Use Mini51 to read DS18B20

Example Code Introduction for 32-bit NuMicro® Family

Information

Application	This code uses Mini51 to read DS18B20
BSP Version	Mini51DE Series BSP CMSIS v3.02.000
Hardware	NuTiny-EVB-Mini51 v3.0

For additional information or questions, please contact: Nuvoton Technology Corporation.

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1 Function Description

1.1 Introduction

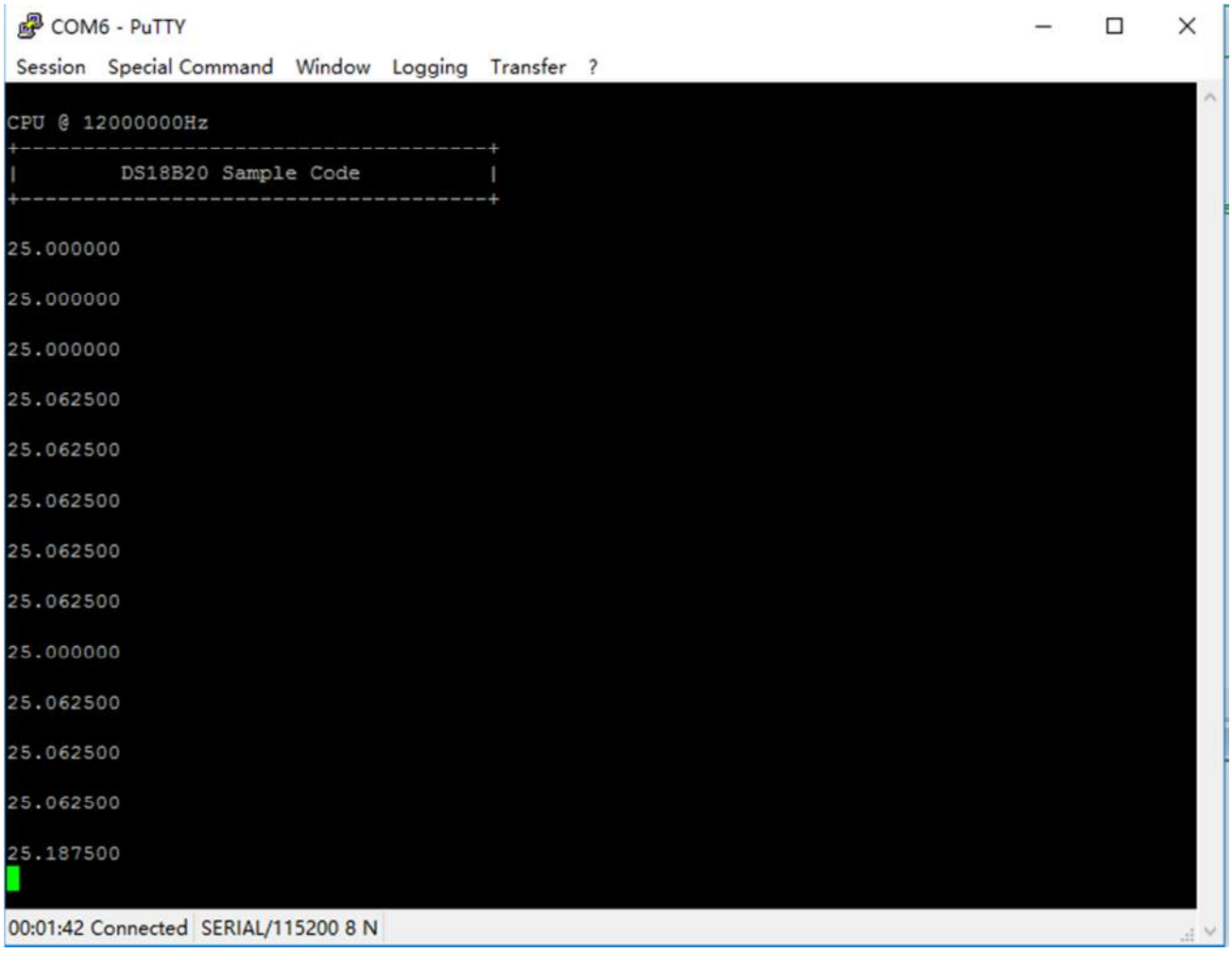
The MCU communicates with DS18B20 through P5.2, reads DS18B20 and then outputs the temperature through serial port as float type. DS18B20 temperature resolution is 12 bits. Serial port baud rate is 115200.

