

Photo Conductive Cell (CdS)

General Description :

CdS is a kind of photosensitive semiconductor, which has the features of high delicacy, quick response and fine agreement between the spectrum character and γ value. It can work well with high stability under severe conditions such as high temperature and humidity.

Features :

- ✧ Low Cost
- ✧ Exceptional temperature stability
- ✧ Fast response time
- ✧ Excellent chopping capability

Applications :

- ✧ Automatic dimmer
- ✧ Automatic flasher
- ✧ Camera
- ✧ Counting machine
- ✧ Light controlled toys

Testing Terms And Conditions :

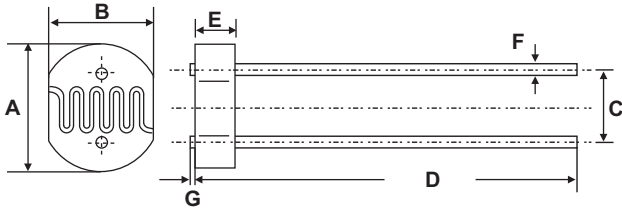
1. Photo Resistance
Exposed in 400–600 Lux, then to test with 10 Lux and 100 Lux under standard illuminance.
(Light Source : 2856K)
2. Dark Resistance
Measured after 10 sec. removal of 10 Lux
3. γ represents the standard value under both 10 Lux and 100 Lux. (± 0.1 unless otherwise stated)

$$\gamma_{10}^{100} = \frac{\text{Log}(R100) - \text{Log}(R10)}{\text{Log}(E100) - \text{Log}(E10)}$$

Where R100, R10 are cell resistance at 100 Lux and 10 Lux respectively

E100, E10 are illumination at 100 Lux and 10 Lux respectively

4. The rise time is the time required for the cell conductance to be risen to 63% of the saturated level.
The requirement for cell conductance of decay from the saturated level to 37%



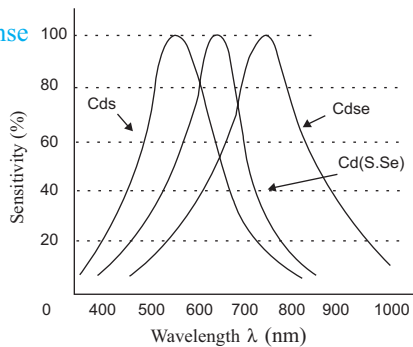
Series	A	B	C	D	E	F	G
GB 44 series ϕ 4	4.3 \pm 0.1	3.6 \pm 0.1	2.5 \pm 0.05	36 \pm 2	1.8 \pm 0.1	0.4 \pm 0.05	0.2 \pm 0.05
GB 55 series ϕ 5	5.1 \pm 0.2	4.3 \pm 0.2	3.4 \pm 0.1	36 \pm 2	1.8 \pm 0.1	0.5 \pm 0.05	0.2 \pm 0.1
GB 77 series ϕ 7	7.1 \pm 0.2	5.8 \pm 0.2	5 \pm 0.1	36 \pm 2	1.8 \pm 1.5	0.5 \pm 0.05	0.2 \pm 0.1

(Unit: mm)

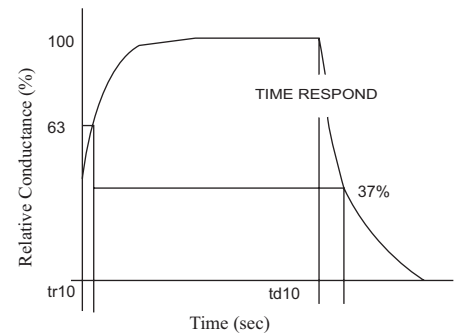
Dimensions and Specifications

Type	Max. Rating			Features						
	Applied Voltage (VDC)	Allowable Power Dissipation (mw)	Ambient Temp. ($^{\circ}$ C)	Peak Response Wavelength (nm)	Light Cell Resistance At 10 Lux (K Ω)		Dark Cell Resistance (M Ω)	$\gamma_{100/10}$	Response Time (ms)	
					Min	Max			Rise	Fall
GB-CD5506	100	90	-30 ~ +70	540	4 - 6	\leq 1	0.2	0.6	30	40
GB-CD5516	100	90	-30 ~ +70	540	5 - 10	1 - 2	0.5	0.6	30	40
GB-CD5527	100	100	-30 ~ +70	540	10 - 20	2 - 4	1.0	0.7	20	30
GB-CD5537	100	100	-30 ~ +70	540	20 - 30	4 - 6	2.0	0.7	20	30
GB-CD5547	100	100	-30 ~ +70	540	30 - 50	6 - 10	5.0	0.7	20	30
GB-CD5548	100	100	-30 ~ +70	540	50 - 100	10 - 20	10	0.8	20	30
GB-CD5558	100	100	-30 ~ +70	540	100-200	20 - 35	20	0.8	20	30
GB-CD4406	100	90	-30 ~ +70	560	4 - 6	\leq 1	0.5	0.6	30	40
GB-CD4416	100	90	-30 ~ +70	560	5 - 10	1 - 2	1.0	0.6	30	40
GB-CD4427	100	100	-30 ~ +70	560	10 - 20	2 - 4	2.0	0.7	30	30
GB-CD4437	100	100	-30 ~ +70	560	20 - 30	4 - 6	5.0	0.7	20	30
GB-CD4447	100	100	-30 ~ +70	560	30 - 50	6 - 10	10	0.8	20	30
GB-CD4448	100	100	-30 ~ +70	560	50 - 100	10 - 20	20	0.8	20	30
GB-CD4458	100	100	-30 ~ +70	560	100-200	20 - 35	20	0.8	20	30

