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GP2S01/GP2S01F

Long Focal Distance Type Photointerrupter

■ Features

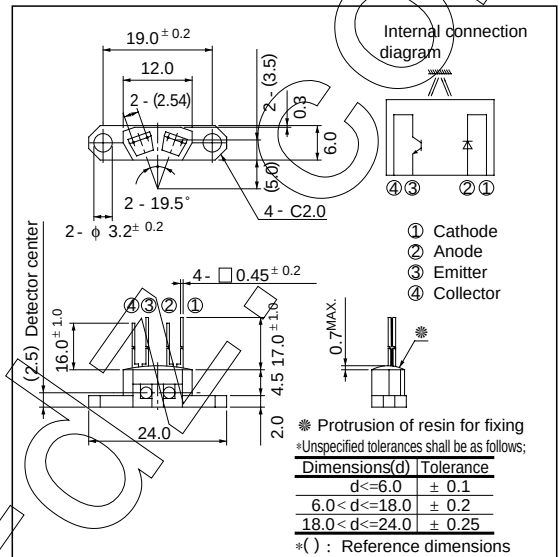
1. Long focal distance
2. Visible light cut-off type: **GP2S01F**

■ 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

Parameter			Symbol	Conditions	MIN.	TYP.	MAX.	Unit		
Input	Forward voltage		V _F	I _F = 20mA	-	1.2	1.4	V		
	Peak forward voltage		V _{FM}	I _{FM} = 0.5A	-	3.0	4.0	V		
	Reverse current		I _R	V _R = 3V	-	-	10	μ A		
Output	Collector dark current		I _{CEO}	V _{CE} = 20V	-	10 ⁻⁹	10 ⁻⁷	A		
Transfer charac- teristics	^{*3} Collector Current		GP2S01	I _C	I _F = 20mA V _{CE} = 5V	0.2	-	2	mA	
			GP2S01F			0.2	-	0.9		
	Response time	Rise time	GP2S01	t _r	I _C = 0.2mA, V _{CE} = 2V R _L = 1k Ω, d = 5mm	-	30	90	μ s	
			GP2S01F			-	30	120		
		Fall time	GP2S01			t _f	-	40	120	μ s
			GP2S01F				-	40	160	
	^{*4} Leak current			I _{LEAK}	I _F = 20mA, V _{CE} = 5V	-	-	10	μ A	

