

N32G031x Series Errata Sheet V1. 4. 0

Contents

1	Errata List	1
2	PWR	3
3	RCC	3
3.1	When running the program, the LSI is biased	3
3.2	LSE is affected by toggling of adjacent pins	3
3.3	HSE instability causes chips to run off	3
4	GPIO and AFIO	4
4.1	GPIO analog function	4
4.2	IO reverse current	4
5	ADC	5
5.1	When the injection channel is triggered, the regular channel is also triggered	5
5.2	Read ADC data register ADC_DAT (ADC_JDATx) value exception issue after the ADC ENDC (or JENDC) flag is set	5
6	SPI&I2S	6
6.1	SPI	6
6.1.1	SPI baud rate setting when CRC is enabled	6
6.1.2	Slave mode CRC check	6
6.1.3	When the power supply is 1.8V~2.0V, the SPI data rate may not reach 18Mbps	7
6.2	I2S	7
6.2.1	PCM long frame mode	7
7	I2C	8
7.1	A software event that must be managed before the current byte is transferred.	8
7.2	Attentions when reading a single byte at time	8
7.3	STOP establishment time exceeds minimum threshold in standard mode	9
8	USART	9
8.1	Parity error flag	9
8.2	RTS hardware flow control	9
9	TIM	11

9.1	TIM overcapture.....	11
9.2	ADTIM and GPTIM cannot generate compare events under certain circumstances	11
9.3	The issue of switching from another mode to 100% or 0% duty cycle PWM mode	12
10	RTC	13
10.1	RTC subsecond match	13
10.2	RTC second match	13
10.3	RTC calendar function cannot be initialized multiple times within 1 second	13
10.4	RTC mistakenly triggers TISOVF flag bit	14
10.5	RTC_DATE register lock	14
11	Marking information	15
12	Version history	16
13	Notice	17

1 Errata List

Table 1-1 Errata overview

Errata link			Chip version
			Version B
Section 3: RCC	Section 3.1: When running the program, the LSI is biased		•
	Section 3.2: LSE is affected by toggling of adjacent pins		•
	Section 3.3: HSE instability causes chips to run off		•
Section 4: GPIO and AFIO	Section 4.1: GPIO analog function		•
	Section 4.2: IO reverse current		•
Section 5: ADC	Section 5.1: When the injection channel is triggered, the regular channel is also triggered		•
	Section 5.1: Read ADC data register ADC_DAT (ADC_JDATx) value exception issue after the ADC ENDG (or JENDG) flag is set		•
Section 6: SPI&I2S	Section 6.1: SPI	Section 6.1.1: SPI baud rate setting when CRC is enabled	•
		Section 6.1.1: Slave mode CRC check	•
		Section 6.1.3: When the power supply is 1.8V~2.0V, the SPI data rate may not reach 18Mbps	•
	Section 6.2: I2S	Section 6.2.1: PCM long frame mode	•
Section 7: I2C	Section 7.1: A software event that must be managed before the current byte is transferred		•
	Section 7.2: Attentions when reading a single byte at time		•
Section 8: USART	Section 8.1: Parity error flag		•
	Section 8.2: RTS hardware flow control		•
Section 9: TIM	Section 9.1: TIM overcapture		•
	Section 9.2: ADTIM and GPTIM cannot generate compare events under certain circumstances		•
	Section 9.3: The issue of switching from another mode to 100% or 0% duty cycle PWM mode		•
Section 10: RTC	Section 10.1: RTC subsecond match		•
	Section 10.2: RTC second match		•
	Section 10.3: RTC calendar function cannot be initialized multiple times within 1 second		•
	Section 10.4: RTC mistakenly triggers TISOVF flag bit		•

	Section 10.5: RTC_DATA register lock	•
--	--	---

2 PWR

3 RCC

3.1 When running the program, the LSI is biased

Description

When the LSI is running the program, the Jitter is large, the average frequency (1S time) is $30K \pm 1KHz$, and the instantaneous frequency is $20K \sim 45KHz$.

Resolution

For precise timing, it is recommended that customers use LSE instead of LSI.

3.2 LSE is affected by toggling of adjacent pins

Description

LSE is affected by toggling of adjacent pins.

Resolution

Avoid toggling of adjacent pins of LSE

3.3 HSE instability causes chips to run off

Description

When enabling HSE and waiting for the HSE ready flag to be set to run the code directly, the system program may be unstably due to the HSE clock, causing the program to run away.

Resolution

After enabling HSE, add a software delay of about 10 milliseconds, then wait for the HSE Ready flag to be set before running the code.

4 GPIO and AFIO

4.1 GPIO analog function

Description

When the 4 GPIOs PA1/PA2/PA3/PA4 are in the high-level output state, when they switch to the analog function, there will be a short output voltage drop of about 30mv during the switching process.