1.2 Principle

Please refer to DS18B20 Datasheet.

1.3 Demo Result

The UART0 TX pin of MCU is P0.0



2 Code Description

Reading the temperature of the DS18B20 is simple. There are two stages, and each stage has three steps. The first stage, sending reset, sending skip ROM, and sending convert temperature commands in order. The second stage, sending reset, sending skip ROM, and sending read temperature commands in order.

```
/**
  * @brief  Read temperature from DS18B20
  * @param  None
  * @return  i16temp: temperature
  */
int16_t DS18B20_ReadTemperature(void)
{
    uint8_t  u8tempH, u8tempL;
    int16_t  i16temp;

    DS18B20_Reset();
    DS18B20_WriteByte(CMD_SKIP_ROM);
    DS18B20_WriteByte(CMD_CONVERT_T);

    while (!DQ);                              //Waiting for conversion to complete

    DS18B20_Reset();
    DS18B20_WriteByte(CMD_SKIP_ROM);
    DS18B20_WriteByte(CMD_READ_SCRATCHPAD);
    u8tempL = DS18B20_ReadByte();             //Read temperature low byte
    u8tempH = DS18B20_ReadByte();             //Read temperature high byte
    i16temp = (u8tempH << 8) | u8tempL;

    return (i16temp);
}
```

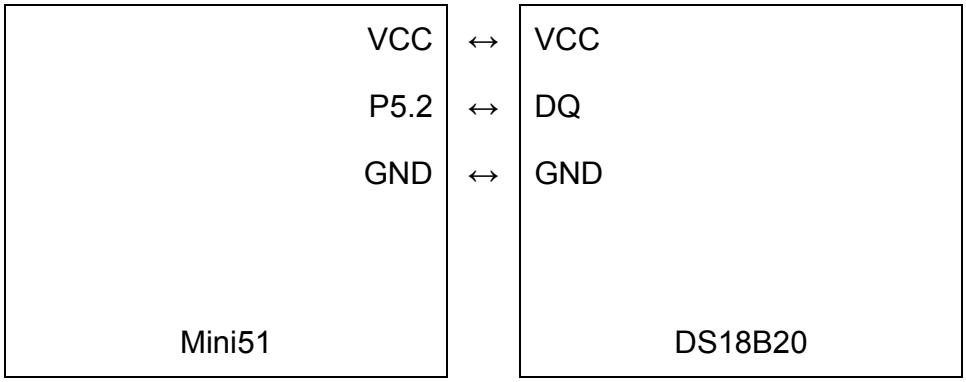
3 Software and Hardware Environment

Software Environment

- BSP version
  - Mini51DE Series BSP CMSIS v3.02.000
- IDE version
  - Keil uVersion 5.26

Hardware Environment

- Circuit components
  - NuTiny-EVB-Mini51 v3.0
  - DS18B20
- Diagram



4 Directory Information

- EC_Mini51_Ds18b20_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
  - SampleCode
    - ExampleCode — Source file of example code

5 How to Execute Example Code

1. Browsing into sample code folder by Directory Information (section 4) and double click Mini51_Ds18b20.uvproj.
2. Enter Keil compile mode
   a. Build
   b. Download
   c. Start/Stop debug session
3. Enter debug mode
   a. Run

6 Revision History

Date	Revision	Description
Jun. 19, 2019	1.00	1. Initially issued.

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