



§ **SPECIFICATION APPROVAL SHEET** §

Fdt Tech Module No **Lx040X3PS0-FDR**

Description: **4" Color TFT-LCD Module**

SPEC No.: **SAS-0610002**

Version: **1.2**

Issue Date: **October 29 2007**

※ This approval sheet contains 18 pages including the cover and appendix.

Customer:	APPROVED BY:
Date: / / 07	

APPROVED BY:

CHECKED BY:

DESIGNED BY:



FLAT DISPLAY TECHNOLOGY

4" Color TFT-LCD Module

■ Lx040X3PS0-FDR

1. General Description

1.1 Features

- Fit Prime View PA040XS3 TFT-LCD
- Built-in DC/DC & LED Driver & Video Decoder
- Ultra Compact
- NTSC/PAL Video Auto Switch
- Up/Down & Right/Left Display Reverse
- Single Operation Voltage +12V
- Composite Video / RGB Mode (Option) Switch

1.2 Applications

- Portable product
- Industrial
- Hand-held
- Security
- Instrument Display
- Office Electronics

1.3 Application Precautions

Do not use the products herein for the following equipment which demands extremely high performance in terms of functionality, reliability, or accuracy.

- Aerospace equipment
- Communication equipment for trunk lines.
- Control equipment for the nuclear power industry.
- Medical equipment related to life support, etc.

The other application that demands high reliability and functionality should first contact a sales representative.