Resolution

Avoid the above methods of use.

4.2 IO reverse current

Description

If the IO that does not support failsafe is powered on before VDD, an exception may occur at this time, and the external pin reset cannot return to normal after the exception.

Resolution

It is recommended that customers use the power-on of VDD prior to the power-on of IO.

5 ADC

5.1 When the injection channel is triggered, the regular channel is also triggered

Description

The ADC converts continuously, and the external trigger of the regular channel is disabled. When the software or hardware trigger injection channel conversion, the regular channel may be converted, and the corresponding status bit of the regular channel conversion will be set.

Resolution

Ignore the status bit and data generated by the regular channel.

5.2 Read ADC data register ADC_DAT (ADC_JDATx) value exception issue after the ADC ENDC (or JENDC) flag is set

Description

When the regular sequence conversion completion flag ENDC (injection sequence conversion completion flag JENDC) is set, the ADC Data Register ADC_DAT (ADC_JDATx) is read immediately, possibly with the result of the previous conversion.

Resolution

1. When the ENDC/JENDC flag is set, delay 8 ADC_CLK clocks before reading the ADC data registers (ADC_DAT/ADC_JDATx);
2. In some scenarios, use the any regular channel conversion completion flag ENDCA (any injection channel conversion completion flag JENDCA) flag instead of the ENDC (JENDCA) flag.

6 SPI&I2S

6.1 SPI

6.1.1 SPI baud rate setting when CRC is enabled

Description

When the CRC check function is turned on, depending on the working environment of the SPI interface, such as board-level delay, ambient temperature, etc., both the SPI master and slave will have CRC check exceptions.

In the ideal room temperature environment of the laboratory, when the SPI clock is greater than 14MHz, an abnormal CRC check error may occur.

Resolution

When the CRC function is enabled, it is recommended that the CRC clock frequency configuration should not exceed 14MHz.

When a CRC exception error occurs, reduce the SPI baud rate configuration.

6.1.2 Slave mode CRC check

Description

SPI works in slave mode and CRC check has been enabled, even if the NSS pin is high level, as long as the SPI receives the clock signal, the CRC calculation will still be performed

Resolution

Before using the CRC check, clear the CRC data register so that the CRC check of the master and slave devices can be synchronized

The steps to clear are as follows:

1. SPI enable bit reset (set 0)
2. CRC check bit reset (set 0)
3. CRC check bit set (set 1)
4. SPI enable bit set (set 1)

6.1.3 When the power supply is 1.8V~2.0V, the SPI data rate may not reach 18Mbps

Description

When the power supply is 1.8V~2.0V, the SPI data rate may not reach 18Mbps depending on the IO and board-level wiring delay characteristics.

The highest communication rate measured in the ideal environment of the laboratory is:

-25°C ~ 45°C can reach 18Mbps.

-40°C ~ -25°C, 45°C-105°C : 12Mbps.

Resolution

If customers have 1.8V high temperature and low temperature SPI communication requirements, it is recommended to contact Nationstech Company for technical support.

6.2 I2S

6.2.1 PCM long frame mode

Description

When I2S works in master mode, PCM long frame mode, and the data format is "32bit" or "16bit extended to 32bit", the WS signal is one cycle per 16bit instead of 32bit.

Resolution

When I2S is the master mode and the long frame mode must be used, the 16bit data mode should be used.

7 I2C

7.1 A software event that must be managed before the current byte is transferred.

Description

When EV7, EV7_1, EV6_1, EV6, EV2, EV8, and EV3 events occur, the events must be processed before the current byte is transferred, otherwise there may be a problem of reading an extra byte, reading duplicate data, or losing data. If the software does not read the N-1th byte before the stop signal is generated, the Nth byte in the shift register is corrupted (shifted one bit to the left).

Resolution

1. When using I2C to transfer more than one byte, try to use DMA mode
2. When using I2C interrupt, adjust the interrupt priority to the highest priority of the application
3. When the read data reaches the N-1th byte:
 - a) Detect BSF as 1
 - b) Configure SCL as GPIO open-drain output and set it to 0
 - c) Set STOPGEN as 1
 - d) Read the N-1th byte
 - e) Configure SCL as I2C multiplexing function open-drain output mode
 - f) read the last byte

7.2 Attentions when reading a single byte at time

Description

In the master read mode, when the length of the read byte is a single byte, a read data error may occur.

Resolution

When read single byte:

- a) After receive ADDR_F
- b) Set ACKEN bit as 0
- c) Clear ADDR_F bit ☐ Cleared by reading STS1 and then STS2 ☐
- d) Set STOPGEN as 1

- e) Read last byte□

7.3 STOP establishment time exceeds minimum threshold in standard mode

Description:

In host mode: At a communication rate of 100K, triggering the slave's clock extension results in a STOP establishment time below 4μs.

