ST7789V

ST7789V Application Note

Ver 1.0
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ST7789V

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1 CMI Panel

1.1 CMI 2.4" Application FPC Circuit

ST7789V Interface Selection:

IM3	IM2	IM1	IM0	MPU Interface Mode	Data pin
0	0	0	0	80-8bit parallel I/F	DB[7:0]
0	0	0	1	80-16bit parallel I/F	DB[15:0]
0	0	1	0	80-9bit parallel I/F	DB[8:0]
0	0	1	1	80-18bit parallel I/F	DB[17:0],
0	1	0	1	3-line 9bit serial I/F	SDA: in/out
0	1	1	0	4-line 8bit serial I/F	SDA: in/out
1	0	0	0	80-16bit parallel I/F Ⅱ	DB[17:10], DB[8:1]
1	0	0	1	80-8bit parallel I/F Ⅱ	DB[17:10]
1	0	1	0	80-18bit parallel I/F Ⅱ	DB[17:0],
1	0	1	1	80-9bit parallel I/F Ⅱ	DB[17:9]
1	1	0	1	3-line 9bit serial I/F Ⅱ	SDA:in/ SDO: out
1	1	1	0	4-line 8bit serial I/F Ⅱ	SDA:in/ SDO: out

Panel Spec. Reference:

1. F02427-01U Product Spec_v1.1

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Test Pin

U2 TP
1 — VPP

U3 TP
1 — VGH

U5 TP
1 — AVDD

U7 TP
1 — AVCL

U8

CMI 2.4"

Interface Mode Select

R1 R=0   VDDI
R2 R=0
IM3   VDDI

R3 R=0   VDDI
R4 R=0
IM2

R5 R=0   VDDI
R6 R=0
IM1

R7 R=0   VDDI
R8 R=0
IM0

U6
36 PINS   FPC Output Pin

Note:

1. There is no CABC function in this schematic.

2. Please connect input pins that are not used to VSS.

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1.2 CMI 2.4"Panel Initial code Suggestion

```
Void ST7789VCMI24panelinitialcode(void)
{
//----------------------------------ST7789V reset sequence----------------------------------//
LCD_RESET=1;
Delayms(1);                              //Delay 1ms
LCD_RESET=0;
Delayms(10);                             //Delay 10ms
LCD_RESET=1;
Delayms(120);                            //Delay 120ms
//----------------------------------------------------------------------------------------//
Write command 0x11;
Delayms(120);                            //Delay 120ms
//-----------------------------------Display Setting-----------------------------------//
Write command 0x36;
Write data 0x00;
Write command 0x3a;
Write data 0x06;
//------------------------------ST7789V Frame rate setting------------------------------//
Write command 0xb2;
Write data 0x0c;
Write data 0x0c;
Write data 0x00;
Write data 0x33;
Write data 0x33;
Write command 0xb7;
Write data 0x35;
//------------------------------ST7789V Power setting-----------------------------------//
Write command 0xbb;
Write data 0x2b;
Write command 0xc0;
Write data 0x2c;
Write command 0xc2;
Write data 0x01;
Write command 0xc3;
Write data 0x11;
Write command 0xc4;
```

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Write data 0x20;

Write command 0xc6;

Write data 0x0f;

Write command 0xd0;

Write data 0xa4;

Write data 0xa1;

//-------------------------------ST7789V gamma setting-------------------------------------//

Write command 0xe0;

Write data 0xd0;

Write data 0x00;

Write data 0x05;

Write data 0x0e;

Write data 0x15;

Write data 0x0d;

Write data 0x37;

Write data 0x43;

Write data 0x47;

Write data 0x09;

Write data 0x15;

Write data 0x12;

Write data 0x16;

Write data 0x19;

Write command 0xe1;

Write data 0xd0;

Write data 0x00;

Write data 0x05;

Write data 0x0d;

Write data 0x0c;

Write data 0x06;

Write data 0x2d;

Write data 0x44;

Write data 0x40;

Write data 0x0e;

Write data 0x1c;

Write data 0x18;

Write data 0x16;

Write data 0x19;

Write command 0x29;

}

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```
Void ST7789VPanelTurnOnDisplay (void)
{
Write command 0x29;
}


Void ST7789VPanelTurnOffDisplay (void)
{
Write command 0x28;
}


Void ST7789VPanelTurnOnPartial (void)
{
Write command 0x30;
Write data 0x00;
Write PSL;           //PSL: Start Line
Write data 0x00;
Write PEL;           //PEL: End Line
Write command 0x12;
}


Void ST7789VPanelTurnOffPartial (void)
{
Write command 0x13;
}


Void ST7789VPanelTurnOnIdle (void)
{
Write command 0x39;
}


Void ST7789VPanelTurnOffIdle (void)
{
Write command 0x38;
}



Void ST7789VPanelSleepInMode (void)
{
Write command 0x10;
```

Delayms (120);

}

Void ST7789VPanelSleepOutMode (void)

{

Write command 0x11;

Delayms (120);

}

1.3 CMI 2.4" 2 Data Lane Serial I/F FPC Circuit

2 Data Lane serial Interface Selection:

IM3	IM2	IM1	IM0	MPU Interface Mode	Data pin
0	1	0	1	3-line 9bit serial I/F	SDA: in/out, WRX: in

Panel Spec. Reference:

1. F02427-01U Product Spec_v1.1

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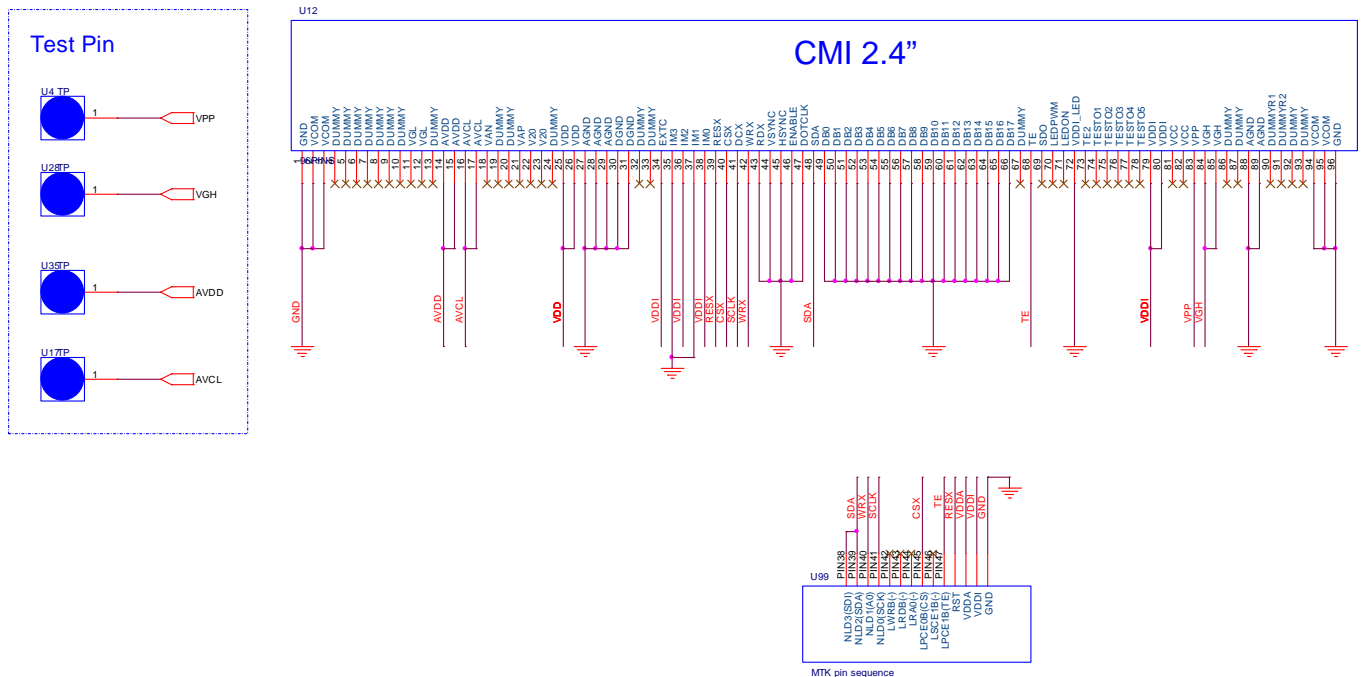
1.4 CMI 2.4" 2 Data Lane Serial I/F Initial code Suggestion

```
Void ST7789VCMI24panelinitialcode(void)
{
//----------------------------------ST7789V reset sequence----------------------------------//
LCD_RESET=1;
Delayms(1);                                    //Delay 1ms
LCD_RESET=0;
Delayms(10);                                   //Delay 10ms
LCD_RESET=1;
Delayms(120);                                  //Delay 120ms
//------------------------------------------------------------------------------------------//
Write command 0x11;
Delayms(120);                                  //Delay 120ms
//----------------------------------Display Setting------------------------------------------//
Write command 0x36;
Write data 0x00;
Write command 0x3a;
Write data 0x06;
//------------------------------ST7789V Frame rate setting----------------------------------//
Write command 0xb2;
Write data 0x0c;
Write data 0x0c;
Write data 0x00;
Write data 0x33;
Write data 0x33;
Write command 0xb7;
Write data 0x35;
//------------------------------ST7789V Power setting----------------------------------//
Write command 0xbb;
Write data 0x2b;
Write command 0xc0;
Write data 0x2c;
Write command 0xc2;
Write data 0x01;
Write command 0xc3;
Write data 0x11;
Write command 0xc4;
```

Write data 0x20;

Write command 0xc6;

Write data 0x0f;

Write command 0xd0;

Write data 0xa4;

Write data 0xa1;

//--------------------------------ST7789V gamma setting-------------------------------------//

Write command 0xe0;

Write data 0xd0;

Write data 0x00;

Write data 0x05;

Write data 0x0e;

Write data 0x15;

Write data 0x0d;

Write data 0x37;

Write data 0x43;

Write data 0x47;

Write data 0x09;

Write data 0x15;

Write data 0x12;

Write data 0x16;

Write data 0x19;

Write command 0xe1;

Write data 0xd0;

Write data 0x00;

Write data 0x05;

Write data 0x0d;

Write data 0x0c;

Write data 0x06;

Write data 0x2d;

Write data 0x44;

Write data 0x40;

Write data 0x0e;

Write data 0x1c;

Write data 0x18;

Write data 0x16;

Write data 0x19;

Write command 0xe7;   //2 data lane interface enable

Write data 0x10;

Write command 0x29;

}

Void ST7789VPanelTurnOnDisplay (void)

{

Write command 0x29;

}

Void ST7789VPanelTurnOffDisplay (void)

{

Write command 0x28;

}

Void ST7789VPanelTurnOnPartial (void)

{

Write command 0x30;

Write data 0x00;

Write PSL;   //PSL: Start Line

Write data 0x00;

Write PEL;   //PEL: End Line

Write command 0x12;

}

Void ST7789VPanelTurnOffPartial (void)

{

Write command 0x13;

}

Void ST7789VPanelTurnOnIdle (void)

{

Write command 0x39;

}

Void ST7789VPanelTurnOffIdle (void)

{

Write command 0x38;

}

Void ST7789VPanelSleepInMode (void)

```
{
Write command 0x10;
Delayms (120);
}


Void ST7789VPanelSleepOutMode (void)
{
Write command 0x11;
Delayms (120);
}
```

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1.5 CMI 2.8" Application FPC Circuit

ST7789V Interface Selection:

IM3	IM2	IM1	IM0	MPU Interface Mode	Data pin
0	0	0	0	80-8bit parallel I/F	DB[7:0]
0	0	0	1	80-16bit parallel I/F	DB[15:0]
0	0	1	0	80-9bit parallel I/F	DB[8:0]
0	0	1	1	80-18bit parallel I/F	DB[17:0],
0	1	0	1	3-line 9bit serial I/F	SDA: in/out
0	1	1	0	4-line 8bit serial I/F	SDA: in/out
1	0	0	0	80-16bit parallel I/F Ⅱ	DB[17:10], DB[8:1]
1	0	0	1	80-8bit parallel I/F Ⅱ	DB[17:10]
1	0	1	0	80-18bit parallel I/F Ⅱ	DB[17:0],
1	0	1	1	80-9bit parallel I/F Ⅱ	DB[17:9]
1	1	0	1	3-line 9bit serial I/F Ⅱ	SDA:in/ SDO: out
1	1	1	0	4-line 8bit serial I/F Ⅱ	SDA:in/ SDO: out

Panel Spec. Reference:

1. F02812-01U TFT LCD Specification v1.5
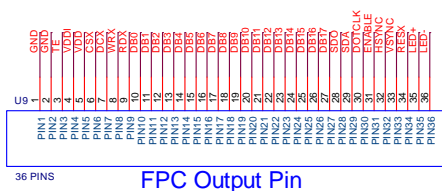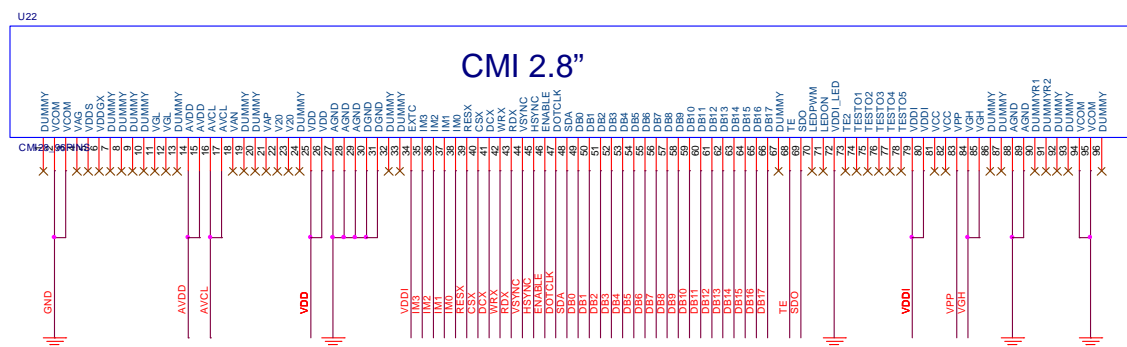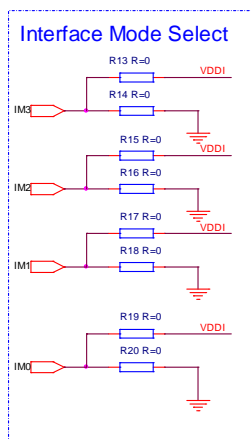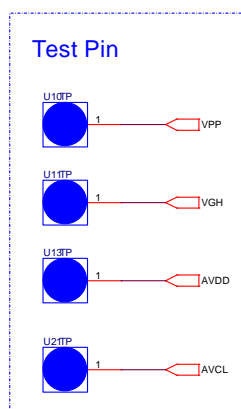
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Test Pin

U10TP 1 — VPP

U11TP 1 — VGH

U13TP 1 — AVDD

U21TP 1 — AVCL

U22

CMI 2.8"

Interface Mode Select

R13 R=0 — VDDI
R14 R=0
IM3

R15 R=0 — VDDI
R16 R=0
IM2

R17 R=0 — VDDI
R18 R=0
IM1

R19 R=0 — VDDI
R20 R=0
IM0

U9

36 PINS

FPC Output Pin

Note:

1. There is no CABC function in this schematic.

2. Please connect input pins that are not used to VSS

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1.6 **CMI 2.8"Panel Initial code Suggestion**

