



# SPECIFICATIONS

**Model:** M7-A035/043/050/056/070/080A-RT

## Customer Approval:

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	Signature	Date
Design		
Mechanic		
Quality		
Approved by		



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Easy TFT is target to the users updating their product from monochrome LCD to TFT displays or new products fast developing, our solution can provides a simple and reliable way to control TFT displays. M7-M series include small screen with RGB port from 3.5" to 8", meeting the requirements for various applications from customers.

## 1.0 General Description

1. The bottle neck of MCU speed is solved: compared with the black and white module, the data volume of color screen is much larger and require rapid data refresh while updating interface, which cannot be satisfied by traditional MCU, otherwise the responding speed of whole system will be very slow.
2. The data storage space of common MCU is within 64K, which is not enough to store one picture for TFT displays; our module adopts an MIN-SD card to store picture data and this is quite enough for common interface design.
3. The technology of TFT displays change quickly and the driver IC updating fast, the product life time can't be guaranteed. The software and hardware is required to change often in order to adopt the new displays, which brings a lot of extra work. Our solution can help customer to solve the problem, when there is screen change, we can adopt it on our mainboard, the consumer don't need to changing their software and hardware.
4. The adoption of alphabetic string command for module control is simple and clear; only need MCU output "Hello World" from the UART
5. The user copy pictures from computer to the SD card, saving a lot of work like general modeling and compiling etc. and development time is shortened.

## 2.0 Electrical Parameters

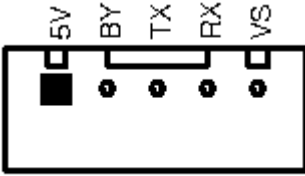
NAME	A035	A043	A050	A056	A070	A080
Input voltage	5V±5%	5V±5%	5V±5%	5V±5%	5V±5%	5V±5%
Current	<200mA	<300mA	<450mA	<600mA	<600mA	<750mA
Color Depth	65K colors	65K colors	65K colors	65K colors	65K colors	65K colors
Operating Temperature	-10--60℃	-10--60℃	-10--60℃	-10--60℃	-10--70℃	-10--60℃
Storage Temperature	-30----80℃	-30----80℃	-30----80℃	-30----80℃	-30----80℃	-30----80℃
Luminance	200cd/m <sup>2</sup>	250cd/m <sup>2</sup>	200cd/m <sup>2</sup>	200cd/m <sup>2</sup>	210cd/m <sup>2</sup>	200cd/m <sup>2</sup>
Display Mode	Transmissive	Transmissive	Transmissive	Transmissive	Transmissive	Transmissive
Resolving	320*240	480*272	800*480	640*480	800*480	800*480

## 3.0 Mechanical Parameters (mm)

ITEM	A035	A043	A050	A056	A070	A080
Size of panel	76.9*64.0	105.5*67.2	120.7*75.8	126.5*100.0	164.9*100.0	183.0*141.0
Size of module	93.0*70.0*14.9	122.0*74.7*14.3	134.6*90.0*14.8	144.8*110.5*14.8	180.0*107.0*15.8	200.0*148.8*19.0
Size (VA)	72.8*55.5	98.1*57.0	110.0*66.8	115.0*87.0	154.4*88.0	163.0*122.5

## 4.0 Pin Definition

J1 on module is communication port and K1 is reset key.



## 5.0 Interface Design

1. Firstly, put all pictures needed into the folder of BMP\_FILE, convert them into BMP format and change picture names in proper sequence from 000.BMP. The operation can be completed with software of ACDSEE; see [Appendix I](#) for details in operation.

The picture files with names in proper sequence are shown in figure below:

BMP	000. bmp	83 KB	Windows Bitmap	240x117x24b
BMP	001. bmp	83 KB	Windows Bitmap	240x117x24b
BMP	002. bmp	83 KB	Windows Bitmap	240x117x24b
BMP	003. bmp	83 KB	Windows Bitmap	240x117x24b
BMP	004. bmp	83 KB	Windows Bitmap	240x117x24b
BMP	005. bmp	83 KB	Windows Bitmap	240x117x24b
BMP	006. bmp	282 KB	Windows Bitmap	240x400x24b

2. Execute batch processing command Bmptobin.exe and two files will be generated in the folder of BMP\_DATA after execution, among which BMPDATA.BIN is the data file where all picture data are put successively and TABLE.BIN is the table file equivalent to index file; copy these two files into the folder virtualized by the module and then they are available for use.

3. If special character display is required by user, like Chinese or Japanese etc. The software attached in this module can be used for extracting font library; see [Appendix IV](#) for details. (Only for Chinese version)  
Revise the name of extracted font library file and copy it in to USB flash disk for application; the file name should be changed as HZK.BIN.

4. Press K1 key (reset key) on module after all files are copied into SD card and then they are available for use.

## 6.0 Control Command

This module adopts alphabetic string to control all operations.

