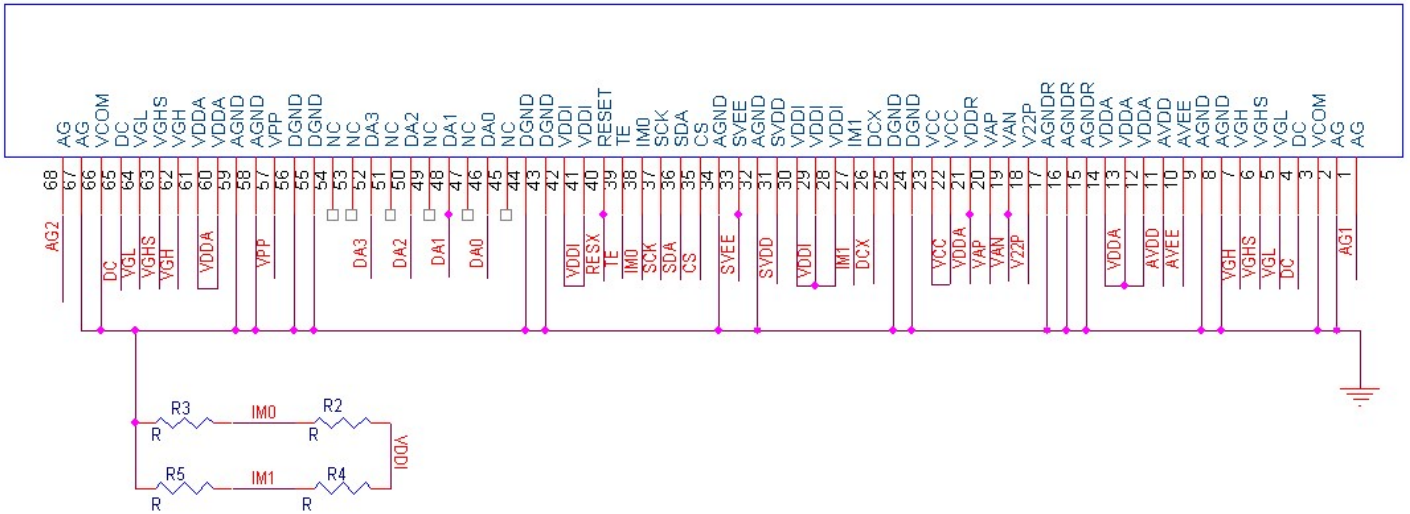


ST77903 Application Note

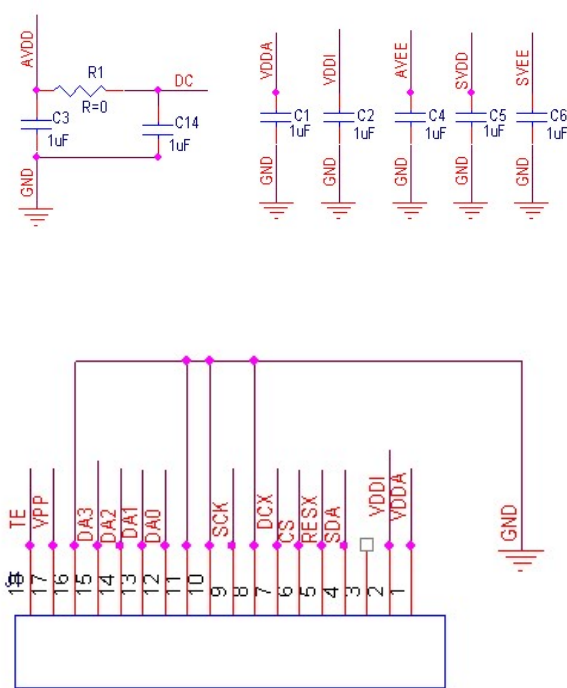
2022. 04

Sitronix

1.1 IVO 1.6" IPS FPC Circuit for QSPI



IM[1:0]=00, QSPI Interface
 C1、C2 and C14 capacitance are option. C3~C6 capacitance are 1uF.
 R1= 0 ohm.



