MS51驱动TLC2543

NuMicro® 8 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 MS51 读取 TLC2543 的 A/D 转换值
BSP 版本	MS51_Series_BSP_Keil_V1.00.002
开发平台	NuTiny-MS51FB V1.1

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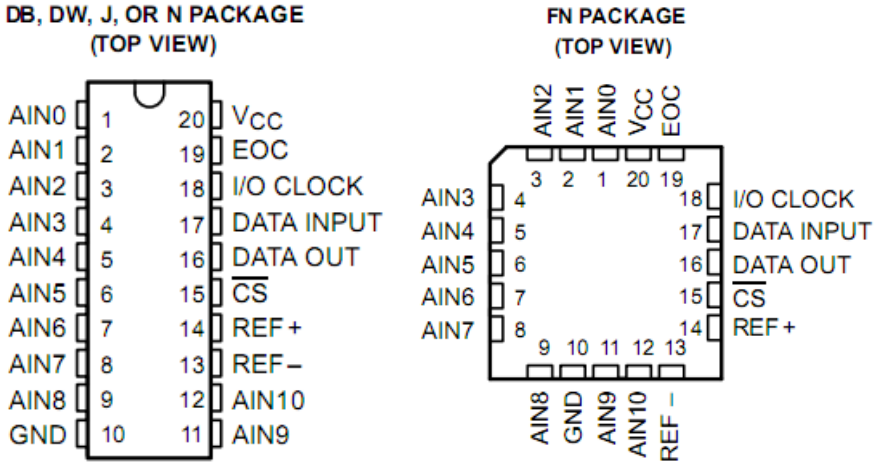
1 功能介绍

1.1 简介

TLC2543是带有11通道的12位A/D转换芯片，引脚图如下：



本范例使用MS51系列通过GPIO口模拟TLC2543的读写时序获取TLC2543的A/D转换结果，并通过串口打印出TLC2543采样的ADC值，TLC2543的读写时序如下：

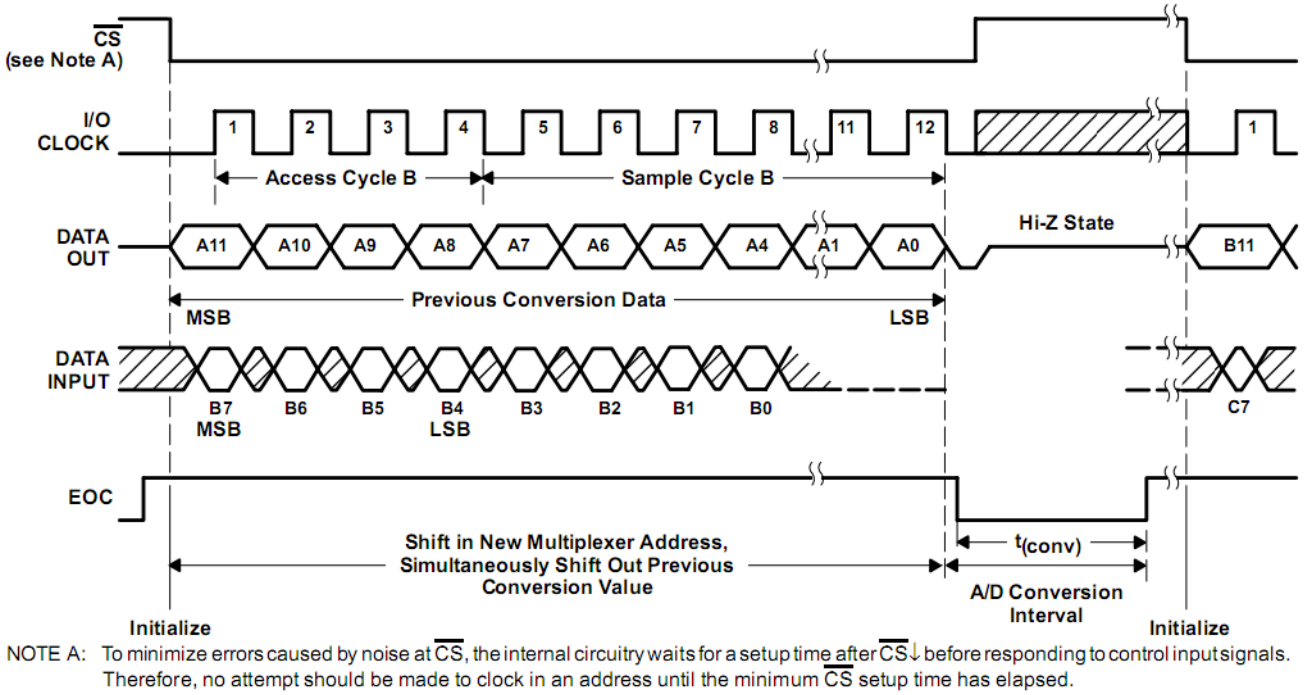


Figure 9. Timing for 12-Clock Transfer Using $\overline{CS}$ With MSB First

注：关于TLC2543的详细信息，请参考TLC2543的数据手册。

1.2 执行结果

执行结果，打印数据如下：

```
+-----------------------------------------------------------+
|   TLC2543 Driver                                          |
+-----------------------------------------------------------+
The ADC data is: 0x872
The ADC data is: 0x870
The ADC data is: 0x877
The ADC data is: 0x86a
The ADC data is: 0x875
The ADC data is: 0x873
The ADC data is: 0x86f
The ADC data is: 0x867
The ADC data is: 0x86a
The ADC data is: 0x870
The ADC data is: 0x875
The ADC data is: 0x86d
The ADC data is: 0x86f
```

