

GP2S01/GP2S01F

Long Focal Distance Type Photointerrupter

■ Features

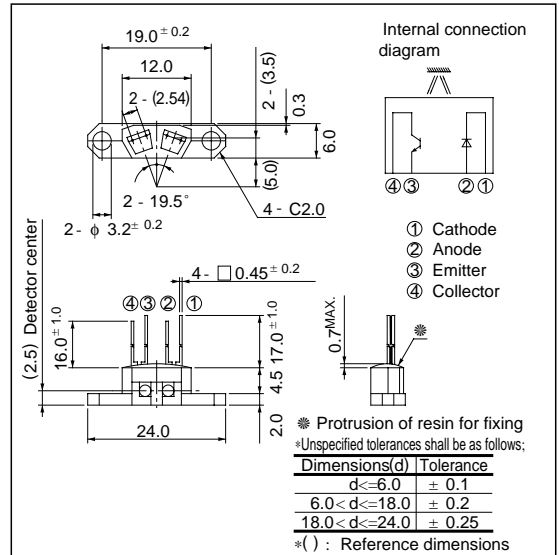
1. Long focal distance
2. Visible light cut-off type: **GP2S01F**

■ Applications

1. Copiers, printers
2. Automatic vending machines, ticket vending machines
3. Optoelectronic switches, optoelectronic counters

■ Outline Dimensions

(Unit : mm)



■ Absolute Maximum Ratings

(Ta = 25°C)

Parameter		Symbol	Rating	Unit
Input	Forward current	I _F	50	mA
	*1 Peak forward current	I _{FM}	1	A
	Reverse voltage	V _R	6	V
	Power dissipation	P	75	mW
Output	Collector-emitter voltage	V _{CEO}	35	V
	Emitter-collector voltage	V _{ECO}	6	V
	Collector current	I _C	20	mA
	Collector power dissipation	P _C	75	mW
Operating temperature		T _{opr}	- 25 to + 85	°C
Storage temperature		T _{stg}	- 40 to + 100	°C
*2 Soldering temperature		T _{sol}	260	°C

*1 Pulse width $\leq 100 \mu s$, Duty ratio = 0.01

*2 For 5 seconds

■ Electro-optical Characteristics

($T_a = 25^\circ\text{C}$)

Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit	
Input	Forward voltage	V_F	$I_F = 20\text{mA}$	-	1.2	1.4	V	
	Peak forward voltage	V_{FM}	$I_{FM} = 0.5\text{A}$	-	3.0	4.0	V	
	Reverse current	I_R	$V_R = 3\text{V}$	-	-	10	μA	
Output	Collector dark current	I_{CEO}	$V_{CE} = 20\text{V}$	-	10^{-9}	10^{-7}	A	
Transfer characteristics	^{*3} Collector Current	GP2S01	$I_F = 20\text{mA}$ $V_{CE} = 5\text{V}$	0.2	-	2	mA	
		GP2S01F		0.2	-	0.9		
	Response time	Rise time	GP2S01	$I_C = 0.2\text{mA}, V_{CE} = 2\text{V}$ $R_L = 1\text{k}\Omega, d = 5\text{mm}$	-	30	90	μs
			GP2S01F		-	30	120	
		Fall time	GP2S01		-	40	120	μs
			GP2S01F		-	40	160	
	^{*4} Leak current		I_{LEAK}	$I_F = 20\text{mA}, V_{CE} = 5\text{V}$	-	-	10	μA

*3 Test method: A reflective object shall be an OMS test card (white) specified by Sharp, and be 5.0mm away from the sensor

