USART Frame structure of FIG.

Description:

1) IDLE Communication line (RxD or TxD No data transmission on), must be high when the line is idle

2) St Start bit, always low

3) 0-8 Data bits

4) P Parity bit, odd or even parity

5) Sp Stop bit, always a high-level data frame structure composed of UCSRB with UCSRC Register UCSZ [2: 0] , UPM [1: 0] with USBS set up. Receive and transmit using the same settings. Any changes to the settings could undermine ongoing data transmission. among them, UCSZ [2: 0] Determine the number of data bits in the frame, UPM [1: 0] And for enabling to determine the type of parity, USBS Set frame has one or two stop bits. The receiver ignores the second stop bit, and therefore only the first frame error ended a bit "0" When it is detected.

Parity bit is calculated

Parity bit is calculated for each data bit XORed. If odd parity, the exclusive-OR need negated. Relationship between the parity bit and the data bits is as follows:

$$P_{even} = d_{n-1} \oplus \ldots \oplus d_3 \oplus d_2 \oplus d_1 \oplus d_0 \oplus 0 \quad P_{odd} = d_{n-1} \oplus \ldots \oplus d_3 \oplus d_2 \oplus d_1 \oplus d_0 \oplus 1$$

Description:

1) P_{even} Even parity

2) P_{odd} Odd results

3) d_n The first n Data bits

USART initialization

Before the first of the communication USART Initialized. The initialization process normally comprises setting the baud rate, setting a frame structure, and can receive or transmitter according to need. For interrupt-driven USART Operation, during initialization to clear the global interrupt flag and ban USART All interrupts.

During reinitialization or a frame structure such as changing the baud rate, must ensure that no data transmission. TXC Flag may be used to detect whether or not the sender all the transmission, RXC Flag may be used to detect whether there is data in the receive buffer is not read. in case TXC Flag used for this purpose, before each transmission of data (write UDR Before register) must be cleared TXC Flag.

Transmitter

Position UCSRB Register TXEN Bit to enable USART The data is sent. After the can TxD Universal pin IO le function USART Functionality substituent, the transmitter's serial output. Before sending data to set the baud rate, mode of operation and frame format. If synchronous operation is applied to XCK Pin is the clock signal on clock data transmission.

send 5 To 8 The frame data

The data to be transmitted is loaded into the transmit buffer to the data transmission. CPU By writing UDR Register to load the data. When the transmit shift register can transmit a new data, the data buffer will be transferred to the shift register. When the shift register is idle (no ongoing data transmission), or the last stop bit previous frame data transmission is completed, the new data will be loaded. Once the shift register is loaded with new data, it is provided according to the established transmission