

## 2. Maximum Rated Values

Items	Specified value
Power Supply Voltage	-0.3~4.5V DC
Usable Ambient Temperature	-20~+60°C (-4~+140°F) Do not use in a freezing or condensation environment.
Storage Temperature	-20~+70°C (-4~+158°F)

## 3. Electrical Characteristic

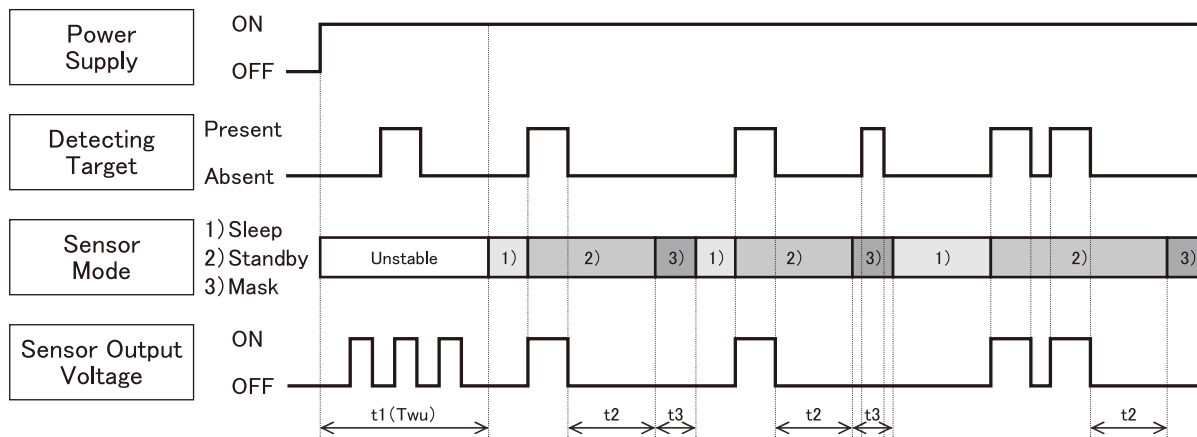
 [Conditions for Measuring: Ambient temperature 25°C(77°F)]

Items	Symbol	1 $\mu$ A type	2 $\mu$ A type	6 $\mu$ A type	Measured Conditions
Operating Voltage	Min.	2.3V DC	2.3V DC	2.3V DC	—
	Max.	4.0V DC	4.0V DC	4.0V DC	—
Electrical Current Consumption (Sleep mode) (*4)	Avg.	1.0 $\mu$ A	—	—	Iout=0
	Max.	1.6 $\mu$ A	—	—	
Electrical Current Consumption (Standby mode) (*4)	Avg.	1.9 $\mu$ A	1.9 $\mu$ A	6.0 $\mu$ A	Iout=0
	Max.	3.0 $\mu$ A	3.0 $\mu$ A	12.0 $\mu$ A	
Output Current	Max.	Iout	100 $\mu$ A	100 $\mu$ A	Vout $\geq$ Vdd-0.5
Output Voltage	Min.	Vout	Vdd-0.5VDC	Vdd-0.5VDC	Vdd-0.5VDC
Circuit Stability Time (When voltage is applied)	Avg.	T <sub>wu</sub>	25s	25s	—
	Max.	T <sub>wu</sub>	210s	210s	30s

(\*4)(\*5): "Sleep mode" or "Standby mode" is for 1  $\mu$  A current consumption version. Please refer to "TIMING CHART" below.

## TIMING CHART

### 1. Digital output (1 $\mu$ A current consumption)



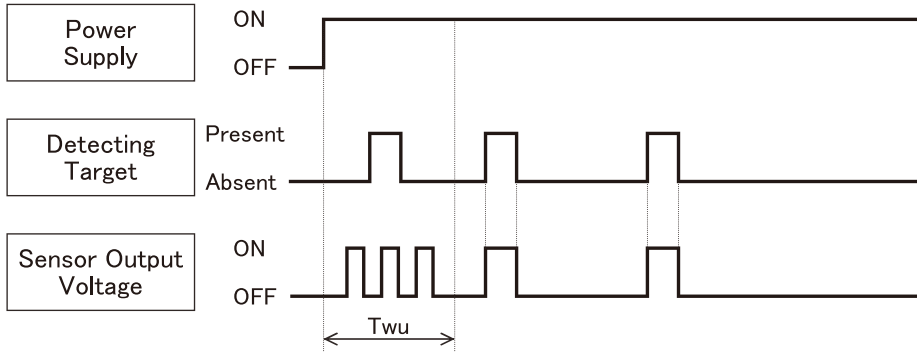
### [Modes]

- 1) Sleep Mode : When the output is OFF. The electrical current consumption is approximately 1  $\mu$  A.
- 2) Standby Mode : After the sensor's output reaches ON status, the sensor switches to standby mode. The electrical current consumption is ~ 1.9  $\mu$  A. When the sensor's output returns to an OFF value after expiration of the "hold time", the sensor switches again to sleep mode.
- 3) Mask Mode : Time during which the output is forced to OFF after the end of the standby mode. (no detection is possible during this period.)

