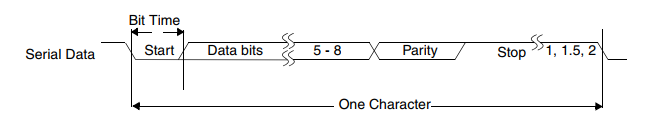
## Revision History

|  |  |  |  |
| --- | --- | --- | --- |
| **Date** | **Revision** | **Author** | **Changes** |
| 2021/1/21 | 1.0 | ZhangSheng | Initial version. |

## IP Description: (讲清楚IP的工作方式)

Universal Asynchronous Receiver/Transmitter (UART)



## Feature set: （功能列表）

* 9-bit Data Transmit
* Fractional BaudRate Support（RCC&UART Module both have）
* CTS/RTS
* IrDA 1.0 SIR Protocol
* FIFO support 16\*8
* DMA support

## Feature comparison with STM32: （跟STM32的功能比较）

**Chip-Platform:**

|  |  |  |
| --- | --- | --- |
| 符号描述：   1. ✅支持 2. ❌不支持 3. ❌硬件有，但SDK计划不支持 | At103 | STM32 |
| 9-bit Data Transmit | ✅ | ✅ |
| Fractional BaudRate Support | ✅ | ✅ |
| IrDA 1.0 SIR Protocol | ✅ | ✅ |
| FIFO support 16\*8 | ✅ | ❌ |
| DMA support | ✅ | ✅ |
| synchronous mode | ❌ | ✅ |
| Single wire half duplex communcation | ❌ | ✅ |
| 1. Multiprocessor communication - enter into mute mode if address match does not occur 2. Wake up from mute mode (by idle line detection or address mark detection) 3. Two receiver wakeup modes: Address bit (MSB, 9th bit), Idle line | ❌ | ✅ |
| Smartcard Emulation Capability | ❌ | ✅ |
| LIN Mode | ❌ | ✅ |
| Separate enable bits for Transmitter and Receiver | ❌ | ✅ |

## API Design: （分类列出会实现的API, API尽量一样）

|  |  |  |
| --- | --- | --- |
|  | 103 | STM32 |
| init/de-init | UART\_DeInit  UART\_Init  UART\_StructInit | USART\_ClockInit（Sync mode）  USART\_ClockStructInit（Sync mode） |
| Config | UART\_ITConfig  UART\_IrDAConfig（Lowpower/Normal）  UART\_FIFOConfig  //UART\_DMAConfig(Mode Select/EN) | USART\_WakeUpConfig  USART\_LINBreakDetectLengthConfig |
| Set | UART\_SetPrescaler  UART\_SetAddress | USART\_SetGuardTime |
| Transmit | UART\_SendData  UART\_SendBreak |  |
| Receive | UART\_ReceiveData |  |
| Cmd（Enable/Disable） | UART\_IrDACmd  UART\_FIFOCmd | UART\_Cmd  USART\_LINCmd  USART\_SmartCardCmd  USART\_SmartCardNACKCmd  USART\_ReceiverWakeUpCmd  USART\_HalfDuplexCmd  USART\_OverSampling8Cmd  USART\_OneBitMethodCmd |
| FlagStatus | UART\_GetFlagStatus  UART\_ClearFlag  UART\_GetITStatus  UART\_ClearITPendingBit |  |

## Data structure design:

typedef struct

{

  uint32\_t USART\_BaudRate;

  uint16\_t USART\_WordLength;

  uint16\_t USART\_StopBits;

  uint16\_t USART\_Parity;

  //uint16\_t USART\_Mode; //TX,RX,TX|RX

  uint16\_t USART\_HardwareFlowControl;

} USART\_InitTypeDef;

## Known behavior and issue

1. RCC INT寄存器的中断使能位打开一次之后就无法关闭，标志位也无法清除。一旦打开之后就会无限进入中断