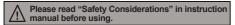
### **Photoelectric Sensor for PCB detection**

#### Features

- 30mm×3mm of rectangular light beam (at 30mm distance) provides accurate detection of PCBs regardless of holes, incomplete fabrication, protrusions, or intrusions on the boards.
- Background suppression (BGS) sensing method allows stable detection regardless of the color, texture or surface of the background object.
- Sensing distance: 10 to 100mm (adjustable distance: 20 to 100mm)
- Light ON / Dark ON operation mode switch
- Power reverse polarity protection circuit,
   Output short over current protection circuit
- IP65 protection structure (IEC standard)





**NEW** 

### Model

Model	Application	Sensing distance	Sensing type	Power supply	Output type	Control output
BJP100-BDT	For PCB detection	100mm	BGS reflective type	12-24VDC	Transistor output	NPN open
D3F 100-DD1						collector output
BJP100-BDT-P						PNP open collector output

### Specifications

Madal	NPN open collector output	BJP100-BDT		
Model PNP open collector output		BJP100-BDT-P		
		BGS reflective		
Sensing distance <sup>×1</sup>		10 to 100mm (at setting distance: 100mm)		
Available sett	ing distance <sup>×1</sup>	20 to 100mm		
Hysteresis*1		Max. 10% of setting distance		
Sensing targe	et	Opaque		
Response tim	ne	Max. 1.5ms		
Power supply	1	12-24VDC ±10% (ripple P-P: max. 10%)		
Current cons	umption	Max. 30mA		
Light source		Red LED (660nm)		
Distance sett	ing	Distance setting adjuster		
Operation mo	ode	Light ON/Dark ON selectable by switch		
		NPN or PNP open collector output		
Control output	t	Load voltage: max. 26.4VDC=     Load current: max. 100mA		
		• Residual voltage - NPN: max.1VDC==, PNP: max. 2VDC		
Protection circuit		Power reverse polarity protection circuit, output short over current protection circuit		
Indicator		Operation indicator: red LED, stability indicator: green LED		
Connection		Cable type		
Insulation res		Over 20MΩ (at 500VDC megger)		
Noise immun	,	±240V of square wave noise (pulse width: 1μs) by the noise simulator		
Dielectric stre	ength	1,000VAC at 50/60Hz for 1min		
Vibration		1.5mm amplitude at 10 to 55Hz frequency in each X, Y, Z direction for 2 hours		
Shock		500m/s² (approx. 50G) in each X, Y, Z direction for 3 times		
	Ambient illumination	Sunlight: max. 10,000lx, Incandescent lamp: max. 3,000lx (receiver illumination)		
Environment	Ambient temperature	-20 to 55°C, storage: -40 to 70°C		
	Ambient humidity	35 to 85%RH, storage: 35 to 85%RH		
Protection structure		IP65 (IEC standard)		
Material		Case: polycarbonate+acrylonitrile butadiene styrene, LED indicator: polycarbonate, sensing part: polymethyl methacrylate		
Cable		Ø3.5mm, 3-wire, 2m (AWG 24, core wire diameter: 0.08mm, no. of core wires: 40, insulator diameter: Ø1mm)		
Accessories		Adjustment screwdriver, bracket A, M3 bolts: 2, M3 nuts: 2		
Approval		CE		
Weight <sup>**2</sup>		Approx. 105g (approx. 50g)		
27.4 81 1	1.11 100 100	·		

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X2: The weight includes packaging. The weight in parenthesis is for unit only.

<sup>\*\*</sup>Beam spot size is approx. 30×3mm (width×height, at distance: 30mm).

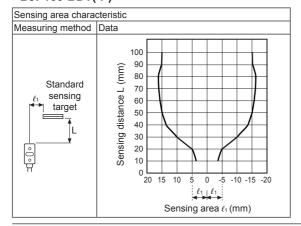
<sup>\*</sup>The temperature and humidity of environment resistance is rated at non-freezing or condensation.

# **Photoelectric Sensor for PCB detection**

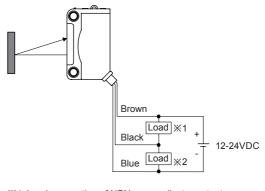
### Feature Data

### **©** BGS reflective type

### • BJP100-BDT(-P)



### Connections

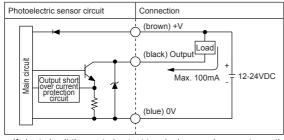


X1: Load connection of NPN open collector output

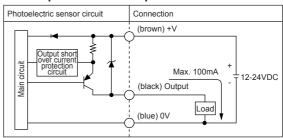
X2: Load connection of PNP open collector output

### Control Output Circuit Diagram

### • NPN open collector output



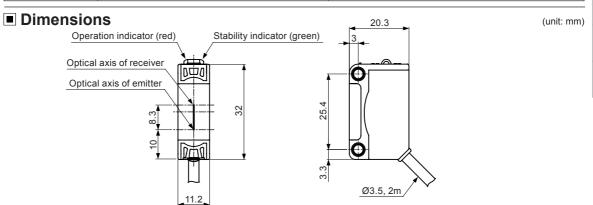
### PNP open collector output



If short-circuit the control output terminal or supply current over the rated specification, normal control signal is not output due to the output short over current protection circuit.

