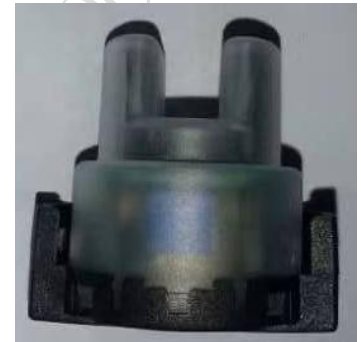


## Turbidity (Liquid) Sensor

### Description

The Turbidity sensor detects water quality by measuring the level of turbidity. This sensor module is composed of an Infrared emitting diode and a matched photo transistor mounted in a plastic shell closure.

Infrared light is used to measure the turbidity level, it is able to detect suspended particles in water by measuring the light transmittance and scattering rate which changes with the amount of total suspended solids in water, the more turbid the water is, the less light will pass through. At the detector (photo transistor) end, the amount of light received will be converted into the corresponding current. If there is more light passing through, the corresponding current will be larger; if there is less light passing through, the corresponding current will be smaller. Therefore the turbidity of water can be defined by measuring the corresponding output current of the photo transistor.



### Applications

This Turbidity sensor can be used in measurement of water quality in dish washer and washing machine.

### Electrical Parameters

#### Absolute Maximum Ratings

Ta=25°C

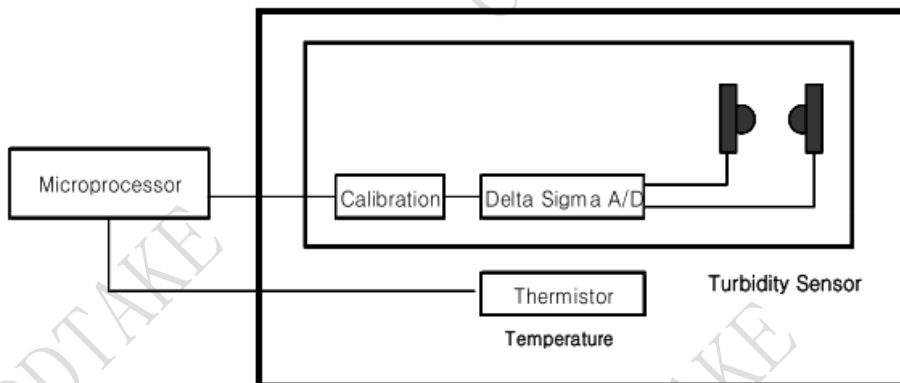
Item		Symbol	Rating	Unit
IR Emitter (Input)	Power Dissipation	PD	75	mW
	Forward Current	IF	60	mA
	Peak Forward Current	IFP	1.0	A
	Reverse Voltage	VR	5	V
Detector (Output)	Power Dissipation	PD	100	mW
	Collector Current	IC	40	mA
	Collector-Emitter Breakdown Voltage	BVCEO	30	V
	Emitter-Collector Breakdown Voltage	BVECO	5	V
Operating Temperature		Topr	-20~+85	°C
Storage Temperature		Tstg	-30~+100	°C

