NUC472/NUC442 Board Support Package Directory Introduction

Rev.3.01.000

Directory Information

Document	Driver reference manual and revision history.
Library	Driver header and source files.
SampleCode	Driver sample code.
ThirdParty	Third party source code, including FatFs, LibMAD, lwIP, LibMAD, and FreeRTOS™. Due to license issue, uC/OS-II™; and uC/OS-III™; source code are not included and the directory is empty. The source code could be downloaded from Micrium official website

Document Information

NuMicro NUC472_NUC442 Series CMSIS BSP Revision History.pdf	This document shows the revision history of NUC472/NUC442 BSP
NUC472_NUC442 BSP Users Manual.chm	The container document, which can be used to open the other two sub documents (CMSIS.chm and NuMicroNUC472NUC442DriverReferenceGuide.chm), also contains index and search information of the two sub documents
CMSIS.chm	Document of CMSIS 3.01.
NuMicroNUC472NUC442 DriverReference Guide.chm	This document describes the usage of drivers in NUC472/NUC442 BSP.

Library Information

CMSIS	Cortex® Microcontroller Software Interface Standard (CMSIS) V3.01 definitions by ARM® Corp.
Device	CMSIS compliant device header file.
SmartcardLib	Smartcard library binary and header file
StdDriver	All peripheral driver header and source files.
UsbHostLib	USB host library source code

Sample Code Information

FreeRTOS	Simple FreeRTOS™ demo code.
FreeRTOS_lwIP_httpd	A simple HTTP server demonstrates LwIP under FreeRTOS™. The server's IP address could configure statically to 192.168.0.2, or assign by DHCP server.

FreeRTOS_lwIP_TCP_ EchoServer	A TCP echo server which is implemented with LwIP under FreeRTOS™. The server listen to port 80, IP address could configure statically to 192.168.1.2 or assign by DHCP server. This server replies “Hello World!!” if the received string is “nuvoton”, otherwise reply "Wrong Password!!" to its client.
FreeRTOS_lwIP_UDP_ EchoServer	A UDP echo server which is implemented with LwIP under FreeRTOS™. The server listen to port 80, IP address could be configured statically to 192.168.1.2 or assign by DHCP server. After receiving any string from its peer, this sample code reply with “Hello World!!”.
Hard_Fault_Sample	Show hard fault information when hard fault happened.
NUC472-NuTiny	Sample code for NUC472 Tiny Board.
Semihost	Show how to print and get character with IDE console window.
StdDriver	Sample code to demonstrate the usage of NUC472/NUC442 MCU peripheral driver APIs.
Template	A project template for NUC472/NUC442 MCU.
uCOSII	A simple demo for µC/OS-II™, which demonstrates the crypto function under µC/OS-II™.
uCOSII_lwIP_httpd	A simple HTTP server to demonstrate LwIP under µC/OS-II™. The server’s IP address could be configured statically to 192.168.0.2, or assigned by DHCP server.
uCOSIII	Sample demo for µC/OS-III™, which demonstrates the crypto function under µC/OS-III™.

ThirdParty Information

FATFS	A generic FAT file system module for small embedded systems. Its official website is: http://elm-han.org/fsw/ff/00index_e.html
FreeRTOS	A real time operating system available for free download. Its official website is: http://www.freertos.org/.
LibMAD	A MPEG audio decoder library which currently supports MPEG-1 and the MPEG-2 extension to lower sampling frequencies, as well as the de facto MPEG 2.5 format. All three audio layers — Layer I, Layer II, and Layer III (i.e. MP3) are fully implemented. This library is distributed under GPL license. Please contact Underbit Technologies (http://www.underbit.com/) for the commercial license.
lwip-1.4.1	A widely used open source TCP/IP stack designed for embedded systems. Its official website is: http://savannah.nongnu.org/projects/lwip/
uCOS-II	This directory is intentionally left empty. uC/OS-II™ is a real time operation system for microprocessors. The source code can be download from its official website: http://micrium.com/
uCOS-III	This directory is intentionally left empty. uC/OS-III™ is a real time operation system for microprocessors. The source code can be download from its official website: http://micrium.com/

\SampleCode\ NUC472-NuTiny

LED	Toggle PB.10 to turn on / off the board LED.