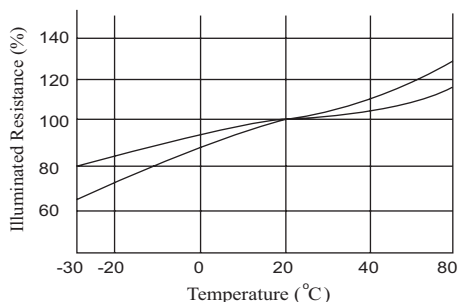
Graph 1. Spectral Response Character



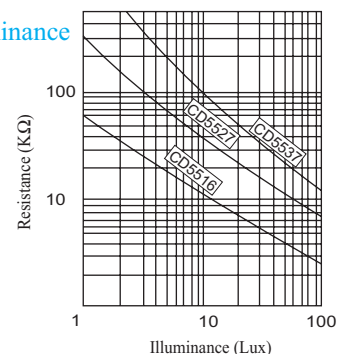
Graph 2. Response Time



Graph 3. Character of Temperature



Graph 4. Resistance — illuminance Character



LITEON

NPN 1-1/4 STANDARD 5 ϕ PHOTOTRANSISTOR

LTR-3208/3208E

Bob Ger

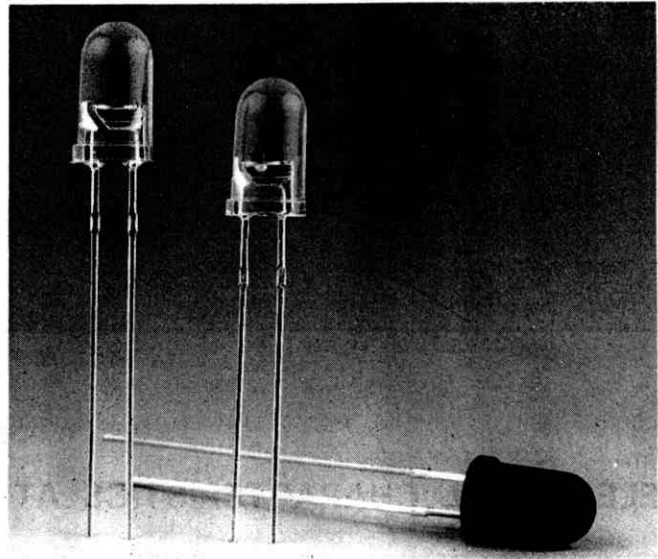
FEATURES

- WIDE RANGE OF COLLECTOR CURRENTS.
- LENSED FOR HIGH SENSITIVITY.
- LOW COST PLASTIC PACKAGE.

DESCRIPTION

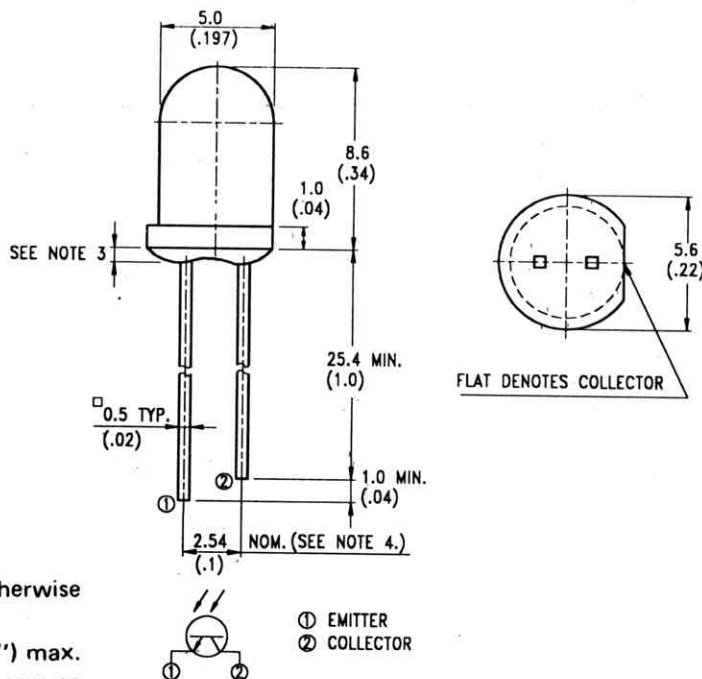
The LTR-3208 series consist of a NPN silicon phototransistor mounted in a lensed, clear plastic, end looking package. The lensing effect of the package allows an acceptance half angle of 10° measured from the optical axis to the half power point. This series is mechanically and spectrally matched to the LTE-4208 series of infrared emitting diodes.

The LTR-3208E is a special dark plastic package that cut the visible light and suitable for the detectors of infrared applications.



INFRARED PRODUCTS

PACKAGE DIMENSIONS



NOTES:

1. All dimensions are in millimeters (inches).
2. Tolerance is $\pm 0.25\text{mm}$ (.010") unless otherwise noted.
3. Protruded resin under flange is 1.5mm (.059") max.
4. Lead spacing is measured where the leads emerge from the package.
5. Specifications are subject to change without notice.

ABSOLUTE MAXIMUM RATINGS AT T_A = 25 °C

PARAMETER	MAXIMUM RATING	UNIT
Power Dissipation	100	mW
Collector-Emitter Voltage	30	V
Emitter-Collector Voltage	5	V
Operating Temperature Range	-55 °C to + 100 °C	
Storage Temperature Range	-55 °C to + 100 °C	
Lead Soldering Temperature [1.6mm (0.063in) From Body]	260 °C for 5.Seconds	

ELECTRICAL CHARACTERISTICS AT T_A = 25 °C

PARAMETER	SYMBOL	PART NO LTR—	MIN	TYP	MAX	UNIT	TEST CONDITION
Collector-Emitter Breakdown Voltage	V _{(BR) CEO}		30			V	I _C = 1 mA E _e = 0 mW/cm ²
Emitter-Collector Breakdown Voltage	V _{(BR) ECO}		5			V	I _E = 100 μA E _e = 0 mW/cm ²
Collector Emitter Saturation Voltage	V _{CE (SAT)}				0.4	V	I _C = 0.5 mA E _e = 0.5 mW/cm ²
Rise Time	T _r			10		μS	V _{CC} = 30 V I _C = 800 μA R _L = 1 kΩ
Fall Time	T _f			5		μS	
Collector Dark Current	I _{CEO}				100	nA	V _{CE} = 10 V E _e = 0 mW/cm ²
On State Collector Current	I _{C (ON)}	3208	1	4		mA	V _{CE} = 5 V E _e = 1 mW/cm ²
		3208E	1	2		mA	λ = 940 nm

