ILITEK
I Love Innovation

ILI9488

a-Si TFT LCD Single Chip Driver
320(RGB) x 480 Resolution, 16.7M-color
WITH INTERNAL GRAM

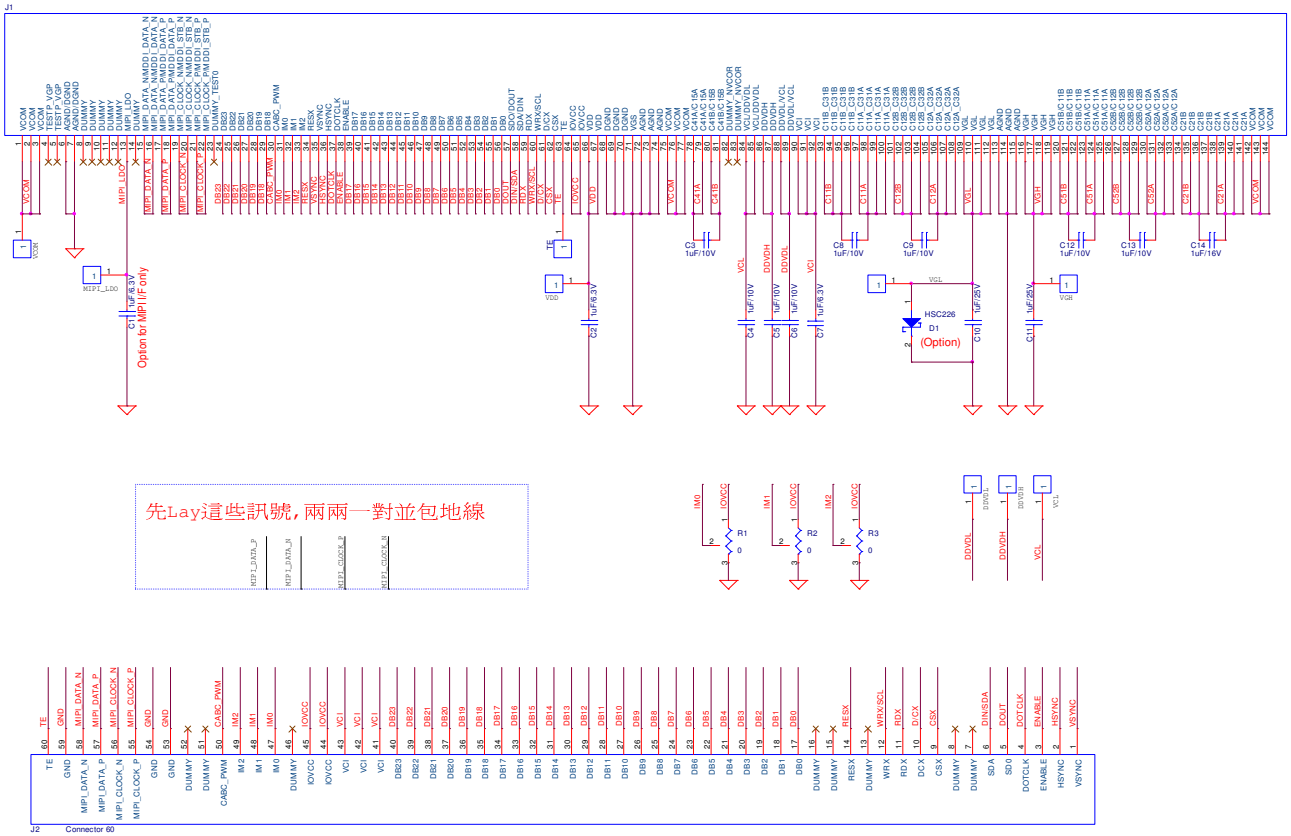
Application Notes

Version: Preliminary V0.3
Date: Dec 10 2012

ILI TECHNOLOGY CORP.
8F., No.38, Taiyuan St., Jhubei City, Hsinchu County 302, Taiwan (R.O.C.)
Tel.886-3-5600099; Fax.886-3-5600055
http://www.ilitek.com

