



§ SPECIFICATION APPROVAL SHEET §

Fdt Tech Module No **Lx06401Pxx-FDR**

Description: **6.4" Color TFT-LCD Analogy Interface Module**

SPEC No.: **SAS-0604001**

Version: **1.3**

Issue Date: **December 10 2008**

※ This approval sheet contains 22 pages including the cover and appendix.

Customer:

APPROVED BY:

Date: / / 08

APPROVED BY:

CHECKED BY:

DESIGNED BY:



FLAT DISPLAY TECHNOLOGY

PRIME VIEW PA064DS1 - TFT LCD DRIVER BOARD

- LD06401P~~x~~3-FDR
- LM06401P~~xx~~-FDR
- LP06401P~~xx~~-FDR

1. General Description

1.1 Features

- Fit Prime View PA064DS1 TFT LCD
- Ultra Compact
- DC/DC DC/AC Video Decoder All In One
- NTSC/PAL Video Auto Switch
- Up / Down Display Reverse
- Left / Right Display Reverse
- Single Operation Voltage 12V

1.2 Applications

- Security
- Video Game
- Door Phone
- Video Phone
- Portable TV
- Instrument Display

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.

FLAT DISPLAY TECHNOLOGY

■ LD06401P~~x~~3-FDR ■ LM06401P~~xx~~-FDR ■ LP06401P~~xx~~-FDR V1.3 

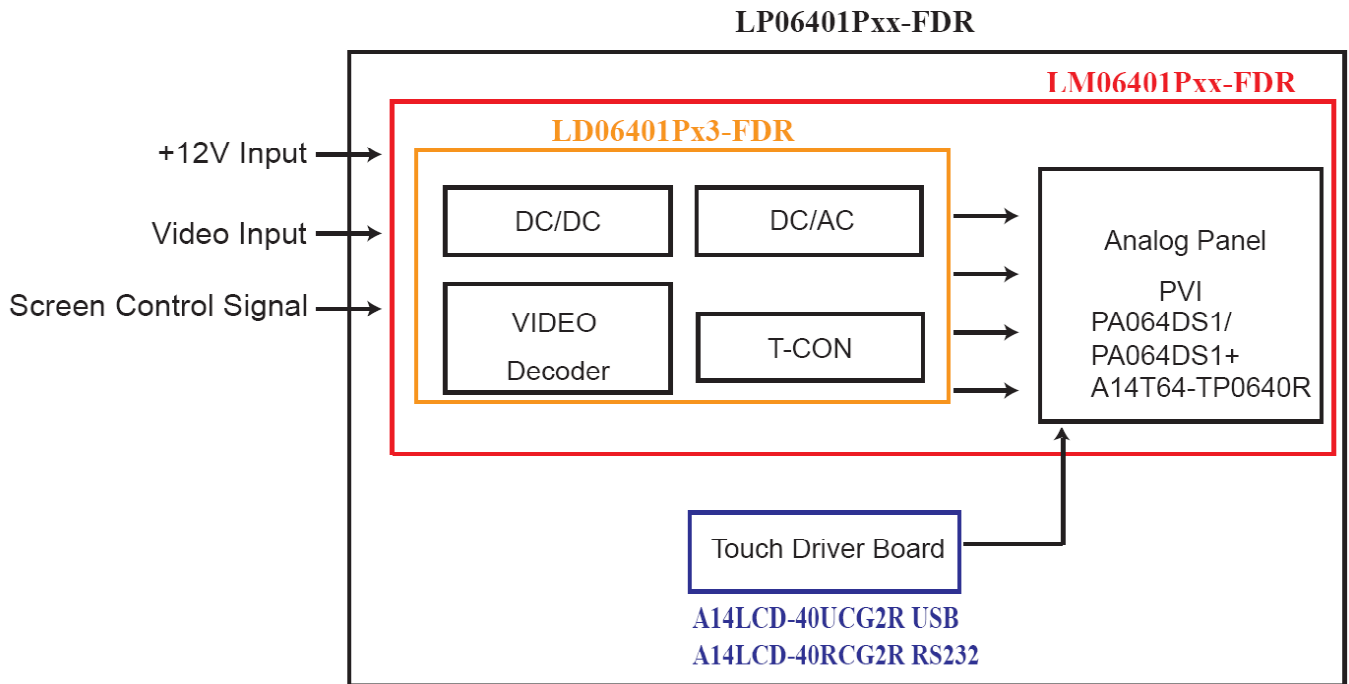
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3. Block Diagram

3.1 Block Diagram



4. TFT-LCD Information

4.1 TFT-LCD Mechanical Specifications

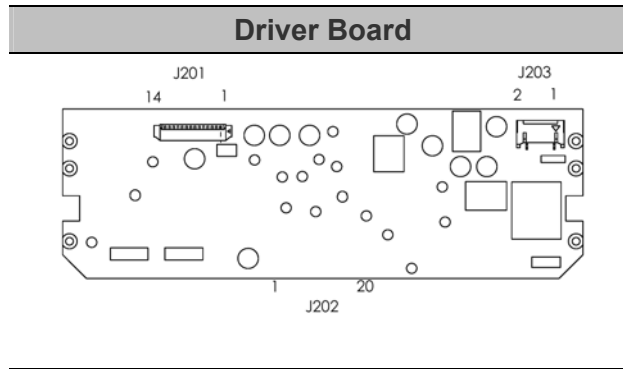
Parameter	Specifications	Unit
Screen Size	6.4 (diagonal)	inch
Display Format	320 x (R.G.B) x 234	dot
Active Area	129.6 (H) x 97.34 (V)	mm
Pixel Pitch	0.405 (H) x 0.416 (V)	mm
Pixel Configuration	Stripe	
Outline Dimension	156.3 (W) x 119.8 (H) x 14.3 (D) (typ.)	mm
Surface Treatment	Anti-Glare + WV Film	
Weight	235 ±10	g

