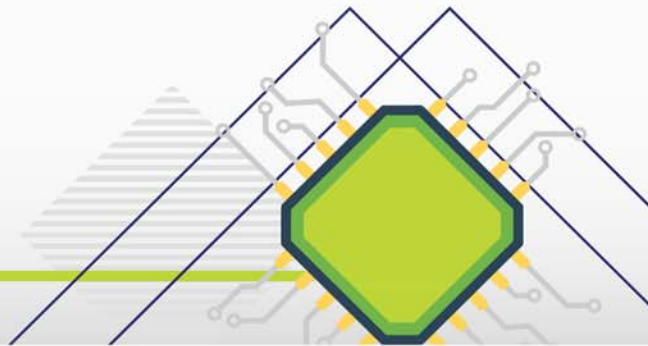




§ SPECIFICATION APPROVAL SHEET §

FDT Tech Module No. : UC035QIx1x-00R

Description : 3.5" Digital TFT-LCD Module

SPEC No. : SAS-1702001

Version : 0.2

Issue Date : May 29, 2018

※ This approval sheet contains 23 pages including the cover and appendix.

Customer : Date : / / 18	Approved By :
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Approved By :

Checked By :

Designed By :





1. General Description

FDT Micro Controller-HMI is a unique TFT LCD module which builds graphic and character inside. It provides user to present customized & full color graphics or characters without any SOC or IPC system. In addition, user can update or upload his graphics or characters via Micro SD slot by himself. FDT Micro Controller-HMI not only enhances your product values also saves your cost.

1.1 Features

- Variable-Oriented
- Friendly and Free Development Environment
- Multi-layer design
- Advanced GUI function
- Easy Touch Effects
- Multi-Language (Unicode)
- Easy and fast update image with Micro SD
- Single Operation Voltage +5V
- Built-in Real Time Clock / Buzzer
- LED Backlight Brightness Control
- RAM Support 8MB / Flash Memory 128MB
- 4Wires RTP Touch Support
- Serial Communication: UART (RS232 Option)
- Low Power Consumption / High reliability

1.2 Application

- Industrial controller
- Medical Equipment
- Security Equipment
- Simple Function Equipment



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Preliminary

3. Specifications

LCD	
Panel Size	3.5"
Resolution (Pixels)	320x240
Luminance Without RTP	300cd/m ²
Luminance (RTP)	240 cd/m ²
Contrast Ratio	400
View Angle	60 / 60 / 50 / 55
LED Life Time	10K (Min.)
Touch Screen	
Resistive Type	4W
Storage	
Micro SD Slot	Recommend SDHC
Flash Memory	128M Bytes (Note1)
RAM	8M Bytes (Note2)
Picture Format	
Type	BMP category

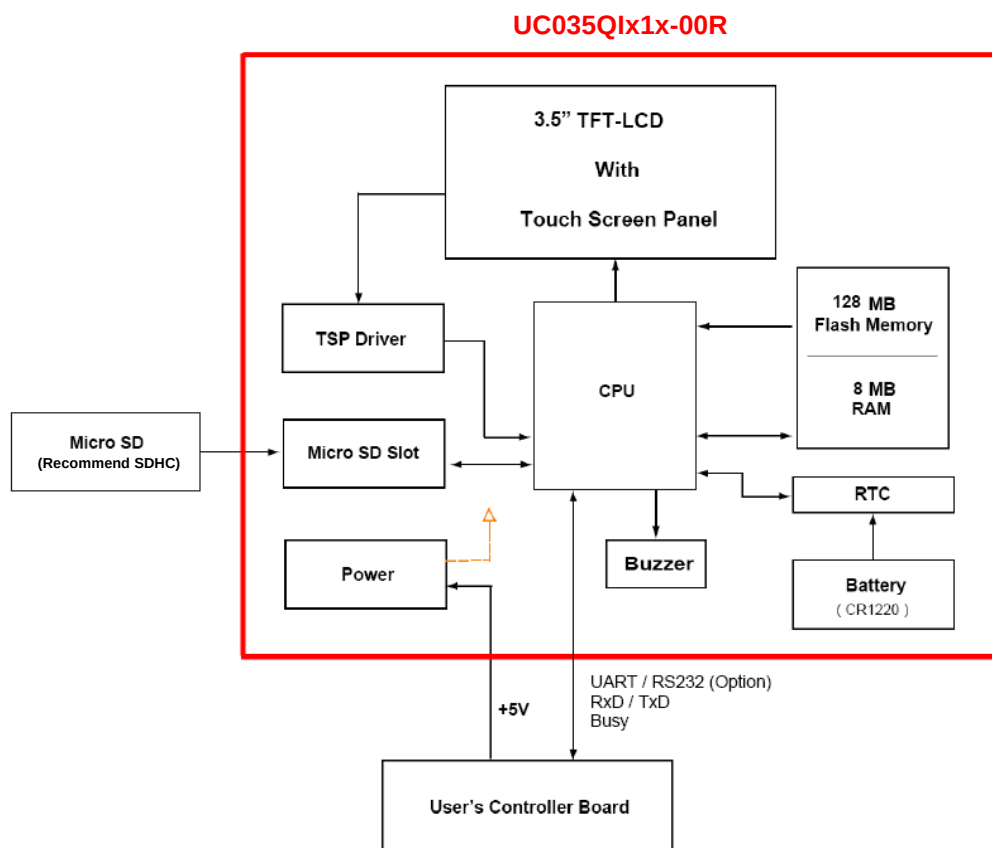
Power Requirement			
Power Input		+5V VDC	
Power Consumption@+5V		1.1 Watts (±15%)	
Controls			
Transmission Interface		UART / RS232 (Duplex Transmission)	
Communication Protocol			
UART Transmission Rate		115200 (max.921600bps) Bps	
Data Bit		8 Bits	
Parity Bit Check		None	
Stop Bit		1 Bit	
Environment			
Temperature Range		Without RTP	4W RTP
	Operating	-20~+70℃	-20~+60℃
	Storage	-20~+70℃	-20~+70℃
High Temperature & High Humidity (No Condensation)	Operating	+40℃ / 90%	+35℃ / 90%

Note 1: Storage memory for Icons, Pictures, Fonts and configure.

