Patterns and other PWM Except that it is a one-way mode operation. From the counter BOTTOM To accumulate TOP Then came back BOTTOM Re-count. When the count value TCNT3 Arrivals TOP or BOTTOM , The output signal of the comparison OC3x It will be set or cleared, depending on the comparison output mode COM3 Setting, as detailed register description. Since the one-way operation, fast PWM Operating frequency of the phase correction mode is employed bi-directionally operable PWM Double mode. It makes the fast frequency PWM Mode is suitable for power regulation, rectification and DAC application. High-frequency signal can be reduced external components (capacitors, inductors) in size, thereby reducing system cost.

When the count value reaches TOP When the timer counter overflow flag TOV3 It will be set, and the updated buffer value comparison value to the comparator. If enabled, can be updated in the interrupt service routine OCR3A register.

Set up OC3x Pin data direction register as an output a comparison signal to obtain an output OC3x Waveform. Frequency of the waveform following formula can be calculated:

$$f_{OC3xfpwm} = f_{sys} / (N * (1 + TOP))$$

among them, N It represents the prescale factor (1 , 8 , 64 , 256 or 1024).

when TCNT3 with OCR3x Compare match, the waveform generator to set (clear) OC3x Signal, when TCNT3 When cleared, the waveform generator will be cleared (set) OC3x Signal in order to produce PWM wave. thus OCR3x The extremes will produce special PWM Waveform. when OCR3x Set as 0x00 , The output of PWM For each (1 + TOP) There is a clock count of a narrow spike. when OCR3x Set as TOP Waveform, the output is continuously high or low. If you use OCR3A As a TOP And set COM3A = 1 , The comparator output signal OC3A It will have a duty cycle of 50% of PWM wave.

Phase correction PWM mode

When set WGM3 [3: 0] = 1 , 2 , 3 , 10 or 11 When the timer counter 1 Enter phase correction PWM Max mode, counting TOP Respectively 0xFF , 0x1FF , 0x3FF , ICR3 or OCR3A . Bidirectional counter operation by BOTTOM Increments to TOP And then descending to BOTTOM , Then repeat this operation. Count reaches TOP with BOTTOM Have to change direction when the count value TOP or BOTTOM On average only stay a count clock. In the process increments or decrements the count value TCNT3 versus OCR3x Match, the comparison signal output OC3x It will be set or cleared, depending on the comparison output mode COM3 setting. Compared with the one-way operation, bidirectional operation obtainable maximum operation frequency, but its excellent symmetry is more suitable for motor control.

Phase correction PWM Mode, when the count reaches BOTTOM When set TOV3 Flag when the count reaches TOP When the buffer is updated to compare the value of the comparison value. If enabled, the interrupt service routine can be updated relatively buffer OCR3x Register.

Set up OC3x Pin data direction register as an output a comparison signal to obtain an output OC3x Waveform. Frequency of the waveform following formula can be calculated:

$$f_{OC3xcpcpwm} = f_{sys} / (N * TOP * 2)$$

among them, N It represents the prescale factor (1 , 8 , 64 , 256 or 1024).

In up-counting process, when TCNT3 versus OCR3x Match, the waveform generator will be cleared (set) OC3x signal. In the process of counting down, when TCNT3 versus OCR3x When the match is set to the waveform generator (clear) OC3x signal. thus OCR3x The extremes will produce a special PWM wave. when OCR3x Set as TOP or BOTTOM Time, OC3x Signal output