4.2 TFT-LCD Optical Characteristics

Parameter	Symbol	Condition	Min	Typ	Max	Unit	Remark
Viewing Angle	Horizontal	Left	55	60	-	deg	
		Right	55	60	-	deg	
	Vertical	Top	35	40	-	deg	
		Bottom	50	55	-	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	330	-	---	
White Chromaticity	x	$\theta = 0^\circ$	0.27	0.30	0.33		
	y	$\theta = 0^\circ$	0.28	0.31	0.34		
Lamp Life Time		+25°C	-	30000	-	Hr	

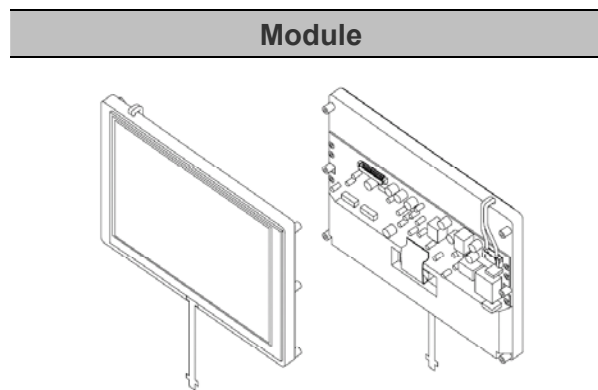
5. Order Information

5.1 Driver Board



Order Part Number	NTSC	PAL	NTSC/PAL	Master RGB Mode	Slave RGB Mode
LD06401PN3-FDR	◎				
LD06401PP3-FDR		◎			
LD06401PS3-FDR			◎		

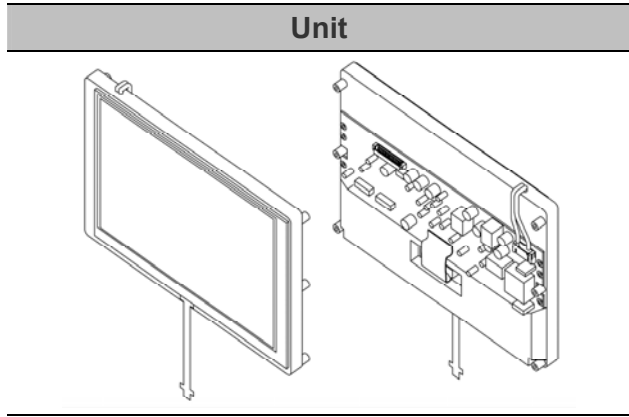
5.2 Module



Order Part Number	NTSC	PAL	NTSC/PAL	Master RGB Mode	Slave RGB Mode	TFT-LCD Panel PA064DS1	Touch Panel A14T64-TP0640R
LM06401PN3-FDR	◎					◎	
LM06401PP3-FDR		◎				◎	
LM06401PS3-FDR			◎			◎	
LM06401PN5-FDR	◎					◎	◎
LM06401PP5-FDR		◎				◎	◎
LM06401PS5-FDR			◎			◎	◎

FLAT DISPLAY TECHNOLOGY

5.3 Unit



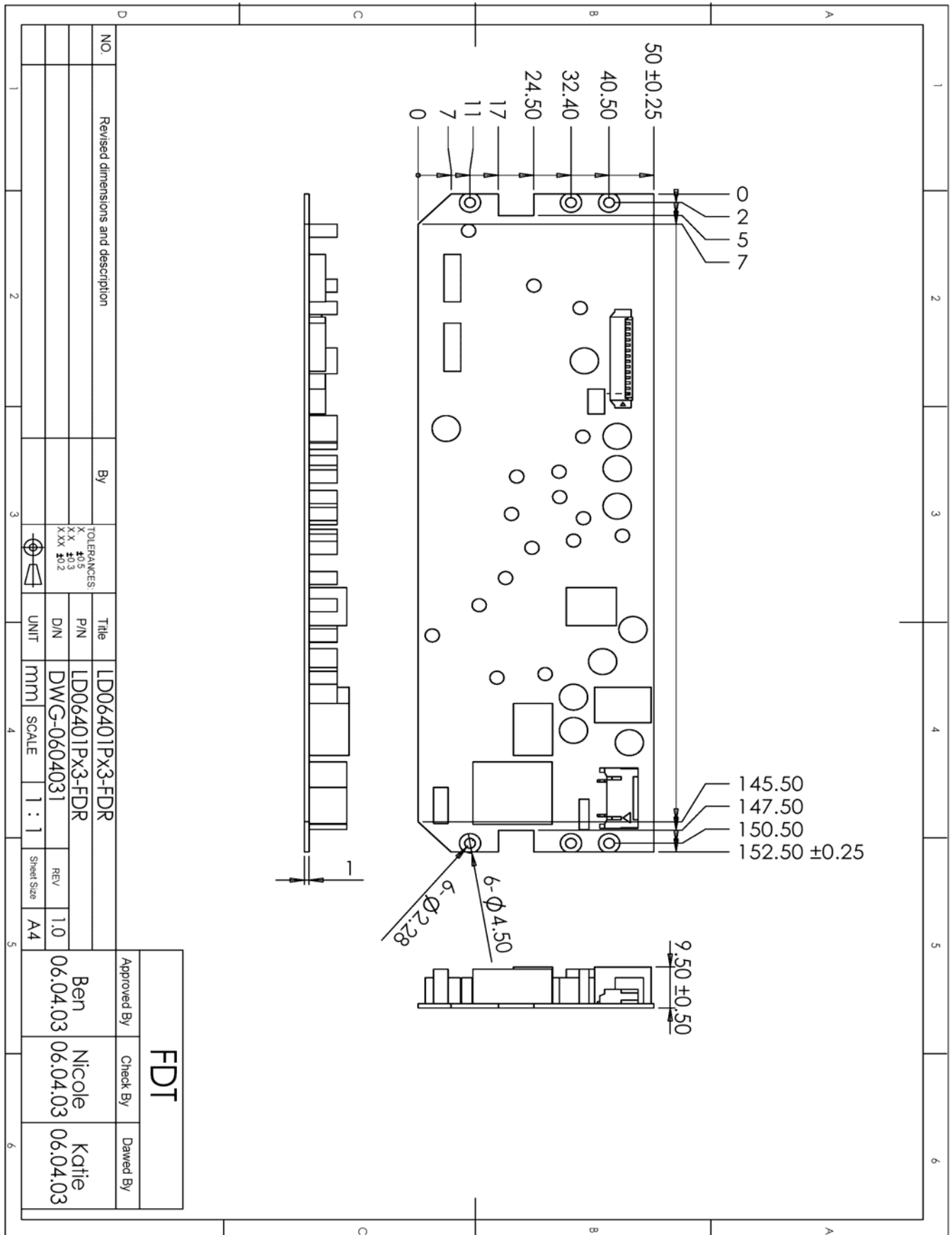
Order Part Number	NTSC	PAL	NTSC/PAL	Master RGB Mode	Slave RGB Mode	TFT-LCD Panel PA064DS1	Touch Panel A14T64-TP0640R
LP06401PN5-FDR	☉					☉	☉
LP06401PP5-FDR		☉				☉	☉
LP06401PS5-FDR			☉			☉	☉
LP06401PN6-FDR	☉					☉	☉
LP06401PP6-FDR		☉				☉	☉
LP06401PS6-FDR			☉			☉	☉