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■ Lx040X3PS0-FDR V1.2

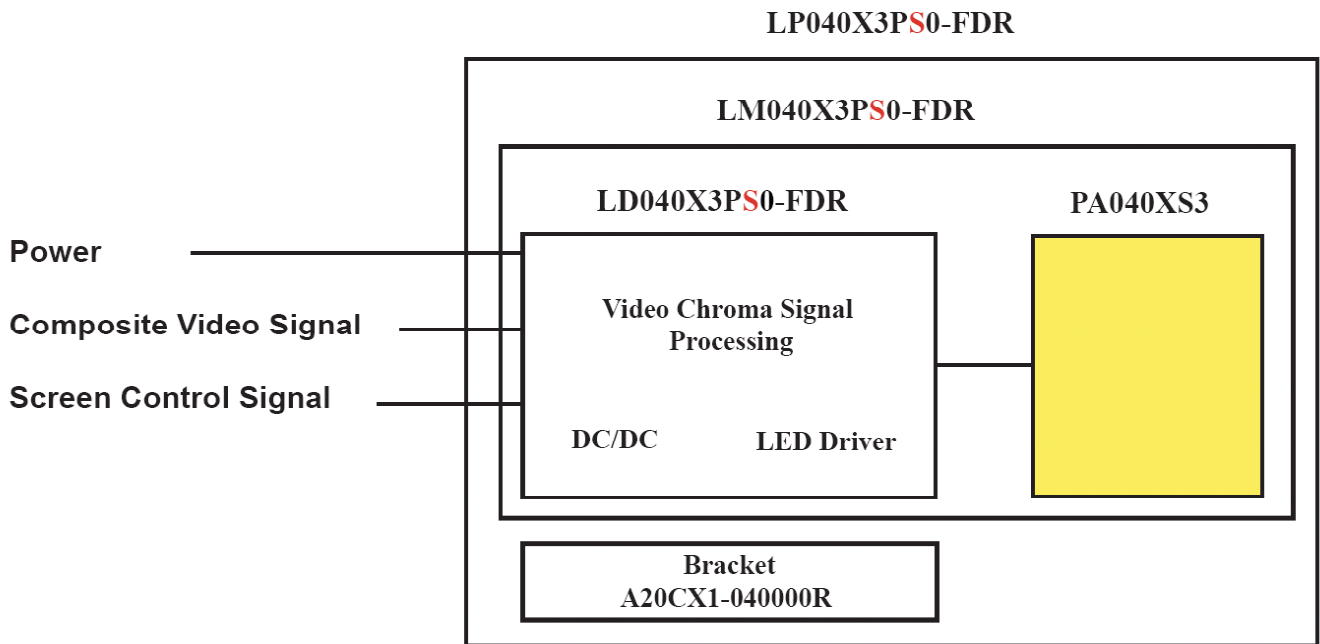


2. Contents

Contents	Page
1. General Description	1
1.1 Features	1
1.2 Application	1
1.3 Application Precautions	1
2. Contents	2
3. Black Diagram	2
3.1 Black Diagram	3
4. TFT-LCD Information	4
4.1 TFT-LCD Mechanical Specifications	4
4.2 TFT-LCD Optical Characteristics	4
5. Order Information	5-6
5.1 Driver Board	5
5.2 Module	5
5.3 Unit	6
6. Dimension Information	7-9
6.1 Driver Board	7
6.2 Module	8
6.3 Unit	9
7. Pin Description	10-13
7.1 J203 : Pin Assignment of Panel I/O (Pitch 0.5mm 30Pin,Down Entry Type)	10
7.2 J301 : Pin Assignment of Signal Input (Pitch 1.25mm 15Pin, Side Entry Type)	11
7.3 J302 : Pin Assignment of Signal Input (Pitch 1.25mm 14Pin, Side Entry Type)(Option)	12
7.4 J101: Pin Assignment of RGB Mode (Pitch 1.25mm 10Pin, Side Entry Type)(Option)	13
8. Absolute Maximum Ratings	14
8.1 Absolute Maximum Ratings	14
9. Recommended operating conditions	14
9.1 Electrical Characteristics	14
9.2 LED Backlight Data	15
9.3 Optics Sample Test Data	15
10. Application Schematic Diagram	16
10.1 Application Circuit	16
10.2 RGB Function Application Block	17

3. Block Diagram

3.1 Block Diagram



4. TFT-LCD Information

4.1 TFT-LCD Mechanical Specifications

Parameter	Specifications	Unit
Screen Size	4 (diagonal)	inch
Display Format	320 x (R.G.B) x 234	dot
Surface Treatment	Anti – Glare	
Active Area	81.120(H) x 61.776(V)	mm
Pixel Pitch	0.2535(H) x 0.2640(V)	mm
Pixel Configuration	Stripe	
Outline Dimension	93.00(W) x 73.50(H) x 3.5(D)(Typ.)	mm
Weight	74±5	g

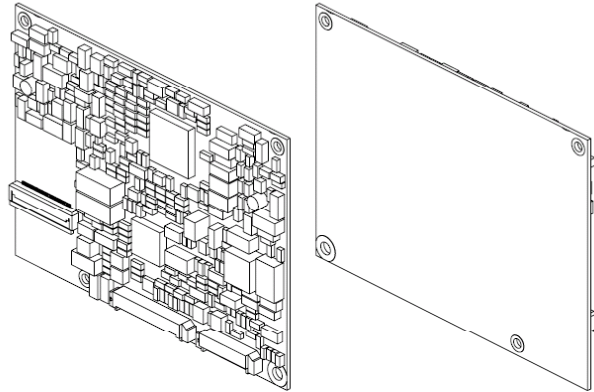
4.2 TFT-LCD Optical Characteristics

Parameter	Symbol	Condition	Min	Typ	Max	Unit	Remark	
Viewing Angle	Horizontal	Left	45	50	---	deg		
		Right	45	50	---	deg		
	Vertical	Top	CR \geq 10	10	15	---	deg	
		Bottom		30	35	---	deg	
Contrast Ratio	CR	At optimized Viewing angle	200	350	---			
Response time	Rise Fall	Tr	---	15	30	ms		
		Tf	---	25	50	ms		
Uniformity	U		75	80	---	%		
Brightness			300	350	---	Cd/m ²		
White Chromaticity	x	$\Theta = 0^\circ$	0.28	0.31	0.34			
	y	$\Theta = 0^\circ$	0.30	0.33	0.36			
LED Life Time		Ta=+25°C		10000		Hr		

5. Order Information

5.1 Driver Board

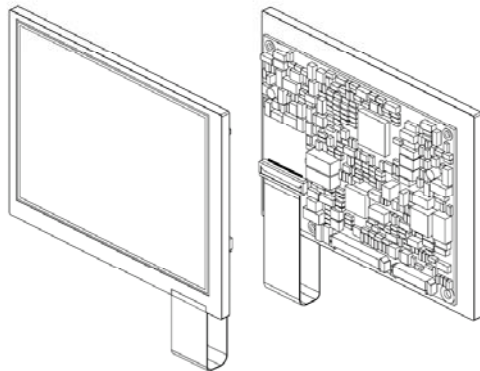
Board



Order Part Number	NTSC	PAL	NTSC/PAL Auto Switch	Zoom Mode	Master RGB MODE	Slave RGB MODE
LD040X3PS0-FDR			⊙			

