Input Capture Mode

Input capture to capture external events and give them a time stamp indicating the time the event occurs, may be performed in front of the counting mode, but used to remove ICR3 As the count value TOP Waveform value generation patterns.

External trigger event occurs by pin ICP3 Input may be realized by an analog comparator unit. When the pin ICP3 Logic level on the output is changed, or the analog comparator ACO Level is changed, and this change in level is input to the capture unit captures input capture is triggered, then 16 Bit count value TCNT3 Data is copied into the input capture register ICR3 While input capture flag ICF3 Set, if ICIE1 Bit "1" , Input Capture Flag generates an Input Capture interrupt.

By setting the Analog Comparator Control and Status Register ACSR The analog comparator input capture control bit ACIC To select the input capture trigger source ICP3 or ACO . It should be noted that the change may cause a trigger source input capture, and therefore must be changed after the trigger source ICF3 To conduct a clearing operation to avoid erroneous results.

Capture Input selection control signal after an optional noise suppressor edge detector, based on the input capture ICES1 Configuration, see whether or not the detected edge trigger condition is met. Noise suppressor is a simple digital filtering, the input signal 4 Samples only when 4 When samples are equal the output value will be the edge detector. By the noise suppressor TCCR3B Register ICNC1 Bit control their enabled or disabled.

When using the input capture function, when ICF3 After being set, should be read as early as possible ICR3 Value of the register, because the next time capture after the event ICR3 The value will be updated. Recommended enable input capture interrupt at any input capture mode, the change count is not recommended during operation TOP value.

Input captured timestamp other features may be used to calculate the frequency and the duty ratio signal, as a trigger event and create a log. Measuring the duty cycle required external signal each time after the capture trigger edge is changed, so read ICR3 After the value of the edge-triggered signal to be changed as soon as possible.

PWM Automatically shutdown and restart of output

When set TCCR3C Register DOC3x Bit is high, PWM When auto-off feature is enabled, the trigger condition is met, the hardware clears the corresponding output COM3x Bits, PWM output signal OC3x And its output pin is disconnected, the switching to a common IO Output achieved PWM Automatically shut down the output. At this time, the state of the output pin by a general IO To control the output.

PWM Off automatically after the output is enabled, which also need to set the trigger conditions from TCCR3D Register DSX3n Bits to select trigger source. Triggered by an analog comparator interrupt, external interrupt, the interrupt pin change and the timer overflow interrupt, please refer to the specific circumstances TCCR3D Register description. Or when a certain trigger source is selected as the trigger condition, in which the interrupt flag is set at the same time, the hardware will be cleared COM3x Bit to close PWM Output.

In the event of a triggering event closed PWM After the output, the timer module is no corresponding interrupt flag, the software needs to know the trigger and the trigger event by source interrupt flag read.