



## ■ Photointerrupter Lineup

### <Transmissive type>

Output type	Package type	Outline	Mounting method	Model No. (series)	Page	
Single phototransistor	Compact	General purpose	PWB mounting type	GP1S2x series/GP1S37J0000F	83	
High response speed		High resolution	PWB mounting type/ Soldering reflow	GP1S2xJ0000F series/GP1S092HCPIF/ GP1S9xJ0000F series/ GP1S09xHCZ0F series/ GP1S19xHCZ0F/GP1S19xHCxSF	83	
		Two-phase PT output	PWB mounting type	GP1S39J0000F	83	
		Case type	General purpose	Snap-in	GP1S56VJ00F	84
			High resolution	PWB mounting type, etc.	GP1S5x series/GP1S5xVJ000F series/ GP1S56x series	84
			Horizontal slit, High resolution	PWB mounting type	GP1S59J0000F/GP1S525VJ00F	84
			With connector	General purpose	Snap-in	GP1S74PJ000F
Darlington phototransistor	Case type	General purpose	PWB mounting type, etc.	GP1L5xJ series/GP1L5xV series	85	
High sensitivity		Wide gap	PWB mounting type	GP1L57J0000F	85	
Digital output	Compact	Low voltage operation	PWB mounting type	GP1A91 series/GP1A98HCZ0F	85	
(OPIC output)	Case type	High resolution	PWB mounting type	GP1A5x series	86	
		Wide gap	Both-side/PWB mounting type	GP1A5xHR series/GP1A52LRJ00F	86	
	With connector	General purpose	Screw mounting type/Snap-in	GP1A05 series/GP1A7x series/ GP1A07x series	87	

### <Reflective type>

Output type	Package type	Outline	Mounting method	Model No. (series)	Page
Single phototransistor	Compact, DIP	General purpose	PWB mounting type	GP2S2x series	87
High response speed		Long focal distance	PWB mounting type	GP2S40J0000F	87
		Leadless	Long focal distance	PWB mounting type	GP2S700HCP
	Compact, thin (leadless)	General purpose	PWB mounting type	GP2S60	87
Darlington phototransistor	Compact, DIP	General purpose	PWB mounting type	GP2L24J0000F	88
High sensitivity					
OPIC output	With connector	Light modulation type, Sensitivity adjusted	Screw mounting type/ Compact snap-in/ Inverter light countermeasures	GP2A2x series, GP2A200LCS0F/ GP2A231LRSAF, GP2A240LCS0F	88

### <Application-specific photointerrupter lineup>

Detection type	Outline (Output type etc.)	Mounting method	Model No. (series)	Page	
Transmissive type	With connector With actuator (Phototransistor output)	Snap-in	GP1S44S1J00F	89	
	With connector With actuator (OPIC output)	Snap-in	GP1A44E1J00F	89	
	Compact, [built-in ball]	(2-phase PT output) 3 direction detection	PWB mounting type	GP1S36J0000F	90
		(2-phase PT output) 4 direction detection	PWB mounting type	GP1S036HEZ	90
	Case type With encoder function	Resolution: Linear scale slit pitch: 0.7 mm	Side mounting type	GP1A3xR series	90
	Phase A (digital output) Phase B (digital output)	Resolution: Linear scale slit pitch: 0.17/0.14 mm	PWB mounting type	GP1A038RBK0F/GP1A046RBZLF/ GP1A047RBZLF/GP1A038RCK0F/ GP1A044RCKLF	90
		Resolution: Linear scale slit pitch: 0.085	PWB mounting type	GP1A037RDKJF/GP1A047RDZLF	90
Reflective type	Injection For prism system (Single phototransistor)	Screw mounting	GP2S29SJ000F	91	
	For amusement industry	-	GP2A221HRKA/GP2A222HCKA	91	



