



§ SPECIFICATION APPROVAL SHEET §

Fdt Tech Module No LT070T8xA0-FDR

Description: 7" Digital TFT-LCD Module

SPEC No.: SAS-1012007

Version: 0.2

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

Customer:

Date: / / 13

APPROVED BY:

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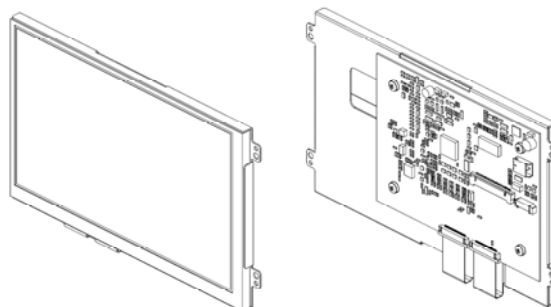
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7" Digital TFT-LCD Module



■ LT070T8xA0-FDR

1. General Descriptions

1.1 Features

- 18bits LVDS interface
- Image Reversion: Up/Down and Left/Right
- LED Backlight Circuit Operation Voltage: +5V
- Support Touch Screen Function (Option)

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.

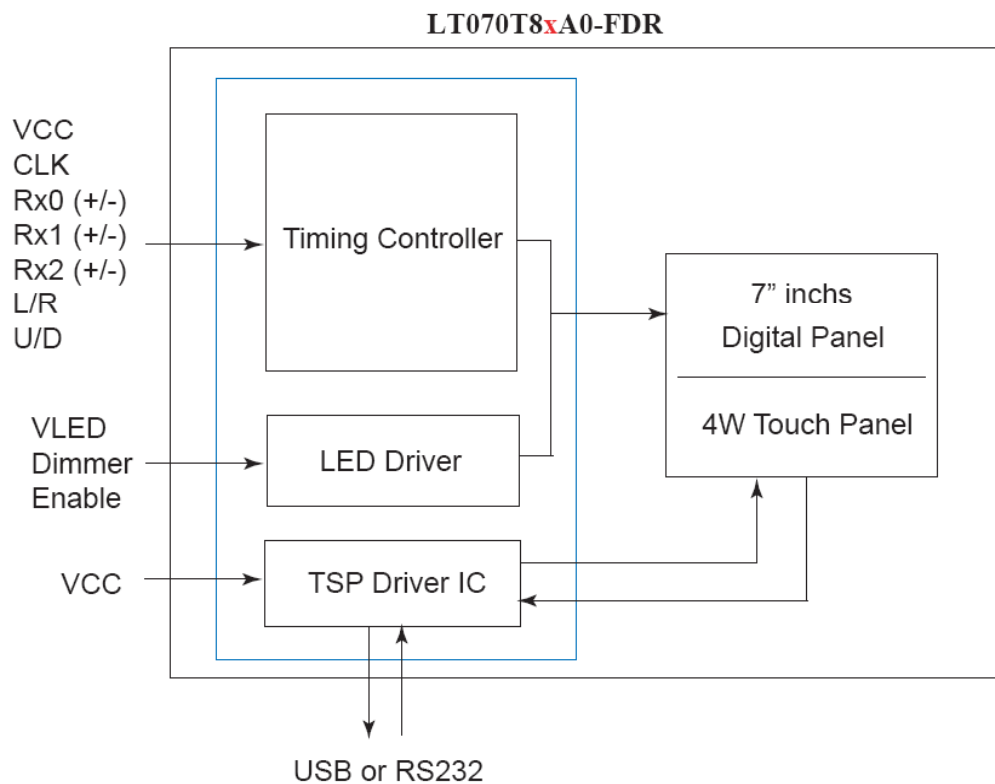


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3. Block Diagram

3.1 Block Diagram



Pre-release

4. TFT-LCD Information

4.1 TFT-LCD Mechanical Specifications