1.2 IVO 1.6" IPS Initial Code

Resulation:400X400

Inversion: 1 Dot

External system porch setting: $VBP+VSW \geq 6$, $VFP \geq 6$

Line Time minima> 40.0uS

```
Void ST77903_PanellInitialCode (void)
{
//-----ST77903 Reset Sequence-----//
LCD_reset(1);
Delayms (1);                      //Delay 1ms
LCD_reset(0);
Delayms (1);                      //Delay 1ms
LCD_reset(1);
Delayms (120);                   //Delay 120ms
//-----Display Control setting-----//

WriteComm (0xf0);
WriteData (0xc3);
WriteComm (0xf0);
WriteData (0x96);
WriteComm (0xf0);
WriteData (0xa5);
WriteComm (0xe9);
WriteData (0x20);
WriteComm (0xe7);
WriteData (0x80);
WriteData (0x77);
WriteData (0x1f);
WriteData (0xcc);
WriteComm (0xc1);
WriteData (0x77);
```

WriteData (0x07);
WriteData (0xc2);
WriteData (0x07);
WriteComm (0xc2);
WriteData (0x77);
WriteData (0x07);
WriteData (0xc2);
WriteData (0x07);
WriteComm (0xc3);
WriteData (0x22);
WriteData (0x02);
WriteData (0x22);
WriteData (0x04);
WriteComm (0xc4);
WriteData (0x22);
WriteData (0x02);
WriteData (0x22);
WriteData (0x04);
WriteComm (0xc5);
WriteData (0x71);
WriteComm (0xe0);
WriteData (0x87);
WriteData (0x09);
WriteData (0x0c);
WriteData (0x06);
WriteData (0x05);
WriteData (0x03);
WriteData (0x29);
WriteData (0x32);
WriteData (0x49);
WriteData (0x0f);
WriteData (0x1b);
WriteData (0x17);
WriteData (0x2a);
WriteData (0x2f);
WriteComm (0xe1);
WriteData (0x87);
WriteData (0x09);

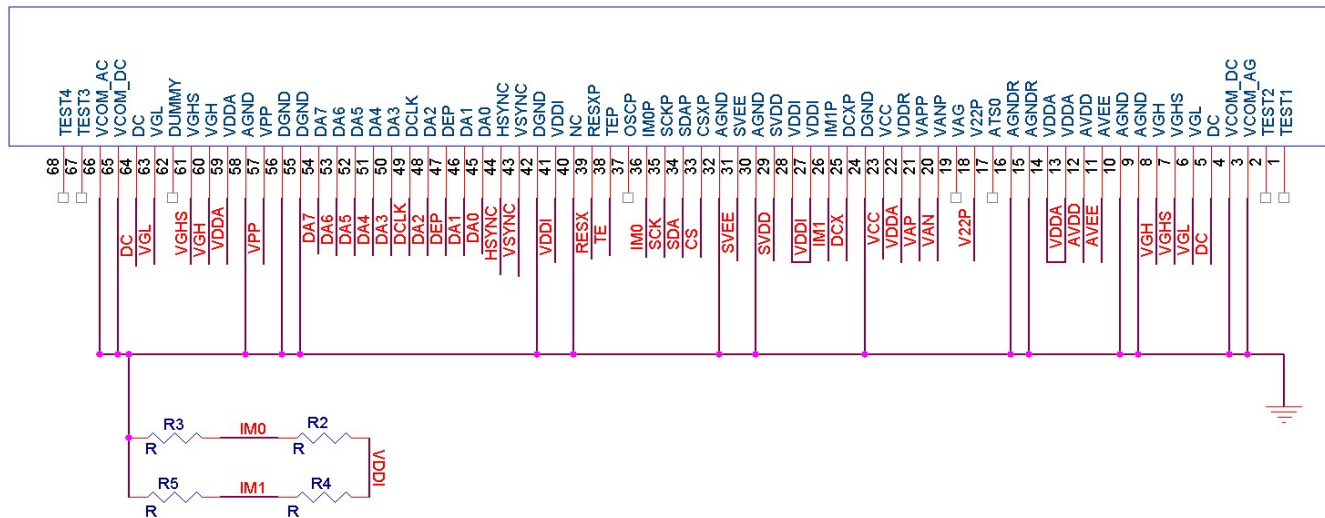
WriteData (0x0c);
WriteData (0x06);
WriteData (0x05);
WriteData (0x03);
WriteData (0x29);
WriteData (0x32);
WriteData (0x49);
WriteData (0x0f);
WriteData (0x1b);
WriteData (0x17);
WriteData (0x2a);
WriteData (0x2f);
WriteComm (0xe5);
WriteData (0xb2);
WriteData (0xf5);
WriteData (0xbd);
WriteData (0x24);
WriteData (0x22);
WriteData (0x25);
WriteData (0x10);
WriteData (0x22);
WriteData (0x22);
WriteData (0x22);
WriteData (0x22);
WriteData (0x22);
WriteData (0x22);
WriteData (0x22);
WriteComm (0xe6);
WriteData (0xb2);
WriteData (0xf5);
WriteData (0xbd);
WriteData (0x24);
WriteData (0x22);
WriteData (0x25);
WriteData (0x10);
WriteData (0x22);
WriteData (0x22);
WriteData (0x22);

