AT405P-ALS-T11

DATA SHEET

REV. : 1.0

DATE : 20-Apr.-2005

Ambient Light Sensor, RoHS Compliant, Released for Lead (Pb)-free Solder Process

Description

AT405P-ALS-T11 ambient light sensor plays a key role in power savings strategies by controlling LCD display intensity and keypad backlighting of mobile devices and in industrial on/off-lighting operation. It is sensitive to visible light much like the human eye and has peak sensitivity at 570 nm. AT405P-ALS-T11 has analog output and is packaged in a small surface mount package.

Features

• Product designed and qualified acc. AEC-Q101 for the automotive market
• High sensitivity, I_{PCE} = 50 µA (E_V = 100 lx)
• Adapted to human eye responsivity
• Wide angle of half sensitivity φ = ± 60°
• Surface mount package
• Dimensions: L 4 mm x W 2 mm x H 1.05 mm
• Lead (Pb)-free soldering released
• Lead (Pb)-free component in accordance with RoHS 2002/95/EC and WEEE 2002/96/EC

Applications

Ambient light sensor for control of display backlight dimming in LCD displays and keypad backlighting of mobile devices and in industrial on/off-lighting operation.
• Automotive sensors
• Mobile phones
• Notebook computers
• PDA’s
• Cameras
• Dashboards

Absolute Maximum Ratings

T_{amb} = 25 °C, unless otherwise specified

Parameter	Test condition Symbol	Symbol	Value	Unit
Collector emitter voltage		V_{CEO}	6	V
Emitter collector voltage		V_{CEO}	1.5	V
Collector current		I_C	20	mA
Total power dissipation	$T_{amb} \leq 55$ °C	P_{tot}	100	mW
Junction temperature		T_j	100	°C
Operating temperature range		T_{amb}	- 40 to + 100	°C
Storage temperature range		T_{stg}	-40 to + 100	°C
Soldering temperature	Reflow Profile Figure 7	T_{sd}	260	°C
Thermal resistance junction/ambient		R_{thJA}	450	K/W

Basic Characteristics

T_{amb} = 25 °C, unless otherwise specified

Parameter	Test condition	Symbol	Min	Typ	Max	Unit
Collector emitter breakdown voltage	I_C = 0.1 mA	V_{CEO}	6			V
Collector dark current	V_{CE} = 5 V, E = 0 I	I_{CEO}		3	50	nA
Collector-emitter capacitance	V_{CE} = 0 V, f = 1 MHz, E = 0	C_{CEO}		16		pF
Collector light current	Ev = 20 lx, CIE illuminant A, V_{CE} = 5 V	I_{PCE}	3.5	10	16	µA
	Ev = 100 lx, CIE illuminant A, V_{CE} = 5 V	I_{PCE}		40		µA
Angle of half sensitivity		φ	± 60			deg
Wavelength of peak sensitivity		λ_p		590		nm
Range of spectral bandwidth		$\lambda_{0.1}$		360 to 970		nm
Collector emitter saturation voltage	Ev = 20 lx, standard light A, I_{PCE} = 1.2 µA	V_{CEsat}		0.1		V

