

M451从U盘显示BMP文件

NuMicro® 32 位系列微控制器范例代码介绍

文件信息

代码简述	本范例代码使用 M451 读出 U 盘的 BMP 档
BSP 版本	M451BSP_v3.01.003
开发平台	NuTiny-EVB-M451-LQFP100 V1.3

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1 功能介绍

1.1 简介

使用M451 TINY BOARD，应用EBI界面连接3.5寸TFT屏，再把U盘的BMP档读出。

BMP格式为24 BIT，转成RGB 565格式丢出。

2 代码介绍

ILI9325 初始化:

```
void ILI9325_Initial(void)
{
    SET_RST;
    CLK_SysTickDelay(1000); // Delay 1ms
    CLR_RST;
    CLK_SysTickDelay(10000); // DeLCD_CtrlWrite_ILI9325elay 10ms ,This delay time is necessary
    SET_RST;
    CLK_SysTickDelay(50000); // Delay 50 ms

    //***** Start Initial Sequence *****

    LCD_WR_REG(0xCF);
    LCD_WR_DATA(0x00);
    LCD_WR_DATA(0xC1);
    LCD_WR_DATA(0X30);
    LCD_WR_REG(0xED);
    LCD_WR_DATA(0x64);
    LCD_WR_DATA(0x03);
    LCD_WR_DATA(0X12);
    LCD_WR_DATA(0X81);
    LCD_WR_REG(0xE8);
    LCD_WR_DATA(0x85);
    LCD_WR_DATA(0x10);
    LCD_WR_DATA(0x7A);
    LCD_WR_REG(0xCB);
    LCD_WR_DATA(0x39);
    LCD_WR_DATA(0x2C);
    LCD_WR_DATA(0x00);
    LCD_WR_DATA(0x34);
    LCD_WR_DATA(0x02);
    LCD_WR_REG(0xF7);
    LCD_WR_DATA(0x20);
    LCD_WR_REG(0xEA);
    LCD_WR_DATA(0x00);
    LCD_WR_DATA(0x00);
    LCD_WR_REG(0xC0); //Power control
    LCD_WR_DATA(0x1B); //VRH[5:0]
```

```
LCD_WR_REG(0xC1);          //Power control
LCD_WR_DATA(0x01);          //SAP[2:0];BT[3:0]
LCD_WR_REG(0xC5);          //VCM control
LCD_WR_DATA(0x30);          //3F
LCD_WR_DATA(0x30);          //3C
LCD_WR_REG(0xC7);          //VCM control2
LCD_WR_DATA(0XB7);
LCD_WR_REG(0x36);          // Memory Access Control
LCD_WR_DATA(0x48);
LCD_WR_REG(0x3A);
LCD_WR_DATA(0x55);
LCD_WR_REG(0xB1);
LCD_WR_DATA(0x00);
LCD_WR_DATA(0x1A);
LCD_WR_REG(0xB6);          //Display Function Control
LCD_WR_DATA(0x0A);
LCD_WR_DATA(0xA2);
LCD_WR_REG(0xF2);          //3Gamma Function Disable
LCD_WR_DATA(0x00);
LCD_WR_REG(0x26);          //Gamma curve selected
LCD_WR_DATA(0x01);
LCD_WR_REG(0xE0);          //Set Gamma
LCD_WR_DATA(0x0F);
LCD_WR_DATA(0x2A);
LCD_WR_DATA(0x28);
LCD_WR_DATA(0x08);
LCD_WR_DATA(0x0E);
LCD_WR_DATA(0x08);
LCD_WR_DATA(0x54);
LCD_WR_DATA(0XA9);
LCD_WR_DATA(0x43);
LCD_WR_DATA(0x0A);
LCD_WR_DATA(0x0F);
LCD_WR_DATA(0x00);
LCD_WR_DATA(0x00);
LCD_WR_DATA(0x00);
LCD_WR_REG(0XE1);          //Set Gamma
LCD_WR_DATA(0x00);
LCD_WR_DATA(0x15);
LCD_WR_DATA(0x17);
```

```
LCD_WR_DATA(0x07);
LCD_WR_DATA(0x11);
LCD_WR_DATA(0x06);
LCD_WR_DATA(0x2B);
LCD_WR_DATA(0x56);
LCD_WR_DATA(0x3C);
LCD_WR_DATA(0x05);
LCD_WR_DATA(0x10);
LCD_WR_DATA(0x0F);
LCD_WR_DATA(0x3F);
LCD_WR_DATA(0x3F);
LCD_WR_DATA(0x0F);
LCD_WR_REG(0x2B);
LCD_WR_DATA(0x00);
LCD_WR_DATA(0x00);
LCD_WR_DATA(0x01);
LCD_WR_DATA(0x3f);
LCD_WR_REG(0x2A);
LCD_WR_DATA(0x00);
LCD_WR_DATA(0x00);
LCD_WR_DATA(0x00);
LCD_WR_DATA(0xef);
LCD_WR_REG(0x11); //Exit Sleep
CLK_SysTickDelay(120000);
LCD_WR_REG(0x29); //display on

//set xy, y
LCD_WR_REG(0x36);
LCD_WR_DATA(0x0);

//set x, y memory access
LCD_WR_REG(0x2a);
LCD_WR_DATA(0 >> 8);
LCD_WR_DATA(0 & 0xFF);
LCD_WR_DATA(320 >> 8);
LCD_WR_DATA(320 & 0xFF);
LCD_WR_REG(0x2b);
LCD_WR_DATA(0 >> 8);
LCD_WR_DATA(0 & 0xFF);
LCD_WR_DATA(480 >> 8);
LCD_WR_DATA(480 & 0xFF);
```

```
}
```