Features

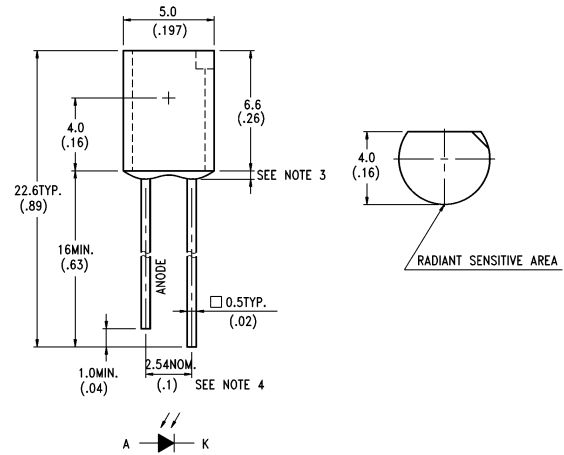
- High photo sensitivity.
- Suitable for infrared radiation.
- Low junction capacitance.
- High cut-off frequency.
- Fast switching time.

Description

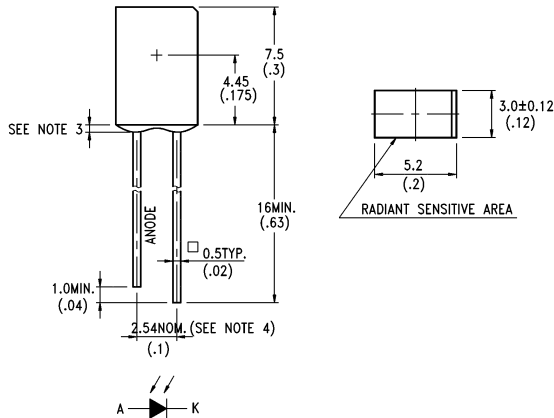
The LTR-516AD/LTR-526AD/LTR-536AD/LTR-546AD are special dark plastic package that cut the visible light and suitable for the detectors of infrared applications.

Package Dimensions

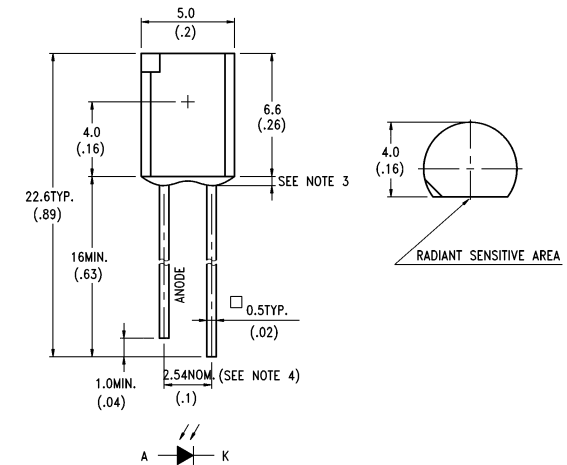
LTR-516AD



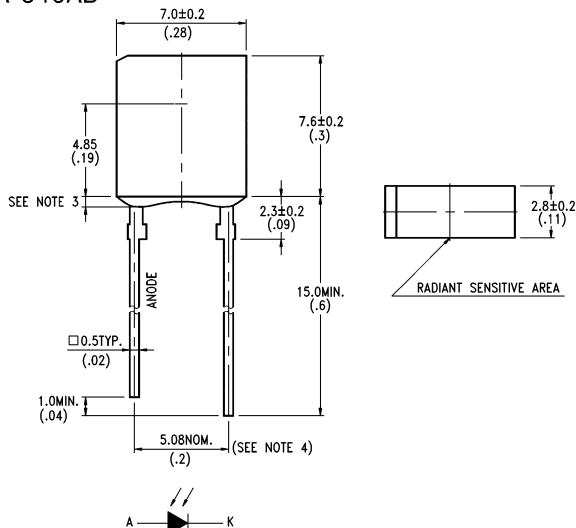
LTR-536AD



LTR-526AD



LTR-546AD



Notes:

1. All dimensions are in millimeters (inches).
2. Tolerance is ± 0.25 mm (.010") unless otherwise noted.
3. Protruded resin under flange is 1.5mm (.059") max.
4. Lead spacing is measured where the leads emerge from the package.
5. Specifications are subject to change without notice.

Absolute Maximum Ratings at Ta=25 °C

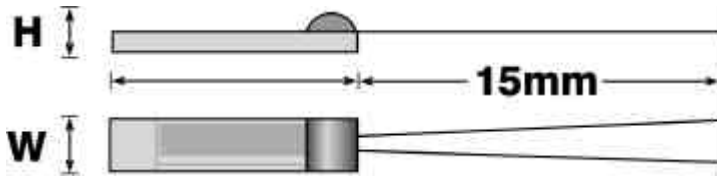
Parameter	Maximum Rating	Unit
Power Dissipation	150	mW
Reverse Break Down Voltage	30	V
Operating Temperature Range	-55 °C to + 100 °C	
Storage Temperature Range	-55 °C to + 100 °C	
Lead Soldering Temperature [1.6mm (.063 in.) from body]	260 °C for 5 Seconds	

Electrical Optical Characteristics at Ta=25 °C

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Condition
Reverse Break Down Voltage	V _{(BR)R}	30			V	I _R =100 μ A E _e =0mW/cm ²
Reverse Dark Current	I _{D(R)}			30	nA	V _R =10V E _e =0mW/cm ²
Open Circuit Voltage	V _{OC}		350		mV	λ =940nm E _e =0.5mW/cm ²
Rise Time	T _r		50		nsec	V _R =10V λ =940nm R _L =1K Ω
Fall Time	T _f		50		nsec	
Light Current	I _S	1.7	2		μ A	V _R =5V λ =940nm E _e =0.1mW/cm ²
Total Capacitance	C _T		25		pF	R=3V V _F =1MHZ E _e =0mW/cm ²
Wavelength of the Max Sensitivity	λ SMAX		950		nm	

Sensor Scientific, inc.