5.2 Module

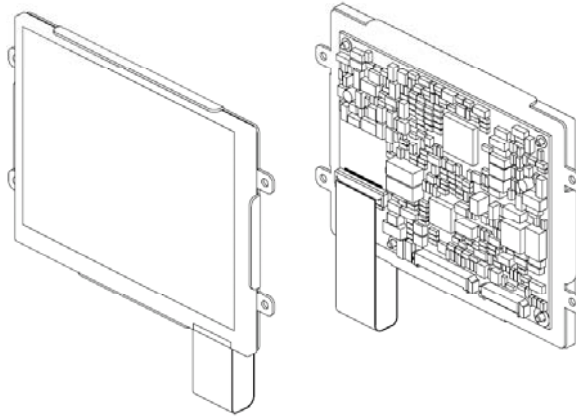
Module



Order Part Number	NTSC	PAL	NTSC/PAL Switch	Zoom Mode	Master RGB MODE	Slave RGB MODE	TFT-LCD Panel PA040XS3
LM040X3PS0-FDR			⊙				⊙

5.3 Unit

Unit



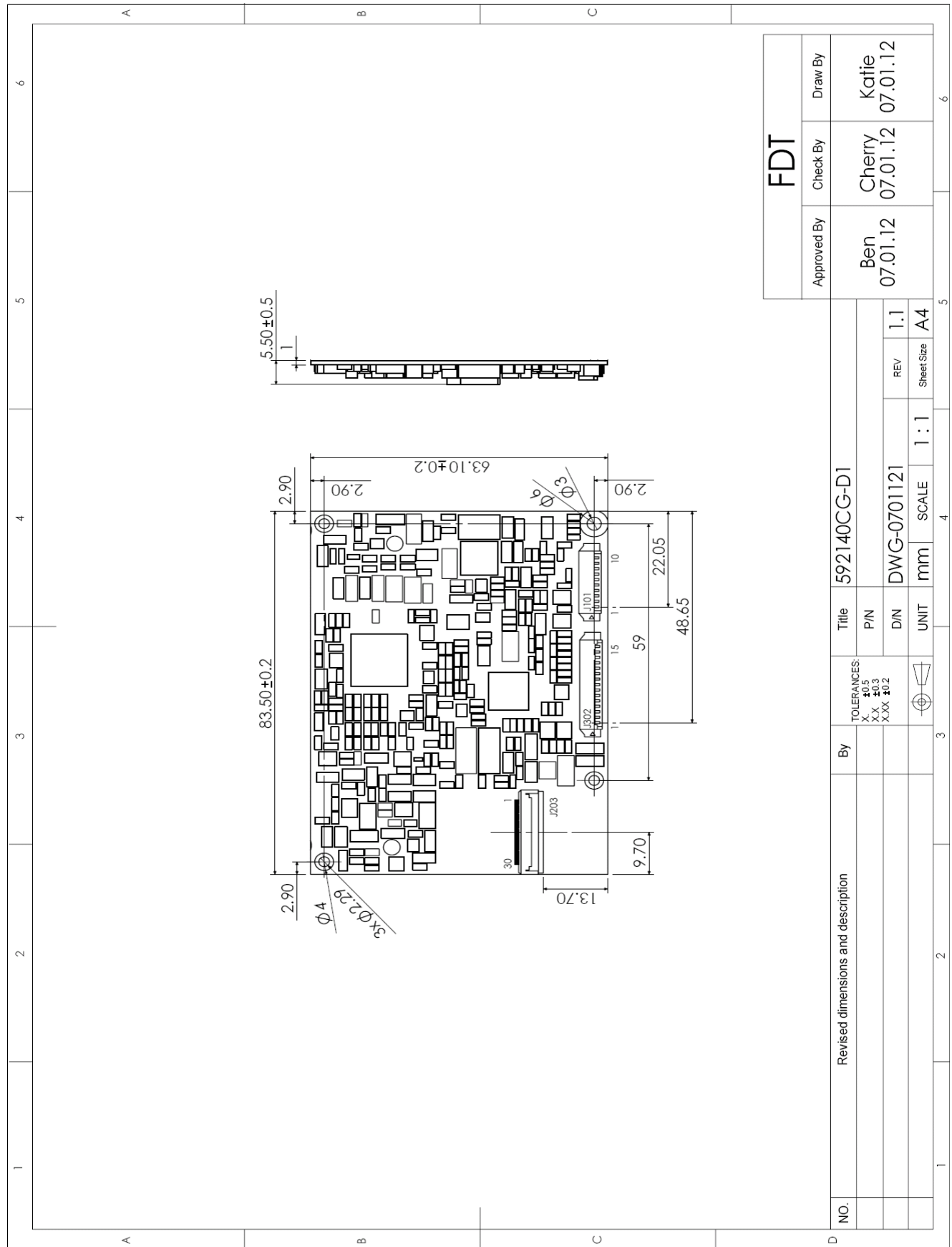
Order Part Number	NTSC	PAL	NTSC/PAL Switch	Zoom Mode	Master RGB MODE	Slave RGB MODE	TFT-LCD Panel PA040XS3	Bracket A20CX1-040000R
LP040X3PS0-FDR			⊙				⊙	⊙

The tape in back of the bracket is to avoid the panel falling from the unit in delivery.