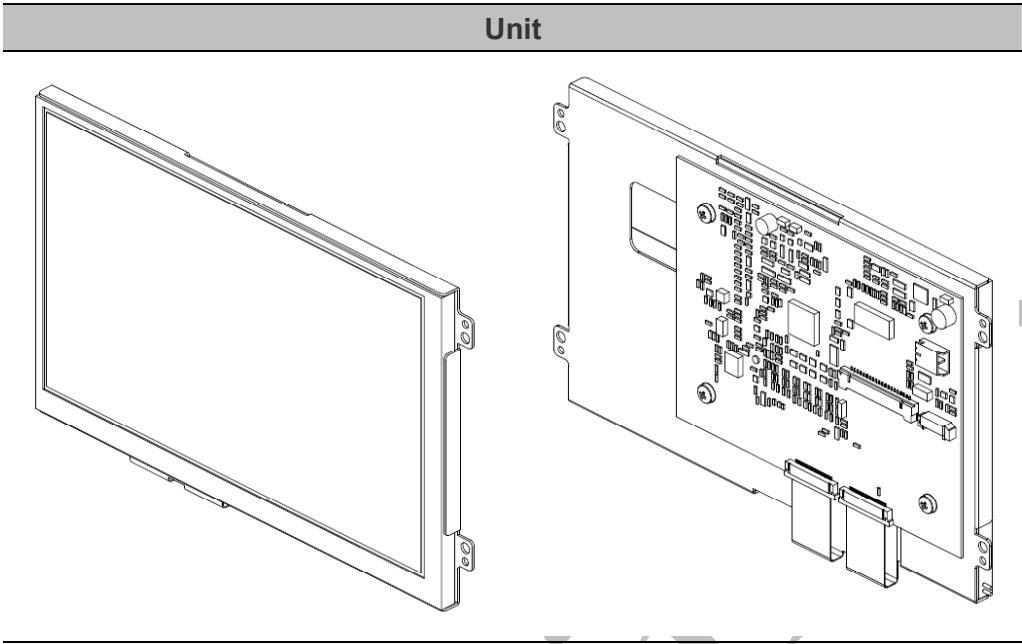
Parameter	Specifications	Unit
Screen Size	7 (Diagonal)	inch
Display Format	800 x (R.G.B) x 480	dot
Display Mode	Normally white, Transmissive	
Active Area	152.4(H) x 91.44(V)	mm
Pixel Pitch	0.1905(H) x 0.1905(V)	mm
Surface Treatment	Anti-glare	
Weight	370±20(Typ)	g

4.2 TFT-LCD Optical Characteristics

Parameter	Symbol	Condition	Min	Typ	Max	Unit	Remark
Viewing Angle	Horizontal	Left	60	70	-	deg	
		Right	60	70	-	deg	
	Vertical	Top	40	50	-	deg	
		Bottom	60	70	-	deg	
Contrast Ratio	CR	At optimized Viewing angle	400	500	-		
Response time	Rise Fall	Tr	-	10	20	ms	
		Tf	-	15	30	ms	
Uniformity	U		70	75	-	%	
Brightness	L	$\theta = 0^\circ / \phi = 0$	200	250	-	cd/m ²	
Brightness With TSP	L	$\theta = 0^\circ / \phi = 0$	160	200	-	cd/m ²	
White Chromaticity	x	$\theta = 0^\circ$	0.26	0.31	0.36		
	y	$\theta = 0^\circ$	0.28	0.33	0.38		
LED Life Time			20000			Hrs	