Resolution:

It is recommended to reduce the communication rate to 50K or below, in accordance with the slave peripheral's timing requirements.

8 USART

8.1 Parity error flag

Description

During the reception of one byte of data, before the stop bit is received, a parity error is detected, and the parity error flag is set. During this period, the parity error flag cannot be cleared by software (reading the status register and then reading the data register). If the parity error interrupt is enabled, the parity error interrupt handler will be entered multiple times.

Resolution

After the read data buffer flag is set, after receiving the data, the operation of clearing the parity error flag is performed. If the parity error interrupt is enabled, in order to avoid entering the interrupt processing function multiple times, when the parity error interrupt is entered for the first time, the parity error interrupt is turned off, and after the data is received, the parity error interrupt is turned on again.

8.2 RTS hardware flow control

Description

Enable RTS hardware flow control. When the USART receives data, the RTS signal will be automatically pulled high. If the byte data is not read from the data register in time, and a new byte is sent to the USART (violating the flow control protocol), the RTS signal will be pulled low again. USART waits again to receive

the next frame of data.

Resolution

Before the next new data is received, the data is read out from the data register in time.

9 TIM

9.1 TIM overcapture

Description

When reading the capture data register data (under normal circumstances, the read data register operation will cause the capture flag to be cleared), a trigger capture is generated externally, even if the previous capture has been correctly read and the new capture data is also sent to the register exactly, but the overcapture flag is still detected. The system is critical for overcapture, but no capture data is lost.

Resolution

None

9.2 ADTIM and GPTIM cannot generate compare events under certain circumstances

Description

In edge-aligned mode, in up-counting PWM1 mode, when the current PWM cycle CCDATx shadow register $\geq$ AR value, the shadow register value of CCDATx in the next PWM cycle is 0. At the moment when the PWM cycle counter is 0, although the counter value = CCDATx shadow register value = 0 and OCxREF = 0, but still no compare event is generated.

Resolution

If it is not required that "the compare event is generated at the time when the counter value = CCDATx shadow register value = 0", the compare event generated through another channel can replace the compare event that is not generated.

9.3 The issue of switching from another mode to 100% or 0% duty cycle

PWM mode

Description

When switching from any mode (except frozen mode) to PWM1/2 mode, if the PWM duty cycle is set to 100% or 0%, the mode switch to PWM1/2 mode fail, if reconfig the PWM duty (not 0% or 100%), the mode switch to PWM1/2 mode success.

Resolution

When switching from forced active/forced inactive/set channel x to the active level on match/ set channel x to the inactive level on match mode to PWM1/2 mode with a 100% or 0% duty cycle, modify CCxP to achieve the PWM with 100% or 0% duty.

When switching from toggle mode to PWM1/2 mode with a 100% or 0% duty cycle, have no solution.

10 RTC

10.1 RTC subsecond match

Description

The RTC programmable alarm clock function does not enable matching of date, hour, minute and second, but only enables matching of sub-seconds (that is, an alarm interrupt is generated when sub-seconds match in every second). The alarm interrupt cannot be generated in the first sub-second match after the alarm function is enabled, and the alarm interrupt is generated for each sub-second match after that.

Resolution

None

10.2 RTC second match

Description

When the alarm clock configuration second matches, the chip enters the SLEEP mode. When the alarm interrupt is generated to wake up the chip from SLEEP, and the interrupt processing function is executed (only the operation of clearing the interrupt flag bit is performed), it immediately enters the STOP mode. The next alarm interrupt cannot wake the chip from STOP mode.

Resolution

Before setting the RTC time, you need to enter the RTC initialization mode. Before entering the RTC initialization mode, you need to wait for the value of the sub-second register to be less than the synchronous prescaler value and cannot be 0.

10.3 RTC calendar function cannot be initialized multiple times within 1 second

Description

The RTC calendar function is initialized multiple times within 1 second, so that the RTC alarm clock interrupt cannot be generated.

Resolution

The interval between two initializations of the RTC calendar function is more than 1 second.

10.4 RTC mistakenly triggers TISOVF flag bit

Description

When the system wakes up from STANDBY mode, or when the IWDG timeout generates a system reset, the RTC will probabilistically trigger the TISOVF flag bit by mistake.

Workaround

Before entering STANDBY mode or IWDG timeout, When the SHOPF flag is 0, configure the RTC_SCTRL.SUBF[14:0] register, and the flag will be set to 1. When the SHOPF flag is 0 again, configure the RTC_SCTRL.SUBF[14:0] register for the second time; note that the NRST cannot be triggered when the software executes the above process clock.