1. HSD 3.5 Inch Panel

1.1. Application circuit



1.2. HSD 3.5 Inch Initial Code

Void ILI9488_HSD_Initial_Code(void)

```
{// VCI=2.8V
//************* Reset LCD Driver ****************//
LCD_nRESET = 1;
Delayms(1); // Delay 1ms
LCD_nRESET = 0;
Delayms(10); // Delay 10ms // This delay time is necessary
LCD_nRESET = 1;
Delayms(120); // Delay 120 ms
//************* Start Initial Sequence **********//
LCD_ILI9488_CMD(0xE0);     //P-Gamma
LCD_ILI9488_INDEX(0x00);
LCD_ILI9488_INDEX(0x03);
LCD_ILI9488_INDEX(0x0C);
LCD_ILI9488_INDEX(0x09);
LCD_ILI9488_INDEX(0x17);
LCD_ILI9488_INDEX(0x09);
LCD_ILI9488_INDEX(0x3E);
LCD_ILI9488_INDEX(0x89);
LCD_ILI9488_INDEX(0x49);
LCD_ILI9488_INDEX(0x08);
LCD_ILI9488_INDEX(0x0D);
LCD_ILI9488_INDEX(0x0A);
LCD_ILI9488_INDEX(0x13);
LCD_ILI9488_INDEX(0x15);
LCD_ILI9488_INDEX(0x0F);

LCD_ILI9488_CMD(0XE1);     //N-Gamma
LCD_ILI9488_INDEX(0x00);
LCD_ILI9488_INDEX(0x11);
LCD_ILI9488_INDEX(0x15);
LCD_ILI9488_INDEX(0x03);
LCD_ILI9488_INDEX(0x0F);
LCD_ILI9488_INDEX(0x05);
LCD_ILI9488_INDEX(0x2D);
LCD_ILI9488_INDEX(0x34);
LCD_ILI9488_INDEX(0x41);
LCD_ILI9488_INDEX(0x02);
```

```
LCD_ILI9488_INDEX(0x0B);
LCD_ILI9488_INDEX(0x0A);
LCD_ILI9488_INDEX(0x33);
LCD_ILI9488_INDEX(0x37);
LCD_ILI9488_INDEX(0x0F);

LCD_ILI9488_CMD(0XC0);     //Power Control 1
LCD_ILI9488_INDEX(0x17);   //Vreg1out
LCD_ILI9488_INDEX(0x15);   //Verg2out

LCD_ILI9488_CMD(0xC1);     //Power Control 2
LCD_ILI9488_INDEX(0x41);   //VGH,VGL

LCD_ILI9488_CMD(0xC5);     //Power Control 3
LCD_ILI9488_INDEX(0x00);
LCD_ILI9488_INDEX(0x12);   //Vcom
LCD_ILI9488_INDEX(0x80;)

LCD_ILI9488_CMD(0x36);     //Memory Access
LCD_ILI9488_INDEX(0x48);

LCD_ILI9488_CMD(0x3A);     // Interface Pixel Format
LCD_ILI9488_INDEX(0x66);

LCD_ILI9488_CMD(0XB0);     // Interface Mode Control
LCD_ILI9488_INDEX(0x00);

LCD_ILI9488_CMD(0xB1);     //Frame rate
LCD_ILI9488_INDEX(0xA0);   //60Hz

LCD_ILI9488_CMD(0xB4);     //Display Inversion Control
LCD_ILI9488_INDEX(0x02);   //2-dot

LCD_ILI9488_CMD(0XB6);     //RGB/MCU Interface Control
LCD_ILI9488_INDEX(0x02);   //MCU
LCD_ILI9488_INDEX(0x02);   //Source,Gate scan dieection
```

