SPECIFCATIONS

Model: ET-035/043/050/056/070/080A

Customer Approval:

	Signature	Date
Design		
Mechanic		
Quality		
Approved by		

Table of Contents

1.0 General Descriptio--- ----------3

2.0 Electrical Characteristics- ----------3

3.0 Mechanical Parameters ----------3

4.0 Pin Definition ----------4

5.0 Interface Design ----------4

6.0 Control Command ----------4

7.0 Outline Drawing ----------8

8.0 User's Guide ---------- ------- ----------13

9.0 Reliability Test Items ---------- 15

10.0 Package Specification ----------15

ET-xxxA 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. ET-xxxA 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 MINI-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

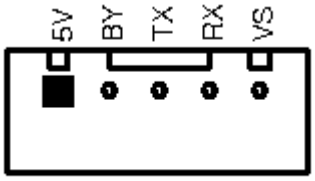
NAME	A035	A043	A050	A056	A070	A080
Input voltage	**5V±5%**	5V±5%	5V±5%	5V±5%	5V±5%	5V±5%
Current	**<200mA**	<300mA	<450mA	<600mA	<600mA	<750mA
Color Depth	**65K colors**	65K colors	65K colors	65K colors	65Kcolors	65K colors
Operating Temperature	**-20--70℃**	-20--70℃	-20--70℃	-20--70℃	-20--70℃	-20--70℃
Storage Temperature	**-30----80℃**	-30----80℃	-30----80℃	-30----80℃	-30----80℃	-30----80℃
Luminance	230cd/m²	280cd/m²	240cd/m²	230cd/m²	240cd/m²	230cd/m²
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*13.7	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

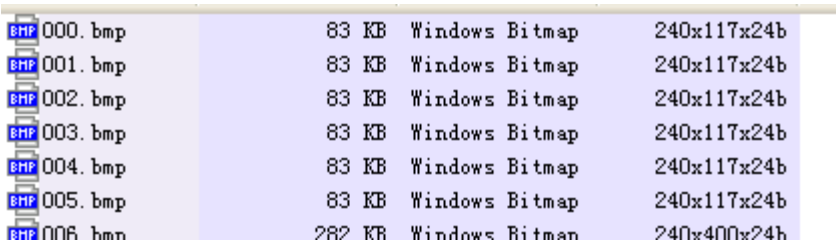
J1 on module is communication port and K1 is reset key.



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:



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 flash disk for application

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,PNG
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 befor 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 color(Font 24)	HZB24 Xa Ya C Cb Str	" HZB24 0 0 31 0 ABCDEF\n"	Font Size 12x24

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 siries picture must be same size **

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

Note:

Xa Ya :start x y coordinates
Xe Ye :End x y coordinates
C :color(16bits,RGB 565)
Cb color underpainting
Xb Yb ：start end X Y coordinates in livelong PIC
Xs Ys : Need to intercept the size from livelong picture
Str :alphabetic string(8x16)
Pn : Pictures serial number(000-999)
R : Radius
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