^{*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

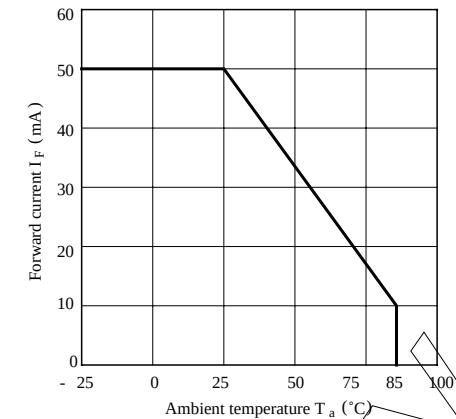


Fig. 2 Collector Power Dissipation vs. Ambient Temperature

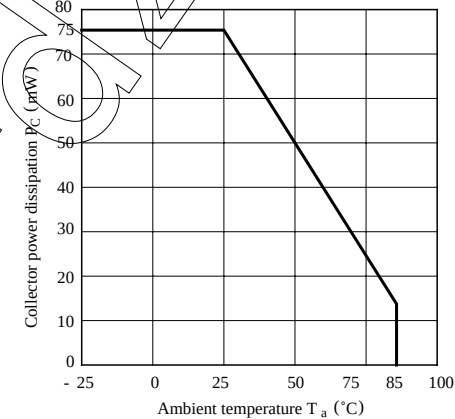


Fig. 3 Peak Forward Current vs. Duty Ratio

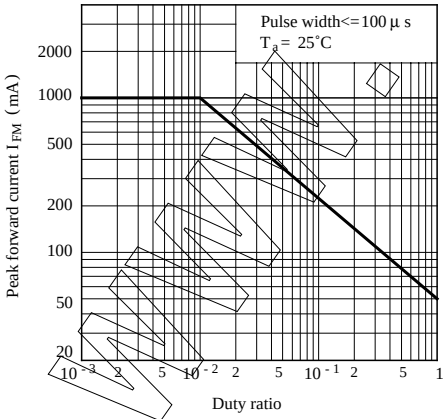


Fig. 4 Forward Current vs. Forward Voltage

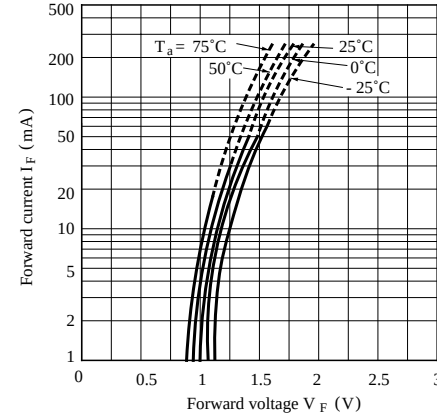


Fig. 5 Collector Current vs. Forward Current

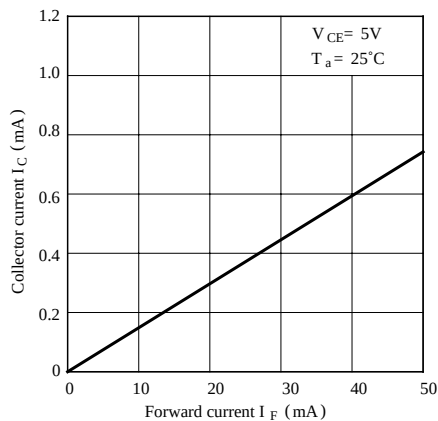


Fig. 6 Collector Current vs. Collector-emitter Voltage

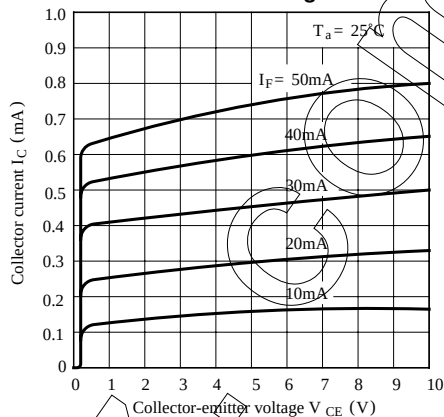


Fig. 7 Collector Current vs. Ambient Temperature

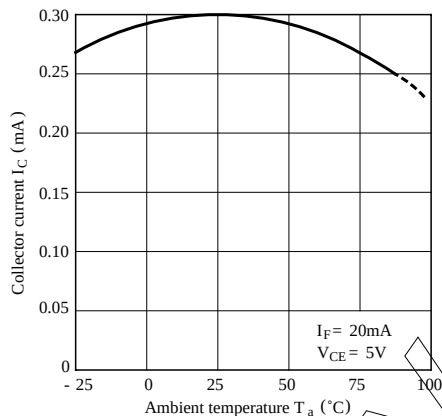


Fig. 8 Collector Dark Current vs. Ambient Temperature

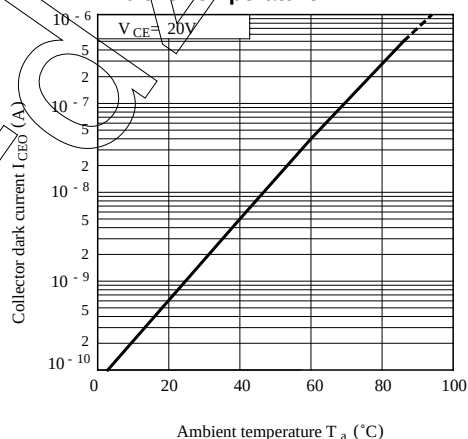
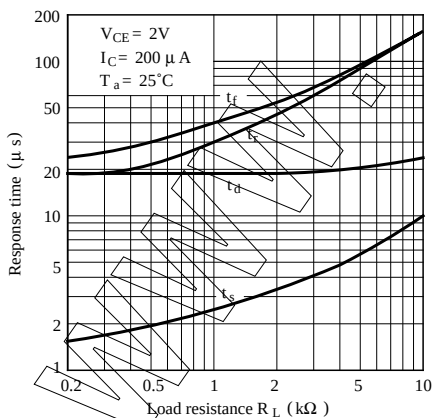