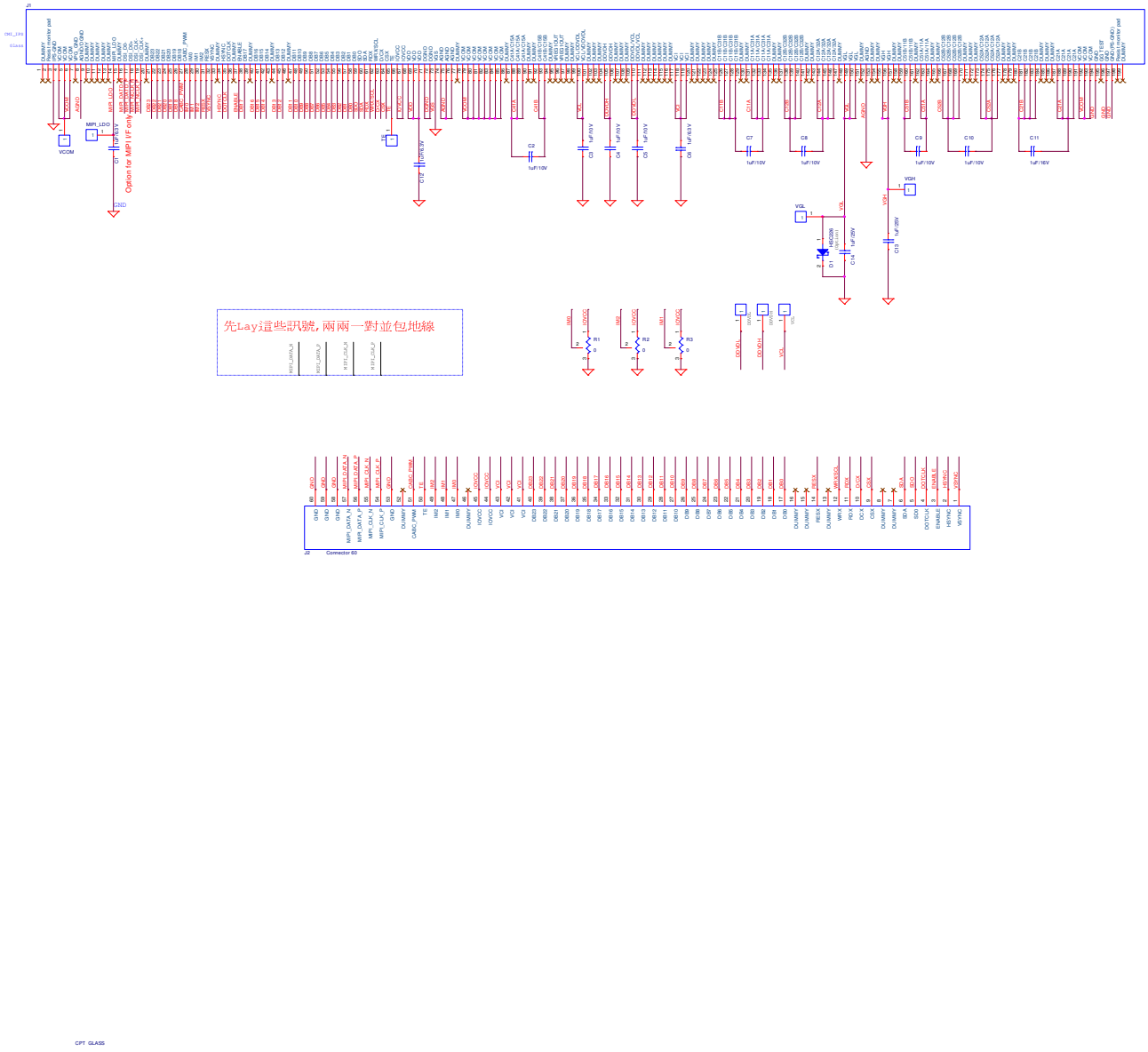
```
LCD_ILI9488_CMD(0XE9);     // Set Image Function
LCD_ILI9488_INDEX(0x00);   // Disable 24 bit data input

LCD_ILI9488_CMD(0xF7);     // Adjust Control
LCD_ILI9488_INDEX(0xA9);
LCD_ILI9488_INDEX(0x51);
LCD_ILI9488_INDEX(0x2C);
LCD_ILI9488_INDEX(0x82);   // D7 stream, loose

LCD_ILI9488_CMD(0x11);    //Sleep out
Delayms(120);
LCD_ILI9488_CMD(0x29);   //Display on
}
Void ILI9488_EnterSleep_Code(void)
{
LCD_ILI9488_CMD(0x28)     //Display off
Delayms(10);
LCD_ILI9488_CMD(0x10);    // Internal oscillator will be stopped
Delayms(120);
}
Void ILI9488_ExitSleep_Code(void)
{
LCD_ILI9488_CMD(0x11);    // Sleep out
Delayms(120);
LCD_ILI9488_CMD(0x29)     //Display on
}
```