***** 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
```

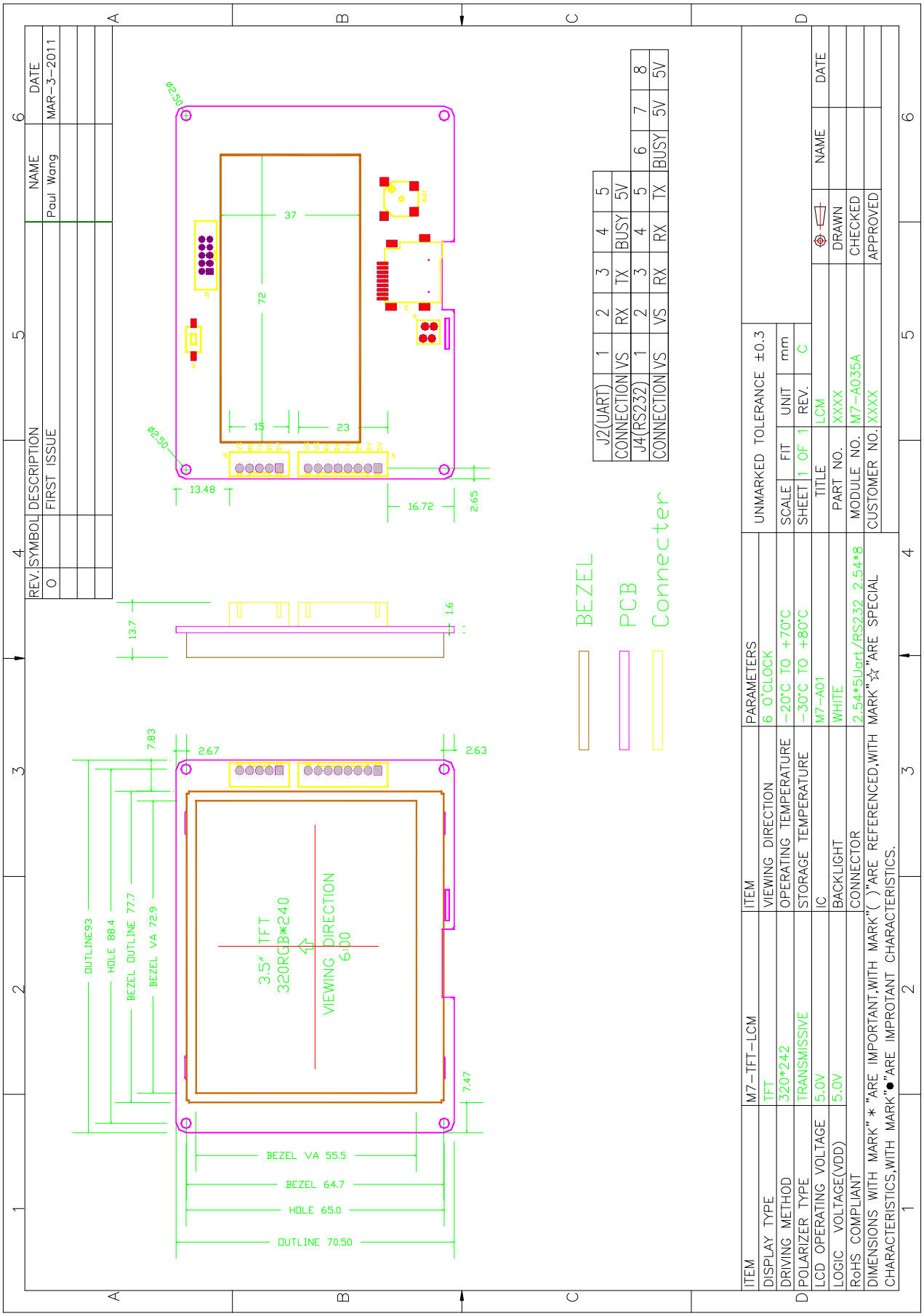
TP Test Mode

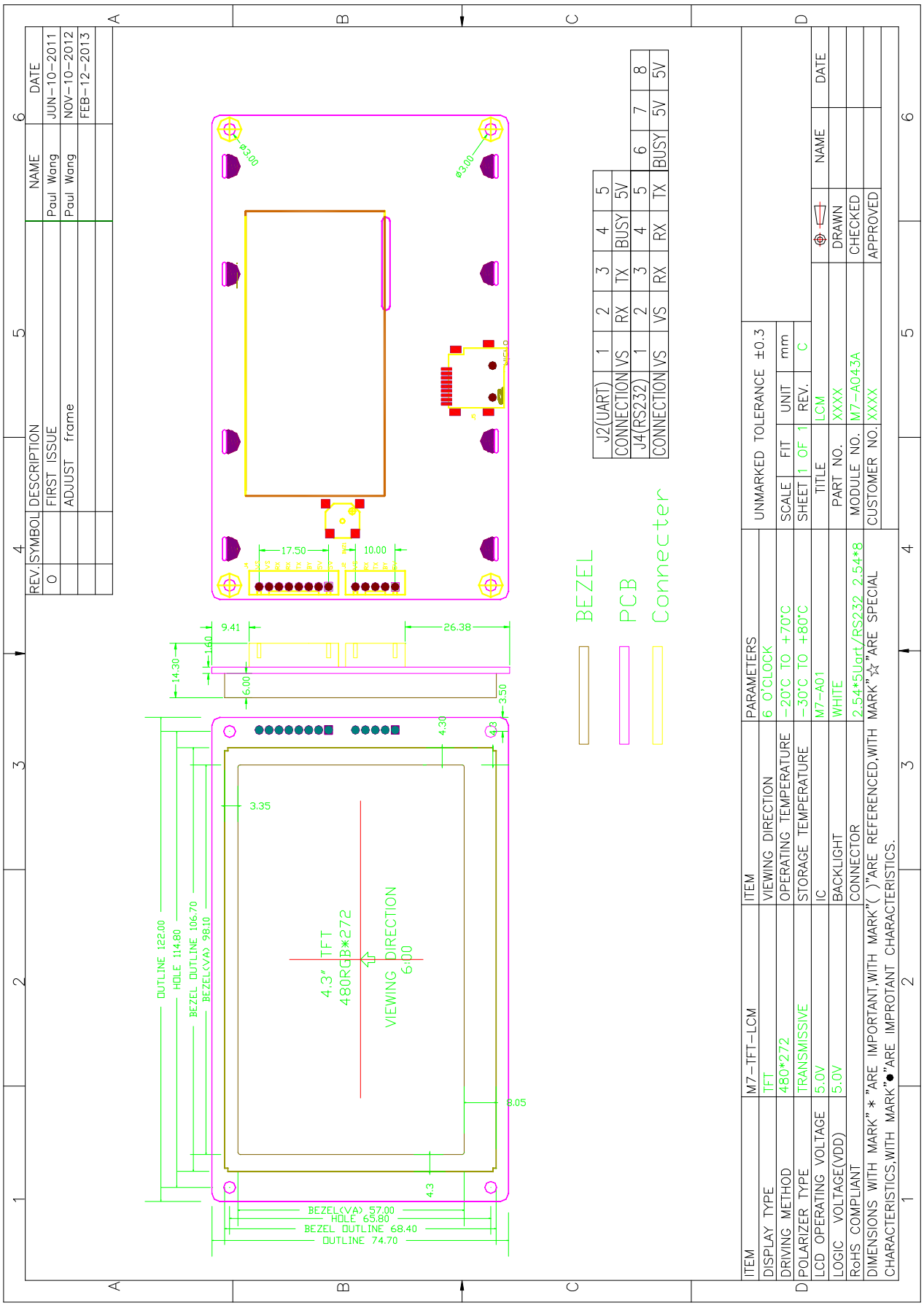
```
TpTestFlag=1  // TP test mode, open this mode on the following position display a small circle
TpColor=63488  // Small circle color
TpInterval=100 // TP detection interval time ( unit: ms )
```

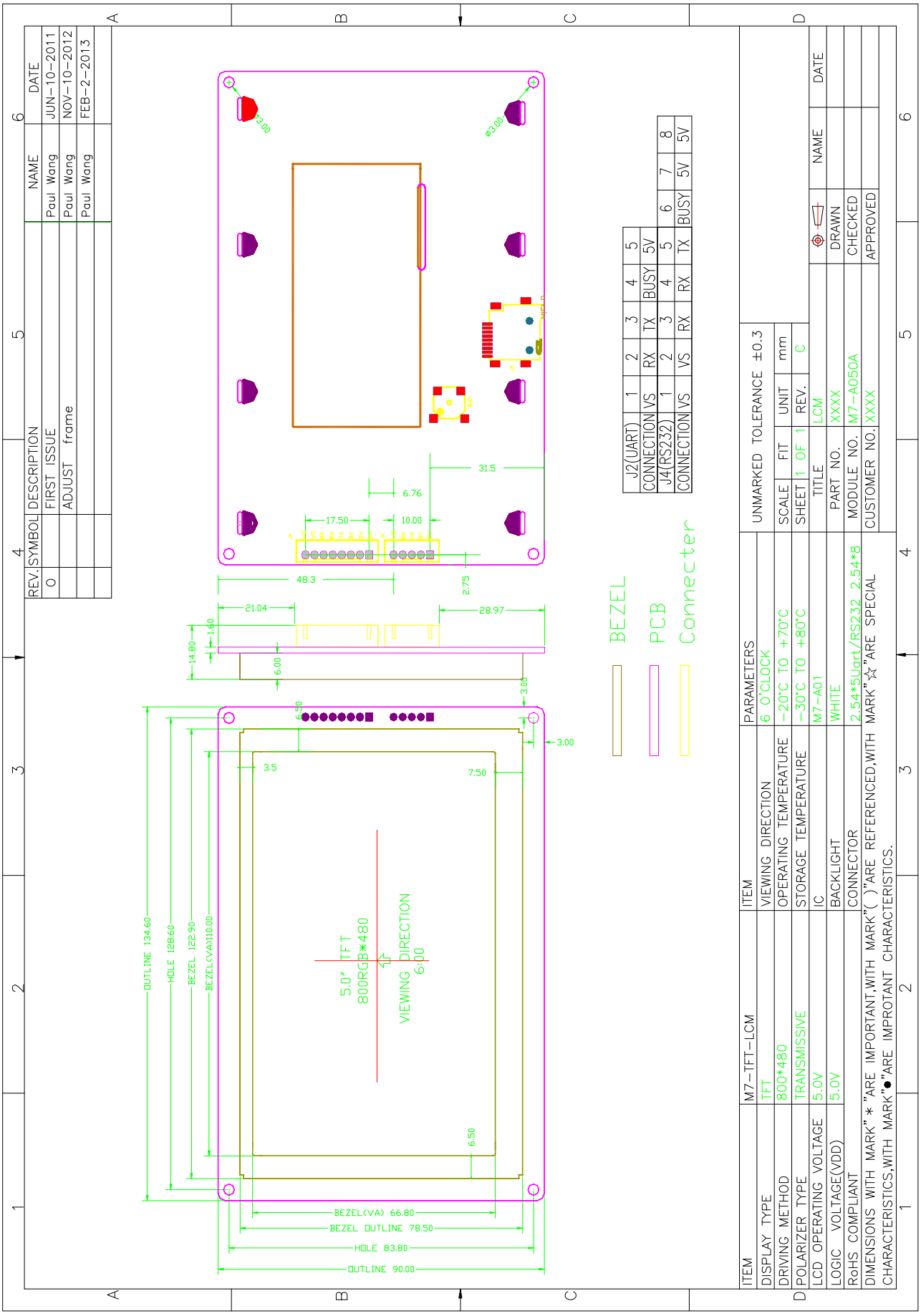
NOTE

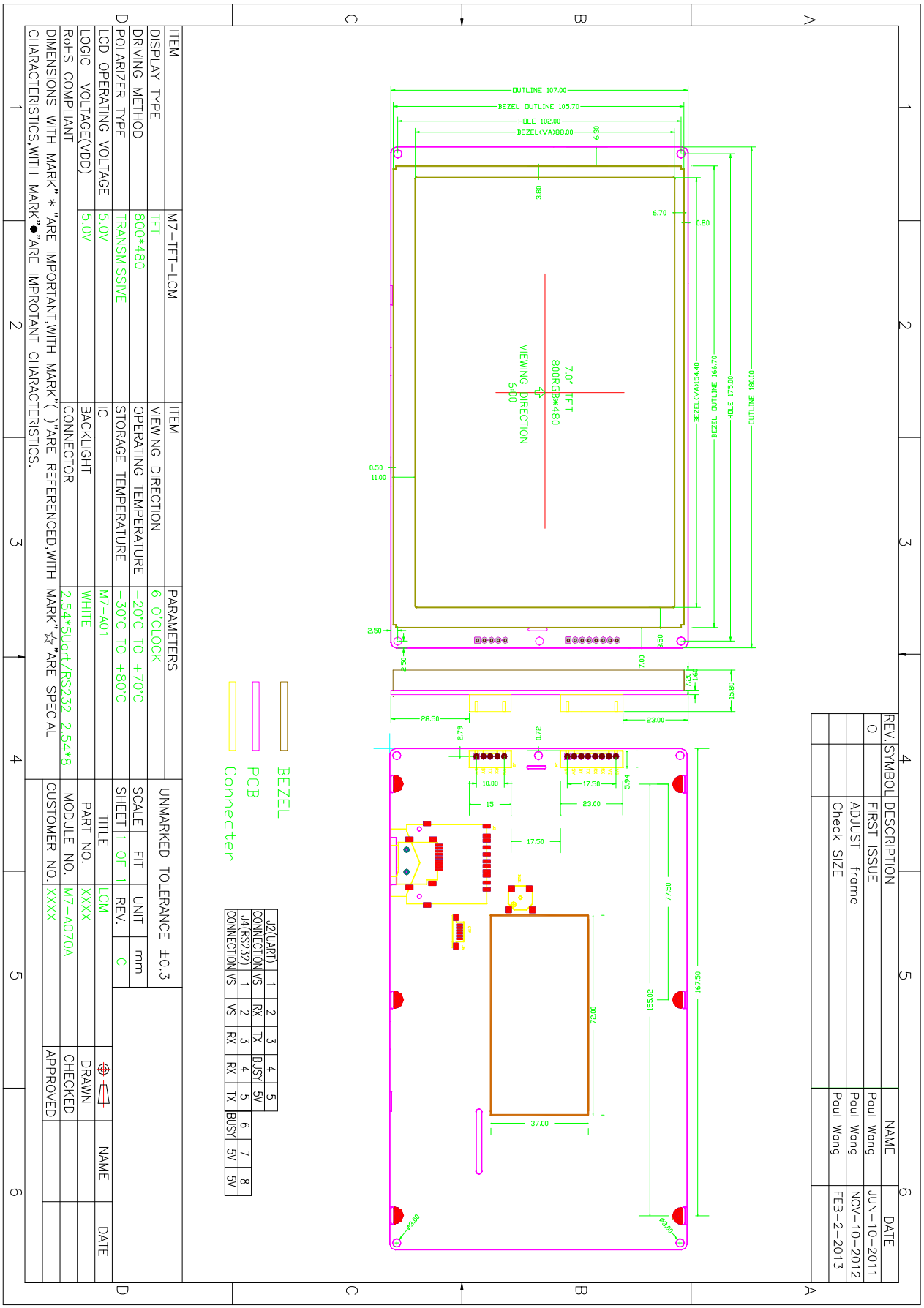
Touch screen click coordinates back format: " TXY Xaddr Yaddr\n

7.0 Outline Drawing




REV. SYMBOL DESCRIPTION NAME DATE
0 FIRST ISSUE Paul Wang JUN-10-2011
ADJUST frame Paul Wang NOV-10-2012
FEB-12-2013
J2(UART) 1 2 3 4 5
CONNECTION VS RX TX BUSY 5V
J4(RS232) 1 2 3 4 5 6 7 8
