BOD Driver Sample Code Reference Guide

V1.00.001

Publication Release Date: Sep. 2011

Support Chips:

ISD9160

Support Platforms:

NuvotonPlatform_Keil

Table of Contents

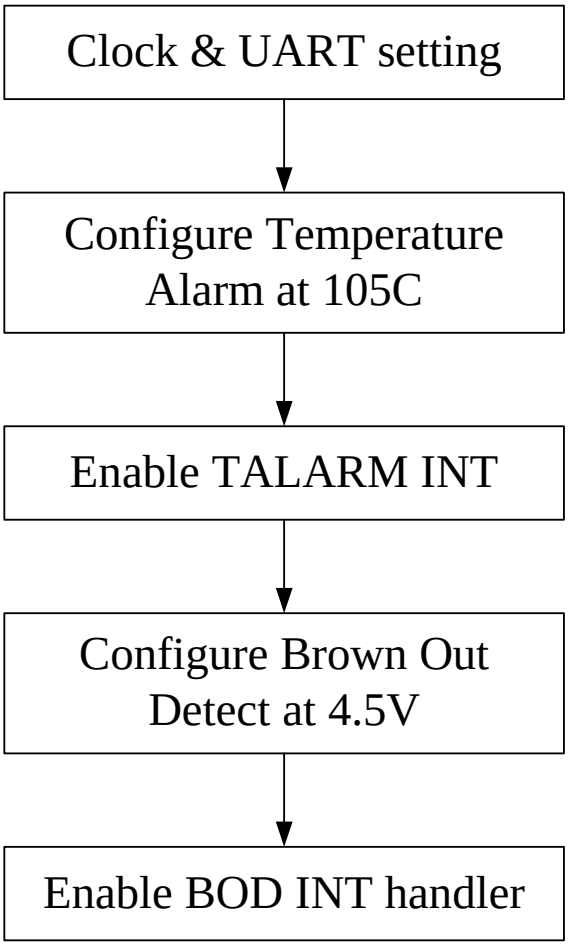
1. Introduction

This sample code will demo BOD IP on ISD9160 chip.

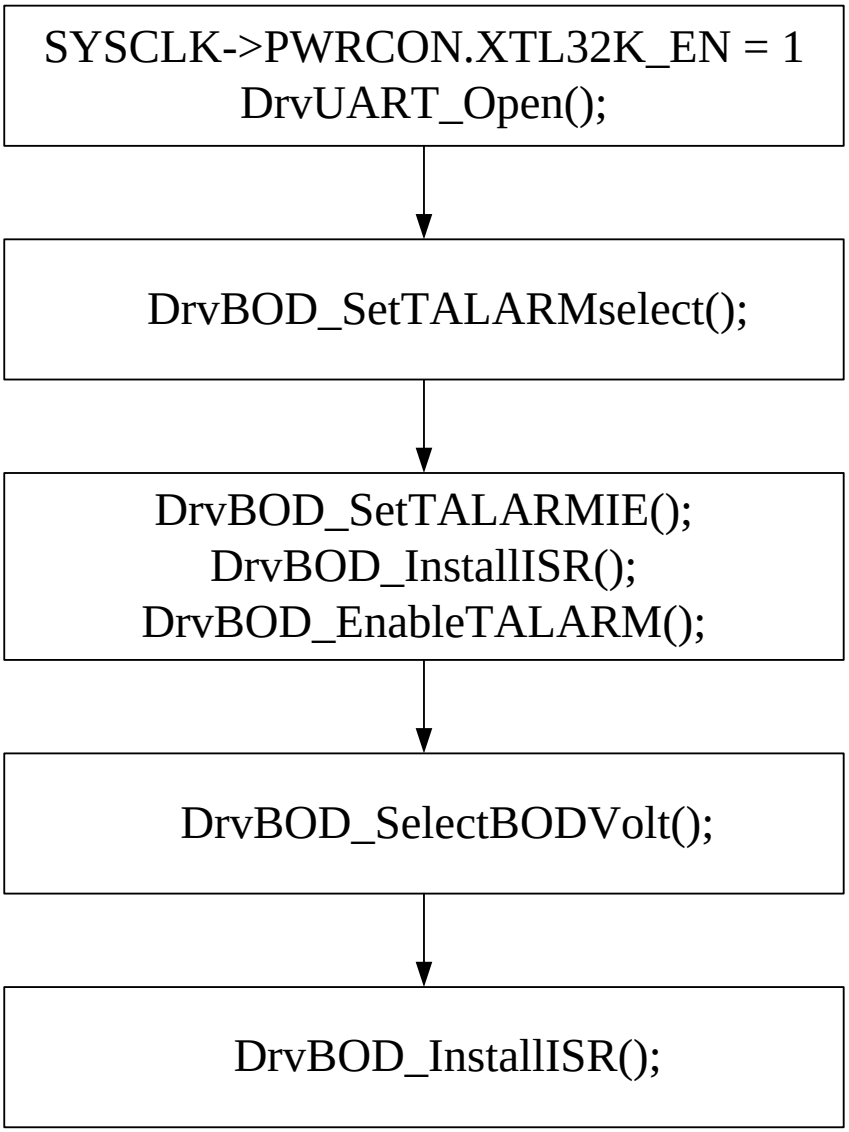
1.1 Feature

- Configure Temperature Alarm at 105C to protect the chip from dangerously high internal temperatures, generally associated with excessive load (or short circuit) on the speaker driver.
- Configure Brown Out Detection at 4.5V.
- Wait for INT, and Debug messages will show the trigger function.