Typical Electrical & Optical characteristics

Ta=25°C

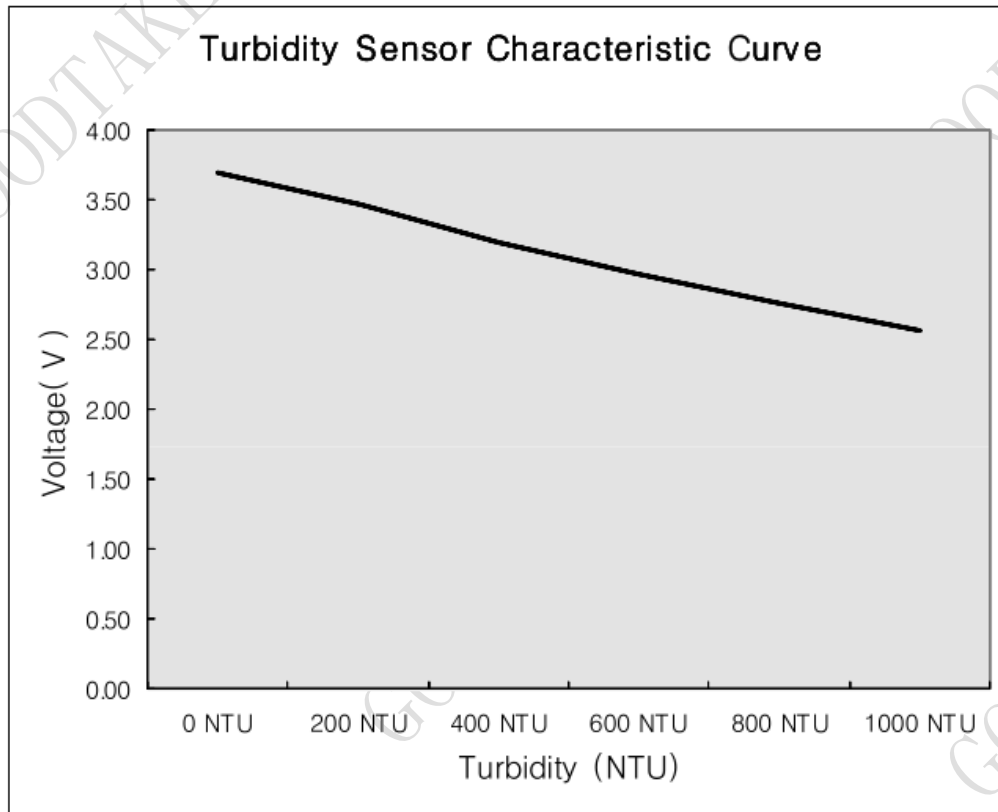
Parameter		Symbol	Min	Typ	Max	Unit	Test Condition
IR Emitter (Input)	Forward Voltage	V <sub>F</sub>		1.2	1.3	V	I <sub>F</sub> =20 mA
	Reverse Current	I <sub>R</sub>			10	μA	V <sub>F</sub> =5V
	Peak Wavelength	λ <sub>P-IR</sub>		940		nm	
Detector (Output)	Collector Dark Current	I <sub>CEO</sub>		5	100	nA	V <sub>CE</sub> =10V I <sub>F</sub> =0mA E <sub>e</sub> =0mW/cm <sup>2</sup>
	Collector-Emitter Saturation Voltage	V <sub>CE(sat)</sub>		0.1	0.4	V	I <sub>c</sub> =2mA I <sub>F</sub> =20mA
	Peak Wavelength	λ <sub>P-PT</sub>		880	-	nm	
Sensor Module	Power supply (Pin1)	V <sub>CC</sub>	5			V	
	Output voltage (Pin2)	P <sub>T</sub>	0 ~ 5			V	
	IR current range (Pin3)	I <sub>R</sub>	1.2 ~ 2.8			mA	*Trim pot adjust, calibrate
	Turbidity measure range	R <sub>a</sub>	0 ~ 1000			NTU	* 1NTU = 1 mg/L.
	Insulation Resistance		over 100 MΩ				at DC 500V
	Insulation Voltage		AC 1800V, be endured during		1sec		