```
Void ST7789VCMI28panelinitialcode(void)
{
//---------------------------------ST7789V reset sequence----------------------------------//
LCD_RESET=1;
Delayms(1);                                    //Delay 1ms
LCD_RESET=0;
Delayms(10);                                   //Delay 10ms
LCD_RESET=1;
Delayms(120);                                  //Delay 120ms
//-------------------------------------------------------------------------------------------//
Write command 0x11;
Delayms(120);                                  //Delay 120ms
//-----------------------------display and color format setting------------------------------//
Write command 0x36;
Write data 0x00;
Write command 0x3a;
Write data 0x06;
//--------------------------------ST7789V Frame rate setting---------------------------------//
Write command 0xb2;
Write data 0x0c;
Write data 0x0c;
Write data 0x00;
Write data 0x33;
Write data 0x33;
Write command 0xb7;
Write data 0x35;
//--------------------------------ST7789V Power setting---------------------------------//
Write command 0xbb;
Write data 0x28;
Write command 0xc0;
Write data 0x2c;
Write command 0xc2;
Write data 0x01;
Write command 0xc3;
Write data 0x0b;
Write command 0xc4;
```

Write data 0x20;

Write command 0xc6;

Write data 0x0f;

Write command 0xd0;

Write data 0xa4;

Write data 0xa1;

//--------------------------------ST7789V gamma setting-------------------------------------//

Write command 0xe0;

Write data 0xd0;

Write data 0x01;

Write data 0x08;

Write data 0x0f;

Write data 0x11;

Write data 0x2a;

Write data 0x36;

Write data 0x55;

Write data 0x44;

Write data 0x3a;

Write data 0x0b;

Write data 0x06;

Write data 0x11;

Write data 0x20;

Write command 0xe1;

Write data 0xd0;

Write data 0x02;

Write data 0x07;

Write data 0x0a;

Write data 0x0b;

Write data 0x18;

Write data 0x34;

Write data 0x43;

Write data 0x4a;

Write data 0x2b;

Write data 0x1b;

Write data 0x1c;

Write data 0x22;

Write data 0x1f;

Write command 0x29;

}

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```
Void ST7789VPanelTurnOnDisplay (void)
{
Write command 0x29;
}


Void ST7789VPanelTurnOffDisplay (void)
{
Write command 0x28;
}


Void ST7789VPanelTurnOnPartial (void)
{
Write command 0x30;
Write data 0x00;
Write PSL;          //PSL: Start Line
Write data 0x00;
Write PEL;          //PEL: End Line
Write command 0x12;
}


Void ST7789VPanelTurnOffPartial (void)
{
Write command 0x13;
}


Void ST7789VPanelTurnOnIdle (void)
{
Write command 0x39;
}


Void ST7789VPanelTurnOffIdle (void)
{
Write command 0x38;
}



Void ST7789VPanelSleepInMode (void)
{
```

Write command 0x10;

Delayms (120);

}

Void ST7789VPanelSleepOutMode (void)

{

Write command 0x11;

Delayms (120);

}

2 CPT Panel

2.1 CPT 2.4" Application FPC Circuit

ST7789V Interface Selection:

IM3	IM2	IM1	IM0	MPU Interface Mode	Data pin
0	0	0	0	80-8bit parallel I/F	DB[7:0]
0	0	0	1	80-16bit parallel I/F	DB[15:0]
0	0	1	0	80-9bit parallel I/F	DB[8:0]
0	0	1	1	80-18bit parallel I/F	DB[17:0],
0	1	0	1	3-line 9bit serial I/F	SDA: in/out
0	1	1	0	4-line 8bit serial I/F	SDA: in/out
1	0	0	0	80-16bit parallel I/F Ⅱ	DB[17:10], DB[8:1]
1	0	0	1	80-8bit parallel I/F Ⅱ	DB[17:10]
1	0	1	0	80-18bit parallel I/F Ⅱ	DB[17:0],
1	0	1	1	80-9bit parallel I/F Ⅱ	DB[17:9]
1	1	0	1	3-line 9bit serial I/F Ⅱ	SDA:in/ SDO: out
1	1	1	0	4-line 8bit serial I/F Ⅱ	SDA:in/ SDO: out

Panel Spec. Reference:

1. CLAF024G421 BX
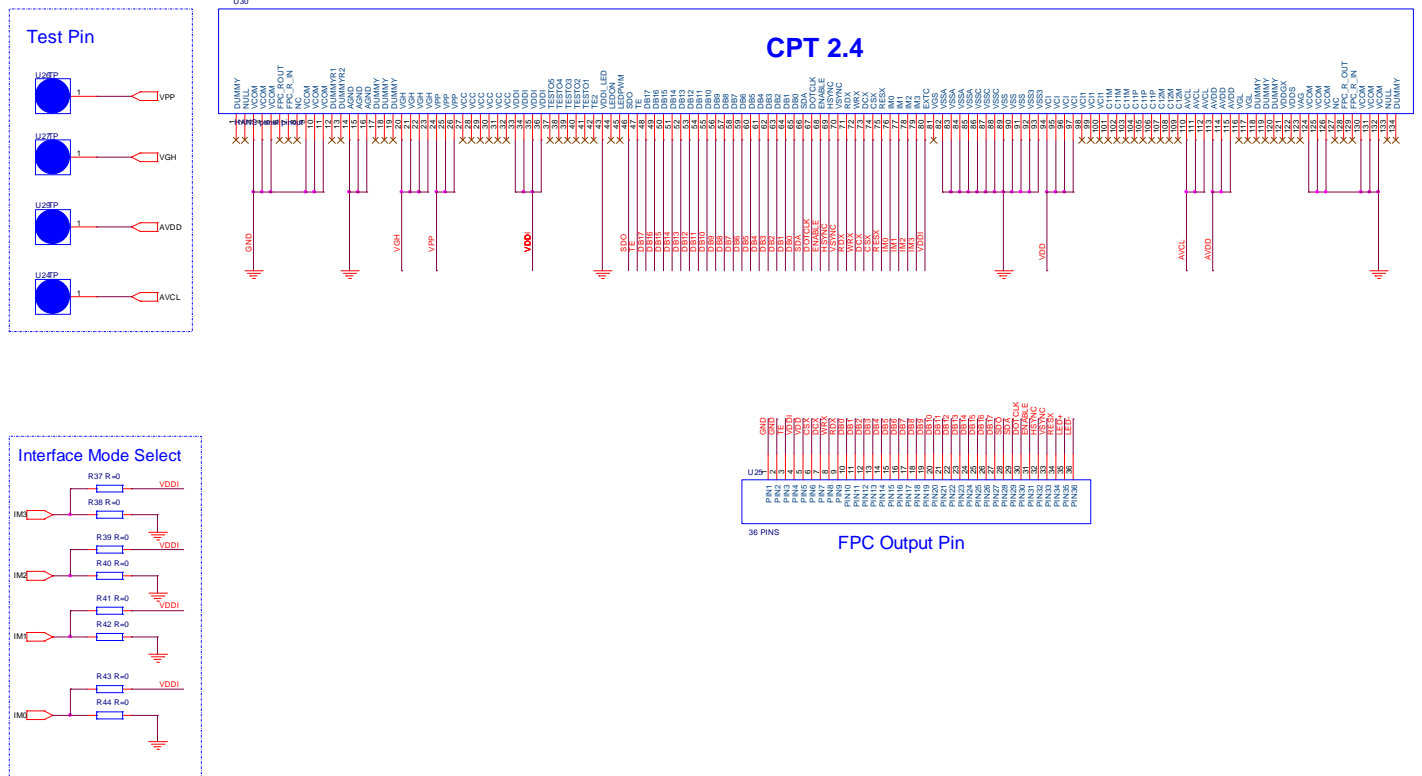
Test Pin

CPT 2.4

Interface Mode Select

FPC Output Pin

36 PINS

Note:

1. There is no CABC function in this schematic.

2. Please connect input pins that are not used to VSS

2.2 **CPT 2.4" Panel Initial Code Suggestion**

```
Void ST7789VCPT24panelinitialcode(void)
{
//----------------------------------ST7789V reset sequence----------------------------------//
LCD_RESET=1;
Delayms(1);                                    //Delay 1ms
LCD_RESET=0;
Delayms(10);                                   //Delay 10ms
LCD_RESET=1;
Delayms(120);                                  //Delay 120ms
//------------------------------------------------------------------------------------------//
Write command 0x11;
Delayms(120);                                  //Delay 120ms
//-----------------------------display and color format setting--------------------------//
Write command 0x36;
Write data 0x00;
Write command 0x3a;
Write data 0x06;
//------------------------------- Frame rate setting--------------------------------//
Write command 0xb2;
Write data 0x0c;
Write data 0x0c;
Write data 0x00;
Write data 0x33;
Write data 0x33;
Write command 0xb7;
Write data 0x35;
//-------------------------------ST7789V Power setting-----------------------------------//
Write command 0xbb;
Write data 0x1f;
Write command 0xc0;
Write data 0x2c;
Write command 0xc2;
Write data 0x01;
Write command 0xc3;
Write data 0x11;
Write command 0xc4;
```

Write data 0x20;
Write command 0xc6;
Write data 0x0f;
Write command 0xd0;
Write data 0xa4;
Write data 0xa1;
//-------------------------------ST7789V gamma setting------------------------------------//
Write command 0xe0;
Write data 0xd0;
Write data 0x00;
Write data 0x14;
Write data 0x15;
Write data 0x13;
Write data 0x2c;
Write data 0x42;
Write data 0x43;
Write data 0x4e;
Write data 0x09;
Write data 0x16;
Write data 0x14;
Write data 0x18;
Write data 0x21;
Write command 0xe1;
Write data 0xd0;
Write data 0x00;
Write data 0x14;
Write data 0x15;
Write data 0x13;
Write data 0x0b;
Write data 0x43;
Write data 0x55;
Write data 0x53;
Write data 0x0c;
Write data 0x17;
Write data 0x14;
Write data 0x23;
Write data 0x20;
Write command 0x29;
}

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```
Void ST7789VPanelTurnOnDisplay (void)
{
Write command 0x29;
}


Void ST7789VPanelTurnOffDisplay (void)
{
Write command 0x28;
}


Void ST7789VPanelTurnOnPartial (void)
{
Write command 0x30;
Write data 0x00;
Write PSL;            //PSL: Start Line
Write data 0x00;
Write PEL;            //PEL: End Line
Write command 0x12;
}


Void ST7789VPanelTurnOffPartial (void)
{
Write command 0x13;
}


Void ST7789VPanelTurnOnIdle (void)
{
Write command 0x39;
}


Void ST7789VPanelTurnOffIdle (void)
{
Write command 0x38;
}



Void ST7789VPanelSleepInMode (void)
{
```

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Write command 0x10;

Delayms (120);

}

Void ST7789VPanelSleepOutMode (void)

{

Write command 0x11;

Delayms (120);

}

2.3 **CPT 2.8" Application FPC Circuit**

ST7789V Interface Selection:

IM3	IM2	IM1	IM0	MPU Interface Mode	Data pin
0	0	0	0	80-8bit parallel I/F	DB[7:0]
0	0	0	1	80-16bit parallel I/F	DB[15:0]
0	0	1	0	80-9bit parallel I/F	DB[8:0]
0	0	1	1	80-18bit parallel I/F	DB[17:0],
0	1	0	1	3-line 9bit serial I/F	SDA: in/out
0	1	1	0	4-line 8bit serial I/F	SDA: in/out
1	0	0	0	80-16bit parallel I/F Ⅱ	DB[17:10], DB[8:1]
1	0	0	1	80-8bit parallel I/F Ⅱ	DB[17:10]
1	0	1	0	80-18bit parallel I/F Ⅱ	DB[17:0],
1	0	1	1	80-9bit parallel I/F Ⅱ	DB[17:9]
1	1	0	1	3-line 9bit serial I/F Ⅱ	SDA:in/ SDO: out
1	1	1	0	4-line 8bit serial I/F Ⅱ	SDA:in/ SDO: out

Panel Spec. Reference:

1. CLAF028GJ0100XA_Ver.0.2_2011.05.10
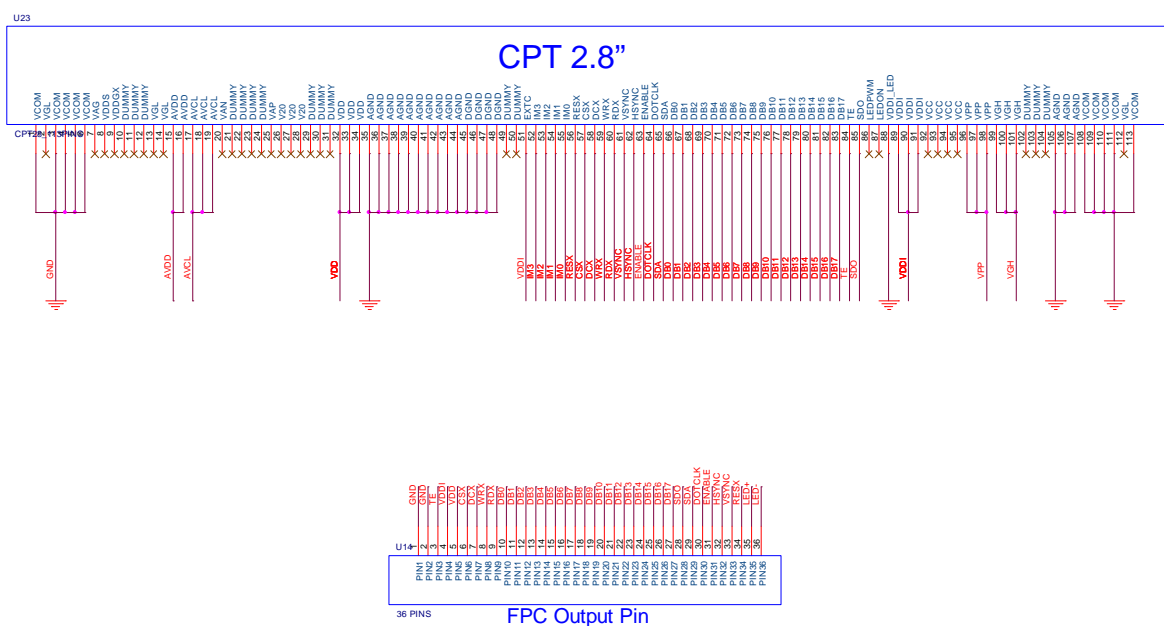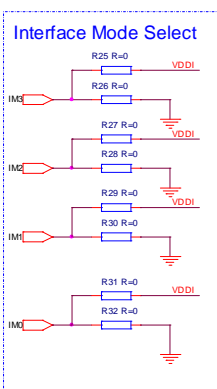
Test Pin

Interface Mode Select

CPT 2.8"

FPC Output Pin

Note:

3. There is no CABC function in this schematic.

4. Please connect input pins that are not used to VSS

2.4 CPT 2.8"Panel Initial code Suggestion

Void ST7789VCPT28panelinitialcode(void)

{

//--------------------------------ST7789V reset sequence-----------------------------------//

LCD_RESET=1;

Delayms(1);   //Delay 1ms

LCD_RESET=0;

Delayms(10);   //Delay 10ms

LCD_RESET=1;

Delayms(120);   //Delay 120ms

//--//

Write command 0x11;

Delayms(120);   //Delay 120ms

//-----------------------------display and color format setting-------------------------------//

Write command 0x36;

Write data 0x00;

Write command 0x3a;

Write data 0x06;

//-------------------------------ST7789V Frame rate setting----------------------------------//

Write command 0xb2;

Write data 0x0c;

Write data 0x0c;

Write data 0x00;

Write data 0x33;

Write data 0x33;

Write command 0xb7;

Write data 0x35;

//-------------------------------ST7789V Power setting--------------------------------------//

Write command 0xbb;

Write data 0x1f;

Write command 0xc0;

Write data 0x2c;

Write command 0xc2;

Write data 0x01;

Write command 0xc3;

Write data 0x17;

Write command 0xc4;

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Write data 0x20;

Write command 0xc6;

Write data 0x0f;

Write command 0xd0;

Write data 0xa4;

Write data 0xa1;

//-------------------------------ST7789V gamma setting-------------------------------//

Write command 0xe0;

Write data 0xd0;

Write data 0x00;

Write data 0x14;

Write data 0x15;

Write data 0x13;

Write data 0x2c;

Write data 0x42;

Write data 0x43;

Write data 0x4e;

Write data 0x09;

Write data 0x16;

Write data 0x14;

Write data 0x18;

Write data 0x21;

Write command 0xe1;

Write data 0xd0;

Write data 0x00;

Write data 0x14;

Write data 0x15;

Write data 0x13;

Write data 0x0b;

Write data 0x43;

Write data 0x55;

Write data 0x53;

Write data 0x0c;

Write data 0x17;

Write data 0x14;

Write data 0x23;

Write data 0x20;

Write command 0x29;

}

