



## Distance Measuring Sensor Lineup

Sensor type	Output	Detected distance	Features	Model No.	Page	
PSD	1-bit digital output according to distance measuring	13 cm	1-bit digital output	GP2Y0D413K0F	34	
		24 cm	1-bit digital output	GP2Y0D21YK0F	34	
		80 cm	1-bit digital output	GP2Y0D02YK0F	34	
	Analog voltage output according to distance measuring	1.5 to 15 cm	Analog output	GP2Y0AF15 series	34	
		2 to 15 cm	Analog output	GP2Y0A51SK0F	34	
		4 to 30 cm	Analog output	GP2Y0A41SK0F / GP2Y0AF30 series	34	
		10 to 80 cm	Analog output	GP2Y0A21YK0F	34	
		20 to 150 cm	Analog output	GP2Y0A02YK0F	34	
		100 to 550 cm	Analog output	GP2Y0A710K0F	34	
		CMOS	Analog voltage output according to distance measuring (Including I <sup>2</sup> C output)	4 to 50 cm	Compact size, high-precision measurement	Analog output
I <sup>2</sup> C output	GP2Y0E02B					35
Analog, I <sup>2</sup> C output	GP2Y0E03					35
ToF	I <sup>2</sup> C output					10 to 200 cm
		1 to 30 cm	Compact size, high-precision measurement	IR laser	GP2AP03VT00F	

The model marked with ▲ may not be available in the near future. Contact with SHARP for details before use.

## Dust Sensor Unit Lineup

Output	Features	Model No.	Page
Analog output	Pulse analog output, single-shot detection of house dust, general purpose	GP2Y1010AU0F	37
	Pulse analog output, single-shot detection of house dust, high sensitivity	GP2Y1012AU0F	37
	Pulse analog output, single-shot detection of house dust, high precision	GP2Y1014AU0F	37
Digital output	Digital (PWM) output, built-in microprocessor controller, single-shot detection of house dust, high sensitivity	GP2Y1023AU0F	37
	Digital (UART) output, built-in microprocessor controller, single-shot detection of house dust, high concentration	GP2Y1026AU0F	37
	Digital (UART) output, built-in microprocessor controller, sensing can discriminate between PM2.5 and PM10, internal cleaning possible	GP2Y1030AU0F	37

## PM Sensor Unit Lineup

Output	Features	Model No.	Page
Digital output	Digital (UART/I <sup>2</sup> C) Output Detectable PM1.0/PM2.5/PM10 separately Equipped with auto cleaning mode function	GP2Y1040AU0F	37



## Distance Measuring Sensors (1) PSD Type

### ◆Digital Output

(Ta = 25°C)

Model No.	Detected distance (cm)	Features	Absolute maximum ratings		Electro-optical characteristics*1				
			Vcc (V)	Topr (°C)	VOH (V) MIN.	VoL (V) MAX.	Dissipation current		
						Operating (mA)	Standby (µA)		
GP2Y0D413K0F	13	Distance measuring sensor united with PSD*2, infrared LED and signal processing circuit, digital voltage output according to the measured distance	-0.3 to +7	-10 to +60	Vcc -0.3	0.6	MAX. 27	-	
GP2Y0D21YK0F	24	Distance measuring sensor united with PSD*2, infrared LED and signal processing circuit, digital voltage output according to the measured distance	-0.3 to +7	-10 to +60	Vcc -0.3	0.6	MAX. 40	-	
GP2Y0D02YK0F	80	Distance measuring sensor united with PSD*2, infrared LED and signal processing circuit, long distance measuring type, digital voltage output according to the measured distance	-0.3 to +7	-10 to +60	Vcc -0.3	0.6	MAX. 50	-	

\*1 Vcc = 5 V

\*2 PSD: Position Sensitive Detector

The model marked with ▲ may not be available in the near future. Contact with SHARP for details before use.

