

**a-Si TFT LCD Single Chip Driver with
176RGBx220 Resolution and 262K color**

Application Notes

Version: Preliminary V0.6

Date: May, 6th, 2008

ILI TECHNOLOGY CORP.

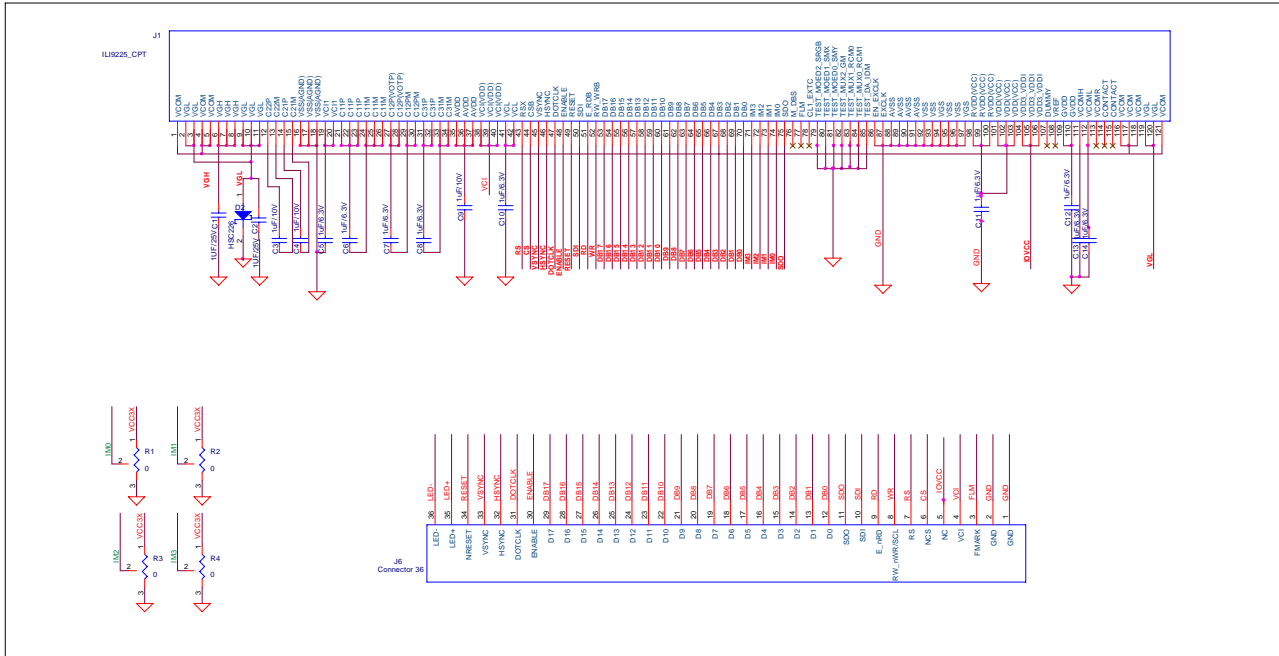
4F, No. 2, Tech. 5th Rd., Hsinchu Science Park,
Taiwan 300, R.O.C.