5. Order Information

5.1 Unit

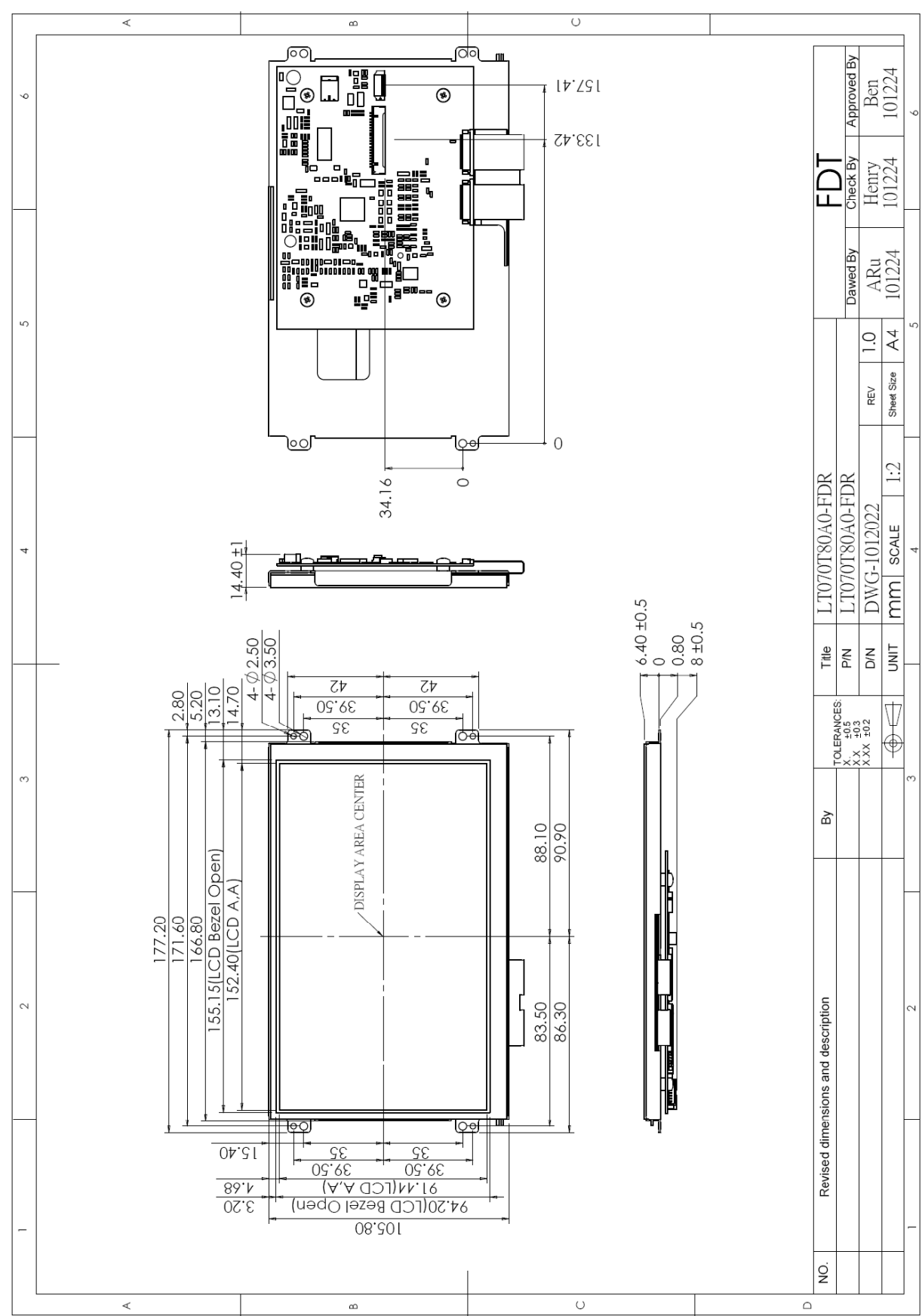


Parameter	LT070T80A0-FDR	LT070T81A0-FDR	LT070T82A0-FDR
Signal Input Connector	20 PIN	20 PIN	20 PIN
Touch Panel Type	-	4W Resistive	4W Resistive
Touch Screen Interface	-	USB	RS-232
Bracket	⊙	⊙	⊙

Note: 1.The assembling of panel and bracket is aimed for delivery, packaging and experiemnt. If the demand of shockproof and longterm fix, pls have it into consideration of mechanism design.

