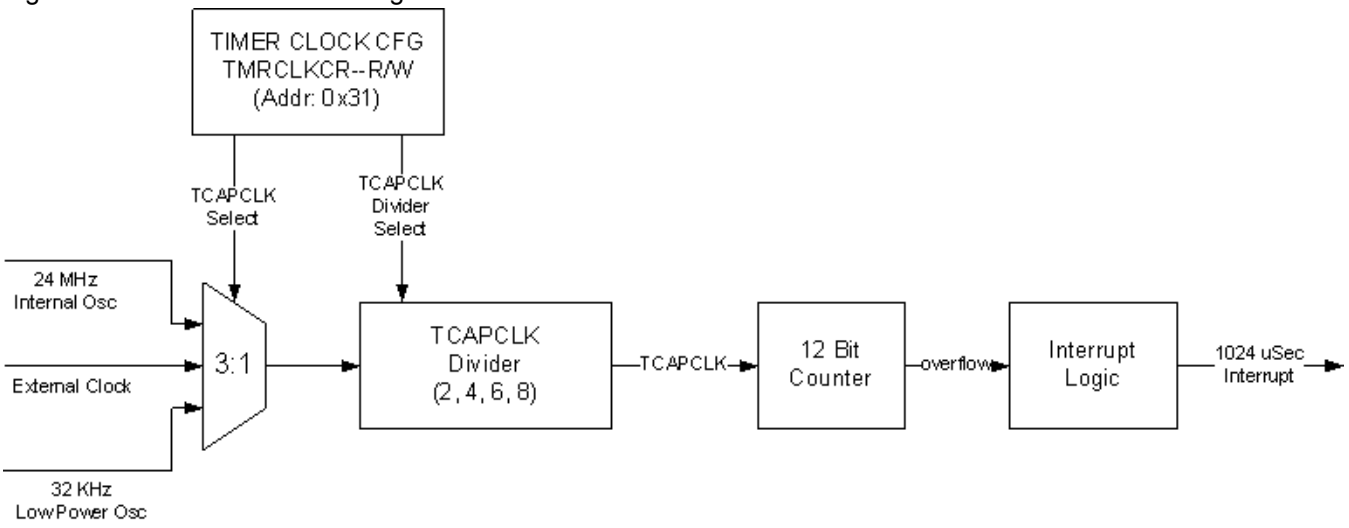
1 Millisecond Interval Timer Datasheet MSTIMER V 1.2

Resources	API Memory (Bytes)		Pins (per External I/O)
	Flash	RAM	
CY7C639/638/633/602/601xx, CYRF69xx3	19 Bytes	0	None

Features and Overview

- 12-bit interval timer
- Input clock: enCoRe II TCAPCLK clock
- Provides a 1 Millisecond interrupt with the TCAPCLK Divider = 6 (24 MHz/6 = 4 MHz)
- Source clock rates up to 24 MHz
- Designed for use with the USB User Module for USB Suspend handling

Figure 1. MSTIMER Block Diagram



Functional Description

The MSTIMER User Module provides convenient access to the "1024 microsecond" feature of the enCoRe II.

DC and AC Electrical Characteristics

See the device datasheet for your enCoRe II device for the electrical characteristics of the millisecond timer.

Placement

The MSTIMER User Module occupies the MSTIMER block. Alternate placement is not available.

Parameters and Resources

The MSTIMER User Module does not have any parameters.

Application Programming Interface

The Application Programming Interface (API) routines are provided as part of the user module to enable you to deal with the module at a higher level. This section specifies the interface to each function together with the related constants provided by the include files.

The standard method of using this feature is to add custom user code to the interrupt service routine found in the MSTIMERINT.ASM file in the project library directory. In the application code, enable the MSTIMER interrupt by calling the MSTIMER_EnableInt to begin the periodic calling of the interrupt service routine, and thereby calling the custom user code. When the MSTIMER functionality is no longer needed, call MSTIMER_DisableInt to disable the interrupt service routine from being called. Enable or disable the MSTIMER interrupt repeatedly as needed by the application.

The API programming routines for MSTIMER follow:

MSTIMER_EnableInt

Description:

Enables the interrupt mode operation. The MSTIMER_ISR function in the MSTIMERINT.ASM file is called on 1 ms periods. You must enable global interrupts before the interrupts are actually serviced.

C Prototype:

```
void  MSTIMER_EnableInt(void);
```

Assembly:

```
lcall  MSTIMER_EnableInt
```

Parameters:

None

Return Value:

None

Side Effects:

This routine modifies the appropriate interrupt enable register in I/O space. You can alter the A and X registers by this function.

MSTIMER_DisableInt

Description:

Disables the interrupt mode operation.

C Prototype:

```
void  MSTIMER_DisableInt(void);
```

Assembly:

```
lcall  MSTIMER_DisableInt
```

Parameters:

None

Return Value:

None

Side Effects:

This routine modifies the appropriate interrupt enable register in IO space. You can alter the A and X registers by this function.

MSTIMER_Start

Description:

Given for interface consistency only. Does nothing.

C Prototype:

```
void  MSTIMER_Start(void);
```

Assembly:

```
lcall  MSTIMER_Start
```

Parameters:

None

Return Value:

None

Side Effects:

You can alter the A and X registers by this function.

MSTIMER_Stop

Description:

Disables the MSTIMER by disabling the interrupt.

C Prototype:

```
void  MSTIMER_Stop(void);
```

Assembly:

```
lcall  MSTIMER_Stop
```

Parameters:

None

Return Value:

None

Side Effects:

You can alter the A and X registers by this function.

Sample Firmware Source Code

The following code is an example of how to use the MSTIMER User Module. The code sample in assembly language is:

```
include "m8c.inc"       ; part specific constants and macros
include "memory.inc"    ; Constants & macros for SMM/LMM and Compiler
include "PSoCAPI.inc"   ; PSoC API definitions for all User Modules

export _main

_main:

    M8C_EnableGInt ;  Enable Global Interrupts
    lcall MSTIMER_EnableInt; Enable MSTIMER
                                          ; MSTIMER interrupts will arise every 1 ms;


.terminate:
    jmp .terminate
```

The same code written in C is:

```
#include <m8c.h>        // part specific constants and macros
#include "PSoCAPI.h"    // PSoC API definitions for all User Modules

void main(void)
{
    M8C_EnableGInt ; // Enable Global Interrupts
    MSTIMER_EnableInt(); // Enable MSTIMER
                                         // MSTIMER interrupts will arise every 1 ms;
}
```

Version History

Version	Originator	Description
1.2	DHA	Added Version History.
1.2.b	DHA	Added Sample Firmware Source Code section to this user module datasheet.

Note PSoC Designer 5.1 introduces a Version History in all user module datasheets. This section documents high level descriptions of the differences between the current and previous user module versions.