CONNECTION VS VS RX RX TX BUSY 5V 5V
BEZEL
PCB
Connecter
UNMARKED TOLERANCE ±0.3
SCALE FIT UNIT mm
SHEET 1 OF 1 REV. C
TITLE LCM
PART NO. XXXX
MODULE NO. M7-A043A
CUSTOMER NO. XXXX
NAME DATE
DRAWN
CHECKED
APPROVED
ITEM M7-TFT-LCM
DISPLAY TYPE TFT
DRIVING METHOD 480*272
POLARIZER TYPE TRANSMISSIVE
LCD OPERATING VOLTAGE 5.0V
LOGIC VOLTAGE(VDD) 5.0V
RoHS COMPLIANT
DIMENSIONS WITH MARK" * "ARE IMPORTANT,WITH MARK"( )"ARE REFERENCED,WITH MARK"☆"ARE SPECIAL
CHARACTERISTICS,WITH MARK"●"ARE IMPROTANT CHARACTERISTICS.
ITEM PARAMETERS
VIEWING DIRECTION 6 O'CLOCK
OPERATING TEMPERATURE -20°C TO +70°C
STORAGE TEMPERATURE -30°C TO +80°C
IC M7-A01
BACKLIGHT WHITE
CONNECTOR 2.54*5Uart/RS232 2.54*8
4.3" TFT
480RGB*272
VIEWING DIRECTION
6:00
OUTLINE 122.00
HOLE 114.80