Tel.886-3-5670095; Fax.886-3-5670096

<http://www.ilitek.c>

Application FPC Circuit

1.1. CPT2.0" Panel



1.2 CPT 2.0 inch initial code

void ILI9225_CPT24_Initial(void)

```
{
// VCI=2.8V
//***** Reset LCD Driver *****//
LCD_nRESET = 1;
    delays(1); // Delay 1ms
LCD_nRESET = 0;
    delays(10); // Delay 10ms           // This delay time is necessary
LCD_nRESET = 1;
    delays(50); // Delay 50 ms
//***** Start Initial Sequence *****//
LCD_CtrlWrite_ILI9225(0x0001, 0x011C); // set SS and NL bit
LCD_CtrlWrite_ILI9225(0x0002, 0x0100); // set 1 line inversion
LCD_CtrlWrite_ILI9225(0x0003, 0x1030); // set GRAM write direction and BGR=1.
LCD_CtrlWrite_ILI9225(0x0008, 0x0808); // set BP and FP
LCD_CtrlWrite_ILI9225(0x000C, 0x0000); // RGB interface setting  R0Ch=0x0110 for RGB 18Bit and R0Ch=0111for RGB16Bit
LCD_CtrlWrite_ILI9225(0x000F, 0x0801); // Set frame rate
LCD_CtrlWrite_ILI9225(0x0020, 0x0000); // Set GRAM Address
LCD_CtrlWrite_ILI9225(0x0021, 0x0000); // Set GRAM Address
//*****Power On sequence *****//
    delays(50); // Delay 50ms
LCD_CtrlWrite_ILI9225(0x0010, 0x0A00); // Set SAP,DSTB,STB
LCD_CtrlWrite_ILI9225(0x0011, 0x1038); // Set APON,PON,AON,VCI1EN,VC
    delays(50); // Delay 50ms
LCD_CtrlWrite_ILI9225(0x0012, 0x1121); // Internal reference voltage= Vci;
LCD_CtrlWrite_ILI9225(0x0013, 0x0066); // Set GVDD
LCD_CtrlWrite_ILI9225(0x0014, 0x5F60); // Set VCOMH/VCOML voltage
//----- Set GRAM area -----//
LCD_CtrlWrite_ILI9225 (0x30, 0x0000);
LCD_CtrlWrite_ILI9225 (0x31, 0x00DB);
LCD_CtrlWrite_ILI9225 (0x32, 0x0000);
LCD_CtrlWrite_ILI9225 (0x33, 0x0000);
LCD_CtrlWrite_ILI9225 (0x34, 0x00DB);
LCD_CtrlWrite_ILI9225 (0x35, 0x0000);
LCD_CtrlWrite_ILI9225 (0x36, 0x00AF);
LCD_CtrlWrite_ILI9225 (0x37, 0x0000);
LCD_CtrlWrite_ILI9225 (0x38, 0x00DB);
LCD_CtrlWrite_ILI9225 (0x39, 0x0000);
// ----- Adjust the Gamma Curve -----//
LCD_CtrlWrite_ILI9225(0x0050, 0x0400);
LCD_CtrlWrite_ILI9225(0x0051, 0x060B);
LCD_CtrlWrite_ILI9225(0x0052, 0x0C0A);
LCD_CtrlWrite_ILI9225(0x0053, 0x0105);
LCD_CtrlWrite_ILI9225(0x0054, 0x0A0C);
LCD_CtrlWrite_ILI9225(0x0055, 0x0B06);
LCD_CtrlWrite_ILI9225(0x0056, 0x0004);
LCD_CtrlWrite_ILI9225(0x0057, 0x0501);
LCD_CtrlWrite_ILI9225(0x0058, 0x0E00);
LCD_CtrlWrite_ILI9225(0x0059, 0x000E);
    delays(50); // Delay 50ms
LCD_CtrlWrite_ILI9225(0x0007, 0x1017);
}
```