Order Part Number	Touch Panel Driver A14LCD-40UCG2R			Touch Panel Driver A14LCD-40RCG2R		
	USB Driver Board	USB Transmits Line	USB 4P-4P CABLE	RS232 Driver Board	RS232 Transmits Line	RS232 4P-4P CABLE
LP06401PN5-FDR	☉	☉	☉			
LP06401PP5-FDR	☉	☉	☉			
LP06401PS5-FDR	☉	☉	☉			
LP06401PN6-FDR				☉	☉	☉
LP06401PP6-FDR				☉	☉	☉
LP06401PS6-FDR				☉	☉	☉

FLAT DISPLAY TECHNOLOGY

6. Dimension Information

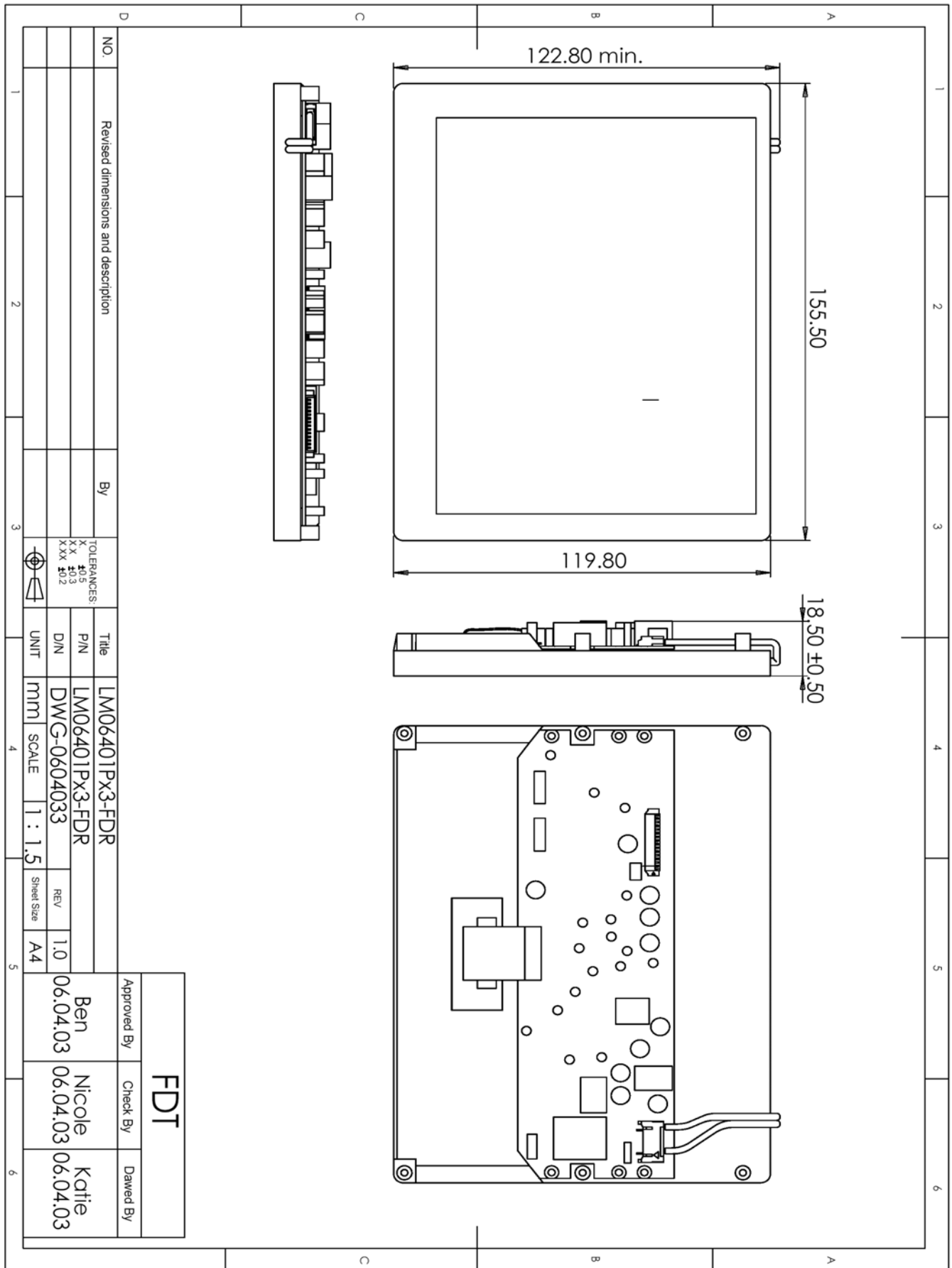
6.1 Driver Board (LD06401Px3-FDR)