BEZEL OUTLINE 106.70
BEZEL(VA) 98.10
BEZEL(VA) 57.00
HOLE 65.80
BEZEL OUTLINE 68.40
OUTLINE 74.70
ø3.00
ø3.00
17.50
10.00
9.41
1.40
14.30
6.00
26.38
3.50
4.30
4.3
3.35
8.05
4.3


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
J2(UART) 1 2 3 4 5
CONNECTION VS RX TX BUSY 5V
J4(RS232) 1 2 3 4 5 6 7 8
CONNECTION VS VS RX RX TX BUSY 5V 5V
BEZEL
PCB
Connecter
UNMARKED TOLERANCE ±0.3
ITEM PARAMETERS
M7-TFT-LCM
DISPLAY TYPE TFT
DRIVING METHOD 800*480
POLARIZER TYPE TRANSMISSIVE
LCD OPERATING VOLTAGE 5.0V
LOGIC VOLTAGE(VDD) 5.0V
RoHS COMPLIANT
ITEM
VIEWING DIRECTION 6 O'CLOCK
OPERATING TEMPERATURE -20°C TO +70°C
STORAGE TEMPERATURE -30°C TO +80°C
IC M7-A01
BACKLIGHT WHITE
CONNECTOR 2.54*5Uart/RS232 2.54*8
SCALE FIT UNIT mm
SHEET 1 OF 1 REV. C