6. Dimension Information

6.1 Unit (LT070T80A0-FDR)



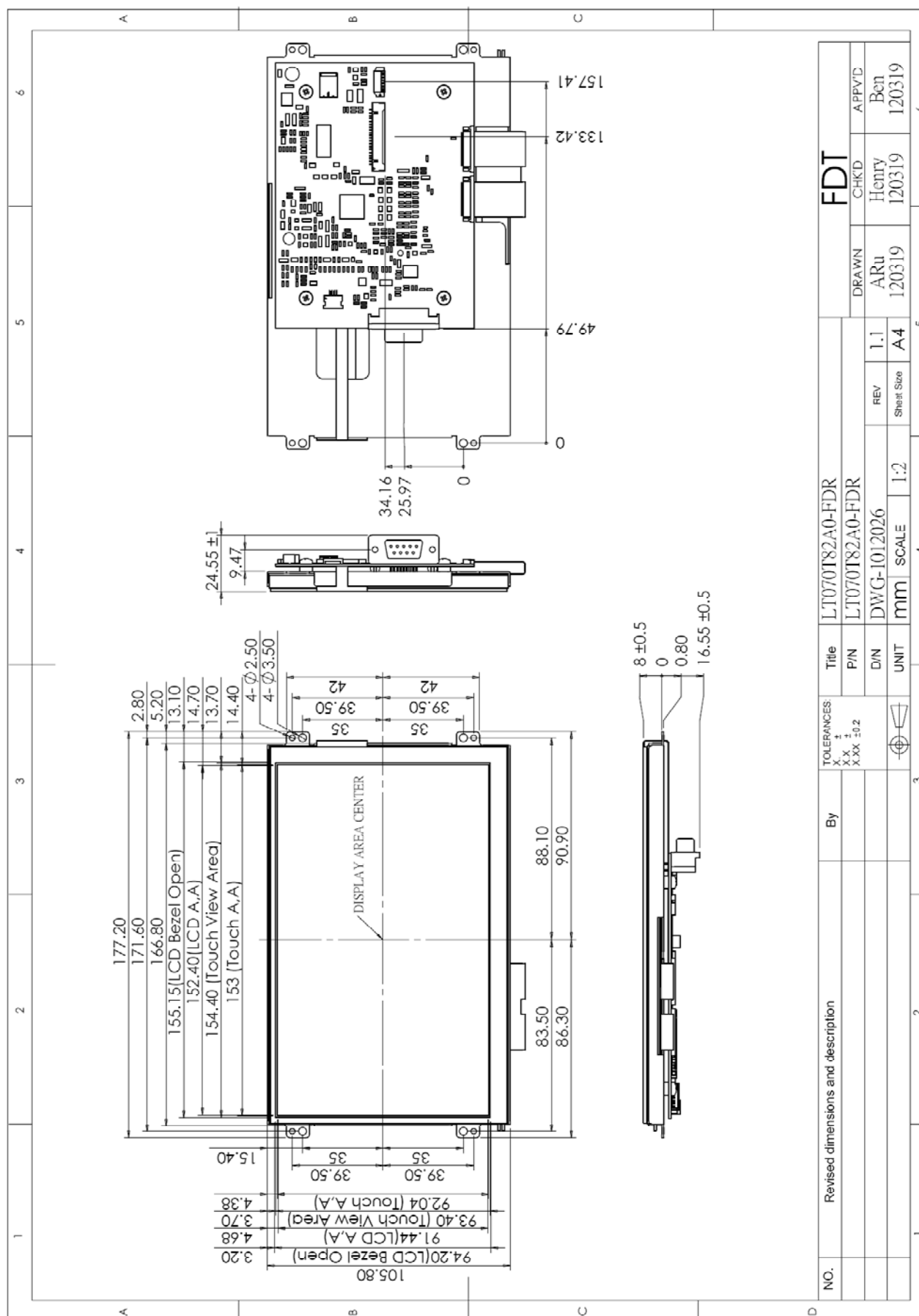
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6.3 Unit (LT070T82A0-FDR)



NO.	Revised dimensions and description	By	TOLERANCES: X.X ± X.X ± X.X ± 0.2	Title	LT07070T82A0-FDR	FDT			
				P/N	LT07070T82A0-FDR		DRAWN	CHK'D	APP'D
				D/N	DWG-1012026	REV	ARu	Henry	Ben
				UNIT	mm	SCALE	1:2	120319	120319
						Sheet Size	A4		

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7. Pin Description

7.1 J501A : LVDS I/O Terminals (Pitch 1.25mm 20Pin, Side Entry Type)

※ FDT Connector Part No.: MS240420G (STM) [Same as DF14-20P-1.25H (HIROSE)];

FDT Matching Connector Part No.: P240420 (STM) [Same as DF14-20S-1.25C (HIROSE)].

