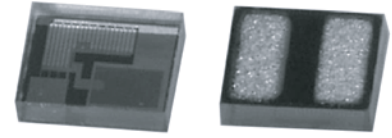


# Visible Radiant Optical Sensors

## Photo-diode Type BCS1210A1 Series

Conformity to RoHS Directive

TDK Visible Radiant Optical Sensors are photo IC products that contain a current amplifier circuit using a thin film silicon semiconductor. The sensors use an amorphous silicon semiconductor on a glass substrate as a photodiode. They are optimal as light sensors when performing automatic light control for displays, etc.



### FEATURES

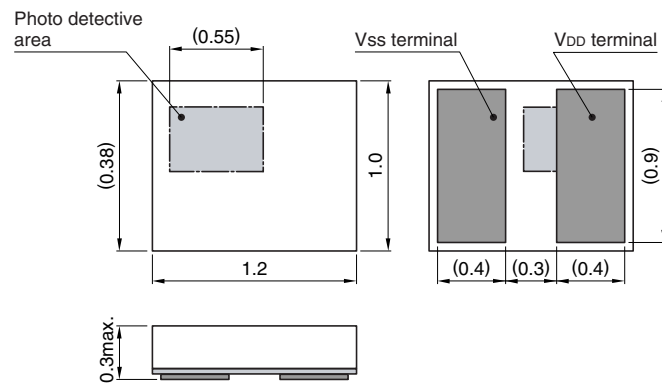
- BCS1210A1HE/1210A1LE are ultra-thin type (thickness: 0.3 mm max.).
- They are highly sensitive to visible light, having a spectral sensitivity close to that of the spectral luminous efficiency of the human eye.
- The sensors have virtually no sensitivity in the infrared region, meaning they do not require optical filters to block infrared light (generally, photodiodes using crystal silicon semiconductors require optical filters).
- The series consist of surface mount devices that can be applied lead-free reflow soldering, having a 1210 size ultra-small packaging.
- It is a product conforming to RoHS directive.

### APPLICATIONS

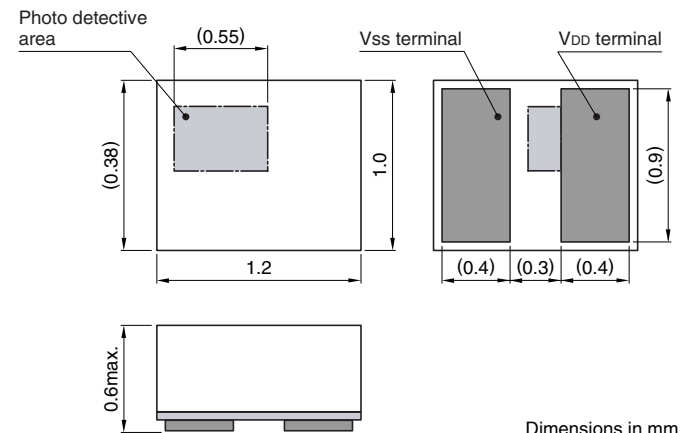
- Brightness control for LCD, EL and CRT
- Brightness control for keypads (e. g. Mobile phones)
- Switch for IC card or other thin set
- Exposure adjust for compact camera
- Sub exposure adjust for digital camera

### SHAPES AND DIMENSIONS

#### BCS1210A1HE/BCS1210A1LE

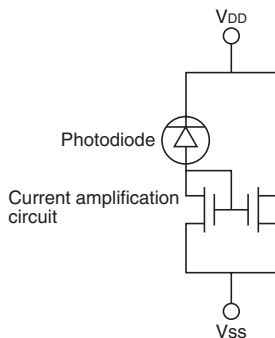


#### BCS1210A1HD/BCS1210A1LD



Dimensions in mm

### CIRCUIT DIAGRAM



• Conformity to RoHS Directive: This means that, in conformity with EU Directive 2002/95/EC, lead, cadmium, mercury, hexavalent chromium, and specific bromine-based flame retardants, PBB and PBDE, have not been used, except for exempted applications.

• All specifications are subject to change without notice.