TITLE LCM
PART NO. XXXX
MODULE NO. M7-A050A
CUSTOMER NO. XXXX
NAME DATE
DRAWN
CHECKED
APPROVED
DIMENSIONS WITH MARK"＊"ARE IMPORTANT,WITH MARK"( )"ARE REFERENCED,WITH MARK"☆"ARE SPECIAL CHARACTERISTICS,WITH MARK"●"ARE IMPROTANT CHARACTERISTICS.
5.0" TFT 800RGB*480
VIEWING DIRECTION 6.00
OUTLINE 134.60
HOLE 128.60
BEZEL 122.90
BEZEL(VA)110.00
BEZEL(VA) 66.80
BEZEL OUTLINE 78.50
HOLE 83.80
OUTLINE 90.00
48.3
31.5
6.76
17.50
10.00
2.75
21.04
28.97
14.80
1.60
6.00
3.00
6.50
3.5
7.50
φ3.00



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

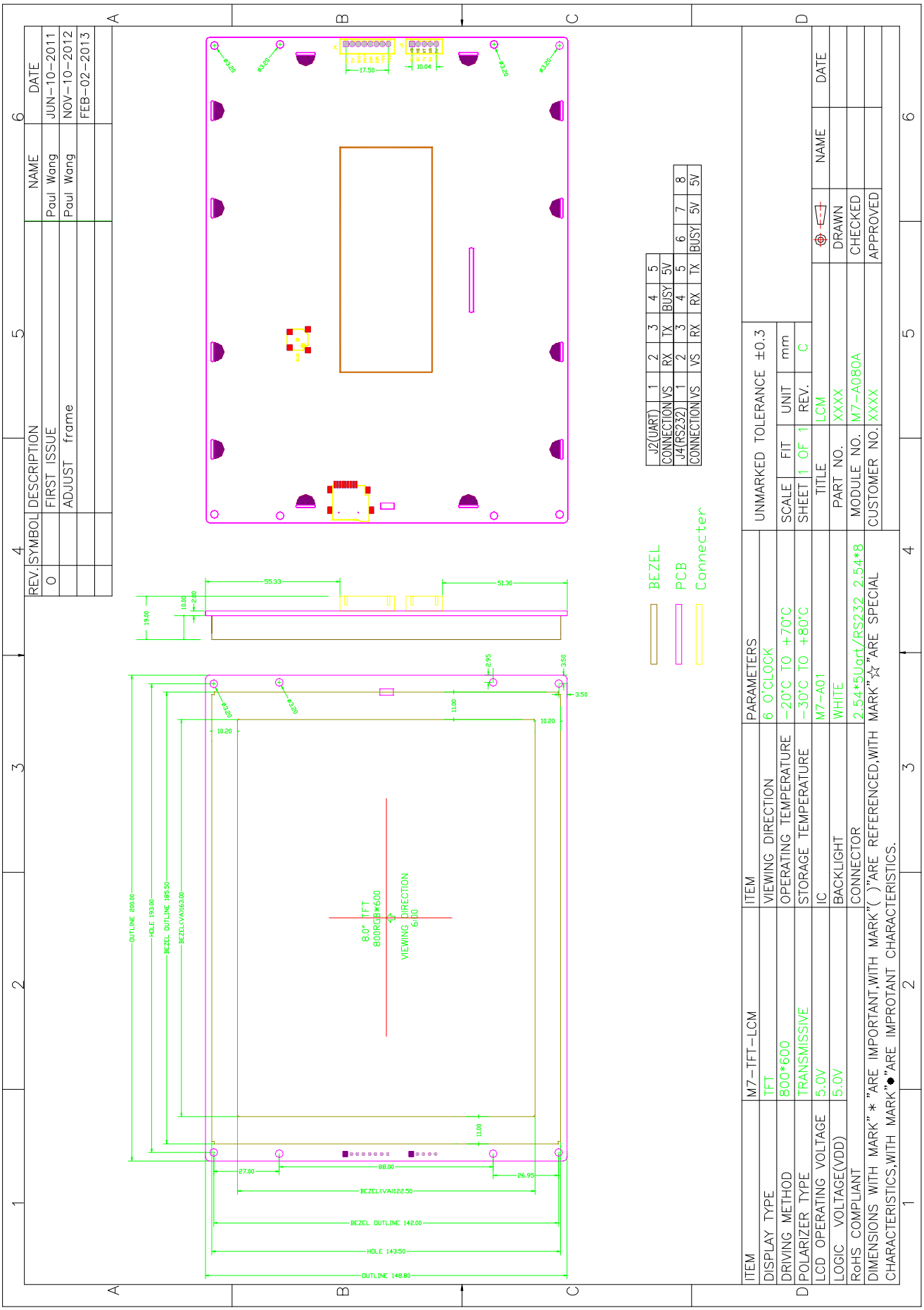
ITEM	M7-TFT-LCM	ITEM	PARAMETERS
DISPLAY TYPE	TFT	VIEWING DIRECTION	6 O'CLOCK
DRIVING METHOD	800*480	OPERATING TEMPERATURE	-20°C TO +70°C