Note 2: GUI cache memory

4. Block Diagram

4.1 Block Diagram

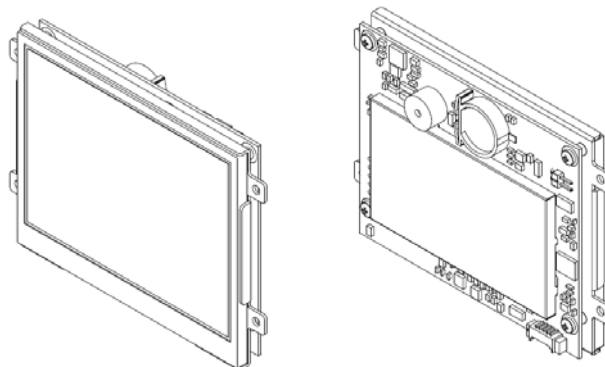




5. Order Information

5.1 Unit

Unit



Parameter	UC035QIA10-00R	UC035QIA14-00R	UC035QIB10-00R	UC035QIB14-00R	Unit	Remark
RTC	⊙	⊙	⊙	⊙		
Touch Screen Function	-	4W Resistance	-	4W Resistance		
Outline Dimension	88.9x65.7x13.9	88.9x65.7x15	88.9x65.7x13.9	88.9x65.7x15		
Buzzer Function	⊙	⊙	⊙	⊙		
Transmission Interface	UART	UART	RS232	RS232		
Weight	86	95	86	95	g	±10%
Condition	Standard	Standard	Non- Standard	Non- Standard		

Note: The assembling of panel and bracket is aimed for delivery, packaging and experiment. If the demand of shockproof and long-term fix, pls have it into consideration of mechanism design.

5.2 Accessories (Option)

NO.	Item	Order P/N	Picture	Remark
1.	5P 1.25mm - 4P1.25mm - 5.5mm DC Jack 2.1 φ	LACABLE012-FDR		Only for UC035QIA1 x -00R
2.	Signal Cable 5Pin-7Pin 1.25mm (L:150mm)	LACABLE0016-FDR		Only for UC035QIB1 x -00R
3.	RS232 Board	LOPOWER014-FDR		
4.	Female/Female Null Modem Type L:1800mm	LACABLE045-FDR		



6. Absolute Maximum Ratings

6.1 Absolute Maximum Ratings

Parameter	Symbol	Min	Max	Unit	Remark
Input Voltage	V _{in}	4.2	+5.7	V	
UART Mode	TXD / BUSY	+0.3	+3.6	V	
	RXD	+0.3	+5.5	V	
RS232 Mode	TXD / BUSY	-6	+6	V	
	RXD	-15	+15	V	
Operating Temperature Without RTP		-20	+70	°C	
Operating Temperature With RTP		-20	+60	°C	
Storage Temperature Without RTP		-20	+70	°C	
Storage Temperature With RTP		-20	+70	°C	
High Temperature & High Humidity (No Condensation) Without RTP			+40 / 90	°C / %	
High Temperature & High Humidity (No Condensation) With RTP			+35 / 90	°C / %	

7. Recommended Operating Conditions

7.1 Electrical Characteristics

Parameter	Symbol	Min	Typ	Max	Unit	Note
Input Voltage	V _{in}	+4.5	+5	+5.5	V	
Total Current	I _{in} (+5V)	-	211	-	mA	±15%
Power Consumption		-	1.1	-	W	@5V
UART Mode	TXD / BUSY	+0.3	+3.3	-	V	
	RXD	+0.3	+3.3	+5.3	V	
RS232 Mode	TXD / BUSY	-5	-	+5	V	
	RXD	-12	-	+12	V	

8. Pin Description

8.1 J701 Pin Assignment of Signal Input (Pitch 1.25mm 5Pin, Side Entry Type)

FDT Connector Part No.: MS24015R (STM) [Same as 53261-0519 (MOLEX)];

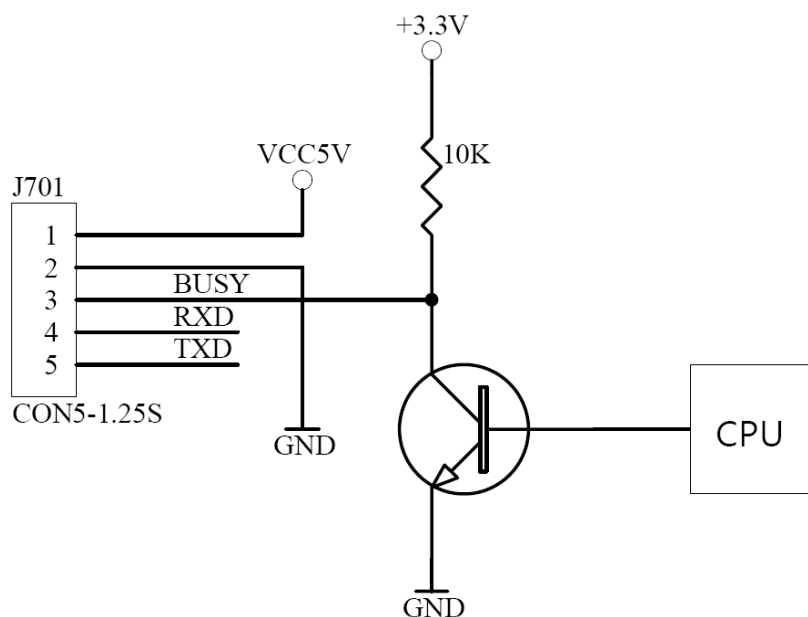
FDT Matching Connector Part No.: P24015 (STM) [Same as 51021-0500 (MOLEX)].

Pin No	Symbol	I/O	Description	Remark
1	VCC5V	-	+5V Input Voltage	DC
2	GND	-	Ground	
3	BUSY	O	Busy status	(Note1,2)
4	RXD	I	Receive Data (UART)	
5	TXD	O	Transmit Data (UART)	

Note: 1.Your application circuit board must be connects with busy pin of uC-HMI.