### ◆Analog Output

(Ta = 25°C)

Model No.	Distance measuring range (cm)	Features	Absolute maximum ratings		Electro-optical characteristics*1			
			Vcc (V)	Topr (°C)	VOH (V) MIN.	VoL (V) MAX.	Dissipation current	
						Operating (mA)		
GP2Y0AF15 series	1.5 to 15	Distance measuring sensor united with PSD*2, infrared LED and signal processing circuit, short measuring cycle (16.5 ms), compact, lineup of various connector shapes	-0.3 to +7	-10 to +60	Vo (TYP.) = 0.4 V (at L = 15 cm), ΔVo (TYP.) = 2.3 V (at L = 15 cm → 1.5 cm)		TYP. 17	
GP2Y0A51SK0F	2 to 15	Distance measuring sensor united with PSD*2, infrared LED and signal processing circuit, short measuring cycle (16.5 ms)	-0.3 to +7	-10 to +60	Vo (TYP.) = 0.4 V (at L = 15 cm), ΔVo (TYP.) = 2.25 V (at L = 15 cm → 2 cm)		TYP. 12	
GP2Y0AF30 series	4 to 30	Distance measuring sensor united with PSD*2, infrared LED and signal processing circuit, short measuring cycle (16.5 ms), compact, lineup of various connector shapes	-0.3 to +7	-10 to +60	Vo (TYP.) = 0.4 V (at L = 30 cm), ΔVo (TYP.) = 2.3 V (at L = 30 cm → 4 cm)		TYP. 17	
GP2Y0A41SK0F	4 to 30	Distance measuring sensor united with PSD*2, infrared LED and signal processing circuit, short measuring cycle (16.5 ms)	-0.3 to +7	-10 to +60	Vo (TYP.) = 0.4 V (at L = 30 cm), ΔVo (TYP.) = 2.25 V (at L = 30 cm → 4 cm)		MAX. 22	
GP2Y0A21YK0F	10 to 80	Distance measuring sensor united with PSD*2, infrared LED and signal processing circuit	-0.3 to +7	-10 to +60	Vo (TYP.) = 0.4 V (at L = 80 cm), ΔVo (TYP.) = 1.9 V (at L: 80 cm → 10 cm)		MAX. 40	
GP2Y0A02YK0F	20 to 150	Distance measuring sensor united with PSD*2, infrared LED and signal processing circuit, long distance measuring type	-0.3 to +7	-10 to +60	Vo (TYP.) = 0.4 V (at L = 150 cm), ΔVo (TYP.) = 2.05 V (at L = 150 cm → 20 cm)		MAX. 50	
GP2Y0A710K0F	100 to 550	Distance measuring sensor united with PSD*2, infrared LED and signal processing circuit, long distance measuring type	-0.3 to +7	-10 to +60	Vo (TYP.) = 2.5 V (at L = 100 cm), ΔVo (TYP.) = 0.7 V (at L = 100 cm → 200 cm)		TYP. 30	

\*1 Vcc = 5 V

\*2 PSD: Position Sensitive Detector

#### Notice

In the absence of confirmation by device specification sheets, SHARP takes no responsibility for any defects that may occur in equipment using any SHARP devices shown in catalogs, data books, etc.

Except where specially indicated, models listed on this page comply with the EU RoHS Directive\*. For details, please contact SHARP. \*EU RoHS Directive: EU legislation restricting the use of lead, cadmium, hexavalent chromium, mercury, specific brominated flame retardants (PBB and PBDE), and phthalates (DEHP, BBP, DBP, DIBP).

Contact SHARP in order to obtain the latest device specification sheets before using any SHARP device.



## Distance Measuring Sensors (2) CMOS Type

### ◆Analog Output (including I<sup>2</sup>C output)

(Ta = 25°C)

Model No.	Distance measuring range (cm)	Features	Absolute maximum ratings		Electro-optical characteristics*1		
			V <sub>CC</sub> (V)	T <sub>opr</sub> (°C)	V <sub>OH</sub> (V) MIN.	V <sub>OL</sub> (V) MAX.	Dissipation current Operating (mA)
GP2Y0E02A	4 to 50	Infrared LED and CMOS image sensor with built-in signal processing circuit, compact size (18.9 × 8 × 5.2 mm), high-precision measurement, analog output	-0.3 to +3.6	-10 to +60	V <sub>OUT</sub> (A) 1 = 0.3 to 0.8 V (at L = 50 cm), V <sub>OUT</sub> (A) 3 = 2.1 to 2.3 V (at L = 4 cm)		MAX. 36
GP2Y0E02B	4 to 50	Infrared LED and CMOS image sensor with built-in signal processing circuit, compact size (18.9 × 8 × 5.2 mm), high-precision measurement, I <sup>2</sup> C output	-0.3 to +3.6	-10 to +60	D1 = 45 to 55 cm (at L = 50 cm), D3 = 3 to 5 cm (at L = 4 cm)		MAX. 36
GP2Y0E03	4 to 50	Infrared LED and CMOS image sensor with built-in signal processing circuit, compact size (16.7 × 11 × 5.2 mm), high-precision measurement, analog / I <sup>2</sup> C output both compatible	-0.3 to +5.5	-10 to +60	V <sub>OUT</sub> (A) 1 = 0.3 to 0.8 V, D1 = 45 to 55 cm (at L = 50 cm), V <sub>OUT</sub> (A) 3 = 2.1 to 2.3 V, D3 = 3 to 5 cm (at L = 4 cm)		MAX. 36