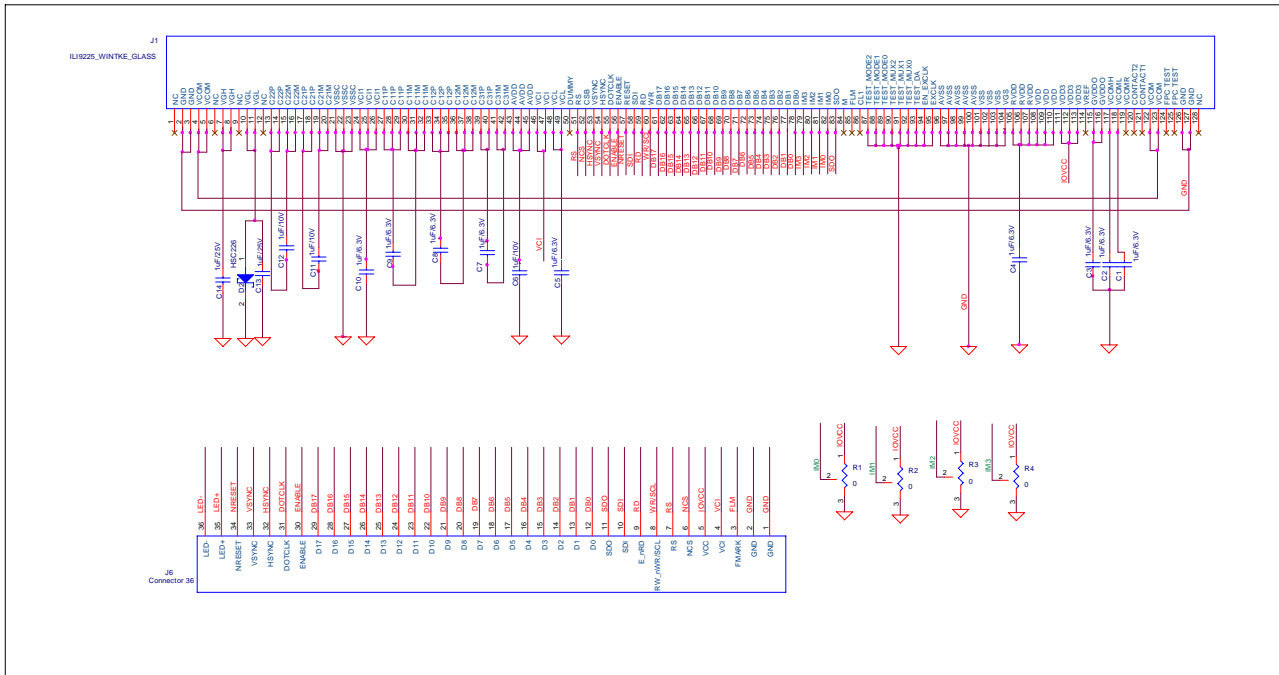
void LCD_Enter Standby_ILI9225(void)

```
{  
    LCD_CtrlWrite_ILI9225(0x0007, 0x0000);    // Set D1=0, D0=1  
    delaysms(50);  
    LCD_CtrlWrite_ILI9225(0x0011, 0x0007);    // // Set APON,PON,AON,VC11EN,VC  
    delaysms(50);  
    LCD_CtrlWrite_ILI9225(0x0010, 0x0A01);    // Enter Standby mode  
}
```

void LCD_Exit Standby_ILI9225(void)

```
{  
    LCD_CtrlWrite_ILI9225(0x0010, 0x0A00);    // Exit Sleep/ Standby mode  
    LCD_CtrlWrite_ILI9225(0x0011, 0x1038);    // // Set APON,PON,AON,VC11EN,VC  
    delaysms(50)  
    LCD_CtrlWrite_ILI9225(0x0007, 0x1017);    // Set D1=0, D0=1  
}
```