## ■ Photointerrupters

### <Transmissive type>

#### ◆ Single phototransistor output

### <Compact type>

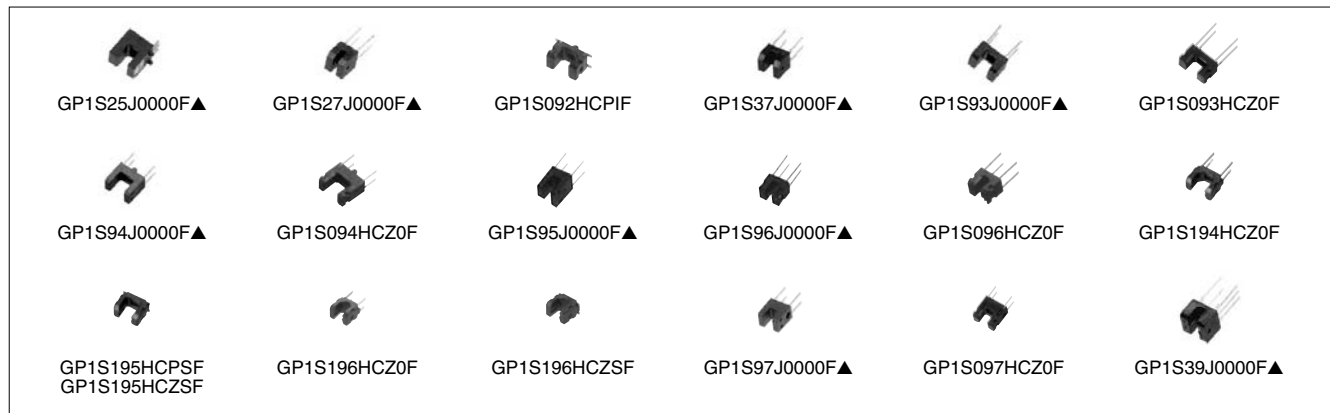
(Ta = 25°C)

Model No.	Internal connection diagram	Features	Detecting and emitting gap (mm)	Slit width (mm)	Electro-optical characteristics						
					Current transfer ratio			Response time			
					CTR (%) MIN.	IF (mA)	VCE (V)	tr (μs) TYP.	Ic (mA)	RL (Ω)	VCE (V)
GP1S25J0000F▲		Side lead type, For soldering reflow	1.6	0.3	1.0	5	5	35	0.1	1 000	5
GP1S27J0000F▲		PWB mounting type	0.9	0.8	4.3	1.5	5	50	0.1	1 000	5
GP1S092HCPIF		Height: 2.9 mm, For soldering reflow, with positioning boss	2.0	0.3	2.0	5	5	50	0.1	1 000	5
GP1S37J0000F▲		PWB mounting type	2.0	0.8	1	3	5	50	0.1	1 000	5
GP1S93J0000F▲		Wide gap, low profile (3.1 mm)	2.0	0.3	2.0	5	5	50	0.1	1 000	5
GP1S093HCZ0F		Wide gap, low profile (2.9 mm)	2.0	0.3	2.0	5	5	50	0.1	1 000	5
GP1S94J0000F▲		Wide gap, with positioning pin	3.5	0.3	0.8	5	5	50	0.1	1 000	5
GP1S094HCZ0F		Wide gap, with positioning pin, PWB mounting type (5.5 × 2.6 × 4.8 mm)	3.0	0.3	0.8	5	5	50	0.1	1 000	5
GP1S95J0000F▲		High resolution, thin detector type	1.6	0.3	1.0	5	5	35	0.1	1 000	5
GP1S96J0000F▲		Low profile (3.5 × 2.6 × 3.1 mm)	1.0	0.3	2.0	5	5	50	0.1	1 000	5
GP1S096HCZ0F		Low profile (3.5 × 2.6 × 2.9 mm)	1.0	0.3	2.0	5	5	50	0.1	1 000	5
GP1S194HCZ0F		Compact, wide gap, size: 3.7 × 2.0 × 2.7 mm	1.7	0.3	1.0	5	5	–	–	–	–
GP1S195HCZSF GP1S195HCPSF		Compact, wide gap, surface mount compatible, size: 3.5 × 2.0 × 2.7 mm	1.5	0.3	1.0	5	5	–	–	–	–
GP1S196HCZ0F		Compact, Low profile (3.1 × 2.0 × 2.7 mm)	1.1	0.3	2.0	5	5	50	0.1	1 000	5
GP1S196HCZSF		Surface mount, for soldering reflow, compact, low profile (3.1 × 2.0 × 2.7 mm)	1.1	0.3	2.0	5	5	50	0.1	1 000	5
GP1S97J0000F▲		High resolution, wide gap, with mounting hole, PWB mounting type	2.2	0.3	1.6	5	5	50	0.1	1 000	5
GP1S097HCZ0F		High resolution, wide gap, with mounting hole (4.5 × 2.6 × 4.5 mm)	2.0	0.3	2.0	5	5	50	0.1	1 000	5
GP1S39J0000F▲			PWB mounting type, two-phase output type	1.5	0.6 <sup>*1</sup>	3.3	4	5	50	0.1	1 000