2. CMI IPS 3.5 Inch Panel

2.1. Application circuit



2.2. CMI IPS 3.5 Inch Initial Code

Void ILI9488_CMI_Initial_Code(void)

```
{// VCI=2.8V
//************* Reset LCD Driver ****************//
LCD_nRESET = 1;
Delayms(1); // Delay 1ms
LCD_nRESET = 0;
Delayms(10); // Delay 10ms // This delay time is necessary
LCD_nRESET = 1;
Delayms(120); // Delay 120 ms
//************* Start Initial Sequence **********//

LCD_ILI9488_CMD(0xE0);     //P-Gamma
LCD_ILI9488_INDEX(0x00);
LCD_ILI9488_INDEX(0x13);
LCD_ILI9488_INDEX(0x18);
LCD_ILI9488_INDEX(0x04);
LCD_ILI9488_INDEX(0x0F);
LCD_ILI9488_INDEX(0x06);
LCD_ILI9488_INDEX(0x3A);
LCD_ILI9488_INDEX(0x56);
LCD_ILI9488_INDEX(0x4D);
LCD_ILI9488_INDEX(0x03);
LCD_ILI9488_INDEX(0x0A);
LCD_ILI9488_INDEX(0x06);
LCD_ILI9488_INDEX(0x30);
LCD_ILI9488_INDEX(0x3E);
LCD_ILI9488_INDEX(0x0F);

LCD_ILI9488_CMD(0XE1);     //N-Gamma
LCD_ILI9488_INDEX(0x00);
LCD_ILI9488_INDEX(0x13);
LCD_ILI9488_INDEX(0x18);
LCD_ILI9488_INDEX(0x01);
LCD_ILI9488_INDEX(0x11);
LCD_ILI9488_INDEX(0x06);
LCD_ILI9488_INDEX(0x38);
LCD_ILI9488_INDEX(0x34);
LCD_ILI9488_INDEX(0x4D);
```

```
LCD_ILI9488_INDEX(0x06);
LCD_ILI9488_INDEX(0x0D);
LCD_ILI9488_INDEX(0x0B);
LCD_ILI9488_INDEX(0x31);
LCD_ILI9488_INDEX(0x37);
LCD_ILI9488_INDEX(0x0F);

LCD_ILI9488_CMD(0XC0);     //Power Control 1
LCD_ILI9488_INDEX(0x18);   //Vreg1out
LCD_ILI9488_INDEX(0x17);   //Verg2out

LCD_ILI9488_CMD(0xC1);     //Power Control 2
LCD_ILI9488_INDEX(0x41);   //VGH,VGL

LCD_ILI9488_CMD(0xC5);     //Power Control 3
LCD_ILI9488_INDEX(0x00);
LCD_ILI9488_INDEX(0x1A);   //Vcom
LCD_ILI9488_INDEX(0x80;)

LCD_ILI9488_CMD(0x36);     //Memory Access
LCD_ILI9488_INDEX(0x48);

LCD_ILI9488_CMD(0x3A);     // Interface Pixel Format
LCD_ILI9488_INDEX(0x66);   //18bit

LCD_ILI9488_CMD(0XB0);     // Interface Mode Control
LCD_ILI9488_INDEX(0x00);

LCD_ILI9488_CMD(0xB1);     //Frame rate
LCD_ILI9488_INDEX(0xA0);   //60Hz

LCD_ILI9488_CMD(0xB4);     //Display Inversion Control
LCD_ILI9488_INDEX(0x02);   //2-dot

LCD_ILI9488_CMD(0XB6);     //RGB/MCU Interface Control
LCD_ILI9488_INDEX(0x02);   //MCU
LCD_ILI9488_INDEX(0x02);   //Source,Gate scan dieection
```

```
LCD_ILI9488_CMD(0XE9);     // Set Image Function
LCD_ILI9488_INDEX(0x00);    //disable 24 bit data input

LCD_ILI9488_CMD(0xF7);     // Adjust Control
LCD_ILI9488_INDEX(0xA9);
LCD_ILI9488_INDEX(0x51);
LCD_ILI9488_INDEX(0x2C);
LCD_ILI9488_INDEX(0x82);    // D7 stream, loose

LCD_ILI9488_CMD(0x21);     //Normal Black

LCD_ILI9488_CMD(0x11);    //Sleep out
Delayms(120);
LCD_ILI9488_CMD(0x29);   //Display on
}
```

Void ILI9488_EnterSleep_Code(void)

