

## Application note

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### N32G033 series BOOT Jump application note

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#### Introduction

N32G033 series MCU embedded boot program (BOOT), stored in System Memory, used to reprogram user program (Main FLASH) through UART1 interface.

NSING technologies MCU series products provide a variety of starting mode, can be selected by BOOT0 pin and option byte configuration. In practice, the MCU is usually set to Main Flash boot mode. If you want to use the embedded bootstrap program, you must change the MCU to System Memory boot mode and then power it on again. For details on the startup mode, refer to the corresponding user manual.

This document describes a BOOT jump method to enable users to use the embedded bootstrap mode without changing the BOOT mode.

This document applies to the N32G033 series of NSING Technologies.

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## 1. Hardware requirements

Currently, bootstrap programs embedded in MCU only support UART1 interface, and corresponding IO ports are PA9/PA10 by default, and can be configured as PA13/PA14, PF0/PF1, PA2/PA3 by option byte USER4[1:0]. Ensure that the port connection is available before use.

## 2. Operation method

### 2.1 Project directory

Enter the project directory:

```
"Nsing.N32G033_Library.0.1.0\ projects\n32g033_EVAL\applications\JumpToBOOT"
```

KEIL Engineering "MDK-ARM"

Source file 'src/xxx. c'

Header file 'inc/xxx. h'

### 2.2 Parameters definition

#### 2.2.1 Function pointer

A function pointer type must be defined in advance: `typedef void (*pFunction)(void);`

#### 2.2.2 Necessary parameters

The following parameters must be defined:

```
uint32_t BootAddr, SPAddr;
```

### 2.3 Method of use

#### 2.3.1 System Clock Setting

Refer to the following functions to set the system clock to 64MHz and use HSI as the clock source.

```
void SetSysClock_HSI(void)
```

```
{
```

```
    /* Sets the code latency value */
```

```
    FLASH_SetLatency(FLASH_LATENCY_1);
```

```
    /* It is necessary to initialize the RCC peripheral to the reset state.*/
```

```
    RCC_DeInit();
```

```
/* Enable HSI */
RCC_EnableHsi(ENABLE);
while (RCC_WaitHsiStable() != SUCCESS)
{
    /* If HSI failed to start-up,the clock configuration must be wrong.
       User can add some code here to dela with this problem */
}

/* AHB prescaler factor set to 1,HCLK = SYSCLK = 64M */
RCC_ConfigHclk(RCC_SYSCLK_DIV1);
/* APB prescaler factor set to 1,PCLK2 = HCLK = 32M */
RCC_ConfigPclk(RCC_HCLK_DIV2);

/* Select HSI as system clock source */
RCC_ConfigSysclk(RCC_SYSCLK_SRC_HSI);

/* Wait till HSI is used as system clock source */
while (RCC_GetSysclkSrc() != RCC_SYSCLK_SRC_HSI);
}
```

### 2.3.2 API functions

By calling the following API (Jump\_To\_BOOT), the MCU jumps directly to the bootstrap program (BOOT)

```
void Jump_To_BOOT(void)
{
    /* Disable all interrupt */
    __disable_irq();

    /* Config IWDG */
    IWDG_ReloadKey();
    IWDG_WriteConfig(IWDG_WRITE_DISABLE);
    IWDG_SetPrescalerDiv(IWDG_PRESCALER_DIV256);
}
```

```
/* Config system clock as 64M with HSI */
SetSysClock_HSI();

BootAddr = *(uint32_t*)0x1FFF0004;
SPAddr = *(uint32_t*)0x1FFF0000;

/* Set JumpBoot addr */
pFunction JumpBoot = (pFunction)BootAddr;

/* Initialize Stack Pointer */
__set_MSP(SPAddr);

/* Enable interrupt */
__enable_irq();

/* Jump to BOOT */
JumpBoot();
}
```