FLAT DISPLAY TECHNOLOGY

■ LD06401Px3-FDR ■ LM06401Px3-FDR ■ LP06401Px3-FDR V1.3 

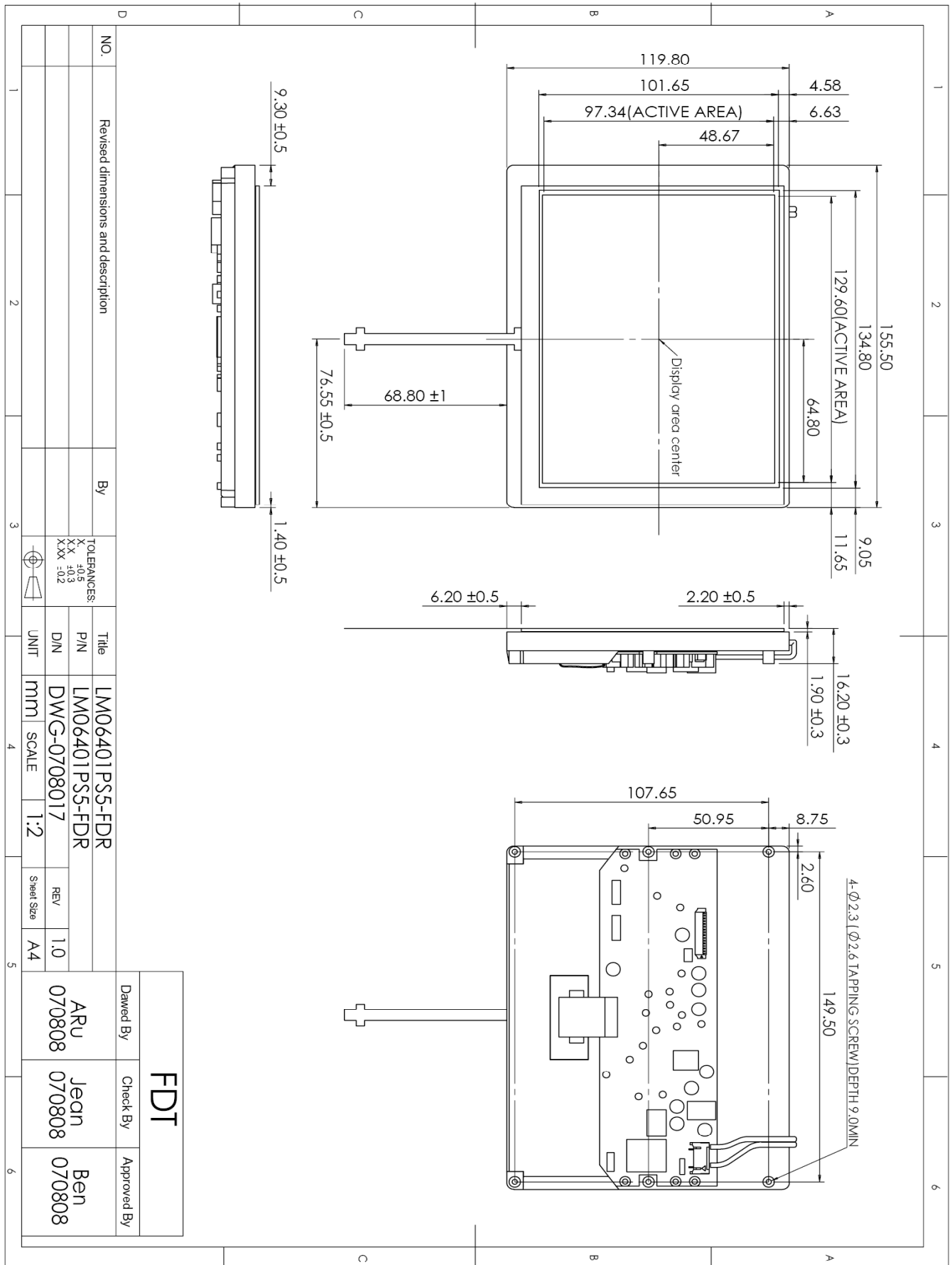
6.2 Module (LM06401Px3-FDR)



