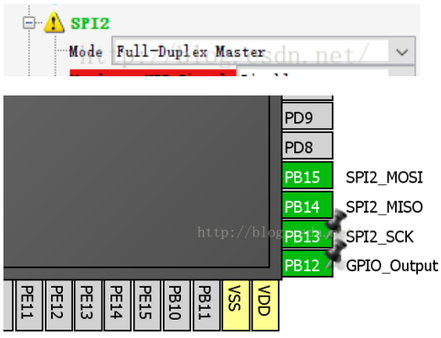
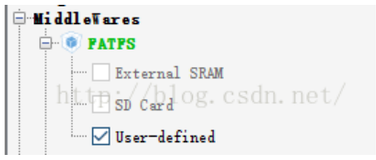
使用STM32CUBEMX生成FatFS代码，操作SPI FLASH

2016-03-10 21:50 280人阅读 评论(0) 收藏 举报

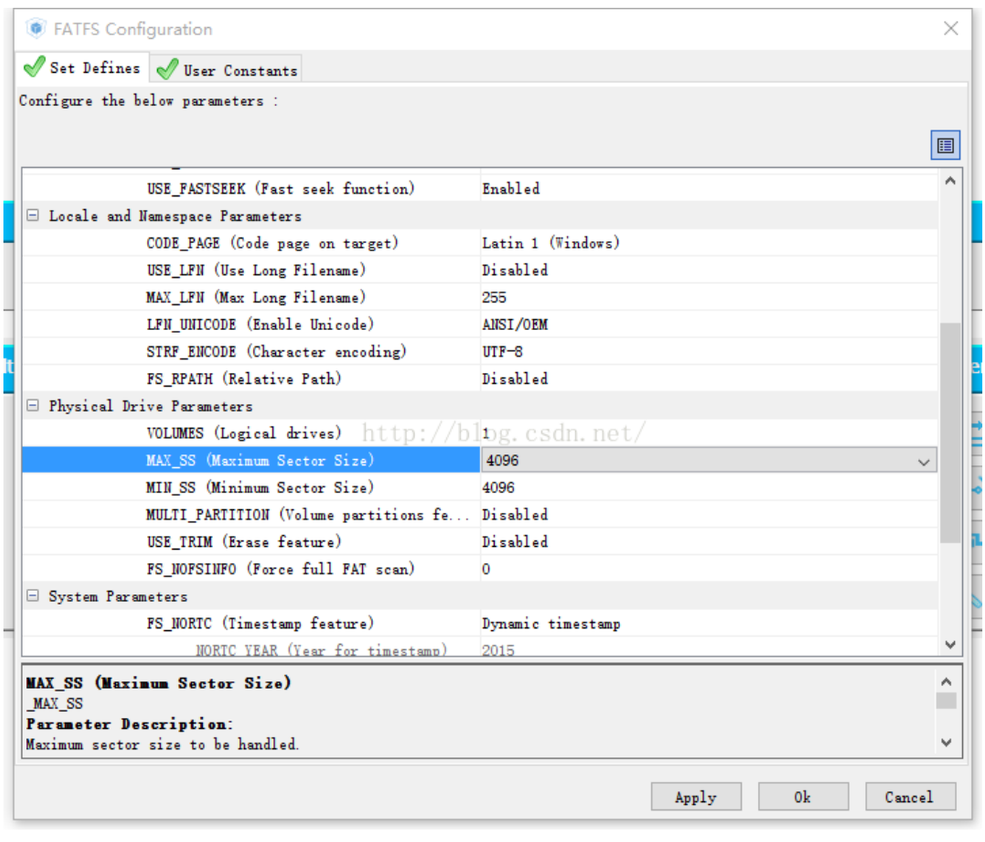
首先配置SPI，我的板子是SPI2连接到SPI FLASH 上，我的flash是W25Q64， PB12用来当CSN。



