

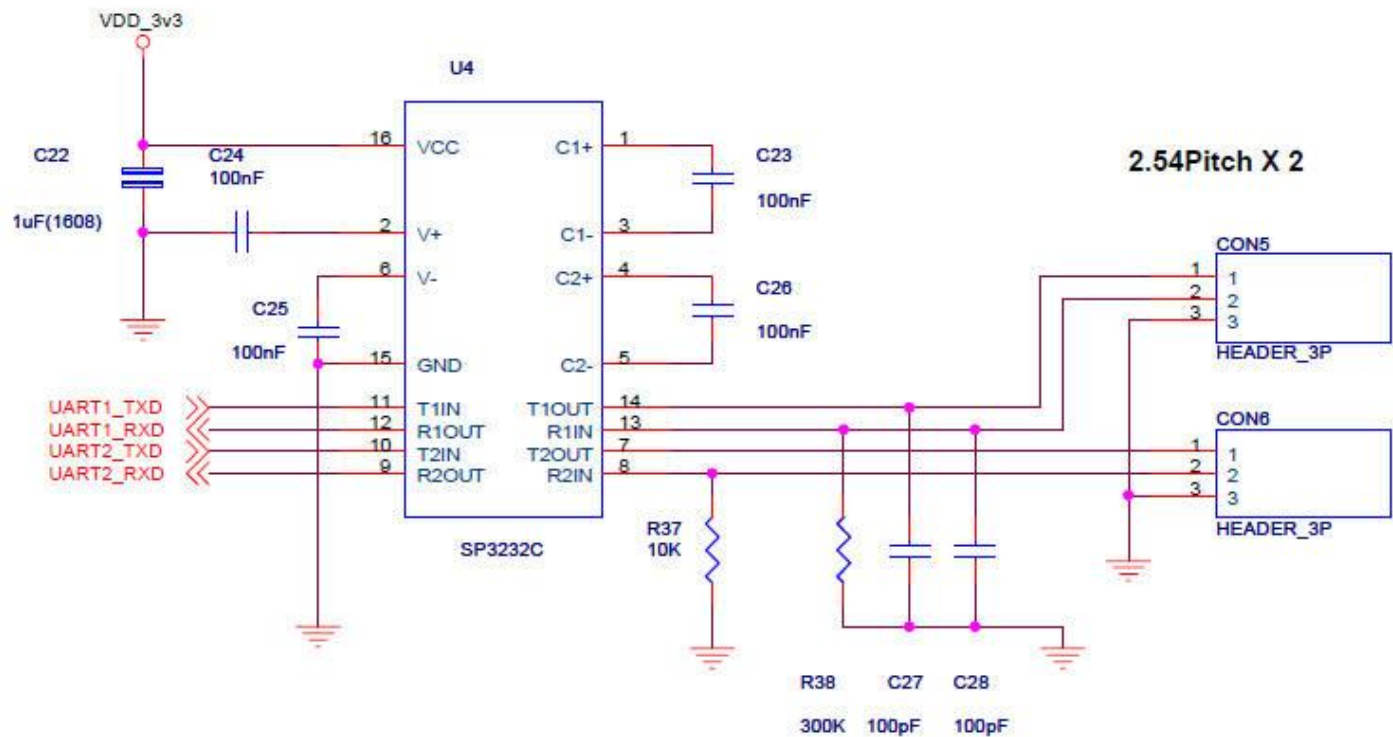
# HelloWorld printf 실습

**2009.11.20**

# 회로도 분석



RS-232C



# Semi-Hosting 구현

```
#ifdef __GNUC__
#define PUTCHAR_PROTOTYPE int __io_putchar(int ch)
#else
#define PUTCHAR_PROTOTYPE int fputc(int ch, FILE *f)
#endif /* __GNUC__ */
```

## PUTCHAR\_PROTOTYPE

```
{
    /* Write a character to the USART */
    if( ch == '\n') {
        USART_SendData(USART1, '\r');
        while(USART_GetFlagStatus(USART1, USART_FLAG_TXE) == RESET);
        USART_SendData(USART1, '\n');
    }else {
        USART_SendData(USART1, (u8) ch);
    }
    /* Loop until the end of transmission */
    while(USART_GetFlagStatus(USART1, USART_FLAG_TXE) == RESET);
    return ch;
}
```

# USART1\_Init

```
void USART1_Init(void)
{
    USART_InitTypeDef USART_InitStructure;

    USART_InitStructure.USART_BaudRate    = 115200;
    USART_InitStructure.USART_WordLength  = USART_WordLength_8b; // or 9
    USART_InitStructure.USART_StopBits    = USART_StopBits_1; // or 0.5, 2, 1.5
    USART_InitStructure.USART_Parity      = USART_Parity_No ; // or even, odd
    USART_InitStructure.USART_HardwareFlowControl
        = USART_HardwareFlowControl_None; // or RTS, CTS, RTS & CTS
    USART_InitStructure.USART_Mode        = USART_Mode_Rx | USART_Mode_Tx;

    /* Configure the USARTx */
    USART_Init(USART1, &USART_InitStructure);

    /* Enable the USART1 */
    USART_Cmd(USART1, ENABLE);
}
```

# GPIO\_Init

```
void GPIO_Configuration(void)
{
    GPIO_InitTypeDef GPIO_InitStructure;

    // UART configuration ...

    /* Configure USARTx_Tx as alternate function push-pull */
    GPIO_InitStructure.GPIO_Pin  = GPIO_USART_Tx_Pin;
    GPIO_InitStructure.GPIO_Speed = GPIO_Speed_50MHz;
    GPIO_InitStructure.GPIO_Mode  = GPIO_Mode_AF_PP;
    GPIO_Init(GPIO_USART, &GPIO_InitStructure);

    /* Configure USARTx_Rx as input floating */
    GPIO_InitStructure.GPIO_Pin  = GPIO_USART_Rx_Pin;
    GPIO_InitStructure.GPIO_Mode  = GPIO_Mode_IN_FLOATING;
    GPIO_Init(GPIO_USART, &GPIO_InitStructure);
}
```

# main

```
int main(void)
{
    /* Enable GPIOA clock */
    RCC_APB2PeriphClockCmd(RCC_APB2Periph_GPIO_USART, ENABLE);

    /* Enable USART1 clocks */
    RCC_APB2PeriphClockCmd(RCC_APB2Periph_USART1, ENABLE);

    /* Configure the GPIO ports */
    GPIO_Configuration();

    /* UART initialization */
    USART1_Init();

    printf("Hello World! - Mango ^)^\n");
    return 0;
}
```

## 실행 결과