**Module Function Description**



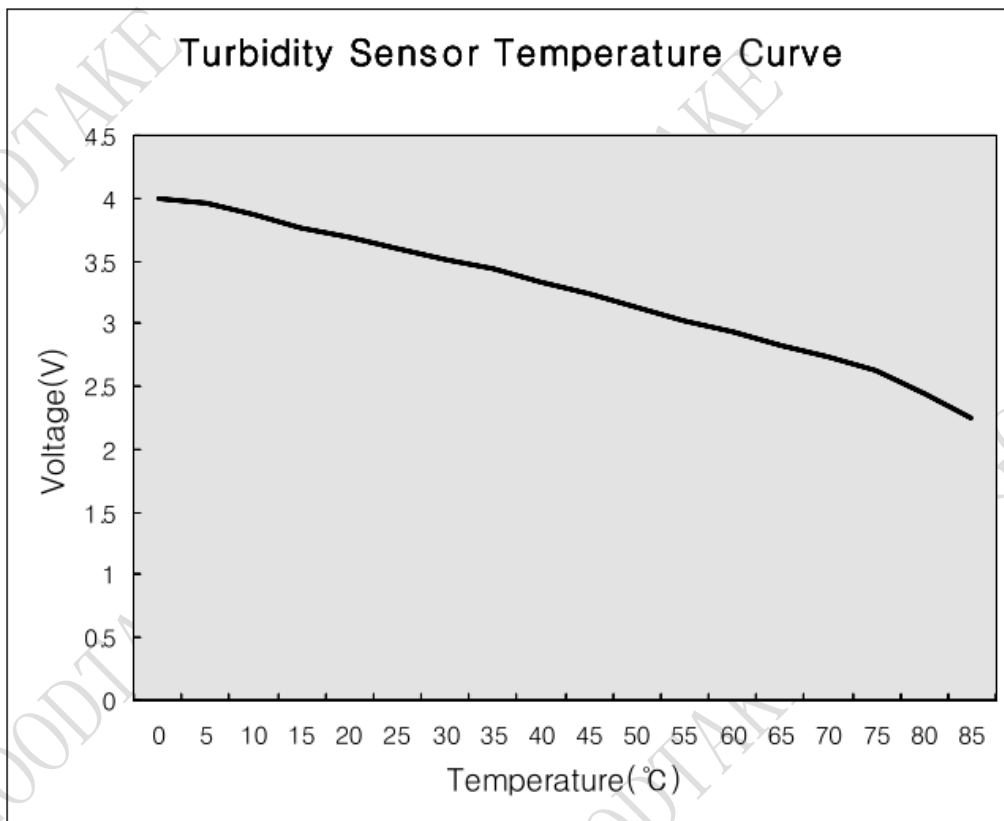
Characteristic Curves

1. Output Voltage vs. Turbidity

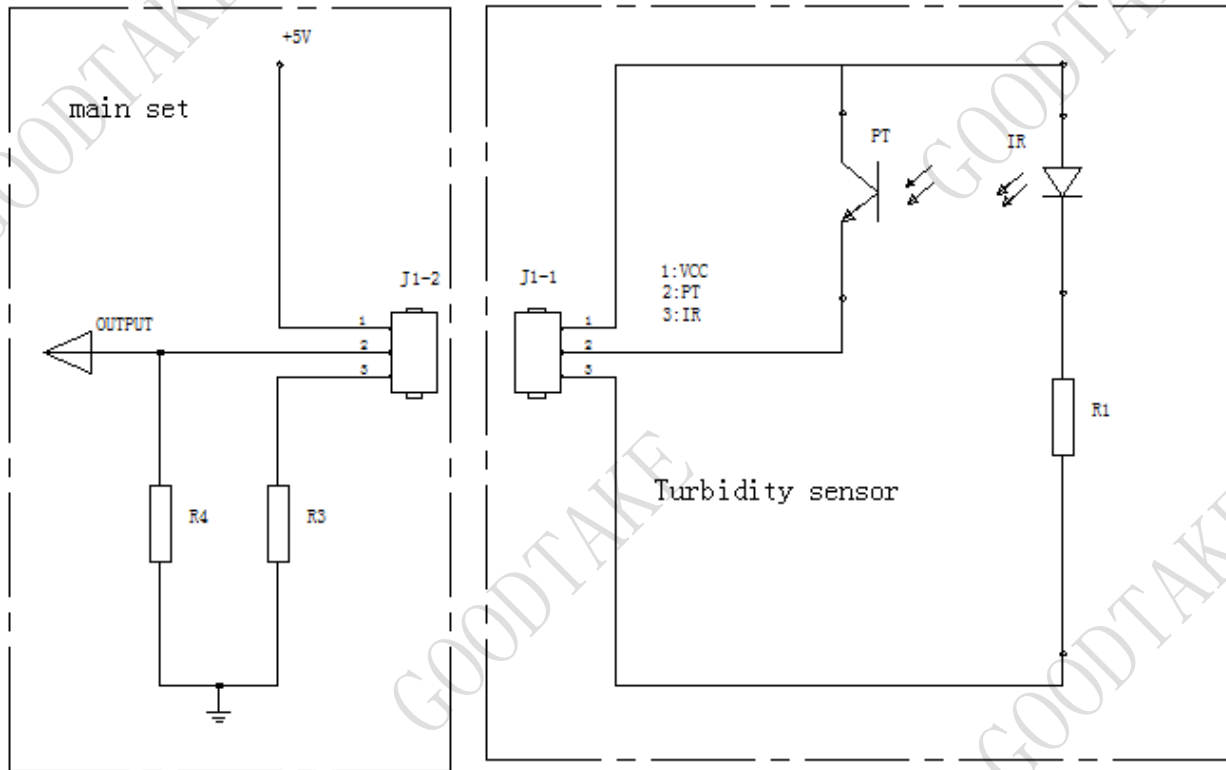


Ta = 25°C  
Vcc = 5V  
( In the Water)