POLARIZER TYPE	TRANSMISSIVE	STORAGE TEMPERATURE	-30°C TO +80°C
LCD OPERATING VOLTAGE	5.0V	IC	M7-A01
LOGIC VOLTAGE(VDD)	5.0V	BACKLIGHT	WHITE
RoHS COMPLIANT		CONNECTOR	2.54*5Uart/Rs232 2.54*8

UNMARKED TOLERANCE ±0.3

SCALE	FIT	UNIT
SHEET 1 OF 1	REV.	C
TITLE	LCM	
PART NO.	XXXX	
MODULE NO.	M7-A070A	
CUSTOMER NO.	XXXX	

	NAME	DATE
DRAWN		
CHECKED		
APPROVED		

DIMENSIONS WITH MARK"＊"ARE IMPORTANT,WITH MARK"( )"ARE REFERENCED,WITH MARK"☆"ARE SPECIAL CHARACTERISTICS,WITH MARK"●"ARE IMPROTANT CHARACTERISTICS.

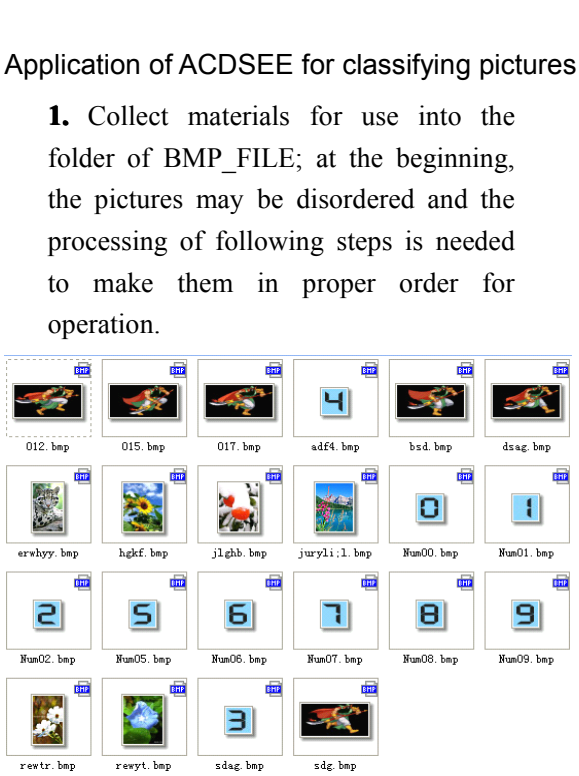

REV. SYMBOL DESCRIPTION NAME DATE
0 FIRST ISSUE Paul Wang JUN-10-2011
ADJUST frame Paul Wang NOV-10-2012
FEB-02-2013
J2(UART) 1 2 3 4 5
CONNECTION VS RX TX BUSY 5V
J4(RS232) 1 2 3 4 5 6 7 8