接下来配置FATFS，这里选择用户定义的。



配置FATFS的时候要注意，由于SPI FLASH 的sector是4096字节的，故需要设置sector的大小为4096，其余选项根据自己情况配置。



配置好了生成代码和工程。记得把堆栈尺寸调大一些。我用IAR这样配置：

mengfei314

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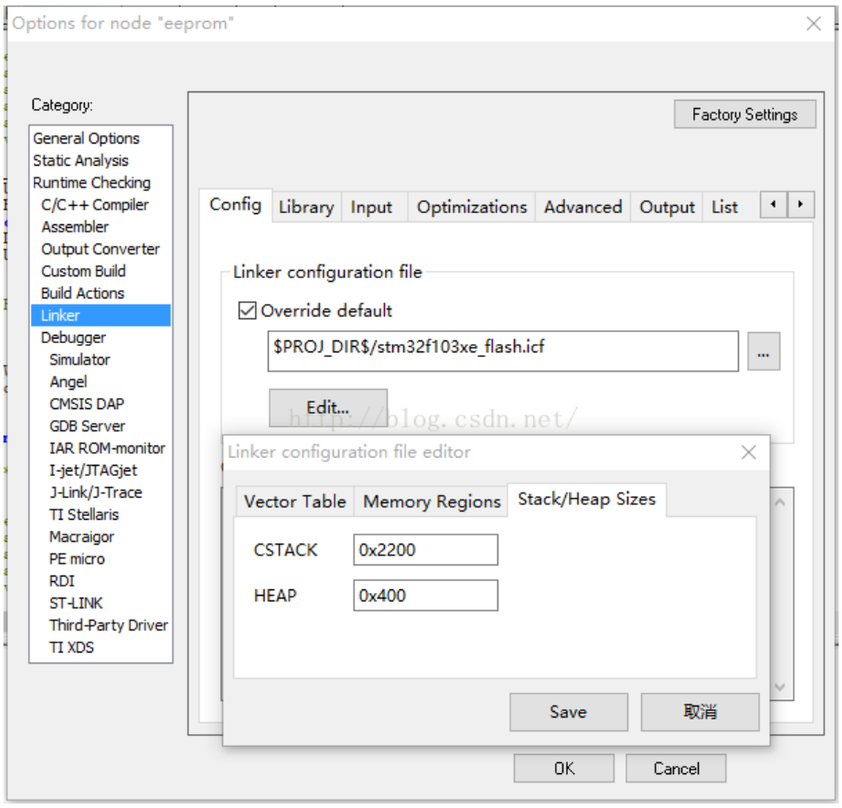
卡的信息都没有问题，...



接着把SPI FLASH的读写操作实现：读一个sector和写一个sector。我写好的函数叫做W25_WriteSector和W25_ReadSector. 然后定义好常量：

```cpp
#define PAGE_SIZE       256
#define SECTOR_SIZE     4096

#define SECTOR_COUNT    200
#define BLOCK_SIZE  65536
#define FLASH_PAGES_PER_SECTOR  SECTOR_SIZE/PAGE_SIZE
```

下一步打开user_diskio.c 文件，填充几个函数。

```cpp
/**
  * @brief  Reads Sector(s)
  * @param  pdrv: Physical drive number (0..)
  * @param  *buff: Data buffer to store read data
  * @param  sector: Sector address (LBA)
  * @param  count: Number of sectors to read (1..128)
  * @retval DRESULT: Operation result
  */
DRESULT USER_read (
    BYTE pdrv,      /* Physical drive nmuber to identify the drive */
    BYTE *buff,     /* Data buffer to store read data */
    DWORD sector,   /* Sector address in LBA */
    UINT count      /* Number of sectors to read */
)
{
  /* USER CODE HERE */
  UINT i = 0;
  for(i = 0; i < count; i ++)
  {
    W25_ReadSector(sector, buff);
    sector ++;
    buff += SECTOR_SIZE;
  }
  return RES_OK;
}
```

```cpp
/**
  * @brief  Writes Sector(s)
  * @param  pdrv: Physical drive number (0..)
  * @param  *buff: Data to be written
  * @param  sector: Sector address (LBA)
  * @param  count: Number of sectors to write (1..128)
  * @retval DRESULT: Operation result
  */
#if _USE_WRITE == 1
DRESULT USER_write (
    BYTE pdrv,          /* Physical drive nmuber to identify the drive */
    const BYTE *buff,   /* Data to be written */
    DWORD sector,       /* Sector address in LBA */
```

```
    UINT count          /* Number of sectors to write */
)
{
  /* USER CODE HERE */
  UINT i = 0;
  for(i = 0; i < count; i ++)
  {
    W25_WriteSector(sector, buff);
    sector ++;
    buff += SECTOR_SIZE;
  }
  return RES_OK;
}
#endif /* _USE_WRITE == 1 */
```

```cpp
/**
  * @brief  I/O control operation
  * @param  pdrv: Physical drive number (0..)
  * @param  cmd: Control code
  * @param  *buff: Buffer to send/receive control data
  * @retval DRESULT: Operation result
  */
#if _USE_IOCTL == 1
DRESULT USER_ioctl (
    BYTE pdrv,      /* Physical drive nmuber (0..) */
    BYTE cmd,       /* Control code */
    void *buff      /* Buffer to send/receive control data */
)
{
  DRESULT res = RES_OK;

  switch(cmd)
  {
    case CTRL_SYNC :
        break;

    case CTRL_TRIM:
        break;

    case GET_BLOCK_SIZE:
    *(DWORD*)buff = BLOCK_SIZE;
    break;

    case GET_SECTOR_SIZE:
    *(DWORD*)buff = SECTOR_SIZE;
        break;

    case GET_SECTOR_COUNT:
    *(DWORD*)buff = SECTOR_COUNT;
    break;

    default:
    res = RES_PARERR;
    break;
    }

  return res;
}
#endif /* _USE_IOCTL == 1 */
```