The command format begins with command word continued with parameter list in which parameters are separated by space and ends with a return character; pay attention that the return character is a must. **When the command is executing, the busy pin is low, and the module can't receive new command, until the busy pin is high.**

“CMD n1 n2.....Return”

The parameters n1, n2... in table below express a 16-bit unsigned integer data and s1, s2...expresses alphabetic string.

**Drawing commands**

Function	Command Format	Example	
Browse Pictures	ALL	"ALL\n"	
Draw a circle	CIRCLE Xa Ya R C	"CIRCLE 100 100 50 31\n"	
Fill in color	CLR Xa Ya Xe Ye C	"CLR 0 0 100 100 31\n"	
Clear screen	CLS C	"CLS 31\n"	
Cut a picture	CUT Pn Xa Ya Xb Yb Xs Ys	"CUT 1 30 30 0 0 100 100\n"	
Draw a dot	DOT Xa Ya C	"DOT 100 100 31\n"	
Draw a line	LINE Xa Ya Xe Ye C	"LINE 10 10 50 50 31\n"	
Backlight on	LEDON	"LEDON\n"	
Backlight off	LEDOFF	"LEDOFF\n"	
LOAD PIC	PIC Pn Xa Ya	"PIC 1 30 30\n"	
Display image files directly	LOAD Xa Ya Path	"LOAD 0 0 jpg\jpg03.jpg\n"	Support BMP,JPG,TGA,PN G
Draw a rectangle	RECT Xa Ya Xe Ye C	"RECT 10 10 100 100 31\n"	
Get screen size *	SIZE	"SIZE\n"	
Display alphabetic string	STR Xa Ya C Str	"STR 0 0 31 ABCDEF\n"	
Buzzer control	BUZ Tb Fb	"BUZ 300 2000\n"	

**Display alphabetic string. Copy the font file to SD card before use these commands**

Function		Example	
Display alphabetic string(Font 16)	HZ16 Xa Ya C Str	" HZ16 0 0 31 ABCDEF\n"	Font Size 8x16
Display alphabetic string(Font 24)	HZ24 Xa Ya C Str	" HZ24 0 0 31 ABCDEF\n"	Font Size 12x24
Display alphabetic string(Font 32)	HZ32 Xa Ya C Str	" HZ32 0 0 31 ABCDEF\n"	Font Size 16x32
Display alphabetic string(Font 48)	HZ48 Xa Ya C Str	" HZ48 0 0 31 ABCDEF\n"	Font Size 24x48
Display alphabetic string(Font 64)	HZ64 Xa Ya C Str	" HZ64 0 0 31 ABCDEF\n"	Font Size 32x64
Display alphabetic string with back color(Font 16)	HZB16 Xa Ya C Cb Str	" HZB16 0 0 31 0 ABCDEF\n"	Font Size 8x16
Display alphabetic string with back	HZB24 Xa Ya C Cb Str	" HZB24 0 0 31 0 ABCDEF\n"	Font Size 12x24



color(Font 24)			
Display alphabetic string with back color(Font 32)	HZB32 Xa Ya C Cb Str	" HZB32 0 0 31 0 ABCDEF\n"	Font Size 16x32
Display alphabetic string with back color(Font 48)	HZB48 Xa Ya C Cb Str	" HZB48 0 0 31 0 ABCDEF\n"	Font Size 24x48
Display alphabetic string with back color(Font 64)	HZB64 Xa Ya C Cb Str	" HZB64 0 0 31 0 ABCDEF\n"	Font Size 32x64

**Note:**

**Animation,the saries picture must be same size \*\***

Function		Example	
<b>Animation1</b>	M1 On/Off Xa Ya Ps Pe Pt	"M1 1 0 0 0 8 100\n"	
<b>Animation2</b>	M2 On/Off Xa Ya Ps Pe Pt	"M2 1 0 0 0 8 100 \n"	
<b>Animation3</b>	M3 On/Off Xa Ya Ps Pe Pt	"M3 1 0 0 0 8 100 \n"	
<b>Animation4</b>	M4 On/Off Xa Ya Ps Pe Pt	"M4 1 0 0 0 8 100 \n"	
<b>Animation5</b>	M5 On/Off Xa Ya Ps Pe Pt	"M5 1 0 0 0 8 100 \n"	

**Note:**

Xa Ya :start x y coordinates

C :color(16bits,RGB 565 )

Xb Yb : start end X Y coordinates in livelong PIC

Pn : Pictures serial number(000-999)

Ps : Start animation picture number

Pe : End animation picture number

Pt : Spacing time (Unit ms)

Bt : Buzzer on time (Unit ms)

Bf : Buzzer frequency(Unit Hz) 1K-4K

Path Denote the path of the picture file

Xe Ye :End x y coordinates

Cb color underpainting

Xs Ys : Need to intercept the size from livelong picture

Str :alphabetic string(8x16)

R : Radius

\* Using the command ,there will be a return value format is a "SXY Xsize Ysize\n"

"\n" : 0x0d & 0x0a

\*\* Animation display can have up to 4 groups, each group of pictures must be continuous and each picture size must be the same, the total amount of data is less than 1MB



