PSoC Sensei

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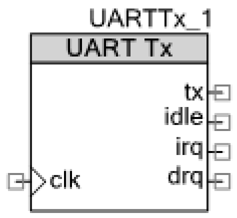
Transmit Only UART

1.10

Features

- High speed operation (up to 33 Mbaud)
- 4-Entry FIFO
- Signaling for Interrupts and DMA
- 8-bit, no parity, 1 stop bit (8-N-1)



General Description

Implements UART functionality for the Transmit direction with the settings of 8-bits, no parity and 1 stop bit.

When to use a Transmit Only UART

The component is intended for use when only the Tx portion of a UART is needed and the speed requirement exceeds the capability of the standard UART component. The standard UART component operates with an 8x oversampled clock (needed for the Rx direction) and therefore operates at a lower speed for a given input clock.

Input/Output Connections

This section describes the various input and output connections for UARTTx. An asterisk (*) in the list of I/Os indicates that the I/O may be hidden on the symbol under the conditions listed in the description of that I/O.

clk – Input

All functionality is implemented synchronous to this clock. If this clock is not synchronous to BUS_CLK a synchronizer will be added to synchronize to BUS_CLK.

tx – Output

Serial transmit UART signal.

idle – Output

Indicates that the FIFO is empty and no data is currently being sent.

irq – Output

Interrupt request signal.

drq – Output

Level sensitive DMA signal.

Parameters and Setup

There are no configuration parameters for this component.

DMA

This component is often used with DMA to implement high speed block transfers of data.

Name	Direction	Request Signal	Request Type	Burst Length	Description
UARTTx_FIFO_PTR	Destination	drq	Level	1	Transmit FIFO

Application Programming Interface

Application Programming Interface (API) routines allow you to configure the component using software. The following table lists and describes the interface to each function. The subsequent sections cover each function in more detail.

By default, PSoC Creator assigns the instance name “UARTTx_1" to the first instance of a component in a given design. You can rename it to any unique value that follows the syntactic rules for identifiers. The instance name becomes the prefix of every global function name, variable, and constant symbol. For readability, the instance name used in the following table is "UARTTx".

Function	Description
void UARTTx_Start(void)	Starts (Initializes) the UART
void UARTTx_Stop(void)	Stops (Clears the FIFO) the UART
void UARTTx_Init(void)	Initializes
void UARTTx_WriteData(uint8 val)	Writes a single byte to the FIFO for transmission

void UARTTx_PutString(uint8 *string)	Transmits the contents of a null terminated string
void UARTTx_PutArray(uint8 *string, uint16 byteCount)	Transmits the contents of a byte array
uint8 UARTTx_ReadStatus(void)	Reads the status register
void UARTTx_SetInterruptMode(uint8 interruptSource)	Sets the interrupt mask
void UARTTx_ClearFIFO(void)	Clears the FIFO
void UARTTx_Sleep(void)	Saves configuration and disables
void UARTTx_Wakeup(void)	Restores configuration and enables
void UARTTx_SaveConfig(void)	Saves the configuration
void UARTTx_RestoreConfig(void)	Restores the configuration

void UARTTx_Start(void)

Description:	Starts the UART. Initializes in preparation to transmit data.
Parameters:	None
Return Value:	None
Side Effects:	None

void UARTTx_Stop(void)

Description:	Stops the UART. Clears the transmission FIFO.
Parameters:	None
Return Value:	None
Side Effects:	None

void UARTTx_Init(void)

Description:	Initializes the component.
Parameters:	None
Return Value:	None
Side Effects:	None

void UARTTx_WriteData(uint8 val)

Description:	Writes a single byte to the transmission FIFO. This function does not check that there is room available in the FIFO. UARTTx_ReadStatus() should be used to check that space is available in the FIFO before calling this function.
Parameters:	(uint8) value to be transmitted
Return Value:	None
Side Effects:	None

void UARTTx_PutString(uint8 *string)

Description:	Transmits a null terminated string. The null character is not transmitted. Unless space for the entire string is available in the FIFO, this function will wait and transmit each byte to the FIFO as space is made available.
Parameters:	(uint8 *) string to be transmitted
Return Value:	None
Side Effects:	None

void UARTTx_PutArray(uint8 *string, uint16 byteCount)

Description: Transmits an array of bytes. The number of bytes from the array is determined based on the value provided. Unless space for the entire array is available in the FIFO, this function will wait and transmit each byte to the FIFO as space is made available.

Parameters: (uint8 *) array to be transmitted
(uint16) number of bytes to transmit

Return Value: None

Side Effects: None

uint8 UARTTx_ReadStatus(void)

Description: Reads the status register. Can be used to determine if more space is available in the transmit FIFO. IDLE condition can be read to determine whether all bytes have been fully transmitted.

Parameters: None

Return Value: (uint8) state of the status register.

Status Masks	Value	Type
UARTTx_NOT_FULL	0x01	Transparent
UARTTx_IDLE	0x02	Transparent

Side Effects: All Clear on Read status bits are cleared.

void UARTTx_SetInterruptMode(uint8 interruptSource)

Description: Sets the interrupt mask register.

Parameters: (uint8) byte containing the constant with the following mask fields set.

Interrupt Source	Value
UARTTx_NOT_FULL	0x01
UARTTx_IDLE	0x02

Return Value: None

Side Effects: None

void UARTTx_ClearFIFO(void)

Description: Clears the contents of the FIFO.

Parameters: None

Return Value: None

Side Effects: None

void UARTTx_Sleep(void)

Description: Saves the configuration and non-rentention register values. Disables and clears the FIFO.

Parameters: None

Return Value: None

Side Effects: None

void UARTTx_Wakeup(void)

Description: Restores the configuration and non-retention register values.

Parameters: None

Return Value: None

Side Effects: None

void UARTTx_SaveConfig(void)

Description: Saves the user configuration of non-rentention registers. Called by UARTTx_Sleep routine to save the component state before entering sleep.

Parameters: None

Return Value: None

Side Effects: None

void UARTTx_RestoreConfig(void)

Description: Restores the user configuration of non-rentention registers. Called by UARTTx_Wakeup routine to restore the component state after returning from sleep.

Parameters: None

Return Value: None

Side Effects: None

Component Changes

This section lists the major changes in the component from the previous version.

Version	Description of Changes	Reason for Changes / Impact
1.10	Removed power management backup structure in the case of PSoC 3 ES3 silicon.	The structure was empty for PSoC 3 ES3 which resulted in a compiler error.