这些函数填充好，就可以用FATFS了。对于一个新的SPI FLASH，先挂载f_mount，再格式化文件系统f_mkfs，之后就可以做各种新建文件、读写操作了。

补充一个，在fatfs.c 文件中，定义了这样一个：

```cpp
char USER_Path[4];  /* USER logical drive path */
```

之后我们可以在main或者其他文件里用extern声明它，mount和mkfs时的USER_Path都是它。

附上我的测试代码

```cpp
void mount_disk(void)
{
  uint8_t res = f_mount(&fs, USER_Path, 0);
  if (res != FR_OK)
  {
    printf("FAILED: %d\n",res);
   return;
 }
  printf("MOUNT OK\n");
```

```
}

void format_disk(void)
{
  uint8_t res = 0;

  printf("PROCESSING...\n");
  res = f_mkfs(USER_Path, 1, 4096);
  if (res == FR_OK)
  {
    printf("OK!\n");
  }
  else
  {
    printf("failed with: %d\n",res);
  }
}

void create_file(void)
{
  FIL file;
  FIL *pf = &file;
  uint8_t res;

  res = f_open(pf, "0:/test.txt", FA_OPEN_ALWAYS | FA_WRITE);
  if (res == FR_OK)
  {
    printf("creat ok\n");
  }
  else
  {
    printf("creat failed\n");
    printf("error code: %d\n",res);
  }

  f_printf(pf, "hello fatfs!\n");

  res = f_close(pf);
    if (res != FR_OK)
    {
      printf("close file error\n");
      printf("error code: %d\n",res);
    }
}

void get_disk_info(void)
{
    FATFS fs;
    FATFS *fls = &fs;
    FRESULT res;
    DWORD fre_clust;

    res = f_getfree("/",&fre_clust,&fls);         /* Get Number of Free Clusters */
    if (res == FR_OK)
    {
                                                 /* Print free space in unit of MB (assuming 4096
        printf("%d KB Total Drive Space.\n"
               "%d KB Available Space.\n",
               ((fls->n_fatent-2)*fls->csize)*4,(fre_clust*fls->csize)*4);
    }
    else
    {
        printf("get disk info error\n");
        printf("error code: %d\n",res);
    }
}

void read_file(void)
{
  FIL file;
  FRESULT res;
  UINT bw;
  uint8_t rbuf[100] = {0};

  res = f_open(&file, "0:/test.txt", FA_READ);
  if (res != FR_OK)
  {
    printf("open error: %d\n",res);
    return;
  }
  f_read(&file, rbuf, 20, &bw);
  printf("%s\n", rbuf);

  res = f_close(&file);
  if (res != FR_OK)
  {
     printf("close file error\n");
     printf("error code: %d\n",res);
  }
}
```

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