## Configure info

Change TXT file in Micro SD card

SD FORMAT FAT16(128M-1G)

### Configuration

#### parameters

baud rate range:2400,4800,9600,19200,38400,56000,57600,115200

### NOTE

**This series of products using the configuration file to configure CONFIG.INI module parameters. When in use, the configuration file (CONFIG.INI) must be copied to the SD card**

BaudRate=9600 // Serial port baud rate

StartColor=30 //Start color

DemoStatus=1 // Choose automatically browse pictures when boot module

DemoTime=1000 // Automatic browse pictures time interval ( unit: ms )

DemoXaddr=0 // Automatic browse pictures X coordinates

DemoYaddr=0 // Automatic browse pictures Y coordinates

### TP Test Mode

TpTestFlag=1 // TP test mode, open this mode on the following position display a small circle

TpColor=63488 // Small circle color

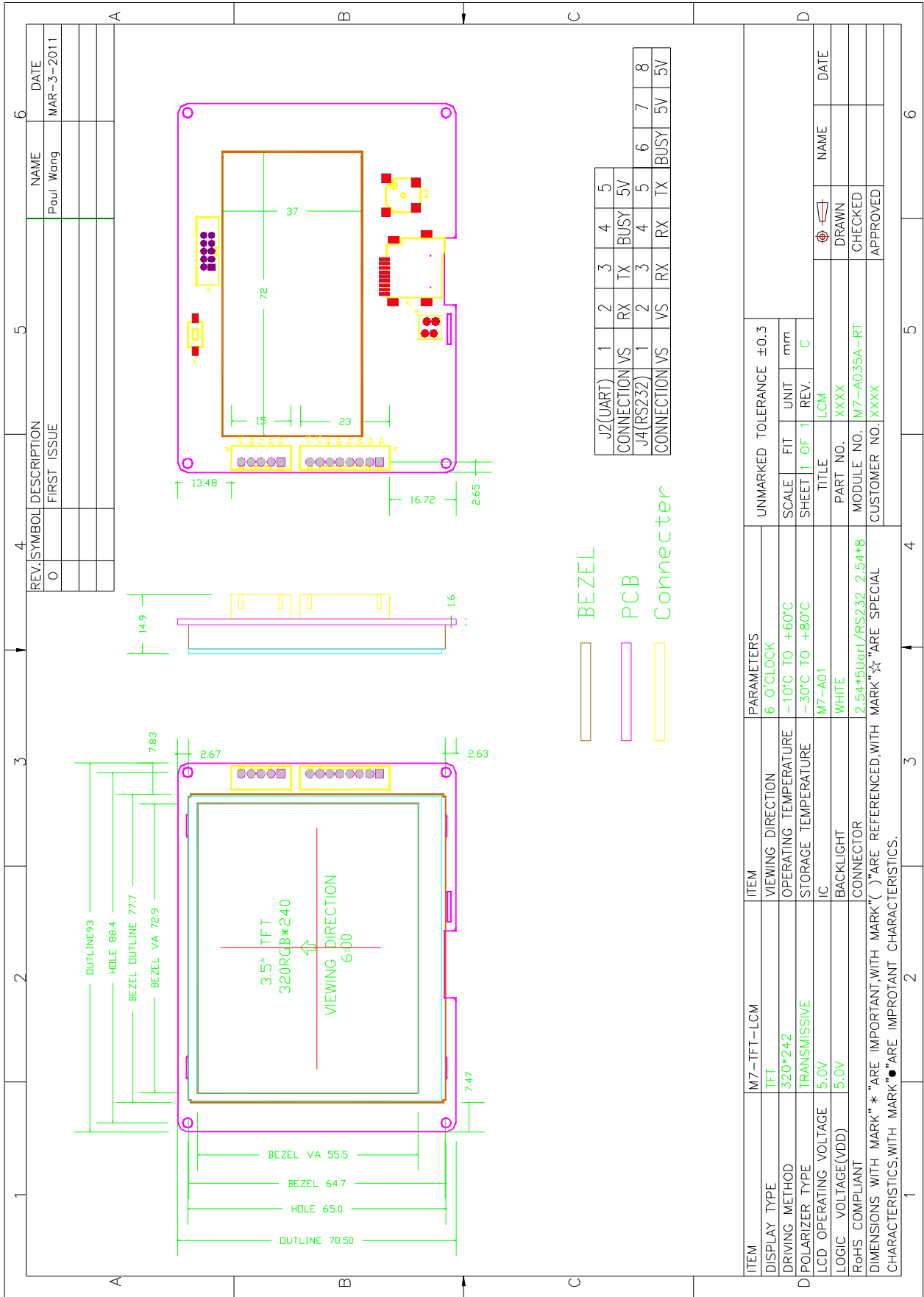
TpInterval=100 // TP detection interval time ( unit: ms )