2 代码介绍

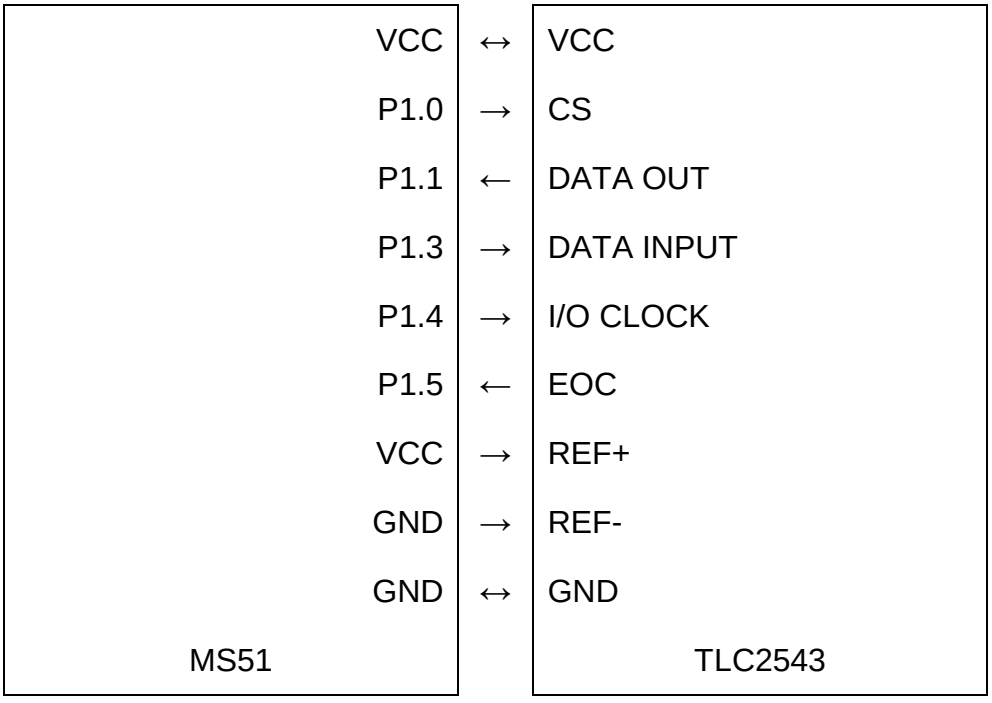
通过 GPIO 模拟 TLC2543 的读写时序，读取其 A/D 转换值：

```
/**
  * @brief Read the conversion data of TLC2543.
  *
  * @param[in] u8Channel define the conversion channel, from 0~11.
  *
  * @return  The conversion data. It is the previous conversion data.
*/
uint16_t TLC2543_Read(uint8_t u8Channel)
{
    uint16_t u16DataOut = 0;
    uint16_t u16DataIn = 0;
    uint8_t i = 0;

    u16DataOut = ((uint16_t)u8Channel) << 12;

    TLC2543_CS = 0;

    for(i = 0; i < 12; i++)
    {
        TLC2543_CLK = 0;
        TLC2543_DIN = (bit)(u16DataOut & 0x8000);
        u16DataOut <<= 1;
        TLC2543_Delay();
        TLC2543_CLK = 1;
        u16DataIn <<= 1;
        if(TLC2543_DOUT == 1)
        {
            u16DataIn |= 0x01;
        }
        TLC2543_Delay();
    }

    TLC2543_CLK = 0;
    TLC2543_Delay();
    TLC2543_CS = 1;
    TLC2543_Delay();
```

```
        while(TLC2543_EOC == 0);

        return u16DataIn;
    }
```

3 软件与硬件环境

- 软件环境
  - BSP 版本
    - MS51_Series_BSP_Keil_V1.00.002
  - IDE 版本
    - Keil uVersion 4.72
- 硬件环境
  - 电路组件
    - NuTiny-MS51FB V1.1
    - TLC2543
  - 示意图



4 目录信息

- EC_MS51_TLC2543_V1.00
  - Library — Sample code header and source files
    - Device — MCU header files
    - Startup — MCU Startup file
    - StdDriver — All peripheral driver header and source files
  - SampleCode
    - ExampleCode — Source file of example code

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 TLC2543.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
Sep.25, 2019	1.00	1. 初始发布.

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