WriteData (0x22);
WriteData (0x22);
WriteData (0x22);
WriteData (0x22);
WriteComm (0xec);
WriteData (0x40);
WriteData (0x03);
WriteComm (0x36);
WriteData (0x0c);
WriteComm (0x3a);
WriteData (0x07);
WriteComm (0xb2);
WriteData (0x00);
WriteComm (0xb3);
WriteData (0x01);
WriteComm (0xb4);
WriteData (0x00);
WriteComm (0xb5);
WriteData (0x00);
WriteData (0x08);
WriteData (0x00);
WriteData (0x08);
WriteComm (0xa5);
WriteData (0x00);
WriteData (0x00);
WriteData (0x00);
WriteData (0x00);
WriteData (0x20);
WriteData (0x15);
WriteData (0x2a);
WriteData (0x8a);
WriteData (0x02);
WriteComm (0xa6);
WriteData (0x00);
WriteData (0x00);
WriteData (0x00);
WriteData (0x00);
WriteData (0x20);

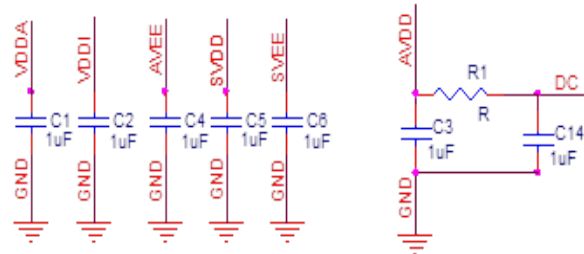
WriteData (0x15);
WriteData (0x2a);
WriteData (0x8a);
WriteData (0x02);
WriteComm (0xba);
WriteData (0x0a);
WriteData (0x5a);
WriteData (0x23);
WriteData (0x10);
WriteData (0x25);
WriteData (0x02);
WriteData (0x00);
WriteComm (0xbb);
WriteData (0x00);
WriteData (0x2d);
WriteData (0x00);
WriteData (0x25);
WriteData (0x88);
WriteData (0x87);
WriteData (0x18);
WriteData (0x00);
WriteComm (0xbc);
WriteData (0x00);
WriteData (0x30);
WriteData (0x00);
WriteData (0x29);
WriteData (0x88);
WriteData (0x87);
WriteData (0x18);
WriteData (0x00);
WriteComm (0xbd);
WriteData (0xa1);
WriteData (0xb2);
WriteData (0x2b);
WriteData (0x1a);
WriteData (0x56);
WriteData (0x43);
WriteData (0x34);

```
WriteData (0x65);  
WriteData (0xff);  
WriteData (0xff);  
WriteData (0x0f);  
WriteComm (0x35);  
WriteData (0x00);  
WriteComm (0x21);  
WriteComm (0x11);  
delay_ms 120  
WriteComm (0x29);  
delay_ms 120
```

