

# GP2S29

## Long Focal Distance, Reflective Type Photointerrupter

### ■ Features

1. Wide range of detecting distance  
(Detecting distance : 1 to 20mm)
2. Prism system
3. High sensitivity (S/N ratio : 75)
4. Easy circuit design in sub sequent stage due to large output current

### ■ Applications

1. Printers
2. Facsimiles
3. DAT
4. Copiers
5. LBP's

### ■ Absolute Maximum Ratings (Ta=25°C)

	Parameter	Symbol	Rating	Unit
Input	*1 Forward current	I <sub>F</sub>	50	mA
	*2 Peak forward current	I <sub>FM</sub>	1	A
	Reverse voltage	V <sub>R</sub>	6	V
Output	*1 Power dissipation	P	75	mW
	Collector-emitter voltage	V <sub>CEO</sub>	35	V
	Emitter-collector voltage	V <sub>ECO</sub>	6	V
	Collector current	I <sub>CP</sub>	20	mA
	*1 Collector dissipation	P <sub>C</sub>	75	mW
	*1 Total power dissipation	P <sub>tot</sub>	100	mW
	Operating temperature	T <sub>opr</sub>	-25 to +85	°C
	Storage temperature	T <sub>stg</sub>	-40 to +100	°C
	*3 Soldering temperature	T <sub>sol</sub>	260	°C

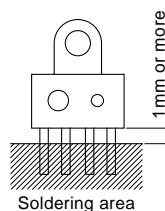
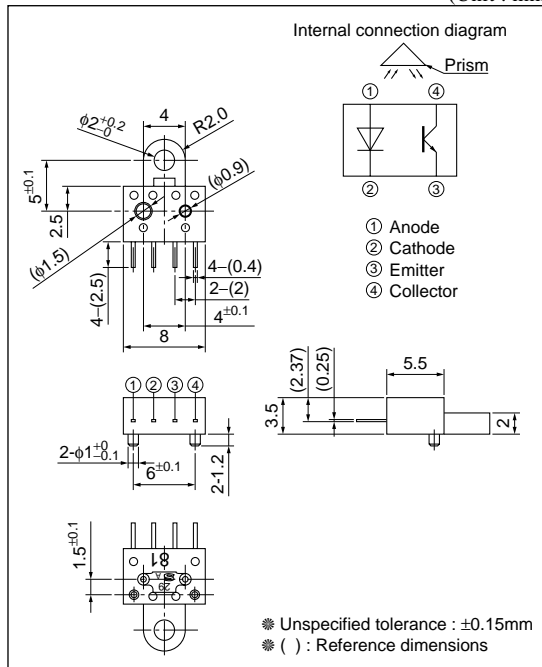
\*1 The derating factors of absolute maximum ratings due to ambient temperature are shown in Fig.1 to 2

\*2 Pulse width<=100μs, Duty ratio:0.01

\*3 For 3s

### ■ Outline Dimensions

(Unit : mm)



■ Electro-optical Characteristics

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

Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit
Input	Forward voltage	$V_F$	$I_F=20\text{mA}$	—	1.25	1.4	V
	Peak forward voltage	$V_{FM}$	$I_{FM}=0.5\text{A}$	—	3	4	V
	Reverse current	$I_R$	$V_R=3\text{V}$	—	—	10	$\mu\text{A}$
Output	Collector dark current	$I_{CEO}$	$V_{CE}=20\text{V}$	—	—	100	nA
Transfer characteristics	<sup>*4</sup> Collector current	$I_C$	$V_{CE}=5\text{V}, I_F=20\text{mA}$	0.2	—	2.4	mA
	<sup>*5</sup> Leak current	$I_{LEAK}$	$V_{CE}=5\text{V}, I_F=20\text{mA}$	—	—	10	$\mu\text{A}$
	Signal to noise ratio	S/N	$I_C/I_{LEAK}$	75	—	—	—
	<sup>*4</sup> Collector-emitter saturation voltage	$V_{CE(sat)}$	$I_C=0.1\text{mA}$ $I_F=40\text{mA}$	—	0.1	0.4	V
	Response time	Rise time	$t_r$	$V_{CE}=2\text{V}, I_C=0.5\text{mA}$ $R_L=1\text{k}\Omega, d=8\text{mm}$	—	38	90
Fall time		$t_f$	—		48	110	$\mu\text{s}$