2. Output Voltage vs. Temperature

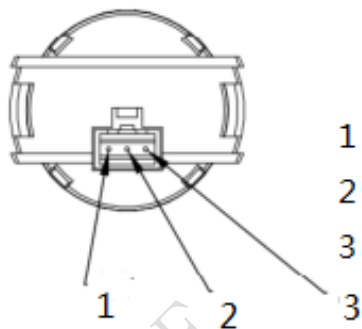


**Schematic Diagram**

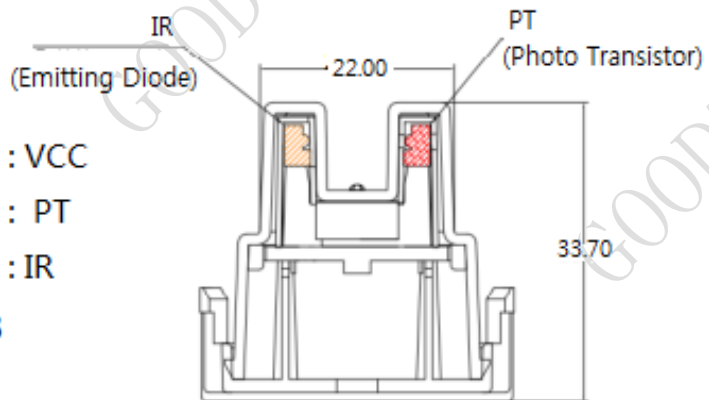


**Package Structure**

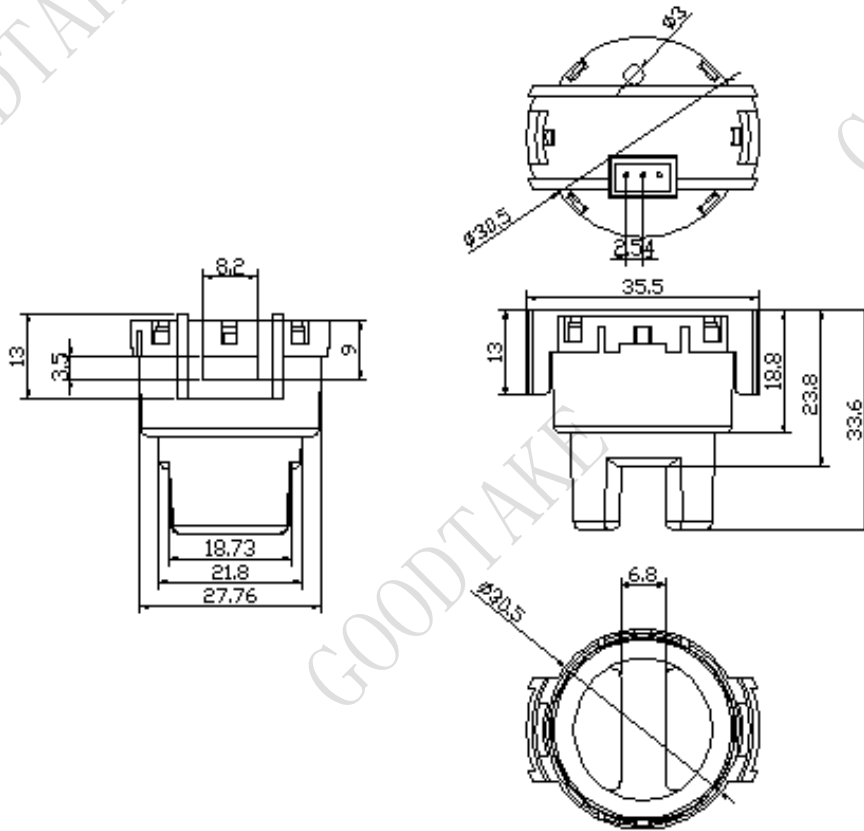
**Pin Connection**



- 1 : VCC
- 2 : PT
- 3 : IR



**Dimension Drawings**



**Caution Notes:**

1. Only the top part (The cap in natural color) of the sensor module is waterproof, the plastic base (in dark color) and the wiring terminals should not be in contact with water.
2. For wire terminal connection, please pay attention to the polarity of the power supply, reverse polarity connection will results in circuit burn-out.
3. Make sure the supply voltage is 5V DC, pay attention to the voltage value before connecting to Power, over voltage will results in permanent damage to the sensor module.