```
Void ST7789VPanelTurnOnDisplay (void)
{
Write command 0x29;
}


Void ST7789VPanelTurnOffDisplay (void)
{
Write command 0x28;
}


Void ST7789VPanelTurnOnPartial (void)
{
Write command 0x30;
Write data 0x00;
Write PSL;            //PSL: Start Line
Write data 0x00;
Write PEL;            //PEL: End Line
Write command 0x12;
}


Void ST7789VPanelTurnOffPartial (void)
{
Write command 0x13;
}


Void ST7789VPanelTurnOnIdle (void)
{
Write command 0x39;
}


Void ST7789VPanelTurnOffIdle (void)
{
Write command 0x38;
}



Void ST7789VPanelSleepInMode (void)
{
```

Write command 0x10;

Delayms (120);

}

Void ST7789VPanelSleepOutMode (void)

{

Write command 0x11;

Delayms (120);

}

3 Hannstar Panel

3.1 HANNS 2.4" Application FPC Circuit

ST7789V Interface Selection:

IM3	IM2	IM1	IM0	MPU Interface Mode	Data pin
0	0	0	0	80-8bit parallel I/F	DB[7:0]
0	0	0	1	80-16bit parallel I/F	DB[15:0]
0	0	1	0	80-9bit parallel I/F	DB[8:0]
0	0	1	1	80-18bit parallel I/F	DB[17:0],
0	1	0	1	3-line 9bit serial I/F	SDA: in/out
0	1	1	0	4-line 8bit serial I/F	SDA: in/out
1	0	0	0	80-16bit parallel I/F Ⅱ	DB[17:10], DB[8:1]
1	0	0	1	80-8bit parallel I/F Ⅱ	DB[17:10]
1	0	1	0	80-18bit parallel I/F Ⅱ	DB[17:0],
1	0	1	1	80-9bit parallel I/F Ⅱ	DB[17:9]
1	1	0	1	3-line 9bit serial I/F Ⅱ	SDA:in/ SDO: out
1	1	1	0	4-line 8bit serial I/F Ⅱ	SDA:in/ SDO: out

Panel Spec. Reference:

1. HSD024F3N5-A Preliminary Specification 1.0(14umIC)

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Test Pin

Interface Mode Select

HANNS 2.4" Panel

FPC Output Pin

Note:

1. *There is no CABC function in this schematic.*

2. *Please connect input pins that are not used to VSS*

3.2 HANNS 2.4"Panel Initial code Suggestion

Void ST7789VHANNS24panelinitialcode(void)

{

//---------------------------------ST7789V reset sequence----------------------------------//

LCD_RESET=1;

Delayms(1);   //Delay 1ms

LCD_RESET=0;

Delayms(10);   //Delay 10ms

LCD_RESET=1;

Delayms(120);   //Delay 120ms

//---//

Write command 0x11;

Delayms(120);   //Delay 120ms

//----------------------------display and color format setting-----------------------------//

Write command 0x36;

Write data 0x00;

Write command 0x3a;

Write data 0x06;

//------------------------------ST7789V Frame rate setting--------------------------------//

Write command 0xb2;

Write data 0x0c;

Write data 0x0c;

Write data 0x00;

Write data 0x33;

Write data 0x33;

Write command 0xb7;

Write data 0x35;

//------------------------------ST7789V Power setting------------------------------------//

Write command 0xbb;

Write data 0x35;

Write command 0xc0;

Write data 0x2c;

Write command 0xc2;

Write data 0x01;

Write command 0xc3;

Write data 0x0b;

Write command 0xc4;

Write data 0x20;

Write command 0xc6;

Write data 0x0f;

Write command 0xd0;

Write data 0xa4;

Write data 0xa1;

//--------------------------------ST7789V gamma setting-------------------------------------//

Write command 0xe0;

Write data 0xd0;

Write data 0x00;

Write data 0x02;

Write data 0x07;

Write data 0x0b;

Write data 0x1a;

Write data 0x31;

Write data 0x54;

Write data 0x40;

Write data 0x29;

Write data 0x12;

Write data 0x12;

Write data 0x12;

Write data 0x17;

Write command 0xe1;

Write data 0xd0;

Write data 0x00;

Write data 0x02;

Write data 0x07;

Write data 0x05;

Write data 0x25;

Write data 0x2d;

Write data 0x44;

Write data 0x45;

Write data 0x1c;

Write data 0x18;

Write data 0x16;

Write data 0x1c;

Write data 0x1d;

Write command 0x29;

}

```
Void ST7789VPanelTurnOnDisplay (void)
{
Write command 0x29;
}


Void ST7789VPanelTurnOffDisplay (void)
{
Write command 0x28;
}


Void ST7789VPanelTurnOnPartial (void)
{
Write command 0x30;
Write data 0x00;
Write PSL;          //PSL: Start Line
Write data 0x00;
Write PEL;          //PEL: End Line
Write command 0x12;
}


Void ST7789VPanelTurnOffPartial (void)
{
Write command 0x13;
}


Void ST7789VPanelTurnOnIdle (void)
{
Write command 0x39;
}


Void ST7789VPanelTurnOffIdle (void)
{
Write command 0x38;
}



Void ST7789VPanelSleepInMode (void)
{
```

Write command 0x10;

Delayms (120);

}

Void ST7789VPanelSleepOutMode (void)

{
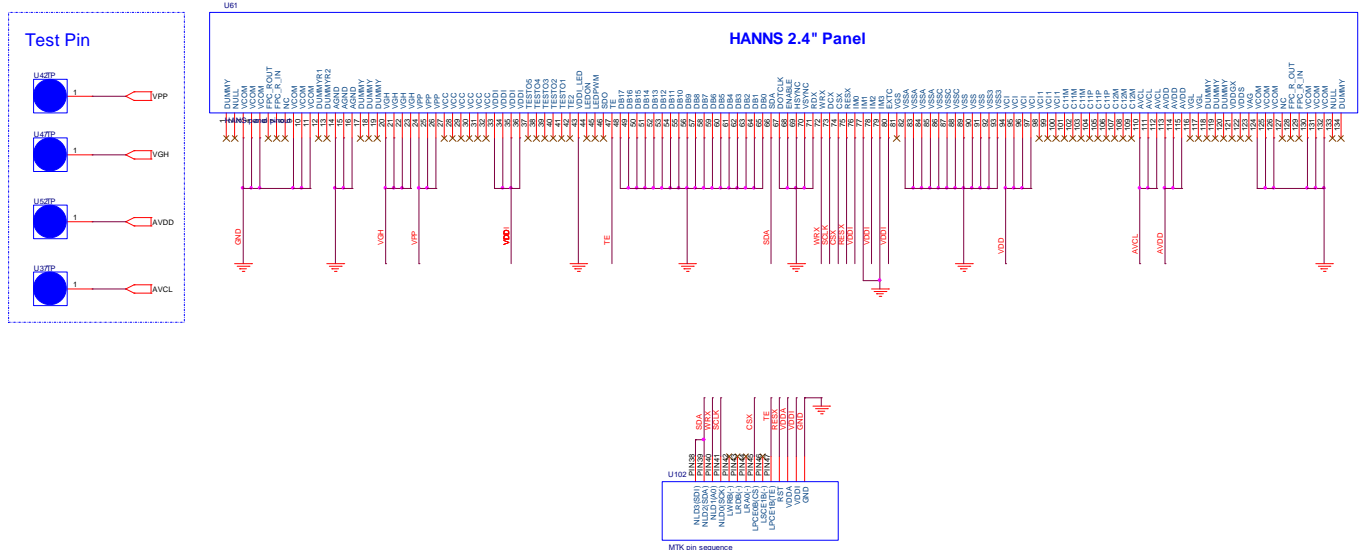
Write command 0x11;

Delayms (120);

}

3.3 HANNS 2.4" 2 Data Lane Serial I/F FPC Circuit

2 Data Lane Serial Interface Selection:

IM3	IM2	IM1	IM0	MPU Interface Mode	Data pin
0	1	0	1	2 data lane serial I/F	SDA: in/out, WRX: in

Panel Spec. Reference:

1. HSD024F3N5-A Preliminary Specification 1.0(14umIC)

3.4 HANNS 2.4"Panel 2 Data Lane Initial code Suggestion

```
Void ST7789VHANNS24panelinitialcode(void)
{
//-----------------------------------ST7789V reset sequence-----------------------------------//
LCD_RESET=1;
Delayms(1);                              //Delay 1ms
LCD_RESET=0;
Delayms(10);                             //Delay 10ms
LCD_RESET=1;
Delayms(120);                            //Delay 120ms
//----------------------------------------------------------------------------------------------//
Write command 0x11;
Delayms(120);                            //Delay 120ms
//------------------------------display and color format setting------------------------------//
Write command 0x36;
Write data 0x00;
Write command 0x3a;
Write data 0x06;
//------------------------------ST7789V Frame rate setting------------------------------//
Write command 0xb2;
Write data 0x0c;
Write data 0x0c;
Write data 0x00;
Write data 0x33;
Write data 0x33;
Write command 0xb7;
Write data 0x35;
//------------------------------ST7789V Power setting------------------------------//
Write command 0xbb;
Write data 0x35;
Write command 0xc0;
Write data 0x2c;
Write command 0xc2;
Write data 0x01;
Write command 0xc3;
Write data 0x0b;
Write command 0xc4;
```

Write data 0x20;
Write command 0xc6;
Write data 0x0f;
Write command 0xd0;
Write data 0xa4;
Write data 0xa1;
//-------------------------------ST7789V gamma setting-------------------------------------//
Write command 0xe0;
Write data 0xd0;
Write data 0x00;
Write data 0x02;
Write data 0x07;
Write data 0x0b;
Write data 0x1a;
Write data 0x31;
Write data 0x54;
Write data 0x40;
Write data 0x29;
Write data 0x12;
Write data 0x12;
Write data 0x12;
Write data 0x17;
Write command 0xe1;
Write data 0xd0;
Write data 0x00;
Write data 0x02;
Write data 0x07;
Write data 0x05;
Write data 0x25;
Write data 0x2d;
Write data 0x44;
Write data 0x45;
Write data 0x1c;
Write data 0x18;
Write data 0x16;
Write data 0x1c;
Write data 0x1d;
Write command 0xe7;   //2 data lane interface enable
Write data 0x10;

Write command 0x29;

}

Void ST7789VPanelTurnOnDisplay (void)

{

Write command 0x29;

}

Void ST7789VPanelTurnOffDisplay (void)

{

Write command 0x28;

}

Void ST7789VPanelTurnOnPartial (void)

{

Write command 0x30;

Write data 0x00;

Write PSL;   //PSL: Start Line

Write data 0x00;

Write PEL;   //PEL: End Line

Write command 0x12;

}

Void ST7789VPanelTurnOffPartial (void)

{

Write command 0x13;

}

Void ST7789VPanelTurnOnIdle (void)

{

Write command 0x39;

}

Void ST7789VPanelTurnOffIdle (void)

{

Write command 0x38;

}

Void ST7789VPanelSleepInMode (void)

{

Write command 0x10;

Delayms (120);

}

Void ST7789VPanelSleepOutMode (void)

{

Write command 0x11;

Delayms (120);

}

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3.5 HANNS 2.6" Application FPC Circuit

ST7789V Interface Selection:

IM3	IM2	IM1	IM0	MPU Interface Mode	Data pin
0	0	0	0	80-8bit parallel I/F	DB[7:0]
0	0	0	1	80-16bit parallel I/F	DB[15:0]
0	0	1	0	80-9bit parallel I/F	DB[8:0]
0	0	1	1	80-18bit parallel I/F	DB[17:0],
0	1	0	1	3-line 9bit serial I/F	SDA: in/out
0	1	1	0	4-line 8bit serial I/F	SDA: in/out
1	0	0	0	80-16bit parallel I/F Ⅱ	DB[17:10], DB[8:1]
1	0	0	1	80-8bit parallel I/F Ⅱ	DB[17:10]
1	0	1	0	80-18bit parallel I/F Ⅱ	DB[17:0],
1	0	1	1	80-9bit parallel I/F Ⅱ	DB[17:9]
1	1	0	1	3-line 9bit serial I/F Ⅱ	SDA:in/ SDO: out
1	1	1	0	4-line 8bit serial I/F Ⅱ	SDA:in/ SDO: out

Panel Spec. Reference:

1. HSD026B3N3-B
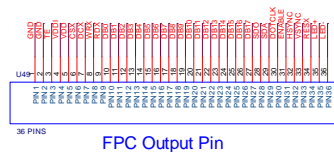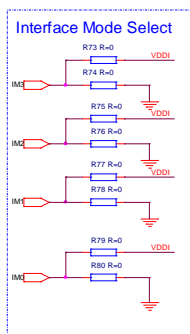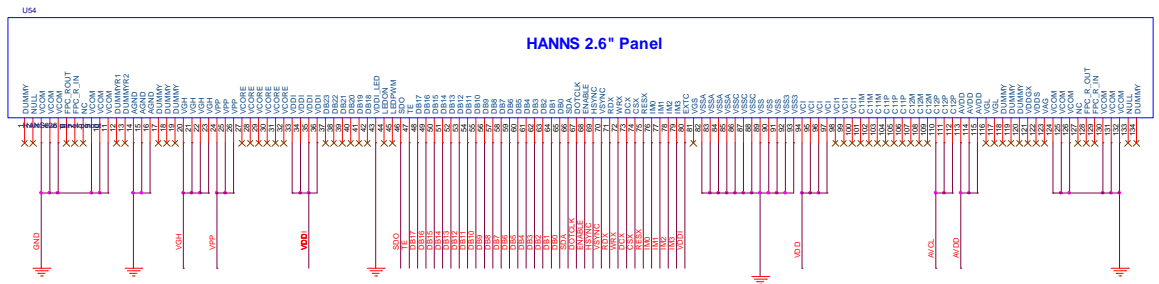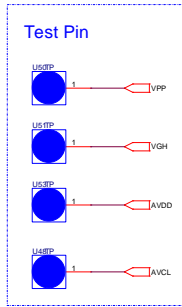
Test Pin

Interface Mode Select

HANNS 2.6" Panel

FPC Output Pin

36 PINS

Note:

1. There is no CABC function in this schematic.

2. Please connect input pins that are not used to VSS

3.6 HANNS 2.6"Panel Initial code Suggestion

