UART Rx Wakeup

Example Code Introduction for 32-bit NuMicro® Family

Information

Application	This code demo the UART RX wakeup
BSP Version	Nano100B Series BSP CMSIS V3.02.002
Hardware	NuTiny-EVB-Nano130-LQFP128 V1.0

The information described in this document is the exclusive intellectual property of Nuvoton Technology Corporation and shall not be reproduced without permission from Nuvoton.

Nuvoton is providing this document only for reference purposes of NuMicro microcontroller based system design. Nuvoton assumes no responsibility for errors or omissions.

All data and specifications are subject to change without notice.

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

www.nuvoton.com

1 Function Description

1.1 Introduction

This example code will demo the system how to wake up by UART RX. And the UART RX enables the PDMA function.

1.2 Principle

The program uses the UART0 TX to show the message. And uses the UART0 RX to be the system wake up source. The UART0 RX connect to PDMA channel 2, and enable PDMA transfer down and timeout interrupts. When the system power down, press any key to wake up the system.

1.3 Demo Result

```
CPU @ 12000000Hz
+------------------------------------------------------------+
|  UART Rx Wakeup Function Test                              |
+------------------------------------------------------------+

Enter Power Down...
 Wakeup OK!!

Enter Power Down...
 Wakeup OK!!

Enter Power Down...
 Wakeup OK!!

Enter Power Down...
 Wakeup OK!!

Enter Power Down...
 Wakeup OK!!

Enter Power Down...
```

2 Code Description

UART0 initial:

```
void UART0_Init()
{
    /*---------------------------------------------------------------------*/
    /* Init UART                                                           */
    /*---------------------------------------------------------------------*/
    UART_Open(UART0, 115200);
    UART0->CTL |= 0x40;     /* RX DMA enable */
}
```

UART RX PDMA setting:

```
PDMA_Open(1 << RX_CH);
PDMA_SetTransferCnt(RX_CH, PDMA_WIDTH_8, TEST_SIZE);
PDMA_SetTransferAddr(RX_CH, UART0_BASE, PDMA_SAR_FIX, (uint32_t)RX_Buffer, PDMA_DAR_INC);
PDMA_SetTransferMode(RX_CH, PDMA_UART0_RX, 0, 0);
PDMA_SetTimeOut(RX_CH, 1, 5000);
PDMA_EnableInt(RX_CH, (PDMA_IER_TD_IE_Msk | PDMA_IER_TO_IE_Msk));
NVIC_EnableIRQ(PDMA_IRQn);
```

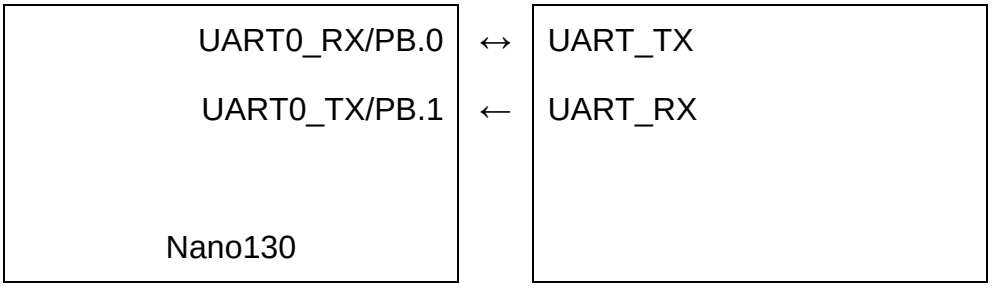
3 Software and Hardware Environment

Software Environment

- BSP version
  - Nano100B Series BSP CMSIS V3.02.002
- IDE version
  - Keil uVersion 5.15

Hardware Environment

- Circuit components
  - NuTiny-EVB-Nano130-LQFP128 V1.0
- Diagram



4 Directory Information

EC_NANO100B_UART_Rx_Wakeup_PDMA_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 NANO100B_UART_Rx_Wakeup_PDMA.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
July. 31, 2019	1.00	1. Initially issued.

Important Notice

Nuvoton Products are neither intended nor warranted for usage in systems or equipment, any malfunction or failure of which may cause loss of human life, bodily injury or severe property damage. Such applications are deemed, "Insecure Usage".

Insecure usage includes, but is not limited to: equipment for surgical implementation, atomic energy control instruments, airplane or spaceship instruments, the control or operation of dynamic, brake or safety systems designed for vehicular use, traffic signal instruments, all types of safety devices, and other applications intended to support or sustain life.

All Insecure Usage shall be made at customer's risk, and in the event that third parties lay claims to Nuvoton as a result of customer's Insecure Usage, customer shall indemnify the damages and liabilities thus incurred by Nuvoton.

Please note that all data and specifications are subject to change without notice.
All the trademarks of products and companies mentioned in this datasheet belong to their respective owners.