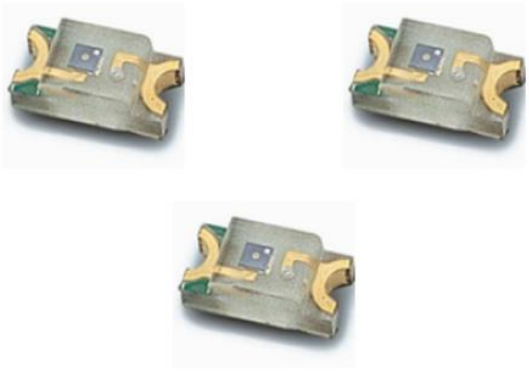
SMD1206 Type

LXD/GB3-A1DPZT
Ambient Light to near IR Phototransistor



Overview

The out put current can be converted to a voltage by connecting it in series with a resistor . The dynamic range is determined by the external resistor and power supply (10K and 5V gives a range of 0~200Lux,but can be over 1000 Lux with a 1K resistor). The internal dark current cancellation enables high accuracy over the full temperature range , even at low light levels.

It is encapsulated in a plastic package having the same shape as metal packages. The shape of photo IC diode also resembies our 5R type cds sensor(cds photoconductive cells),so photo ic diode can be used as a re placement for those cds sensor .

Features

- **Visible to near IR type.**
- **Current output highly linear vs light level**
- **Temperature stable**
- **Integrated high gain photo-current amplifier**
- **RoHS compliant , cadmium-free alternative to photocells.**

Applications

- **Street light switching**
- **Interior and exterior light control (dusk/dawn switch)**
- **Automotive headlight dimmer**
- **Contrast control**
- **Colorimeters**
- **Oil burner flame monitoring**

Absolute Maximum Ratings (Ta= 25℃)

Parameter	Symbol	Rating	Unit
Collector-Emitter Voltage	V_{CEO}	12	V
Emitter-Collector Voltage	V_{ECO}	5	V
Collector Current	I_C	20	mA
Collerctor Power Dissipation	P_C	75	mW
Operating Temperature	Topr.	-20～+65	℃
Storage Temperature	Tstg.	-30～+65	℃
Soldering temperature *1	Tsol.	260	℃

Note : *1. For MAX.5 seconds at the position of 3mm from the package

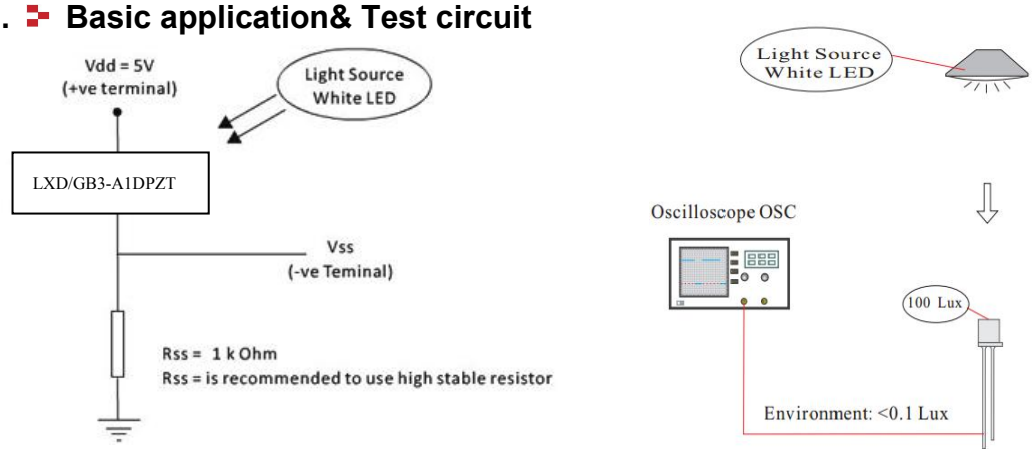
ELECTRO- OPTICAL CHARACTERISTICS

(Ta= 25℃)