## ELECTRICAL CHARACTERISTICS

Item		BCS1210A1HE	BCS1210A1LE	BCS1210A1HD	BCS1210A1LD
Output current [100Lux*1 V <sub>DD</sub> =3V] ( $\mu$ A)	min.*2	18.0	2.3	18.0	2.3
	typ.*2	24.0	3.0	24.0	3.0
	max.*2	30.0	3.8	30.0	3.8
Output current [1000Lux*1 V <sub>DD</sub> =3V] ( $\mu$ A)	min.*2	180.0	22.5	180.0	22.5
	typ.*2	240.0	30.0	240.0	30.0
	max.*2	300.0	37.5	300.0	37.5
Dark current [0Lux V <sub>DD</sub> =3V](nA)		10max.	4max.	10max.	4max.
Reverse bias voltage: VR (V)		5	5	5	5
Spectral sensitivity area (nm)		350 to 750	350 to 750	350 to 750	350 to 750
Peak of sensitivity (nm)		580 $\pm$ 20	580 $\pm$ 20	580 $\pm$ 20	580 $\pm$ 20
Operating temperature range ( $^{\circ}$ C)		-20 to +85	-20 to +85	-20 to +85	-20 to +85
Storage temperature range ( $^{\circ}$ C)		-40 to +85	-40 to +85	-40 to +85	-40 to +85
Dimensions(mm)		1.2 $\times$ 1.0 $\times$ 0.3t	1.2 $\times$ 1.0 $\times$ 0.3t	1.2 $\times$ 1.0 $\times$ 0.6t	1.2 $\times$ 1.0 $\times$ 0.6t

• Measurement temperature: 25 $^{\circ}$ C

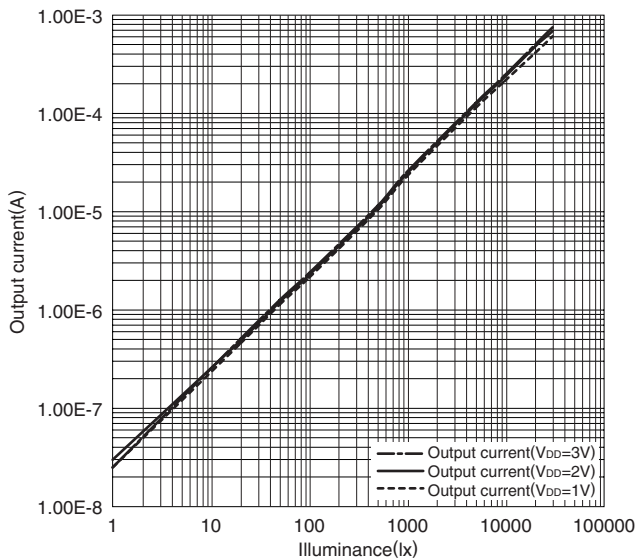
\*1 Light source for measurement is white light fluorescent lamp.(Color temperature 4200K)