PLATINUM THIN FILM RTD ELEMENTS



- AVAILABLE IN 100, 500, 1000, AND 2000 OHM RESISTANCE VALUES
- STANDARD IEC 751, ASTM E1137 & NON-STANDARD TOLERANCES AVAILABLE
- WIDE CHOICE OF SIZES
- 2, 3, AND 4 WIRE EXTENSION LEADS AVAILABLE
- CUSTOM-ENGINEERED TEMPERATURE PROBE ASSEMBLIES

Sensor Scientific, Inc. Platinum Thin Film RTD Elements are fabricated using state-of-the-art thin film processing techniques, resulting in an element of exceptional quality and stability. The wide choice of resistance, tolerance, and size options allows for complete design flexibility.

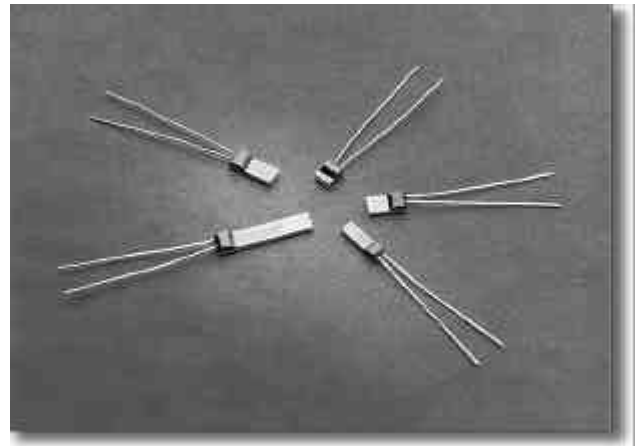
RTD elements are available with extension leads, and incorporated in complete temperature probe assemblies. Please contact Sensor Scientific for additional information.

Assemblies:

Generally, thin film RTD elements are incorporated into some type of assembly for protection. Extension leads may be attached via soldering, crimping, brazing or welding. The attachment method must be capable of withstanding the intended maximum operating temperature.

The following precautions must be taken when incorporating the element into an assembly:

- 1) Avoid straining the element leads.
- 2) If extension leads are attached via soldering or brazing, all flux residue must be removed.
- 3) The resistance of extension leads must be taken into consideration. Resistance value at 0°C calibrated 1mm from end of lead wire.
- 4) If elements are encapsulated in a potting compound, insure that the compound will not induce pressure loads, resulting in a strain-gage effect.



Resistance at 0 Deg. C. ohms	L Length mm	W Width mm	H Height mm	Part Number
100	5.0 +/- 0.2	1.0 +/- 0.2	1.3 +/- 0.2	P01 ●●● 1
100	5.0 +/- 0.2	1.5 +/- 0.2	1.3 +/- 0.2	P01 ●●● 2
100	2.3 +/- 0.2	2.0 +/- 0.2	1.3 +/- 0.2	P01 ●●● 3
100	5.0 +/- 0.2	2.0 +/- 0.2	1.3 +/- 0.2	P01 ●●● 4
100	10.0 +/- 0.2	2.0 +/- 0.2	1.3 +/- 0.2	P01 ●●● 5
100	5.0 +/- 0.2	4.0 +/- 0.2	1.3 +/- 0.2	P01 ●●● 6
100	1.6 +/- 0.15	1.25 +/- 0.1	1.00 +/- 0.2	P01 ●●● M7
500	5.0 +/- 0.2	2.0 +/- 0.2	1.3 +/- 0.2	P05 ●●● 1
500	10.0 +/- 0.2	2.0 +/- 0.2	1.3 +/- 0.2	P05 ●●● 2
500	5.0 +/- 0.2	4.0 +/- 0.2	1.3 +/- 0.2	P05 ●●● 3
1000	4.0 +/- 0.2	2.0 +/- 0.2	1.3 +/- 0.2	P10 ●●● 1
1000	10.0 +/- 0.2	2.0 +/- 0.2	1.3 +/- 0.2	P10 ●●● 2
1000	5.0 +/- 0.2	4.0 +/- 0.2	1.3 +/- 0.2	P10 ●●● 3
1000	1.6 +/- 0.15	1.25 +/- 0.1	1.00 +/- 0.2	P10 ●●● M4
2000	10.0 +/- 0.2	2.0 +/- 0.2	1.3 +/- 0.2	P20 ●●● 4

Resistance value at 0°C calibrated 1mm from end of lead wire. DIN = IEC751



- Tolerance

- 01 = 1/10 DIN B at 0°C
- 02 = 1/5 DIN B at 0°C
- 03 = 1/4 DIN B at 0°C
- 04 = 1/3 DIN B at 0°C
- 0A = 1/2 DIN B (DIN A) at 0°C

- 0B = DIN B
- 05 = ASTM B
- 06 = 3/2 DIN B at 0°C
- 07 = 2 DIN B at 0°C
- 08 = 5 DIN B at 0°C
- 09 = 10 DIN B at 0°C



- Temperature Range

- L = -50 to + 400 Deg C
- M = -50 to + 550 Deg C
- H = -50 to + 600 Deg C

Call us toll-free at 800-524-1610 (in the US) — or check us out on the web at www.sensorsci.com

6 Kings Bridge Road - Fairfield, New Jersey 07004 • sales@sensorsci.com • Phone: (973) 227-7790 - Fax: (973) 227-8063

Reference Table For Pt RTD Elements

°C	Ω	°C	Ω	°C	Ω
-200	18.52	+160	161.05	+510	284.30
-190	22.83	+170	164.77	+520	287.62
-180	27.10	+180	168.48	+530	290.92
-170	31.34	+190	172.17	+540	294.21
-160	35.54	+200	175.86	+550	297.49
-150	39.72	+210	179.53	+560	300.75
-140	43.88	+220	183.19	+570	304.01
-130	48.00	+230	186.84	+580	307.25
-120	52.11	+240	190.47	+590	310.49
-110	56.19	+250	194.10	+600	313.71
-100	60.26	+260	197.71		
-90	64.30	+270	201.31		
-80	68.33	+280	204.90		
-70	72.33	+290	208.48		
-60	76.33	+300	212.05		
-50	80.31	+310	215.61		
-40	84.27	+320	219.15		
-30	88.22	+330	222.68		
-20	92.16	+340	226.21		
-10	96.09	+350	229.72		
0	100.00	+360	233.21		
+10	103.90	+370	236.70		
+20	107.79	+380	240.18		
+30	111.67	+390	243.64		
+40	115.54	+400	247.09		
+50	119.40	+410	250.53		
+60	123.24	+420	253.96		
+70	127.08	+430	257.38		
+80	130.90	+440	260.78		
+90	134.71	+450	264.18		
+100	138.51	+460	267.56		
+110	142.29	+470	270.93		
+120	146.07	+480	274.29		
+130	149.83	+490	277.64		
+140	153.58	+500	280.98		