\*4 Refer to Fig.13

\*5 Refer to Fig.15

Fig.1 Forward Current vs. Ambient Temperature

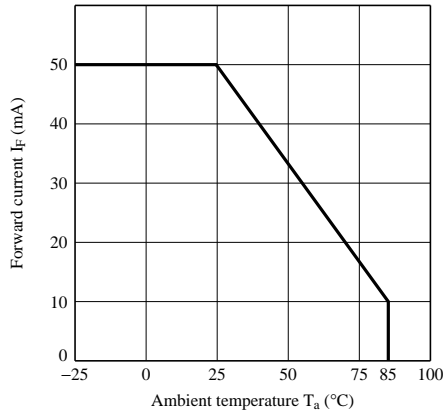


Fig.2 Power Dissipation vs. Ambient Temperature

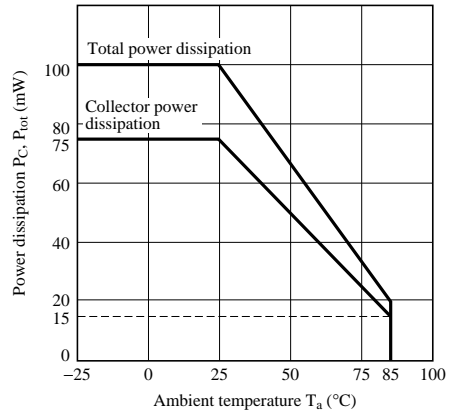


Fig.3 Peak Forward Current vs. Duty Ratio

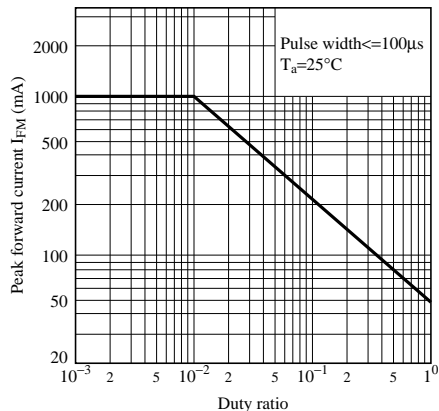


Fig.4 Forward Current vs. Forward Voltage

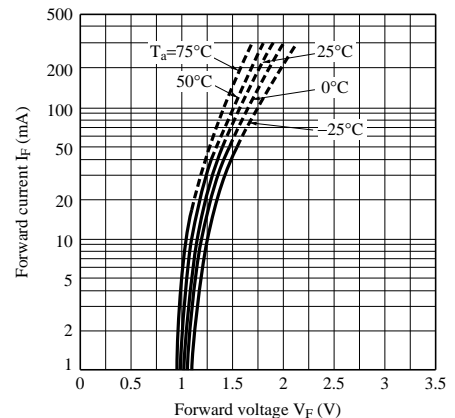


Fig.5 Collector Current vs. Forward Current

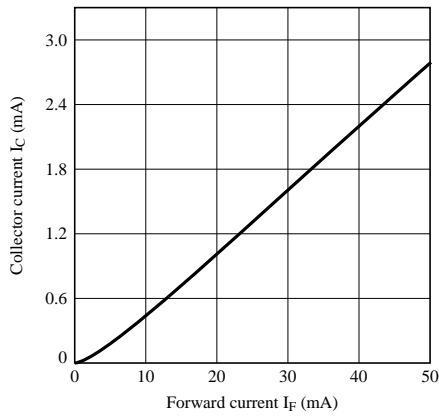


Fig.6 Collector Current vs. Collector-emitter Voltage

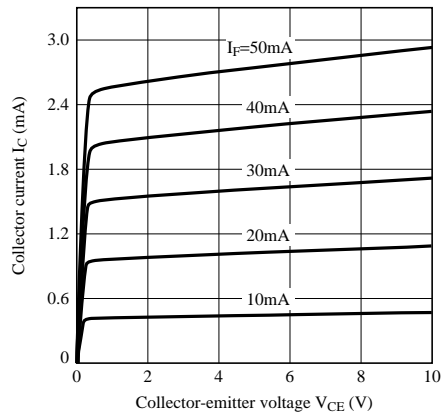


Fig.7 Relative Collector Current vs. Ambient Temperature

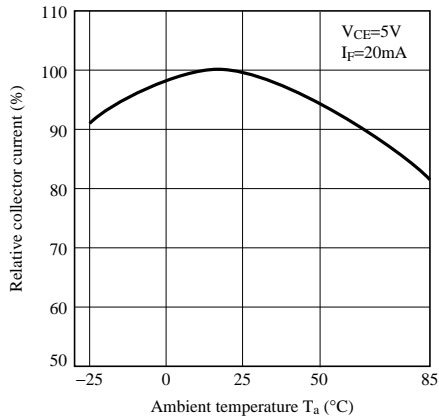


Fig.8 Collector Dark Current vs. Ambient Temperature

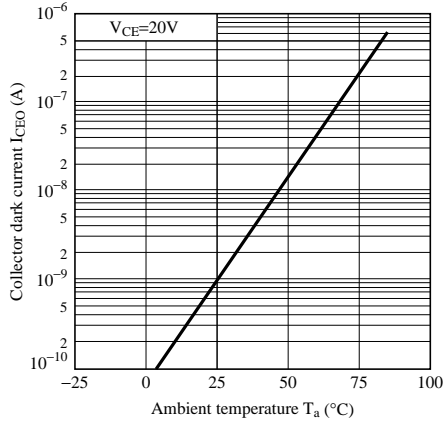
