CompareValues

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Description

This example configures ePWM1A, Comparator1 and internal DAC. The user can compare either PWM1A-DAC output (pin31) or external supply voltage level with internal DAC. Depending on comparator output, the on board LED turns on and off.

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

PWM1A-DAC Output

External DC Supply (<3.3V)

Software Setup

Add the following variables to the watch window:

dac_value - (format = decimal) - This variable adjusts internal DAC voltage level from 0 to 3.3 V. The range of “dac_value” is from 0 to 1024 (i.e. 0 to 3.3 V).

duty_cycle_A - (format = decimal) - This variable adjusts the duty cycle of the PMW which changes the DC voltage output of the PWM1A-DAC. Note that the value of “duty_cycle_A” cannot be higher than the value of “period”.

Overview

In this project, internal DAC value is compared to an (external) dc value. Since the comparator event is configured as cycle by cycle, LED will turn on and off each time when the comparator output status changes. The external dc can either be obtained from external power supply or PWM1A-DAC output.

Initially DAC needs to be set lower than external supply or PWM1A-DAC output voltages. In this example DAC is initialized as 310 (i.e. (310/1024) x 3.3V ≈ 1V), therefore make sure that the external voltage or PWM1A-DAC output is set to a value higher than 1V.

The user should either decrease the level of external power supply / PWM1A-DAC voltage level, or increase the 'dac_value' from watch window (see Fig.1) while running the program to trigger comparator. When PWM1A-DAC (pin 31) is used as dc supply, adjust the output dc voltage by duty_cycle_A while running the program.

```
for(;;)                          // Infinite Loop
{
Comp1Regs.DACVAL.bit.DACVAL =dac_value;    // Change (internal) DAC value
EPwm1Regs.CMPA.half.CMPA = duty_cycle_A;   // Change dc voltage level at
                                           // PWM1A-DAC output
}
```

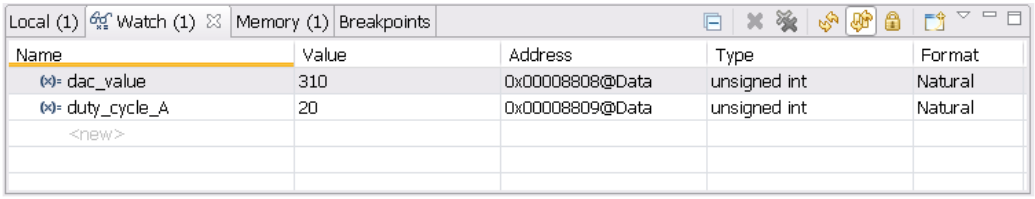

Figure 1: Watch window