisory device for the internal current is provided in the Va power supply system. Therefore, the number of sub-frames decreases to a proper value when the Ia current exceeds a constant value occasionally.

(5) If an abnormal situation such as disconnecting of the input connector occurs, this Module will be on stand-by, which the supply of high output voltage is stopped even if an external power is being supplied. If a normal signal is inputted after this, normal operation state, operations can be restarted again by re-inputting a normal signal. However, it is necessary to rest the Module power when tVH and/or tHV are less than the minimum value provided in the specification

(6) To ensure reliable operation of the S42SD-YB03 Module and to protect it from overheating, do not wrap or cover it with a cloth or like a sheet during power-on period. Also, do not place the S42SD-YB03 Module in a confined space or any other places of poor ventilation.

(7) If you continue to watch the naked S42SD-YB03 screen(without filter glass) for a long time, your eyes could be fatigued. We recommend you rest your eyes occasionally.

(8) The S42SD-YB03 screen is controlled with the display-data signals and synchronized signals. If noise interferes with those signals, the S42SD-YB03 screen could become unstable and, in some case, would cause a failure. Do not place any equipment that generates exessive EMI/RFI noise near the interface cable of the S42SD-YB03 Module, and keep the cables as short as possible.

(9) Be careful not to break the glass panel when you handle the S42SD-YB03 Module. Also, when handling the S42SD-YB03 Module, you must wear gloves or other hand protection to prevent injuries that can occur in case when the glass panel is broken.

(10) The glass panel section and drive circuit section of the S42SD-YB03 Module are closely connected and they function as a pair. If the Module is arbitrarily recombined,

restructured, or disassembled, SDI will not be responsible for the fuction, quality, or operational integrity of the modified Module. Do not recombine, restructure, or disassemble it. (only, the Module for A/S is allowed to be recombined, restructured, or disassembled.)

(11) To avoid a possible electric shock, you must make sure that the power supply voltage of S42SD-YB03 Module is turned off before cleaning. To clean the S42SD-YB03 's glass panel, apply water or a natural detergent to a piece of soft cloth or gauze, and wring the cloth tightly before wiping the screen. Make sure that no water comes in contact with the connecting terminals on the side of the glass panel. Do not use chemical solvents, such as paint thinner or benzene, to clean the glass panel.

(12) The drive circuit section of S42SD-YB03 Module uses C-MOS intergrated circuits that must be protected from static electricity. Therefore when transporting or delivering the Module, be sure to put the Module in an antistatic bag. When handling the S42SD-YB03 Module, take adequate grounding precautions to prevent static electricity.

(13) When delivering or transporting the S42SD-YB03 Module, you must take special precautions because excessive vibration or shock should not be applied to it. If the Module is dropped, or (if) excessive vibration/shock is applied, the glass panel of the S42SD-YB03 Module may be broken and the drive circuit may be damaged. The packing for delivering or transporting should be made with strict instructions.

(14) When storing the S42SD-YB03 Module, you must select an environmentally controlled place. Avoid any environmet in which the temperature or humidity exceeds the specification values. If you are storing it for a long period of time, We recommend that you place the Module together with a dehumidifying agent, such as sillica gel, in a moisture-proof bag and keep it in an environmentally controlled place.

(15) The S42SD-YB03 Module is composed of various kinds of materials such as glass plate, metals and plastics. A qualified service technician is required for the disposal of the S42SD-YB03 Module.

□ *Notice of the S42SD-YB03 Module performance*

The S42SD-YB03 Module is the newest display device utilizing the gas discharge technology and digital signal processing technology, and its performances are mostly similar to those of CRT. However, some display performances of the S42SD-YB03Module are different from the CRT's. Please consider the following notices when you watch the S42SD-YB03 screen.

(1) There is (a) slight Neon luminance shown outside of the effective display area on the glass panel. Conceal this parts so that it may not be seen on the display surface.

(2) Depending on the type and time of usage, there may be a slight change in the Luminance and color. There may be an increase of both X-value and Y-value by 0.05 at the maximum in chromaticity. In this case, adjust it using the external data signal.

(3) Because the S42SD-YB03 Module uses phosphor to emit a light, the phosphor, like a CRT, will be deteriorated in proportion to the display signal and Luminance settings.

If the same pattern is displayed continuously (fixed display) for an extended period of time, the Luminance of that area will be decreased over non-lit areas due to the fact that the discharge surface will be more activated comparing to the other areas.

(4) When the Vsync signal timing becomes shorter right after the changing of Vsync frequency (e.g. from 50 ㎐ to 60H / from 60 ㎐ to 70 ㎐) depending on the Multi-Vsync function, an initial Vsync signal of the changed frequency will be disregarded and the S42SD-YB03 screen will be interrupted for 1 frame period in maximum.

(5) Because the S42SD-YB03 Module is a digital processing display device, this Module is equipped with the Error diffusion technology and a Duplicated Sub-Frame method to display the grayscale and false contour improvement. However, you may sometimes find a color false contour, especially in human facial contour, in moving picture due to the difference of display performance comparing to the TV-tube.

(6) If the S42SD-YB03 Module displays some video test patterns that are mostly used in a laboratory or inspection process of the manufacturing facilities, you may find the following subjects. But these sujects sould not be recognized in the failure or defects because the display performance of the S42SD-YB03 Module is equipped with Error diffusion technology and Duplicated Sub-Frame method(for PAL) based on digital processing technique.