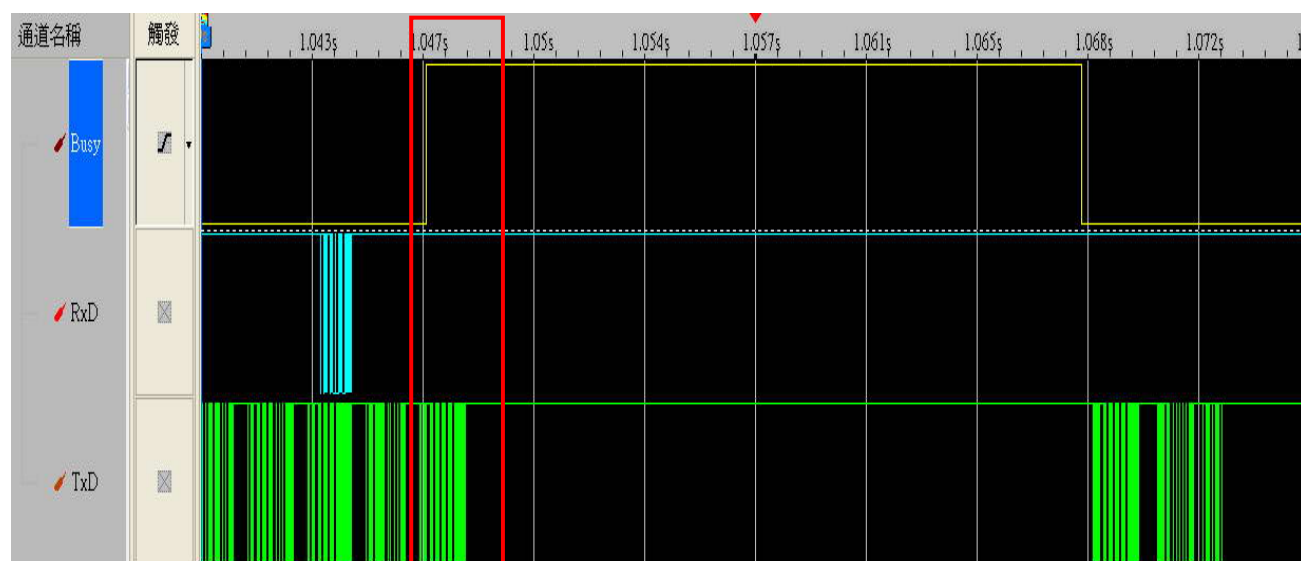
	BUSY Active	BUSY Inactive
UART Mode	+3.3V	0V
RS232 Mode	-5V	+5V

2.Busy circuit of UART Mode



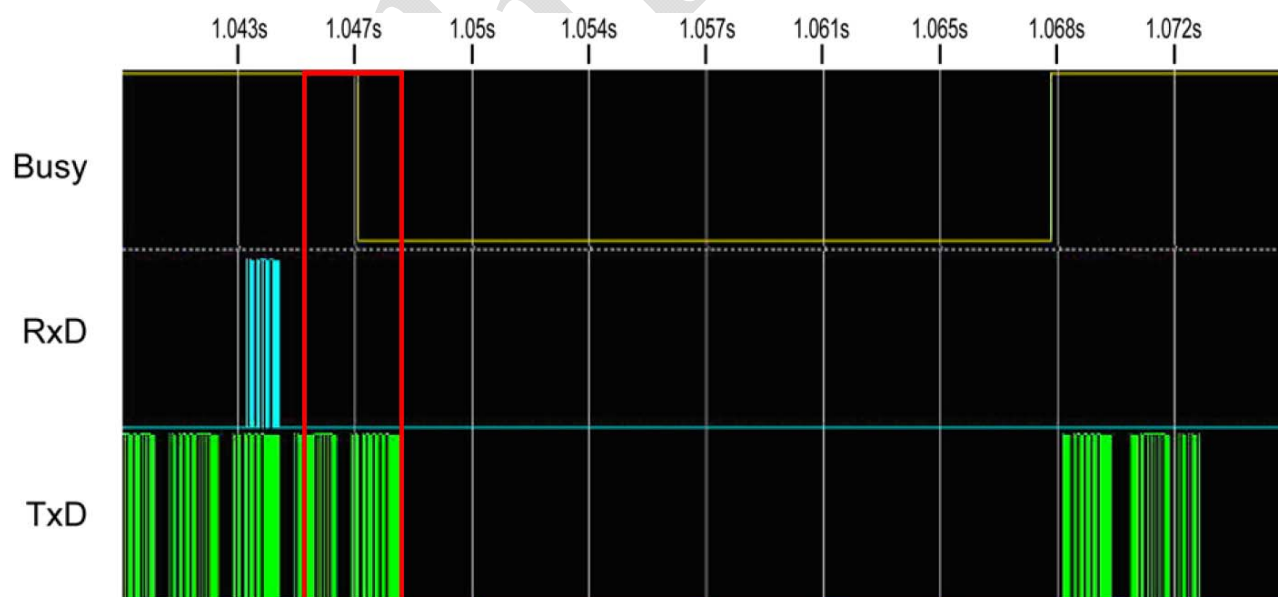


8.2 UART Timing Chart (Client Side)



※ If busy signal of uC-HMI appears on the duration of client processor transmission command. Please don't worry this situation and goes on last command procedure.

8.3 RS232 Timing Chart (Client Side)



※ If busy signal of uC-HMI appears on the duration of client processor transmission command. Please don't worry this situation and goes on last command procedure.



9. 4W Resistance Touch Panel Characteristics

9.1 Optical Performance

Parameter	Specifications
Transmittance	80% Typ.
Haze	5.0% Typ.

9.2 Mechanical Performance

Parameter	Specifications
Input Method	Finger or stylus pen
Operating Force	Max: 100gf
Surface Hardness	3H

9.3 Durability Performance

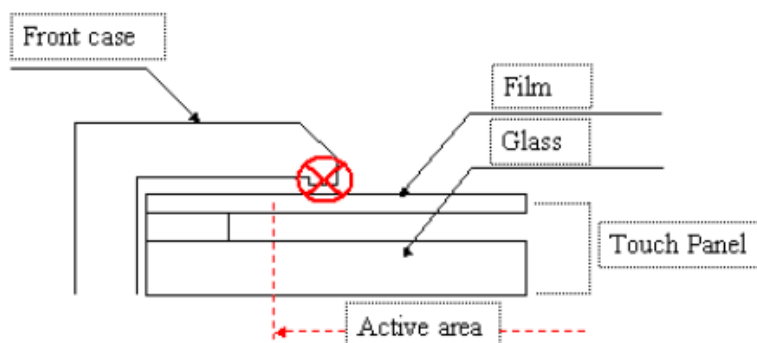
Parameter	Specifications
Input Life	10 ⁶ times(Silicon rubber,R8)
Note Life	10 ⁵ characters (Polyacetal ,R0.8)



