Table of Contents

Table of Contents .................................................................................................................. 2
List of Figures ...................................................................................................................... 3
List of Tables ........................................................................................................................ 4
1. Introduction ...................................................................................................................... 5
2. Method of Configuration ................................................................................................. 5
   2.1 For software reset ...................................................................................................... 5
   2.2 For hardware reset .................................................................................................... 6
3. Revision history ................................................................................................................ 8
List of Figures

Figure 2-1. Address region .................................................................................................................. 5
Figure 2-2. FLASH hardware correction .............................................................................................. 6
List of Tables

Table 3-1. Revision history........................................................................................................8
1. **Introduction**

The purpose of this application note is to avoid the breakdown risk when the MCU exposes to frequently reset. Generally, when a poor or unexpected condition occurs, a reset is generated according to the hardware or software design. And if the condition occurs frequently, then the reset is generated frequently. This note is based on gd32f10x and gd32f20x series chips. In order to achieve more reliable reset, some methods of configuration are recommended as follows.

2. **Method of Configuration**

2.1 **For software reset**

Software reset refers to triggering a MCU reset by code. The execution address of the software reset function is recommended to be configured in the SRAM address region.

**Figure 2-1. Address region**

Two steps are needed in this configuration.

First, assign a section name for the software reset function, when it is declared. And the implementation of the function contains writing the SCB->AIRCR register and a while loop. For Example, the implementation of the function is in a file called nvic_conf.c, and the code is as follows:

```c
void Sys_Reset(void) __attribute__((section("New_Sys_Reset")));

void Sys_Reset(void)
{
    SCB->AIRCR = (NVIC_AIRCR_VECTKEY | (SCB->AIRCR & (0x700)) | (1<<NVIC_SYSRESETREQ)); /* Keep priority group unchanged */
    while(1);
}
```
Second, change the execution address of the function. For example, modify the scatter file if the project is developed in Keil IDE.

---

| LR_IROM1 0x08000000 0x00040000  { | load region size_region |
| ER_IROM1 0x08000000 0x00040000  { | load address = execution address |
| *.o (RESET, +First) | |
| *(InRoot$$Sections) | |
| *(+RO) | |
| RW_IRAM1 0x20000000 0x0000A000  { | RW data |
| .ANY (+RW +ZI) | |
| ER_IRAM2 0x2000A000 UNINIT 0x00000400  { | |
| nvic_conf.o(New_Sys_Reset) | |
| } | |
| } | |

---

2.2 For hardware reset

A CRC check of the FLASH content should be performed when the MCU starts up. Every time the MCU resets, a CRC calculation is carried out, and the value is compared to the correct CRC value stored when the firmware is downloaded. If a wrong CRC value is generated, the MCU should enter into the standby mode and wait for a wakeup event. When the MCU wakes up, a process of FLASH hardware correction is executed same as that when a power-on reset occurs.

Figure 2-2. FLASH hardware correction

Some tips should be complied with when writing the code.
1. A margin of load address should be kept between the CRC check code segment and the other code segment. For example, the load address of the CRC check code segment can be configured at the end of the FLASH by modifying the scatter file. For example, the implementation of the CRC check function is in a file called `crc_check.c`, and the scatter file is as following.

```c
; ************************************************************
; *** Scatter-Loading Description File generated by uVision ***
; *************************************************************
LR_IROM1 0x08000000 0x0003F000 {    ; load region size_region
ER_IROM1 0x08000000 0x0003F000 {  ; load address = execution address
.o (RESET, +First)
*(InRoot$S$Sections)
*(+RO)
}
RW_IRAM1 0x20000000 0x00010000 {  ; RW data
.ANY (+RW +ZI)
}
}
LR_IROM2 0x0803F000 0x1000 {     ; load region size_region
    ER_IROM2 0x0803F000 0x1000 {    ; load address = execution address
        crc_check.o (+RO)
    }
}
```

2. The input context of CRC check should not include the CRC check code segment itself. That means only the other code segment is included.

3. The CRC check code segment should be called at the beginning of the Reset_Handler.
3. Revision history

Table 3-1. Revision history

<table>
<thead>
<tr>
<th>Revision No.</th>
<th>Description</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0</td>
<td>Initial Release</td>
<td>Apr.30, 2021</td>
</tr>
</tbody>
</table>
Important Notice

This document is the property of GigaDevice Semiconductor Inc. and its subsidiaries (the “Company”). This document, including any product of the Company described in this document (the “Product”), is owned by the Company under the intellectual property laws and treaties of the People’s Republic of China and other jurisdictions worldwide. The Company reserves all rights under such laws and treaties and does not grant any license under its patents, copyrights, trademarks, or other intellectual property rights. The names and brands of third party referred thereto (if any) are the property of their respective owner and referred to for identification purposes only.

The Company makes no warranty of any kind, express or implied, with regard to this document or any Product, including, but not limited to, the implied warranties of merchantability and fitness for a particular purpose. The Company does not assume any liability arising out of the application or use of any Product described in this document. Any information provided in this document is provided only for reference purposes. It is the responsibility of the user of this document to properly design, program, and test the functionality and safety of any application made of this information and any resulting product. Except for customized products which has been expressly identified in the applicable agreement, the Products are designed, developed, and/or manufactured for ordinary business, industrial, personal, and/or household applications only. The Products are not designed, intended, or authorized for use as components in systems designed or intended for the operation of weapons, weapons systems, nuclear installations, atomic energy control instruments, combustion control instruments, airplane or spaceship instruments, transportation instruments, traffic signal instruments, life-support devices or systems, other medical devices or systems (including resuscitation equipment and surgical implants), pollution control or hazardous substances management, or other uses where the failure of the device or Product could cause personal injury, death, property or environmental damage (“Unintended Uses”). Customers shall take any and all actions to ensure using and selling the Products in accordance with the applicable laws and regulations. The Company is not liable, in whole or in part, and customers shall and hereby do release the Company as well as its suppliers and/or distributors from any claim, damage, or other liability arising from or related to all Unintended Uses of the Products. Customers shall indemnify and hold the Company as well as its suppliers and/or distributors harmless from and against all claims, costs, damages, and other liabilities, including claims for personal injury or death, arising from or related to any Unintended Uses of the Products.

Information in this document is provided solely in connection with the Products. The Company reserves the right to make changes, corrections, modifications or improvements to this document and Products and services described herein at any time, without notice.