*4 Without reflective object

Fig. 1 Forward Current vs. Ambient Temperature

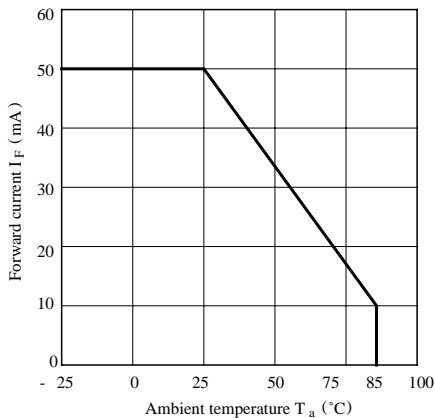


Fig. 2 Collector Power Dissipation vs. Ambient Temperature

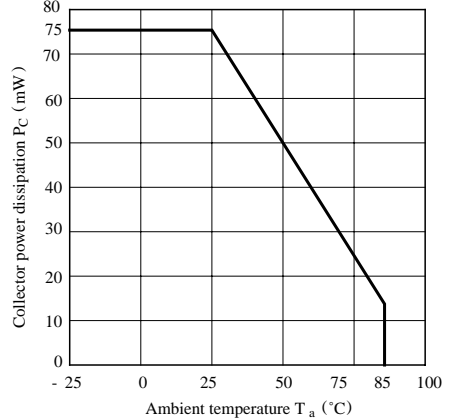


Fig. 3 Peak Forward Current vs. Duty Ratio

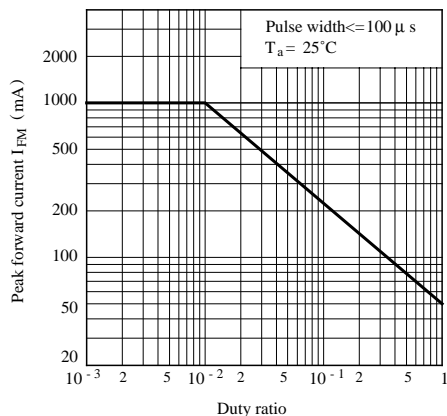


Fig. 4 Forward Current vs. Forward Voltage

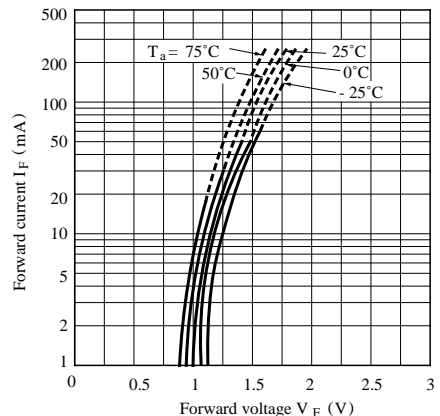


Fig. 5 Collector Current vs. Forward Current

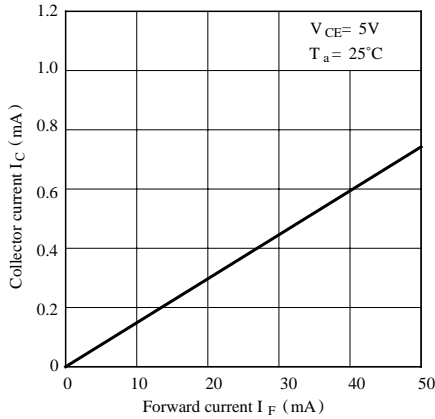


Fig. 6 Collector Current vs. Collector-emitter Voltage

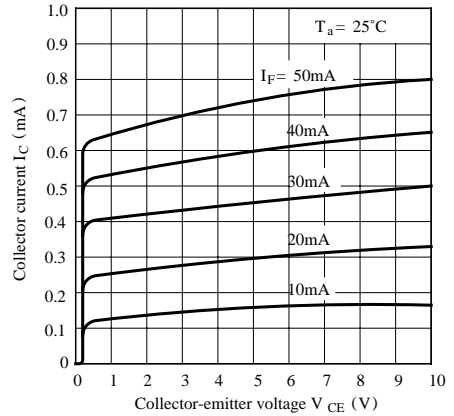


Fig. 7 Collector Current vs. Ambient Temperature

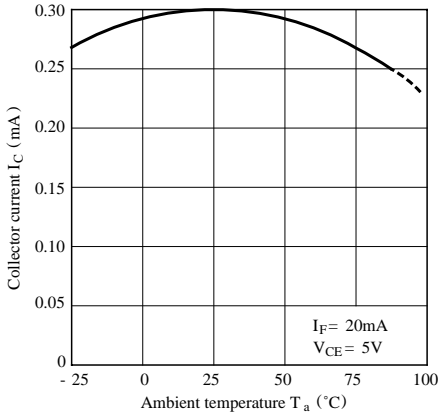


Fig. 8 Collector Dark Current vs. Ambient Temperature

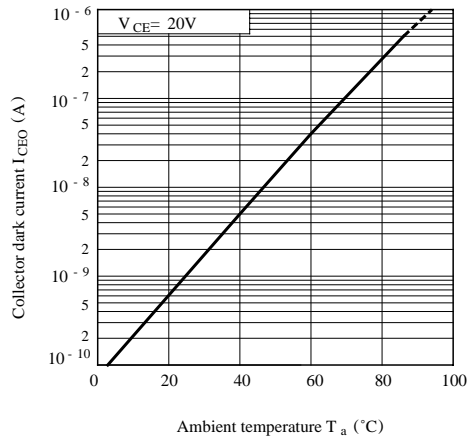
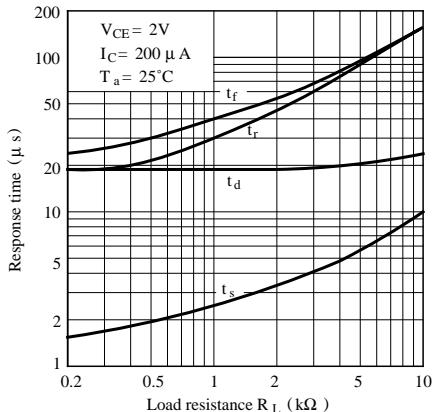


