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QN908x Production Flash Programming

Rev 1.1 — February 2018   **Application note**

Document information

Info	Content
Keywords	QN9080, QN9083, BLE, J-Link, Flash Programming
Abstract	This document describes the techniques for product programing the QN908x with J-Link interface.

Revision history

Rev	Date	Description
1.0	06/2017	Public release.
1.1	02/2018	Changed the flash layout to be consistent with SDK

Contact information

For more information, see www.nxp.com

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1. Introduction

J-Link is an interface for downloading of application files, configuration files, and data into the target chip for the Bluetooth Low Energy application development or mass production based on the QN908x platform.

The J-Link interface is implemented on these pins:

- PA22 for SWCLK
- PA23 for SWDIO

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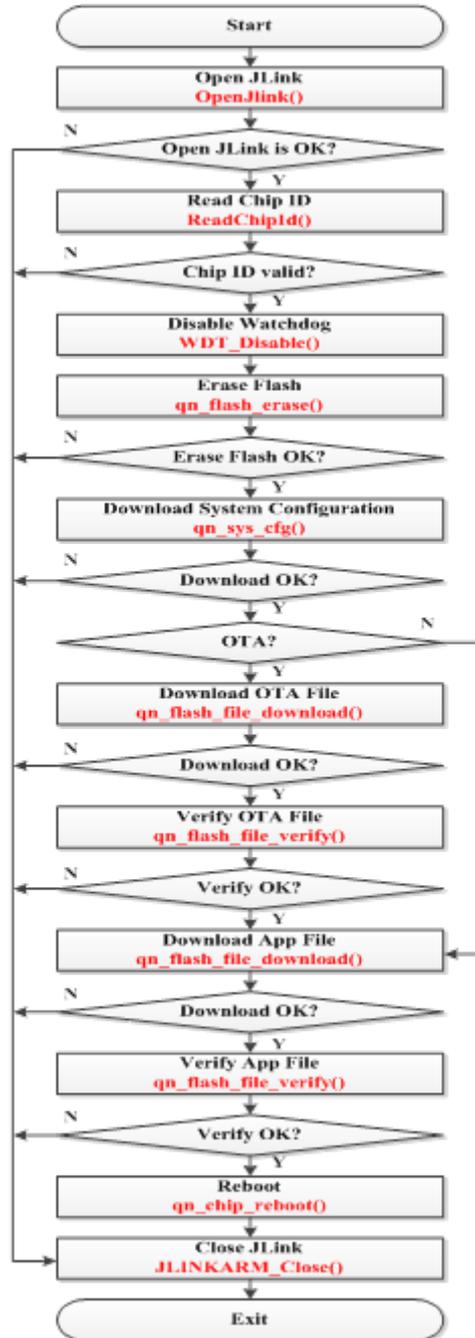**Application note** **Rev 1.1 — February 2018** **3 of 10**

2. J-Link download process

Fig 1.   J-Link download process

Note: The red functions in Fig 1 are included in the demo code and J-Link SDK.