```
Void ST7789VHANNS26panelinitialcode(void)
{
//----------------------------------ST7789V reset sequence----------------------------------//
LCD_RESET=1;
Delayms(1);                                    //Delay 1ms
LCD_RESET=0;
Delayms(10);                                   //Delay 10ms
LCD_RESET=1;
Delayms(120);                                  //Delay 120ms
//---------------------------------------------------------------------------------------//
Write command 0x11;
Delayms(120);                                  //Delay 120ms
//----------------------------display and color format setting----------------------------//
Write command 0x36;
Write data 0x00;
Write command 0x3a;
Write data 0x06;
//------------------------------ST7789V Frame rate setting--------------------------------//
Write command 0xb2;
Write data 0x0c;
Write data 0x0c;
Write data 0x00;
Write data 0x33;
Write data 0x33;
Write command 0xb7;
Write data 0x35;
//------------------------------ST7789V Power setting------------------------------------//
Write command 0xbb;
Write data 0x35;
Write command 0xc0;
Write data 0x2c;
Write command 0xc2;
Write data 0x01;
Write command 0xc3;
Write data 0x0b;
Write command 0xc4;
```

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Write data 0x20;

Write command 0xc6;

Write data 0x0f;

Write command 0xd0;

Write data 0xa4;

Write data 0xa1;

//--------------------------------ST7789V gamma setting-------------------------------------//

Write command 0xe0;

Write data 0xd0;

Write data 0x00;

Write data 0x02;

Write data 0x07;

Write data 0x0b;

Write data 0x1a;

Write data 0x31;

Write data 0x54;

Write data 0x40;

Write data 0x29;

Write data 0x12;

Write data 0x12;

Write data 0x12;

Write data 0x17;

Write command 0xe1;

Write data 0xd0;

Write data 0x00;

Write data 0x02;

Write data 0x07;

Write data 0x05;

Write data 0x25;

Write data 0x2d;

Write data 0x44;

Write data 0x45;

Write data 0x1c;

Write data 0x18;

Write data 0x16;

Write data 0x1c;

Write data 0x1d;

Write command 0x29;

}

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Void ST7789VPanelTurnOnDisplay (void)

{

Write command 0x29;

}

Void ST7789VPanelTurnOffDisplay (void)

{

Write command 0x28;

}

Void ST7789VPanelTurnOnPartial (void)

{

Write command 0x30;

Write data 0x00;

Write PSL;   //PSL: Start Line

Write data 0x00;

Write PEL;   //PEL: End Line

Write command 0x12;

}

Void ST7789VPanelTurnOffPartial (void)

{

Write command 0x13;

}

Void ST7789VPanelTurnOnIdle (void)

{

Write command 0x39;

}

Void ST7789VPanelTurnOffIdle (void)

{

Write command 0x38;

}

Void ST7789VPanelSleepInMode (void)

{

Sitronix

```
Write command 0x10;
Delayms (120);
}


Void ST7789VPanelSleepOutMode (void)
{
Write command 0x11;
Delayms (120);
}
```

3.7 **HANNS 2.8" Application FPC Circuit**

ST7789V Interface Selection:

IM3	IM2	IM1	IM0	MPU Interface Mode	Data pin
0	0	0	0	80-8bit parallel I/F	DB[7:0]
0	0	0	1	80-16bit parallel I/F	DB[15:0]
0	0	1	0	80-9bit parallel I/F	DB[8:0]
0	0	1	1	80-18bit parallel I/F	DB[17:0],
0	1	0	1	3-line 9bit serial I/F	SDA: in/out
0	1	1	0	4-line 8bit serial I/F	SDA: in/out
1	0	0	0	80-16bit parallel I/F Ⅱ	DB[17:10], DB[8:1]
1	0	0	1	80-8bit parallel I/F Ⅱ	DB[17:10]
1	0	1	0	80-18bit parallel I/F Ⅱ	DB[17:0],
1	0	1	1	80-9bit parallel I/F Ⅱ	DB[17:9]
1	1	0	1	3-line 9bit serial I/F Ⅱ	SDA:in/ SDO: out
1	1	1	0	4-line 8bit serial I/F Ⅱ	SDA:in/ SDO: out

Panel Spec. Reference:

1. HSD028B3N1-A Formal Specification For Truly
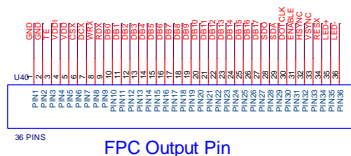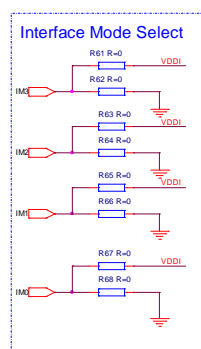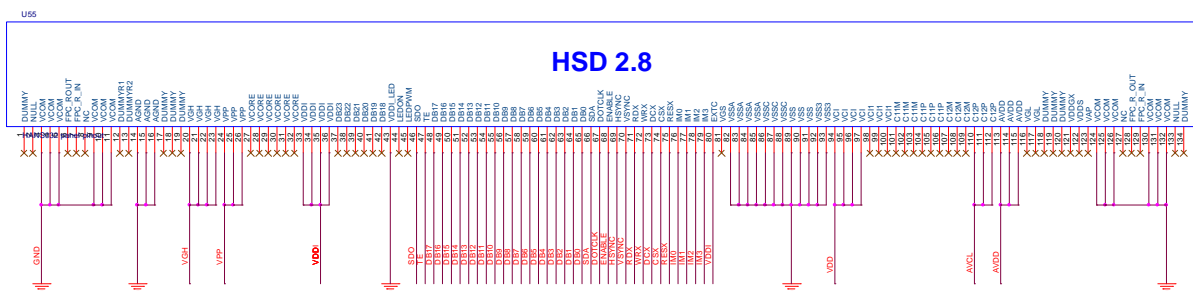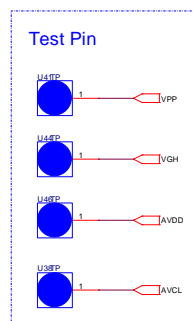
HSD 2.8

U55

Test Pin

VPP

VGH

AVDD

AVCL

Interface Mode Select

R61 R=0　VDDI
R62 R=0
IM3

R63 R=0　VDDI
R64 R=0
IM2

R65 R=0　VDDI
R66 R=0
IM1

R67 R=0　VDDI
R68 R=0
IM0

FPC Output Pin

U40

36 PINS

Note:

1. There is no CABC function in this schematic.

2. Please connect input pins that are not used to VSS

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3.8 HANNS 2.8"Panel Initial code Suggestion

```
Void ST7789VHANNS28panelinitialcode(void)
{
//----------------------------------ST7789V reset sequence----------------------------------//
LCD_RESET=1;
Delayms(1);                                    //Delay 1ms
LCD_RESET=0;
Delayms(10);                                   //Delay 10ms
LCD_RESET=1;
Delayms(120);                                  //Delay 120ms
//-------------------------------------------------------------------------------------------//
Write command 0x11;
Delayms(120);                                  //Delay 120ms
//----------------------------display and color format setting----------------------------//
Write command 0x36;
Write data 0x00;
Write command 0x3a;
Write data 0x06;
//-------------------------------ST7789V Frame rate setting-------------------------------//
Write command 0xb2;
Write data 0x0c;
Write data 0x0c;
Write data 0x00;
Write data 0x33;
Write data 0x33;
Write command 0xb7;
Write data 0x35;
//-------------------------------ST7789V Power setting-------------------------------//
Write command 0xbb;
Write data 0x28;
Write command 0xc0;
Write data 0x2c;
Write command 0xc2;
Write data 0x01;
Write command 0xc3;
Write data 0x10;
Write command 0xc4;
```

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Write data 0x20;

Write command 0xc6;

Write data 0x0f;

Write command 0xd0;

Write data 0xa4;

Write data 0xa1;

//--------------------------------ST7789V gamma setting-------------------------------------//

Write command 0xe0;

Write data 0xd0;

Write data 0x00;

Write data 0x02;

Write data 0x07;

Write data 0x0a;

Write data 0x28;

Write data 0x32;

Write data 0x44;

Write data 0x42;

Write data 0x06;

Write data 0x0e;

Write data 0x12;

Write data 0x14;

Write data 0x17;

Write command 0xe1;

Write data 0xd0;

Write data 0x00;

Write data 0x02;

Write data 0x07;

Write data 0x0a;

Write data 0x28;

Write data 0x31;

Write data 0x54;

Write data 0x47;

Write data 0x0e;

Write data 0x1c;

Write data 0x17;

Write data 0x1b;

Write data 0x1e;

Write command 0x29;

}

```
Void ST7789VPanelTurnOnDisplay (void)
{
Write command 0x29;
}


Void ST7789VPanelTurnOffDisplay (void)
{
Write command 0x28;
}


Void ST7789VPanelTurnOnPartial (void)
{
Write command 0x30;
Write data 0x00;
Write PSL;            //PSL: Start Line
Write data 0x00;
Write PEL;            //PEL: End Line
Write command 0x12;
}


Void ST7789VPanelTurnOffPartial (void)
{
Write command 0x13;
}


Void ST7789VPanelTurnOnIdle (void)
{
Write command 0x39;
}


Void ST7789VPanelTurnOffIdle (void)
{
Write command 0x38;
}



Void ST7789VPanelSleepInMode (void)
{
```

Write command 0x10;

Delayms (120);

}

Void ST7789VPanelSleepOutMode (void)

{

Write command 0x11;

Delayms (120);

}

3.9 HANNS 3.2" Application FPC Circuit

ST7789V Interface Selection:

IM3	IM2	IM1	IM0	MPU Interface Mode	Data pin
0	0	0	0	80-8bit parallel I/F	DB[7:0]
0	0	0	1	80-16bit parallel I/F	DB[15:0]
0	0	1	0	80-9bit parallel I/F	DB[8:0]
0	0	1	1	80-18bit parallel I/F	DB[17:0],
0	1	0	1	3-line 9bit serial I/F	SDA: in/out
0	1	1	0	4-line 8bit serial I/F	SDA: in/out
1	0	0	0	80-16bit parallel I/F Ⅱ	DB[17:10], DB[8:1]
1	0	0	1	80-8bit parallel I/F Ⅱ	DB[17:10]
1	0	1	0	80-18bit parallel I/F Ⅱ	DB[17:0],
1	0	1	1	80-9bit parallel I/F Ⅱ	DB[17:9]
1	1	0	1	3-line 9bit serial I/F Ⅱ	SDA:in/ SDO: out
1	1	1	0	4-line 8bit serial I/F Ⅱ	SDA:in/ SDO: out

Panel Spec. Reference:

1. HSD032B3N5-A02
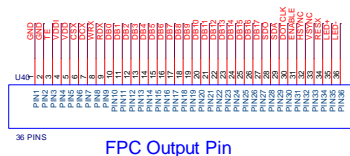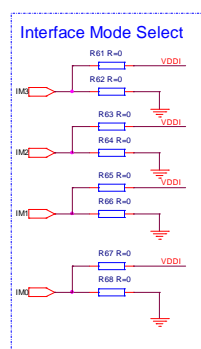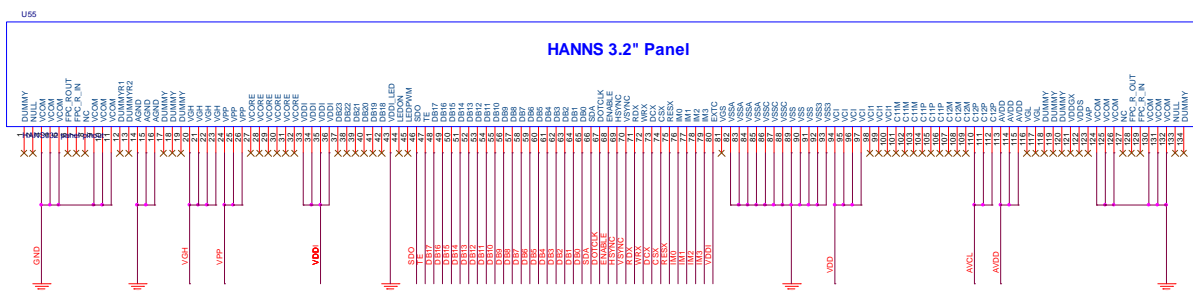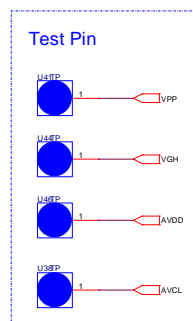
Test Pin

HANNS 3.2" Panel

Interface Mode Select

FPC Output Pin

Note:

3. There is no CABC function in this schematic.

4. Please connect input pins that are not used to VSS

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3.10 HANNS 3.2"Panel Initial code Suggestion

```
Void ST7789VHANNS32panelinitialcode(void)
{
//-------------------------------ST7789V reset sequence----------------------------------//
LCD_RESET=1;
Delayms(1);                                    //Delay 1ms
LCD_RESET=0;
Delayms(10);                                   //Delay 10ms
LCD_RESET=1;
Delayms(120);                                  //Delay 120ms
//--------------------------------------------------------------------------------------//
Write command 0x11;
Delayms(120);                                  //Delay 120ms
//----------------------------display and color format setting-----------------------------//
Write command 0x36;
Write data 0x00;
Write command 0x3a;
Write data 0x06;
//-------------------------------ST7789V Frame rate setting--------------------------------//
Write command 0xb2;
Write data 0x0c;
Write data 0x0c;
Write data 0x00;
Write data 0x33;
Write data 0x33;
Write command 0xb7;
Write data 0x35;
//-------------------------------ST7789V Power setting------------------------------------//
Write command 0xbb;
Write data 0x28;
Write command 0xc0;
Write data 0x2c;
Write command 0xc2;
Write data 0x01;
Write command 0xc3;
Write data 0x10;
Write command 0xc4;
```

Write data 0x20;

Write command 0xc6;

Write data 0x0f;

Write command 0xd0;

Write data 0xa4;

Write data 0xa1;

//--------------------------------ST7789V gamma setting-------------------------------------//

Write command 0xe0;

Write data 0xd0;

Write data 0x00;

Write data 0x02;

Write data 0x07;

Write data 0x0a;

Write data 0x28;

Write data 0x32;

Write data 0x44;

Write data 0x42;

Write data 0x06;

Write data 0x0e;

Write data 0x12;

Write data 0x14;

Write data 0x17;

Write command 0xe1;

Write data 0xd0;

Write data 0x00;

Write data 0x02;

Write data 0x07;

Write data 0x0a;

Write data 0x28;

Write data 0x31;

Write data 0x54;

Write data 0x47;

Write data 0x0e;

Write data 0x1c;

Write data 0x17;

Write data 0x1b;

Write data 0x1e;

Write command 0x29;

}

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```
Void ST7789VPanelTurnOnDisplay (void)
{
Write command 0x29;
}


Void ST7789VPanelTurnOffDisplay (void)
{
Write command 0x28;
}


Void ST7789VPanelTurnOnPartial (void)
{
Write command 0x30;
Write data 0x00;
Write PSL;          //PSL: Start Line
Write data 0x00;
Write PEL;          //PEL: End Line
Write command 0x12;
}


Void ST7789VPanelTurnOffPartial (void)
{
Write command 0x13;
}


Void ST7789VPanelTurnOnIdle (void)
{
Write command 0x39;
}


Void ST7789VPanelTurnOffIdle (void)
{
Write command 0x38;
}



Void ST7789VPanelSleepInMode (void)
{
```

```
Write command 0x10;
Delayms (120);
}


Void ST7789VPanelSleepOutMode (void)
{
Write command 0x11;
Delayms (120);
}
```

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4 BOE Panel

4.1 BOE 2.4"/2.8" Application FPC Circuit

ST7789V Interface Selection:

IM3	IM2	IM1	IM0	MPU Interface Mode	Data pin
0	0	0	0	80-8bit parallel I/F	DB[7:0]
0	0	0	1	80-16bit parallel I/F	DB[15:0]
0	0	1	0	80-9bit parallel I/F	DB[8:0]
0	0	1	1	80-18bit parallel I/F	DB[17:0],
0	1	0	1	3-line 9bit serial I/F	SDA: in/out
0	1	1	0	4-line 8bit serial I/F	SDA: in/out
1	0	0	0	80-16bit parallel I/F Ⅱ	DB[17:10], DB[8:1]
1	0	0	1	80-8bit parallel I/F Ⅱ	DB[17:10]
1	0	1	0	80-18bit parallel I/F Ⅱ	DB[17:0],
1	0	1	1	80-9bit parallel I/F Ⅱ	DB[17:9]
1	1	0	1	3-line 9bit serial I/F Ⅱ	SDA:in/ SDO: out
1	1	1	0	4-line 8bit serial I/F Ⅱ	SDA:in/ SDO: out