It's just a temporary adhesion.

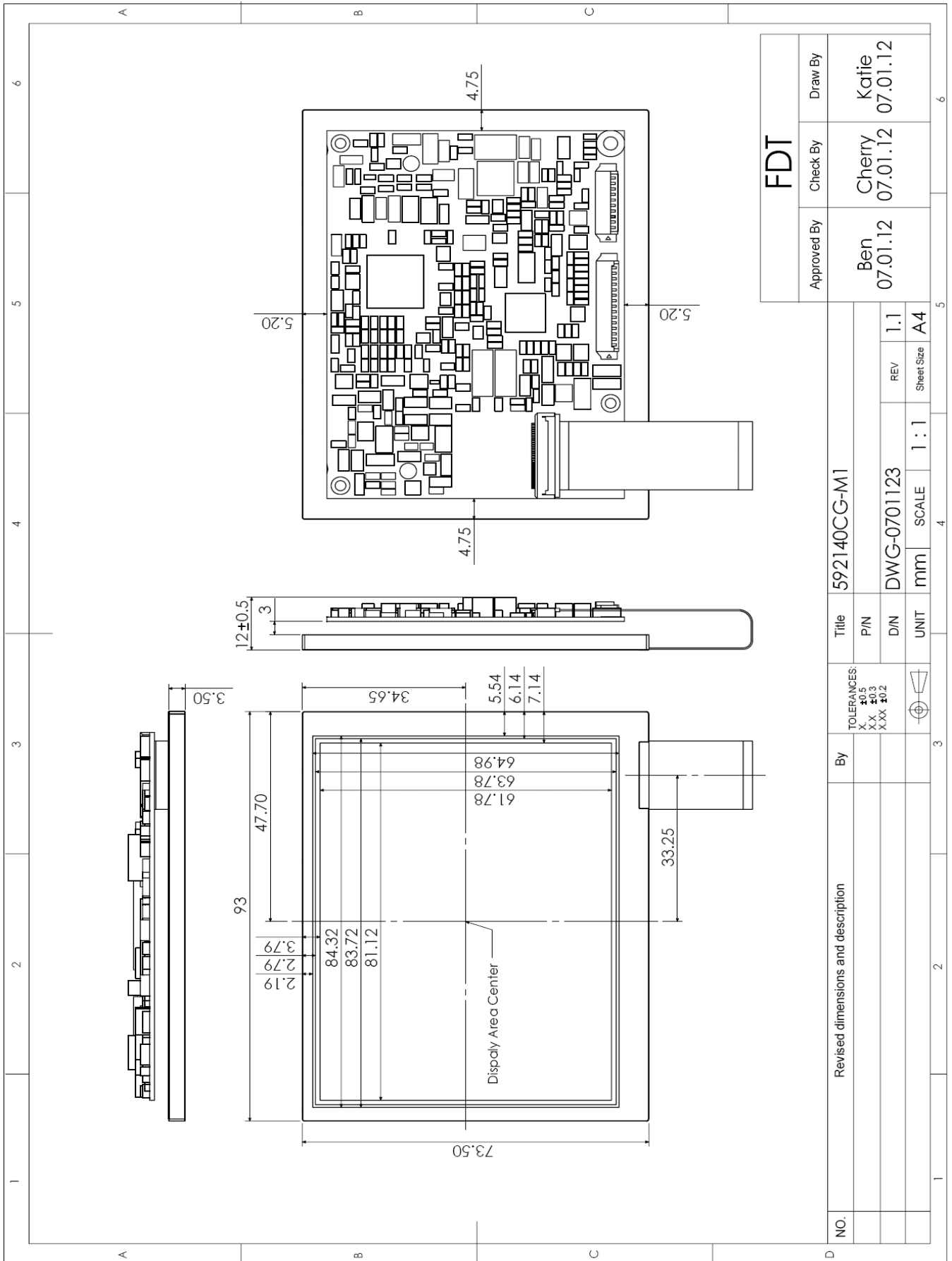
6. Dimension Information

6.1 Driver Board



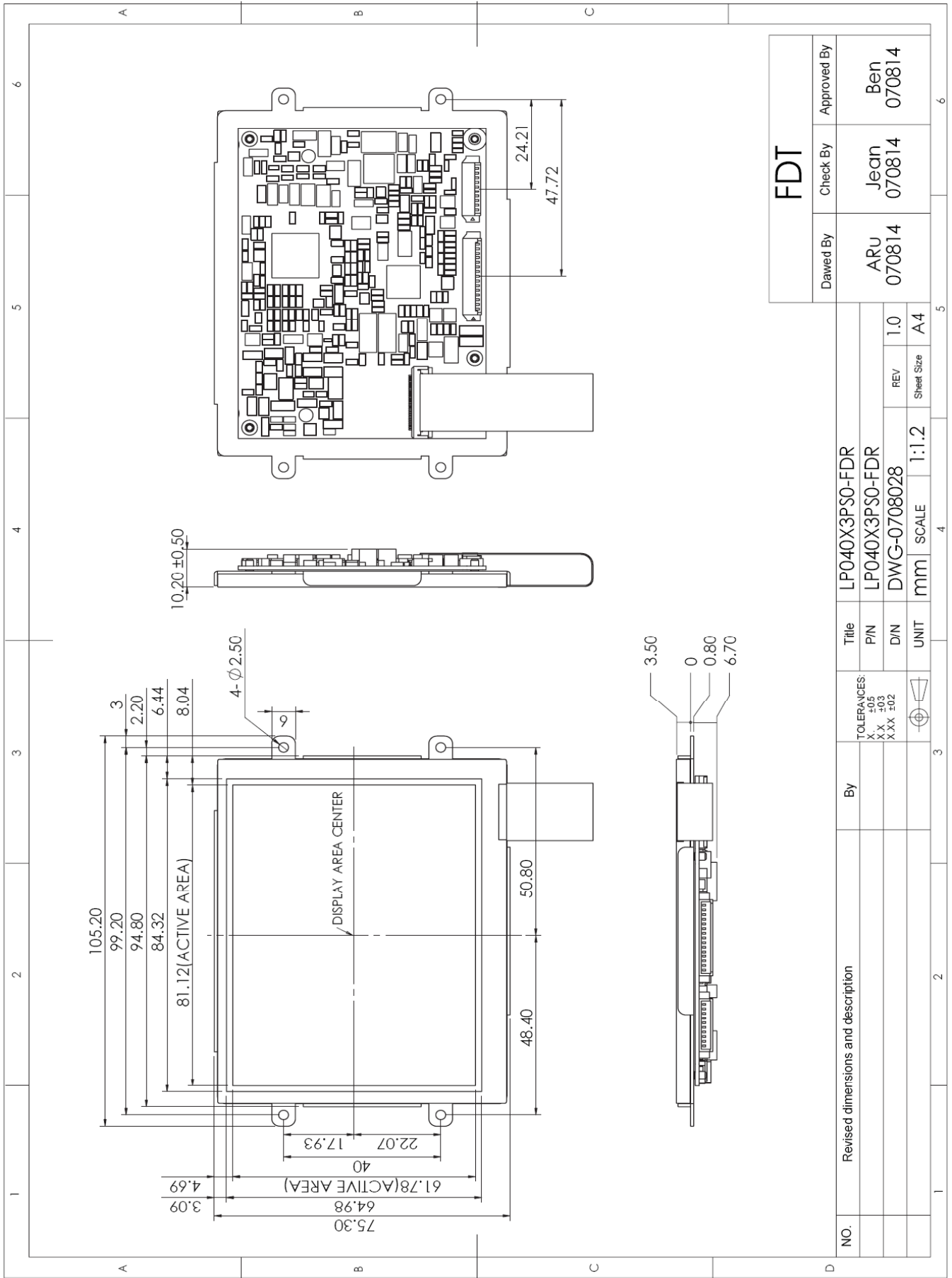
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■ Lx040X3PS0-FDR V1.2



FDT		
Approved By	Check By	Draw By
Ben 07.01.12	Cherry 07.01.12	Katie 07.01.12

NO.	Revised dimensions and description	By	592140CG-M1	Title	592140CG-M1
				P/N	
				D/N	DWG-0701123
				UNIT	mm
				SCALE	1 : 1
				Sheet Size	A4
				REV	1.1



