

本文件是 ArduinoDue_SpiFlashProgramWithSdCard 项目的使用说明,这个项目的操作内容 是利用 Arduino Due 经由按键触发后,开始读取 SD 内指定档名 All_Pic.bin 文件数据,并透过 SPI 接口将读取的数据烧写至 RA8876 或 RA8877 驱动板上的 SPI FLASH,其过程的状态可以经由 Arduino IDE serial monitor 检视,详细说明如下:

硬件需求

Arduino Due 开发板
 SD Card Adapter
 Push Button
 RA8876 or RA8877 驱动板
 板上必须有预留 serial flash 烧路连接阜,TEST[2:1] PIN 设定切换开关.
 SD card (maximum 4GB)









Set RA8876 or RA8877 TEST[2:1] PIN to [01]:

强制 SPI master 界面引脚保持在浮动状态(floating state)(这个操作是给 serial flash 在线烧写 使用)

— Serial Flash ROM 给 DMA 功能使用

SPI Flash 外部烧录埠

1	SPI_CS1
2	SPI_SO
3	SPI_SI
4	SPI_SCLK
5	3.3V
6	GND

Note:

- 1. Arduino Due SPI interface, GND, 3.3V PIN 必须连接到这个连接阜, 如果 RA8876 or RA8877 驱动板有供电, Arduino Due 则不需要为 RA8876 or RA8877 驱动板提供 3.3V.
- 2. RA8876 or RA8877 提供两个 SPI master interface,我们建议 CS0 连接到 Genitop Font ROM,CS1 连接到 serial flash.



3. 当 RA8876 or RA8877 TEST[2:1] pin set to [01],SPI master interface pin 状态会是悬空,如 果 CS0 有连接至 Genitop Font ROM,则 CS0 必须有连接提升电阻到 3.3V,以避免 Arduino Due 无法正常烧写 CS1 线路上的 serial flash.

软件需求 Arduino IDE 1.5.7 <u>http://arduino.cc/en/Main/Software</u> RA8876 Image_Tool_1.0 <u>www.raio.com.tw</u>

操作流程

- 1. 根据上述连接好硬件线路.
- 2. 透过 PC 复制 file2sdcard 档案夹内的 All_Pic.bin,wp1.bin 文件到 SD 卡. 完成后将 SD 卡插入已经连接到 Arduino Due 开发板的 SD 卡转接板.

注:All_Pic.bin(28125KB)与 wp1.bin(938KB)是使用 RA8876Image_Tool_1.0 图档转换工具 转换好的 bin 档文件.

3. 开启 ArduinoDue_SpiFlashProgramWithSdCard.ino 项目,选择 flash type,重新编译后下载.



RA8876 SPI FLASH PROGRAMMER



注:

当 Serial flash 容量 > 128Mbit(16MByte) 选择 #define FLASH_32BIT_ADDR

4. 开启 Arduino Due serial monitor 检视目前的状态.



RA8876 SPI FLASH PROGRAMMER

💿 SpiFlashProgramWithSdCard Arduino 1.5.7					
File E	idit Sketch Tools Help				
Spi	Auto Format Ctrl+T Archive Sketch FlashProgram Spl. Flash Program	<u>م</u>			
1	Hind Inde Seriel Meeiter Child Shift M	-			
2	#include Sena Monton Containterior	E			
3	finclude -				
4	#include				
5	rincluda Programmer ►				
6	Burn Bootloader				
7	boolean FlashErase(void);				
8	<pre>boolean ByteProgramBinToFlash24BitAddr(char * filename);</pre>				
9	<pre>boolean ByteProgramBinToFlash32BitAddr(char * filename);</pre>				
10	<pre>boolean PageProgramBinToFlash24BitAddr(char * filename);</pre>				
-11	11				
12	<pre>boolean VerifyDataFlash24BitAddr(char * filename);</pre>				
13	boolean VerifyDataFlash32BitAddr(c <mark>har</mark> * filename);				
14					
15	/*sd card scs*/				
16	<pre>const int SD_CARD_SCS = 4;</pre>				
17	17 /*spi flash scs*/				
18	const int XNSUS = 52;				
19	/*rabb/b XNSCS and XNFeset*/				
20	2U //const int RA8876_ANSUS = 52;				
21	$\frac{1}{1000} \frac{1}{1000} \frac{1}{1000$	-			
	4	- F			
Done	uploading.				
Verify successful					
Set boot flash true					
CPU :	CPU reset.				
24	Arduino Due (Programmi	ing Port) on COM9			



RA8876 SPI FLASH PROGRAMMER



正常应该要看到如上图显示,如果不是,请再检查线路.

5. 按下按键开始执行 serial flash 烧写.Serial flash 烧写过程包含,擦除,烧写,数据验证. 本文范例为烧写 28125KByte 数据到 256Mbit(32MByte) serial flash,操作时间如下表.

Flash erase	60 秒
Flash erase + Program 28125KByte	375 秒
Flash erase + Program 28125Kbyte +	848 秒
Verify	



正常操作的情况应该显示如下图:

💿 SpiFlashProgramWithSdCard Arduino 1.5.7						
File Ed	it Sketch Tools Help					
00			2			
SpiFI	ashProgramWithSdCard					
82	/*Verlfy	COM9 (Arduino Due (Programming Port))	*			
83	<mark>if</mark> (Verify	Send				
84	analog∛ri	Spi Flash Program				
85	else	SD card initialized				
86	analog∛ri	Click button to start flash program!				
87	}	Flash erase start				
88	else	Flash erase done	E			
89	{	File open ok!				
90	analogWrit	Program 32bit address start				
91	}	Program done!				
92	#endif	File open ok!				
93		Verify start				
94	#ifdef FLASH	Verify done!				
95	SFP.setSeria					
96	<mark>if</mark> (PageProgr					
97	{					
98	analogWri					
99	/*∀erify					
100	<mark>if</mark> (Verify					
101	analogWri					
102	else					
103	analog⊮ri					
104	}		Ŧ			
			•			
Done u	ploading.	[] [[[[[[[[[[[[[[[[[[
Verif	y successful	M gangeron	^			
Set boot flash true						
CPU reset.						
63	63 Atduino Due (Programming Port) on COM9					



如要节省时间,可以选择不执行资料验证.

💿 SpiFlashProgram	WithSdCard Arduino 1.5.7					
File Edit Sketch 1	ools Help					
SpiFlashProgram	WithSdCard§ Spi_Flash_Program.cpp Spi_Flash_Program.h					
25 #define H	LASH_32BIT_ADDR		~			
26						
27 //#define	VERIFY_DATA /*Verify will spend a lot of time*/		E			
28	© COM9 (Arduino Due (Programming Port))					
30 const int		Send				
31 /*push bu	Spi Flagh Program					
32 const int	SD card initialized					
33 // variat	Click button to start flash program!					
34 <mark>int</mark> butto	Flash erase start					
35	Flash erase done					
36 Spi_Flash	File open ok!					
37	Program 32bit address start					
38 void setu	Program done!					
39 /*LED						
40 pinMoo						
41 alla108						
43 /*Butt						
44 pinMod						
45						
46 /*PIO						
47 pinMod						
48 <mark>digit</mark> a						
49			-			
4			,			
Done uploading.						
Set boot flash						
CPU reset.	No line en	ding 🗶 9600 hand 🚽				
			-			
23		Arduino Due (Progra	mming Port) on COM9			

6.本文件的范例在烧写完成之后,可以搭配 RA8876_Lite_DMA.ino 显示图片.