2.1 WTK 1.8 2.0 2.2" Panel



3.2 WTK 1.8" with TP Panel

void ILI9225_With TP_Initial(void)

```
{
// VCI=2.8V
//***** Reset LCD Driver *****//
LCD_nRESET = 1;
    delays(1); // Delay 1ms
LCD_nRESET = 0;
    delays(10); // Delay 10ms           // This delay time is necessary
LCD_nRESET = 1;
    delays(50); // Delay 50 ms
//***** Start Initial Sequence *****//
LCD_CtrlWrite_ILI9225(0x0001, 0x011C); // set SS and NL bit
LCD_CtrlWrite_ILI9225(0x0002, 0x0100); // set 1 line inversion
LCD_CtrlWrite_ILI9225(0x0003, 0x1030); // set GRAM write direction and BGR=1.
LCD_CtrlWrite_ILI9225(0x0008, 0x0808); // set BP and FP
LCD_CtrlWrite_ILI9225(0x000C, 0x0000); // RGB interface setting  R0Ch=0x0110 for RGB 18Bit and R0Ch=0111for RGB16Bit
LCD_CtrlWrite_ILI9225(0x000F, 0x0801); // Set frame rate
LCD_CtrlWrite_ILI9225(0x0020, 0x0000); // Set GRAM Address
LCD_CtrlWrite_ILI9225(0x0021, 0x0000); // Set GRAM Address
//*****Power On sequence *****//
delays(50); // Delay 50ms
LCD_CtrlWrite_ILI9225(0x0010, 0x0A00); // Set SAP,DSTB,STB
LCD_CtrlWrite_ILI9225(0x0011, 0x1038); // Set APON,PON,AON,VCI1EN,VC
delays(50); // Delay 50ms
LCD_CtrlWrite_ILI9225(0x0012, 0x6121); // Internal reference voltage= Vci;
LCD_CtrlWrite_ILI9225(0x0013, 0x0062); // Set GVDD
LCD_CtrlWrite_ILI9225(0x0014, 0x5b60); // Set VCOMH/VCOML voltage
//----- Set GRAM area -----//
LCD_CtrlWrite_ILI9225 (0x30, 0x0000);
LCD_CtrlWrite_ILI9225 (0x31, 0x00DB);
LCD_CtrlWrite_ILI9225 (0x32, 0x0000);
LCD_CtrlWrite_ILI9225 (0x33, 0x0000);
LCD_CtrlWrite_ILI9225 (0x34, 0x00DB);
LCD_CtrlWrite_ILI9225 (0x35, 0x0000);
LCD_CtrlWrite_ILI9225 (0x36, 0x00AF);
LCD_CtrlWrite_ILI9225 (0x37, 0x0000);
LCD_CtrlWrite_ILI9225 (0x38, 0x00DB);
LCD_CtrlWrite_ILI9225 (0x39, 0x0000);
// ----- Adjust the Gamma Curve -----//
LCD_CtrlWrite_ILI9225(0x0050, 0x0000);
LCD_CtrlWrite_ILI9225(0x0051, 0x000B);
LCD_CtrlWrite_ILI9225(0x0052, 0x0a01);
LCD_CtrlWrite_ILI9225(0x0053, 0x010c);
LCD_CtrlWrite_ILI9225(0x0054, 0x010a);
LCD_CtrlWrite_ILI9225(0x0055, 0x0B00);
LCD_CtrlWrite_ILI9225(0x0056, 0x0000);
LCD_CtrlWrite_ILI9225(0x0057, 0x0c01);
LCD_CtrlWrite_ILI9225(0x0058, 0x0E00);
LCD_CtrlWrite_ILI9225(0x0059, 0x000E);
delays(50); // Delay 50ms
LCD_CtrlWrite_ILI9225(0x0007, 0x1017);
}
}
```

void LCD_Enter Standby_ILI9225(void)

```
{
LCD_CtrlWrite_ILI9225(0x0007, 0x0000);    // Set D1=0, D0=1
delayms(50);
LCD_CtrlWrite_ILI9225(0x0011, 0x0007);    // // Set APON,PON,AON,VC11EN,VC
delayms(50);
LCD_CtrlWrite_ILI9225(0x0010, 0x0A01);    // // Enter Standby mode
}
```

void LCD_Exit Standby_ILI9225(void)

```
{
LCD_CtrlWrite_ILI9225(0x0010, 0x0A00);    // Exit Sleep/ Standby mode
LCD_CtrlWrite_ILI9225(0x0011, 0x1038);    // // Set APON,PON,AON,VC11EN,VC
delayms(50)
LCD_CtrlWrite_ILI9225(0x0007, 0x1017);    // Set D1=0, D0=1
}
```


