

# Reflective Object Sensor

## Model No: LBR-123

### Description

The **LBR-123** is a light reflection switch which includes a GaAs IRLED transmitter and a NPN photo-transistor with a high photosensitive receiver for short distance, operating in the infrared range. Both components are mounted side-by-side in a plastic package.

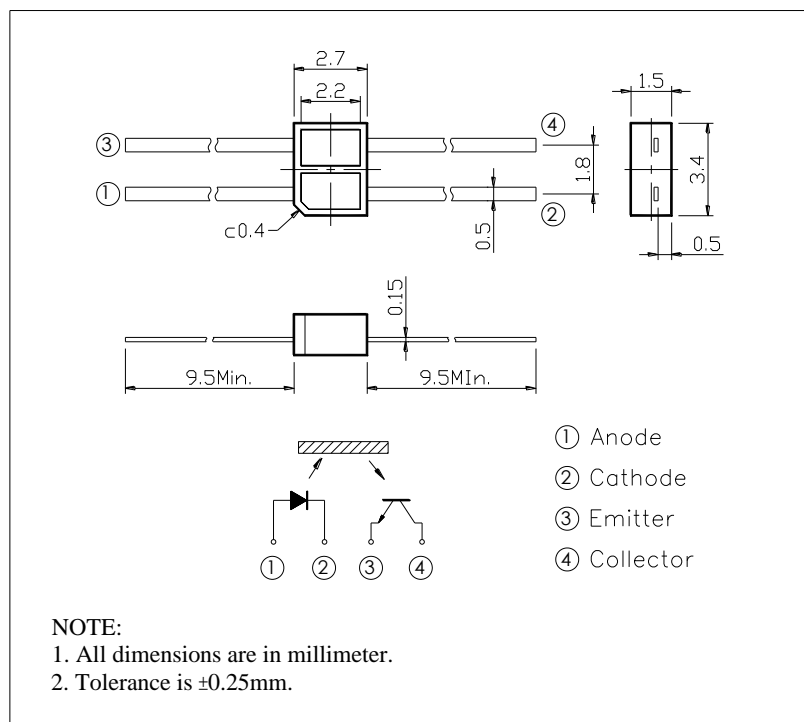
### Features

- Fast response time
- High sensitivity
- Cutting wavelength  $\lambda = 840\text{nm}$
- Thin
- Compact

### Applications

- Camera
- VCR
- Floppy disk driver
- Cassette type recorder
- Various microcomputer control equipment

### Outline dimensions



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Absolute Maximum Ratings (Ambient Temperature: 25°C)

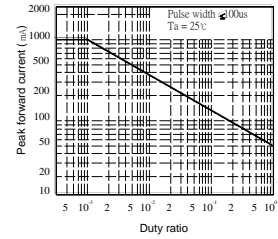
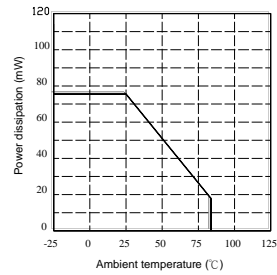
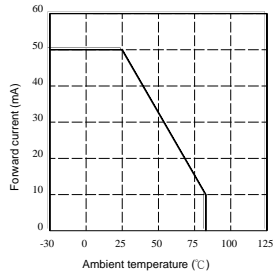
Item		Symbol	Rating	Units	Note
Input	Forward current	I <sub>F</sub>	50	mA	
	Reverse voltage	V <sub>R</sub>	5	V	
	Peak forward current	I <sub>FP</sub>	1	A	Pulse width ≤ 100μs, Duty cycle=1%
	Power dissipation	P <sub>d</sub>	75	mW	
Output	Collector current	I <sub>c</sub>	50	mA	
	Collector-Emitter voltage	BV <sub>ceo</sub>	30	V	
	Emitter-Collector voltage	BV <sub>eco</sub>	5	V	
	Collector power dissipation	P <sub>c</sub>	75	mW	
Storage Temperature		T <sub>stg</sub>	-40 to +85	°C	
Operating Temperature		T <sub>op</sub>	-25 to +85	°C	
Soldering Temperature		T <sub>sol</sub>	260	°C	5 seconds max.