Pin No	Symbol	I/O	Description	Remark
1	VCC	I	Power Supply (3.3 V)	
2	VCC	I	Power Supply (3.3 V)	
3	GND	P	Ground	
4	GND	P	Ground	
5	RX0-	I	Differential Data Input, CH0 (Negative)	R0 ~ R5, G0
6	RX0+	I	Differential Data Input, CH0 (Positive)	
7	GND	P	Ground	
8	RX1-	I	Differential Data Input, CH1 (Negative)	G1 ~ G5, B0, B1
9	RX1+	I	Differential Data Input , CH1 (Positive)	
10	GND	P	Ground	
11	RX2-	I	Differential Data Input , CH2 (Negative)	B2 ~ B5, DE, Hsync, Vsync
12	RX2+	I	Differential Data Input , CH2 (Positive)	
13	GND	P	Ground	
14	CLK-	I	Differential Clock Input (Negative)	LVDS Level Clock
15	CLK+	I	Differential Clock Input (Positive)	
16	GND	P	Ground	
17	L/R	I	Horizontal Display Mode Select Signal	Note
18	U/D	I	Vertical Display Mode Select Signal	Note
19	GND	P	Ground	
20	GND	P	Ground	

Note: The definitions U/D & R/L

L/R=High , U/D=High



L/R=Low , U/D=High



L/R=High , U/D=Low



L/R=Low , U/D=Low

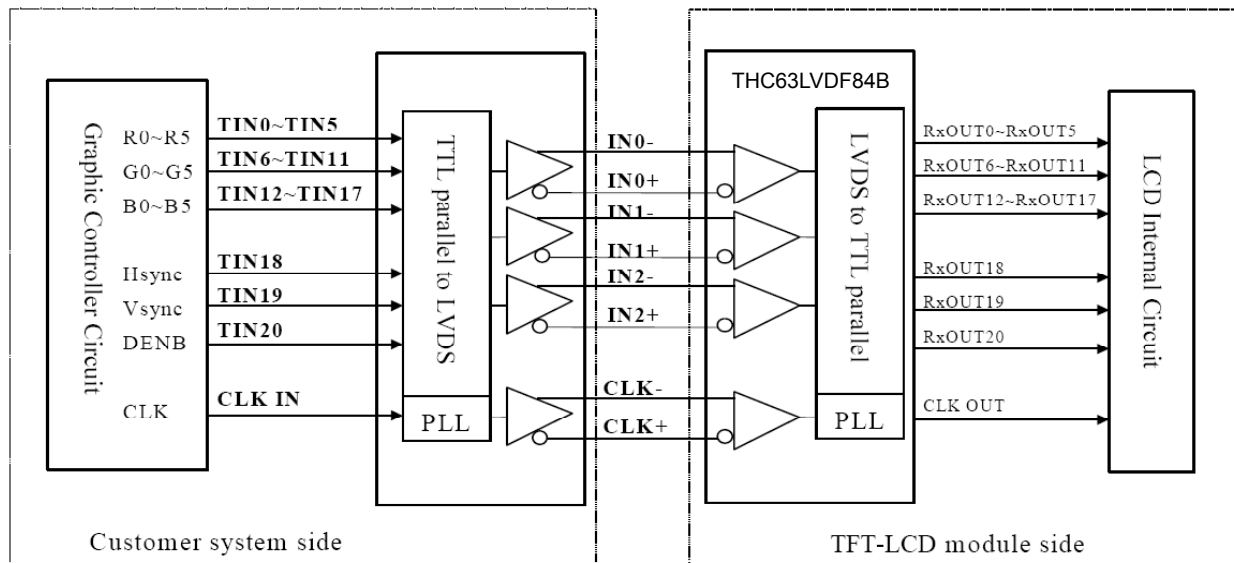


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LVDS Interface Block Diagram



7.2 J502: Pin Assignment of Inverter (Pitch 1.25mm 6Pin, Side Entry Type)

※ FDT Connector Part No.: MS24016R (STM) [Same as 53261-0619 (MOLEX)];

FDT Matching Connector Part No.: P24016 (STM) [Same as 51021-0600 (MOLEX)].

Pin No	Symbol	I/O	Description	Remark
1	VLED	-	Power Voltage For LED Backlight Circuit (+5V)	
2	VLED	-	Power Voltage For LED Backlight Circuit (+5V)	
3	DIMMER	O	Backlight Brightness Adjust	
4	ENABLE	O	Enable For LED Backlight	
5	GND	-	Power Ground	
6	GND	-	Power Ground	

7.3 J401C : Pin Assignment of Touch USB (USBA-Female 2.0mm, Side Entry Type)(Option)

Pin No	Symbol	I/O	Description	Remark
1	DGND	-	Digital Ground	
2	D+	-	DATA (+)	
3	D-	-	DATA (-)	
4	VBUS	-	USB VCC	