FLAT DISPLAY TECHNOLOGY

■ LD06401Px3-FDR ■ LM06401Px3-FDR ■ LP06401Px3-FDR V1.3 

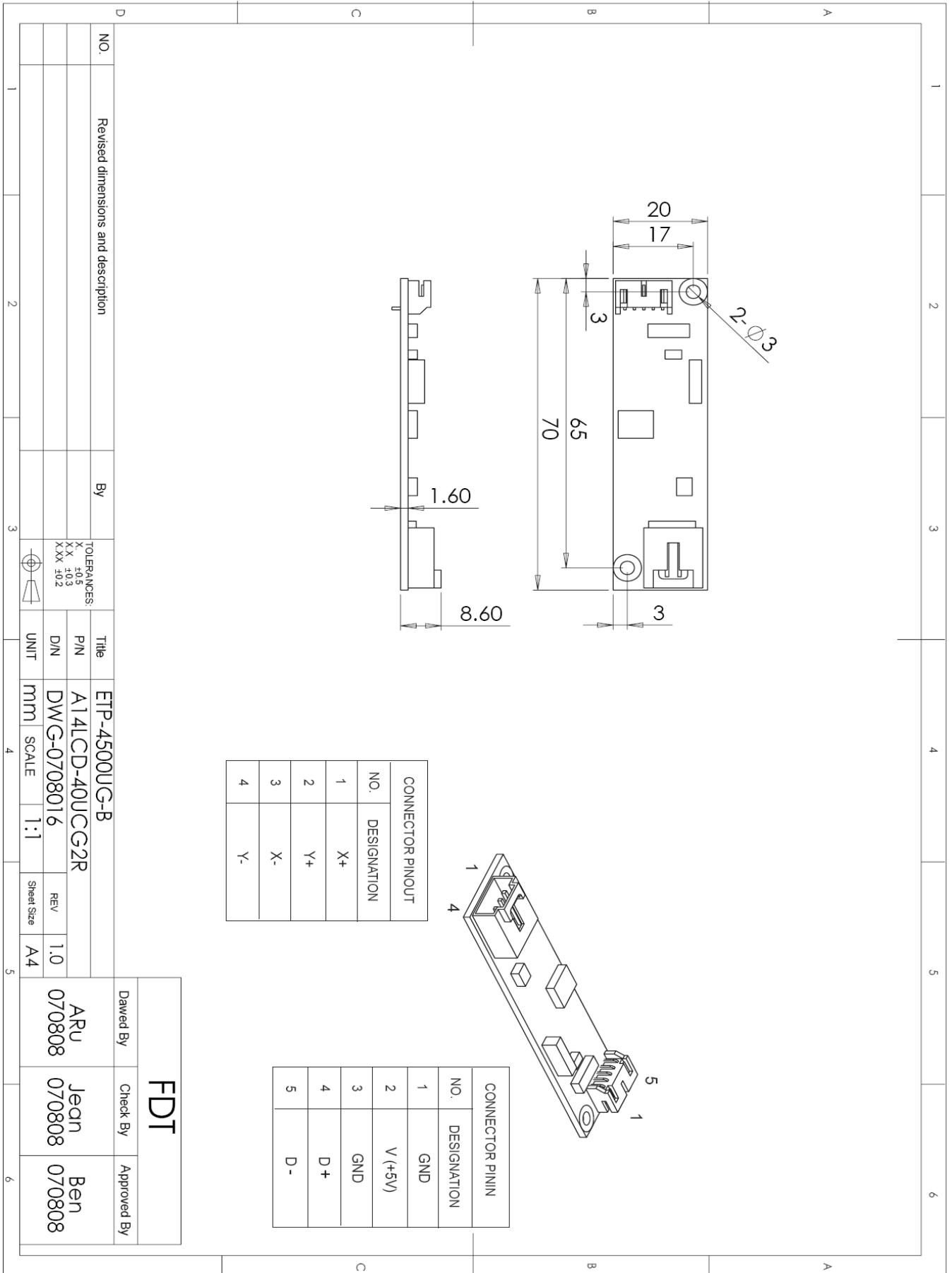
6.3 Module (LM06401Px5-FDR)