Typical Characteristics

Tamb = 25 °C, unless otherwise specified

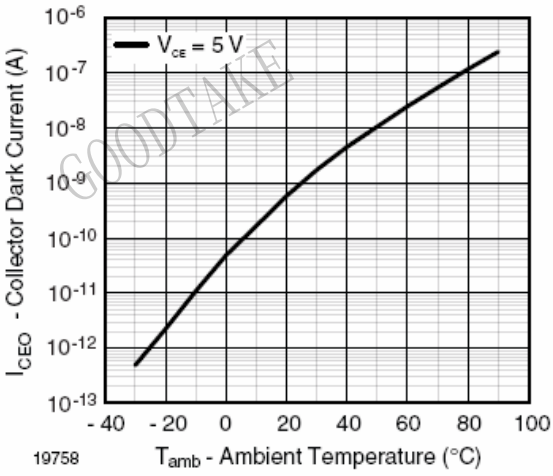


Figure 1. Collector Dark Current vs. Ambient Temperature

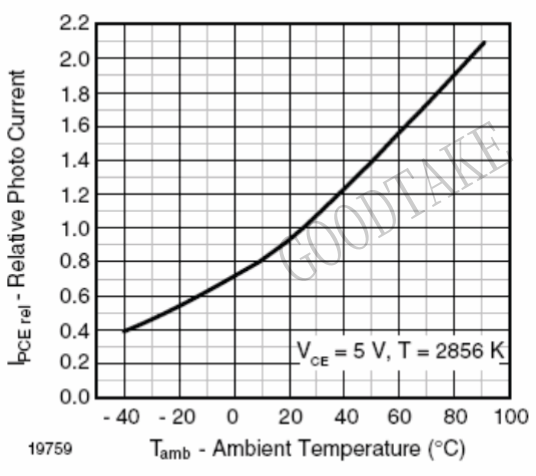


Figure 2. Relative Photo Current vs. Ambient Temperature

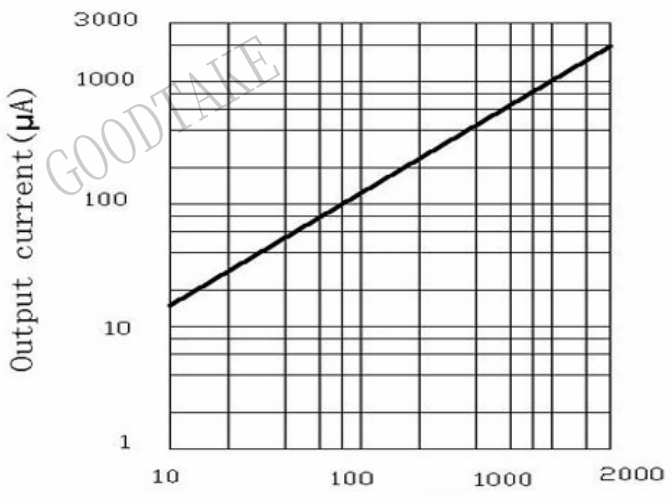


Figure 3 Illuminance(lux)

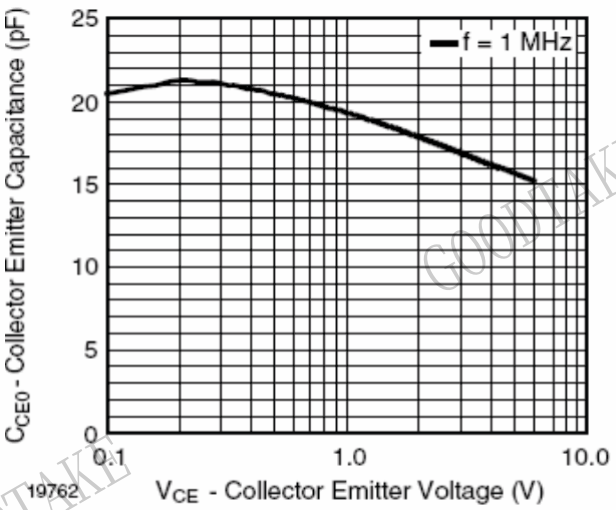


Figure 4. Collector Emitter Capacitance vs. Collector Emitter Voltage

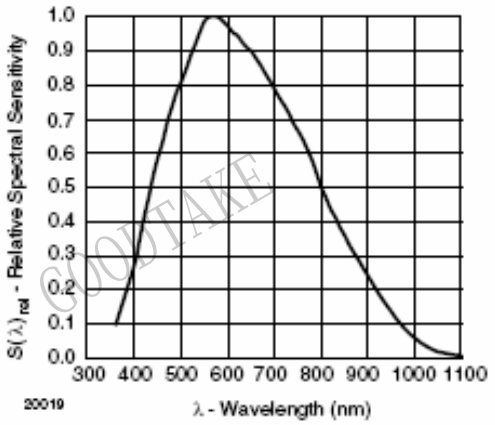


Figure 5. Relative Spectral Sensitivity vs. Wavelength

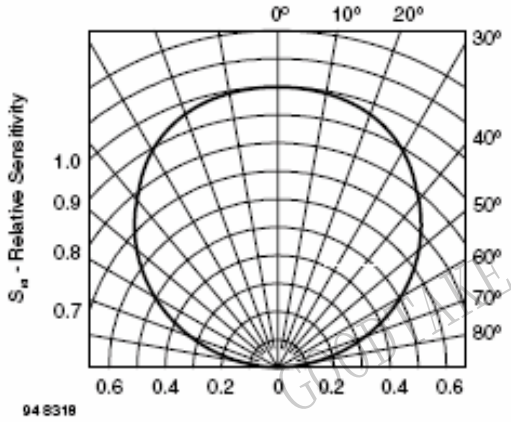


Figure 6. Relative Radiant Sensitivity vs. Angular Displacement

Drypack

Devices are packed in moisture barrier bags (MBB) to prevent the products from moisture absorption during transportation and storage. Each bag contains a desiccant.

Floor Life

Floor life (time between soldering and removing from MBB) must not exceed the time indicated in J-STD-020 AT442-AS-A1 is released for:
Moisture Sensitivity Level 4, according to JEDEC, J-STD-020
Floor Life: 72 h
Conditions: T_{amb} < 30 °C, RH < 60 %

Drying

In case of moisture absorption devices should be baked before soldering. Conditions see J-STD-020 or Label. Devices taped on reel dry using recommended conditions 192 h at 40 °C (+ 5 °C), RH < 5 %.