7. Pin Description

7.1 J203 : Pin Assignment of Panel I/O (Pitch 0.5mm 30Pin,Down Entry Type)

Pin No	Symbol	I/O	Description	Remark
1	STH1	I/O	Star Pulse For Source Driver	
2	AVSS	I	Analog GND For Source Driver	
3	AVDD	I	Analog Power Input For Source Driver	
4	VB	I	Video Input B	
5	VG	I	Video Input G	
6	VR	I	Video Input R	
7	VSS	I	Digital GND	
8	VDD	I	Digital Power Input	
9	CPH1	I	Sampling And Shift Clock For Source Driver	
10	CPH2	I	Sampling And Shift Clock For Source Driver	
11	CPH3	I	Sampling And Shift Clock For Source Driver	
12	STH2	I/O	Start Pulse For Source Driver	
13	NC	-	Not Connector	
14	OE	I	Output Enable For Source Driver	
15	R/L	I	Left/Right Control For Source Driver	
16	VCOM	I	Common Electrode Voltage	
17	VCOM	I	Common Electrode Voltage	
18	XOE	I	Output Enable For Gate Driver	
19	CPV	I	Clock Input For Gate Driver	
20	U/D	I	Up / Down Control For Gate Driver	
21	STVU	I/O	Vertical Start Pulse	
22	STVD	I/O	Vertical Start Pulse	
23	VGL	I	Gate Off Voltage	
24	NC	-	Not Connector	
25	VSS	I	GND	
26	VCC	I	Logic Power For Gate Driver	
27	VGH	I	Gate On Voltage	
28	GLD1	-	Ground For LED Backlight	
29	GLD2	-	Ground For LED Backlight	
30	VLED	-	Supply Voltage For LED Backlight	

Not: About TFT-LCD Panel detail information please refer PVI's PA040XS3 Specification

7.2 J301 : Pin Assignment of Signal Input (Pitch 1.25mm 15Pin, Side Entry Type)

Pin No	Symbol	I/O	Description	Remark
1	Vin	I	+12V Input Voltage	
2	GND	-	Power Ground	
3	GND	-	Power Ground	
4	AGND	-	Signal Ground	
5	Video-in	I	Video Input (1Vp-p /75Ω) / SYHS-Y	
6	+5VA	O	+5VA Output Voltage	Note1
7	Bright	I	Bright Adjust Control	
8	Contrast	I	Contrast Adjust Control	
9	Color	I	Color Adjust Control	
10	Tint	I	Tint Adjust Control	Note2
11	NPC	O	NTSC / PAL Detect Output	Note3
12	LRC	I	Screen Left / Right Reverse	Note4
13	UDC	I	Screen Up / Down Reverse	Note4
14	Dimmer	I	Backlight Brightness Adjust Control	
15	Enable	I	Backlight ON/OFF	Note5

Note1: The +5V Power Supply External Control Circuit.(Max. Output is 10mA)

Note2: The TINT is only operation in NTSC system.

Note3: The output High level for NTSC Mode and Low level for PAL mode.

Note4: Default +5V or Floating is normal scanning and 0V is for reversed scanning.

Note5: The floating or 0V is backlight on and 5V is backlight off.

7.3 J302 : Pin Assignment of Signal Input (Pitch 1.25mm 14Pin, Side Entry Type)(Option)

Pin No	Symbol	I/O	Description	Remark
1	Vin	I	+12V Input Voltage	
2	GND	-	Power Ground	
3	GND	-	Power Ground	
4	AGND	-	Signal Ground	
5	Video-in	I	Video Input (1Vp-p /75Ω) / SYHS-Y	
6	+5VA	O	+5VA Output Voltage	Note1
7	Bright	I	Bright Adjust Control	
8	Contrast	I	Contrast Adjust Control	
9	Color	I	Color Adjust Control	
10	Tint	I	Tint Adjust Control	Note2
11	NPC	O	NTSC / PAL Detect Output	Note3
12	LRC	I	Screen Left / Right Reverse	Note4
13	UDC	I	Screen Up / Down Reverse	Note4
14	GND	-	Power Ground	

Note1: The +5V Power Supply External Control Circuit.(Max. Output is 10mA)

Note2: The TINT is only operation in NTSC system.

Note3: The output High level for NTSC Mode and Low level for PAL mode.

Note4: Default +5V or Floating is normal scanning and 0V is for reversed scanning.

7.4 J101: Pin Assignment of RGB Mode (Pitch 1.25mm 10Pin, Side Entry Type) (Option)

Pin No	Symbol	I/O	Description	Remark
1	EXT-R	I	External R Signal Input (0.7Vp-p / 75Ω)	
2	EXT-G	I	External G Signal Input (0.7Vp-p / 75Ω)	
3	EXT-B	I	External B Signal Input (0.7Vp-p / 75Ω)	
4	EXT-SW	I	Switch Video (Low) / R.G.B (High) Mode	
5	CSYI	I	Composite Sync. Input	Note1
6	Video-CSY	O	Internal Composite Sync. Output	Note2
7	HSY	O	Horizontal Sync. Output	Note3
8	VSY	O	Vertical Sync. Output	Note4
9	AGND	-	Ground	Note4
10	SVHS-C	I	Chroma Signal Input	Note5

Note1: EXT-SW is High for external R.G.B INPUT (15.75 KHZ), Low is composite video input.