Fig. 9 Response Time vs. Load Resistance



Test Circuit for Response Time

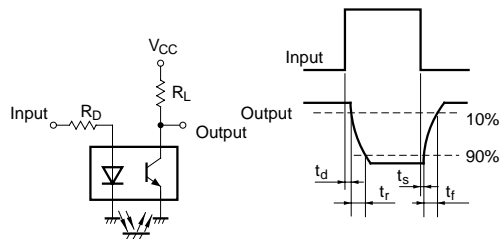


Fig.10 Frequency Response

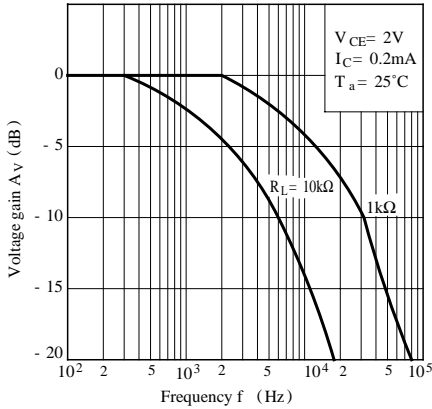


Fig.11 Relative Collector Current vs. Distance between GP2S01(F) and Test Card

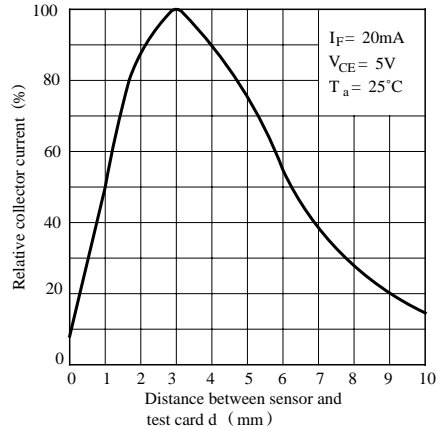
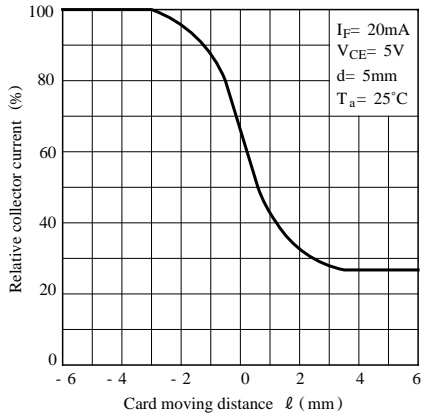


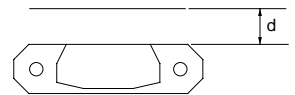
Fig.12 Relative Collector Current vs. Card Moving Distance



Distance Characteristic Test Condition

Correspond to Fig.11

SHARP OMS TEST CARD (White)



GP2S01 (GP2S01F)

Correspond to Fig.12

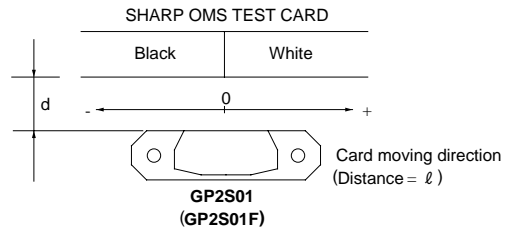
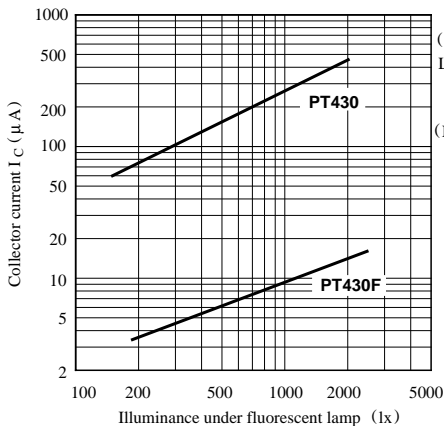


Fig.13 Collector Current vs. Illuminance (Reference)



(Test condition)

Light source: White fluorescent lamp
 Sharp FLR-40 SW/M
 $V_{CE} = 2V, T_a = 25^\circ C$

(Note) Comparison between outputs of transparent resin molded type photo-transistor (PT430) and visible light cut-off type (PT430F)