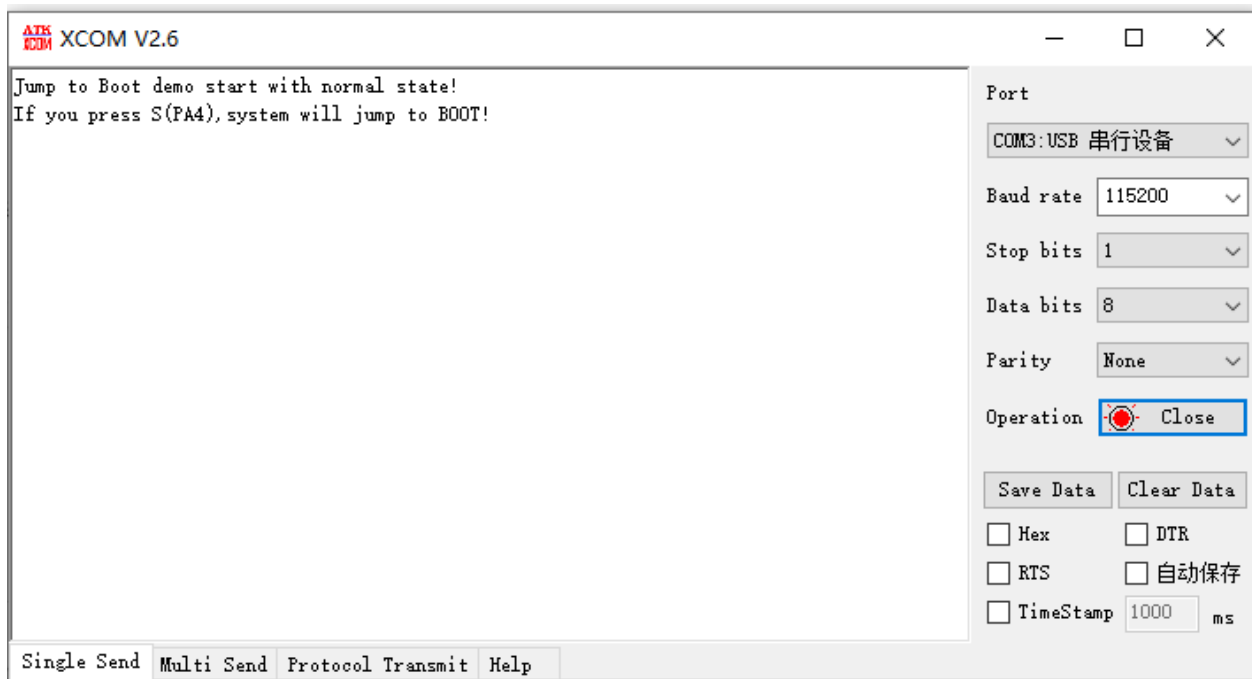
## 2.4 The sample application

With reference to the sample software package JumpToBOOT, it demonstrates how to jump to BOOT. After the jump is successful, the program can be updated through UART1 interface.

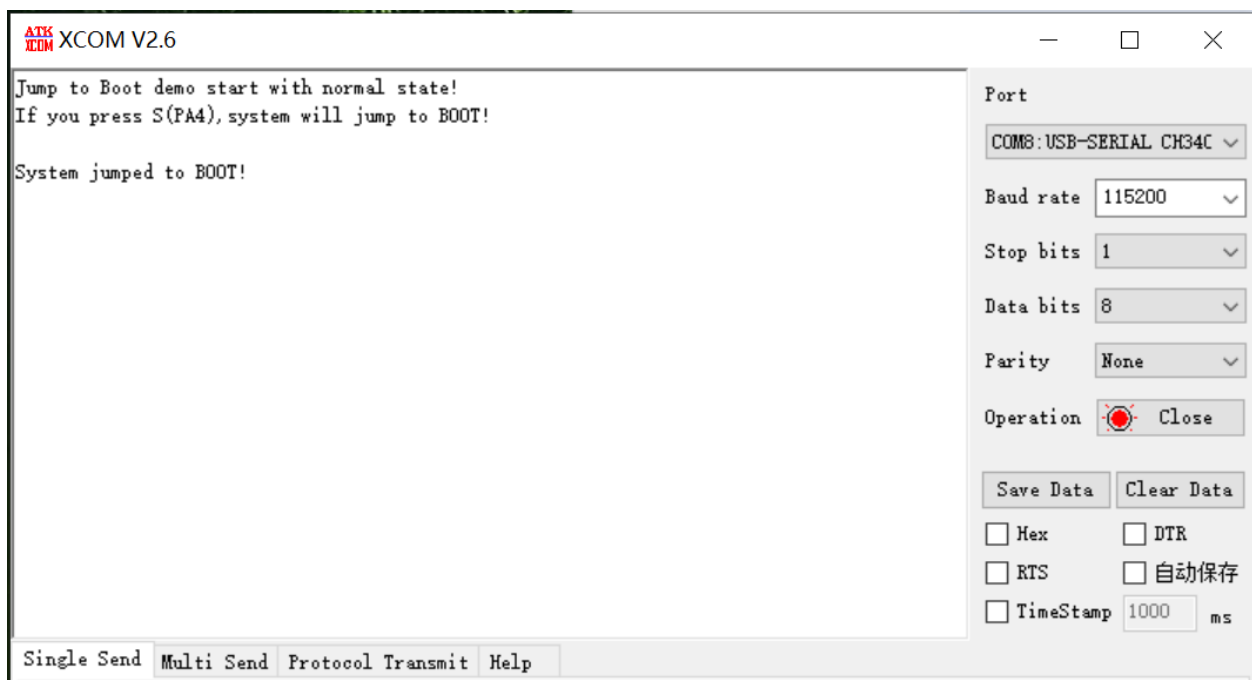
### 2.4.1 BOOT test

Based on N32G033K8Q7-1-STB V1.0, the test process is demonstrated.

1. Under KEIL, change the chip model to N32G033K8. After compiling, burn it to the development board. Connect PC through USB cable, turn on the power supply, and check the prompt information through serial port tool on PC.



2. Open the serial port in the serial port tool and press KEY2(PA4) to switch to BOOT.



3. Close the serial port again in the serial port tool (If not closed, the download tool will show the serial port failed to open), and the connection is successful through the BOOT download tool, as shown in the following figure.

**Nations MCU Download Tool V1.3.6**

Model File Operations Offline downloader Language Help

**Status**

Read chip information successfully!  
Chip Model:N32G033 Series  
Boot command set version:V1.0  
Boot Subversion:V1.0  
Flash size:64KB  
UCID:0x361610080F43303437303333330093939  
UID:0xFFFFFFFFFFFFFFFFFFFFFFFF  
The current chip is in read protection L0  
FLASH CRC32 value: 0xFFFFFFFF

Clear Recount Download Hide<<

**Configuration**

Interface: USART Baud rate: 9600

Device: COM3 Disconnect

**Download**

Erase Mode: Erase by file size

Start address:0x 08000000 Download Area: Flash

Download File: Browse

Download

☐ The front cross page does not erase the current page  
☐ The behind cross page does not erase the current page  
☐ Unlock the read protection L1 before downloading  
☐ Enable reading protection L1 after downloading  
☐ Enable reading protection L2 after downloading  
☐ Write CRC32

Copyright (C) 2020-2025 Nations Technologies Inc. Total:0 Pass:0 Fail:0 2025-09-08 14:57:31

### 3. Version history

| Version | Date       | Modify            |
|---------|------------|-------------------|
| V1.0.0  | 2025-09-08 | Create a document |
|         |            |                   |



## 4. Notice

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