Note2: CSYI must be positive SYNC. Signal input

Note3: If EXT-SW is low the VIDEO-CSY switch to CSYI. CSYI is composite SYNC of RGB mode when EXT-SW is high (Master mode)

Note4: HSY and VSX is negative SYNC. Signal output for on Screen display (OSD). CSYI connect with VIDEO-CSY when external R.G.B signal synchronize composite video sync (slave mode)

Note5: SVHS-C is option.

This is optional. If you use S-VIDEO or RGB Mode function please contact FDT to modify some components of the interface board.

8. Absolute Maximum Ratings

8.1 Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit	Remark
Input Voltage	Vin	10	14	V	
Video Input Signal	Video in	0.5	2.0	Vp-p	@75Ω
Digital Input Signal	TTL	+0.3	+3.6	V	
Operating Temperature		-10	+60	°C	
Storage Temperature		-20	+70	°C	

9. Recommended operating conditions

9.1 Electrical Characteristics

Parameter	Symbol	I/O	Min	Typ	Max	Unit	Note
Input Voltage	Vin	I	-	+12	-	V	
Total Current	Iin	I	-	155.7	-	mA	
Power Consumption		I		1.87		W	@+12V
Output Voltage	+5VA	O	+4.8	+5	+5.2	V	
Video Input Signal	Video in	I		1.0		Vp-p	@75Ω
Brightness Adjust	Bright	I	-	+1.21	-	V	
Contrast Adjust	Contrast	I	-	+2.51	-	V	
Color Adjust	Color	I	-	+2.68	-	V	
Tint Adjust	Tint (NTSC Only)	I	-	+3.11	-	V	
Video Auto Detect	NTSC/ PAL	O	0		3.3	V	
Screen Reverse	Left/ Right	I	0		3.3	V	
Screen Reverse	UP/ Down	I	0		3.3	V	
Enable Backlight	Enable	I	0		5	V	

9.2 LED Backlight Data

Parameter	Symbol	Min	Typ	Max	Unit	Note
LED Backlight Voltage	VLED	-	12.8	14.0	V	IL=20mA
LED Backlight Current	ILED	-	20	-	mA	
Backlight Power Consumption		-	512	560	mW	

9.3 Optics Sample Test Data

Parameter	White Window	Red	Green	Blue	Remark
S/N : 001 x	0.302	0.560	0.336	0.149	±15%
.y	0.312	0.348	0.525	0.119	
L(cd/m ²)	392.4	-	-	-	
TC(°K)	7385				

NOTE : 1. Luminance Meter : BM-7 FAST(TOPCON)