2. Block Diagram



3. Calling Sequence



4. Code Section –Smpl_DrvBODTALARM.c

```
/*---------------------------------------------------------------------------------------------------------*/
/* Global variables                                                                                        */
/*---------------------------------------------------------------------------------------------------------*/
char *cBODvol={"2.12.22.42.52.72.83.04.5"};

/*---------------------------------------------------------------------------------------------------------*/
/* Define functions prototype                                                                              */
/*---------------------------------------------------------------------------------------------------------*/


void SysTimerDelay(uint32_t us)
{
    SysTick->LOAD = us * 22; /* Assume the internal 22MHz RC used */
    SysTick->VAL   =  (0x00);
    SysTick->CTRL = (1 << SYSTICK_CLKSOURCE) | (1<<SYSTICK_ENABLE);

    /* Waiting for down-count to zero */
    while((SysTick->CTRL & (1 << 16)) == 0);
}


void DrvBODTALARM_BODISR(void)
{
    char cBuffer[3];
    uint8_t u8addr;

    u8addr = 3*(BOD->BOD_SEL.BOD_LVL);
    cBuffer[0] = *(cBODvol+u8addr);
    cBuffer[1] = *(cBODvol+u8addr+1);
    cBuffer[2] = *(cBODvol+u8addr+2);
    printf("Brown Out Detect voltage level below %s\n",cBuffer);

    if(BOD->BOD_SEL.BOD_LVL > 0)
        BOD->BOD_SEL.BOD_LVL--;
}


void DrvBODTALARM_TALARMISR(void)
{
    printf("Temperature Sense event occurs\n");
}
```

```
/*---------------------------------------------------------------------------------------------------*/
/* BODTALARM Test Sample                                                                             */
/* Test Item                                                                                         */
/* It sends the messages to HyperTerminal.                                                           */
/*---------------------------------------------------------------------------------------------------*/

int32_t main()
{
    STR_UART_T sParam;
    uint32_t u32config0;

    UNLOCKREG();
    SYSCLK->PWRCON.XTL32K_EN = 1;
    LOCKREG();
    /* Waiting for 12M Xtal stalble */
    SysTimerDelay(5000);

    /* Set UART Pin */
    DrvGPIO_InitFunction(FUNC_UART0);

    /* UART Setting */
    sParam.u32BaudRate      = 115200;
    sParam.u8cDataBits      = DRVUART_DATABITS_8;
    sParam.u8cStopBits      = DRVUART_STOPBITS_1;
    sParam.u8cParity        = DRVUART_PARITY_NONE;
    sParam.u8cRxTriggerLevel= DRVUART_FIFO_1BYTES;

    DrvUART_Open(UART_PORT0,&sParam);

    printf("+-----------------------------------------------------------+\n");
    printf("|          BOD&TALAM Sample Code                            |\n");
    printf("+-----------------------------------------------------------+\n");
    printf("| Brown out detection from 4.5V to 2.1V                     |\n");
    printf("| Temperature Alarm Sense Level = 105C                      |\n");
    printf("+-----------------------------------------------------------+\n");
    printf("\n");
```

```
    /* Configure Temperature Alarm */
    DrvBOD_SetTALARMselect(TALARM_SEL_105C);
    DrvBOD_SetTALARMIE(TALARM_EN_IEENABLE);
    DrvBOD_InstallISR(DrvBODTALARM_TALARMISR,1);
    DrvBOD_EnableTALARM(TALARM_EN_ENENABLE);

    /* Configure BOD */
    DrvBOD_SelectBODVolt(BODLVL_45V);
    DrvFMC_Read(CONFIG_BASE, &u32config0);
    u32config0 |= 0x00800000; //BOD enable
    DrvFMC_Write(CONFIG_BASE, u32config0);
    DrvBOD_InstallISR(DrvBODTALARM_BODISR,0);
    printf("Set Config0[23] = 1, Please reset again....\n");

    while(1);
}
```

5. Execution Environment Setup and Result

- Prepare ISD9160 EVB board.
- Compile&Download the sample code.
- Console window will show the results of BOD&TALARM.

6. Revision History

Version	Date	Description
V1.00.01	Sep. 2011	Created