Reflow Solder Profiles

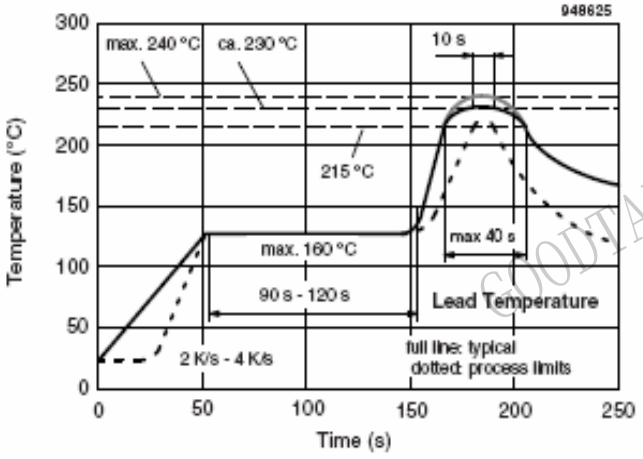


Figure 8. Lead Tin (SnPb) Reflow Solder Profile

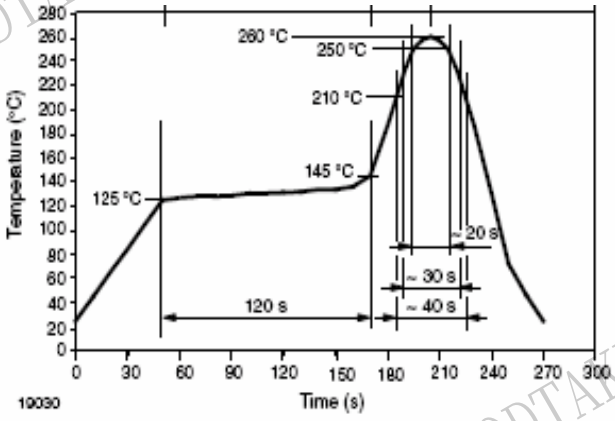
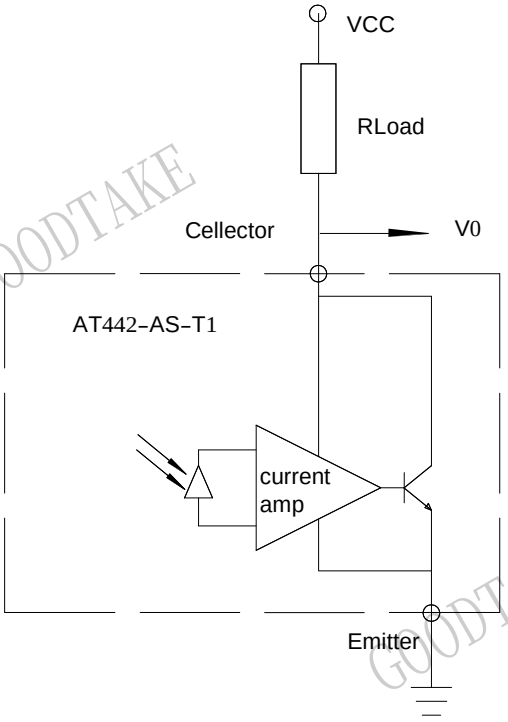
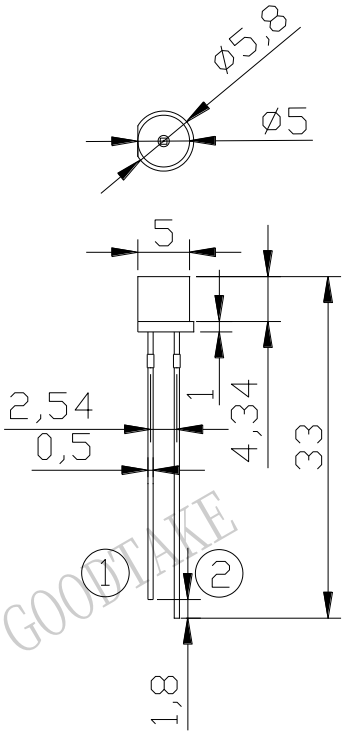


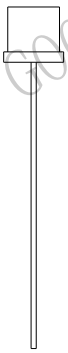
Figure 7. Tin (Sn) Reflow Solder Profile (Pb-free)

Application circuit



Package Dimensions in millimeters





1. Unspecified tollernce shall be ±0.2
2. Dimensions in parenthesis are shown for reference
3. pin name

① emitter

② Cellector