J-Link SDK: www.segger.com

3. Flash layout

The 512-KB flash is partitioned as shown in Fig 2 and Fig 3:
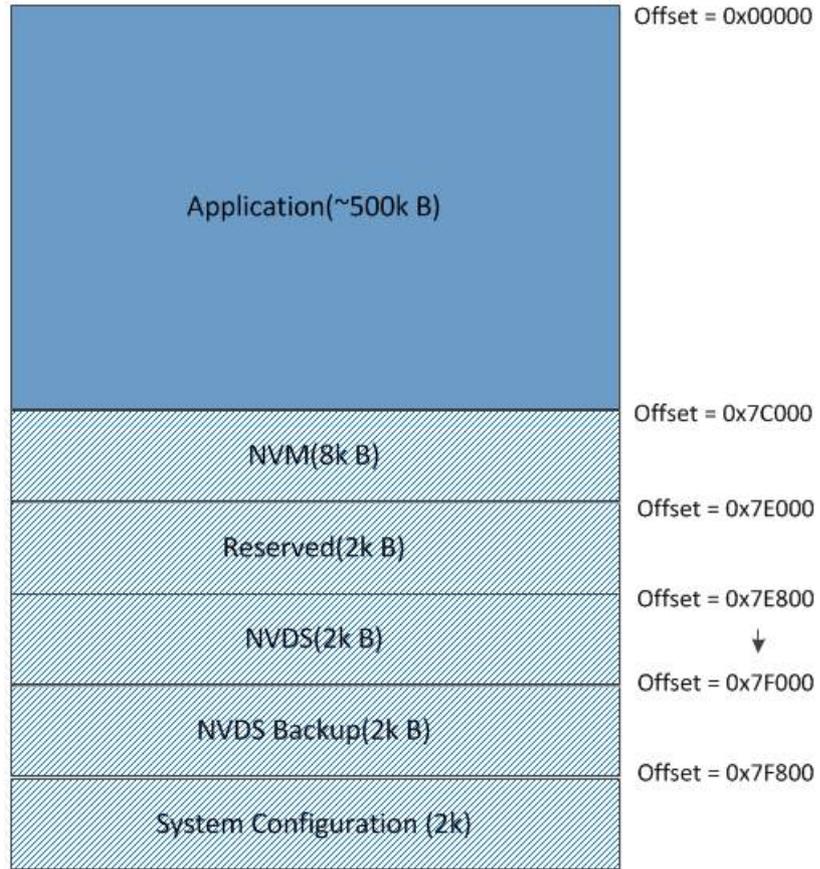
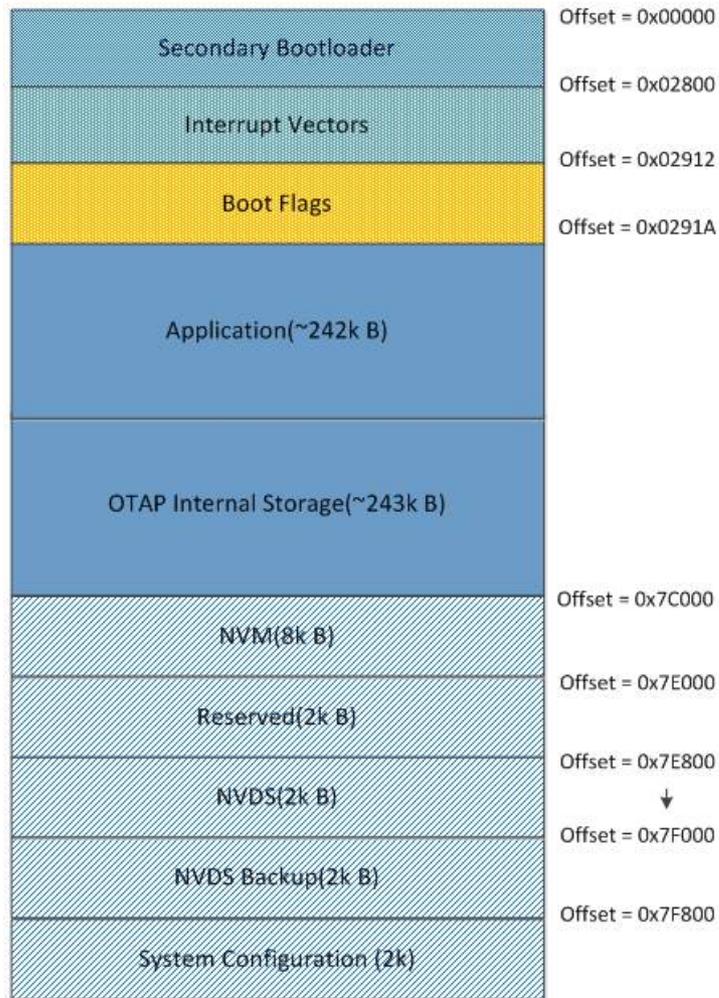

Fig 2. Flash space without OTA

Fig 3.   Flash space with OTA

4.   Example code

4.1   Read chip Id

```
unsigned int ReadChipId(void)
{
    U32 chip_id;
    JLINKARM_ReadMemHW(0x40000108, 4, &chip_id);  // QN908X.UM 2.5.10 Chip ID
    register
```

```
        return chip_id;
    }
```

4.2 Disable watchdog

```
void WDT_Disable()
    {
        // Disable watchdog timer
        U32 dis_wdt;
        dis_wdt = 0x1ACCE551;
        JLINKARM_WriteMemHW(0x40001020 ,4, &dis_wdt);
        dis_wdt = 0x0;
        JLINKARM_WriteMemHW(0x40001008 ,4, &dis_wdt);
        dis_wdt = 0x0;
        JLINKARM_WriteMemHW(0x40001020 ,4, &dis_wdt);
    }
```

4.3 Erase flash

```
BOOL qn_flash_erase(void)
    {
        U32 data;

        data = 0x40000000;
        JLINKARM_WriteMemHW(0x40000010 ,4, &data); // System clock source and divider
        register
        data = 0xffffffff;
        JLINKARM_WriteMemHW(0x4000000c ,4, &data); // Clock enable
        data = 0x0002001e;
        JLINKARM_WriteMemHW(0x4008100c ,4, &data); // TIME_CTRL  0x4001e

        data = 16000;
        JLINKARM_WriteMemHW(0x40081008 ,4, &data); // erase time = 2ms, default =
        80ms

        // chip erase
        data = 0x0000503f;
        JLINKARM_WriteMemHW(0x40081010 ,4, &data);
        data = 0x30000000;
        JLINKARM_WriteMemHW(0x40081004 ,4, &data); //ERASE_CTRL
        data = 0xca1e093f;
        JLINKARM_WriteMemHW(0x400810a8 ,4, &data); // DEBUG_PASSWORD  SWD erase
        password = 0xCA1E093F

        return TRUE;
    }
```

4.4 Download file

```
BOOL qn_flash_file_download(const char* sFileName, unsigned int Addr)
    {
        JLINKARM_BeginDownload(0);
        JLINK_DownloadFile(sFileName,Addr);
        JLINKARM_EndDownload();

        return TRUE;
```

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```
    }
```

4.5 Verify

```
BOOL qn_flash_file_verify(unsigned int Addr, unsigned int FileNumBytes, void*
FileData)
{
    // Read App File
    JLINKARM_ReadMem(Addr, FileNumBytes, rdFlashData);

    // Verify App
    if (memcmp(FileData, rdFlashData, FileNumBytes) != 0)
    {
        return FALSE;
    }

    return TRUE;
}
```

4.6 Chip reboot

```
BOOL CswdDlg::qn_chip_reboot(void)
{
    U32 data;

    data = 0xfe5fffff;
    JLINKARM_WriteMemHW(0x40000000 ,4, &data);      // bit 32 - write 1 to Reboot
    entire system

    return TRUE;
}
```

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