Fig. 9 Response Time vs. Load Resistance



Test Circuit for Response Time

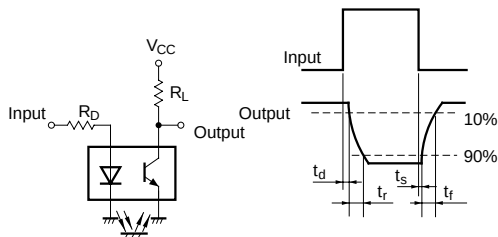


Fig.10 Frequency Response

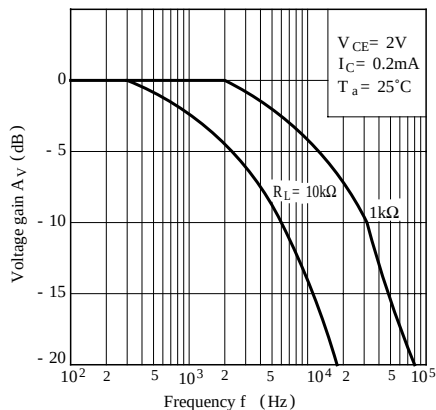


Fig.11 Relative Collector Current vs. Distance between GP2S01(F) and Test Card

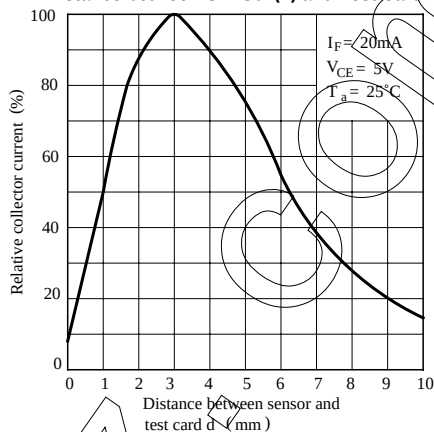
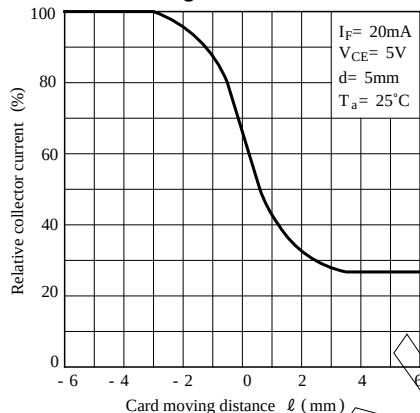


Fig.12 Relative Collector Current vs. Card Moving Distance



Distance Characteristic Test Condition

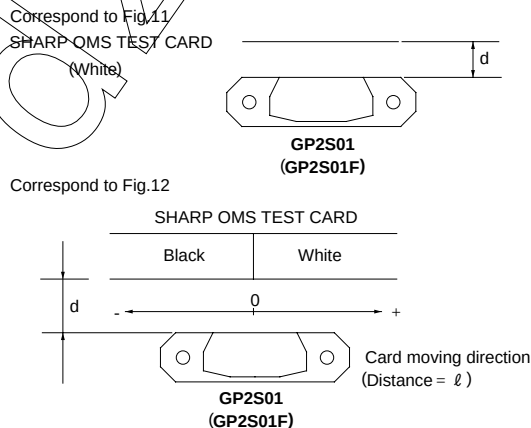
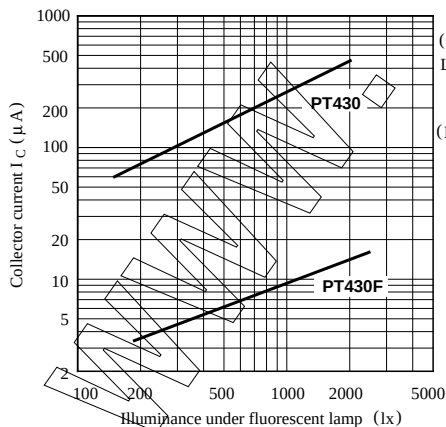


Fig.13 Collector Current vs. Illuminance (Reference)



(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)