سوالات تحلیلی دستور کار سری 6

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سوال اول)

از مشخصات PWM می توان به Modulation frequency اشاره کرد که بیان گر چه مقدار پالس در هر ثانیه رخ می دهد. Period را داریم که برابر با 1 / Modulation frequency است. م توان به on-time بودن آن اشاره کرد که نشان دهنده مقدار زمانی است که هر پالس روشن است و همچنین Duty-cycle نیز از مشخصات PWM است.

PWM signal characteristics:

– Modulation frequency: how many pulses occur per second (fixed)

– Period: 1/(modulation frequency)

– On-time: amount of time that each pulse is on (asserted)

– Duty-cycle: on-time/period

– Adjust on-time (hence duty cycle) to represent the analog value

سوال دوم)

دو نوع PWM وجود دارد mode 1 و mode 2 که هر دو آن ها با field TIM_OC_INITTypeDef.OCMODE با استفاده از مقادیر TIM_OCMODE_PWM1 و TIM_OCMODE_PWM2 قابل تنظیم هستند.

تفاوت های آن ها عبارت است از:

1. **PWM mode 1:** در upcounting چنل تا زمانی که Period < Pulse فعال است در غیر این صورت غیر فعال است.
   در downcounting چنل تا زمانی که Period > Pulse است غیر فعال است در غیر این صورت فعال است.

2. **PWM mode 2:** کارکرد آن کاملا برعکس mode 1 است.

سوال سوم)

رجیستر های capture/compare در دو دسته system module group و concurrent group تقسیم میشوند :

System Module Group :

- **Mode:** (Capture/Compare Mode) enables and configures the capture or compare mode for this register.
- **CCx**: (Capture Compare Registers) displays or sets the value of each of the capture/compare registers (CRC, CC1, CC2, CC3, CC4).
- **IEXx:** (External Interrupt Request Flags 3 - 6) is set in Capture Mode 0 when an external event causes a capture. It is also set in Compare Mode when a compare event occurs.
- **CCx Pin:** sets or clears the state of port pins CC0-CC4.

Concurrent Compare Group :

- **Add. Outputs:** defines which pins on Port 5 are activated for a concurrent compare event.
- **COMO:** (CC4 Compare Mode Select Bit) is set to select Mode 1 for register CC4. Mode 0 is selected if COMO is reset.
- **COCOEN1:** is set to enable Concurrent Compare .
- **COCOEN0:** when set, uses Port 5 to output signal levels from CC4 when a Concurrent Compare event occurs.
- **COMSET:** holds a match value for Timer 2. When this value equals Timer 2 (compare event), the pins on Port 5 that correspond with the SETMSK value are set high.
- **SETMSK:** holds the bits that correspond to the pins on Port 5 that will be set high when COMSET matches Timer 2.
- **ICS:** (Interrupt Request Flag For Compare Register COMSET) sets when a compare match occurs for COMSET
- **COMCLR:** holds a match value for Timer 2. When this value equals Timer 2 (compare event), the pins on Port 5 that correspond with the CLRMSK value are set low.
- **CLRMSK:** holds the bits that correspond to the pins on Port 5 that will be set low when COMCLR matches Timer 2.
- **ICR**: (Interrupt Request Flag For Compare Register COMCLR) sets when a compare match occurs for COMCLR.
- **T2CM:** (Timer 2 Compare Mode) selects Compare Mode 1 when set, and Compare Mode 0 when reset. This is only used when Compare Mode is enabled.
- **I2FR:** (External Interrupt 2 Falling / Rising Edge Flag) is set to capture register CRC on a positive transition at pin INT2.
- **I3FR**: (External Interrupt 3 Falling / Rising Edge Flag) is set to capture register CRC on a positive transition at pin INT3.