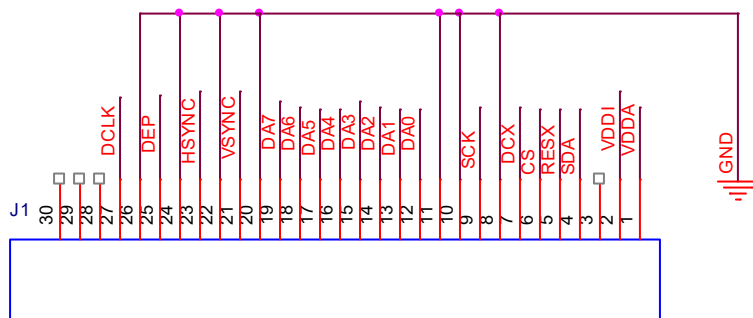

2.1 IVO 2.23" IPS FPC Circuit for RGB IF



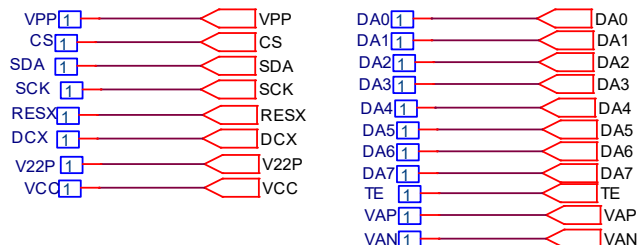
IM1P, IM0P	I/F	command	display data I/F
00	S/D/Q - SPI	D8	S-SPI
		DB	D-SPI
		DE	Q-SPI
01	pure 4 lane QSPI	DE	pure Q-SPI
10	3-SPI	-	serial RGB
11	4-SPI	-	serial RGB



C14 capacitance are option.



Test Pad



Note: Use Power Pad(VGL 、VGHS) instead of assigning GIP Pad, if VGL and VGH voltage are needed in Panel.

2.2 IVO 2.23" IPS (G0222) Initial Code

Resulation:200X480

Inversion: 1 Dot

External system porch setting: $VBP+VSW \geq 5$, $VFP \geq 3$

VSW<2

Frame Rate <= 60Hz

```
Void ST77903_PanelInitialCode (void)
{
//-----ST77903 Reset Sequence-----//
LCD_Nreset(1);
Delayms (1);                      //Delay 1ms
LCD_Nreset(0);
Delayms (1);                      //Delay 1ms
LCD_Nreset(1);
Delayms (120);                   //Delay 120ms
//-----Display Control setting-----//
WriteComm (0xF0);
WriteData (0xC3);
WriteComm (0xF0);
WriteData (0x96);
WriteComm (0xF0);
WriteData (0xA5)
WriteComm (0xED);
WriteData (0xC3);
WriteComm (0xE4);
WriteData (0x40);
WriteData (0x0F);
WriteComm (0xE7);
WriteData (0x80);
WriteComm (0xC1);
WriteData (0x77);
WriteData (0x07);
WriteData (0x7F);
```

WriteData (0x14);
WriteComm (0xC2);;
WriteData (0x77);
WriteData (0x07);
WriteData (0x7F);
WriteData (0x14);
WriteComm (0xC3);
WriteData (0x44);
WriteData (0x04);
WriteData (0x44);
WriteData (0x04);
WriteComm (0xC4);
WriteData (0x44);
WriteData (0x04);
WriteData (0x44);
WriteData (0x04);
WriteComm (0xC5);
WriteData (0x45);
WriteComm (0xE0);
WriteData (0xE1);
WriteData (0x08);
WriteData (0x0D);
WriteData (0x09);
WriteData (0x08);
WriteData (0x25);
WriteData (0x32);
WriteData (0x43);
WriteData (0x4B);
WriteData (0x2A);
WriteData (0x16);
WriteData (0x16);
WriteData (0x31);
WriteData (0x35);
WriteComm (0xE1);
WriteData (0xA5);
WriteData (0x0B);
WriteData (0x11);
WriteData (0x0C);