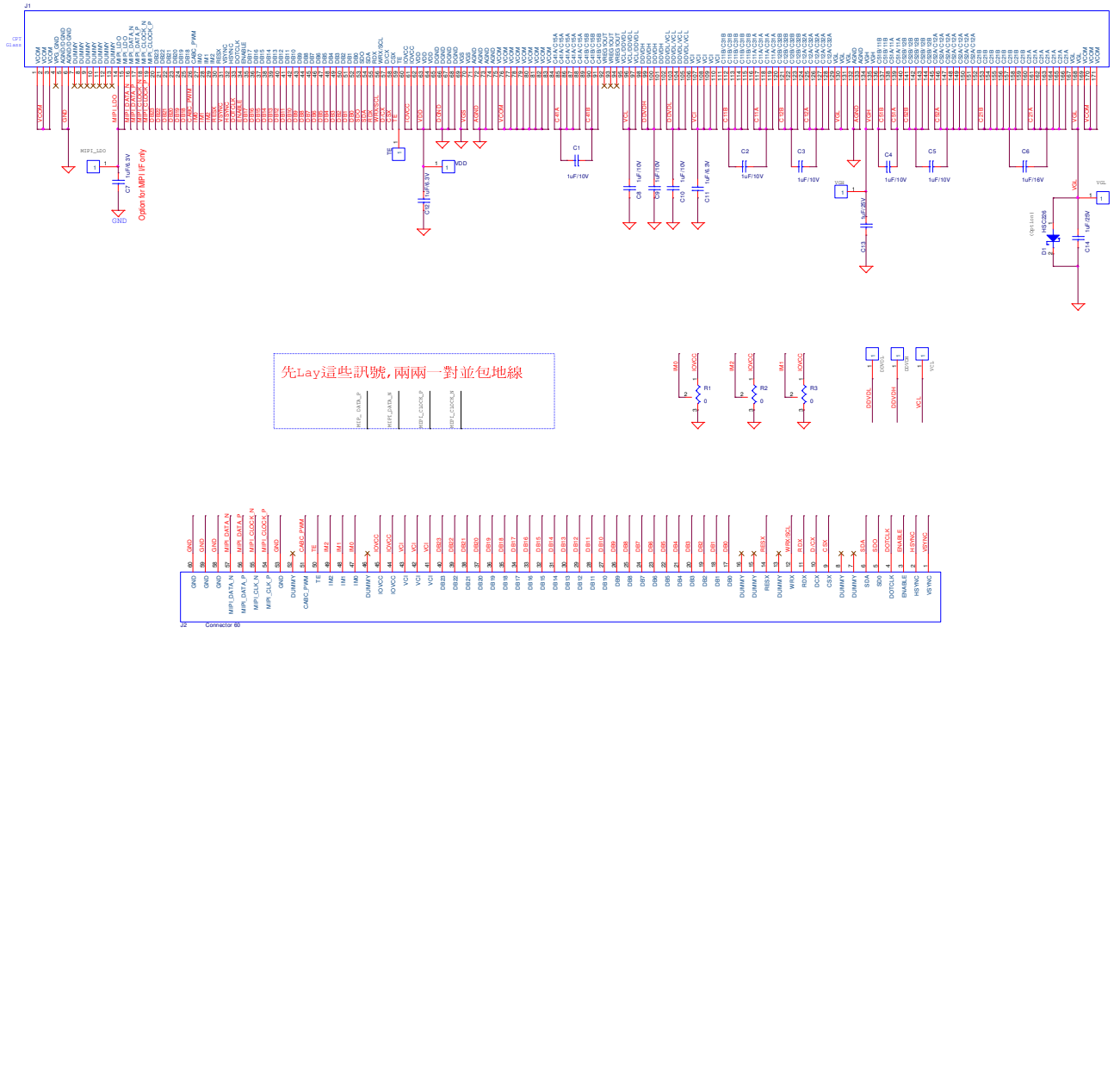
```
{
LCD_ILI9488_CMD(0x28)     //Display off
Delayms(10);
LCD_ILI9488_CMD(0x10);     // Internal oscillator will be stopped
Delayms(120);
}
```

Void ILI9488_ExitSleep_Code(void)

```
{
LCD_ILI9488_CMD(0x11);    // Sleep out
Delayms(120);
LCD_ILI9488_CMD(0x29)     //Display on
}
```