9.4 Touch Screen Integration Design Guide

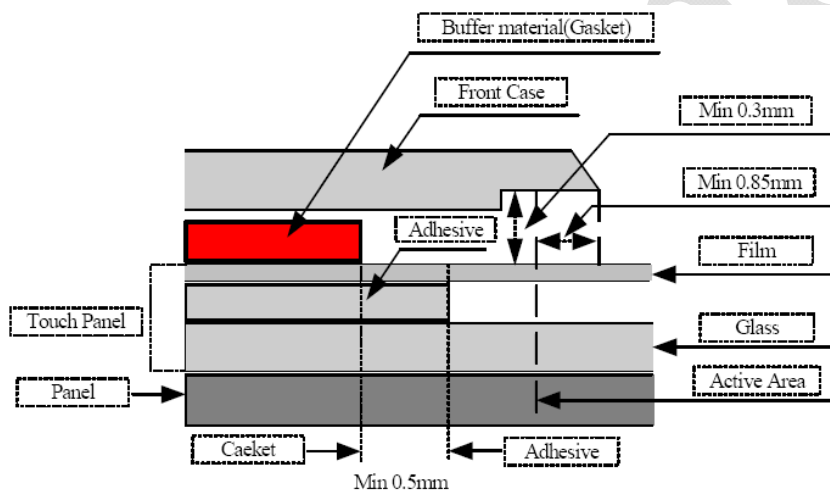
Avoid the design that Front-case overlap and press on the active area of the touch-panel.

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



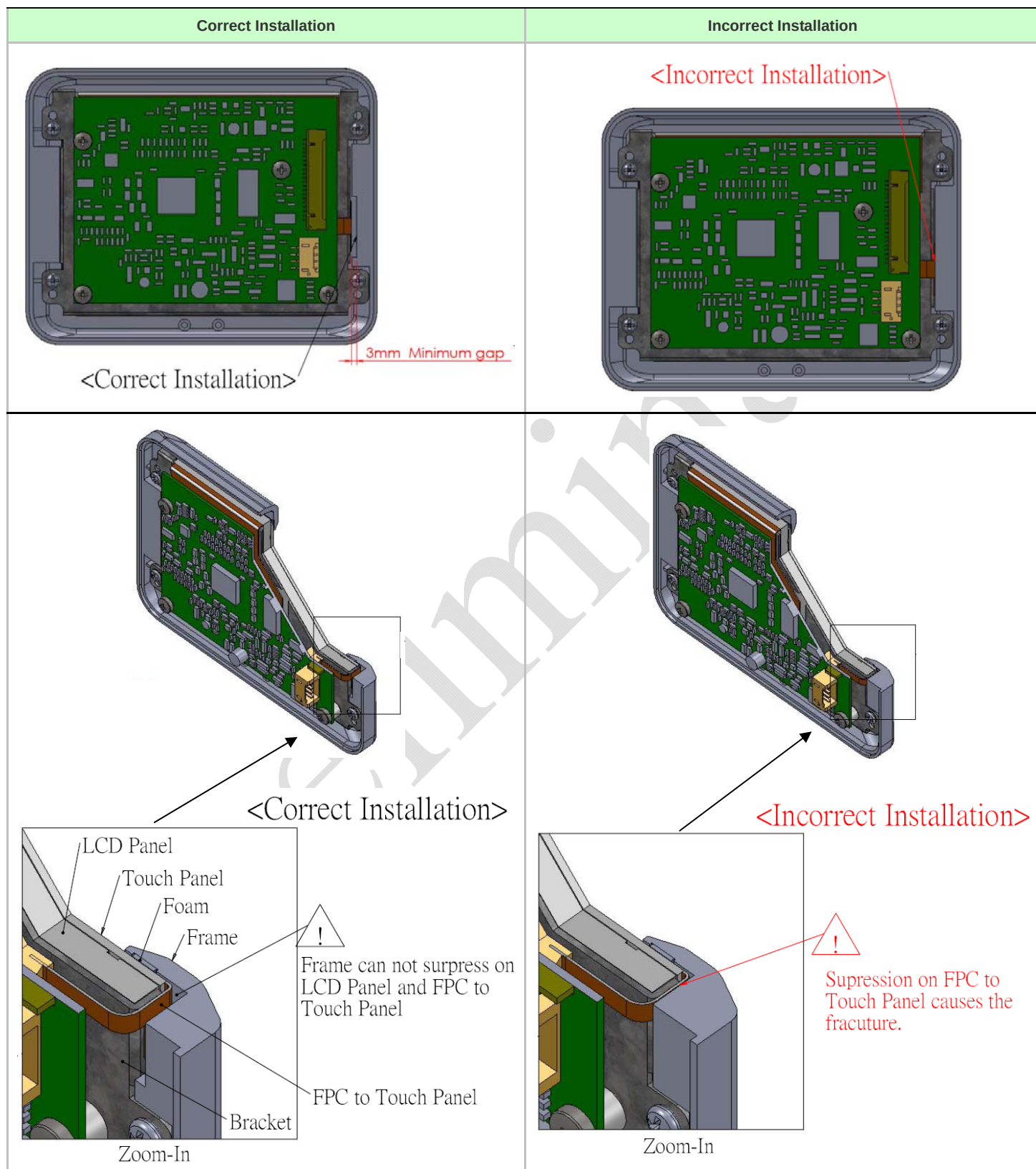
Use a buffer material (Gasket) between the touch-panel and front-case to protect damage and wrong operating.

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.