WriteData (0x0C);
WriteData (0x28);
WriteData (0x35);
WriteData (0x33);
WriteData (0x47);
WriteData (0x25);
WriteData (0x12);
WriteData (0x12);
WriteData (0x2C);
WriteData (0x31);
WriteComm (0xE5);
WriteData (0x2D);
WriteData (0xF5);
WriteData (0x22);
WriteData (0x55);
WriteData (0x22);
WriteData (0x25);
WriteData (0x10);
WriteData (0x22);
WriteData (0x22);
WriteData (0x22);
WriteData (0x22);
WriteData (0x22);
WriteData (0x22);
WriteData (0x22);
WriteComm (0xE6);
WriteData (0x2D);
WriteData (0xF5);
WriteData (0x22);
WriteData (0x55);
WriteData (0x22);
WriteData (0x25);
WriteData (0x10);
WriteData (0x22);
WriteData (0x22);
WriteData (0x22);
WriteData (0x22);
WriteData (0x22);

WriteData (0x22);
WriteData (0x22);
WriteComm (0xEC);
WriteData (0x00);
WriteData (0x55);
WriteData (0x00);
WriteData (0x00);
WriteData (0x00);
WriteData (0x08);
WriteComm (0xA4);
WriteData (0xC0);
WriteData (0x63);
WriteComm (0xA5);
WriteData (0x00);
WriteData (0x00);
WriteData (0x00);
WriteData (0x00);
WriteData (0x00);
WriteData (0x0E);
WriteData (0x2A);
WriteData (0xBA);
WriteData (0x02);
WriteComm (0xA6);
WriteData (0x00);
WriteData (0x00);
WriteData (0x00);
WriteData (0x00);
WriteData (0x00);
WriteData (0x0E);
WriteData (0x2A);
WriteData (0xBA);
WriteData (0x02);
WriteComm (0xB2);
WriteData (0x19);
WriteComm (0xB3);
WriteData (0x01);
WriteComm (0xB4);
WriteData (0x01);

WriteComm (0xB5);
WriteData (0x00);
WriteData (0x08);
WriteData (0x00);
WriteData (0x08);
WriteComm (0xB6);
WriteData (0xEF);
WriteData (0x18);
WriteComm (0xBA);
WriteData (0x0A);
WriteData (0x5A);
WriteData (0x23);
WriteData (0x10);
WriteData (0x22);
WriteData (0x01);
WriteData (0x00);
WriteComm (0xBB);
WriteData (0x00);
WriteData (0x2A);
WriteData (0x00);
WriteData (0x21);
WriteData (0x83);
WriteData (0x87);
WriteData (0x18);
WriteData (0x00);
WriteComm (0xBC);
WriteData (0x00);
WriteData (0x2A);
WriteData (0x00);
WriteData (0x21);
WriteData (0x83);
WriteData (0x87);
WriteData (0x18);
WriteData (0x00);
WriteComm (0xBD);
WriteData (0x58);
WriteData (0x67);
WriteData (0x76);

```

WriteData (0x85);
WriteData (0x43);
WriteData (0x34);
WriteData (0x21);
WriteData (0x12);
WriteData (0xFF);
WriteData (0xFF);
WriteData (0x0F);
WriteComm (0x35);
WriteData (0x00);
WriteComm (0x36);
WriteData (0x0C);
WriteComm (0x3A);
WriteData (0x07);
WriteComm (0xD9);
WriteData (0x22);
WriteComm (0xF0);
WriteData (0x3C);
WriteComm (0xF0);
WriteData (0x69);
WriteComm (0xF0);
WriteData (0x5A)
WriteComm (0x21);
//-----SRGB setting-----//
WriteComm (0xA0);
WriteData (0x40);
WriteData (0x02);
WriteData (0x02);
//-----SRGB setting -----//
WriteComm (0x11);
Delayms (120);                                //Delay 120ms

WriteComm (0x29);
Delayms (120);                                //Delay 120ms

}

```