\*2 Standard value

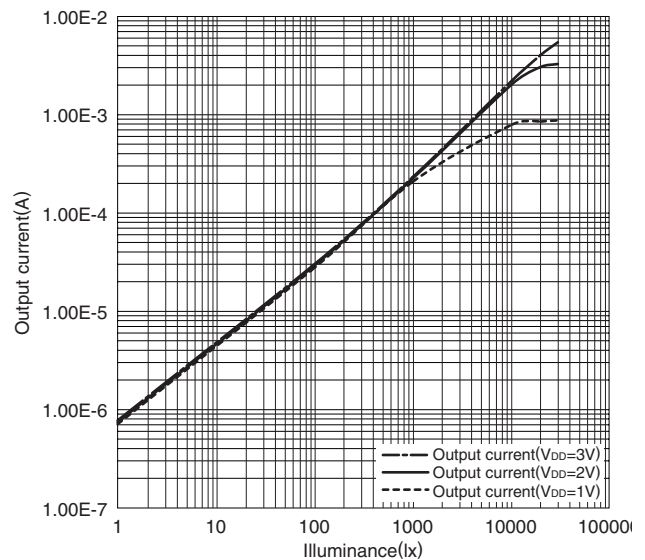
## TYPICAL ELECTRICAL CHARACTERISTICS

### OUTPUT CURRENT CHARACTERISTICS

#### BCS1210LD/BCS1210LE

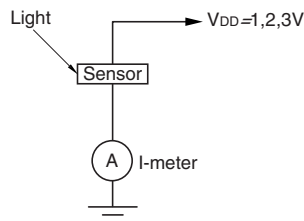


#### BCS1210HD/BCS1210HE



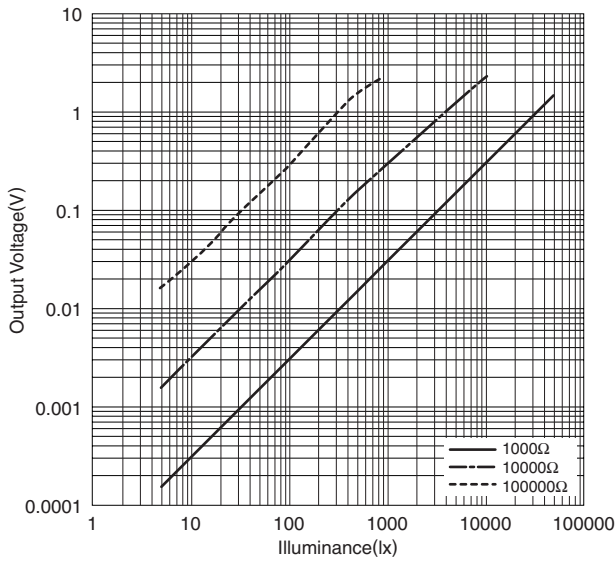
### TEST CIRCUIT

Measurement temperature: 25 $^{\circ}$ C

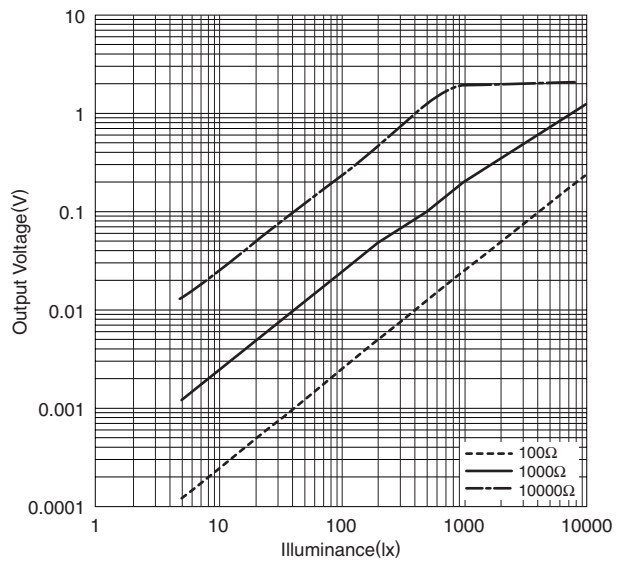


### OUTPUT VOLTAGE CHARACTERISTICS

#### BCS1210LD/BCS1210LE

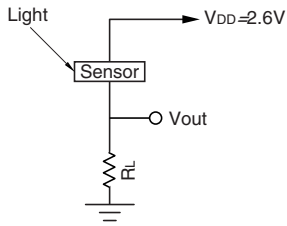


#### BCS1210HD/BCS1210HE

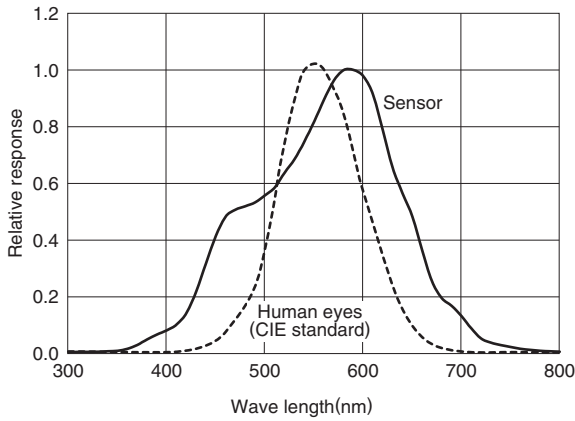


### TEST CIRCUIT

Measurement temperature: 25°C

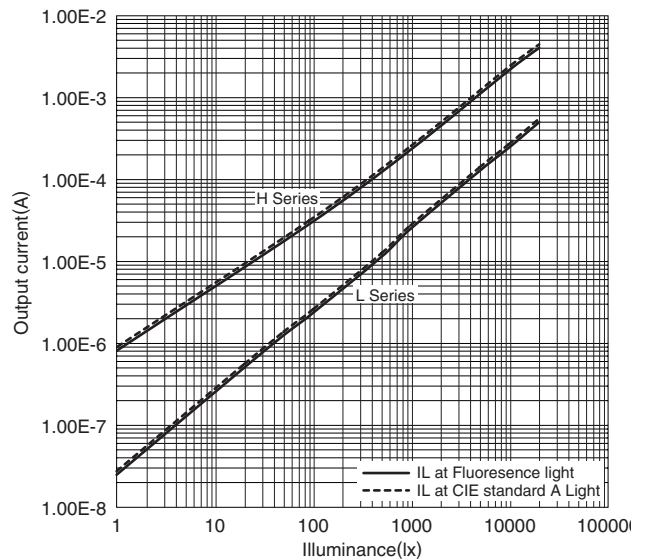


### SENSITIVITY WAVELENGTH



### LIGHT CURRENT RATION

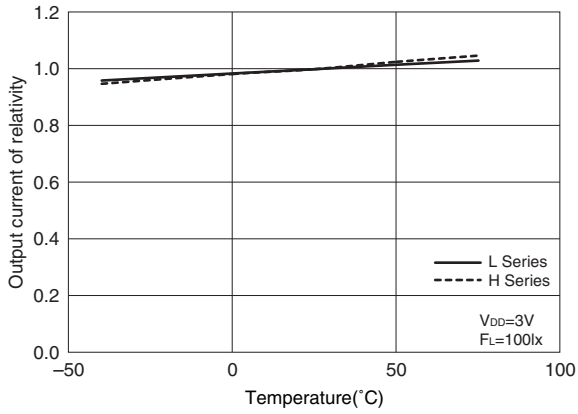
(IL at CIE standard A Light)/(IL at Fluorescence light)