Panel Spec. Reference:

1. 2.4QVGA PRODUCT SPEC BT024QVME104 (Cell)(NEW)
2. 五代线 BT028QVME101-D001 2.8QVGA PS B1 Cell

Note:

1. There is no CABC function in this schematic.

2. Please connect input pins that are not used to VSS
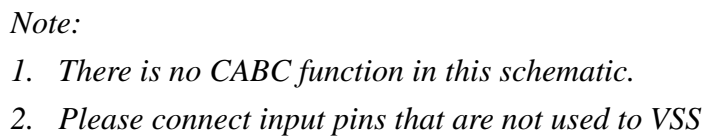
4.2 **BOE 2.4"Panel Initial code Suggestion**

```
Void ST7789VBOE24panelinitialcode(void)
{
//---------------------------------ST7789V reset sequence----------------------------------//
LCD_RESET=1;
Delayms(1);                                      //Delay 1ms
LCD_RESET=0;
Delayms(10);                                     //Delay 10ms
LCD_RESET=1;
Delayms(120);                                    //Delay 120ms
//-------------------------------------------------------------------------------------------//
Write command 0x11;
Delayms(120);                                    //Delay 120ms
//----------------------------display and color format setting------------------------------//
Write command 0x36;
Write data 0x00;
Write command 0x3a;
Write data 0x06;
//-------------------------------ST7789V Frame rate setting---------------------------------//
Write command 0xb2;
Write data 0x0c;
Write data 0x0c;
Write data 0x00;
Write data 0x33;
Write data 0x33;
Write command 0xb7;
Write data 0x35;
//-------------------------------ST7789V Power setting--------------------------------------//
Write command 0xbb;
Write data 0x1c;
Write command 0xc0;
Write data 0x2c;
Write command 0xc2;
Write data 0x01;
Write command 0xc3;
Write data 0x0b;
Write command 0xc4;
```

Write data 0x20;

Write command 0xc6;

Write data 0x0f;

Write command 0xd0;

Write data 0xa4;

Write data 0xa1;

//---------------------------------ST7789V gamma setting-------------------------------------//

Write command 0xe0;

Write data 0xd0;

Write data 0x00;

Write data 0x03;

Write data 0x09;

Write data 0x13;

Write data 0x1c;

Write data 0x3a;

Write data 0x55;

Write data 0x48;

Write data 0x18;

Write data 0x12;

Write data 0x0e;

Write data 0x19;

Write data 0x1e;

Write command 0xe1;

Write data 0xd0;

Write data 0x00;

Write data 0x03;

Write data 0x09;

Write data 0x05;

Write data 0x25;

Write data 0x3a;

Write data 0x55;

Write data 0x50;

Write data 0x3d;

Write data 0x1c;

Write data 0x1d;

Write data 0x1d;

Write data 0x1e;

Write command 0x29;

}

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Void ST7789VPanelTurnOnDisplay (void)

{

Write command 0x29;

}

Void ST7789VPanelTurnOffDisplay (void)

{

Write command 0x28;

}

Void ST7789VPanelTurnOnPartial (void)

{

Write command 0x30;

Write data 0x00;

Write PSL;   //PSL: Start Line

Write data 0x00;

Write PEL;   //PEL: End Line

Write command 0x12;

}

Void ST7789VPanelTurnOffPartial (void)

{

Write command 0x13;

}

Void ST7789VPanelTurnOnIdle (void)

{

Write command 0x39;

}

Void ST7789VPanelTurnOffIdle (void)

{

Write command 0x38;

}

Void ST7789VPanelSleepInMode (void)

{

```
Write command 0x10;
Delayms (120);
}


Void ST7789VPanelSleepOutMode (void)
{
Write command 0x11;
Delayms (120);
}
```

4.3 BOE 2.8"Panel Initial code Suggestion

```
Void ST7789VBOE28panelinitialcode(void)
{
//--------------------------------ST7789V reset sequence----------------------------------//
LCD_RESET=1;
Delayms(1);                                    //Delay 1ms
LCD_RESET=0;
Delayms(10);                                   //Delay 10ms
LCD_RESET=1;
Delayms(120);                                  //Delay 120ms
//------------------------------------------------------------------------------------------//
Write command 0x11;
Delayms(120);                                  //Delay 120ms
//------------------------------------Display Setting----------------------------------------//
Write command 0x36;
Write data 0x00;
Write command 0x3a;
Write data 0x06;
//------------------------------ST7789V Frame rate setting----------------------------------//
Write command 0xb2;
Write data 0x0c;
Write data 0x0c;
Write data 0x00;
Write data 0x33;
Write data 0x33;
Write command 0xb7;
Write data 0x35;
//------------------------------ST7789V Power setting--------------------------------------//
Write command 0xbb;
Write data 0x20;
Write command 0xc0;
Write data 0x2c;
Write command 0xc2;
Write data 0x01;
Write command 0xc3;
Write data 0x0b;
Write command 0xc4;
```

Write data 0x20;

Write command 0xc6;

Write data 0x0f;

Write command 0xd0;

Write data 0xa4;

Write data 0xa1;

//--------------------------------ST7789V gamma setting-------------------------------------//

Write command 0xe0;

Write data 0xd0;

Write data 0x03;

Write data 0x09;

Write data 0x0e;

Write data 0x11;

Write data 0x3d;

Write data 0x47;

Write data 0x55;

Write data 0x53;

Write data 0x1a;

Write data 0x16;

Write data 0x14;

Write data 0x1f;

Write data 0x22;

Write command 0xe1;

Write data 0xd0;

Write data 0x02;

Write data 0x08;

Write data 0x0d;

Write data 0x12;

Write data 0x2c;

Write data 0x43;

Write data 0x55;

Write data 0x53;

Write data 0x1e;

Write data 0x1b;

Write data 0x19;

Write data 0x20;

Write data 0x22;

Write command 0x29;

}

Sitronix

```
Void ST7789VPanelTurnOnDisplay (void)
{
Write command 0x29;
}


Void ST7789VPanelTurnOffDisplay (void)
{
Write command 0x28;
}


Void ST7789VPanelTurnOnPartial (void)
{
Write command 0x30;
Write data 0x00;
Write PSL;           //PSL: Start Line
Write data 0x00;
Write PEL;           //PEL: End Line
Write command 0x12;
}


Void ST7789VPanelTurnOffPartial (void)
{
Write command 0x13;
}


Void ST7789VPanelTurnOnIdle (void)
{
Write command 0x39;
}


Void ST7789VPanelTurnOffIdle (void)
{
Write command 0x38;
}



Void ST7789VPanelSleepInMode (void)
{
Write command 0x10;
```

Delayms (120);

}

Void ST7789VPanelSleepOutMode (void)

{

Write command 0x11;

Delayms (120);

}

5 TM Panel

## 5.1 TM 2.2" Application FPC Circuit

ST7789V Interface Selection:

IM3	IM2	IM1	IM0	MPU Interface Mode	Data pin
0	0	0	0	80-8bit parallel I/F	DB[7:0]
0	0	0	1	80-16bit parallel I/F	DB[15:0]
0	0	1	0	80-9bit parallel I/F	DB[8:0]
0	0	1	1	80-18bit parallel I/F	DB[17:0],
0	1	0	1	3-line 9bit serial I/F	SDA: in/out
0	1	1	0	4-line 8bit serial I/F	SDA: in/out
1	0	0	0	80-16bit parallel I/F II	DB[17:10], DB[8:1]
1	0	0	1	80-8bit parallel I/F II	DB[17:10]
1	0	1	0	80-18bit parallel I/F II	DB[17:0],
1	0	1	1	80-9bit parallel I/F II	DB[17:9]
1	1	0	1	3-line 9bit serial I/F II	SDA:in/ SDO: out
1	1	1	0	4-line 8bit serial I/F II	SDA:in/ SDO: out

Panel Spec. Reference:

1. TM022HYH31 32 33 34_V1 1 Approving
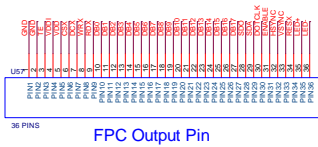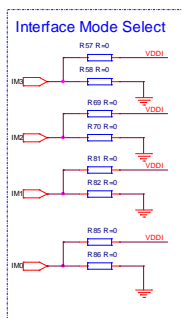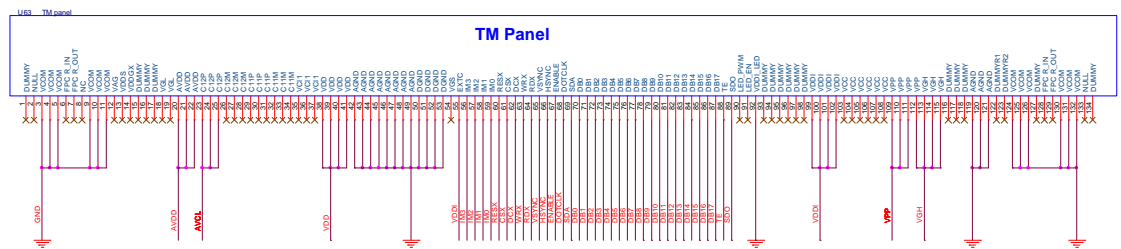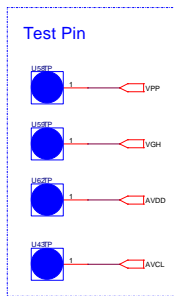
Sitronix

Note:

1. There is no CABC function in this schematic.
2. Please connect input pins that are not used to VSS

5.2 TM 2.2"Panel Initial code Suggestion

```
Void ST7789VTM22panelinitialcode(void)
{
//----------------------------------ST7789V reset sequence----------------------------------//
LCD_RESET=1;
Delayms(1);                                    //Delay 1ms
LCD_RESET=0;
Delayms(10);                                   //Delay 10ms
LCD_RESET=1;
Delayms(120);                                  //Delay 120ms
//---------------------------------------------------------------------------------------------//
Write command 0x11;
Delayms(120);                                  //Delay 120ms
//----------------------------display and color format setting-----------------------------//
Write command 0x36;
Write data 0x00;
Write command 0x3a;
Write data 0x06;
//-------------------------------ST7789V Frame rate setting--------------------------------//
Write command 0xb2;
Write data 0x0c;
Write data 0x0c;
Write data 0x00;
Write data 0x33;
Write data 0x33;
Write command 0xb7;
Write data 0x35;
//-------------------------------ST7789V Power setting-------------------------------------//
Write command 0xbb;
Write data 0x20;
Write command 0xc0;
Write data 0x2c;
Write command 0xc2;
Write data 0x01;
Write command 0xc3;
Write data 0x0b;
Write command 0xc4;
```

```
Write data 0x20;
Write command 0xc6;
Write data 0x0f;
Write command 0xd0;
Write data 0xa4;
Write data 0xa1;
//-------------------------------ST7789V gamma setting--------------------------------------//
Write command 0xe0;
Write data 0xd0;
Write data 0x00;
Write data 0x03;
Write data 0x08;
Write data 0x0a;
Write data 0x17;
Write data 0x2e;
Write data 0x44;
Write data 0x3f;
Write data 0x29;
Write data 0x10;
Write data 0x0e;
Write data 0x14;
Write data 0x18;
Write command 0xe1;
Write data 0xd0;
Write data 0x00;
Write data 0x03;
Write data 0x08;
Write data 0x07;
Write data 0x27;
Write data 0x2b;
Write data 0x44;
Write data 0x41;
Write data 0x3c;
Write data 0x1b;
Write data 0x1d;
Write data 0x14;
Write data 0x18;
Write command 0x29;
}
```

```
Void ST7789VPanelTurnOnDisplay (void)
{
Write command 0x29;
}


Void ST7789VPanelTurnOffDisplay (void)
{
Write command 0x28;
}


Void ST7789VPanelTurnOnPartial (void)
{
Write command 0x30;
Write data 0x00;
Write PSL;              //PSL: Start Line
Write data 0x00;
Write PEL;              //PEL: End Line
Write command 0x12;
}


Void ST7789VPanelTurnOffPartial (void)
{
Write command 0x13;
}


Void ST7789VPanelTurnOnIdle (void)
{
Write command 0x39;
}


Void ST7789VPanelTurnOffIdle (void)
{
Write command 0x38;
}



Void ST7789VPanelSleepInMode (void)
{
```

Write command 0x10;

Delayms (120);

}

Void ST7789VPanelSleepOutMode (void)
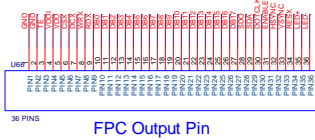
{

Write command 0x11;

Delayms (120);

}

5.3 TM 2.4" Application FPC Circuit

ST7789V Interface Selection:

IM3	IM2	IM1	IM0	MPU Interface Mode	Data pin
0	0	0	0	80-8bit parallel I/F	DB[7:0]
0	0	0	1	80-16bit parallel I/F	DB[15:0]
0	0	1	0	80-9bit parallel I/F	DB[8:0]
0	0	1	1	80-18bit parallel I/F	DB[17:0],
0	1	0	1	3-line 9bit serial I/F	SDA: in/out
0	1	1	0	4-line 8bit serial I/F	SDA: in/out
1	0	0	0	80-16bit parallel I/F Ⅱ	DB[17:10], DB[8:1]
1	0	0	1	80-8bit parallel I/F Ⅱ	DB[17:10]
1	0	1	0	80-18bit parallel I/F Ⅱ	DB[17:0],
1	0	1	1	80-9bit parallel I/F Ⅱ	DB[17:9]
1	1	0	1	3-line 9bit serial I/F Ⅱ	SDA:in/ SDO: out
1	1	1	0	4-line 8bit serial I/F Ⅱ	SDA:in/ SDO: out

Panel Spec. Reference:

1. TM024HYH61&62_V1.0.Final Specification

Test Pin

VPP

VGH

AVDD

AVCL

TM Panel

Interface Mode Select

IM3

IM2

IM1

IM0

FPC Output Pin

36 PINS

Note:

1. *There is no CABC function in this schematic.*

2. *Please connect input pins that are not used to VSS*

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5.4 TM 2.4"Panel Initial code Suggestion

```
Void ST7789VTM24panelinitialcode(void)
{
//---------------------------------ST7789V reset sequence----------------------------------//
LCD_RESET=1;
Delayms(1);                                  //Delay 1ms
LCD_RESET=0;
Delayms(10);                                 //Delay 10ms
LCD_RESET=1;
Delayms(120);                                //Delay 120ms
//-------------------------------------------------------------------------------------------//
Write command 0x11;
Delayms(120);                                //Delay 120ms
//----------------------------display and color format setting----------------------------//
Write command 0x36;
Write data 0x00;
Write command 0x3a;
Write data 0x06;
//------------------------------ST7789V Frame rate setting--------------------------------//
Write command 0xb2;
Write data 0x0c;
Write data 0x0c;
Write data 0x00;
Write data 0x33;
Write data 0x33;
Write command 0xb7;
Write data 0x35;
//-------------------------------ST7789V Power setting-----------------------------------//
Write command 0xbb;
Write data 0x20;
Write command 0xc0;
Write data 0x2c;
Write command 0xc2;
Write data 0x01;
Write command 0xc3;
Write data 0x0b;
Write command 0xc4;
```

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Write data 0x20;
Write command 0xc6;
Write data 0x0f;
Write command 0xd0;
Write data 0xa4;
Write data 0xa1;
//-------------------------------ST7789V gamma setting-------------------------------------//
Write command 0xe0;
Write data 0xd0;
Write data 0x00;
Write data 0x03;
Write data 0x08;
Write data 0x0a;
Write data 0x17;
Write data 0x2e;
Write data 0x44;
Write data 0x3f;
Write data 0x29;
Write data 0x10;
Write data 0x0e;
Write data 0x14;
Write data 0x18;
Write command 0xe1;
Write data 0xd0;
Write data 0x00;
Write data 0x03;
Write data 0x08;
Write data 0x07;
Write data 0x27;
Write data 0x2b;
Write data 0x44;
Write data 0x41;
Write data 0x3c;
Write data 0x1b;
Write data 0x1d;
Write data 0x14;
Write data 0x18;
Write command 0x29;
}