7.4 J401D : Pin Assignment of Touch RS232 (D-SUB 9 MALE)(Option)

Pin No	Symbol	I/O	Description	Remark
1	NC	-	No Connection	
2	RXD	-	Receive Data	
3	TXD	-	Transmit Data	
4	NC	-	No Connection	
5	GND	-	Ground	
6	NC	-	No Connection	
7	NC	-	No Connection	
8	NC	-	No Connection	
9	NC	-	No Connection	

8. Absolute Maximum Ratings

8.1 Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit	Remark
Input Voltage	Vcc	+3	+3.6	V	
LED Driver Input Voltage	VLED	+4.5	+5.8	V	
Digital Input Signal	TTL	Vcc-0.5	Vcc+0.5	V	U/D, R/L
LVDS Receiver Input Voltage		-0.3	Vcc+0.3	V	
Operating Temperature		-20	+70	°C	
Storage Temperature		-30	+80	°C	
Operating Temperature With TSP		-10	+60	°C	
Storage Temperature With TSP		-30	+70	°C	

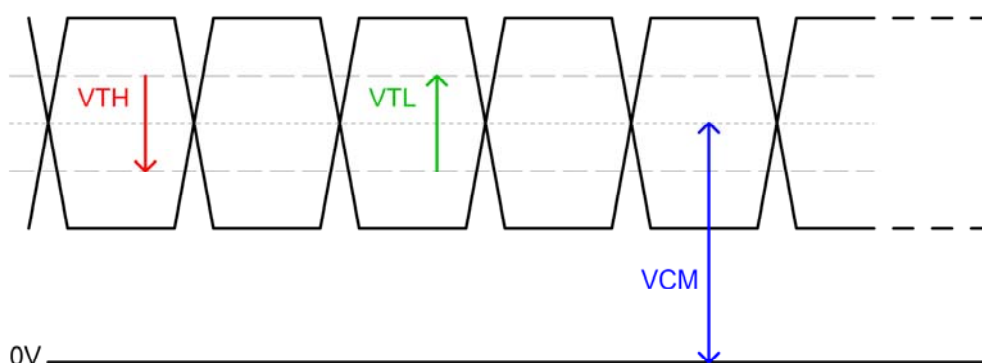
9. Recommended Operating Conditions

9.1 Electrical Characteristics

Parameter	Symbol	Min	Typ	Max	Unit	Note	Remark
Input Voltage	Vcc	+3.1	+3.3	+3.5	V		
Total Current	Icc (+3.3V)	-	210	-	mA		±15%
LED Driver Input Voltage	VLED	+4.8	+5	+5.5	V		
LED Driver Current	ILED (+5V)	-	420	-	mA		±15%
LED Driver Power Consumption		-	2.1	-	W		@+5V
Digital Input Signal	TTL	Vcc-0.3	Vcc	Vcc+0.3	V		U/D, R/L
Differential Input High Threshold	VTH	-	-	100	mV		VCM=1.2V
Differential Input Low Threshold	VTL	-100	-	-	mV		VCM=1.2V
Dimmer Adjust	Dimmer	0(Dark)	-	+3.3(Bright)	V	Floating: 1/2 VCC	Positive
Enable Backlight	Enable	0		+3.3	V		1: Enable 0: Disable

Note: Please input VCC if the function of the backlight unit needs to be worked normally. Please do not input VLED only.

Differential Signal



10. Interface Timing

10.1 Timing Parameters

Parameter	Symbol	Min	Typ	Max	Unit
DCLK frequency	Fdclk	-	40	45	MHz
DCLK cycle	Tcph	22	25	-	ns
DCLK pulse width	Tcw	8	-	-	ns
Data set-up time	Tsu	4	-	-	ns
Data hold time	Thd	2	-	-	ns
Time that the last data to LD	Tld	1	-	-	Tcph
Pulse width of LD	Twld	2	-	-	Tcph
Time that LD to STHL/R	Tlds	5	-	-	Tcph
POL set-up time	Tpsu	6	-	-	ns
POL hold time	Tphd	6	-	-	ns
CKV frequency	Fvclk	-	-	200	KHz
CKV rise time	Trck	-	-	100	ns
CKV falling time	Tfck	-	-	100	ns
CKV pulse width	PWCLK	500	-	-	ns
Horizontal display timing range	Tdh	-	800	-	Tcph
Horizontal timing range	Th	-	1056	-	Tcph
STVU/D setup time	Tsuv	200	-	-	ns
STVU/D hold time	Thdv	300	-	-	ns
STVU/D delay time	Tdt	-	-	500	ns
Driver output delay time	Tdo	-	-	900	ns
Output rise time	Ttlh	-	500	1000	ns
Output falling time	Tthl	-	400	800	ns
OEV pulse width	Twcl	1	-	-	us
OEV to Driver output delay time	Toe	-	-	900	ns
Horizontal lines per field	Tv	512	525	610	Tdh
Vertical display timing range	Tvd	-	480	-	Tdh