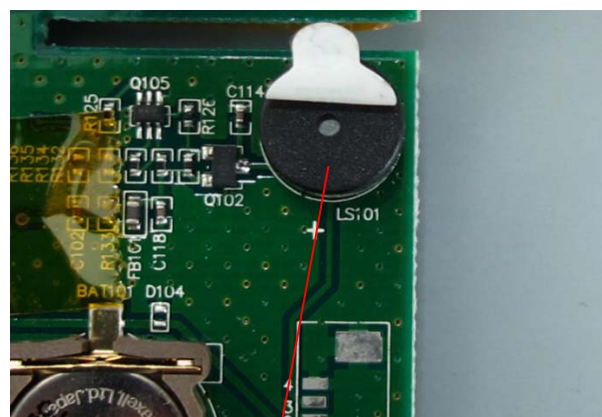
9.5 Mechanical Design Notice For Touch Panel





10. Buzzer Notice

10.1 Remove Buzzer Label



Remove



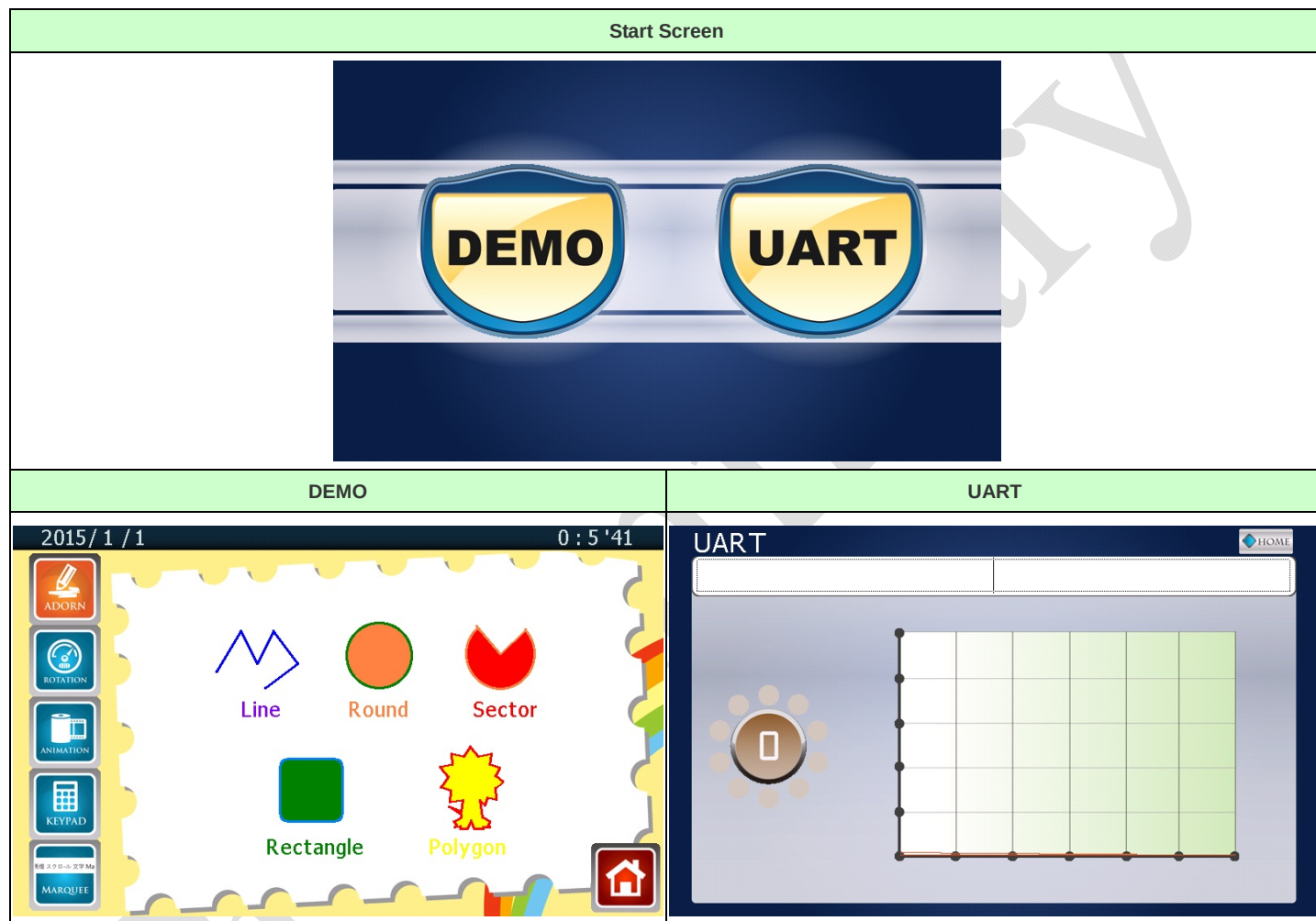
11. The Built-in Demo Project of the Module

11.1 Operation Explaining

The uC-HMI module delivery is included a project.

