

## 14.9 Register Description

### 14.9.1 TCCR0A – Timer/Counter Control Register A

Bit	7	6	5	4	3	2	1	0	
0x24 (0x44)	COM0A1	COM0A0	COM0B1	COM0B0	–	–	WGM01	WGM00	TCCR0A
Read/Write	R/W	R/W	R/W	R/W	R	R	R/W	R/W	
Initial Value	0	0	0	0	0	0	0	0	

- Bits 7:6 – COM0A1:0: Compare Match Output A Mode**

These bits control the output compare pin (OC0A) behavior. If one or both of the COM0A1:0 bits are set, the OC0A output overrides the normal port functionality of the I/O pin it is connected to. However, note that the data direction register (DDR) bit corresponding to the OC0A pin must be set in order to enable the output driver.

When OC0A is connected to the pin, the function of the COM0A1:0 bits depends on the WGM02:0 bit setting. [Table 14-2](#) shows the COM0A1:0 bit functionality when the WGM02:0 bits are set to a normal or CTC mode (non-PWM).

**Table 14-2. Compare Output Mode, non-PWM Mode**

COM0A1	COM0A0	Description
0	0	Normal port operation, OC0A disconnected.
0	1	Toggle OC0A on compare match
1	0	Clear OC0A on compare match
1	1	Set OC0A on compare match

[Table 14-3](#) shows the COM0A1:0 bit functionality when the WGM01:0 bits are set to fast PWM mode.

**Table 14-3. Compare Output Mode, Fast PWM Mode<sup>(1)</sup>**

COM0A1	COM0A0	Description
0	0	Normal port operation, OC0A disconnected.
0	1	WGM02 = 0: Normal port operation, OC0A disconnected. WGM02 = 1: Toggle OC0A on compare match.
1	0	Clear OC0A on compare match, set OC0A at BOTTOM, (non-inverting mode).
1	1	Set OC0A on compare match, clear OC0A at BOTTOM, (inverting mode).

Note: 1. A special case occurs when OCR0A equals TOP and COM0A1 is set. In this case, the compare match is ignored, but the set or clear is done at BOTTOM. See [Section 14.7.3 “Fast PWM Mode” on page 80](#) for more details.

[Table 14-4](#) shows the COM0A1:0 bit functionality when the WGM02:0 bits are set to phase correct PWM mode.

**Table 14-4. Compare Output Mode, Phase Correct PWM Mode<sup>(1)</sup>**

COM0A1	COM0A0	Description
0	0	Normal port operation, OC0A disconnected.
0	1	WGM02 = 0: Normal port operation, OC0A disconnected. WGM02 = 1: Toggle OC0A on compare match.
1	0	Clear OC0A on compare match when up-counting. Set OC0A on compare match when down-counting.
1	1	Set OC0A on compare match when up-counting. Clear OC0A on compare match when down-counting.

Note: 1. A special case occurs when OCR0A equals TOP and COM0A1 is set. In this case, the compare match is ignored, but the set or clear is done at TOP. See [Section 15.9.4 “Phase Correct PWM Mode” on page 103](#) for more details.