11. 4W Resistance Touch Panel Characteristics

11.1 Electrical Performance

Parameter	Symbol	Min	Typ	Max	Unit	Remark
Terminal Resistance	X	390	-	1350	Ω	
	Y	100	-	800	Ω	
Linearity		-	-	1.5	%	
Insulation Impedance		10	-	-	M Ω	DC 25V

11.2 Optical Performance

Parameter	Specifications
Light Transmittance	$\geq 83\%$
Haze	5%(Typ)

11.3 Mechanical Performance

Parameter	Specifications
Input Method	Finger or stylus pen
Operating Force	$\leq 50g$
Surface Hardness	3H or more

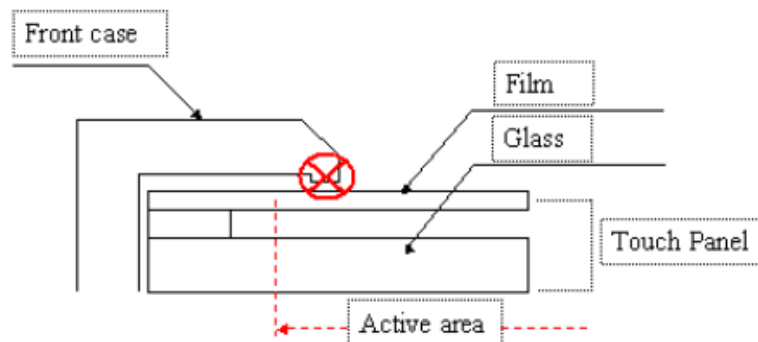
11.4 Durability Performance

Parameter	Specifications
Hitting Durability	≥ 1000000 times, with R8.0 mm silicon rubber, 200g, 5 times / sec
Sliding Durability	≥ 100000 times, with R0.8 mm polyacetal stylus, 250g, 60 mm / sec

11.5 Touch Screen Integration Design Guide

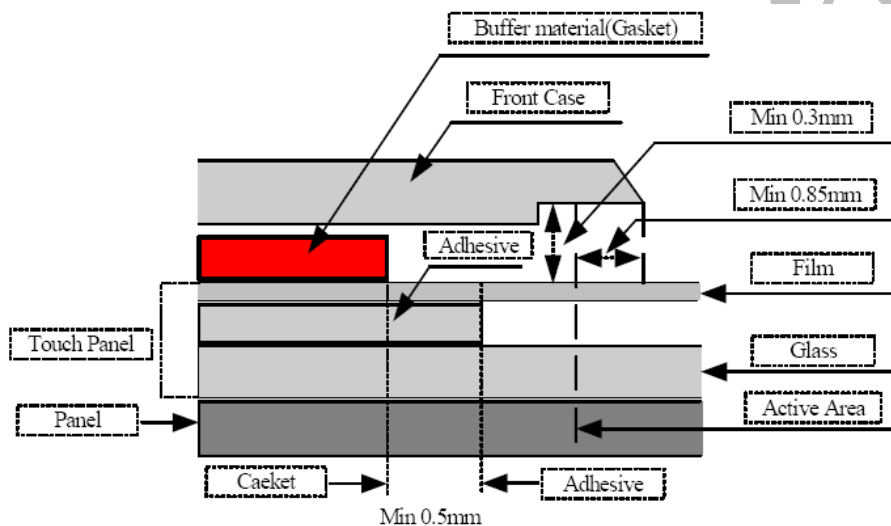
Avoid the design that Front-case overlap and press on the active area of the touch-panel.

Give enough gap (over 0.5mm at compressed) between the front case and touch-panel to protect wrong operating.