Reference
Tables are
available in
5°C and 1°C
increments
upon request

The permissible deviations for platinum resistance elements are determined by the following equations (in accordance with IEC 751,2: 1995-07 [DIN EN 60751: 1996-07]):

Permissible deviation in °C = ±(0.15 + 0.002 [t]) for Class A
Permissible deviation in °C = ±(0.3 + 0.005 [t]) for Class B

Where [t] is the temperature value (in °C)

Deviations in °C apply to all nominal resistances; deviations in Ω only to 100 Ω.

For nominal resistance values other than 100 Ω the deviation values in Ω must be multiplied by the factor R₀ X 10⁻².

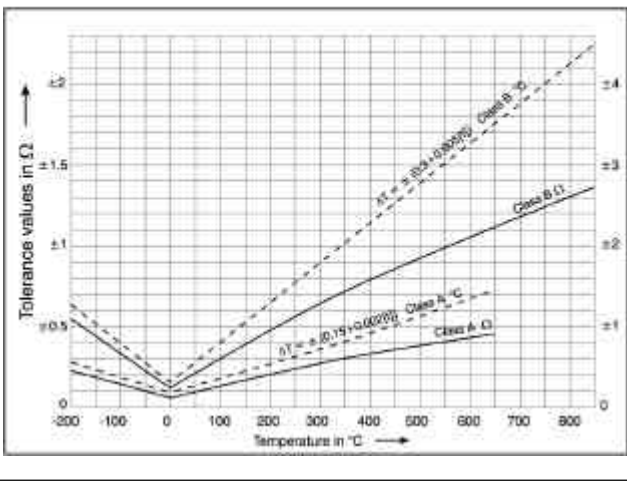
Other tolerances are available

Tolerance				
temp °C	Class A		Class B	
	Ω	°C	Ω	°C
-200	±0.24	±0.55	±0.56	±1.3
-100	±0.14	±0.35	±0.32	±0.8
0	±0.06	±0.15	±0.12	±0.3
100	±0.13	±0.35	±0.30	±0.8
200	±0.20	±0.55	±0.48	±1.3
300	±0.27	±0.75	±0.64	±1.8
400	±0.33	±0.95	±0.79	±2.3
500	±0.38	±1.15	±0.93	±2.8
600	±0.43	±1.35	±1.06	±3.3
650	±0.46	±1.45	±1.13	±3.6
700	-	-	±1.17	±3.8
800	-	-	±1.28	±4.3
850	-	-	±1.34	±4.6

Nominal Resistance: 100 ohms @ 0°C

For Nominal resistance values other than 100 Ω @ °C resistance values from the table are corrected using the equation R₀ X 10² where R₀ = nominal resistance at 0°C.

- Mean temperature coefficient between 0 and 100°C = 3.85 x 10⁻³ x K⁻¹ (in accordance with IEC 751,2:1995-07 [DIN EN 60751:1996-07])
- Calculation of Resistance values:
Equations acc. to IEC 751,2: 1995-07 (DIN EN 60751: 1996-07)
Temperature range from -200 to 0°C:
R_t + R₀ (1 + A† + B†² + C(† - 100°C) †³)
Temperature range from 0 to +850°C:
R_t + R₀ (1 + A† + B†²)
Where: A = 3.9083 x 10⁻³ °C⁻¹; B = -5.775 x 10⁻⁷ °C⁻²; C = -4.183 x 10⁻¹² °C⁻⁴
R_t is the resistance in Ω at temperature †
† is the temperature in °C
- Resistance values from -200 to -250°C were obtained by our own fixed point measurement



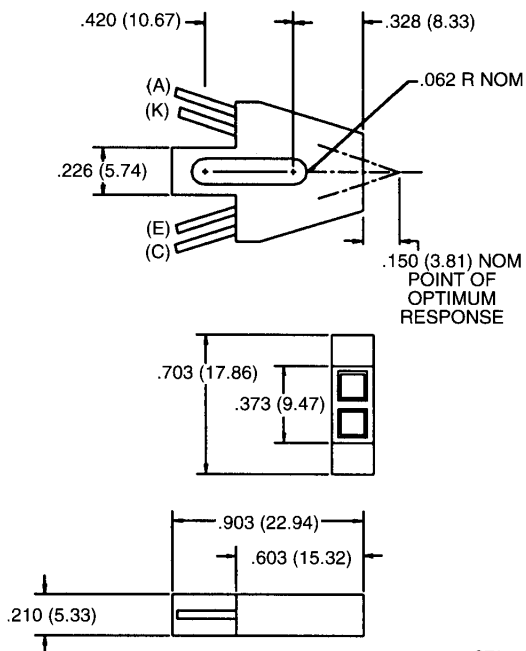
Part Number	Response time in seconds				Self-heating			
	Water v=0.2 m/s flow		Air 1 m/s flow		Coefficient mW/K		Current (mA) required to self heat 0.1K at 20°C	
	T 0.5	T 0.9	T 0.5	T 0.9	water 0.2 m/s flow	air 1 m/s flow	water 0.2 m/s flow	air 1 m/s flow
PO1 ●●● 1	0.05	0.2	4	10	40	4	6	2
PO1 ●●● 2	0.07	0.3	6	20	40	6	6	2
PO1 ●●● 3	0.05	0.2	4	10	40	4	6	2
PO1 ●●● 4	0.07	0.3	6	20	40	6	6	2
PO1 ●●● 5	0.07	0.3	6	20	89	6	10	2
PO1 ●●● 6	0.11	0.3	6	20	89	6	10	2
PO5 ●●● 1	0.07	0.3	6	20	35	6	3	1
PO5 ●●● 2	0.07	0.3	6	20	110	6	4	1
PO5 ●●● 3	0.11	0.3	6	20	100	6	4	1
P10 ●●● 1	0.07	0.3	6	20	35	6	2	1
P10 ●●● 2	0.07	0.3	6	20	110	6	3	1
P10 ●●● 3	0.11	0.3	6	20	100	6	3	1



REFLECTIVE OBJECT SENSORS

QRB1113/1114

PACKAGE DIMENSIONS



DESCRIPTION

The QRB1113/1114 consists of an infrared emitting diode and an NPN silicon phototransistor mounted side by side on a converging optical axis in a black plastic housing. The phototransistor responds to radiation from the emitting diode only when a reflective object passes within its field of view. The area of the optimum response approximates a circle .200" in diameter.

