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## Ambient Light Sensor, RoHS Compliant, Released for Lead

### (Pb)-free Solder Process

#### Description

AT405-ALS-T2 is a photo transistor specially made for ambient light sensing. It is used in power savings circuit for controlling of LCD display intensity and back-lighting of portable devices. It is sensitive to visible light with a light spectrum similar to the human eye, with an analog output for convenient interfacing to the control circuit.

#### Features

- High sensitivity,  $I_{PCE} = 40 \mu A$  ( $E_v = 100lx$ )
- Adapted to human eye responsivity
- Wide angle of half sensitivity  $\phi = \pm 60^\circ$
- $\Phi 5mm$  T-1 $\frac{3}{4}$  epoxy package with flat lens
- A Lead-free product in accordance with RoHS

#### Applications

- Automatic light dimming of LCD TV/ Displays.
- Replacements for CDS photo sensitive cells.
- Automatic day/night switch
- Automatic Dashboard dimming



## Absolute Maximum Ratings

Tamb=25°C, unless otherwise specified

Parameter	Test Conditions	Symbol	Value	Unit
Collector-emitter voltage		V <sub>CEO</sub>	6	V
Emitter-collector voltage		V <sub>ECO</sub>	1.5	V
Collector current		I <sub>c</sub>	20	mA
Total power dissipation	Tamb ≤ 55° C	P <sub>tot</sub>	100	mW
Operating Temperature range		Tamb	-40...+100	°C
Storage Temperature range		Tstg	-40...+100	°C
Solder Heat Resistance	2mm from package, t ≤ 5sec, 2 cycles	Tsd	260	°C

## Basic Characteristics

Tamb=25°C

Parameter	Test Conditions	Symbol	Min	Typ	Max	Unit
Collector-emitter breakdown voltage	I <sub>c</sub> = 0.1mA	V <sub>CEO</sub>	15			V
Operating voltage		V <sub>s</sub>	2.5		5.5	V
Collector dark current	V <sub>CE</sub> =10V, E <sub>v</sub> =0	I <sub>CEO</sub>		3	50	nA
Collector-emitter capacitance	V <sub>CE</sub> = 0V, f= 1MHz, E <sub>v</sub> = 0	C <sub>CEO</sub>		16		pF
Collector light current	E <sub>v</sub> =20lx, STD illuminant A, V <sub>CE</sub> = 5V	I <sub>PCE</sub>	3.5	10	16	μA
	E <sub>v</sub> =100lx, STD illuminant A, V <sub>CE</sub> = 5V	I <sub>PCE</sub>		40		μA
Angle of half sensitivity		Φ		±60		deg
Peak Wavelength		λ <sub>P</sub>		630		nm
Spectral Bandwidth		λ <sub>0.1</sub>	360		970	nm
Collector-emitter Saturation Voltage	E <sub>v</sub> =1klx, STD illuminant A, V <sub>CE</sub> = 5V I <sub>PCE</sub> = 1.2mA	V <sub>CE sat</sub>			0.4	V

**Typical Characteristics** ( $T_{amb} = 25^{\circ}C$  unless otherwise specified)

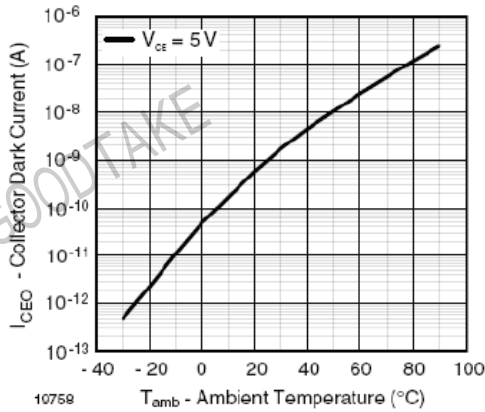


Figure 1. Collector Dark Current vs. Ambient Temperature

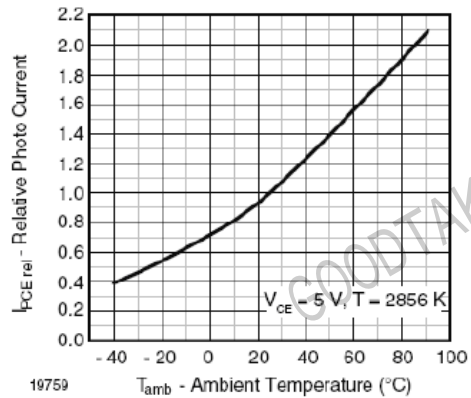


Figure 2. Relative Photo Current vs. Ambient Temperature

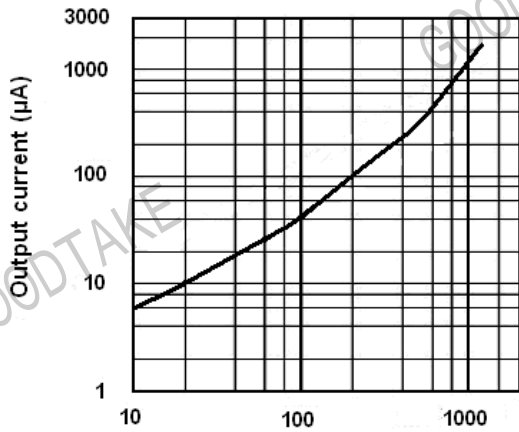


Figure 3 illuminance (lux)