### NOTE

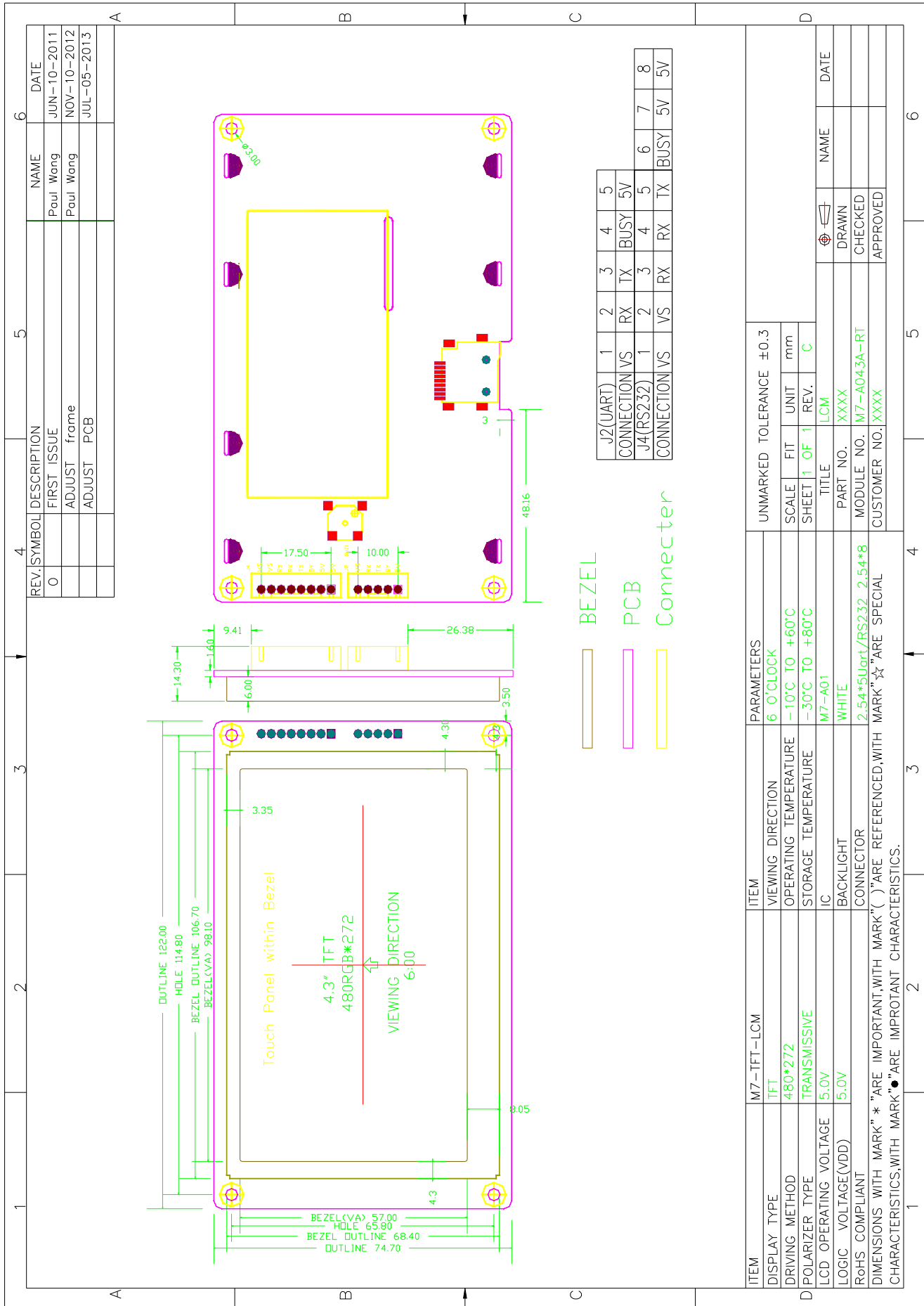
Touch screen click coordinates back format: " TXY Xaddr Yaddr\n