\* Topr: -25 to +85 °C

\*1 Reading pitch

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



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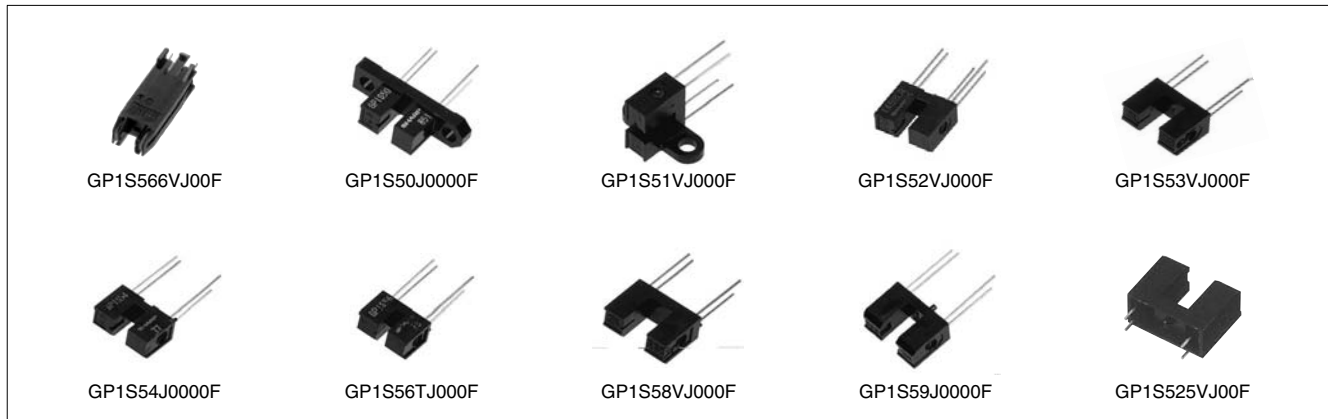
### <Case type>

(Ta = 25°C)

Model No.	Internal connection diagram	Features	Detecting and emitting gap (mm)	Slit width (mm)	Electro-optical characteristics						
					Current transfer ratio			Response time			
					CTR (%) MIN.	IF (mA)	VCE (V)	tr (μs) TYP.	IC (mA)	RL (Ω)	VCE (V)
GP1S566VJ00F		Long case, snap-in mounting type	3.0	0.5	2.5	20	5	3	2	100	2
GP1S50J0000F		High resolution, both-side mounting type	3.0	0.5	2.5	20	5	3	2	100	2
GP1S51VJ000F*1		High resolution, side mounting type	3.0	0.5	2.5	20	5	3	2	100	2
GP1S52VJ000F*1		High resolution, PWB mounting type	3.0	0.5	2.5	20	5	3	2	100	2
GP1S53VJ000F		High resolution, PWB mounting type	5.0	0.5	2.5	20	5	3	2	100	2
GP1S54J0000F		High resolution, with positioning pin, PWB mounting type	3.0	0.5	2.5	20	5	3	2	100	2
GP1S56TJ000F		High resolution, with positioning pin, PWB mounting type	2.0	0.15	2.0	20	5	38	0.5	1 000	2
GP1S58VJ000F		High resolution, with positioning pin, PWB mounting type	5.0	0.5	2.5	20	5	3	2	100	2
GP1S59J0000F		High resolution, horizontal slit, with positioning pin, PWB mounting type	4.2	0.5	2.5	20	5	3	2	100	2
GP1S525VJ00F		Short lead type with easy board mounting, horizontal slit, high precision positioning (lead: within ø1.2 mm)	5.0	0.5	3.25	20	10	3	2	100	2

\* Topr: -25 to +85 °C

\*1 High reliability types: GP1SQ51VJ00F, and GP1SQ52J000F are also available.