Description		Symbol	Condition	Min.	Typ.	Max.	Unit
Collerct Dark Current		ICEO	VCE=10V,Ev=0Lx	-	-	1000	nA
Photo Current		IPCE	VCE=5V,EV=20lx	2	--	21	μA
Spectral sensitivity		λ	--	320-1100			nm
Peak wavelength		λp	--	-	850	-	nm
Switching Time	Rising time	tr	VCE=5V,IC=1mA, RL=1KΩ	-	15	-	μs
	Falling time	tf		-	15	-	μs
Viewing Angle		Δθ		-	±80	-	deg.
C-E Saturation Voltage		VCE(SAT)	IB=100μA,IC=15mA	-	-	1	V

*Light source White LED 6500k

. Basic application& Test circuit



Response Vs Wavelength

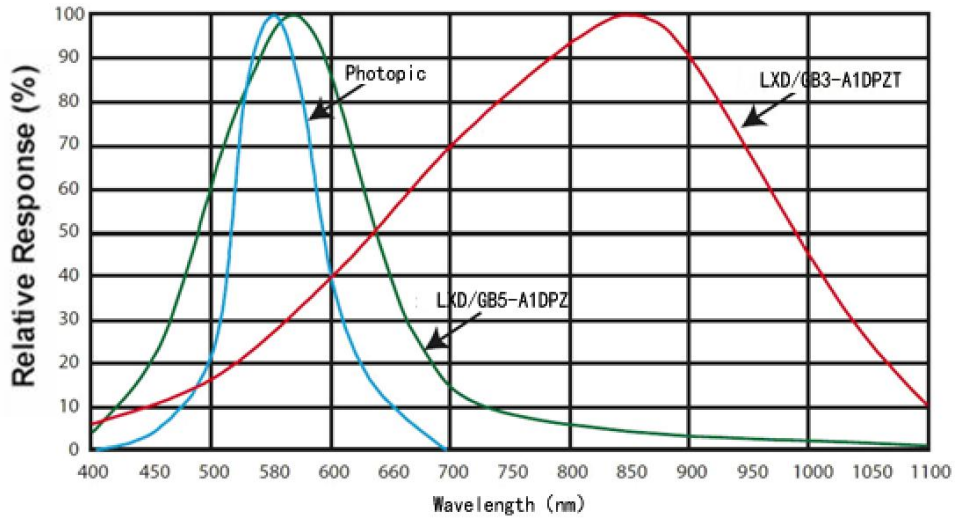
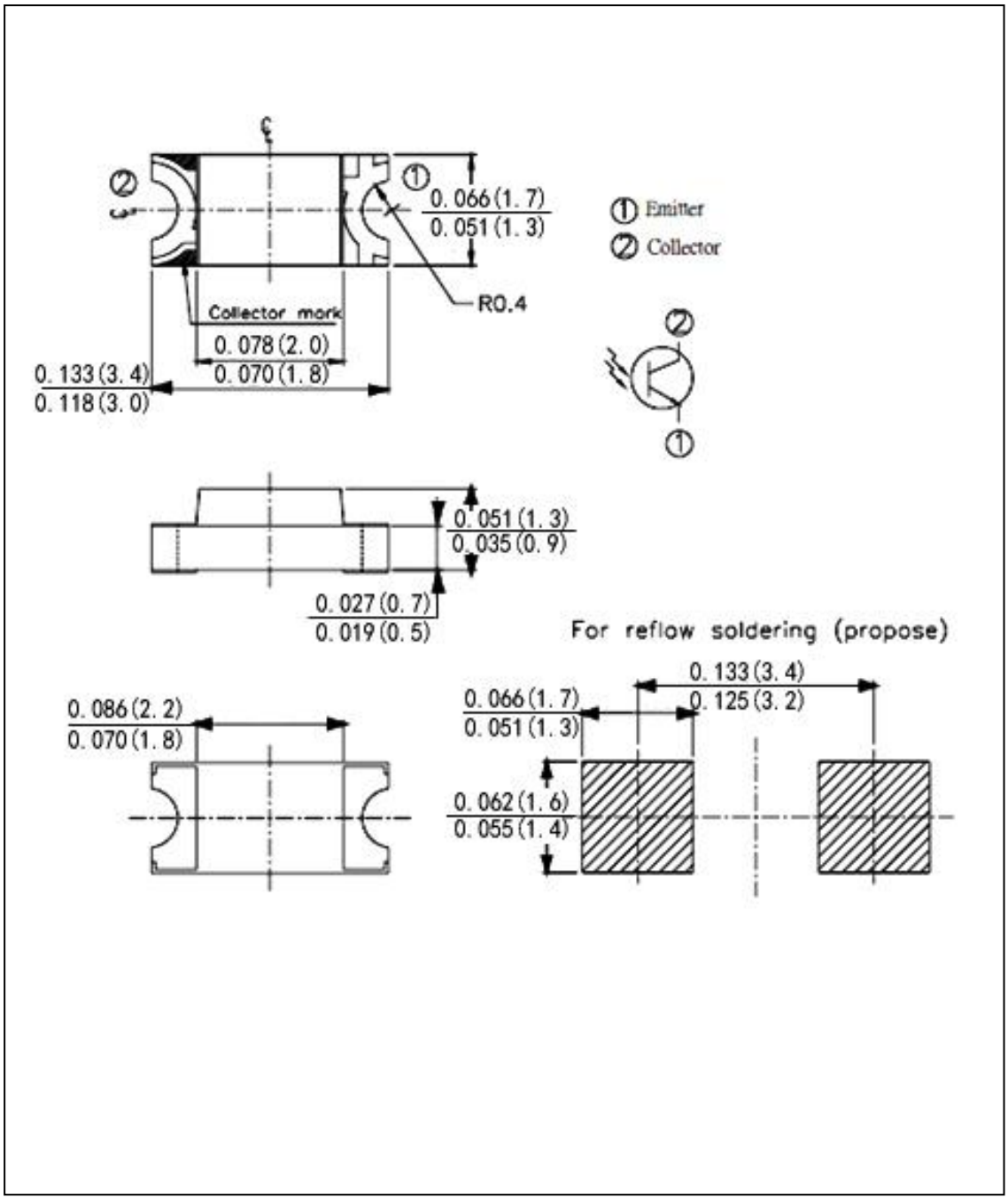