\*1 V<sub>CC</sub> = 3.3 V



The model marked with ▲ may not be available in the near future. Contact with SHARP for details before use.

**Notice**

In the absence of confirmation by device specification sheets, SHARP takes no responsibility for any defects that may occur in equipment using any SHARP devices shown in catalogs, data books, etc.

Except where specially indicated, models listed on this page comply with the EU RoHS Directive\*. For details, please contact SHARP.

\*EU RoHS Directive: EU legislation restricting the use of lead, cadmium, hexavalent chromium, mercury, specific brominated flame retardants (PBB and PBDE), and phthalates (DEHP, BBP, DBP, DIBP).

Contact SHARP in order to obtain the latest device specification sheets before using any SHARP device.

## ■ToF Type Distance Measuring Sensor (ToF = Time of Flight)

(Ta = 25°C)

Model No.	Features	Absolute maximum ratings			Electro-optical characteristics				
		VDD (V)	Tstg (°C)	Operating supply voltage VDD (V)	Average Dissipation current (VDD+VCSEL) ICC (mA) TYP.	VCSEL Peak emission wavelength $\lambda_p$ (nm)	Possible measuring distance (white paper) Rwhite (cm)	Measurement accuracy (white paper) Racc	Detection time Trange (msec)
☆GP2AP02VT20F	Ultra miniature integrated light detector: 4.0 × 2.2 × 1.5 mm Equipped TDC circuit achieves higher precision and allows operation in 50,000-lux sunlight I2C interface	3.6	-40 to +85	2.6 to 3.5	10	940	10 to 200	±4 % (@120 cm)	33
GP2AP03VT00F	Ultra miniature integrated light detector: 4.0 × 2.2 × 1.5 mm Equipped TDC circuit achieves higher precision and highly precise measurement at close range I2C interface	3.6	-40 to +85	3.0 to 3.5	10	940	1 to 30	±6 mm (@10 cm)	33



**Notice**

In the absence of confirmation by device specification sheets, SHARP takes no responsibility for any defects that may occur in equipment using any SHARP devices shown in catalogs, data books, etc.

Except where specially indicated, models listed on this page comply with the EU RoHS Directive\*. For details, please contact SHARP.

\*EU RoHS Directive: EU legislation restricting the use of lead, cadmium, hexavalent chromium, mercury, specific brominated flame retardants (PBB and PBDE), and phthalates (DEHP, BBP, DBP, DIBP).

Contact SHARP in order to obtain the latest device specification sheets before using any SHARP device.

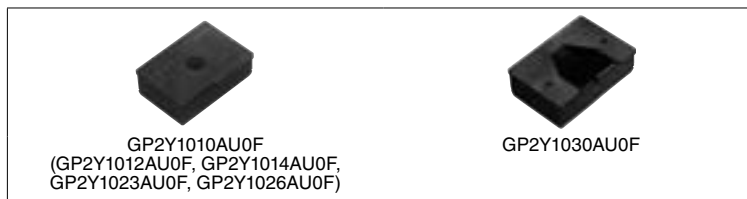


## ■ Dust Sensor Unit

(Ta = 25°C)