Electrical Specifications (Ambient Temperature: 25°C)

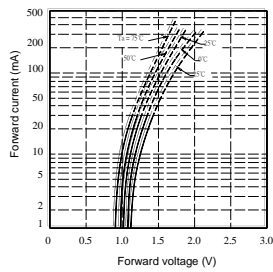
Item		Symbol	MIN.	TYP.	MAX.	Units	Conditions
Input	Forward voltage	V <sub>F</sub>		1.2	1.4	V	I <sub>F</sub> =20mA
	Reverse current	I <sub>R</sub>			10	μA	V <sub>R</sub> =5V
	Peak wavelength	λ <sub>p</sub>		940		nm	
	View angle	2θ 1/2		110		Deg.	I <sub>F</sub> =20mA
Output	Dark current	I <sub>ceo</sub>			100	nA	V <sub>ce</sub> =10V
	C-E saturation voltage	V <sub>ce(sat)</sub>			0.4	V	I <sub>c</sub> =2mA, I <sub>B</sub> =0.1mA
Light current		I <sub>c(on)</sub>	0.1			mA	V <sub>ce</sub> =5V I <sub>F</sub> =20mA
Leakage current		I <sub>Leak</sub>			1	μA	
Speed	Rise Time	t <sub>r</sub>		20		μs	V <sub>ce</sub> =2V I <sub>c</sub> =100uA RL=1KΩ
	Fall Time	t <sub>f</sub>		20			

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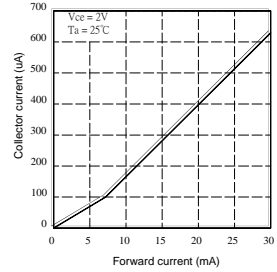
## Reference Data



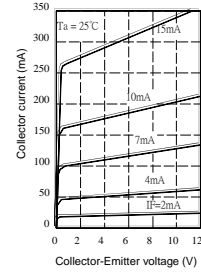
Forward current Vs.  
Forward voltage



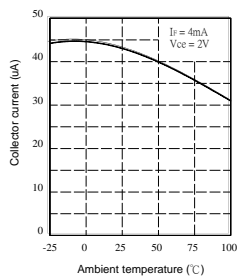
Collector current Vs.  
Forward current



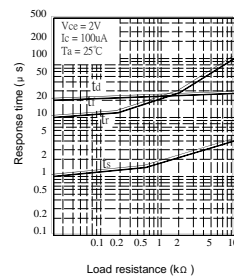
Collector current Vs.  
Collector-Emitter voltage



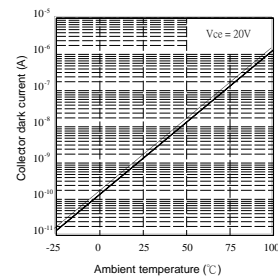
Collector current Vs.  
Ambient temperature



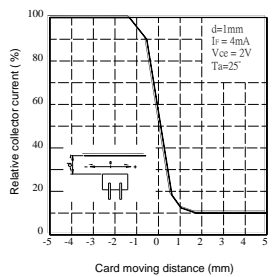
Response time Vs.  
Load resistance



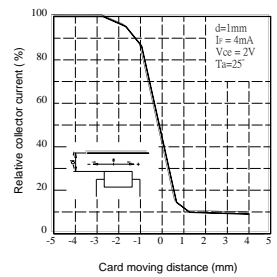
Collector dark current Vs.  
Ambient temperature



Relative collector current Vs.  
Card moving distance(1)



Relative collector current Vs.  
Card moving distance(2)



Test circuit for response time