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```
Void ST7789VPanelTurnOnDisplay (void)
{
Write command 0x29;
}


Void ST7789VPanelTurnOffDisplay (void)
{
Write command 0x28;
}


Void ST7789VPanelTurnOnPartial (void)
{
Write command 0x30;
Write data 0x00;
Write PSL;            //PSL: Start Line
Write data 0x00;
Write PEL;            //PEL: End Line
Write command 0x12;
}


Void ST7789VPanelTurnOffPartial (void)
{
Write command 0x13;
}


Void ST7789VPanelTurnOnIdle (void)
{
Write command 0x39;
}


Void ST7789VPanelTurnOffIdle (void)
{
Write command 0x38;
}



Void ST7789VPanelSleepInMode (void)
{
```

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Write command 0x10;

Delayms (120);

}

Void ST7789VPanelSleepOutMode (void)
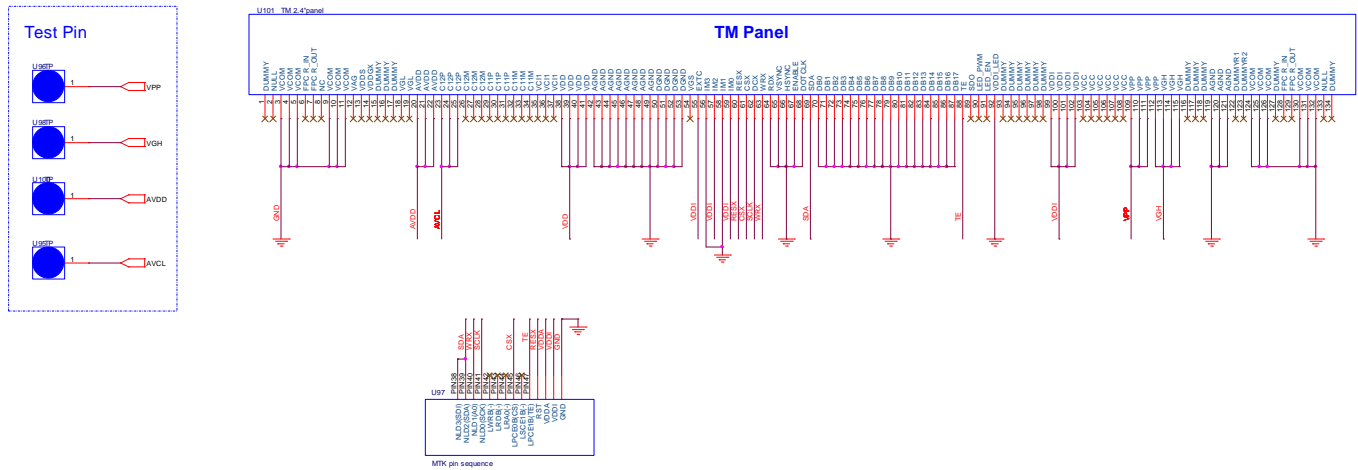
{

Write command 0x11;

Delayms (120);

}

5.5 TM 2.4" 2 Data Lane Serial I/F FPC Circuit

2 Data Lane Serial Interface Selection:

IM3	IM2	IM1	IM0	MPU Interface Mode	Data pin
0	1	0	1	3-line 9bit serial I/F	SDA: in/out, WRX: in

Panel Spec. Reference:

0. TM024HYH61&62_V1.0.Final Specification

5.6 TM 2.4"Panel 2 Data Lane Initial code Suggestion

```
Void ST7789VTM24panelinitialcode(void)
{
//----------------------------------ST7789V reset sequence----------------------------------//
LCD_RESET=1;
Delayms(1);                                  //Delay 1ms
LCD_RESET=0;
Delayms(10);                                 //Delay 10ms
LCD_RESET=1;
Delayms(120);                                //Delay 120ms
//------------------------------------------------------------------------------------------//
Write command 0x11;
Delayms(120);                                //Delay 120ms
//-----------------------------display and color format setting-----------------------------//
Write command 0x36;
Write data 0x00;
Write command 0x3a;
Write data 0x06;
//------------------------------ST7789V Frame rate setting------------------------------//
Write command 0xb2;
Write data 0x0c;
Write data 0x0c;
Write data 0x00;
Write data 0x33;
Write data 0x33;
Write command 0xb7;
Write data 0x35;
//-------------------------------ST7789V Power setting-------------------------------//
Write command 0xbb;
Write data 0x20;
Write command 0xc0;
Write data 0x2c;
Write command 0xc2;
Write data 0x01;
Write command 0xc3;
Write data 0x0b;
Write command 0xc4;
```

Write data 0x20;

Write command 0xc6;

Write data 0x0f;

Write command 0xd0;

Write data 0xa4;

Write data 0xa1;

//--------------------------------ST7789V gamma setting-------------------------------------//

Write command 0xe0;

Write data 0xd0;

Write data 0x00;

Write data 0x03;

Write data 0x08;

Write data 0x0a;

Write data 0x17;

Write data 0x2e;

Write data 0x44;

Write data 0x3f;

Write data 0x29;

Write data 0x10;

Write data 0x0e;

Write data 0x14;

Write data 0x18;

Write command 0xe1;

Write data 0xd0;

Write data 0x00;

Write data 0x03;

Write data 0x08;

Write data 0x07;

Write data 0x27;

Write data 0x2b;

Write data 0x44;

Write data 0x41;

Write data 0x3c;

Write data 0x1b;

Write data 0x1d;

Write data 0x14;

Write data 0x18;

Write command 0xe7;   //2 data lane interface enable

Write data 0x10;

```
Write command 0x29;
}


Void ST7789VPanelTurnOnDisplay (void)
{
Write command 0x29;
}


Void ST7789VPanelTurnOffDisplay (void)
{
Write command 0x28;
}


Void ST7789VPanelTurnOnPartial (void)
{
Write command 0x30;
Write data 0x00;
Write PSL;          //PSL: Start Line
Write data 0x00;
Write PEL;          //PEL: End Line
Write command 0x12;
}


Void ST7789VPanelTurnOffPartial (void)
{
Write command 0x13;
}


Void ST7789VPanelTurnOnIdle (void)
{
Write command 0x39;
}


Void ST7789VPanelTurnOffIdle (void)
{
Write command 0x38;
}
```

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```
Void ST7789VPanelSleepInMode (void)
{
Write command 0x10;
Delayms (120);
}


Void ST7789VPanelSleepOutMode (void)
{
Write command 0x11;
Delayms (120);
}
```

5.7 TM 2.8" Application FPC Circuit

ST7789V Interface Selection:

IM3	IM2	IM1	IM0	MPU Interface Mode	Data pin
0	0	0	0	80-8bit parallel I/F	DB[7:0]
0	0	0	1	80-16bit parallel I/F	DB[15:0]
0	0	1	0	80-9bit parallel I/F	DB[8:0]
0	0	1	1	80-18bit parallel I/F	DB[17:0],
0	1	0	1	3-line 9bit serial I/F	SDA: in/out
0	1	1	0	4-line 8bit serial I/F	SDA: in/out
1	0	0	0	80-16bit parallel I/F Ⅱ	DB[17:10], DB[8:1]
1	0	0	1	80-8bit parallel I/F Ⅱ	DB[17:10]
1	0	1	0	80-18bit parallel I/F Ⅱ	DB[17:0],
1	0	1	1	80-9bit parallel I/F Ⅱ	DB[17:9]
1	1	0	1	3-line 9bit serial I/F Ⅱ	SDA:in/ SDO: out
1	1	1	0	4-line 8bit serial I/F Ⅱ	SDA:in/ SDO: out

Panel Spec. Reference:

1. TM028HYS01_V1.0
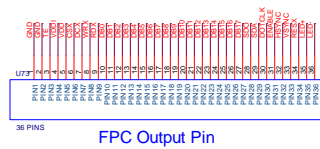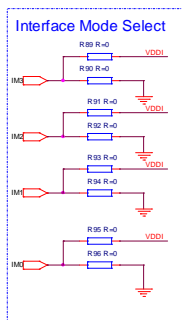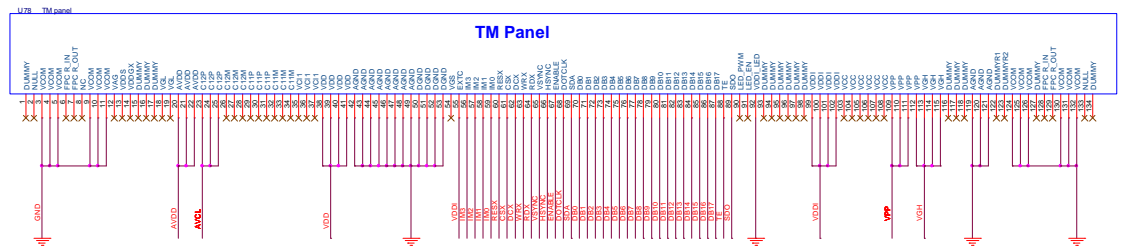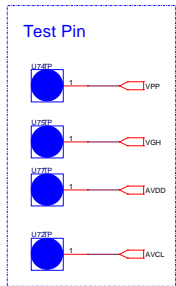
Test Pin

TM Panel

Interface Mode Select

FPC Output Pin

36 PINS

Note:

1. *There is no CABC function in this schematic.*

2. *Please connect input pins that are not used to VSS*

Sitronix

5.8 TM 2.8"Panel Initial code Suggestion

```
Void ST7789VTM28panelinitialcode(void)
{
//----------------------------------ST7789V reset sequence----------------------------------//
LCD_RESET=1;
Delayms(1);                              //Delay 1ms
LCD_RESET=0;
Delayms(10);                             //Delay 10ms
LCD_RESET=1;
Delayms(120);                            //Delay 120ms
//--------------------------------------------------------------------------------------//
Write command 0x11;
Delayms(120);                            //Delay 120ms
//----------------------------display and color format setting----------------------------//
Write command 0x36;
Write data 0x00;
Write command 0x3a;
Write data 0x06;
//------------------------------ST7789V Frame rate setting--------------------------------//
Write command 0xb2;
Write data 0x0c;
Write data 0x0c;
Write data 0x00;
Write data 0x33;
Write data 0x33;
Write command 0xb7;
Write data 0x35;
//------------------------------ST7789V Power setting------------------------------------//
Write command 0xbb;
Write data 0x15;
Write command 0xc0;
Write data 0x2c;
Write command 0xc2;
Write data 0x01;
Write command 0xc3;
Write data 0x0b;
Write command 0xc4;
```

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Write data 0x20;
Write command 0xc6;
Write data 0x0f;
Write command 0xd0;
Write data 0xa4;
Write data 0xa1;
//--------------------------------ST7789V gamma setting--------------------------------------//
Write command 0xe0;
Write data 0xd0;
Write data 0x00;
Write data 0x09;
Write data 0x0c;
Write data 0x0e;
Write data 0x28;
Write data 0x31;
Write data 0x43;
Write data 0x42;
Write data 0x3a;
Write data 0x14;
Write data 0x15;
Write data 0x15;
Write data 0x1a;
Write command 0xe1;
Write data 0xd0;
Write data 0x00;
Write data 0x09;
Write data 0x0c;
Write data 0x0c;
Write data 0x28;
Write data 0x2d;
Write data 0x45;
Write data 0x41;
Write data 0x3b;
Write data 0x19;
Write data 0x16;
Write data 0x15;
Write data 0x1b;
Write command 0x29;
}

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```
Void ST7789VPanelTurnOnDisplay (void)
{
Write command 0x29;
}


Void ST7789VPanelTurnOffDisplay (void)
{
Write command 0x28;
}


Void ST7789VPanelTurnOnPartial (void)
{
Write command 0x30;
Write data 0x00;
Write PSL;          //PSL: Start Line
Write data 0x00;
Write PEL;          //PEL: End Line
Write command 0x12;
}


Void ST7789VPanelTurnOffPartial (void)
{
Write command 0x13;
}


Void ST7789VPanelTurnOnIdle (void)
{
Write command 0x39;
}


Void ST7789VPanelTurnOffIdle (void)
{
Write command 0x38;
}



Void ST7789VPanelSleepInMode (void)
{
```

Write command 0x10;

Delayms (120);

}

Void ST7789VPanelSleepOutMode (void)

{

Write command 0x11;

Delayms (120);

}

Sitronix

5.9 TM 3.14" Application FPC Circuit

ST7789V Interface Selection:

IM3	IM2	IM1	IM0	MPU Interface Mode	Data pin
0	0	0	0	80-8bit parallel I/F	DB[7:0]
0	0	0	1	80-16bit parallel I/F	DB[15:0]
0	0	1	0	80-9bit parallel I/F	DB[8:0]
0	0	1	1	80-18bit parallel I/F	DB[17:0],
0	1	0	1	3-line 9bit serial I/F	SDA: in/out
0	1	1	0	4-line 8bit serial I/F	SDA: in/out
1	0	0	0	80-16bit parallel I/F Ⅱ	DB[17:10], DB[8:1]
1	0	0	1	80-8bit parallel I/F Ⅱ	DB[17:10]
1	0	1	0	80-18bit parallel I/F Ⅱ	DB[17:0],
1	0	1	1	80-9bit parallel I/F Ⅱ	DB[17:9]
1	1	0	1	3-line 9bit serial I/F Ⅱ	SDA:in/ SDO: out
1	1	1	0	4-line 8bit serial I/F Ⅱ	SDA:in/ SDO: out

Panel Spec. Reference:

1. TM031HYS21&TM031HYS22_V1.0.Preliminary Specification
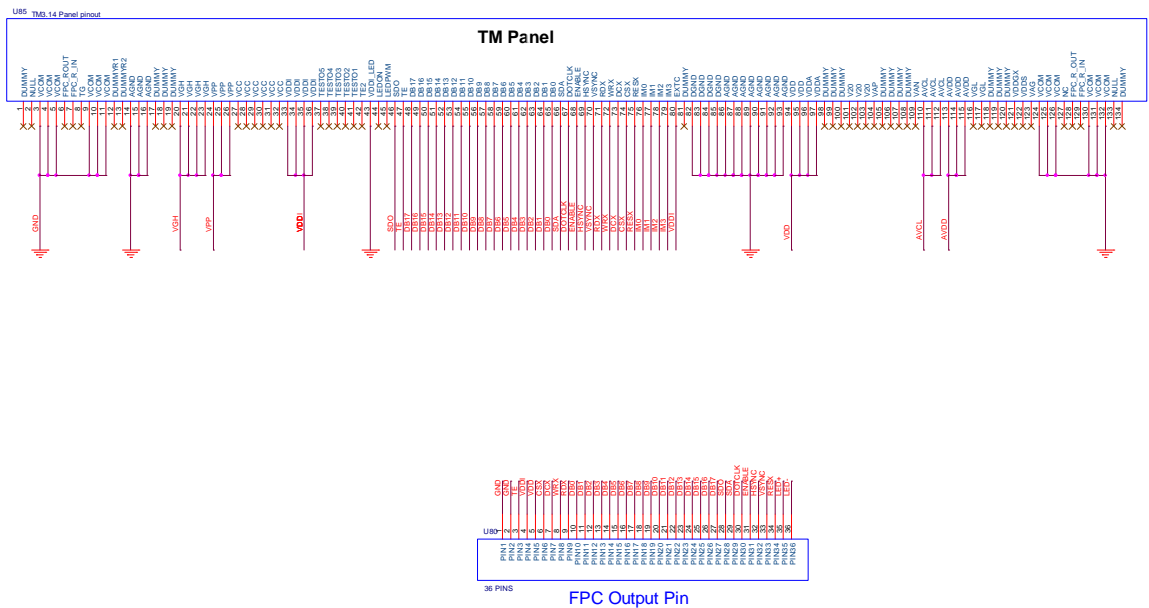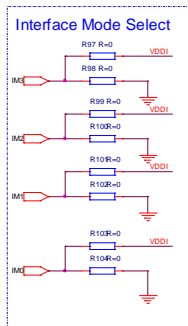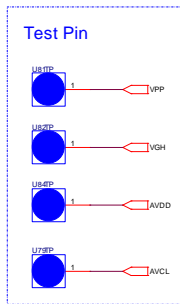
Sitronix

TM Panel

Test Pin

Interface Mode Select

FPC Output Pin

36 PINS

Note:

1. *There is no CABC function in this schematic.*

2. *Please connect input pins that are not used to VSS*

5.10   TM 3.14"Panel Initial code Suggestion

Void ST7789VTM314panelinitialcode(void)

{

//----------------------------------ST7789V reset sequence----------------------------------//

LCD_RESET=1;

Delayms(1);   //Delay 1ms

LCD_RESET=0;

Delayms(10);   //Delay 10ms

LCD_RESET=1;

Delayms(120);   //Delay 120ms

//---//

Write command 0x11;

Delayms(120);   //Delay 120ms

//------------------------------display and color format setting------------------------------//

Write command 0x36;

Write data 0x00;

Write command 0x3a;

Write data 0x06;

//--------------------------------ST7789V Frame rate setting--------------------------------//

Write command 0xb2;

Write data 0x0c;

Write data 0x0c;

Write data 0x00;

Write data 0x33;

Write data 0x33;

Write command 0xb7;

Write data 0x35;

//--------------------------------ST7789V Power setting--------------------------------//

Write command 0xbb;

Write data 0x15;

Write command 0xc0;

Write data 0x2c;

Write command 0xc2;

Write data 0x01;

Write command 0xc3;

Write data 0x0b;

Write command 0xc4;

Write data 0x20;
Write command 0xc6;
Write data 0x0f;
Write command 0xd0;
Write data 0xa4;
Write data 0xa1;
//--------------------------------ST7789V gamma setting-------------------------------------//
Write command 0xe0;
Write data 0xd0;
Write data 0x00;
Write data 0x04;
Write data 0x0a;
Write data 0x0b;
Write data 0x28;
Write data 0x2f;
Write data 0x54;
Write data 0x42;
Write data 0x09;
Write data 0x14;
Write data 0x14;
Write data 0x17;
Write data 0x1c;
Write command 0xe1;
Write data 0xd0;
Write data 0x00;
Write data 0x04;
Write data 0x0a;
Write data 0x0b;
Write data 0x27;
Write data 0x2f;
Write data 0x44;
Write data 0x43;
Write data 0x0b;
Write data 0x15;
Write data 0x15;
Write data 0x18;
Write data 0x1d;
Write command 0x29;
}