Model No.	Features	Topr (°C)	Operating supply voltage (V)	Electro-optical characteristics			
				Dissipation current (mA)	Reference Detection concentration $\mu\text{g}/\text{m}^3$ (TYP.)(* )	Sensitivity	Output
GP2Y1010AU0F	<ul style="list-style-type: none"> <li>Built-in infrared emitting diode, photodiode and signal processing circuit</li> <li>Compact, single-shot detection of house dust</li> <li>Output: Analog voltage</li> </ul>	-10 to +65	4.5 to 5.5	TYP. 11	0 to 1 500	0.5±0.15 V / (0.1 mg/m <sup>3</sup> ) Precision ±30%	Analog voltage
GP2Y1012AU0F	<ul style="list-style-type: none"> <li>High sensitivity</li> <li>Built-in infrared emitting diode, photodiode and signal processing circuit</li> <li>Compact, single-shot detection of house dust</li> <li>Output: Analog voltage</li> </ul>				0 to 750	1.0±0.15 V / (0.1 mg/m <sup>3</sup> ) Precision ±15%	Analog voltage
GP2Y1014AU0F	<ul style="list-style-type: none"> <li>High precision</li> <li>Built-in infrared emitting diode, photodiode and signal processing circuit</li> <li>Compact, single-shot detection of house dust</li> <li>Output: Analog voltage</li> </ul>				0 to 1 500	0.5±0.075 V / (0.1 mg/m <sup>3</sup> ) Precision ±15%	Analog voltage
GP2Y1023AU0F	<ul style="list-style-type: none"> <li>High sensitivity</li> <li>Built-in microcomputer</li> <li>Built-in infrared emitting diode, photodiode and signal processing circuit</li> <li>Compact, single-shot detection of house dust</li> <li>Output: Digital signal output (PWM)</li> </ul>		4.75 to 5.25	TYP. 15	0 to 750	1.4±0.21 ms / (0.1 mg/m <sup>3</sup> ) Precision ±15%	Digital signal (PWM) Temperature correction Averaging
GP2Y1026AU0F	<ul style="list-style-type: none"> <li>High concentration</li> <li>Built-in microcomputer</li> <li>Built-in infrared emitting diode, photodiode and signal processing circuit</li> <li>Compact, single-shot detection of house dust</li> <li>Output: Digital signal output (UART)</li> </ul>		4.5 to 5.5	TYP. 27	0 to 2 100	0.35±0.06 V / (0.1 mg/m <sup>3</sup> ) Precision ±15%	Digital signal (UART) Temperature correction Averaging
GP2Y1030AU0F	<ul style="list-style-type: none"> <li>Built-in microcomputer</li> <li>Built-in infrared emitting diode, photodiode and signal processing circuit</li> <li>Compact, single-shot detection of house dust</li> <li>Discriminated detection, PM2.5 or larger, is possible</li> <li>Internal cleaning possible</li> </ul>				0 to 500	Precision ±15%	Digital signal (UART)

(\*) Based on the TSI 8530 standard



## ■ PM Sensor Unit

(Ta = 25°C)

Model No.	Features	Topr (°C)	Operating supply voltage (V)	Electro-optical characteristics			
				Dissipation current (mA)	Reference Detection concentration $\mu\text{g}/\text{m}^3$ (TYP.)(* )	Sensitivity	Output
GP2Y1040AU0F	<ul style="list-style-type: none"> <li>Built-in VCSEL for high sensitivity and high accuracy</li> <li>Detectable PM1.0/PM2.5/PM10 separately</li> <li>Built-in high reliability fan</li> <li>Equipped with auto cleaning mode function</li> </ul>	-10 to +60	4.5 to 5.5	TYP. 50	0 to 1 000	Precision ±10 $\mu\text{g}$ (0 -100 $\mu\text{g}/\text{m}^3$ ) Precision ±10% (100-500 $\mu\text{g}/\text{m}^3$ )	Digital signal (UART and I <sup>2</sup> C)



### Notice

In the absence of confirmation by device specification sheets, SHARP takes no responsibility for any defects that may occur in equipment using any SHARP devices shown in catalogs, data books, etc.  
 Except where specially indicated, models listed on this page comply with the EU RoHS Directive\*. For details, please contact SHARP.  
 \*EU RoHS Directive: EU legislation restricting the use of lead, cadmium, hexavalent chromium, mercury, specific brominated flame retardants (PBB and PBDE), and phthalates (DEHP, BBP, DBP, DIBP).  
 Contact SHARP in order to obtain the latest device specification sheets before using any SHARP device.