### <With connector type>

(Ta = 25°C)

Model No.	Internal connection diagram	Features	Detecting and emitting gap (mm)	Slit width (mm)	Electro-optical characteristics						
					Current transfer ratio			Response time			
					CTR (%) MIN.	IF (mA)	VCE (V)	tr (μs) TYP.	IC (mA)	RL (Ω)	VCE (V)
GP1S74PJ000F		Snap-in mounting type with connector Applicable to 3 kinds of thickness of mounting boards	5.0	0.5	2.5	20	5	3	2	100	2

\* Topr: -25 to +85 °C



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## ◆Darlington phototransistor output <Case type>

(Ta = 25°C)

Model No.	Internal connection diagram	Features	Detecting and emitting gap (mm)	Slit width (mm)	Electro-optical characteristics						
					Current transfer ratio			Response time			
					CTR (%) MIN.	IF (mA)	VCE (V)	tr (μs) TYP.	IC (mA)	RL (Ω)	VCE (V)
GP1L50J000F		High resolution, both-side mounting type	3.0	0.5	50	1	2	80	2	100	2
GP1L51J000F		High resolution, side mounting type	3.0	0.5	50	1	2	80	2	100	2
GP1L52VJ000F		High resolution, PWB mounting type	3.0	0.5	50	1	2	80	2	100	2
GP1L53VJ000F		High resolution, PWB mounting type	5.0	0.5	30	1	2	80	2	100	2
GP1L57J000F		Wide gap, PWB mounting type	10.0	1.8	70	1	2	130	2	100	2

\* Topr: -25 to +85 °C



## ◆OPIC type ( "OPIC" (Optical IC) is a trademark of SHARP Corporation. An OPIC consists of a light-detecting element and signal-processing circuit integrated onto a single chip. ) <Compact type>

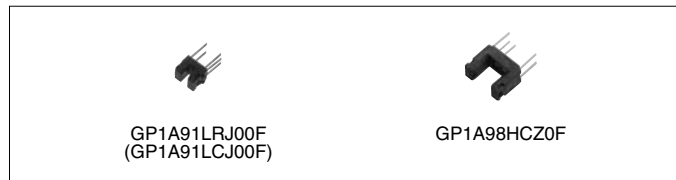
(Ta = 25°C)

Model No.	Internal connection diagram	Features	Detecting and emitting gap (mm)	Slit width (mm)	Electro-optical characteristics							
					Threshold input current			Propagation delay time				
					IFLH (mA) MAX.	IFHL (mA) MAX.	VCC (V)	tPLH (μs) TYP.	tPHL (μs) TYP.	IF (mA)	RL (Ω)	VCC (V)
GP1A91LRJ00F▲		Compact, PWB mounting, low operating voltage (1.4 V to 7.0 V)	1.2	(0.23) *1	-	3.5	3	10.0	3.0	5	3 000	3
GP1A91LCJ00F▲		Compact, PWB mounting, low operating voltage (1.4 V to 7.0 V)	1.2	(0.23) *1	-	3.5	3	10.0	3.0	5	2 500	3
☆GP1A98HCZ0F		Compact, PWB mounting	3.0	0.5	8	-	3.3 to 24	10.0	2.0	10	3 900 to 20 000	3.3 to 24

\* Topr = -25 to +85°C

\*1 Resolution of detecting portion

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### <Case type>

(Ta = 25°C)

Model No.	Internal connection diagram	Features	Detecting and emitting gap (mm)	Slit width (mm)	Electro-optical characteristics							
					Threshold input current			Propagation delay time				
					IFLH (mA) MAX.	IFHL (mA) MAX.	VCC (V)	tPLH (μs) TYP.	tPHL (μs) TYP.	IF (mA)	RL (Ω)	VCC (V)
GP1A50HRJ00F		Both-side mounting type	3.0	0.5	5	–	5	3	5	5	280	5
GP1A51HRJ00F		Side mounting type	3.0	0.5	5	–	5	3	5	5	280	5
GP1A52HRJ00F		PWB mounting type	3.0	0.5	5	–	5	3	5	5	280	5
GP1A53HRJ00F		PWB mounting type	5.0	0.5	8	–	5	3	5	8	280	5
GP1A57HRJ00F		PWB mounting type, with positioning pin	10.0	1.8	7	–	5	3	5	7	280	5
GP1A58HRJ00F		PWB mounting type, with positioning pin	5.0	0.5	8	–	5	3	5	8	280	5
GP1A52LRJ00F		PWB mounting type	3.0	0.5	–	5	5	5	3	5	280	5

\* Topr = -25 to +85°C



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◆ **OPIC type** (“OPIC” (Optical IC) is a trademark of SHARP Corporation. An OPIC consists of a light-detecting element and signal-processing circuit integrated onto a single chip.)