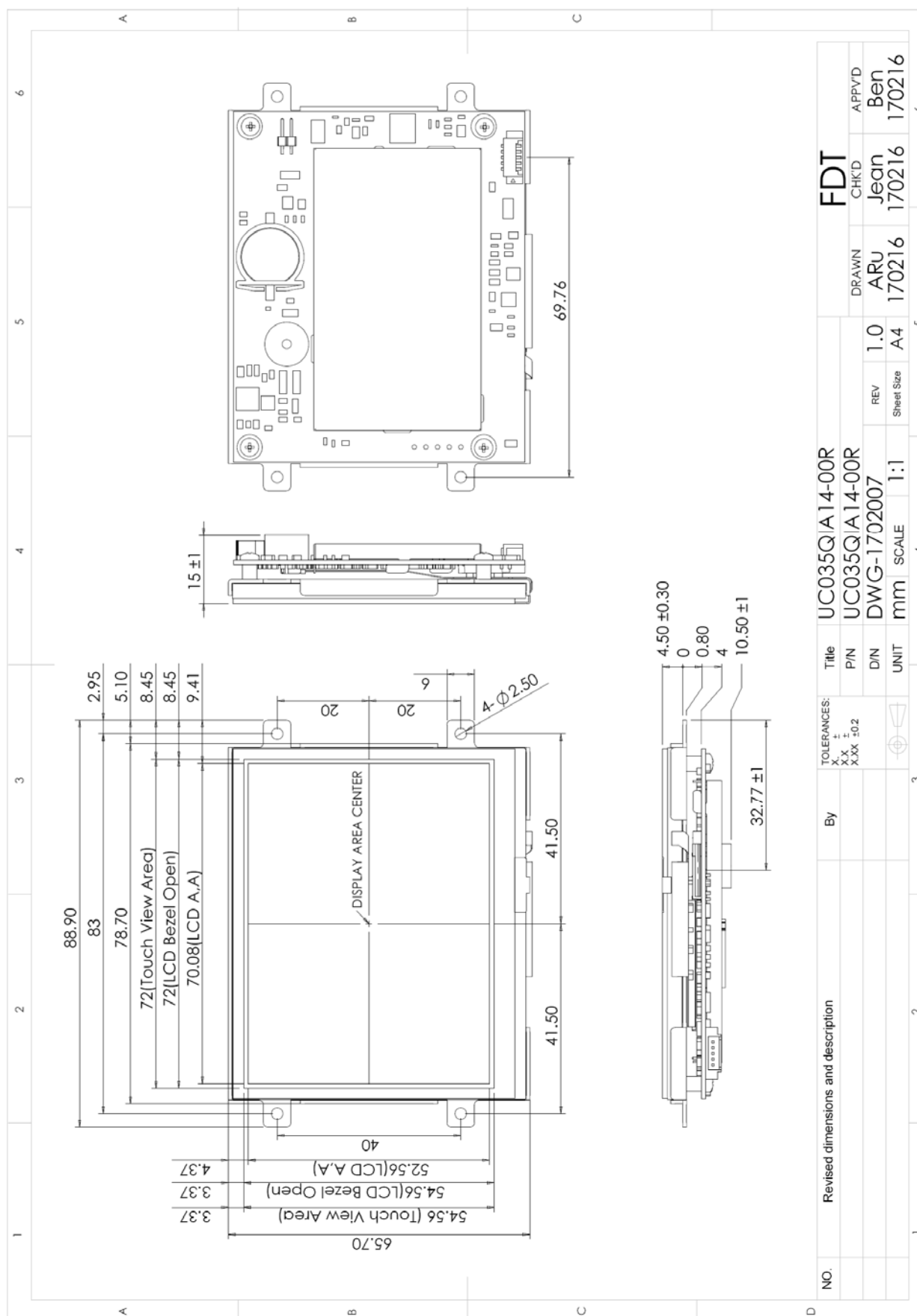
How to use that please refer to the document as “uC-HMI_Module_Demo_User_Guide.pdf”

File located : <Disc:\Project of Standard Module\Documents>





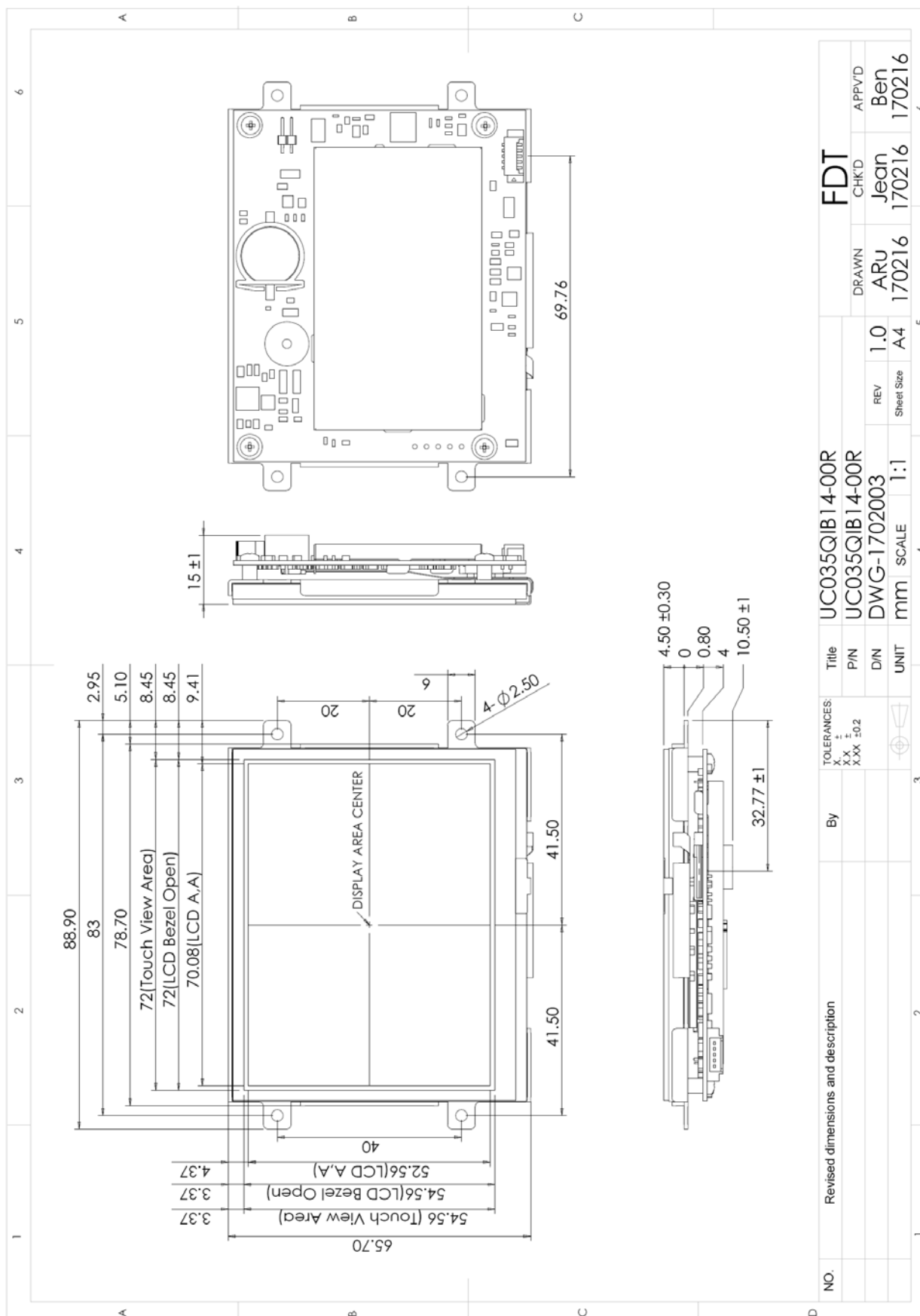
12.2 Unit (UC035QIA14-00R)



[illegible]