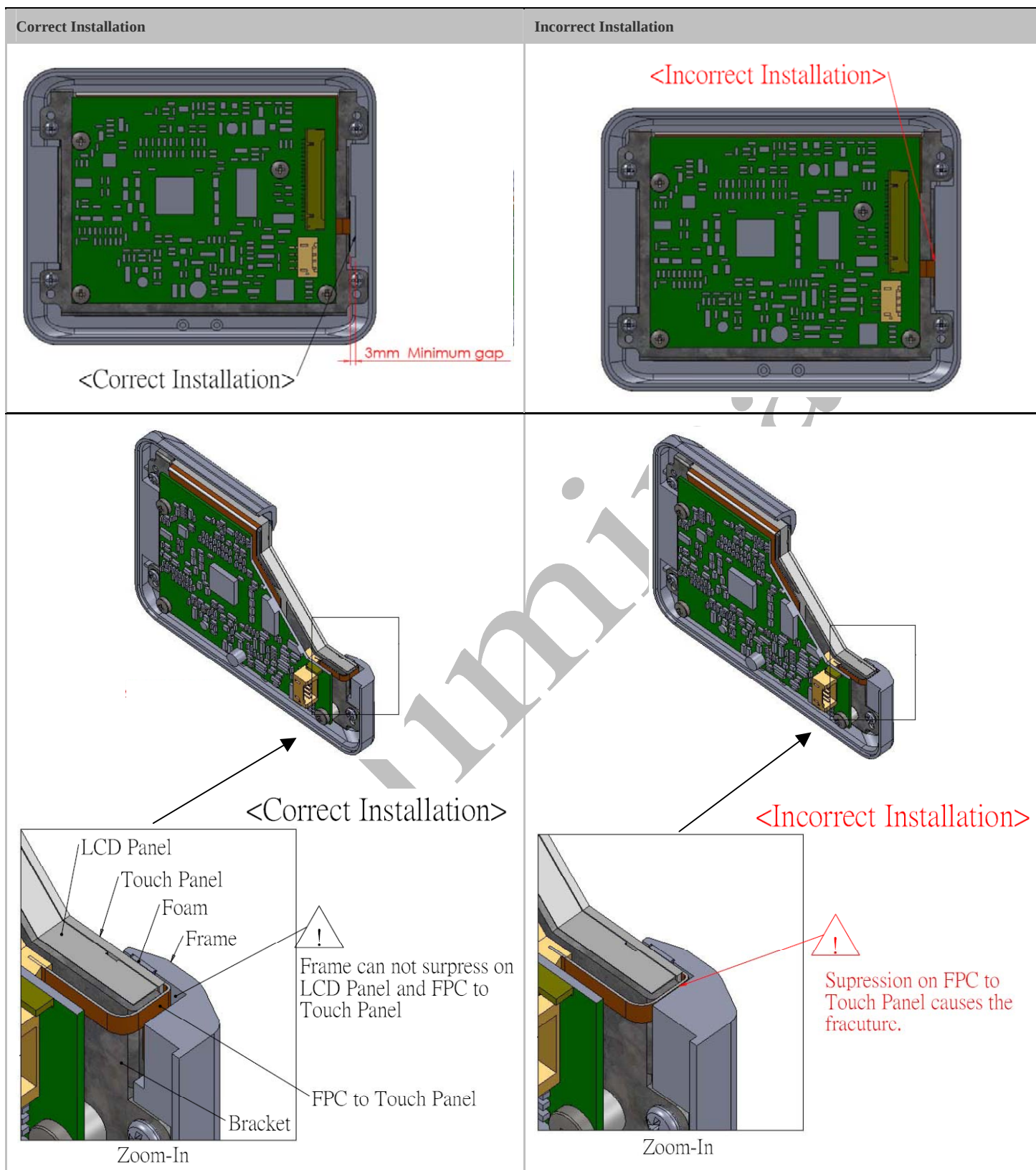
Use a buffer material (Gasket) between the touch-panel and front-case to protect damage and wrong operating.

Avoid the design that buffer material overlap and press on the inside of touch-panel viewing area.



Note: We strongly suggest to follow above design guide to avoid the linear defect happened on the touch panel.

11.6 Mechanical Design Notice For Touch Panel



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12. Operation Manual

12.1 Driver Board Manual