3. CPT 3.5 Inch Panel

3.1. Application circuit



3.2. CPT 3.5 Inch Initial Code

Void ILI9488_CPT_Initial_Code(void)

```
{// VCI=2.8V
//************* Reset LCD Driver ****************//
LCD_nRESET = 1;
Delayms(1); // Delay 1ms
LCD_nRESET = 0;
Delayms(10); // Delay 10ms // This delay time is necessary
LCD_nRESET = 1;
Delayms(120); // Delay 120 ms
//************* Start Initial Sequence **********//
LCD_ILI9488_CMD(0xE0);     //P-Gamma
LCD_ILI9488_INDEX(0x00);
LCD_ILI9488_INDEX(0x04);
LCD_ILI9488_INDEX(0x10);
LCD_ILI9488_INDEX(0x0A);
LCD_ILI9488_INDEX(0x18)
LCD_ILI9488_INDEX(0x0A);
LCD_ILI9488_INDEX(0x41);
LCD_ILI9488_INDEX(0x79);
LCD_ILI9488_INDEX(0x4E);
LCD_ILI9488_INDEX(0x05);
LCD_ILI9488_INDEX(0x10);
LCD_ILI9488_INDEX(0x0D);
LCD_ILI9488_INDEX(0x1A);
LCD_ILI9488_INDEX(0x0E);
LCD_ILI9488_INDEX(0x0F);

LCD_ILI9488_CMD(0XE1);     //N-Gamma
LCD_ILI9488_INDEX(0x00);
LCD_ILI9488_INDEX(0x1C);
LCD_ILI9488_INDEX(0x1E);
LCD_ILI9488_INDEX(0x03);
LCD_ILI9488_INDEX(0x0F);
LCD_ILI9488_INDEX(0x02);
LCD_ILI9488_INDEX(0x31);
LCD_ILI9488_INDEX(0X34);
LCD_ILI9488_INDEX(0x40);
LCD_ILI9488_INDEX(0x01);
```

```
LCD_ILI9488_INDEX(0x07);
LCD_ILI9488_INDEX(0x06);
LCD_ILI9488_INDEX(0x30);
LCD_ILI9488_INDEX(0x36);
LCD_ILI9488_INDEX(0x0F);

LCD_ILI9488_CMD(0XC0);     //Power Control 1
LCD_ILI9488_INDEX(0x17);   //Vreg1out
LCD_ILI9488_INDEX(0x15);   //Verg2out

LCD_ILI9488_CMD(0xC1);     //Power Control 2
LCD_ILI9488_INDEX(0x41);   //VGH,VGL

LCD_ILI9488_CMD(0xC5);     //Power Control 3
LCD_ILI9488_INDEX(0x00);
LCD_ILI9488_INDEX(0x4D);   //Vcom
LCD_ILI9488_INDEX(0x80;)

LCD_ILI9488_CMD(0x36);     //Memory Access
LCD_ILI9488_INDEX(0x48);

LCD_ILI9488_CMD(0x3A);     // Interface Pixel Format
LCD_ILI9488_INDEX(0x66);

LCD_ILI9488_CMD(0XB0);     // Interface Mode Control
LCD_ILI9488_INDEX(0x00);

LCD_ILI9488_CMD(0xB1);     //Frame rate
LCD_ILI9488_INDEX(0xA0);   //60Hz

LCD_ILI9488_CMD(0xB4);     //Display Inversion Control
LCD_ILI9488_INDEX(0x02);   //2-dot

LCD_ILI9488_CMD(0XB6);     //RGB/MCU Interface Control
LCD_ILI9488_INDEX(0x02);   //MCU
LCD_ILI9488_INDEX(0x02);   //Source,Gate scan dieection
```

```
LCD_ILI9488_CMD(0xF7);     // Adjust Control
LCD_ILI9488_INDEX(0xA9);
LCD_ILI9488_INDEX(0x51);
LCD_ILI9488_INDEX(0x2C);
LCD_ILI9488_INDEX(0x82);    // D7 stream, loose

LCD_ILI9488_CMD(0x11);    //Sleep out
Delayms(120);
LCD_ILI9488_CMD(0x29);    //Display on
}
```

Void ILI9488_EnterSleep_Code(void)