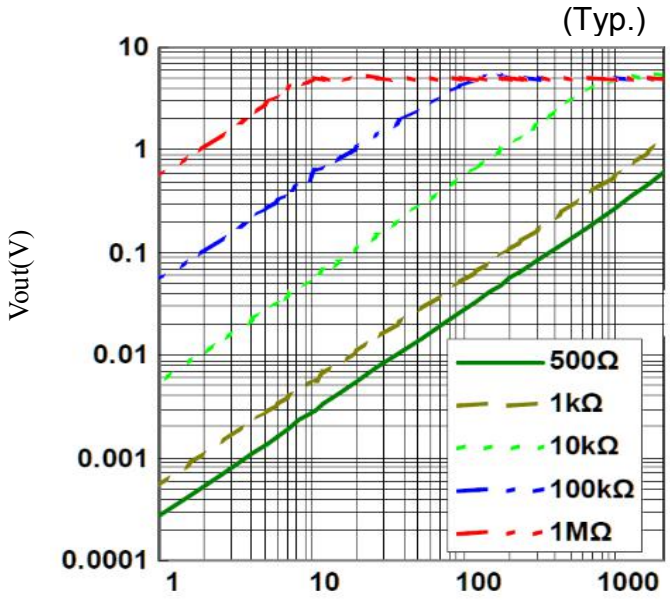
fig1-1 Photopic LXD/GB3-A1DPZT LXD/GB5-A1DPH

PACKAGE DIMENSIONS inch (mm)