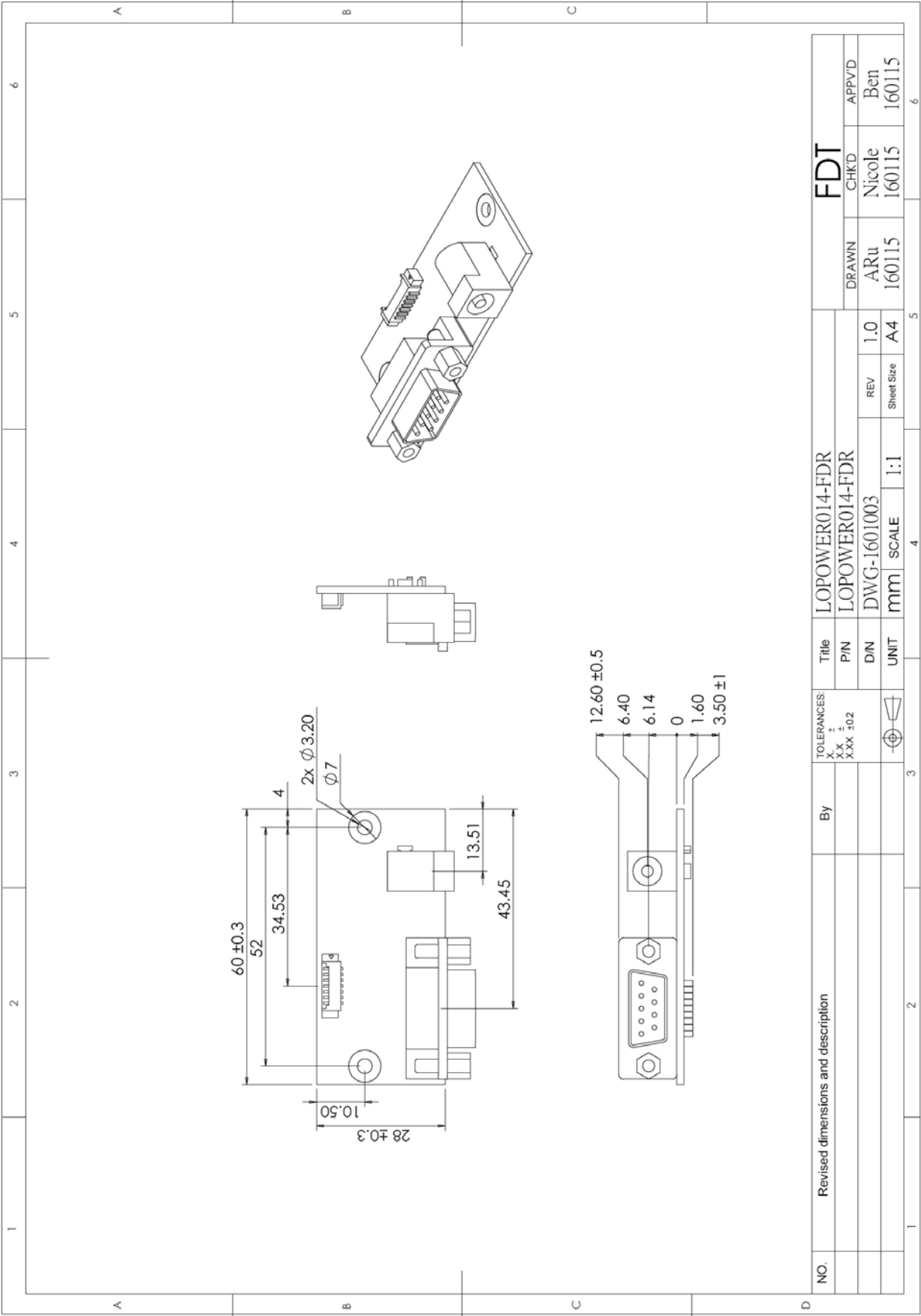


12.4 Unit (UC035QIB14-00R)



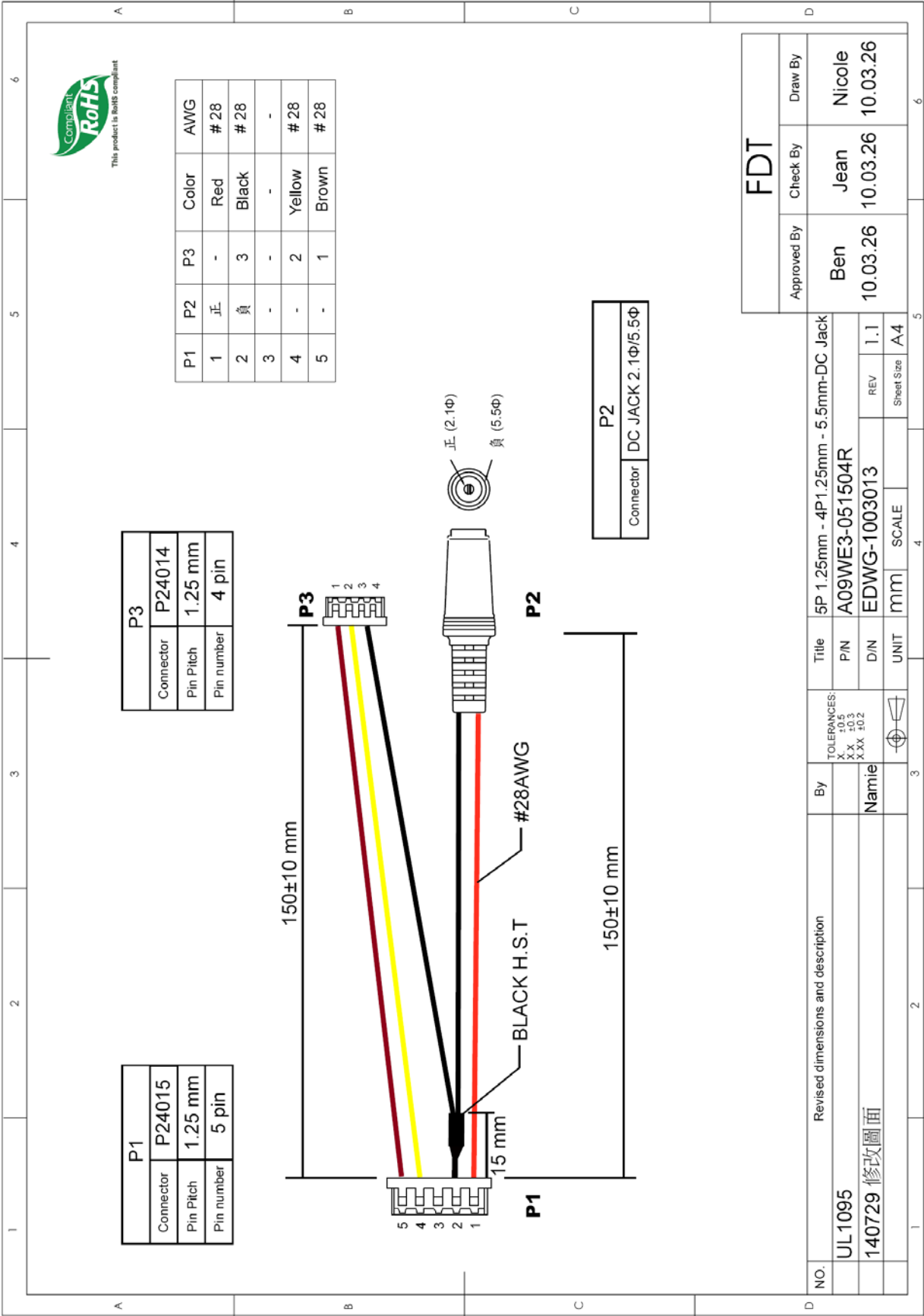


13.2 Application Board Dimension (Option)



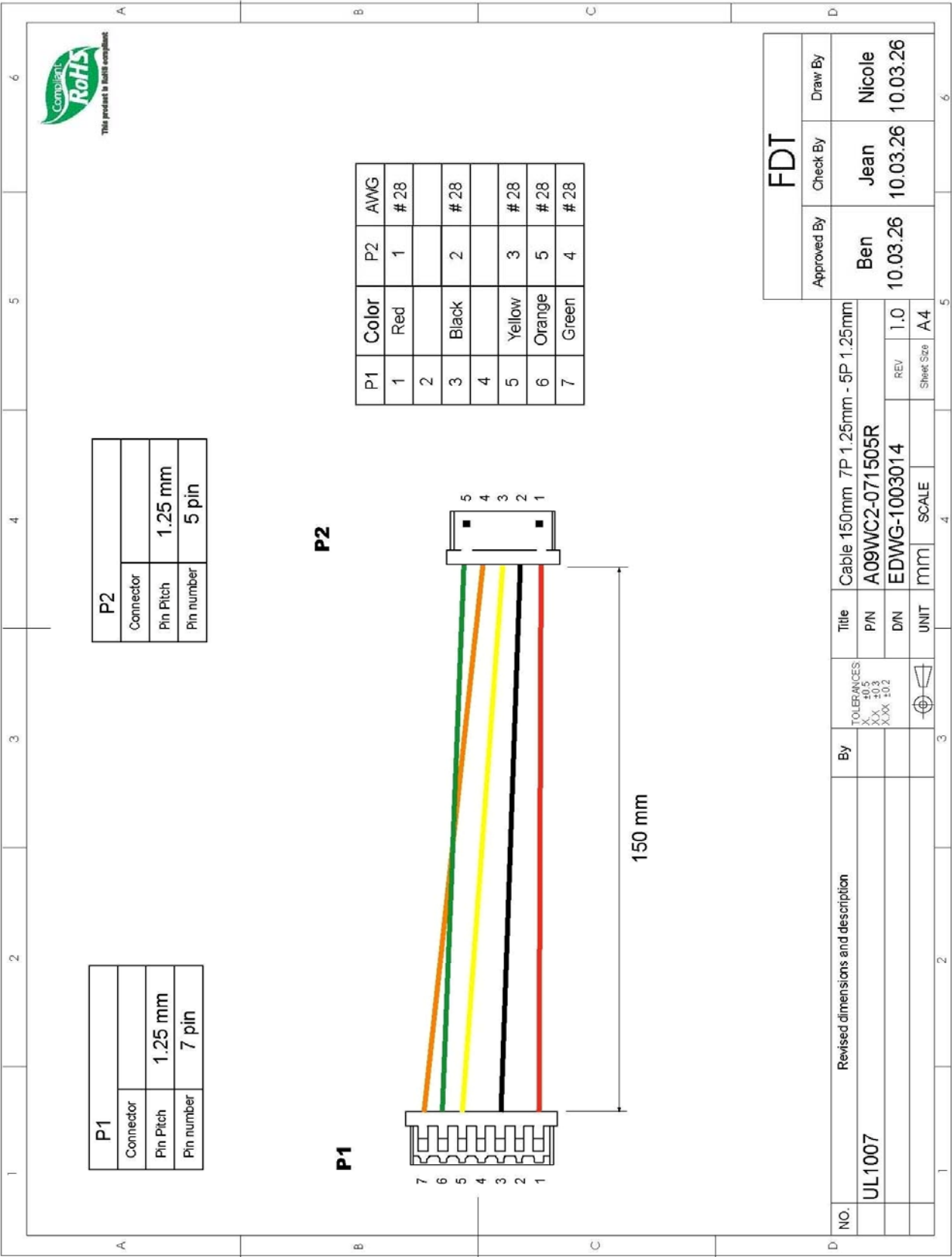


13.3 LACABLE012-FDR (Option)





13.4 LACABLE016-FDR (Option)





14. Appendix

14.1 TFT-LCD Mechanical Specifications

Parameter	Specifications	Unit
Screen Size	3.5" (Diagonal)	inch
Display Format	320 x (R.G.B) x 240	dot
Active Area	70.08(W) x 52.56(H)	mm
Surface Treatment	Haze 20%	

14.2 TFT-LCD Optical Characteristics

Parameter	Symbol	Condition	Min	Typ	Max	Unit	Remark
Viewing Angle	Horizontal	Left	50	60	---	deg	
		Right	50	60	---	deg	
	Vertical	Top	40	50	---	deg	
		Bottom	45	55	---	deg	
Contrast Ratio	CR	At optimized Viewing angle	300	400	---	---	
Brightness Without RTP	L	$\theta = 0^\circ / \phi = 0$	200	300	---	cd/m ²	
Brightness With RTP	L	$\theta = 0^\circ / \phi = 0$	160	240	---	cd/m ²	
LED Life Time	---	T _a =+25°C	10000	---	---	Hrs	Note

Note: The "LED Life Time" is defined as the module brightness decrease to 50% original.