MM32SPIN2x

RCC

What are the precautions for using the external clock?

1. The input range of external crystal: 4-24MHz

2. For using the external crystal, the official typical circuit of the external crystal (510ohm in serial circuit and 510Kohm in parallel circuit) must be referred to if the external crystal is used as the HSE clock at -40 ~ 85℃ (full temperature) and 2.0 ~ 5.5V (full voltage).

3. For using the external crystal, the time of HSE ready should be sufficient and relevant adjustment should be made since the internal resistances vary with different external crystals.

4. When an anomaly is shown in the external crystal such as short circuit, or one of the PINs of OSC-IN and OSC OUT is connected to high or low level, it will cause the crystal to stop oscillating. In that case, the software needs to enable the CSS and switch to the built-in HIS in the NMI interrupt.

What are the precautions for using the internal clock?

It is calibrated to ± 1% at ambient temperature before leaving factory, with a maximum deviation of 8% at full temperature and voltage. If high demands are posed to environment temperature, the external crystal must be used when there is UART communication.

How to check the reset status of RCC->CSR register after chip reset?

After power-on reset, except for the POR bit, the other bits on the reset flag register of the chip are indefinite. Read the flag bit after reset and the value read could not reflect the real situation. With stable power supply and voltage, RMVF bit needs to be cleared before the other normal reset states be detected.

What is the maximum frequency that the chip can run?

96MHz. At that time, there is a need to set 3 latencies. PLL clock output is SYSCLK and HIS, HSE as well as HSE/2 are available to PLL.

GPIO

What are the precautions for using GPIO?

1. After power-on, MCU's GPIOs are all in the high impedance state, except PA13/14.

2. GPIO ports are divided into TC and FT attributes. FT port supports 5V tolerance while the external voltage of GPIO from TX port cannot be greater than the power supply voltage range of MCU.

ADC

What are the precautions for using MM32 ADC?

1. Attention should be paid to input impedance match. If 1Mbps is used as the sampling rate, it only supports 50ohm input impedance.

2. For multiplex sampling and channel switching, an accurate sampling value is required and the sampling hold time of each channel should be enlarged, such as 7.5 cycles.

CRC

What are the precautions for using MM32 CRC?

1. When using CRC for single computing, two NOP operation instructions need to be added.

2. Relevant clocks need to be turned on when using. It only supports 32bit computing and is not allowed to be embedded into modules like UART, SPI and I2C.

3. Software CRC is recommended for 16bit and 32bit mixed operations.

DMA

Does it support device to device?

It does not support device-to-device P2P and only supports M2M, P2M and M2P modes.

EXTI

What are the precautions for using MM32 EXTI?

It supports external wake-up of STOP. For example, EXTI0 can be mapped to PA0, PB0 and PC0, which use the same interrupt line. If they are all configured to enable, only the last configured one is valid.

IWDG

What are the precautions for using IWDG?

IWDG supports interrupt line and reset modes. Watchdog function can be turned off by closing LSI.

PWR

What are the precautions for waking up the Standby mode?

When entering the Standby mode, if PA0 is used to wake up, it needs to be configured to wake up on the rising edge and keeps low level stable before entry.

SPI

Does SPI support single-line half duplex?

Single PIN is not supported to achieve single-line half duplex. Single-line half duplex can be achieved by the combination of two PIN MISO and MOSI, supplemented with software configuration.

SYSTICK

Does MCU support 1/8 SYSCLK and SYSCLK as the clock source of Systick?

It only supports SYSCLK as the clock source of Systick/4.

UART

What are the precautions for using MM32 UART?

When UART is used to communicate with other MCUs or devices at -40 ~ 85℃ (full temperature) and 2.0 ~ 5.5V (full voltage), external crystal other than embedded clock must be used. The embedded clock needs to be calibrated to 1% at 25℃ (ambient temperature) and 3.3V or 5.0V. During the preliminary design, with the self-adaptation code of software baud rate, MCU is taken as the master while the opposite end as the slave in order to support the normal communication when temperature and voltage change.

Does UART support hardware baud rate self-adaptation?

1. It does not support hardware baud rate self-adaptation, but it provides software baud rate self-adaptation code.

2. In designing software self-adaptation baud rate, new parameters will only take effect by modifying the interger and decimal frequency division, disabling UART, setting new decimal frequency division and then enabling UART.

WWDG

Does it support debugging after entering STOP?

MM32 MCU does not support Debug when entering STOP or Standby.

Flash

Can Flash be written directly?

Flash needs to be erased first and then written. If non 0xFF (such as bit 3xFE) is written to one byte, other bits cannot be modified.

Power supply

What are the requirements for voltage rise slope when MCU is powered up?

It should be noted that in the whole process of power-up and power-down, MCU, after completing power-down, should be powered up again when the power supply voltage drops to 0v.

Reset circuit

What are the precautions for MM32 to design reset circuit?

It is not necessary for low level to be kept too long in the reset circuit. In a typically recommended circuit, 100K resistor and 0.1uF capacitor are recommended.

Hardware design

What are the precautions for power-on-reset circuit design?

1. Slow rise should not be shown in the power supply as far as possible.

2. There is no need to use large time constant when power supply is met.

3. A diode in parallel back-to-back, is connected to both ends of the resistor in the RC reset circuit. It is conducive to overcoming the failure of normal

reset when MCU is frequently and repeatedly turned on (the parallel diode can discharge fast only to power-down. For repeated power-on reset, MCU fails to reset again since the voltage cannot drop to 0.6V quickly and climb up again).

4. The recommended RC parameter is 100K plus 0.1 uF capacitor. Another practice is to replace this RC circuit by adding one reset chip and MAX809 is in serial connection with one capacitor on its output pin.