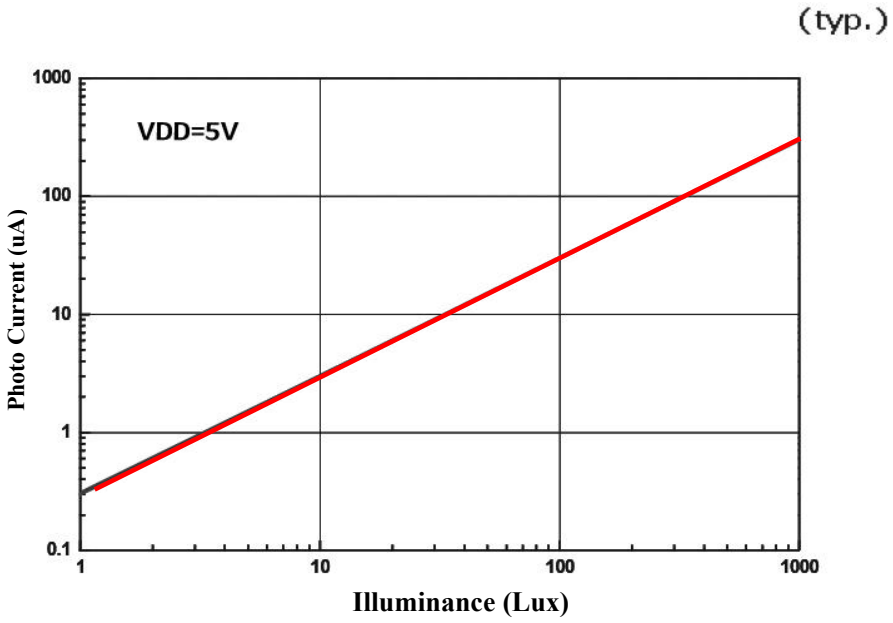


How to Selection of Rss

The LXD/GB3-A1DPZT can be used over a range of lighting conditions by selecting a suitable value of Rss (see figure 1), or by varying Vdd. Also, there is a lower gain version of this device available.



Photocurrent vs. Illuminance:



Dark Current vs. Temperature

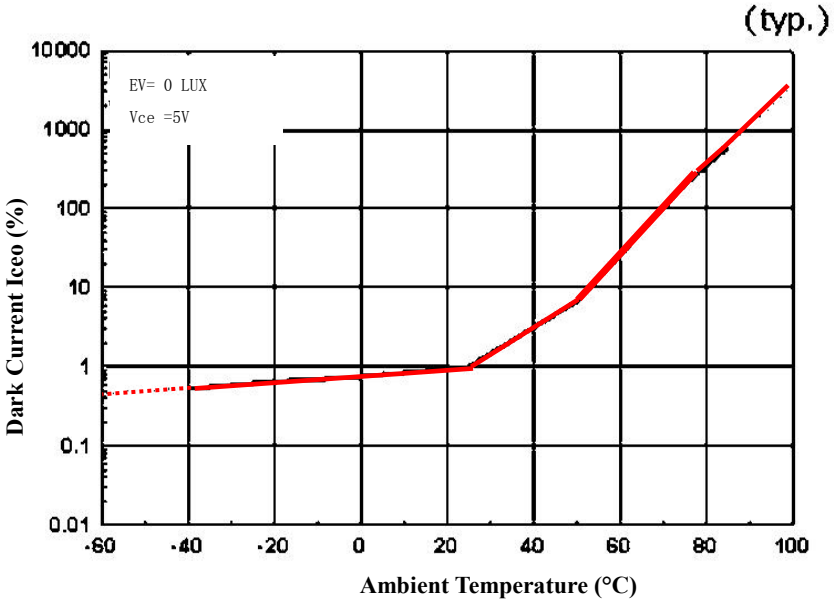
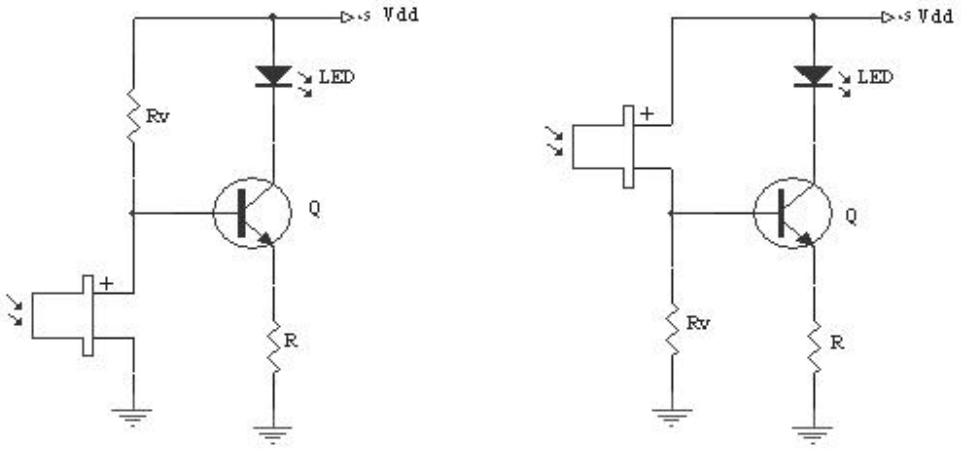