FEATURES

- Phototransistor output
- High Sensitivity
- Low cost plastic housing
- IR transparent plastic covers for dust protection.

ST2179

FUNCTION

- (C) COLLECTOR
- (E) EMITTER
- (K) CATHODE
- (A) ANODE

NOTES:

1. DIMENSIONS ARE IN INCHES (mm).
2. TOLERANCE IS $\pm .010"$ (.25) UNLESS OTHERWISE SPECIFIED.



REFLECTIVE OBJECT SENSORS

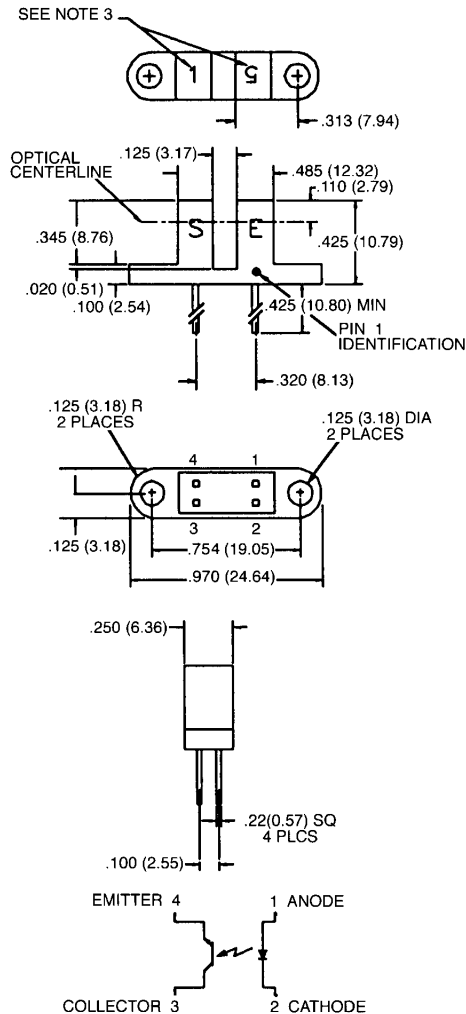
ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ Unless Otherwise Specified)	
Storage Temperature	-40°C to + 85°C
Operating Temperature	-40°C to + 85°C
Soldering:	
Lead Temperature (Iron)	240°C for 5 sec. ^(2,3,4)
Lead Temperature (Flow)	260°C for 10 sec. ^(2,3)
INPUT DIODE	
Continuous Forward Current	50 mA
Reverse Voltage	5.0 Volts
Power Dissipation	100 mW ⁽¹⁾
OUTPUT TRANSISTOR	
Collector-Emitter Voltage	30 Volts
Emitter-Collector Voltage	5.0 Volts
Collector Current	40 mA
Power Dissipation	100 mW ⁽¹⁾

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ Unless Otherwise Specified)						
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNITS	TEST CONDITIONS
INPUT DIODE						
Forward Voltage	V_f	—		1.70	V	$I_f = 40\text{ mA}$
Reverse Leakage Current	I_r	—		100	μA	$V_R = 2.0\text{ V}$
OUTPUT TRANSISTOR						
Emitter-Collector Breakdown	BV_{ECO}	5		—	V	$I_E = 100\mu\text{A}$, $E_e = 0$
Collector-Emitter Breakdown	BV_{CEO}	30		—	V	$I_C = 1.0\text{ mA}$, $E_e = 0$
Collector-Emitter Leakage	I_{CEO}	—		100	nA	$V_{CE} = 10.0\text{ V}$, $E_e = 0$
COUPLED						
On-State Collector Current						
QRB1113	$I_{C(ON)}$	0.20		—	mA	$I_f = 40\text{ mA}$, $V_{CE} = 5\text{ V}$, $D = .150''$ ^(5,6)
QRB1114	$I_{C(ON)}$	0.60		3.00	mA	$I_f = 40\text{ mA}$, $V_{CE} = 5\text{ V}$, $D = .150''$ ^(5,6)
Crosstalk	I_{CX}	—		1.00	μA	$I_f = 40\text{ mA}$, $V_{CE} = 5\text{ V}$ ⁽⁷⁾
Saturation Voltage	$V_{CE(SAT)}$	—		.4	V	$I_f = 40\text{ mA}$, $I_C = 0.1\text{ mA}$, $D = .150''$ ^(5,6)

NOTES
1. Derate power dissipation linearly 1.67 mW/°C above 25°C.
2. RMA flux is recommended.
3. Methanol or Isopropyl alcohols are recommended as cleaning agents.
4. Soldering iron 1/8" (1.6mm) from housing
5. D is the distance from the assembly face to the reflective surface.
6. Measured using Eastman Kodak neutral test card with 90% diffused reflecting surface.
7. Cross talk is the photocurrent measured with current to the input diode and no reflecting surface.

OPB860T11/OPB860T51/OPB860T55

PACKAGE DIMENSIONS



DESCRIPTION

The OPB860T series of switches is designed to allow the user maximum flexibility in applications. Each switch consists of an infrared emitting diode facing an NPN phototransistor across a .125" (3.18mm) gap. A unique housing design provides a smooth external surface to prevent dust build-up while molded internal apertures give precise positioning and also provide protection from ambient light interference.

FEATURES

- Fully enclosed design allows dust protection.
- Lead spacing at .320".
- .050" and .010" aperture options.
- PCB mountable.