初始化 USB Host Mass Storage:

```
int  USBH_MassInit(void)
{
    int i = 0;

    g_umas = NULL;

    for(i = 0; i < UMAS_MAX_DEV; i++)
        _umac_alloc_mark[i] = 0;
    /* register the driver, return -1 if error */
    if(USBH_RegisterDriver(&_UsbMassStorageDriver) < 0)
        return -1;
    return 0;
}
```

在 main 中读出 U 盘的 BMP 档:

```
while (1)
{
    LCD_SetCursor(0, p);
    LCD_WR_REG(0x2c);
    res = f_read(&file1, Buff, 320 * 3, &s1);

    for (i = 0; i < s1; i = i + 3)
    {
        b = Buff[i] >> 3;
        g = Buff[i + 1] >> 2;
        r = Buff[i + 2] >> 3;
        color = b | (g << 5) + (r << (5 + 6));
        LCD_WR_DATA(color);
    }

    p--;
    if (res || s1 == 0)
        break;
}
```

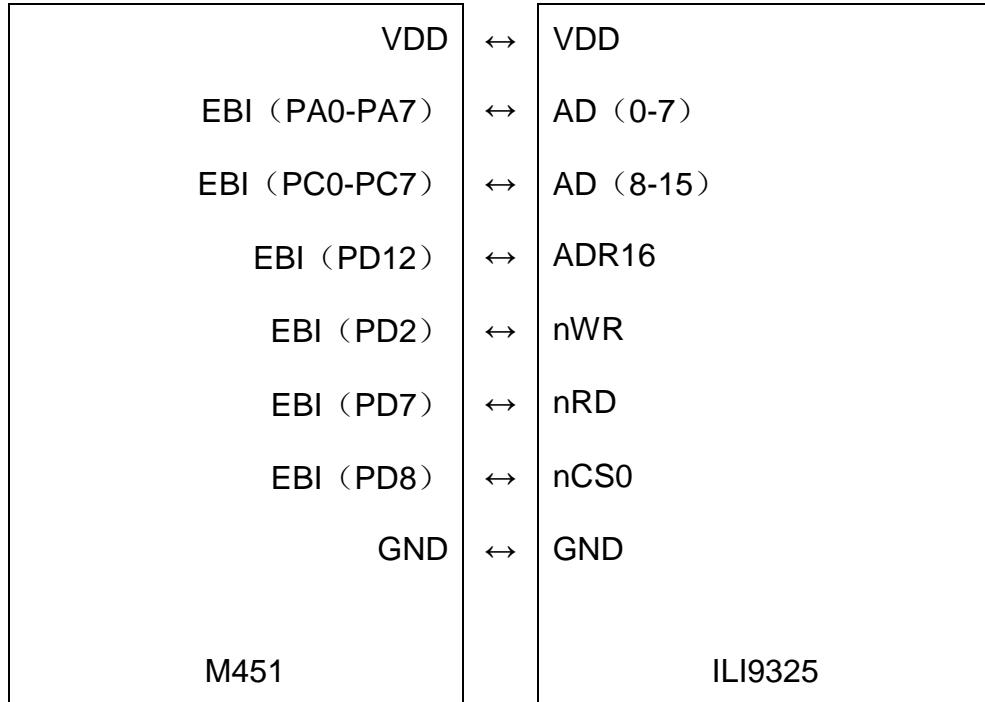
3 软件与硬件环境

- 软件环境

- BSP 版本
 - ◆ M451BSP_v3.01.003
- IDE 版本
 - ◆ Keil uVersion5.25

- 硬件环境

- 电路组件
 - ◆ NuTiny-EVB-M451
 - ◆ ILI9325
- 示意图



4 目录信息

EC_M451_Display_BMP_File_From_USB_Disk_V1.00	
Library	Sample code header and source files
CMSIS	Cortex® Microcontroller Software Interface Standard (CMSIS) by Arm® Corp.
Device	CMSIS compliant device header file
StdDriver	All peripheral driver header and source files
UsbHostLib	USB host library source code
SampleCode	
ExampleCode	Source file of example code
ThirdParty	
FatFs	A generic FAT file system module for small embedded systems. Its official website is: http://elm-chan.org/fsw/ff/00index_e.html .

5 如何执行范例程序

1. 根据目录信息章节进入 ExampleCode 路径中的 KEIL 文件夹，双击 Display_BMP_File_From_USB_Disk.uvproj。
2. 进入编译模式接口
 - a. 编译
 - b. 下载代码至内存
 - c. 进入 / 离开除错模式
3. 进入除错模式接口
 - a. 执行代码

6 修订纪录

Date	Revision	Description
Jul.24, 2019	1.00	1. 初始发布.

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