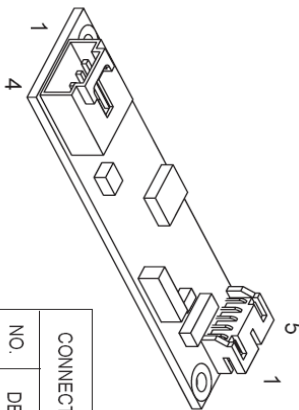
FLAT DISPLAY TECHNOLOGY

■ LD06401Px3-FDR ■ LM06401Px5-FDR ■ LP06401Px5-FDR V1.3 

6.4 USB Driver Board (A14LCD-40UCG2R)



CONNECTOR PINOUT	
NO.	DESIGNATION
1	X+
2	Y+
3	X-
4	Y-



CONNECTOR PININ	
NO.	DESIGNATION
1	GND
2	V(+5V)
3	GND
4	D+
5	D-

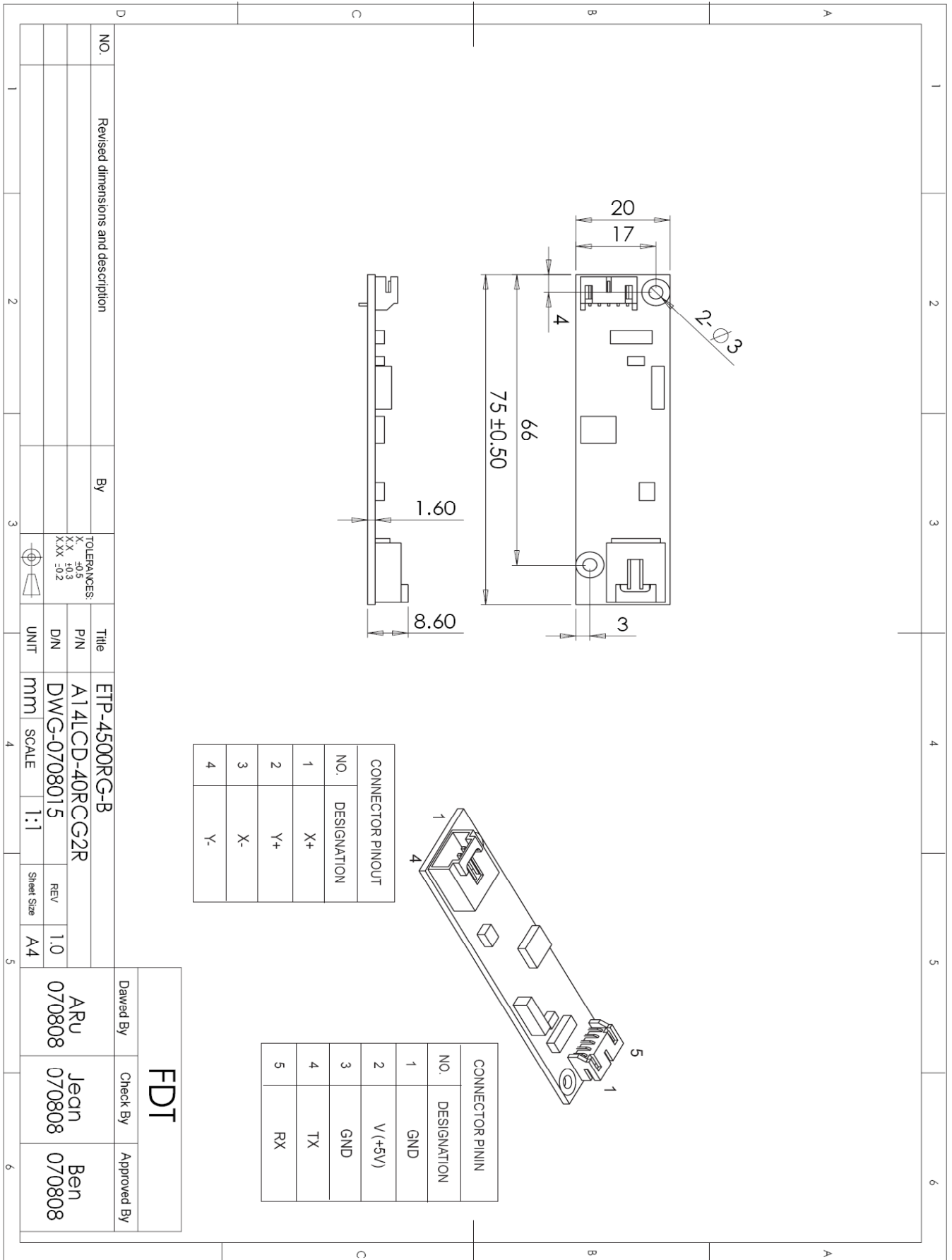
NO.	Revised dimensions and description	By	TOLERANCES: X ±0.5 XX ±0.3 XXX ±0.2	
			Title	ETP-4500UG-B
			P/N	A14LCD-40UCG2R
			D/N	DWG-0708016
			UNIT	MM
			SCALE	1:1
			REV	1.0
			Sheet Size	A4

FDT		
Dawed By	Check By	Approved By
ARU 070808	Jean 070808	Ben 070808

FLAT DISPLAY TECHNOLOGY

■ LD06401Pxx-FDR ■ LM06401Pxx-FDR ■ LP06401Pxx-FDR V1.3

6.5 RS232 Driver Board (A14LCD-40RCG2R)



NO.	DESIGNATION
1	X+
2	Y+
3	X-
4	Y-

NO.	DESIGNATION
1	GND
2	V (+5V)
3	GND
4	TX
5	RX

FDT

Drawn By	Check By	Approved By
ARU 070808	Jean 070808	Ben 070808

NO.	Revised dimensions and description	By	TOLERANCES: X -0.5 XX -0.3 XXX -0.2	Title	ETP-4500RG-B	UNIT	mm	SCALE	1:1	Sheet Size	A4
				P/N	A14LCD-40RCG2R	REV					
				D/N	DWG-0708015	REV				1.0	

7. Pin Description

7.1 J202 : LCD Panel I/O Terminals (FPC I/O 20pin Below Contact Type)

Pin No	Symbol	I/O	Description	Remark
1	HSY	I/O	Horizontal Sync. Input / Output	
2	POLC	O	Video Polarity Alternating Signal	
3	CSY	I	Composite Sync. Signal	
4	VGH	I	Gate On Voltage	
5	VGL	I	Gate On Voltage	
6	VB	I	Video Input B	
7	VR	I	Video Input R	
8	VG	I	Video Input G	
9	GND	-	GND	
10	VDD	I	Digital Power Input	
11	Vcc	I	Analogue Power Input For Source Driver	
12	GND	-	GND	
13	CKC	I	Select Pin For Internal / External Clock Mode	
14	VSX	I/O	Vertical Sync. Input / Output	
15	PSI	I	Synchronize Pulse For Decoder	
16	COMPS	I	Select Pin for Composite Sync. Mode & Sync. Separate Mode	
17	VIY	I	Vertical Sync. Input Pin For Sync. Separate Mode	
18	U / D	I	Up / Down Control For Gate Driver	
19	R / L	I	Left / Right Control For Source Driver	
20	N / P	I	NTSC / PAL Input	

Note: About TFT-LCD Panel detail information please refer PVT's PA064DS1 Specification.

7.2 J201 : Pin Assignment of Signal Input (Pitch1.25mm 14Pin , Side Entry Type)

Pin No	Symbol	I/O	Description	Remark
1	Vin	-	+12V Voltage DC Input	
2	GND	-	Power Ground	
3	GND	-	Power Ground	
4	GND	-	Signal Ground	
5	Video in	I	Video Input	
6	+5V	O	+5V DC Output Voltage	Note 1
7	Bright	I	Bright Control	
8	Contrast	I	Contrast Control	
9	Color	I	Color Control	
10	Tint	I	TINT Control	Note 2
11	NTSC / PAL	O	Auto Detect Video System Output	Note 3
12	Left / Right	I	Left / Right Reverse	Note 4
13	Up / Down	I	Up / Down Reverse	Note 4
14	Dimmer	I	Backlight Brightness Control	

Note1: The +5V DC supply external control circuit. (Max, out is 10mA)

Note2: The TINT is only operating in NTSC system.