ST1782
NOTES:
1. DIMENSIONS ARE IN INCHES (mm).
2. TOLERANCE IS ±.010 (.25) UNLESS OTHERWISE SPECIFIED.
3. NUMBER INDICATES APERTURE SIZE. (5=.050", 1=.010")

APERTURE OPTIONS:

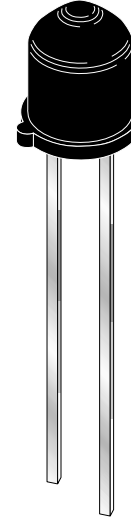
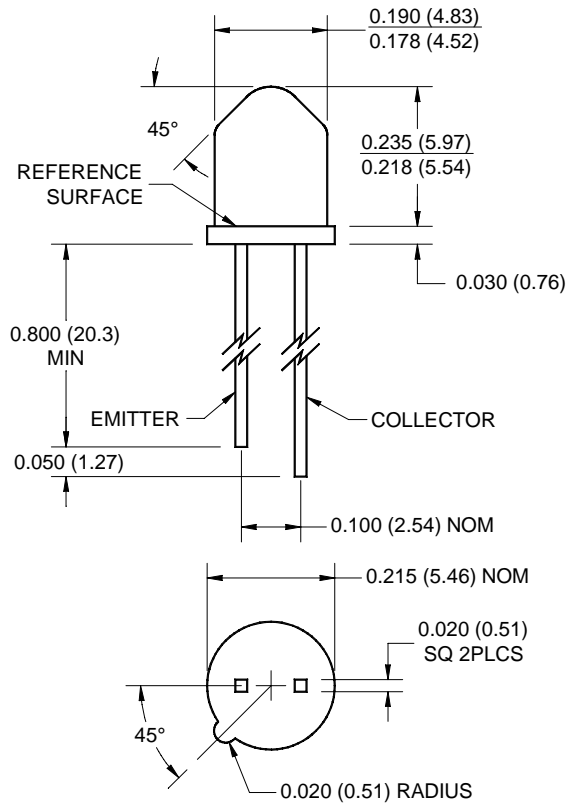
	LED	PHOTOTRANSISTOR
OP8860T11	.010	.010
OP8860T51	.050	.010
OP8860T55	.050	.050

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ Unless Otherwise Specified)	
Storage Temperature	-40°C to $+85^\circ\text{C}$
Operating Temperature	-40°C to $+85^\circ\text{C}$
Soldering:	
Lead Temperature (Iron)	240°C for 5 sec. ^(2,3,4)
Lead Temperature (Flow)	260°C for 10 sec. ^(2,3)
INPUT DIODE	
Continuous Forward Current	50 mA
Reverse Voltage	5.0 Volts
Power Dissipation	100 mW ⁽¹⁾
OUTPUT TRANSISTOR	
Collector-Emitter Voltage	30.0 Volts
Emitter-Collector Voltage	5.0 Volts
Power Dissipation	100 mW ⁽¹⁾

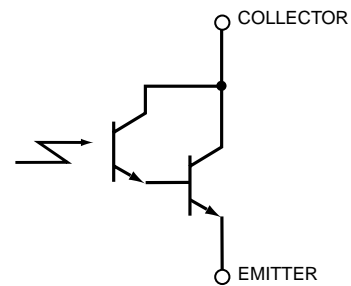
ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ Unless Otherwise Specified)						
PARAMETER	SYMBOL	MIN.	MAX.	UNITS	TEST CONDITIONS	
INPUT DIODE						
Forward Voltage	V_F	—	1.70	V	$I_F = 20\text{ mA}$	
Reverse Leakage Current	I_R	—	100	μA	$V_R = 2.0\text{ V}$	
OUTPUT TRANSISTOR						
Emitter-Collector Breakdown	BV_{ECO}	5	—	V	$I_E = 100\ \mu\text{A}$, $E_e = 0$	
Collector-Emitter Breakdown	BV_{CEO}	30	—	V	$I_C = 1.0\text{ mA}$, $E_e = 0$	
Collector-Emitter Leakage	I_{CEO}	—	100	nA	$V_{\text{CE}} = 10.0\text{ V}$, $E_e = 0$	
COUPLED						
On-State Collector Current						
OPB860N11	$I_{\text{C(ON)}}$	500	—	μA	$I_F = 20\text{ mA}$, $V_{\text{CE}} = 5\text{ V}$	
OPB860N51	$I_{\text{C(ON)}}$	500	—	μA	$I_F = 20\text{ mA}$, $V_{\text{CE}} = 5\text{ V}$	
OPB860N55	$I_{\text{C(ON)}}$	500	—	μA	$I_F = 20\text{ mA}$, $V_{\text{CE}} = 5\text{ V}$	
Saturation Voltage	$V_{\text{CE(SAT)}}$	—	0.40	V	$I_F = 20\text{ mA}$, $I_C = 400\ \mu\text{A}$	

NOTES
<ol style="list-style-type: none"> Derate power dissipation linearly 1.67 mW/°C above 25°C. RMA flux is recommended. Methanol or Isopropyl alcohols are recommended as cleaning agents. Soldering iron tip 1/16" (1.6 mm) from housing.

PACKAGE DIMENSIONS



SCHEMATIC



NOTES:

1. Dimensions for all drawings are in inches (mm).
2. Tolerance of $\pm .010$ (.25) on all non-nominal dimensions unless otherwise specified.
3. Orange stripe on the flange.

DESCRIPTION

The QSD733 is a silicon photodarlington encapsulated in an infrared transparent, black TO-18 package.

FEATURES

- NPN Silicon Photodarlington
- Package Type: Plastic TO-18
- Matched Emitter: QED523
- Narrow Reception Angle, 40°
- Daylight Filter
- Package material and color: black epoxy
- High Sensitivity

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ unless otherwise specified)

Parameter	Symbol	Rating	Unit
Operating Temperature	T_{OPR}	-40 to +100	$^\circ\text{C}$
Storage Temperature	T_{STG}	-40 to +100	$^\circ\text{C}$
Soldering Temperature (Iron) ^(2,3,4)	T_{SOL-I}	240 for 5 sec	$^\circ\text{C}$
Soldering Temperature (Flow) ^(2,3)	T_{SOL-F}	260 for 10 sec	$^\circ\text{C}$
Collector-Emitter Voltage	V_{CE}	30	V
Emitter-Collector Voltage	V_{EC}	5	V
Power Dissipation ⁽¹⁾	P_D	100	mW

1. Derate power dissipation linearly 1.33 mW/ $^\circ\text{C}$ above 25 $^\circ\text{C}$.
2. RMA flux is recommended.
3. Methanol or isopropyl alcohols are recommended as cleaning agents.
4. Soldering iron 1/16" (1.6mm) minimum from housing.
5. $\lambda = 880$ nm, AlGaAs.