CONNECTION VS RX TX RX TX BUSY 5V 5V
BEZEL
PCB
Connecter
UNMARKED TOLERANCE ±0.3
SCALE FIT UNIT mm
SHEET 1 OF 1 REV. C
TITLE LCM
PART NO. XXXX
MODULE NO. M7-A080A
CUSTOMER NO. XXXX
DRAWN
CHECKED
APPROVED
ITEM M7-TFT-LCM PARAMETERS
DISPLAY TYPE TFT
DRIVING METHOD 800*600
POLARIZER TYPE TRANSMISSIVE
LCD OPERATING VOLTAGE 5.0V
LOGIC VOLTAGE(VDD) 5.0V
RoHS COMPLIANT
ITEM
VIEWING DIRECTION 6 O'CLOCK
OPERATING TEMPERATURE -20°C TO +70°C
STORAGE TEMPERATURE -30°C TO +80°C
IC M7-A01
BACKLIGHT WHITE
CONNECTOR 2.54*5Uart/RS232 2.54*8
DIMENSIONS WITH MARK" * "ARE IMPORTANT,WITH MARK"( )"ARE REFERENCED,WITH MARK"☆"ARE SPECIAL
CHARACTERISTICS,WITH MARK"●"ARE IMPROTANT CHARACTERISTICS.
8.0" TFT
800RGB*600
VIEWING DIRECTION
6:00
OUTLINE 200.00
HOLE 193.00