<With 3-pin connector terminal>

(Ta = 25°C)

Model No.	Internal connection diagram	Features	Detecting and emitting gap (mm)	Slit width (mm)	Electro-optical characteristics					
					Supply voltage V <sub>CC</sub> (V)		V <sub>OL</sub> (V) MAX.	Low level output voltage		
					MIN.	MAX.		Light cut-off	I <sub>OL</sub> (mA)	V <sub>CC</sub> (V)
GP1A05AJ000F		Either-side mounting type	5.0	0.5	4.5	5.5	0.35	No	16	5
GP1A05A2J00F		Either-side mounting type	5.0	0.5	4.5	5.5	0.35	No	16	5
GP1A05A5J00F		Either-side mounting type	5.0	0.5	4.5	5.5	0.35	No	16	5
GP1A73AJ000F		Compact, snap-in mounting type	5.0	0.5	4.5	5.5	0.35	No	4	5
GP1A073LCS		Compact, snap-in mounting type, low voltage operation	5.0	0.5	2.7	5.5	0.35	No	4	5
GP1A75EJ000F		Either-side mounting type	5.0	0.5	4.5	5.5	0.35	Yes	16	5
GP1A05EJ000F		Either-side mounting type	5.0	0.5	4.5	5.5	0.4	Yes	16	5
GP1A05E2J00F		Screw mounting type	5.0	0.5	4.5	5.5	0.4	Yes	16	5

\* Topr: -20 to +75°C



## ■ Photointerrupters

<Reflective type>

◆ **Single Phototransistor output**

<Compact>

(Ta = 25°C)

Model No.	Internal connection diagram	Features	Focal distance (mm)	Electro-optical characteristics							
				Current transfer ratio			Response time				
				CTR (%) MIN.	I <sub>F</sub> (mA)	V <sub>CE</sub> (V)	tr (μs) TYP.	I <sub>C</sub> (mA)	R <sub>L</sub> (Ω)	V <sub>CE</sub> (V)	
GP2S24J0000F		Compact (DIP), visible light cut-off	0.7	0.5	4	2	20	0.1	1 000	2	
GP2S27J0000F		Compact, allow reflow soldering, visible light cut-off	0.7	0.5	4	2	20	0.1	1 000	2	
GP2S40J0000F		Compact, long focal distance, visible light cut-off	3	2.5	20	5	50	0.1	1 000	2	
GP2S700HCP		Compact, long focal distance, surface mounting leadless type	3	1.5	4	2	20	0.1	1 000	2	
GP2S60		Thin (3.2 × 1.7 × t: 1.1 mm), leadless type	(0.5)	1.75 <sup>*1</sup> TYP.	4	2	20	0.1	1 000	2	

\* Topr: -25 to +85°C

\*1 Detection area



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### ◆Darlington Phototransistor output <Compact>

(Ta = 25°C)

Model No.	Internal connection diagram	Features	Focal distance (mm)	Electro-optical characteristics							
				Current transfer ratio			Response time				
				CTR (%) MIN.	IF (mA)	VCE (V)	tr (μs) TYP.	Ic (mA)	RL (Ω)	VCE (V)	
GP2L24J0000F		Compact (DIP), visible light cut-off	0.7	12.5	4	2	80	10	100	2	



### ◆OPIC output ( "OPIC" (Optical IC) is a trademark of SHARP Corporation. An OPIC consists of a light-detecting element and signal-processing circuit integrated onto a single chip. ) <With 3-pin connector terminal>

(Ta = 25°C)