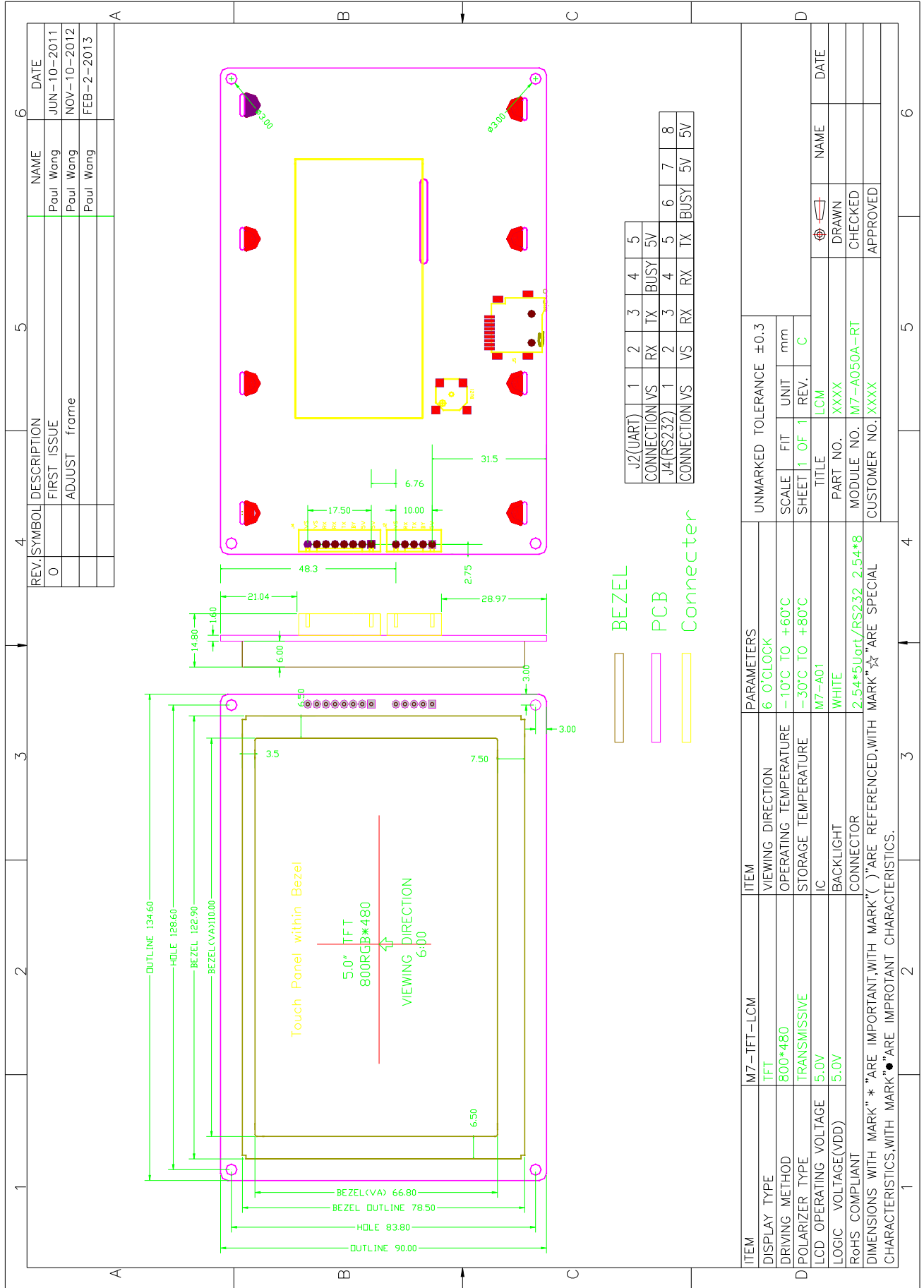


# 7.0 Outline Drawing



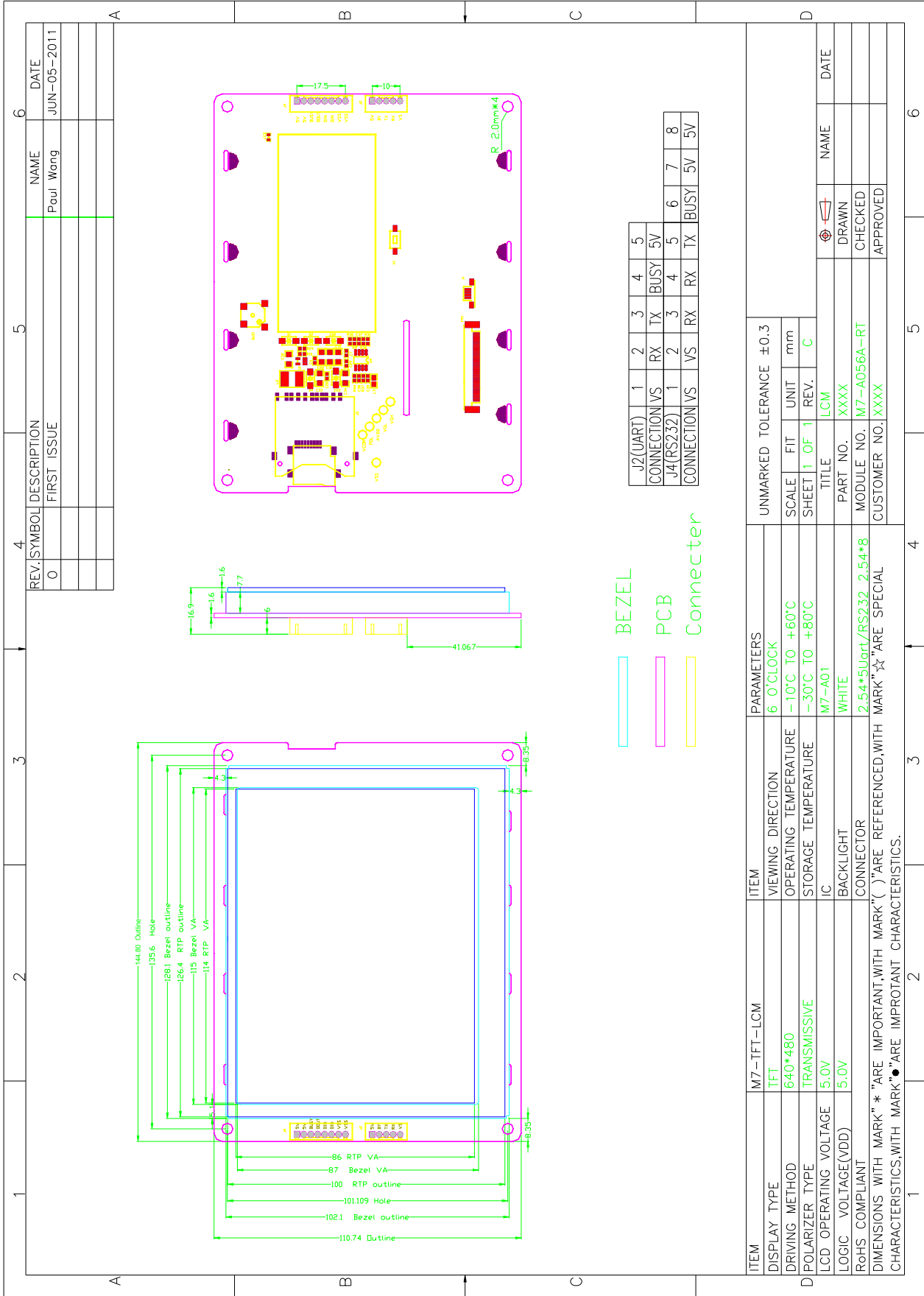


