

DeadBandPWM

November 2010



Description

This program sets up the ePWM2 module to generate complimentary PWM waveforms with a certain amount of deadband.

Hardware Setup

1 ADC-A6 COMP3(+VE)	2 ADC-A2 COMP1 (+VE)	3 ADC-A0	4 3V3
5 ADC-A4 COMP2 (+VE)	6 ADC-B1	7 EPWM-4B GPIO-07	8 TZ1 GPIO-12
9 SCLA GPIO-33	10 ADC-B6 COMP3(-VE)	11 EPWM-4A GPIO-06	12 ADC-A1
13 SDAA GPIO-32	14 ADC-B0	15 EPWM-3B GPIO-05	16 5V0 (Disabled by Default)
17 EPWM-1A GPIO-00	18 ADC-B4 COMP2 (-VE)	19 EPWM-3A GPIO-04	20 SPISOMIA GPIO-17
21 EPWM-1B GPIO-01	22 ADC-A5	23 EPWM-2B GPIO-03	24 SPISIMOA GPIO-16
25 SPISTEA GPIO-19	26 ADC-B2 COMP1 (-VE)	27 EPWM-2A GPIO-02	28 GND
29 SPICLKA GPIO-18	30 GPIO-34 (LED)	31 PWM1A-DAC (Filtered)	32 GND

Table 1: J1 Connections

	No connection
	Oscilloscope

Software Setup

Add the following variables to the watch window:

RED_delay - (format = decimal) -This variable adjusts the rising edge delay.

FED_delay - (format = decimal) -This variable adjusts the falling edge delay.

Initially both of the variables are set to 375ns

Overview

The dead-band submodule supports independent values for rising-edge (RED) and falling-edge (FED) delays. The amount of delay is programmed using the DBRED and DBFED registers. These are 10-bit registers and their value represents the number of time-base clock periods, TBCLK, a signal edge is delayed by.

In this example ePWM2A is the source for both falling-edge and rising-edge delay. Both the falling-edge delay (FED) and rising-edge delay (RED) are applied to the input PWM signals.

The formula to calculate falling-edge-delay and rising-edge-delay are:

$$\text{FED} = \text{FED_delay} \times T_{\text{TBCLK}}$$

$$\text{RED} = \text{RED_delay} \times T_{\text{TBCLK}}$$

where RED_delay and FED_delay are initialized as 30 and T_{TBCLK} is set to 1/80MHz. Therefore, the deabands in this example are 0.375usec.

The user can observe the waveforms using a scope from ePWM2A and ePWM2B pins. In order to change the PWM frequency and duty cycles, the user should change the value of "period" and compare values (CMPA & CMPB) respectively.

Note: The rising & falling edge delays can independently be modified by changing the variables RED_delay & FED_delay from watch window (see Fig.1) while running the program.

```
for (;;)
{
    EPwm2Regs.DBRED = RED_delay; // Change rising-edge delay time from watch window
    EPwm2Regs.DBFED = FED_delay; // Change falling-edge delay time from watch window
}
```

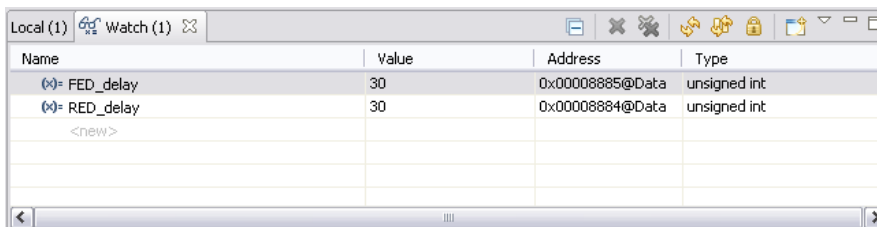


Figure 1: Watch window