Color Sensor (SEN-Color – TCS3200)

- **Voltage:** 5V

- **Current:** ~10–20 mA (varies with light intensity and frequency scaling)

- **Output Signal:** Frequency-based digital output (square wave, 50% duty cycle, 2 Hz to 500 kHz)

- **Detection Method:** Measures light intensity for Red, Green, Blue, and Clear channels using onboard photodiodes

- **Distance to object (recommended):** ~4–5 cm

- **Calibration:** Required for accurate RGB value mapping (min/max frequency values)

- **Special Notes:**
  - Output frequency is affected by S0/S1 (frequency scaling)
  - Sensor type (R/G/B/Clear) selected via S2/S3
  - Output on a single digital pin (measure pulse duration to infer color)

Pin Assignments:

Sensor Pin	Function	Arduino Pin
VCC	5V Power	5V
GND	Ground	GND
OE	Output Enable	GND
OUT	Output Frequency	D4
LED GND	LED Ground	GND
S0	Frequency scaling control	D2
S1	Frequency scaling control	D3
S2	Photodiode selection (color filter)	D5
S3	Photodiode selection (color filter)	D6