

# Model **HTF** Ultra-small Capacitive Touch Sensor

**PATENTED**



▶ HTF-3  
▶ HTF-4  
▶ HTF-5

Normally open  
Standard



▶ HTF-3B  
▶ HTF-4B  
▶ HTF-5B

Normally open  
Shifted Frequency



▶ HTF-31  
▶ HTF-41  
▶ HTF-51

Normally closed  
Standard



▶ HTF-31B  
▶ HTF-41B  
▶ HTF-51B

Normally closed  
Shifted Frequency

Model List	Operation Sensitivity	Operation Configuration	Frequency
HTF-3	30 pF	Normally open	Standard
HTF-4	40 pF		
HTF-5	50 pF		
HTF-3B	30 pF		Shifted Frequency
HTF-4B	40 pF		
HTF-5B	50 pF		
HTF-31	30 pF	Normally closed	Standard
HTF-41	40 pF		
HTF-51	50 pF		
HTF-31B	30 pF		Shifted Frequency
HTF-41B	40 pF		
HTF-51B	50 pF		

## Application

- Touch switch for door knobs
- Elevator switch
- Touch switch for automatic doors
- Touch switch for security purpose
- Seat sensor
- Input switch for electric devices
- Input sensor of amusement equipment
- Safety device for finger pinch avoidance from machine moving parts or door mechanisms

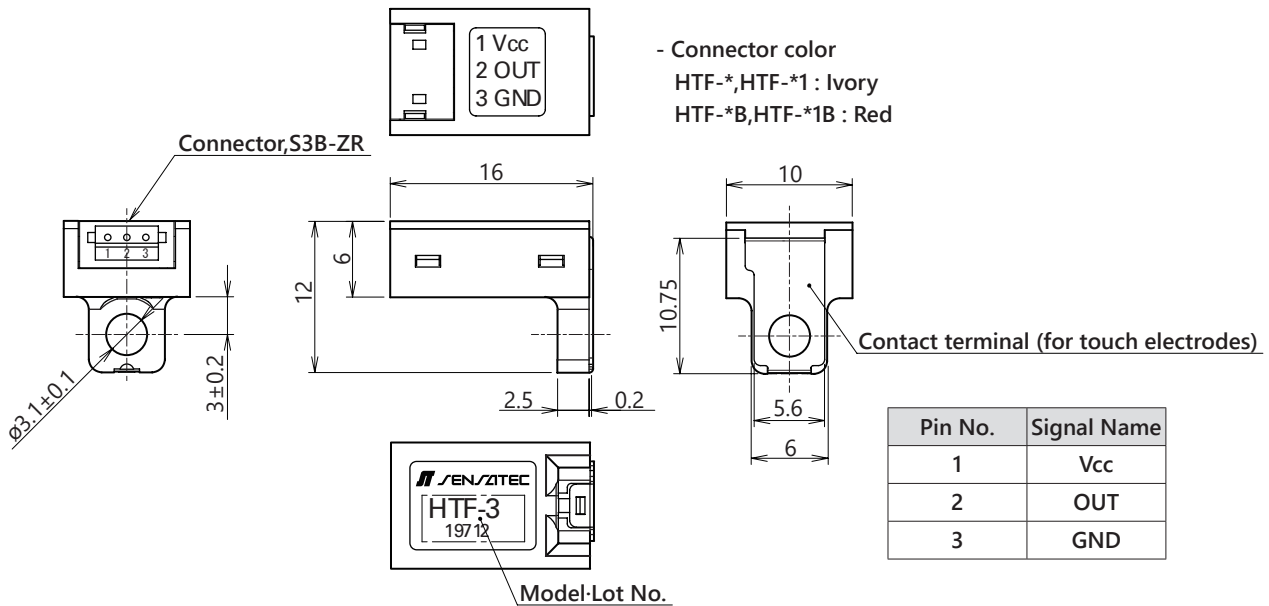
## Features

- Ultra-small touch sensor easy to install in small places.
- Open collector output means direct connection to a microcomputer input is possible without any special interface circuit.
- Does not operate by mistake when touched by an object with small electrostatic capacity such as plastic objects or bags. No need for a potentiometer to set the sensitivity.
- An internal circuit protects the sensor from human static electricity. No need for external protection.
- Equipped with a contact terminal for the touch electrode. The connection is easy and requires only a screw to set the touch electrode.