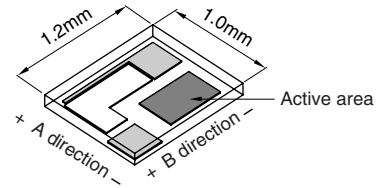
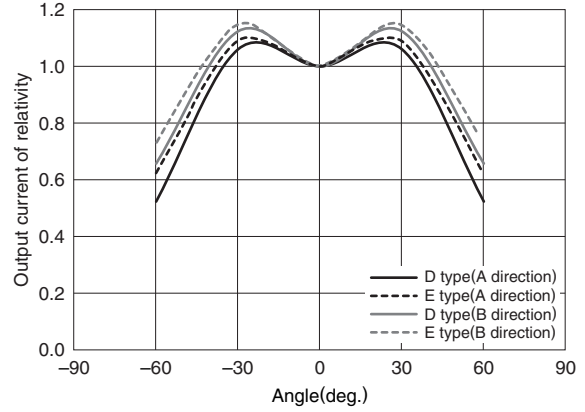
• All specifications are subject to change without notice.

### TEMPERATURE DEPENDENCE OF OUTPUT CURRENT

(V<sub>DD</sub>=3V)

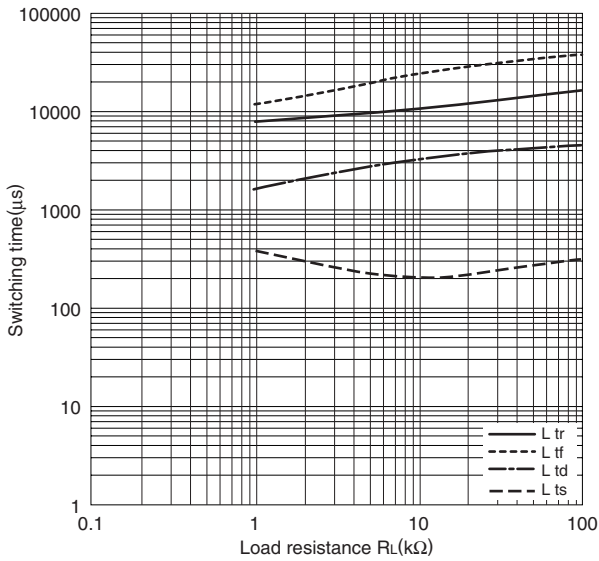


### DIRECTIVITY

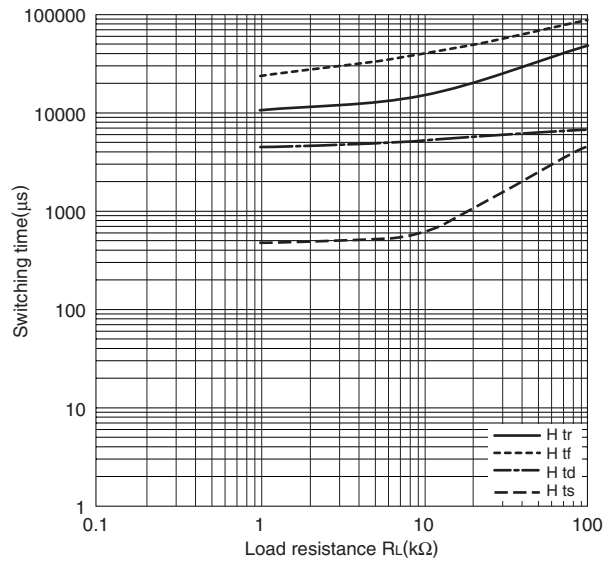


### LIGHT RESPONSE CHARACTERISTICS

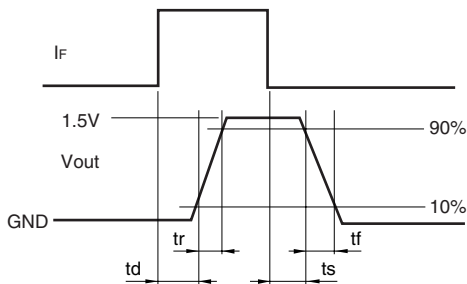
BCS1210LD/BCS1210LE



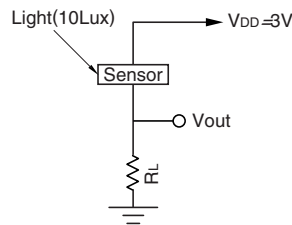
BCS1210HD/BCS1210HE



### WAVEFORM



### TEST CIRCUIT



• All specifications are subject to change without notice.