Fig.2 Two Typical Light Control Circuit of ambient light sensor:



Left chart: Shut down LED by regulating Rv, i.e. to regulate Ev to a fixed value;
Right chart: Turn on LED by regulating Rv, i.e. to regulate Ev to a fixed value.

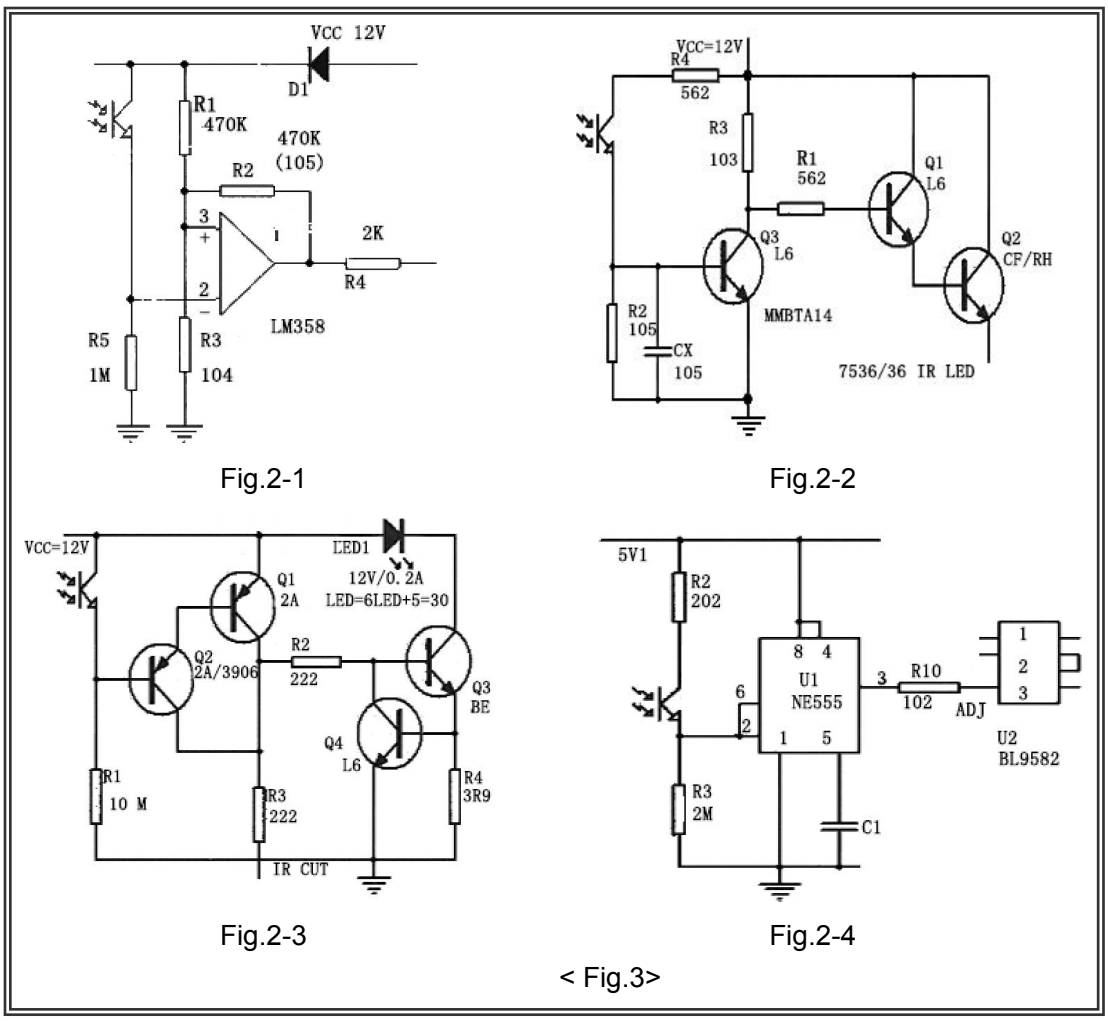
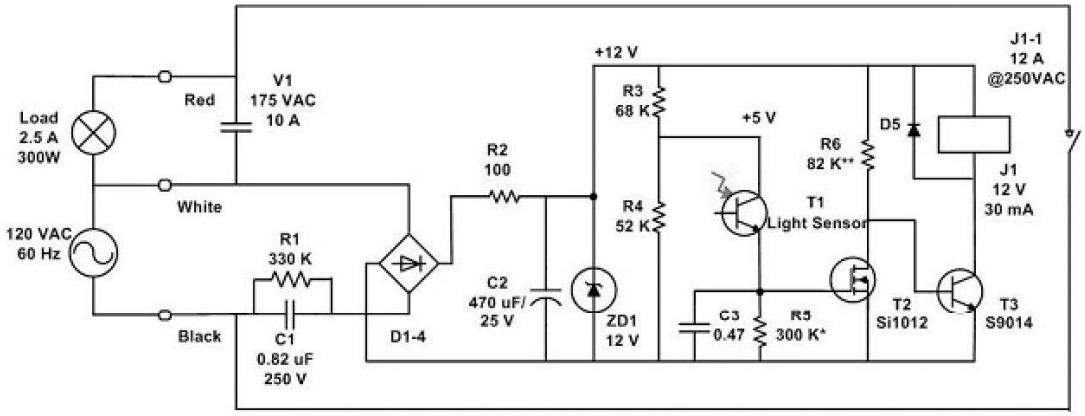