10.5 RTC_DATE register lock

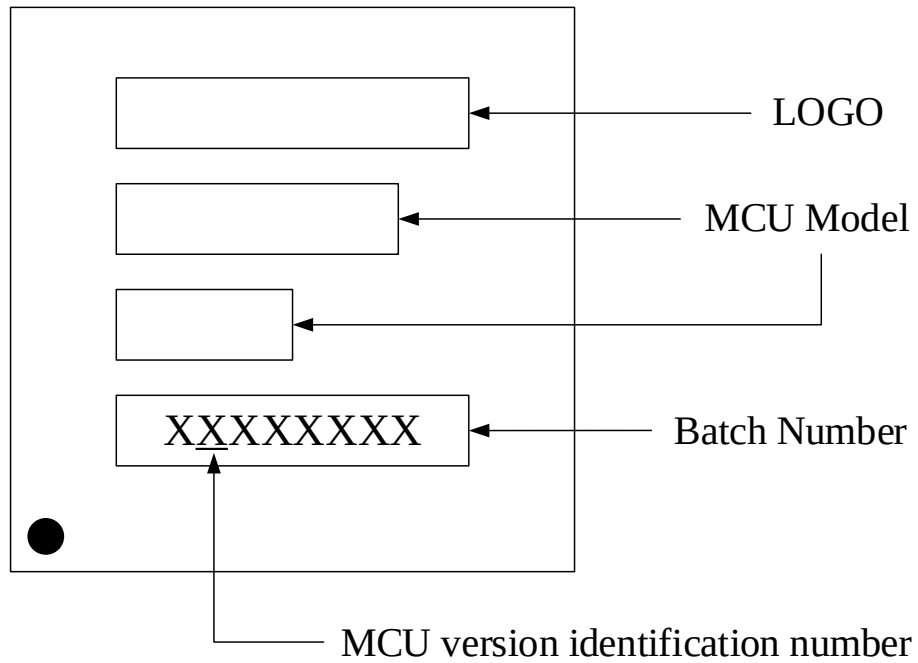
Description

1. Before the system software reset, the RTC_DATE register is not read after reading the RTC_SUBS or RTC_TSH shadow register, and the RTC_DATE register will restore the default value after the system software resets and initializes the RTC without configuration or reads the RTC_DATE register;
2. When reading the calendar, after reading the RTC_SUBS or RTC_TSH shadow register, the value of the RTC_DATE register remains unchanged;

Resolution

1. Read the RTC_DATE register before initializing the RTC;
2. After reading the RTC_SUBS or RTC_TSH shadow register, read the RTC_DATE register;

11 Marking information



12 Version history

Date	Version	Description
2022.6.14	V1.1	Initial version
2023.7.31	V1.2.0	1. Add section 3.1、 3.3 2. Add section 6.1.3 3. Modify 6.1.1 4. Add section 2.1 5. Add section 10.4、 10.5
2023.9.19	V1.3.0	1. Add section 5.2
2025.9.26	V1.4.0	1. Delete Chapter 2.1: Power-Up After Power-Down' 2. Addition of Chapter 7.3 3. Addition of Chapter 9.3

13 Notice

This document is the exclusive property of NSING TECHNOLOGIES PTE. LTD. (Hereinafter referred to as NSING). This document, and the product of NSING described herein (Hereinafter referred to as the Product) are owned by NSING under the laws and treaties of Republic of Singapore and other applicable jurisdictions worldwide. The intellectual properties of the product belong to NSING Technologies Inc. and NSING Technologies Inc. does not grant any third party any license under its patents, copyrights, trademarks, or other intellectual property rights. Names and brands of third party may be mentioned or referred thereto (if any) for identification purposes only. NSING reserves the right to make changes, corrections, enhancements, modifications, and improvements to this document at any time without notice. Please contact NSING and obtain the latest version of this document before placing orders. Although NSING has attempted to provide accurate and reliable information, NSING assumes no responsibility for the accuracy and reliability of this document. 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. In no event shall NSING be liable for any direct, indirect, incidental, special, exemplary, or consequential damages arising in any way out of the use of this document or the Product. NSING 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, all types of safety devices, and other applications intended to supporter sustain life. All Insecure Usage shall be made at user's risk. User shall indemnify NSING and hold NSING harmless from and against all claims, costs, damages, and other liabilities, arising from or related to any customer's Insecure Usage Any express or implied warranty with regard to this document or the Product, including, but not limited to. The warranties of merchantability, fitness for a particular purpose and non-infringement are disclaimed to the fullest extent permitted by law. Unless otherwise explicitly permitted by NSING, anyone may not use, duplicate, modify, transcribe or otherwise distribute this document for any purposes, in whole or in part.