\SampleCode\StdDriver

ACMP	Demonstrate analog comparator (ACMP) comparison by comparing ACMP0_P0 input and VBG voltage and shows the result on UART console.
ADC_Compare	Demonstrate ADC conversion and comparison function by monitoring the conversion result of channel 0.
ADC_ContinuousScan	Convert ADC channel 0, 1, 2 in continuous scan mode and prints conversion result.
ADC_SingleCycleScan	Convert ADC channel 0, 1, 2 in single cycle scan mode and prints conversion result.
ADC_SingleMode	Convert ADC channel 0 in single mode and prints conversion result.
CAN_BasicMode_Rx	Demonstrate CAN bus receive a message with basic mode.
CAN_BasicMode_Tx	Demonstrate CAN bus transmit a message with basic mode.
CAN_BasicMode_Tx_Rx	Demonstrate CAN bus transmit and receive a message with basic mode by connecting CAN0 and CAN1 to the same CAN bus.
CAN_NormalMode_Rx	Demonstrate CAN bus receive a message with normal mode.
CAN_NormalMode_Tx	Demonstrate CAN bus transmit a message with normal mode.
CAN_NormalMode_Tx_Rx	Demonstrate CAN bus transmit and receive a message with normal mode by connecting CAN 0 and CAN1 to the same CAN bus.
CAP_MotionDetection	Implement motion detection with image capture interface.
CAP_Packet_DownScale	Use packet format (all the luma and chroma data interleaved) to store captured image from NT99141 sensor to SRAM.

CAP_Planar_DownScale	Use planar format (all the luma information for a frame, followed by all the information for one chroma channel, and then the information for the other chroma channel) to store captured image from NT99141 sensor to SRAM.
CRYPTO_AES	Show Crypto IP AES-128 ECB mode encrypt/decrypt function.
CRYPTO_PRNG	Generate random numbers using Crypto IP PRNG.
CRYPTO_SHA	Use Crypto IP SHA engine to run through known answer SHA1 test vectors.
CRYPTO_TDES	Show Crypto IP Triple DES CBC mode encrypt/decrypt function.
EBI_SRAM	Configure EBI interface to access SRAM connects on EBI interface.
EMAC_TimeStamp	Demonstrate the usage of Ethernet time stamp function. It sets current time to 1000 second and prints out current time every second. It also sets an alarm at 1010 second. And rewind current time by 5 seconds after the alarm.
EMAC_TxRx	This Ethernet sample tends to get a DHCP lease from DHCP server. And use 192.168.10.10 as IP address it failed to get a lease. After IP address configured, this sample can reply to PING packets.
FMC_MULTI_WORD_PROG	Show FMC ISP multi-word program function. The loader.bin will load fmc_multi_word_prog.bin to SRAM and execute it.
FMC_RW	Show FMC read flash IDs, erase, read, and write functions.
FMC_VECTOR_REMAP	Show how to branch programs between LDROM, APROM start page, and APROM other page.
GPIO	Use GPIO driver to control the GPIO pin direction, control their high/low state, and how to use GPIO interrupts.
I2C_EEPROM	Read/write EEPROM via I²C interface.
I2C_GSENSOR	Read G-sensor (DMARD08) data via I²C interface.