ELECTRICAL / OPTICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$)

PARAMETER	TEST CONDITIONS	SYMBOL	MIN	TYP	MAX	UNITS
Peak Sensitivity Wavelength		λ_{PS}	—	880	—	nm
Reception Angle		θ	—	± 20	—	Deg.
Collector-Emitter Dark Current	$V_{CE} = 10$ V, $E_e = 0$	I_{CEO}	—	—	100	nA
Collector-Emitter Breakdown	$I_C = 1$ mA	BV_{CEO}	30	—	—	V
Emitter-Collector Breakdown	$I_E = 100$ μA	BV_{ECO}	5	—	—	V
On-State Collector Current ⁽⁵⁾	$E_e = 0.125$ mW/cm ² , $V_{CE} = 5$ V	$I_{C(ON)}$	5.0	—	—	mA
Saturation Voltage ⁽⁵⁾	$E_e = 0.125$ mW/cm ² , $I_C = 2.0$ mA	$V_{CE(sat)}$	—	—	1.0	V
Rise Time	$V_{CC} = 5$ V, $R_L = 100$ Ω , $I_C = 0.15$ mA	t_r	—	20	—	μs
Fall Time		t_f	—	50	—	

Figure 1. Light Current vs. Radiant Intensity

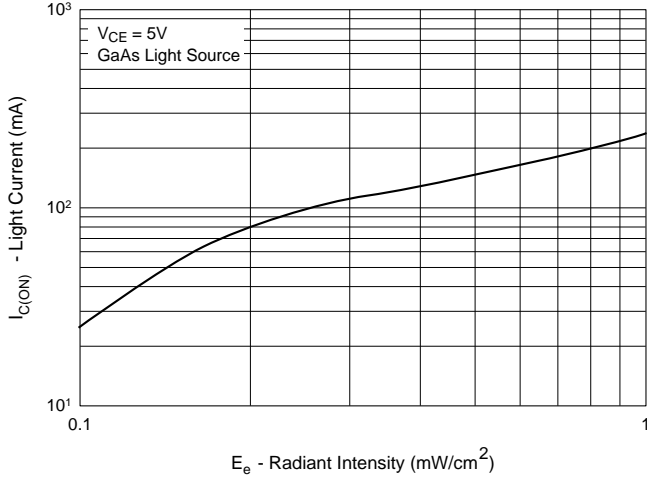


Figure 2. Angular Response Curve

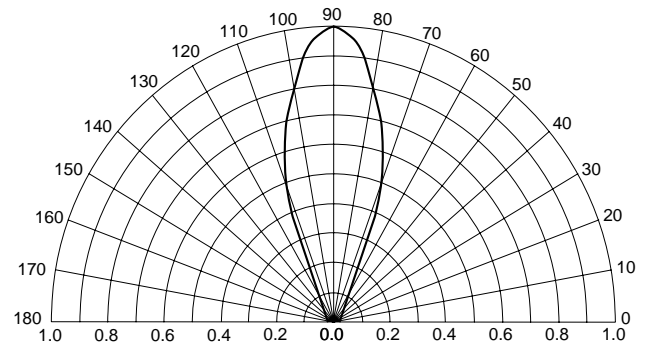


Figure 3. Dark Current vs. Collector - Emitter Voltage

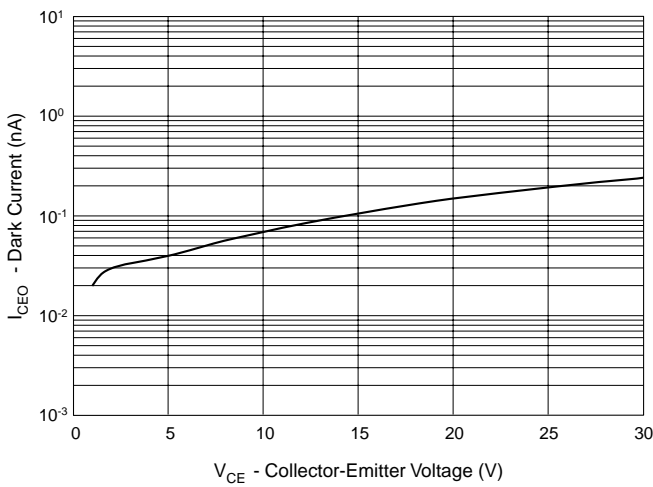


Figure 4. Light Current vs. Collector - Emitter Voltage

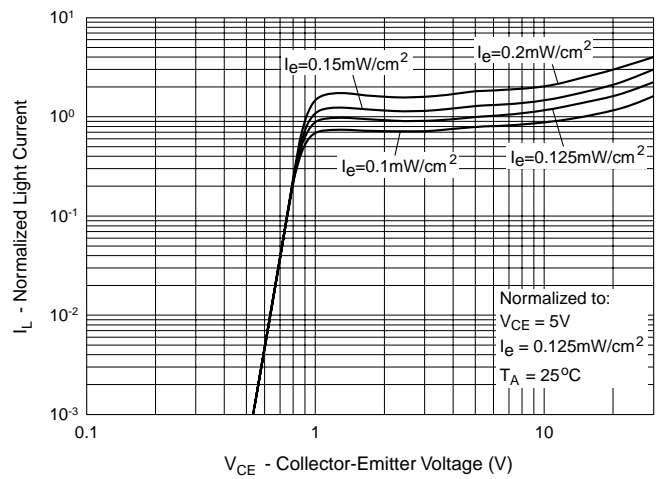


Figure 5. Dark Current vs. Ambient Temperature