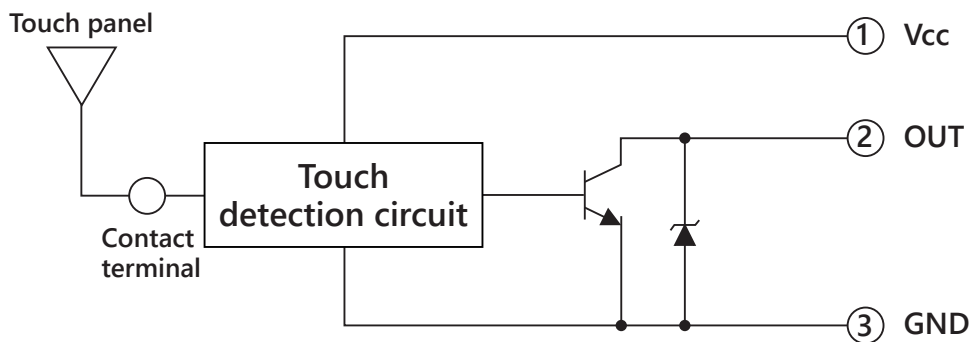
## Rating/Performance

Model	HTF-3	HTF-4	HTF-5	HTF-31	HTF-41	HTF-51
Operation Sensitivity	30 pF±6 pF	40 pF±8 pF	50 pF±10 pF	30 pF±6 pF	40 pF±8 pF	50 pF±10 pF
Power Voltage	5 V to 12 V DC (Operating voltage range: 4.75 V to 13.8 V DC)					
Power Consumption	At 5 V DC : 5 mA DC or less, At 12 V DC : 20 mA DC or less					
Output	NPN transistor open collector 14.4 V DC, 50 mA DC or less					
Maximum Output Saturation Voltage	1 V DC MAX (Load current 50 mA DC)					
Operation Status	Normally open (On output with detection target)			Normally closed (Off output with detection target)		
Temperature Range	-20 to 60 °C (-25 to 65 °C during storage) (Without dew condensation or freezing)					
Humidity Range	35 to 85 % RH (25 to 85 % RH during storage)					
Anti-static Electricity	± 20 kV between the contact terminal and GND (20 times at 1 second interval, 150 pF, 330 Ω)					
Breakdown Voltage	500 V AC, 50/60 Hz for 1 min (Between live parts and the case)					
Insulation Resistance	20 MΩ or more, at 500 V DC megger (Between live parts and the case)					
Vibration Resistance	Durability : 10 to 55 Hz, Double amplitude: 1.5 mm in X-, Y-, and Z-direction, each 2 hours (Device not powered)					
Shock Resistance	Durability : 500 m/s <sup>2</sup> (Approx. 50 G) in X-, Y-, and Z-direction, each 3 times (Device not powered)					
Ingress Protection	IP50					
Case Material	PBT reinforced with glass-fiber (Black)			PBT reinforced with glass-fiber (Gray)		
Connector	Connector : S3B-ZR-SM4A-TF (3-pin), Housing : ZHR-3, Contact : SZH-002T-P0.5 (from J.S.T. Mfg. Co., Ltd.)					
Weight	Approx. 1 g					
Options (Sold Separately)	Connector harness: CNH-ZHR03S28-300					

## Dimensions



## Output Circuit



## Precautions During Use

- The touch (detection) electrode of the touch sensor is connected to the detection circuit. Therefore, it is necessary to ensure sufficient withstand voltage and insulation between the touch sensor power supply and the AC power supply to ensure safety.
- If the sensor is used near a broadcasting station with high output, or if there is strong common-mode noise in the DC power supply because it is also used for a large inverter-fed device, install a capacitor of 0.1  $\mu\text{F}$  or more to the 0 V line to remove the noise to the FG terminal.
- A high-frequency oscillation circuit is used in the touch sensor. Therefore, if several sensors get close or if the same person touches the touch electrodes of several touch sensors at the same time, the detection operation may malfunction due to reciprocal interference. It is recommended to consult with our company since the interference depends on the position and wiring of the touch sensors and the sensor electrodes.
- When using the normally open output type, be sure to use the sensor with the wiring capacity of the output line under 1,000 pF. Otherwise, the charge of the output line may exceed the maximum output current at output drive, resulting in output malfunction. When a longer output wiring is needed for larger output wiring capacity over 1,000 pF, either add a 100  $\Omega$  resistor in series besides the output terminal of the sensor side, or use the normally close output type.
- For normally open output-type sensors, the output line wiring length should be 5 m or less in order to eliminate the influence of the output drive current capability of the IC used in this sensor and the anti-static performance due to wiring inductance.
- The tightening torque for the case should be 0.5 N·m or less.
- For other precautions, refer to "General Precautions" for touch sensors.