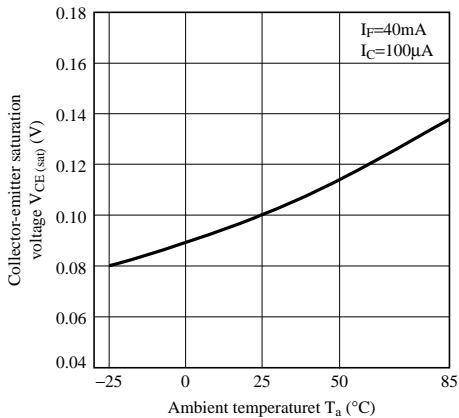
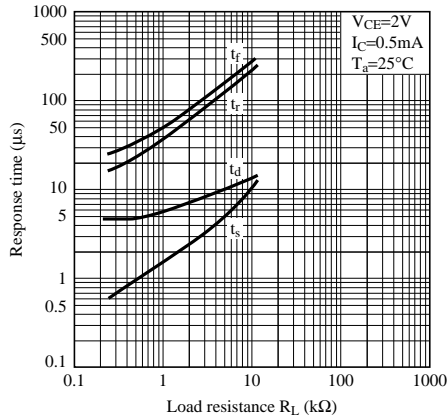


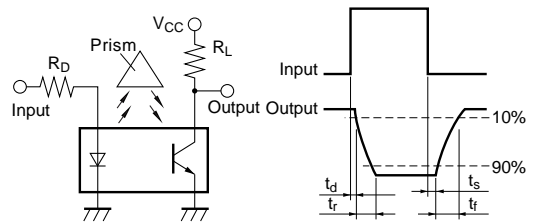
Fig.9 Collector - emitter Saturation Voltage vs. Ambient Temperature



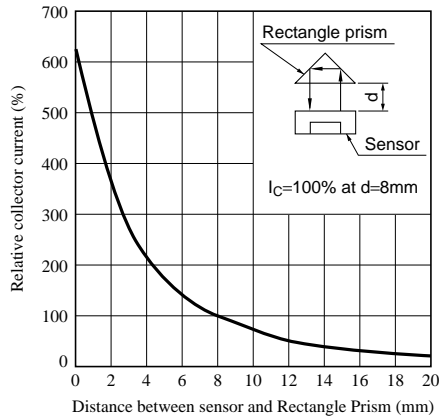
**Fig.10 Response Time vs. Load Resistance**



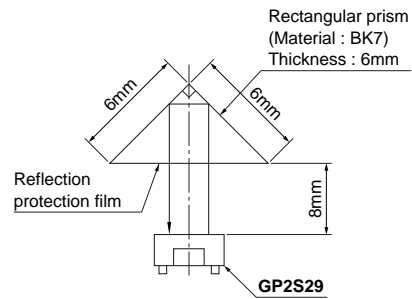
**Fig.11 Test Circuit For Response Time**



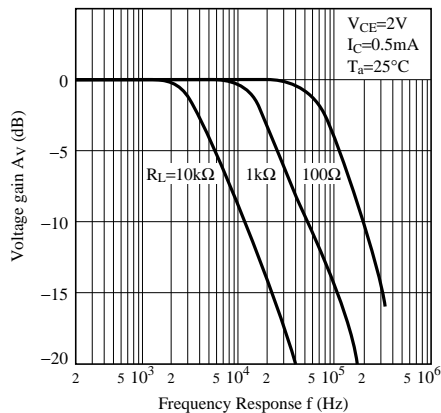
**Fig.12 Relative Collector Current vs. Distance Between Sensor and Rectangle Prism**



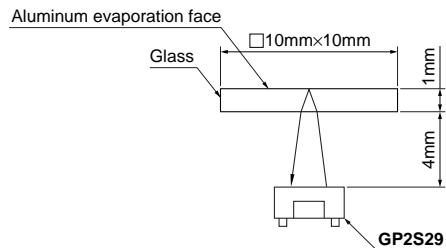
**Fig.13 Measuring Configuration of Collector Current**



**Fig.14 Voltage Gain vs Frequency**



**Fig.15 Measuring Configuration of Leak Current**



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