Fig.2-1 Fig.2-2

Fig.2-3 Fig.2-4

< Fig.3>

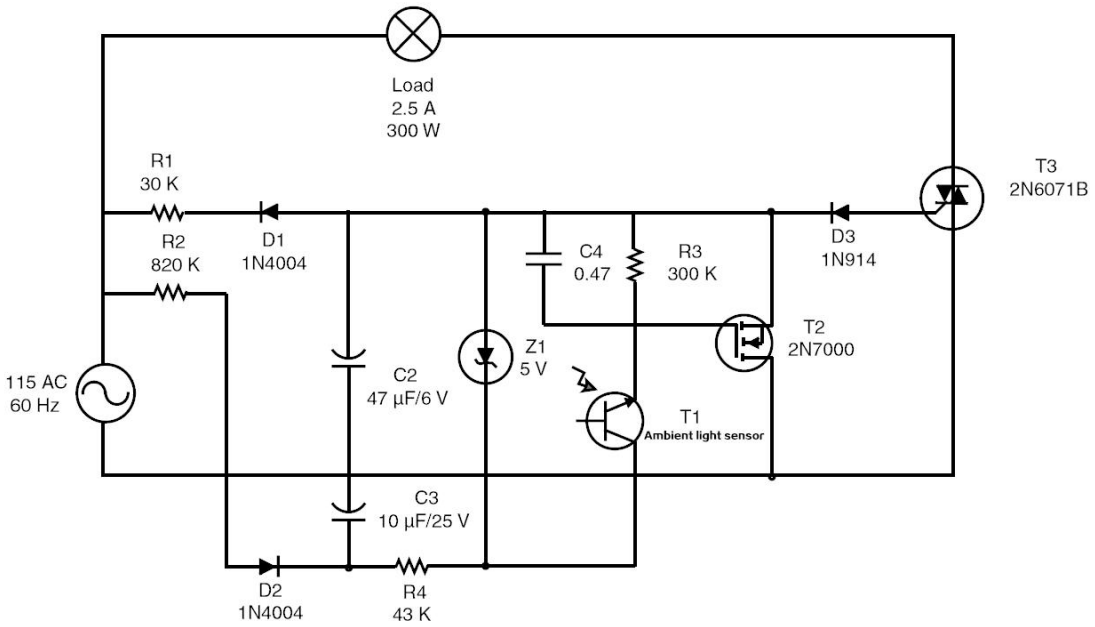
Fig.4 Figure 4 and 5 show how the LXD/GB3-A1DPZT phototransistor can be used to replace a photo resistor in DC relay and Triac power load applications.:



J1: Relay GOODSKY RHW-SH-112DM 12A 250VAC
T1: Ambient Light Sensor
T2: N MOSFET Si1012 (threshold < 1V)
T3: NPN S9014-C (50V 150mA hfe=200-600)
V1: Varistor VISHAY 2322 593.1716 (SVR 7D271K)

<Fig.4>

Figure5. Photo Light Controller (LXD/GB3-A1DPZT, Relay)



T1. LXD/GB3-A1DPZT

T2. (N MOSFET): Si1012, threshold < 1 V, Vgs(max): 6 V

T3. (Triac): 2N6071F, Igt: 3 to 15 mA, Vgt: - 1.4 V to - 2.5 V

R1. On current

R3. Off current threshold

Precautions For Use

1. Over-current-proof

Customer must apply resistors for protection , otherwise slight voltage shift will cause big current change (Burn out will happen).

2. Storage

2.1 Do not open moisture proof bag before the products are ready to use.

2.2 Before opening the package, the photo IC diode should be kept at 30℃ or less and 90%RH or less.

2.3 The photo IC diode should be used within a year.

2.4 After opening the package, the photo IC diode should be kept at 30℃ or less and 70%RH or less.

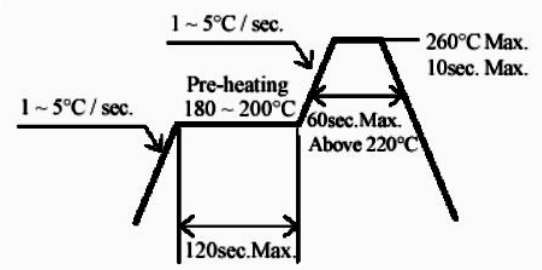
2.5 The photo IC diode should be used within 168 hours (7 days) after opening the package.

2.6 If the moisture absorbent material (silica gel) has faded away or the photo IC diode have exceeded the storage time, baking treatment should be performed using the following conditions.

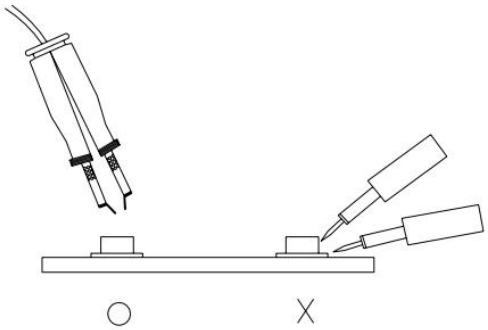
Baking treatment : 60±5℃ for 24 hours.

3. Soldering Condition

3.1 Pb-free solder temperature profile



3.2 Reflow soldering should not be done more than two times.
3.3 When soldering, do not put stress on the photo IC diode during heating.
3.4 After soldering, do not warp the circuit board.
4.Soldering Iron
Each terminal is to go to the tip of soldering iron temperature less than 280℃ for 3 seconds within once in less than the
soldering iron capacity 25W. Leave two seconds and more intervals, and do soldering of each terminal. Be careful
because the damage of the product is often started at the time of the hand solder.
5.Repairing
Repair should not be done after the photo IC diode have been soldered. When repairing is unavoidable, a double-head
soldering iron should be used (as below figure). It should be confirmed beforehand whether the characteristics of the Photo
IC diode will or will not be damaged by repairing.



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