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

Note4: Default is reversed scanning (High) and Low is for normal scanning.

Please do force this pin to ground for normal scan.

7.3 J101 : Pin Assignment Of RGB Mode(Pitch 1.25mm 10P ,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	Note 1
5	CSYI	I	Composite Sync. Input	Note 2
6	INT-VIDEO-CSY	O	Internal Composite Sync. Output	Note 3
7	HSY	O	Horizontal Sync. Output	Note 4
8	VSX	O	Vertical Sync. Output	Note 4
9	GND	-	Ground	
10	SVHS-C	I	Chroma Signal Input	Note 5

*This connector is optional. If you use EXT R.G. B or Y/C Video input mode

Please contact FDT to modify some components of the interface board.

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

Note2: CSYI must be positive sync. signal input.

Note3: If EXT-SW is low the INT-VIDEO-CSY switch to CSYI.

CSYI is composite sync of RGB mode when EXT-SW is high.

Note4: HSY and VSX is negative sync. Signal output for On Screen Display(OSD).

CSYI connect with INT-VIDEO-CSY when external RGB signal synchronize video sync.

Note5: SVHS-C is option.

7.4 J203: Output For LCD Panel Backlight

Pin No	Symbol	I / O	Description	Remark
1	HV+	O	High Voltage Terminal For Backlight	Connect to Pink wire
2	HV-	I	Return Terminal For Backlight	Connect to Pink wire

8. Absolute Maximum Ratings

8.1 Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit	Remark
Input Voltage	V _{in}	+9	+14	V	
Video Input Signal	Video in	0.5	2.0	V _{p-p}	@75Ω
Digital Input Signal	TTL	+0.3	+5.3	V	
Storage Temperature		-20	+70	°C	
Operating Temperature		-10	+60	°C	

9. Recommended operating conditions

9.1 Electrical Characteristics

Parameter	Symbol	I/O	Min	Typ	Max	Unit	Note
Input Voltage	Vin	I	+10	+12	+14	V	
Total Current	Iin	I		512		mA	
Power Consumption		I		6.14		W	@+12v
Video Input Signal	Video in	I		1.0		Vp-p	@75Ω
Output Voltage	+5VA	O		+5V		V	10mA
Brightness Adjust	Bright	I	1.88	1.93	2.06	V	
Contrast Adjust	Contrast	I	2.11	2.59	3.12	V	
Color Adjust	Color	I	2.18	2.42	2.75	V	
Tint Adjust	Tint(NTSC Only)	I	1.5	2.98	3.7	V	
Video Auto Detect	NTSC/ PAL	O		TTL		V	
Screen Reverse	Left / Right	I		TTL		V	
Screen Reverse	UP / Down	I		TTL		V	
Dimmer Adjust	Dimmer	I	0	-	+3.3	V	Negative

9.2 Lamp Data

Parameter	Symbol	Min	Typ	Max	Unit	Note
Lamp Voltage	VL	510	560	610	Vrms	IL=6mA, (±
Lamp Current	IL	4	6	8	mA	10%)

Note: Ta= 25°C @+12V

9.3 Sample Test Data

Parameter	White Window	Red	Green	Blue	Remark
S/N : 001 x	0.296	0.568	0.306	0.151	
.y	0.324	0.337	0.528	0.132	±15%
L	425 (cd/m ²)	-	-	-	
TC	7531 (°K)	-	-	-	

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

2. Pattern Generator: FLUKE PM54200

3. Measurement Distance : 500mm±50mm

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

(After 10mm~20mm Operation)

FLAT DISPLAY TECHNOLOGY

■ LD06401Pxx-FDR ■ LM06401Pxx-FDR ■ LP06401Pxx-FDR V1.3 

10. Touch Panel Characteristics

10.1 Pin assignment (Pitch:1.0mm)

Pin No	Symbol	Description	Remark
1	X1	Lower Electrode X (Right Side)	
2	Y1	Upper Electrode Y (Down Side)	
3	X2	Lower Electrode X (Left Side)	
4	Y2	Upper Electrode Y (Upper Side)	

10.2 Electrical Performance

Parameter	Symbol	Min	Typ	Max	Unit	Remark
Terminal Resistance	X	230	330	430	Ω	
	Y	360	510	660	Ω	
Input Voltage	VT	-	5.0	7.0	V	
Linearity		-	-	1.5	%	
Insulation Impedance		20	-	-	M Ω	DC 25V
Response Time		-	-	10	ms	

10.3 Optical Performance

Parameter	Specifications
Light Transmittance	$\geq 80\%$
Haze	Min.1%

10.4 Mechanical Performance

Parameter	Specifications
Input Method	Finger or stylus pen
Operating Force	$\leq 50g$
Surface Hardness	3H or more
Static Load Resistance	5Kg / 25 cm ²
Impact Resistance	ϕ 12.5mm steel ball, 150cm height

10.5 Durability Performance

Parameter	Specifications
Hitting Durability	≥ 1000000 times, with R8.0 mm silicon rubber, 250g, 3 times / sec
Sliding Durability	≥ 100000 times, with R0.8 mm polyacetal stylus, 250g, 60 mm / sec