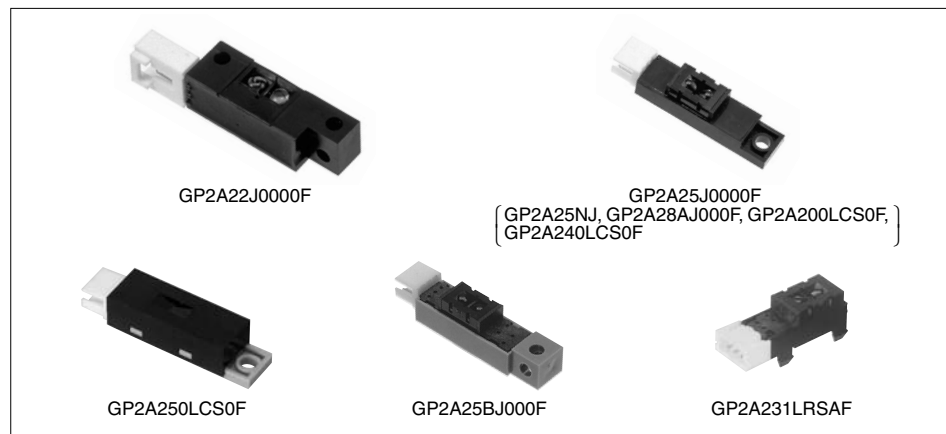
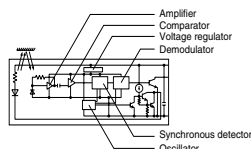
Model No.	Internal connection diagram	Features	Optimum detecting distance (mm)	Electro-optical characteristics					
				Supply voltage Vcc (V)		Dissipation current Icc (mA)		Low level output voltage VOL (V)	
				MIN.	MAX.	Vcc (V)	MAX.	Vcc (V)	MAX.
GP2A22J0000F▲	OPIC output (Following diagram)	Multi types of paper detectable, light modulation type, with connector, sensitivity adjusted	9 to 15	4.75	5.25	30*1	5	0.4	5
GP2A200LCS0F		Multi types of paper detectable, light modulation type, with connector, sensitivity adjusted	5 to 15	4.75	5.25	30*1	5	0.4	5
GP2A240LCS0F		Improved light-resistance characteristic for inverter lighting (500 lx), light modulation type, connector output	5 to 15	4.75	5.25	30*1	5	0.4	5
GP2A250LCS0F		Static electricity resistant, improved light-resistance characteristic for inverter lighting (500 lx), light modulation type, connector output	5 to 15	4.75	5.25	30*1	5	0.4	5
GP2A25J0000F		Multi types of paper detectable, light modulation type, with connector, sensitivity adjusted	3 to 7	4.75	5.25	30*1	5	0.4	5
GP2A231LRS0F		Compact, Hook type, Multi types of paper detectable, light modulation type, with connector, sensitivity adjusted	3 to 7	4.75	5.25	20*1	5	0.4	5
GP2A25NJ000F		Multi types of paper detectable, light modulation type, sensitivity adjusted, applicable to inverter fluorescent lamp, built-in visible light cut filter	3 to 6	4.75	5.25	30*1	5	0.4	5
GP2A25BJ000F		Multi types of paper detectable, light modulation type, with connector, sensitivity adjusted	3 to 7	4.75	5.25	30*1	5	0.4	5
GP2A28AJ000F		Multi types of paper detectable, light modulation type, with connector, sensitivity adjusted, detecting portion with flat configuration	3 to 7	4.75	5.25	30*1	5	0.4	5

\* Topr: -10 to +60°C (GP2A22J0000F, GP2A25J0000F, GP2A25BJ0000F)

\*1 Smoothing value RL = ∞

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

[Internal connection diagram]



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## Photointerrupters for Specific Applications

### ◆ Transmissive type

#### <Single phototransistor output type with actuator and 3-pin connector terminal>

(Ta = 25°C)

Model No.	Internal connection diagram	Features	Actuator lever starting torque (Initial) MAX.	Electro-mechanical characteristics*1									
				Light beam interrupted					Light beam uninterrupted				
				Dissipation current		Collector current			Dissipation current		Collector current		
				Icc1 (mA)	Vcc (V)	Ic1 (μA)	Vcc (V)	Vo (V)	Icc2 (mA)	Vcc (V)	Ic2 (mA)	Vcc (V)	Vo (V)
GP1S44S1J00F		Spring lever type actuator United with connector	1 × 10 <sup>-4</sup> N•m or less	20 MAX.	5	50 MAX.	5	5	20 MAX.	5	0.25 MIN.	5	5

\* Topr: -25 to +75 °C

\*1 Operating voltage: 4.5 to 5.5 V



#### <OPIC type with actuator and 3-pin connector terminal>

(Ta = 25°C)

Model No.	Internal connection diagram	Features	Absolute maximum ratings		Electro-mechanical characteristics	Electro-mechanical characteristics*1										
			Supply voltage Vcc (V)	Output current IOL (mA)		Actuator lever starting torque	Light beam interrupted					Light beam uninterrupted				
							Dissipation current		Low level output voltage			Dissipation current		High level output voltage		
							Iccl (mA)	Vcc (V)	VOL (V)	Vcc (V)	IOL (mA)	Icch (mA)	Vcc (V)	VOH (V)	Vcc (V)	RL (kΩ)
GP1A44E1J00F		Spring lever type actuator, United with connector	10	50	1 × 10 <sup>-4</sup> N•m or less	20 MAX.	5	0.4 MAX.	5	16	20 MAX.	5	Vcc × 0.9 MIN.	5	47	