3.2 CM0 2.2" Panel

void ILI9225_CMO22_Initial(void)

```
{
// VCI=2.8V
//***** Reset LCD Driver *****//
LCD_nRESET = 1;
    delaysms(1); // Delay 1ms
LCD_nRESET = 0;
    delaysms(10); // Delay 10ms           // This delay time is necessary
LCD_nRESET = 1;
    delaysms(50); // Delay 50 ms
//***** Start Initial Sequence *****//
LCD_CtrlWrite_ILI9225(0x0001, 0x011C); // set SS and NL bit
LCD_CtrlWrite_ILI9225(0x0002, 0x0100); // set 1 line inversion
LCD_CtrlWrite_ILI9225(0x0003, 0x1030); // set GRAM write direction and BGR=1.
LCD_CtrlWrite_ILI9225(0x0008, 0x0808); // set BP and FP
LCD_CtrlWrite_ILI9225(0x000C, 0x0000); // RGB interface setting R0Ch=0x0110 for RGB 18Bit and R0Ch=0111for RGB16Bit
LCD_CtrlWrite_ILI9225(0x000F, 0x0801); // Set frame rate
LCD_CtrlWrite_ILI9225(0x0020, 0x0000); // Set GRAM Address
LCD_CtrlWrite_ILI9225(0x0021, 0x0000); // Set GRAM Address
//*****Power On sequence *****//
delaysms(50); // Delay 50ms
LCD_CtrlWrite_ILI9225(0x0010, 0x0A00); // Set SAP,DSTB,STB
LCD_CtrlWrite_ILI9225(0x0011, 0x103B); // Set APON,PON,AON,VCI1EN,VC
delaysms(50); // Delay 50ms
LCD_CtrlWrite_ILI9225(0x0012, 0x3121); // Internal reference voltage= Vci;
LCD_CtrlWrite_ILI9225(0x0013, 0x0066); // Set GVDD
LCD_CtrlWrite_ILI9225(0x0014, 0x3660); // Set VCOMH/VCOML voltage
//----- Set GRAM area -----//
LCD_CtrlWrite_ILI9225 (0x30, 0x0000);
LCD_CtrlWrite_ILI9225 (0x31, 0x00DB);
LCD_CtrlWrite_ILI9225 (0x32, 0x0000);
LCD_CtrlWrite_ILI9225 (0x33, 0x0000);
LCD_CtrlWrite_ILI9225 (0x34, 0x00DB);
LCD_CtrlWrite_ILI9225 (0x35, 0x0000);
LCD_CtrlWrite_ILI9225 (0x36, 0x00AF);
LCD_CtrlWrite_ILI9225 (0x37, 0x0000);
LCD_CtrlWrite_ILI9225 (0x38, 0x00DB);
LCD_CtrlWrite_ILI9225 (0x39, 0x0000);
// ----- Adjust the Gamma Curve -----//
LCD_CtrlWrite_ILI9225(0x0050, 0x0400);
LCD_CtrlWrite_ILI9225(0x0051, 0x080B);
LCD_CtrlWrite_ILI9225(0x0052, 0x0E0C);
LCD_CtrlWrite_ILI9225(0x0053, 0x0103);
LCD_CtrlWrite_ILI9225(0x0054, 0x0C0E);
LCD_CtrlWrite_ILI9225(0x0055, 0x0B08);
LCD_CtrlWrite_ILI9225(0x0056, 0x0004);
LCD_CtrlWrite_ILI9225(0x0057, 0x0301);
LCD_CtrlWrite_ILI9225(0x0058, 0x0E00);
LCD_CtrlWrite_ILI9225(0x0059, 0x000E);
delaysms(50); // Delay 50ms
LCD_CtrlWrite_ILI9225(0x0007, 0x1017);
}
}
```

void LCD_Enter Standby_ILI9225(void)

```
{  
    LCD_CtrlWrite_ILI9225(0x0007, 0x0000);    // Set D1=0, D0=1  
    delaysms(50);  
    LCD_CtrlWrite_ILI9225(0x0011, 0x0007);    // // Set APON,PON,AON,VC11EN,VC  
    delaysms(50);  
    LCD_CtrlWrite_ILI9225(0x0010, 0x0A01);    // // Enter Standby mode  
}
```

void LCD_Exit Standby_ILI9225(void)

```
{  
    LCD_CtrlWrite_ILI9225(0x0010, 0x0A00);    // Exit Sleep/ Standby mode  
    LCD_CtrlWrite_ILI9225(0x0011, 0x103B);    // // Set APON,PON,AON,VC11EN,VC  
    delaysms(50)  
    LCD_CtrlWrite_ILI9225(0x0007, 0x1017);    // Set D1=0, D0=1  
}
```