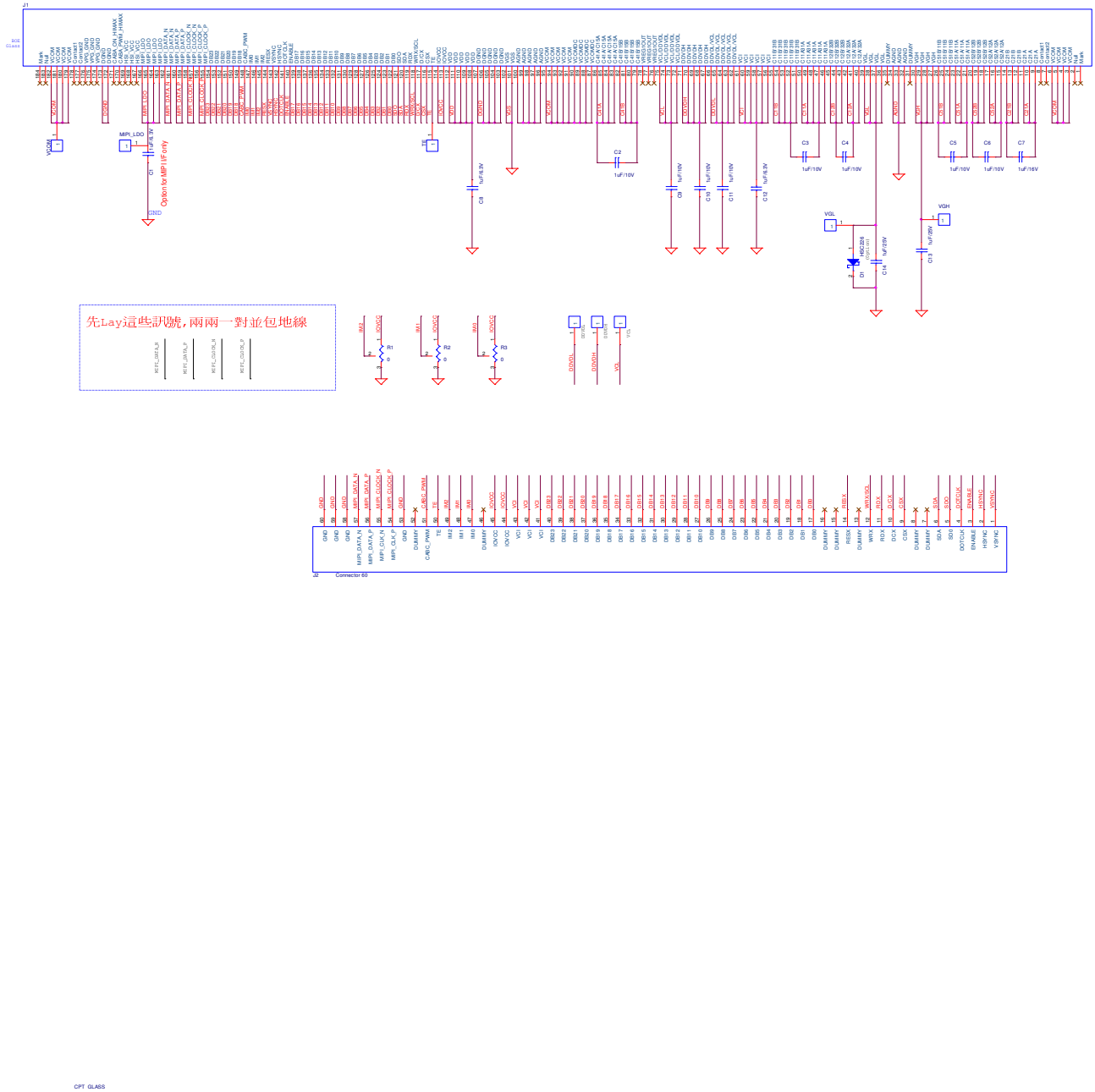
```
{
LCD_ILI9488_CMD(0x28)     //Display off
Delayms(10);
LCD_ILI9488_CMD(0x10);     // Internal oscillator will be stopped
Delayms(120);
}
```

Void ILI9488_ExitSleep_Code(void)

```
{
LCD_ILI9488_CMD(0x11);     // Sleep out
Delayms(120);
LCD_ILI9488_CMD(0x29)     //Display on
}
```