I2C_Master	This is an I²C master mode demo code.
I2C_Slave	This is an I²C slave mode demo code.
I2S_MP3PLAYER	MP3 player sample plays MP3 files stored on SD memory card.
I2S_NAU8822	This is an I²S demo using NAU8822 audio codec, and used to play back the input from line-in or MIC interface.
I2S_WAVPLAYER	This is a WAV file player which plays back WAV file stored in USB pen drive.
PDMA	Use PDMA channel 2 to demonstrate memory to memory transfer.
PDMA_Scatter_Gether	Use PDMA channel 5 to demonstrate memory to memory transfer by scatter-gather mode.
PS2	Simulate the behavior of a PS/2 mouse by moving the cursor on the screen.
PWM_Capture	Demonstrate PWM Capture function by using PWM0 channel 2 to capture the output of PWM0 channel 0. Please connect PA.5 and PC.10 to execute this code.
PWM_DeadZone	Demonstrate the dead-zone feature with PWM0.
RTC_Alarm_Test	Demonstrate the RTC alarm function. It sets an alarm 10 seconds after execution.
RTC_Time_Display	Demonstrate the RTC function and displays current time to the UART console.
SC_ReadATR	Read the smartcard ATR from smartcard 5 interface.
SCUART_TxRx	Demonstrate smartcard UART mode by connecting PA.7 and PA.10 pins.
SD_FATFS	Access a SD card formatted in FAT file system.
SPI_DualMode_Flash	Access SPI flash using SPI dual mode.
SPI_Flash	Access SPI flash through SPI interface.

SPI_LoopBack	This is a SPI read/write demo by connecting SPI0 and SPI1 interface.
SPI_MasterMode	SPI master mode demo code.
SPI_MasterSlave_PDMA	Demonstrate the usage of PDMA transfer. One SPI interface is use as a host, and the other is slave. Totally 4 PDAM channels are used in this sample.
SPI_QuadMode_Flash	Access SPI flash using SPI quad mode.
SPI_SlaveMode	SPI slave mode demo code.
SPI_TFT_LCD	Display an image on TFT LCD panel via SPI interface.
SPI_TxRxLoopback_PDMA	Demonstrate the usage of PDMA transfer. One SPI interface is enabled in loopback mode. Two PDMA channels are used in this sample, one for transmit, the other for receive.
SYS	Demonstrate the usage of SYS driver by changing different PLL setting for the system clock source. And this sample also enables the CLKO (PC.5) output with frequency set to system clock / 4.
Timer_Delay	Demonstrate the usage of TIMER_Delay() API to generate a 1 second delay.
Timer_EventCounter	Use pin PB.4 to demonstrates timer event counter function.
Timer_FreeCountingMode	Use the timer pin PC.8 to demonstrate timer free counting mode function. And displays the measured input frequency to UART console.
Timer_Periodic	Use the timer periodic mode to generate timer interrupt every 1 second.
Timer_ToggleOut	Demonstrate the timer 0 toggle out function on pin PB.4.
UART_AutoFlow	Transmit and receive data using auto flow control.
UART_IrDA	Transmit and receive UART data in UART IrDA mode.
UART_PDMA	Demonstrate UART transmit and receive function with PDMA

UART_RS485	Transmit and receive data in UART RS485 mode.
UART_TxRx_Function	Transmit and receive data from PC terminal through RS232 interface.
USBD_Audio_Speaker	This is an UAC1.0 sample and used to plays the sound send from PC through the USB interface.
USBD_HID_MOUSE	Simulate an USB mouse and draws circle on the screen.
USBD_Mass_Storage_ ShortPacket	Implement a mass storage class sample to demonstrate how to receive an USB short packet.
USBD_Mass_Storage_ SRAM	Use internal SRAM as back end storage media to simulate a 30 KB USB pen drive.
USBD_Mass_Storage SactterGather	Demonstrate the usage of USBD DMA scatter gather function.
USBH_HID	Use USB Host core driver and HID driver. It reads raw data from a USB mouse.
USBH_UMAS	Use USB Host core driver, USB mass storage driver, and FATFS file system to show a disk access shell interface.
USBOTG_Dual_Role_UMAS	This is an OTG sample code. When plug-in Micro-A cable, it will become the USB host, and can access the pen drive user plugged in. When plug-in Micro-B cable, and then plug into PC, it will become a removable disk
WDT_Polling	Use polling mode to check WDT time-out state and reset WDT after time out occurs.
WDT_Wakeup	Use WDT to wake system up from power-down mode periodically.
WWDT_Reload	Demonstrate the WWDT counter reload function.

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