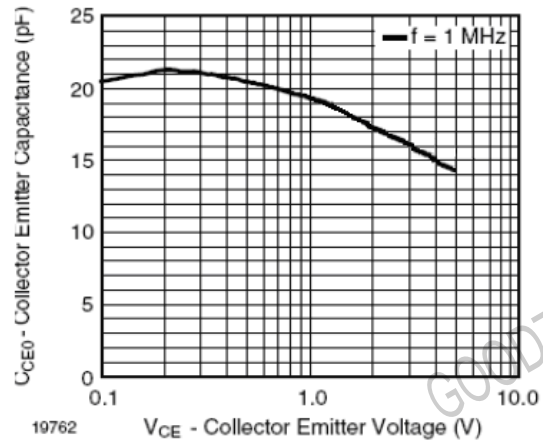


Figure 4. Collector Emitter Capacitance vs. Collector Emitter Voltage

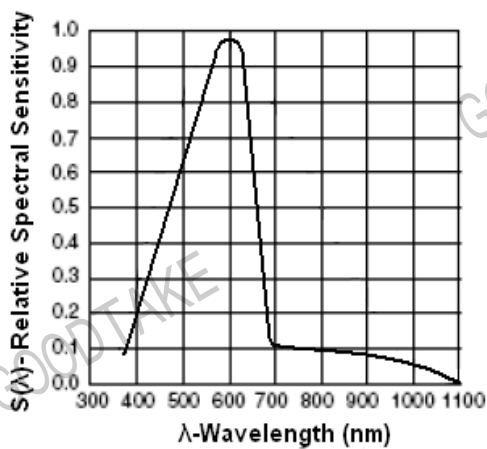


Figure 5. Relative Spectral Sensitivity vs. Wavelength

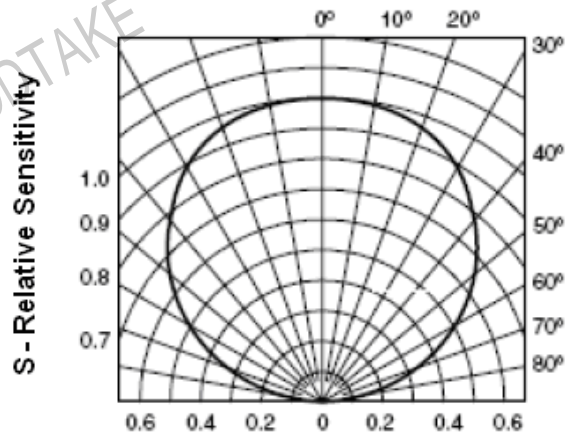
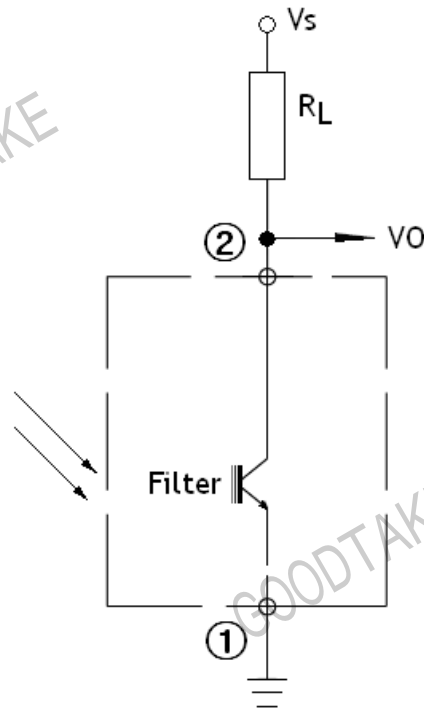
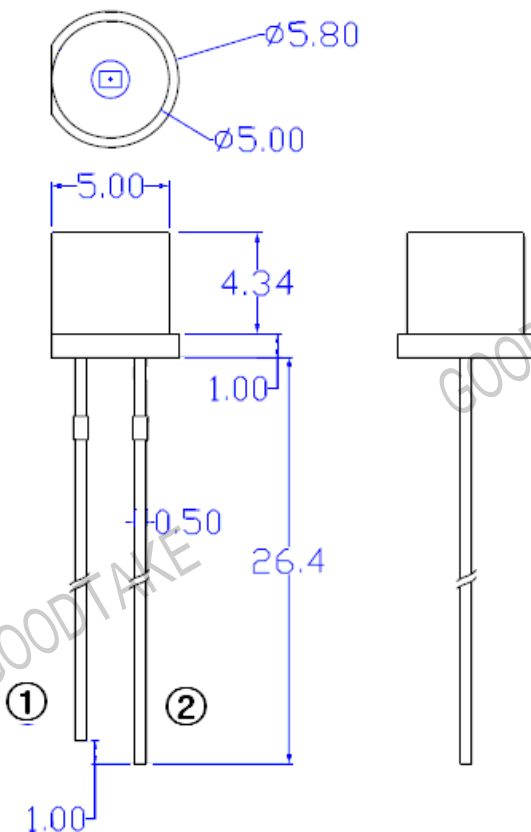


Figure 6. Relative Radiant Sensitivity vs. Angular Displacement

**Application circuit**



**Package Dimensions in millimeters**



1. General tolerance to be  $\pm 0.2\text{mm}$  unless otherwise stated.

2. Pin assignment

- ① emitter
- ② collector