<a> Linearity in the grayscale test pattern
If the S42SD-YB03Module displays the grayscale test pattern (e.g. white color Luminance is gradually changed horizontally or vertically) in a screen, you may find the disparity of Luminance at adjacent grayscale patterns. This behavior is caused by duplicated sub-frame condition(for PAL), display load correction and electroad dependency.

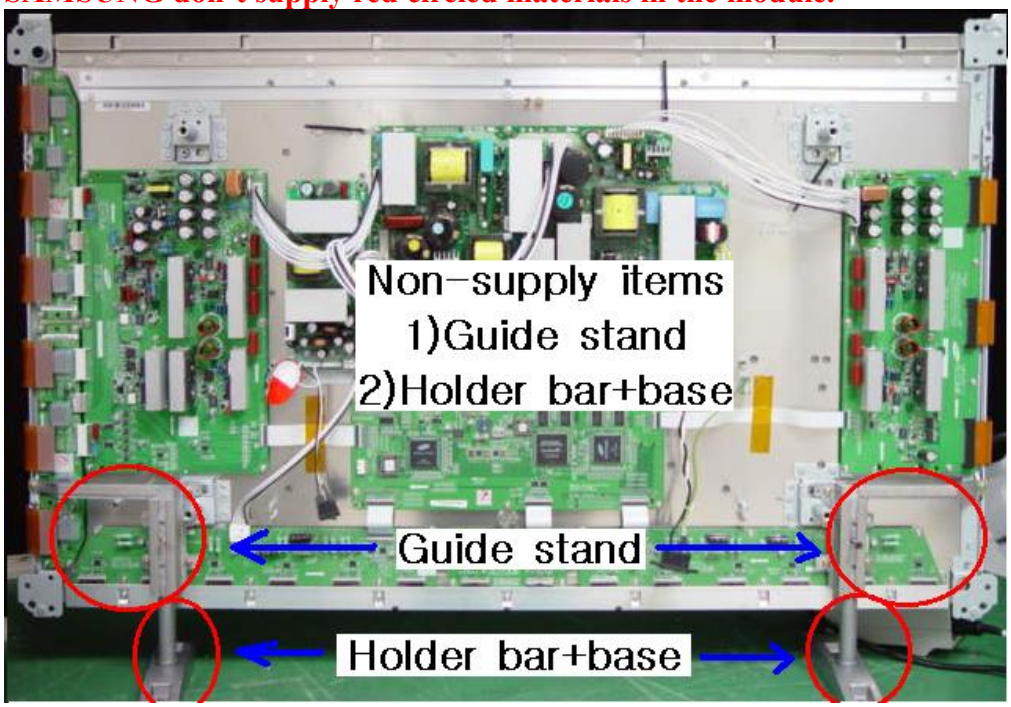
<b> Color contouring and dithering at the stationary picture
If the stationary picture such as a human face or the like is shown in the S42SD-YB03 screen, you may feel some unstable noise at the contour area. This behavior is called the color contouring or dithering, and is caused by the error diffusion condition, display load correction and electroad dependency.

(7) If the S42SD-YB03 Module is operated under inadeqate conditions or harsh environment, the screen may become unstable or noisy. This instability is mostly related to ambient temperature, air pressure, input signal instability (include signal noise), input power voltage and strong magnetic field such as MRI/NMR application or superconducting magnet application. Please do not apply the S42SD-YB03 Module to inadequate conditions or harsh environment mentioned above.

16. Appendix

16.1 Module Stand Supply specification

SAMSUNG don't supply red circled materials in the module.



- Scaler Board/Logic Board LVDS Pin Definition

SCALER BOARD LVDS (DS90C385)		LOGIC BOARD LVDS (DS90CF386)		SIGNAL NAME
PIN #	PIN NAME	PIN #	PIN NAME	
31	TxCLKIN	26	RxCLKOUT	DCLK
51	TxIN0	27	RxOUT0	R0(LSB DATA)
52	TxIN1	29	RxOUT1	R1
54	TxIN2	30	RxOUT2	R2
55	TxIN3	32	RxOUT3	R3
56	TxIN4	33	RxOUT4	R4
2	TxIN5	34	RxOUT5	R7(MSB DATA)
3	TxIN6	35	RxOUT6	R5
4	TxIN7	37	RxOUT7	G0
6	TxIN8	38	RxOUT8	G1
7	TxIN9	39	RxOUT9	G2
8	TxIN10	41	RxOUT10	G6
10	TxIN11	42	RxOUT11	G7(MSB DATA)
11	TxIN12	43	RxOUT12	G3
12	TxIN13	45	RxOUT13	G4
14	TxIN14	46	RxOUT14	G5
15	TxIN15	47	RxOUT15	B0(LSB DATA)
16	TxIN16	49	RxOUT16	B6
18	TxIN17	50	RxOUT17	B7(MSB DATA)
19	TxIN18	51	RxOUT18	B1
20	TxIN19	53	RxOUT19	B2
22	TxIN20	54	RxOUT20	B3
23	TxIN21	55	RxOUT21	B4
24	TxIN22	1	RxOUT22	B5
25	TxIN23	2	RxOUT23	
27	TxIN24	3	RxOUT24	Hsync
28	TxIN25	5	RxOUT25	Vsync
30	TxIN26	6	RxOUT26	D_EN
50	TxIN27	7	RxOUT27	R6

【 Note 】

1. LVDS Chip is supplied by National Semiconductor.
2. LOGIC LVDS CONNECTOR : FH12K1-30S-0.5SH