4. BOE 3.97 Inch Panel

4.1. Application circuit



4.2. BOE 3.97 Inch Initial Code

Void ILI9488_BOE_Initial_Code(void)

```
{// VCI=2.8V
//************* Reset LCD Driver ****************//
LCD_nRESET = 1;
Delayms(1); // Delay 1ms
LCD_nRESET = 0;
Delayms(10); // Delay 10ms // This delay time is necessary
LCD_nRESET = 1;
Delayms(120); // Delay 120 ms
//************* Start Initial Sequence **********//
LCD_ILI9488_CMD(0xE0);     //P-Gamma
LCD_ILI9488_INDEX(0x00);
LCD_ILI9488_INDEX(0x0B);
LCD_ILI9488_INDEX(0x18);
LCD_ILI9488_INDEX(0x0C);
LCD_ILI9488_INDEX(0x19)
LCD_ILI9488_INDEX(0x0C);
LCD_ILI9488_INDEX(0x45);
LCD_ILI9488_INDEX(0x58);
LCD_ILI9488_INDEX(0x53);
LCD_ILI9488_INDEX(0x03);
LCD_ILI9488_INDEX(0x0B);
LCD_ILI9488_INDEX(0x0A);
LCD_ILI9488_INDEX(0x1D);
LCD_ILI9488_INDEX(0x20);
LCD_ILI9488_INDEX(0x0F);

LCD_ILI9488_CMD(0XE1);     //N-Gamma
LCD_ILI9488_INDEX(0x00);
LCD_ILI9488_INDEX(0x16);
LCD_ILI9488_INDEX(0x19);
LCD_ILI9488_INDEX(0x02);
LCD_ILI9488_INDEX(0x0E);
LCD_ILI9488_INDEX(0x03);
LCD_ILI9488_INDEX(0x2B);
LCD_ILI9488_INDEX(0X44);
LCD_ILI9488_INDEX(0x39);
LCD_ILI9488_INDEX(0x02);
```

```
LCD_ILI9488_INDEX(0x06);
LCD_ILI9488_INDEX(0x05);
LCD_ILI9488_INDEX(0x29);
LCD_ILI9488_INDEX(0x35);
LCD_ILI9488_INDEX(0x0F);

LCD_ILI9488_CMD(0XC0);     //Power Control 1
LCD_ILI9488_INDEX(0x15);   //Vreg1out
LCD_ILI9488_INDEX(0x12);   //Verg2out

LCD_ILI9488_CMD(0xC1);     //Power Control 2
LCD_ILI9488_INDEX(0x41);   //VGH,VGL

LCD_ILI9488_CMD(0xC5);     //Power Control 3
LCD_ILI9488_INDEX(0x00);
LCD_ILI9488_INDEX(0x5A);   //Vcom
LCD_ILI9488_INDEX(0x80;)

LCD_ILI9488_CMD(0x36);     //Memory Access
LCD_ILI9488_INDEX(0x48);

LCD_ILI9488_CMD(0x3A);     // Interface Pixel Format
LCD_ILI9488_INDEX(0x66);

LCD_ILI9488_CMD(0XB0);     // Interface Mode Control
LCD_ILI9488_INDEX(0x00);

LCD_ILI9488_CMD(0xB1);     //Frame rate
LCD_ILI9488_INDEX(0xA0);   //60Hz

LCD_ILI9488_CMD(0xB4);     //Display Inversion Control
LCD_ILI9488_INDEX(0x02);   //2-dot

LCD_ILI9488_CMD(0XB6);     //RGB/MCU Interface Control
LCD_ILI9488_INDEX(0x02);   //MCU
LCD_ILI9488_INDEX(0x02);   //Source,Gate scan dieection

LCD_ILI9488_CMD(0XE9);     // Set Image Function
LCD_ILI9488_INDEX(0x00);   //disable 24 bit data input
```

```
LCD_ILI9488_CMD(0xF7);     // Adjust Control
LCD_ILI9488_INDEX(0xA9);
LCD_ILI9488_INDEX(0x51);
LCD_ILI9488_INDEX(0x2C);
LCD_ILI9488_INDEX(0x82);    // D7 stream, loose

LCD_ILI9488_CMD(0x11);    //Sleep out
Delayms(120);
LCD_ILI9488_CMD(0x29);   //Display on
}
Void ILI9488_EnterSleep_Code(void)
{
LCD_ILI9488_CMD(0x28)     //Display off
Delayms(10);
LCD_ILI9488_CMD(0x10);     // Internal oscillator will be stopped
Delayms(120);
}
Void ILI9488_ExitSleep_Code(void)
{
LCD_ILI9488_CMD(0x11);     // Sleep out
Delayms(120);
LCD_ILI9488_CMD(0x29)     //Display on
}
```

5. Revision History

Revision History

Version No.	Date	Page	Description
V0.1	2012/11/16	All	New creation
V0.2	2012/12/6	All	Remove RBEH Register
V0.3	2012/12/10	All	Update Gamma setting sequence