\* Topr: -25 to +75 °C

\*1 Operating voltage: 4.5 to 5.5 V



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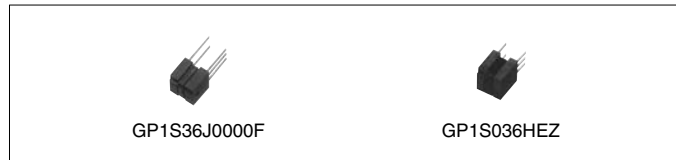
### <Compact, 2-phase phototransistor output type>

(Ta = 25°C)

Model No.	Internal connection diagram	Features	Electro-optical characteristics						
			Current transfer ratio			Response time			
			CTR (%) MIN.	IF (mA)	VCE (V)	tr (μs) TYP.	IC (mA)	RL (Ω)	VCE (V)
GP1S36J0000F▲		Built-in ball (2 phase output), compact, PWB mounting type	1.2	5	5	50	0.1	1 000	5
GP1S036HEZ▲		Built-in ball (2 phase output), compact, PWB mounting type, 4-direction detection	1.1	5	5	50	0.1	1 000	5

\* Topr: -25 to +85 °C

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



### <Case type, with encoder function>

(Ta = 25°C)

Model No.	Absolute maximum ratings			Electro-optical characteristics				
	Vcc (V)	Topr (°C)	Operating voltage Vcc (V)	Output signal	Resolution	Response frequency (kHz) MAX.	IF (mA)	Dissipation current (output side) Icc (mA) MAX.
GP1A30RJ000F▲	7	0 to +70	4.5 to 5.5	Phase A (Digital output) Phase B (Digital output)	Disk slit pitch 0.7 (mm)	5	30	20
GP1A038RBK0F*1, *3	7	0 to +70	2.7 to 5.5		Linear scale slit pitch 0.17 (mm)	20	11	5
GP1A038RCK0F*1, *3	7	0 to +70	2.7 to 5.5		Linear scale slit pitch 0.14 (mm)	20	11	5
GP1A037RDKJF*1, *3	7	0 to +70	2.7 to 5.5		Linear scale slit pitch 0.0847 (mm)	40	25	10
GP1A044RCKLF*1	—	-10 to +60	2.7 to 5.5		Linear scale slit pitch 0.14 (mm)	20	15	5
GP1A046RBZLF*1	—	-10 to +60	2.7 to 5.5		Linear scale slit pitch 0.17 (mm)	20	20	5
GP1A047RBZLF	—	0 to +60	2.7 to 5.5		Linear scale slit pitch 0.17 (mm)	20	20	7
GP1A047RDZLF	—	-10 to +60	2.7 to 5.5		Linear scale slit pitch 0.0847 (mm)	120	20	7

\*1 High precision read and low affection of angle error from vibration thanks to the multi-segment PD system

\*2 Duty ratio: 50±10%, phase difference: 90±30°

\*3 Duty ratio: 50±20%, phase difference: 90±45°

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



#### Notice

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## ◆ Reflective type

### <Case type, phototransistor output>

(Ta = 25°C)

Model No.	Internal connection diagram	Features	Focal distance (mm)	Electro-optical characteristics							
				Current transfer ratio			Response time				
				CTR (%) MIN.	IF (mA)	VCE (V)	tr (μs) TYP.	Ic (mA)	RL (Ω)	VCE (V)	
GP2S29SJ000F		Long focal distance (with prism system), compact, screw mounting type	*1	1.0*1	20	5	38	0.5	1 000	2	

\* Topr: -25 to +85°C

\*1 Space between prism and sensor is 8 mm.



### <For the amusement industry>

(Ta = 25°C)

Model No.	Features	Electro-optical characteristics		
		Supply voltage Vcc	Dissipation current	Response frequency f (Hz)
			Icc (mA)	
GP2A221HRKA	Employs reflective type, pinball detector, connector with lock	4.5 to 15	MAX. 10	MAX. 500
GP2A222HCKA	Employs reflective type, pinball detector, connector with lock In conjunction with an IC, detects beam interruption*1	4.5 to 16.5	MAX. 10	MAX. 500

\*1 Used together with interface IC for control (IR3N184)



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