BEZEL OUTLINE 185.50
BEZEL(VA)163.00
OUTLINE 148.80
HOLE 143.50
BEZEL OUTLINE 142.00
BEZEL(VA)122.50
88.00
27.00
26.95
55.33
51.30
19.90
10.00
2.90
10.20
11.00
3.50
2.95
17.50
10.04

8.0 User's Guide

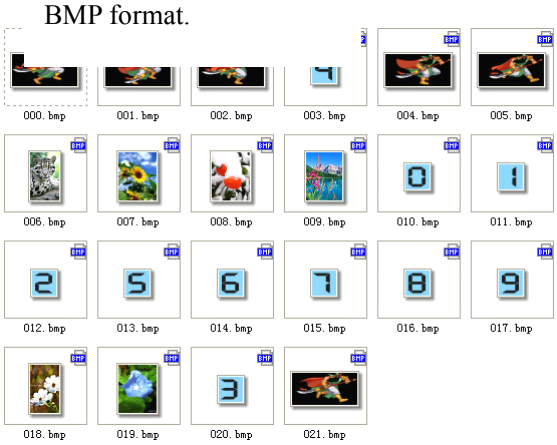
Appendix I

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.

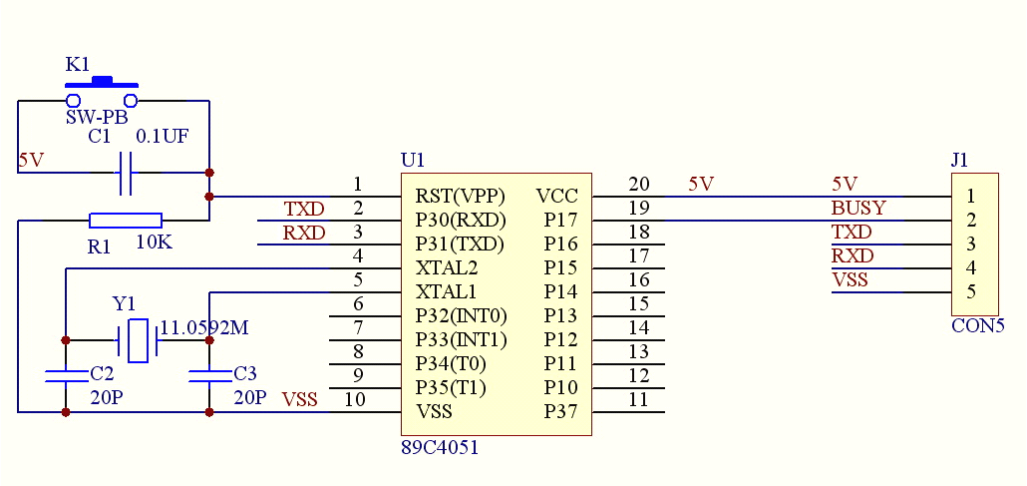
4. Reorder the special picture sequence, for instance, the animation part and special font part must be continuous.

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.

Appendix II

Application circuit



Appendix III

9.0 Reliability Test Items

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

Note1. No defection cosmetic and operational function allowable.

10.0 Package Specification

TBD