### [Durations]

- t<sub>1</sub>(T<sub>wu</sub>): Circuit Stability Time: ~ 25s (typ.)  
During this stage, the output's status is undefined (ON/OFF) and detection is not guaranteed.
- t<sub>2</sub> : Standby Hold Time: ~ 2.6s (typ.)  
Depending on the number of output occurrences during standby mode, the hold time can differ (※1)
- t<sub>3</sub> : Mask Time ~ 1.3s (typ.)  
During this stage, even if the sensor detects something, output will not switch ON.(※2)

**2. Digital Output (2  $\mu$ A and 6  $\mu$ A current consumption)**

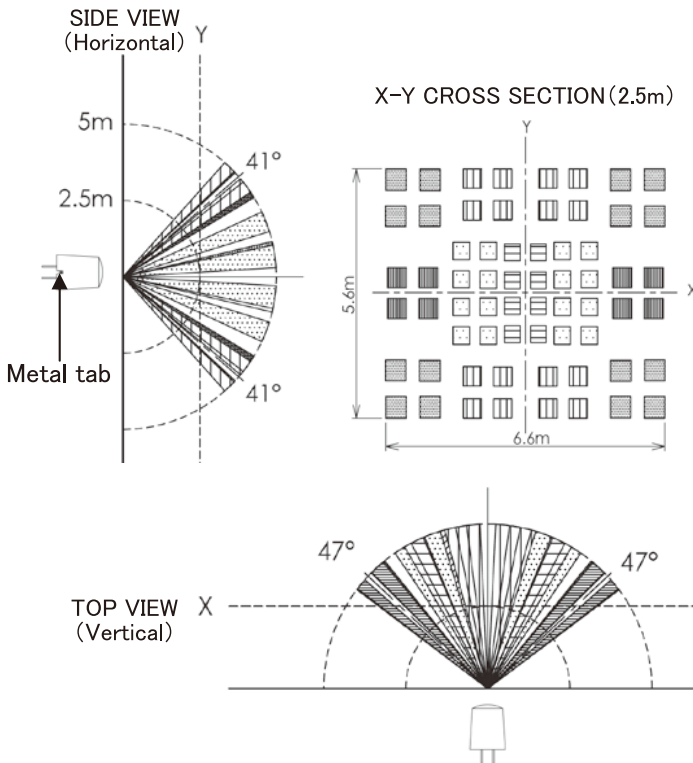


**[ Durations ]**

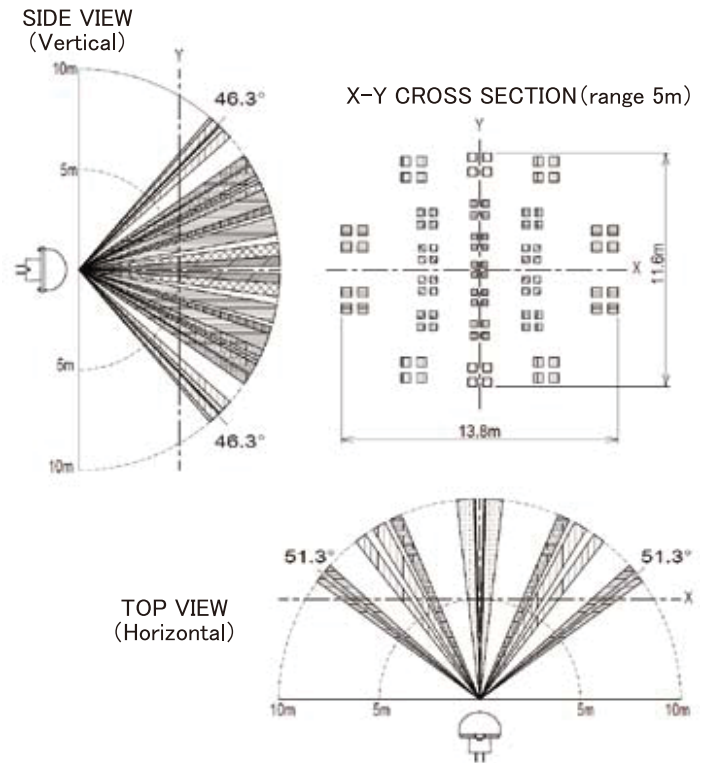
Twu: Circuit Stability Time (2  $\mu$ A): ~ 25s (typ.)  
 Circuit Stability Time (6  $\mu$ A): ~ 30s (max.)  
 During this stage, output status is undefined (ON/OFF) and detection is not guaranteed.

**DETECTION PERFORMANCE**

**1) Standard detection type**



**2) Long Distance detection type**



**2. Detection Zone Notes**

As shown on the diagram, the detection zone is polarized. If a target enters the detection zones + and - at the same time, the signals are respectively cancelled and detection could become impossible at maximum detection range. (Please refer to the detection area diagram for details)