10.6 Environmental

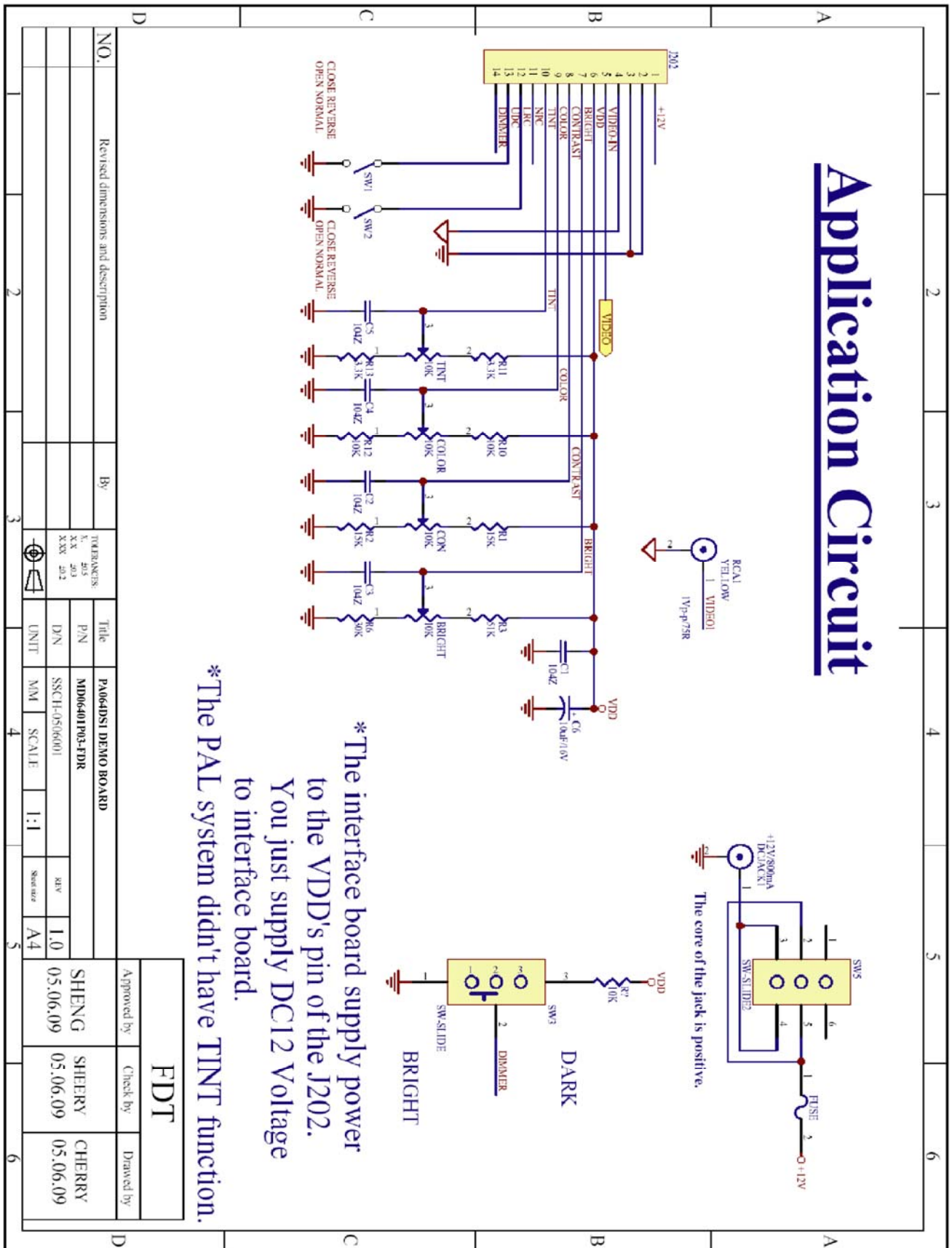
Parameter	Specifications
Operating Temp.	0°C~50°C (Except dew condensation)
Storage Temp.	-20°C~70°C (Except dew condensation)

10.7 Reliability test procedure

Parameter	Specifications
High temperature storage test	70°C for 240 hours.
Low temperature storage test	-20°C for 240 hours.
Thermal Cycling	-20°C (30 min)~70°C (30 min) for 10 cycles.
High temperature and high humidity	50°C, 90%RH for 240 hours.

11. Application Schematic Diagram

11.1 Application Circuit



*The interface board supply power to the VDD's pin of the J202. You just supply DC12 Voltage to interface board.

*The PAL system didn't have TINT function.

FDT

Approved by	Check by	Drawn by
SHENG	SHEERY	CHERRY
05.06.09	05.06.09	05.06.09

NO.	Revised dimensions and description		By	Title		P/N	MATERIALS		UNIT	SCALE	A4
				PA064DST DEMO BOARD			REV				
				MD06401P03-FDR		DIN		SSCH-05/06001		1:1	
				MM		Scale		A4			

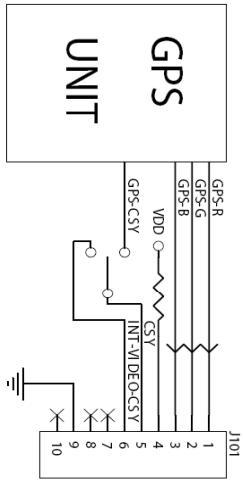
12. R.G.B Function Application Block

12.1 R.G.B Function Application Block

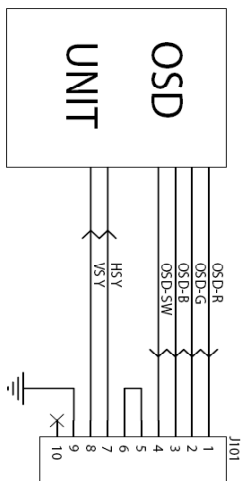
R.G.B Function Application Block

MASTER MODE

GPS R.G.B



SLAVE MODE



EXT-SW :

- 0: DISPLAY VI DEOS GREEN
- 1: DISPLAY GPS SCREEN

CSY:

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

Revised dimensions and description		By		Title		Approved by		FDT	
NO.	NICOLE	TOLERANCES:	X ± 0.5	P/N		BEN	JEAN	CHEERY	
			XX ± 0.3	D/N	SSCH-0412002	04.12.28	04.12.28	04.12.28	
			XXX ± 0.2	UNIT	MM SCALE	REV	Sheet size		
						1.0	A4		