2.Video Pattern Generator: FLUKE PM54200

3. Measurement Distance : 500mm±50mm

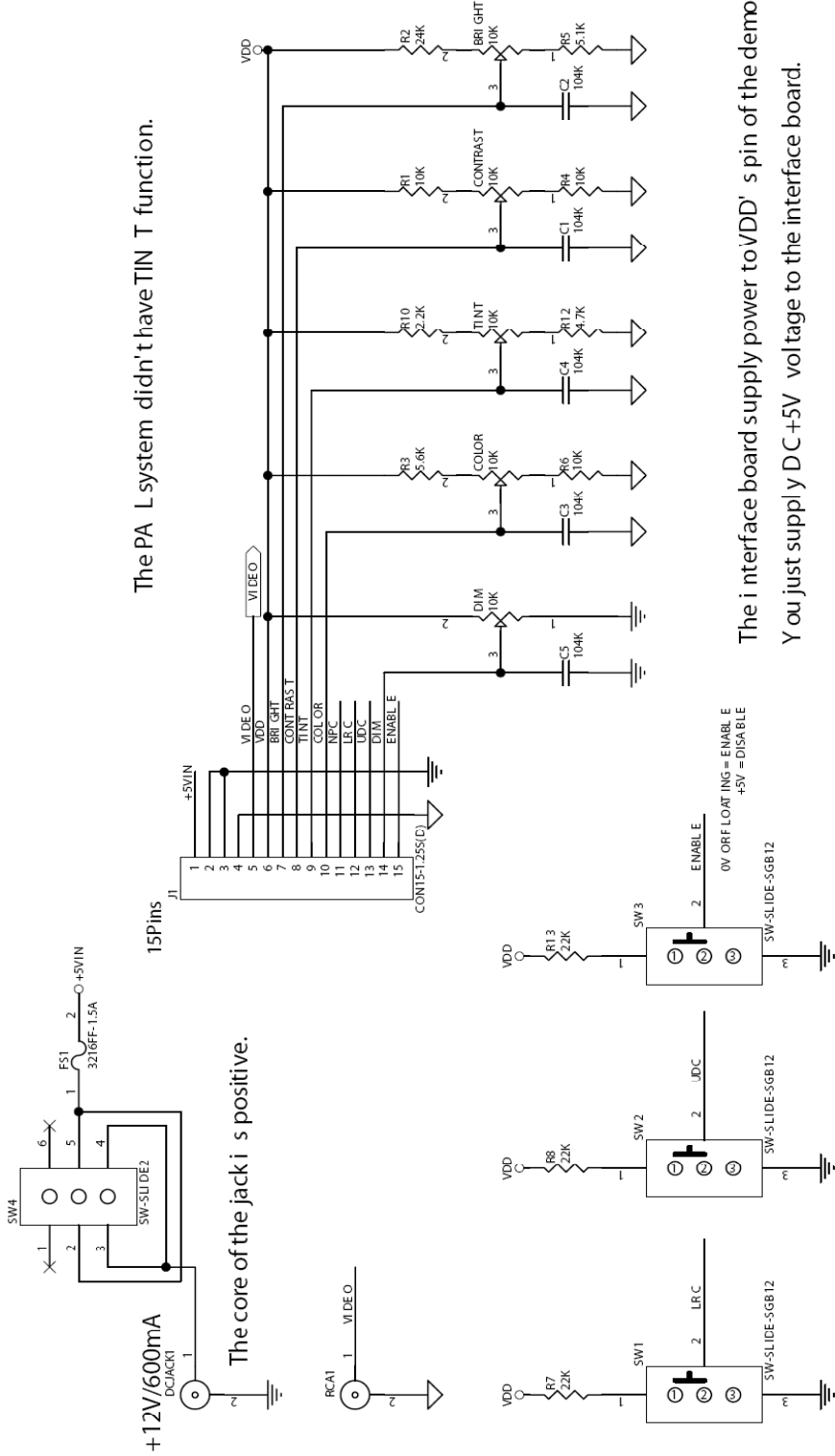
4. TOPCON BM-7 Luminance Meter 2° filed of view is used in the testing

(After 10min ~20min operation)

10. Application Schematic Diagram

10.1 Application Circuit

Application Circuit



The PA L system didn't have TINT function.

The core of the jack is positive.

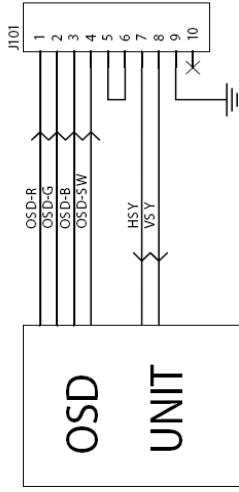
The interface board supply power to VDD pins of the demo board. You just supply DC +5V voltage to the interface board.

NO.	Revised dimensions and description		By	Title		Approved by		Checked by		Drawn by		
			NICOLE	FDT PVI PA040XS3	FDT		BEN		SHERRY		CHERRY	
				LD040X3PS0-FDR	LD040X3PS0-FDR		04.12.27		04.12.27		04.12.27	
				SSCH-0412001	SSCH-0412001		04.12.27		04.12.27		04.12.27	
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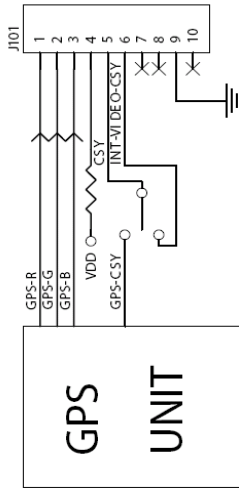
R.G.B Function Application Block

SLAVE MODE



MASTER MODE

GPS R.G.B



EXT-SW :

- 0: DISPLAY VIDEO SCREEN
- 1: DISPLAY GPS SCREEN

CSY:

- CSY CONNECTOR WITH GPS-CSY IS DISPLAY GPS SCREEN
- CSY CONNECTOR WITH INT-VIDEO-CSY IS DISPLAY VIDEO

NO.	Revised dimensions and description	By NICOLE	TOLERANCES: X ± 0.5 XX ± 0.3 XXX ± 0.2	Title		FDT PVT PA040XS3 LD040X3PS0-FDR SSCH-0412002	Approved by BEN	Checked by JEAN	Drawn by CHERRY
				D/N	UNIT				
1	2	3	4	5	6	7	8	9	10