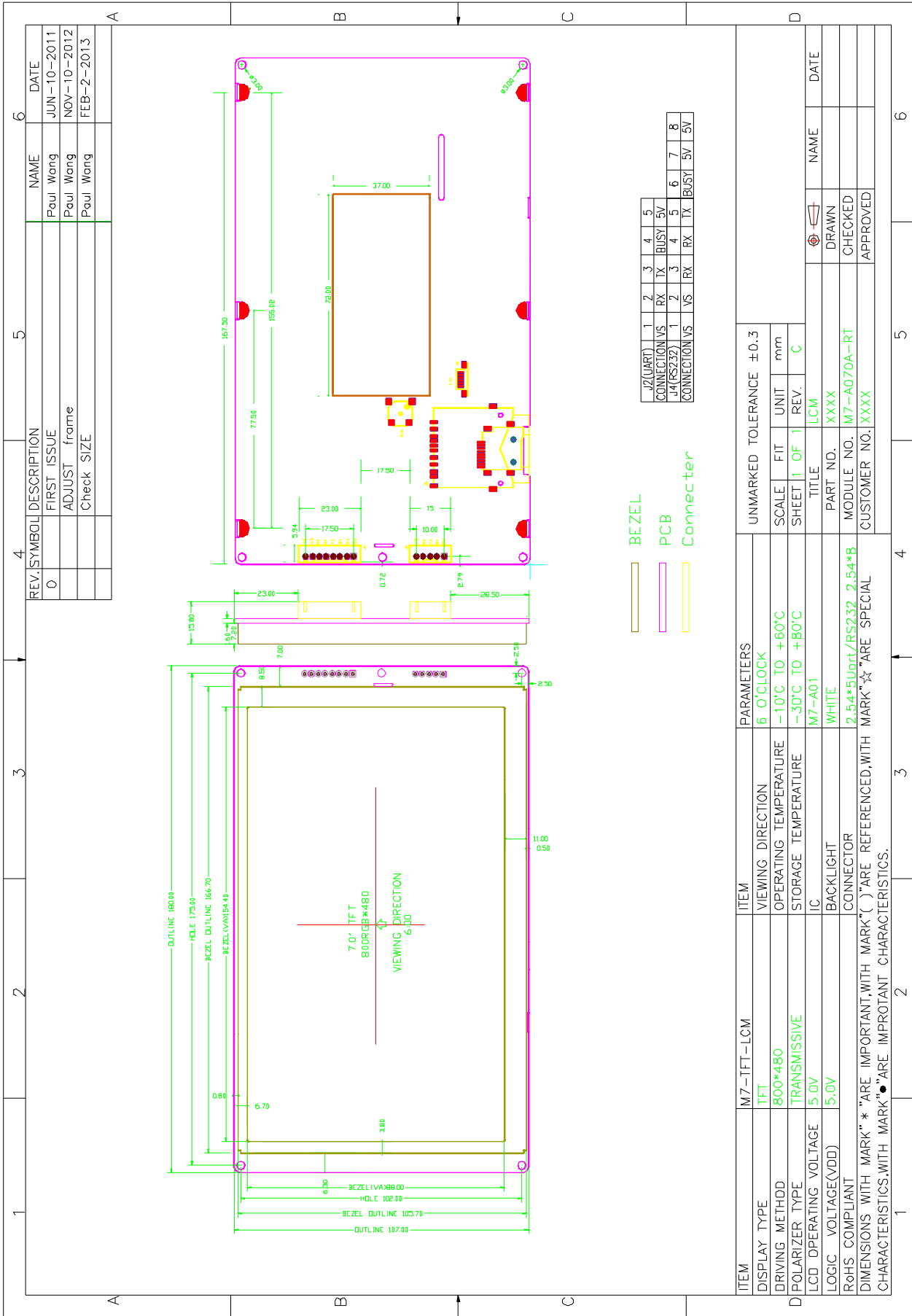


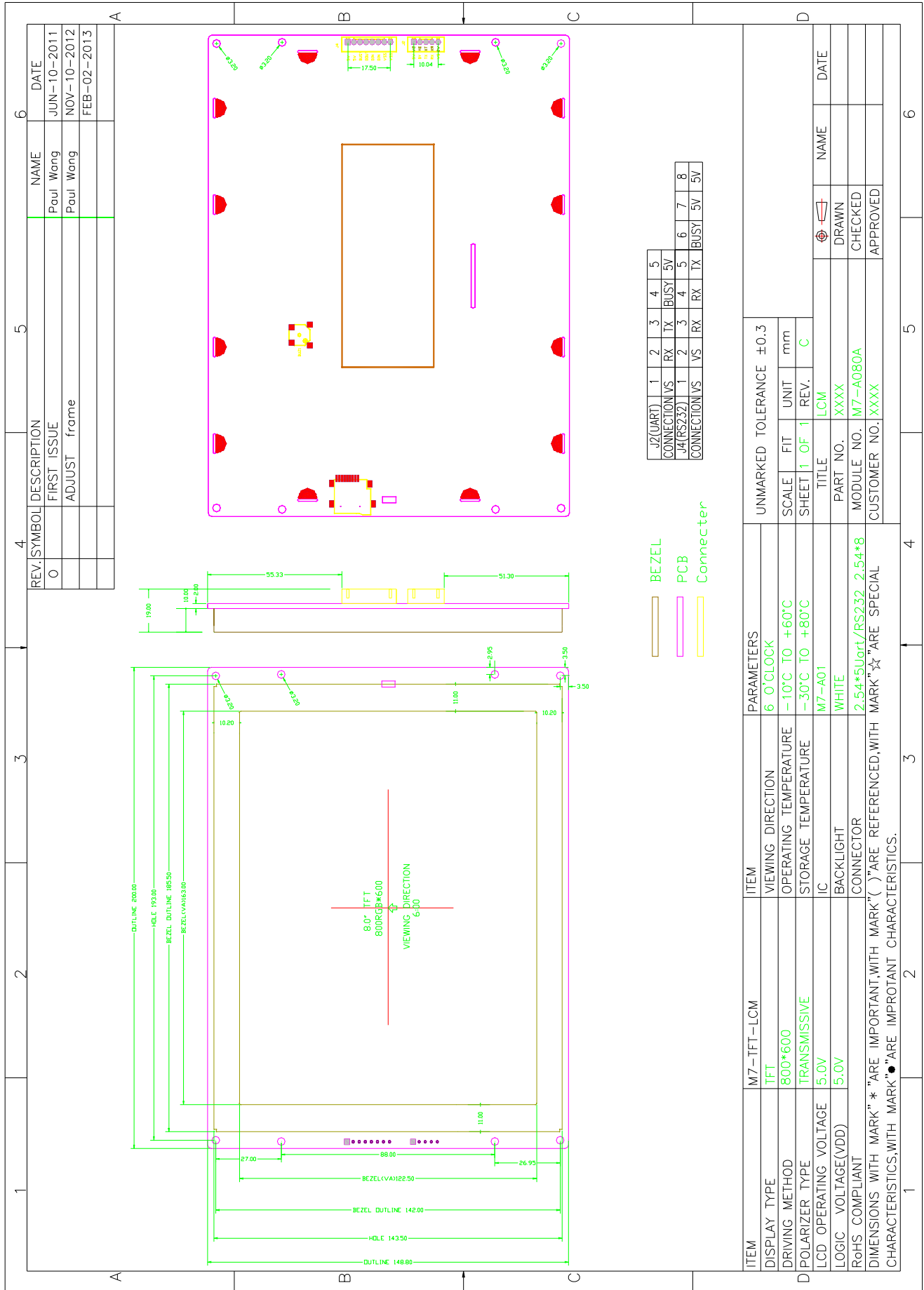


REV.	SYMBOL	DESCRIPTION	NAME	DATE
0		FIRST ISSUE	Paul Wang	JUN-10-2011
		ADJUST frame	Paul Wang	NOV-10-2012
			Paul Wang	FEB-2-2013