4.2 Hydis 2.2”Panel

void ILI9225_Hydis22_Initial(void)

```

{
// VCI=2.8V
//***** Reset LCD Driver *****//
LCD_nRESET = 1;
    delays(1); // Delay 1ms
LCD_nRESET = 0;
    delays(10); // Delay 10ms           // This delay time is necessary
LCD_nRESET = 1;
    delays(50); // Delay 50 ms
//***** Start Initial Sequence *****//
LCD_CtrlWrite_ILI9225(0x0001, 0x011C); // set SS and NL bit
LCD_CtrlWrite_ILI9225(0x0002, 0x0100); // set 1 line inversion
LCD_CtrlWrite_ILI9225(0x0003, 0x1030); // set GRAM write direction and BGR=1.
LCD_CtrlWrite_ILI9225(0x0008, 0x0808); // set BP and FP
LCD_CtrlWrite_ILI9225(0x000C, 0x0000); // RGB interface setting  R0Ch=0x0110 for RGB 18Bit and R0Ch=0111for RGB16Bit
LCD_CtrlWrite_ILI9225(0x000F, 0x0801); // Set frame rate
LCD_CtrlWrite_ILI9225(0x0020, 0x0000); // Set GRAM Address
LCD_CtrlWrite_ILI9225(0x0021, 0x0000); // Set GRAM Address
//*****Power On sequence *****//
delays(50); // Delay 50ms
LCD_CtrlWrite_ILI9225(0x0010, 0x0A00); // Set SAP,DSTB,STB
LCD_CtrlWrite_ILI9225(0x0011, 0x103B); // Set APON,PON,AON,VCI1EN,VC
delays(50); // Delay 50ms
LCD_CtrlWrite_ILI9225(0x0012, 0x6121); // Internal reference voltage= Vci;
LCD_CtrlWrite_ILI9225(0x0013, 0x006F); // Set GVDD
LCD_CtrlWrite_ILI9225(0x0014, 0x495F); // Set VCOMH/VCOML voltage
//----- Set GRAM area -----//
LCD_CtrlWrite_ILI9225 (0x30, 0x0000);
LCD_CtrlWrite_ILI9225 (0x31, 0x00DB);
LCD_CtrlWrite_ILI9225 (0x32, 0x0000);
LCD_CtrlWrite_ILI9225 (0x33, 0x0000);
LCD_CtrlWrite_ILI9225 (0x34, 0x00DB);
LCD_CtrlWrite_ILI9225 (0x35, 0x0000);
LCD_CtrlWrite_ILI9225 (0x36, 0x00AF);
LCD_CtrlWrite_ILI9225 (0x37, 0x0000);
LCD_CtrlWrite_ILI9225 (0x38, 0x00DB);
LCD_CtrlWrite_ILI9225 (0x39, 0x0000);
// ----- Adjust the Gamma Curve -----//
LCD_CtrlWrite_ILI9225(0x0050, 0x0000);
LCD_CtrlWrite_ILI9225(0x0051, 0x0808);
LCD_CtrlWrite_ILI9225(0x0052, 0x080A);
LCD_CtrlWrite_ILI9225(0x0053, 0x000A);
LCD_CtrlWrite_ILI9225(0x0054, 0x0A08);
LCD_CtrlWrite_ILI9225(0x0055, 0x0808);
LCD_CtrlWrite_ILI9225(0x0056, 0x0000);
LCD_CtrlWrite_ILI9225(0x0057, 0x0A00);
LCD_CtrlWrite_ILI9225(0x0058, 0x1007);
LCD_CtrlWrite_ILI9225(0x0059, 0x0710);
delays(50); // Delay 50ms
LCD_CtrlWrite_ILI9225(0x0007, 0x1017);
}

```

void LCD_Enter Standby_ILI9225(void)

```
{
LCD_CtrlWrite_ILI9225(0x0007, 0x0000);    // Set D1=0, D0=1
delayms(50);
LCD_CtrlWrite_ILI9225(0x0011, 0x0007);    // // Set APON,PON,AON,VC11EN,VC
delayms(50);
LCD_CtrlWrite_ILI9225(0x0010, 0x0A01);    // // Enter Standby mode
}
```

void LCD_Exit Standby_ILI9225(void)

```
{
LCD_CtrlWrite_ILI9225(0x0010, 0x0A00);    // Exit Sleep/ Standby mode
LCD_CtrlWrite_ILI9225(0x0011, 0x103B);    // // Set APON,PON,AON,VC11EN,VC
delayms(50)
LCD_CtrlWrite_ILI9225(0x0007, 0x1017);    // Set D1=0, D0=1
}
```


2. Revision History

Revision History

Version No.	Date	Page	Description
V0.1	2008/01/25		New Created
V0.2	2008/02/20		Add BOE FPC
V0.3	2008/03/07		Remove schottky diode form VGH pin
V0.4	2008/04/01		Add AUO 2.2 inch FPC
V0.5	2008/04/25		Add CPT2.0 CMO2.2 Hydis2.2 WKT1.8 panel initial code and modify AUO FPC pin define sequence
V0.6	2008/05/06		Modify CPT FPC circuit