```
Void ST7789VPanelTurnOnDisplay (void)
{
Write command 0x29;
}


Void ST7789VPanelTurnOffDisplay (void)
{
Write command 0x28;
}


Void ST7789VPanelTurnOnPartial (void)
{
Write command 0x30;
Write data 0x00;
Write PSL;          //PSL: Start Line
Write data 0x00;
Write PEL;          //PEL: End Line
Write command 0x12;
}


Void ST7789VPanelTurnOffPartial (void)
{
Write command 0x13;
}


Void ST7789VPanelTurnOnIdle (void)
{
Write command 0x39;
}


Void ST7789VPanelTurnOffIdle (void)
{
Write command 0x38;
}



Void ST7789VPanelSleepInMode (void)
{
```

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Write command 0x10;

Delayms (120);

}

Void ST7789VPanelSleepOutMode (void)

{

Write command 0x11;

Delayms (120);

}

6 Laibao Panel

6.1 Laibao 2.0" Application FPC Circuit

ST7789V Interface Selection:

IM3	IM2	IM1	IM0	MPU Interface Mode	Data pin
0	0	0	0	80-8bit parallel I/F	DB[7:0]
0	0	0	1	80-16bit parallel I/F	DB[15:0]
0	0	1	0	80-9bit parallel I/F	DB[8:0]
0	0	1	1	80-18bit parallel I/F	DB[17:0],
0	1	0	1	3-line 9bit serial I/F	SDA: in/out
0	1	1	0	4-line 8bit serial I/F	SDA: in/out
1	0	0	0	80-16bit parallel I/F II	DB[17:10], DB[8:1]
1	0	0	1	80-8bit parallel I/F II	DB[17:10]
1	0	1	0	80-18bit parallel I/F II	DB[17:0],
1	0	1	1	80-9bit parallel I/F II	DB[17:9]
1	1	0	1	3-line 9bit serial I/F II	SDA:in/ SDO: out
1	1	1	0	4-line 8bit serial I/F II	SDA:in/ SDO: out

Panel Spec. Reference:

1. LaibaoS20008F112G46S2T5-LCD-Ver02(2.0QVGANew)
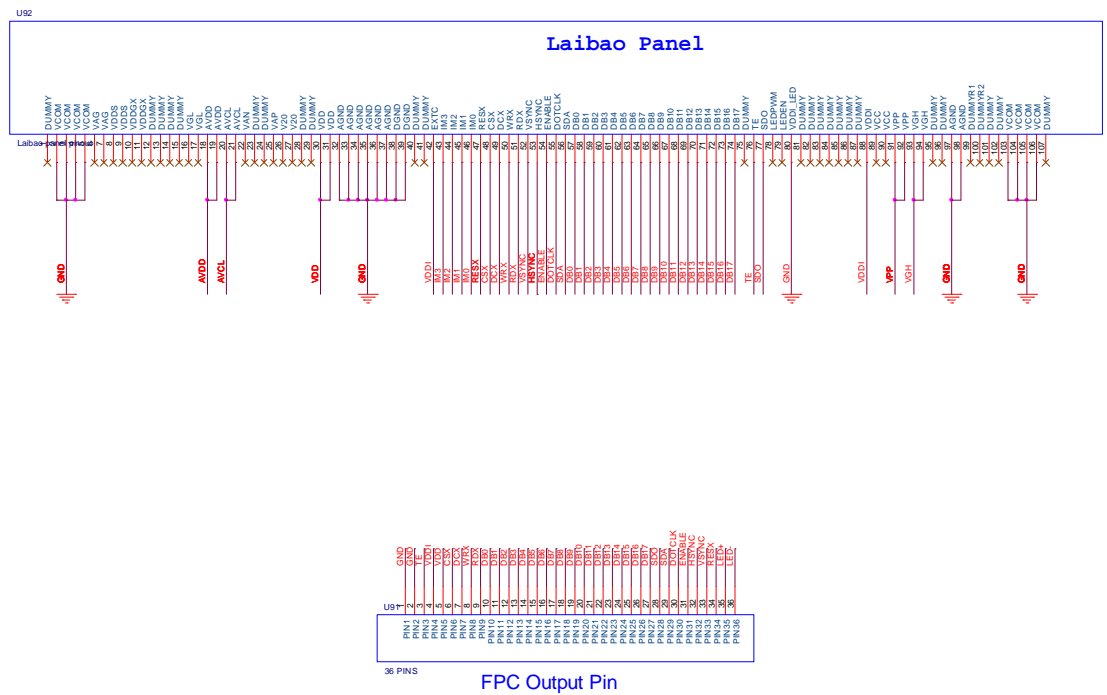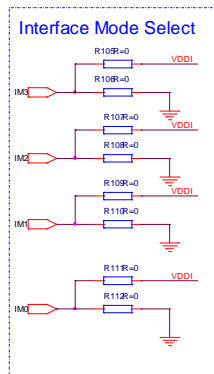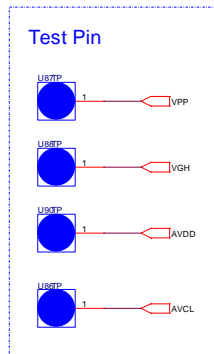
Sitronix

Laibao Panel

Test Pin

Interface Mode Select

FPC Output Pin

36 PINS

Note:

1. *There is no CABC function in this schematic.*

2. *Please connect input pins that are not used to VSS*

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6.2 **Laibao 2.0"Panel Initial code Suggestion**

```
Void ST7789VLaibao20panelinitialcode(void)
{
//----------------------------------ST7789V reset sequence----------------------------------//
LCD_RESET=1;
Delayms(1);                              //Delay 1ms
LCD_RESET=0;
Delayms(10);                             //Delay 10ms
LCD_RESET=1;
Delayms(120);                            //Delay 120ms
//-------------------------------------------------------------------------------------------//
Write command 0x11;
Delayms(120);                            //Delay 120ms
//------------------------------Display and color format setting--------------------------//
Write command 0x36;
Write data 0x00;
Write command 0x3a;
Write data 0x06;
//------------------------------ST7789V Frame rate setting--------------------------------//
Write command 0xb2;
Write data 0x0c;
Write data 0x0c;
Write data 0x00;
Write data 0x33;
Write data 0x33;
Write command 0xb7;
Write data 0x35;
//------------------------------ST7789V Power setting-------------------------------------//
Write command 0xbb;
Write data 0x35;
Write command 0xc0;
Write data 0x2c;
Write command 0xc2;
Write data 0x01;
Write command 0xc3;
Write data 0x11;
Write command 0xc4;
```

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Write data 0x20;
Write command 0xc6;
Write data 0x0f;
Write command 0xd0;
Write data 0xa4;
Write data 0xa1;
//--------------------------------ST7789V gamma setting-------------------------------------//
Write command 0xe0;
Write data 0xd0;
Write data 0x00;
Write data 0x06;
Write data 0x09;
Write data 0x0b;
Write data 0x2a;
Write data 0x3c;
Write data 0x55;
Write data 0x4b;
Write data 0x08;
Write data 0x16;
Write data 0x14;
Write data 0x19;
Write data 0x20;
Write command 0xe1;
Write data 0xd0;
Write data 0x00;
Write data 0x06;
Write data 0x09;
Write data 0x0b;
Write data 0x29;
Write data 0x36;
Write data 0x54;
Write data 0x4b;
Write data 0x0d;
Write data 0x16;
Write data 0x14;
Write data 0x21;
Write data 0x20;
Write command 0x29;
}

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```
Void ST7789VPanelTurnOnDisplay (void)
{
Write command 0x29;
}


Void ST7789VPanelTurnOffDisplay (void)
{
Write command 0x28;
}


Void ST7789VPanelTurnOnPartial (void)
{
Write command 0x30;
Write data 0x00;
Write PSL;          //PSL: Start Line
Write data 0x00;
Write PEL;          //PEL: End Line
Write command 0x12;
}


Void ST7789VPanelTurnOffPartial (void)
{
Write command 0x13;
}


Void ST7789VPanelTurnOnIdle (void)
{
Write command 0x39;
}


Void ST7789VPanelTurnOffIdle (void)
{
Write command 0x38;
}



Void ST7789VPanelSleepInMode (void)
{
```

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Write command 0x10;

Delayms (120);

}
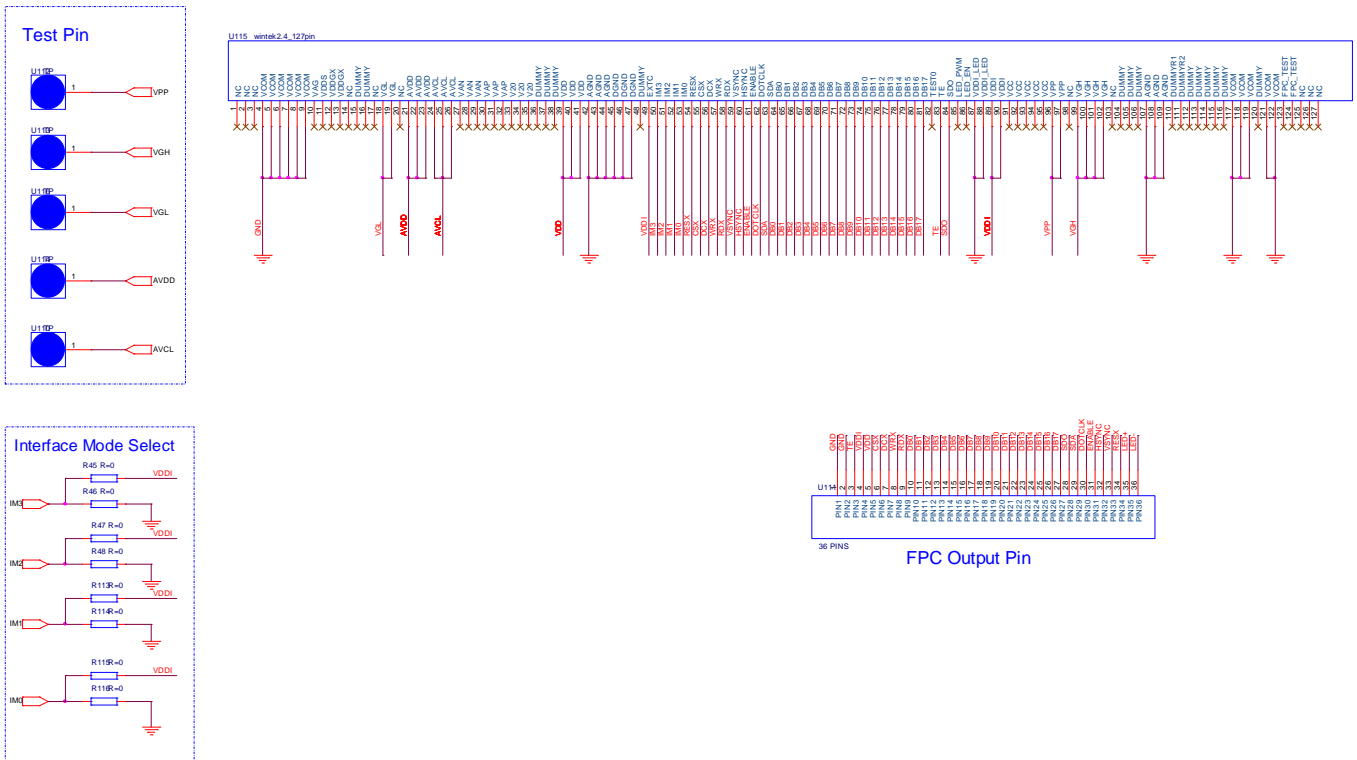

Void ST7789VPanelSleepOutMode (void)

{

Write command 0x11;

Delayms (120);

}

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7 Wintek Panel

7.1 Wintek 2.4" Application FPC Circuit

ST7789V Interface Selection:

IM3	IM2	IM1	IM0	MPU Interface Mode	Data pin
0	0	0	0	80-8bit parallel I/F	DB[7:0]
0	0	0	1	80-16bit parallel I/F	DB[15:0]
0	0	1	0	80-9bit parallel I/F	DB[8:0]
0	0	1	1	80-18bit parallel I/F	DB[17:0],
0	1	0	1	3-line 9bit serial I/F	SDA: in/out
0	1	1	0	4-line 8bit serial I/F	SDA: in/out
1	0	0	0	80-16bit parallel I/F Ⅱ	DB[17:10], DB[8:1]
1	0	0	1	80-8bit parallel I/F Ⅱ	DB[17:10]
1	0	1	0	80-18bit parallel I/F Ⅱ	DB[17:0],
1	0	1	1	80-9bit parallel I/F Ⅱ	DB[17:9]
1	1	0	1	3-line 9bit serial I/F Ⅱ	SDA:in/ SDO: out
1	1	1	0	4-line 8bit serial I/F Ⅱ	SDA:in/ SDO: out

Test Pin

Interface Mode Select

FPC Output Pin

Note:

3. *There is no CABC function in this schematic.*

4. *Please connect input pins that are not used to VSS*

Sitronix

7.2 **Wintek 2.4"Panel Initial code Suggestion**

```
Void ST7789Vwintek24panelinitialcode(void)
{
//---------------------------------ST7789V reset sequence----------------------------------//
LCD_RESET=1;
Delayms(1);                                     //Delay 1ms
LCD_RESET=0;
Delayms(10);                                    //Delay 10ms
LCD_RESET=1;
Delayms(120);                                   //Delay 120ms
//------------------------------------------------------------------------------------------//
Write command 0x11;
Delayms(120);                                   //Delay 120ms
//--------------------------------Display Setting-------------------------------------------//
Write command 0x36;
Write data 0x00;
Write command 0x3a;
Write data 0x06;
//------------------------------ST7789V Frame rate setting---------------------------------//
Write command 0xb2;
Write data 0x0c;
Write data 0x0c;
Write data 0x00;
Write data 0x33;
Write data 0x33;
Write command 0xb7;
Write data 0x35;                                //VGH=13V, VGL=-10.4V
//------------------------------------------------------------------------------------------//
Write command 0xbb;
Write data 0x19;
Write command 0xc0;
Write data 0x2c;
Write command 0xc2;
Write data 0x01;
Write command 0xc3;
Write data 0x05;
Write command 0xc4;
```

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Write data 0x20;
Write command 0xc6;
Write data 0x0f;
Write command 0xd0;
Write data 0xa4;
Write data 0xa1;
//---//
Write command 0xe0;   //gamma setting
Write data 0xd0;
Write data 0x00;
Write data 0x00;
Write data 0x0a;
Write data 0x0b;
Write data 0x28;
Write data 0x30;
Write data 0x54;
Write data 0x42;
Write data 0x1a;
Write data 0x16;
Write data 0x15;
Write data 0x16;
Write data 0x1b;
Write command 0xe1;
Write data 0xd0;
Write data 0x00;
Write data 0x00;
Write data 0x0a;
Write data 0x0a;
Write data 0x28;
Write data 0x2d;
Write data 0x44;
Write data 0x42;
Write data 0x1b;
Write data 0x16;
Write data 0x16;
Write data 0x17;
Write data 0x1a;
Write command 0x29;   //display on
}

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Void ST7789VPanelTurnOnDisplay (void)

{

Write command 0x29;

}

Void ST7789VPanelTurnOffDisplay (void)

{

Write command 0x28;

}

Void ST7789VPanelTurnOnPartial (void)

{

Write command 0x30;

Write data 0x00;

Write PSL;   //PSL: Start Line

Write data 0x00;

Write PEL;   //PEL: End Line

Write command 0x12;

}

Void ST7789VPanelTurnOffPartial (void)

{

Write command 0x13;

}

Void ST7789VPanelTurnOnIdle (void)

{

Write command 0x39;

}

Void ST7789VPanelTurnOffIdle (void)

{

Write command 0x38;

}

Void ST7789VPanelSleepInMode (void)

{

Write command 0x10;

Delayms (120);

}

Void ST7789VPanelSleepOutMode (void)

{

Write command 0x11;
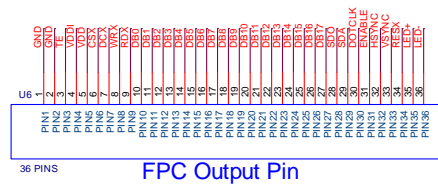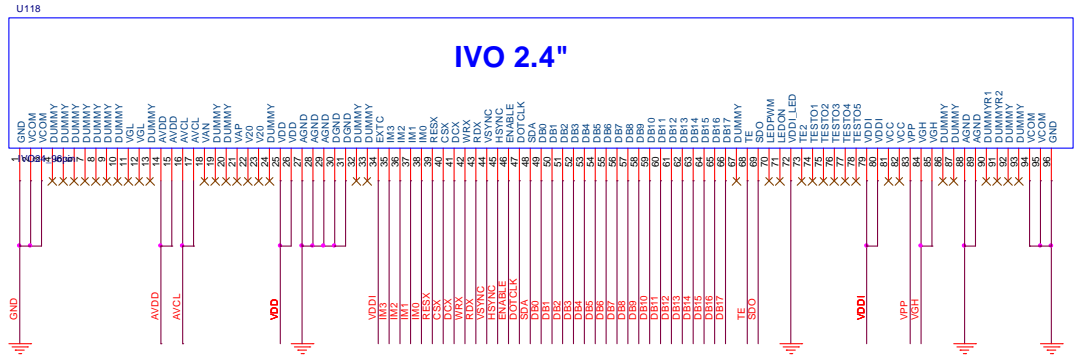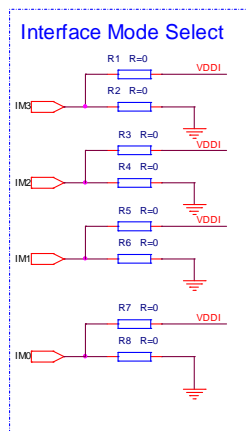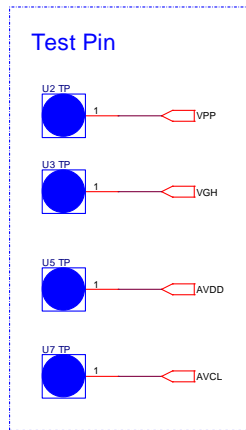
Delayms (120);

}

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8 IVO Panel

8.1 IVO 2.4" Application FPC Circuit

ST7789V Interface Selection:

IM3	IM2	IM1	IM0	MPU Interface Mode	Data pin
0	0	0	0	80-8bit parallel I/F	DB[7:0]
0	0	0	1	80-16bit parallel I/F	DB[15:0]
0	0	1	0	80-9bit parallel I/F	DB[8:0]
0	0	1	1	80-18bit parallel I/F	DB[17:0],
0	1	0	1	3-line 9bit serial I/F	SDA: in/out
0	1	1	0	4-line 8bit serial I/F	SDA: in/out
1	0	0	0	80-16bit parallel I/F II	DB[17:10], DB[8:1]
1	0	0	1	80-8bit parallel I/F II	DB[17:10]
1	0	1	0	80-18bit parallel I/F II	DB[17:0],
1	0	1	1	80-9bit parallel I/F II	DB[17:9]
1	1	0	1	3-line 9bit serial I/F II	SDA:in/ SDO: out
1	1	1	0	4-line 8bit serial I/F II	SDA:in/ SDO: out

Panel Spec. Reference:

1. C024SW21 Product Specification

Test Pin

IVO 2.4"

Interface Mode Select

FPC Output Pin

36 PINS

Note:

5. *There is no CABC function in this schematic.*

6. *Please connect input pins that are not used to VSS*

8.2 IVO 2.4"Panel Initial code Suggestion

```
Void ST7789VIVO24panelinitialcode(void)
{
//----------------------------------ST7789V reset sequence----------------------------------//
LCD_RESET=1;
Delayms(1);                                         //Delay 1ms
LCD_RESET=0;
Delayms(10);                                        //Delay 10ms
LCD_RESET=1;
Delayms(120);                                       //Delay 120ms
//-----------------------------------------------------------------------------------------//
Write command 0x11;
Delayms(120);                                       //Delay 120ms
//--------------------------------Display Setting-------------------------------------------//
Write command 0x36;
Write data 0x00;
Write command 0x3a;
Write data 0x06;
//------------------------------ST7789V Frame rate setting--------------------------------//
Write command 0xb2;
Write data 0x0c;
Write data 0x0c;
Write data 0x00;
Write data 0x33;
Write data 0x33;
Write command 0xb7;
Write data 0x35;                                    //VGH=13V, VGL=-10.4V
//-----------------------------------------------------------------------------------------//
Write command 0xbb;
Write data 0x19;
Write command 0xc0;
Write data 0x2c;
Write command 0xc2;
Write data 0x01;
Write command 0xc3;
Write data 0x12;
Write command 0xc4;
```

```
Write data 0x20;
Write command 0xc6;
Write data 0x0f;
Write command 0xd0;
Write data 0xa4;
Write data 0xa1;
//---------------------------------------------------------------------------------------//
Write command 0xe0;                              //gamma setting
Write data 0xd0;
Write data 0x04;
Write data 0x0d;
Write data 0x11;
Write data 0x13;
Write data 0x2b;
Write data 0x3f;
Write data 0x54;
Write data 0x4c;
Write data 0x18;
Write data 0x0d;
Write data 0x0b;
Write data 0x1f;
Write data 0x23;
Write command 0xe1;
Write data 0xd0;
Write data 0x04;
Write data 0x0c;
Write data 0x11;
Write data 0x13;
Write data 0x2c;
Write data 0x3f;
Write data 0x44;
Write data 0x51;
Write data 0x2f;
Write data 0x1f;
Write data 0x1f;
Write data 0x20;
Write data 0x23;
Write command 0x29;                              //display on
}
```

Void ST7789VPanelTurnOnDisplay (void)

{

Write command 0x29;

}

Void ST7789VPanelTurnOffDisplay (void)

{

Write command 0x28;

}

Void ST7789VPanelTurnOnPartial (void)

{

Write command 0x30;

Write data 0x00;

Write PSL;　　　　//PSL: Start Line

Write data 0x00;

Write PEL;　　　//PEL: End Line

Write command 0x12;

}

Void ST7789VPanelTurnOffPartial (void)

{

Write command 0x13;

}

Void ST7789VPanelTurnOnIdle (void)

{

Write command 0x39;

}

Void ST7789VPanelTurnOffIdle (void)

{

Write command 0x38;

}

Void ST7789VPanelSleepInMode (void)

{

Write command 0x10;

Delayms (120);

}

Void ST7789VPanelSleepOutMode (void)

{

Write command 0x11;

Delayms (120);

}

## 8.3 IVO 2.8" Application FPC Circuit

ST7789V Interface Selection:

IM3	IM2	IM1	IM0	MPU Interface Mode	Data pin
0	0	0	0	80-8bit parallel I/F	DB[7:0]
0	0	0	1	80-16bit parallel I/F	DB[15:0]
0	0	1	0	80-9bit parallel I/F	DB[8:0]
0	0	1	1	80-18bit parallel I/F	DB[17:0],
0	1	0	1	3-line 9bit serial I/F	SDA: in/out
0	1	1	0	4-line 8bit serial I/F	SDA: in/out
1	0	0	0	80-16bit parallel I/F Ⅱ	DB[17:10], DB[8:1]
1	0	0	1	80-8bit parallel I/F Ⅱ	DB[17:10]
1	0	1	0	80-18bit parallel I/F Ⅱ	DB[17:0],
1	0	1	1	80-9bit parallel I/F Ⅱ	DB[17:9]
1	1	0	1	3-line 9bit serial I/F Ⅱ	SDA:in/ SDO: out
1	1	1	0	4-line 8bit serial I/F Ⅱ	SDA:in/ SDO: out

Panel Spec. Reference:

1. C028SN21-0 Product Specification

Test Pin

Interface Mode Select

IVO 2.8

FPC Output Pin
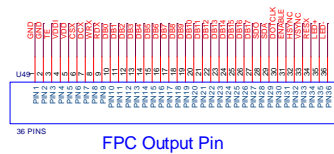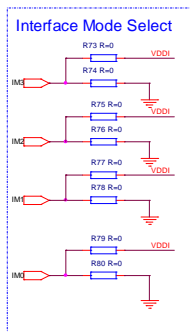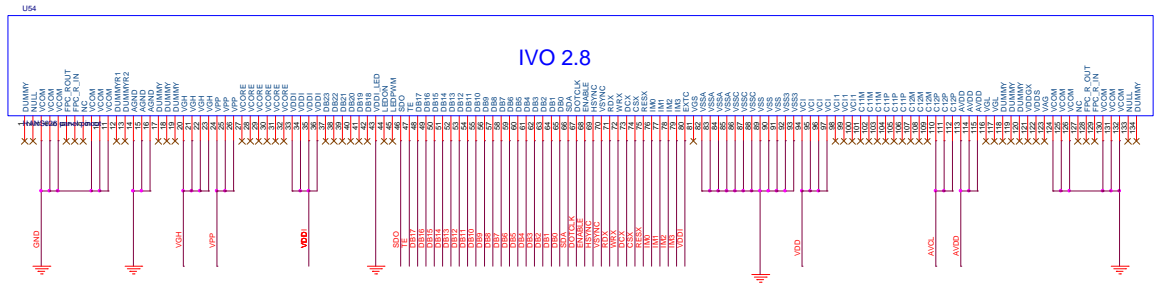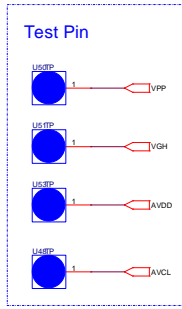
Note:

7. There is no CABC function in this schematic.

8. Please connect input pins that are not used to VSS

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8.4 IVO 2.8"Panel Initial code Suggestion

```
Void ST7789VIVO28panelinitialcode(void)
{
//----------------------------------ST7789V reset sequence----------------------------------//
LCD_RESET=1;
Delayms(1);                                //Delay 1ms
LCD_RESET=0;
Delayms(10);                               //Delay 10ms
LCD_RESET=1;
Delayms(120);                              //Delay 120ms
//----------------------------------------------------------------------------------------//
Write command 0x11;
Delayms(120);                              //Delay 120ms
//--------------------------------Display Setting------------------------------------------//
Write command 0x36;
Write data 0x00;
Write command 0x3a;
Write data 0x06;
//------------------------------ST7789V Frame rate setting--------------------------------//
Write command 0xb2;
Write data 0x0c;
Write data 0x0c;
Write data 0x00;
Write data 0x33;
Write data 0x33;
Write command 0xb7;
Write data 0x35;                           //VGH=13V, VGL=-10.4V
//----------------------------------------------------------------------------------------//
Write command 0xbb;
Write data 0x19;
Write command 0xc0;
Write data 0x2c;
Write command 0xc2;
Write data 0x01;
Write command 0xc3;
Write data 0x12;
Write command 0xc4;
```

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Write data 0x20;
Write command 0xc6;
Write data 0x0f;
Write command 0xd0;
Write data 0xa4;
Write data 0xa1;
//--//
Write command 0xe0;   //gamma setting
Write data 0xd0;
Write data 0x04;
Write data 0x0d;
Write data 0x11;
Write data 0x13;
Write data 0x2b;
Write data 0x3f;
Write data 0x54;
Write data 0x4c;
Write data 0x18;
Write data 0x0d;
Write data 0x0b;
Write data 0x1f;
Write data 0x23;
Write command 0xe1;
Write data 0xd0;
Write data 0x04;
Write data 0x0c;
Write data 0x11;
Write data 0x13;
Write data 0x2c;
Write data 0x3f;
Write data 0x44;
Write data 0x51;
Write data 0x2f;
Write data 0x1f;
Write data 0x1f;
Write data 0x20;
Write data 0x23;
Write command 0x29;   //display on
}

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Void ST7789VPanelTurnOnDisplay (void)

{

Write command 0x29;

}

Void ST7789VPanelTurnOffDisplay (void)

{

Write command 0x28;

}

Void ST7789VPanelTurnOnPartial (void)

{

Write command 0x30;

Write data 0x00;

Write PSL;   //PSL: Start Line

Write data 0x00;

Write PEL;   //PEL: End Line

Write command 0x12;

}

Void ST7789VPanelTurnOffPartial (void)

{

Write command 0x13;

}

Void ST7789VPanelTurnOnIdle (void)

{

Write command 0x39;

}

Void ST7789VPanelTurnOffIdle (void)

{

Write command 0x38;

}

Void ST7789VPanelSleepInMode (void)

{

Write command 0x10;

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Delayms (120);

}

Void ST7789VPanelSleepOutMode (void)

{

Write command 0x11;

Delayms (120);

}

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9 History

ST7789V Application Note Revision History		
Version	Data	Description
1.0	2013/10	First issue

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