

T H E R M O M E T R I C S  
A C O M M I T M E N T T O E X C E L L E N C E

# TSW-10 Turbidity Sensor

The TSW-10 module measures the turbidity (amount of suspended particles) of the wash water in washing machines and dishwashers. An optical sensor for washing machines is a measuring product for a turbid water density or an extraneous matter concentration using the refraction of wavelength between photo transistor and diode. By using an optical transistor and optical diodes, an optical washing machine sensor measures the amount of light coming from the source of the light to the light receiver, in order to calculate water turbidity.



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## Theory of Operation

The sensor operates on the principle that when light is passed through a sample of water, the amount of light transmitted through the sample is dependent on the amount of soil in the water. As the soil level increases, the amount of transmitted light decreases. The turbidity sensor measures the amount of transmitted light to determine the turbidity of the wash water. These turbidity measurements are supplied to the washer controller, which makes decisions on how long to wash in all the cycles. These decisions are made based on a comparison between clean water measurements (taken at the beginning of the wash cycle) and the wash water turbidity measurement taken at the end of each wash cycle. By measuring the turbidity of the wash water, the washing machine can conserve energy on lightly soiled loads by only washing as long as necessary. This will result in energy savings for the consumer.

## Specifications

### Part Number

TSW-10

### Rated Voltage

DC 5V (between No #1 & Ground)

### Voltage Differential

1.3V  $\pm$  20%

### Test Method

After testing voltage in water (0 NTU),  
voltage test in water (1000 NTU)  
(Turbidity level Calibration -> Master NTU standard liquid )  
(Voltage between No #2 pin & Ground)

### Operating Temperature Range

-30°C ~ 80°C

### Storage Temperature Range

-10°C~ 80°C

### Rated Current

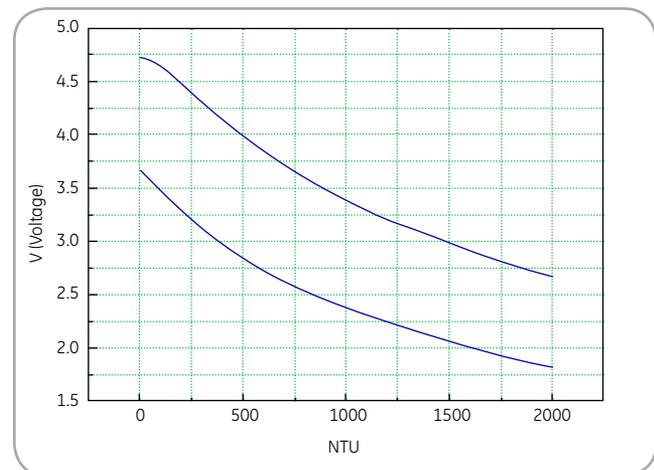
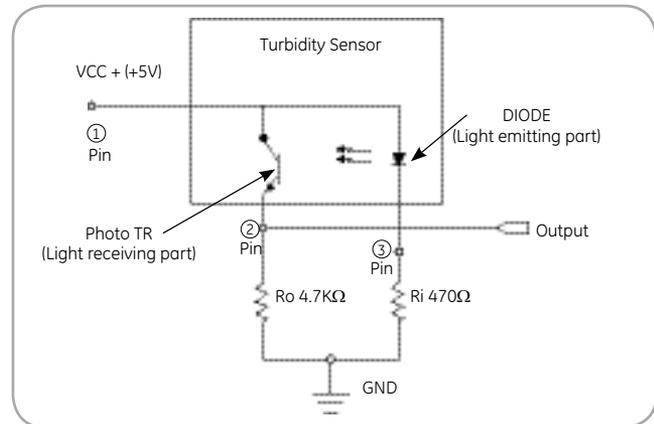
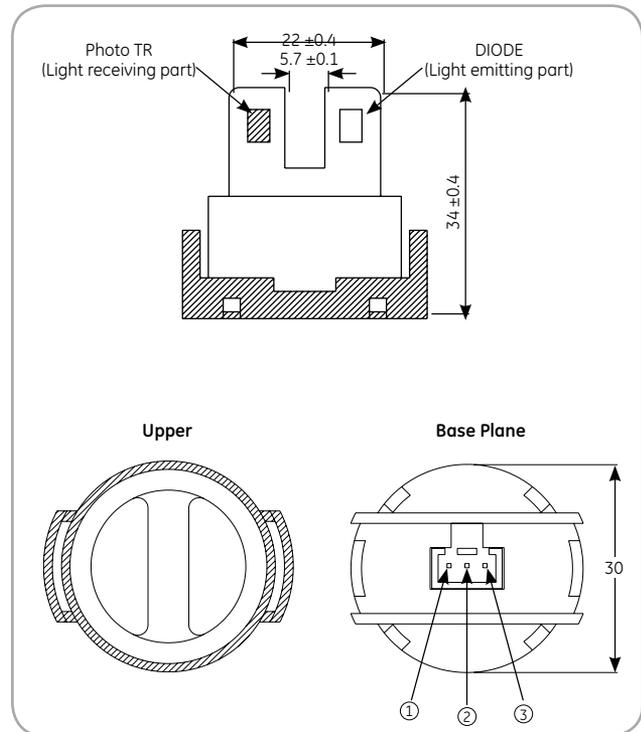
Max. 30 mA

### Insulation Resistance

Min 100 M $\Omega$  by 500V DC

### Application Section

Detecting the turbidity degree of water



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