

Demo Set-up

The SW MC56F84000_PWM_sine_duty demonstrates PWMA SM0 and SM1 modules in complementary mode configuration with varying sine duty wherein duty cycle of modules varies as $(0.5+x)$ and $(0.5-x)$ ($x=0.5\sin\phi$) respectively . It is targeted at MC56F84789 and its derivatives.

The application control and variable access is provided using FreeMASTER communication tool. The FreeMASTER communicates with the MAPS-MC56F84000 board using OSBDM via SCI1.

H/W Setup

The h/w consists of:

1. MAPS-MC56F84000 populated with MC56F84789 device
2. USB cable connected to MAPS OSBDM connector
3. 5V Power supply

Before the demo starts, the HW with OSBDM link needs to be set-up.

Application SW

The demo s/w is located in a folder MC56F84000_PWM_sine_duty.The s/w was designed using CodeWarrior CW10.x

Development Tools

In order to compile run, load and flash the demo the following s/w is necessary to:

1. Install CodeWarrior_CW_MCU_v10.x and Run the CodeWarrior
2. Drag and drop < MC56F84000_PWM_sine_duty\project into the opened CodeWarrior CW10.x
3. Clean(if the project is the first time run in your workspace) and Build the application code target MC56F84789_Internal_PFlash_SDM
4. Connect a USB cable between the PC host and the mbed USB port (CN7 on the MAPS-56F84000 board).
5. Running/debugging loading the code:
 - a. Run -> Debug Configuration
 - b. Set the configuration for debug as download.
6. Click Debug

7. Start

Running the demo

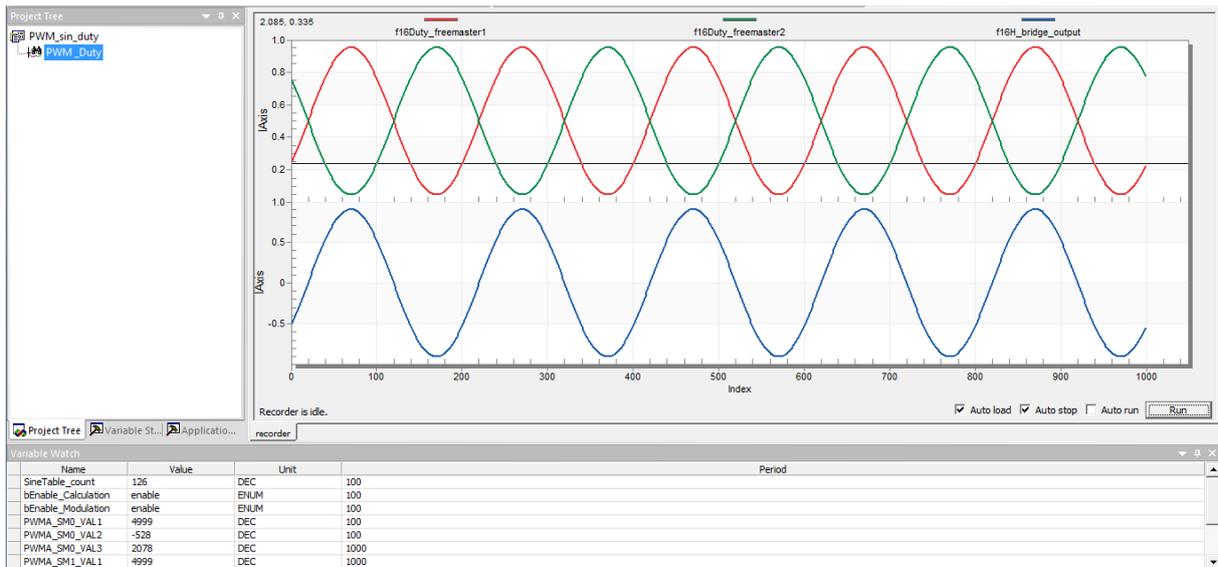
Demo is to be controlled using a FreeMASTER communication tool.

In order to control the application the following s/w is necessary:

1. FreeMASTER Application Installation see:
http://www.freescale.com/webapp/sps/site/prod_summary.jsp?code=FREEMASTER&parentCode=null
2. CodeWarrior Connection Server
this is a part of Freescale CodeWarrior installation, located usually at C:\Freescale\CW MCU v10.6\MCU\ccs\bin
but the ccs_bld000_win.zip can also be obtained without the CodeWarrior installation

The following steps are necessary (if continuing from debug mode, goto step 4 and when freemaster is in run state, terminate the code from CodeWarrior using terminate button):

1. Connect Power Supply
2. Connect OSBDM for FreeMASTER control
3. If the application s/w is not programmed into the MAPS_84000 board, go to section Application SW
4. Install FreeMASTER Application
5. Start FM_84000_PWM_sine_duty.pmp (FreeMASTER Application must be installed before)
6. If the FreeMASTER is not connected (variables values are: ?), check:
 - a. Click at the STOP switch



SM0 duty cycle is shown by duty_freemaster1 variable = $(0.5+x)$

SM 1 duty cycle is shown by duty_freemaster2 variable = $(0.5-x)$

Here x is sine modulated, ie, $(0.5\sin\phi)$

H-Bridge output, which can be used for the inverters is also shown, which is,

$H_bridge_output = (duty_freemaster1 - duty_freemaster2) = \sin\phi$

The PWM outputs are available on the pins

PWMs with complementary center aligned PWM signals

SM0:

1. PWMA_0B – pin68
2. PWMA_0A – pin69

SM 1:

1. PWMA_1B – pin74
2. PWMA_1A – pin75

The PWMs modulation can be switched off with bEnable_Modulation – disable. Then the PWM values are constant.

Other possibility is to set all the PWM value registers manually. At that case, disable bEnable_Calculation – disable and all the PWM dutycycles are updated manually.