ITEM	M7-TFT-LCM	ITEM	PARAMETERS	UNMARKED TOLERANCE ±0.3		
				SCALE	FIT	UNIT
DISPLAY TYPE	TFT	VIEWING DIRECTION	6 O'CLOCK			
DRIVING METHOD	800*480	OPERATING TEMPERATURE	-10°C TO +60°C			
D POLARIZER TYPE	TRANSMISSIVE	STORAGE TEMPERATURE	-30°C TO +80°C			
LCD OPERATING VOLTAGE	5.0V	IC	M7-A01	TITLE	LCM	NAME
LOGIC VOLTAGE(VDD)	5.0V	BACKLIGHT	WHITE	PART NO.	XXXX	DRAWN
RoHS COMPLIANT		CONNECTOR	2.54*5Uo1/RS232 2.54*8	MODULE NO.	M7-A050A-RT	CHECKED
DIMENSIONS WITH MARK * ARE IMPORTANT, WITH MARK ( ) ARE REFERENCED, WITH MARK ☆ ARE SPECIAL CHARACTERISTICS, WITH MARK ● ARE IMPROTANT CHARACTERISTICS.				CUSTOMER NO.	XXXX	APPROVED





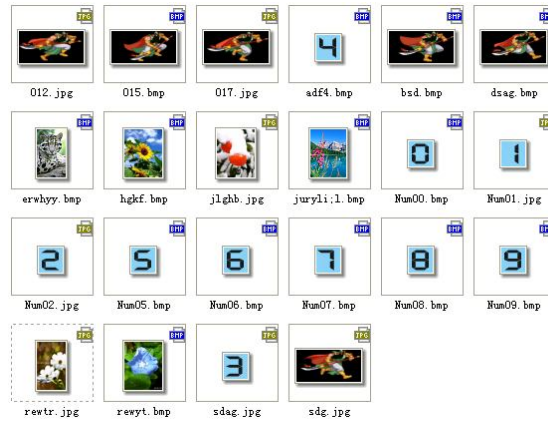


## 8.0 User's Guide

### Appendix I

#### Application of ACDSEE for classifying pictures

1. Collect materials for use into the folder of BMP\_FILE; at the beginning, the pictures may be disordered and the processing of following steps is needed to make them in proper order for operation.



2. Convert all files into BMP format.



3. Sort the pictures successively beginning with 000.



4. Reorder the special picture sequence, for instance, the animation part and special font part must be continuous.

5. Execute the batch file of BmpToBin.exe



6. After execution, there are two files generated in BMP\_DATA, wherein BMPDATA.BIN is data file in which all picture data are put inside in order; TABLE.BIN is table file equivalent to index file. Copy these two files into the folder virtualized the module and then they are available for use.



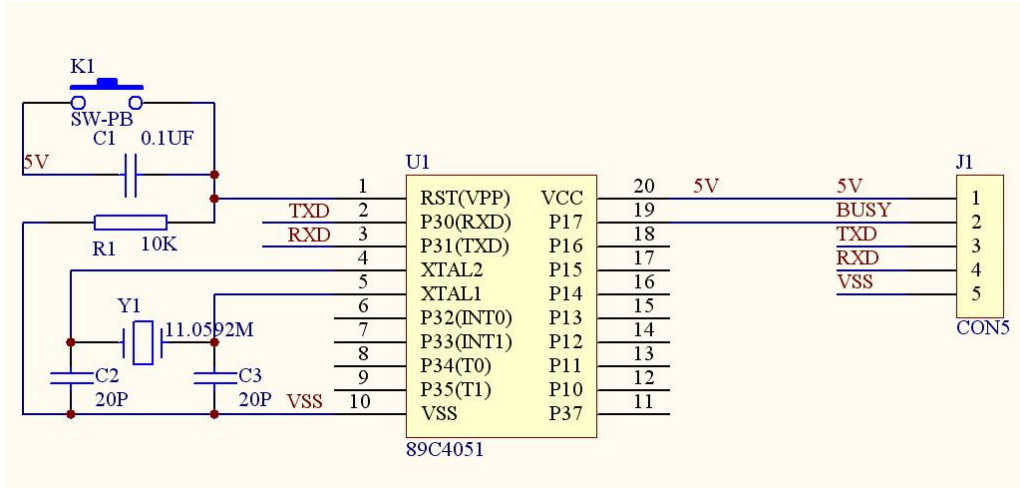
BMPDATA.BIN  
BIN 文件  
750 KB



TABLE.BIN  
BIN 文件  
1 KB

### Appendix II

#### Application circuit



### Appendix III



### 9.0 Reliability Test Items

No	Item	Condition	Quantity
1	High Temperature Operating	50°C, 96Hrs	5
2	Low Temperature Operating	0°C, 96Hrs	5
3	High Humidity	60°C, 90%RH, 96Hrs	5
4	High Temperature Storage	80°C, 96Hrs	5
5	Low Temperature Storage	-40°C, 96Hrs	5
6	Thermal shock	-20°C, 30min~70°C, 30min, 20 cycles.	5

Note1. No deflection cosmetic and operational function allowable.

### 10.0 Package Specification

TBD