### Operation Mode

•			$\vdash$
Operation mode	Light ON	Dark ON	9
Receiver operation	Received light	Received light	1
Receiver operation	Interrupted light	Interrupted light	
Operation indicator	ON ON	ON	1
(red LED)	OFF	OFF L.	ŀ
Transistar autnut	ON ON	ON	
Transistor output	OFF	OFF L.J.	-



(C) Door/Area Sensors

(D) Proximity Sensors

(E) Pressure Sensors

(F) Rotary Encoders

(G) Connectors/ Connector Cables/ Sensor Distribution Boxes/Sockets

(I) SSRs / Power Controllers

(J) Counters

(M) Tacho / Speed / Pulse Meters

(N) Display Units

(O) Sensor Controllers

(P) Switching Mode Power Supplies

(Q) Stepper Motors

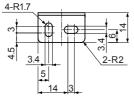
(R) Graphic/ Logic Panels

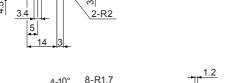
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#### Bracket A

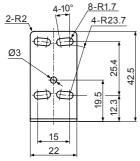
#### •Bracket B (BK-BJP-B, sold separately)

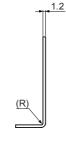
(unit: mm)

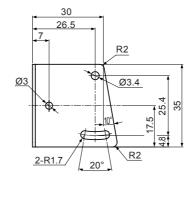


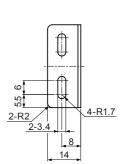




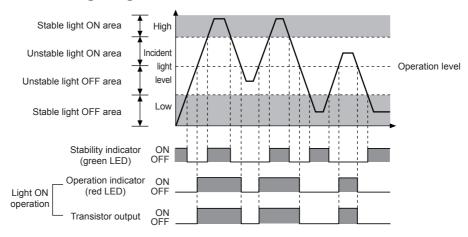








### Operation Timing Diagram



\*\*The waveforms of 'Operation indicator' and 'Transistor output' are for Light ON operation.

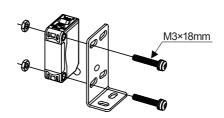
The waveforms are reversed for Dark ON operation.

## **■** Installation and Adjustment

### For mounting

When using photoelectric sensors closely over three units, it may result in malfunction due to mutual interference.

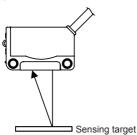
When installing the product, tighten the screw with a tightening torque of 0.5N·m.



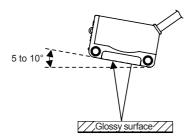
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# **Photoelectric Sensor for PCB detection**

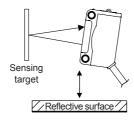
• The sensing side of the unit and the surface of the target object should be parallel when installed.



• If the sensing target has a glossy surface, mount the sensor at a 5 to 10° angle as shown in the figure. Check to see that there is no influence from background objects.

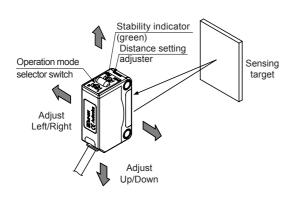


• If there is a reflective surface beneath the sensor, the reflected light may reflect off the surface of the reflective object. Make sure that the sensor is tilted upwards as shown in the figure, or install the sensor distant to the reflective surface.



### Optical axis adjustment

• Place the sensing target. Move the sensor slightly in each direction and check the operation of the stability indicator. Fix the sensor at the center point.



### Operation mode switching

Light ON	D L	Turn the operation mode selection switch all the way to the right (towards L) to select Light ON operation.	
Dark ON D L		Turn the operation mode selection switch all the way to the left (towards D) to select Dark ON operation.	

#### O Distance setting

	Order	Distance setting	Description
	1	(A) MIN MAX	From Light ON status, turn the distance setting adjuster slowly to the right from MIN distance and check the position where operation indicator turns on (A).
	2	(A) (C) MIN MAX (B)	From Dark ON status, turn the distance setting adjuster further right and check the position where the operation indicator turns on (B). Turn the adjuster left and check the position where the operation indicator turns off (C).  **If the operation indicator does not turn on at MAX distance, the maximum setting distance is set at position (C).
;	3	Optimal distance  (A) (C)  MIN MAX	Set the adjuster at the center position between (A) and (C) for optimal sensitivity. Also, check if the stability indicator turns off with or without the sensing target. If it does not turn off, please review the operation mode again, as sensitivity may be unstable.

	Light ON status	Dark ON status
BGS reflective type	Sensor Sensing target Background	No sensing target Background

XSet the distance setting within stable Light ON range for increased environmental (temperature, voltage, dust etc.) resistance after installation.

\*Do not use excessive force when turning the operation selector or distance setting adjuster. It may cause product damage.

(C) Door/Area Sensors

(D) Proximity Sensors

(G) Connectors/ Connector Cables/ Sensor Distribution Boxes/Sockets

(I) SSRs / Power Controllers

(J) Counters

(M) Tacho / Speed / Pulse Meters

(N) Display Units

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