

AT4216-ALS-A1

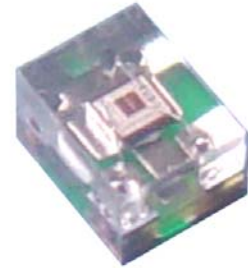
DATA SHEET

REV. : 1.0

DATE : 20-May-2008

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

AT4216-ALS-A1 ambient light sensor plays a key role in power savings strategies by controlling LCD display intensity and keypad backlighting of mobile devices and in commercial on/off-lighting operation. It is sensitive to visible light much like the human eye and has peak sensitivity at 590 nm. AT4216-ALS-A1 has analog output and is packaged in a small surface mount package.

**Features**

- High sensitivity, $I_{PCE} = 50 \mu A$ ($E_V = 100 \text{ lx}$)
- Adapted to human eye responsivity
- Wide angle of half sensitivity $\varphi = \pm 60^\circ$
- Surface mount package
- Dimensions: L 2.0 mm x W 1.6 mm x H 1.05 mm
- Lead (Pb)-free component in accordance with RoHS

Applications

Ambient light sensor for control of display backlight dimming in LCD displays and keypad backlighting of mobile devices and in commercial on/off-lighting operation.

- Mobile phones
- Notebook computers
- PDA's
- Cameras

Absolute Maximum Ratings

$T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified

Parameter	Test condition Symbol	Symbol	Value	Unit
Supply voltage		V_{CC}	-0.3to+7.0	V
Supply current	$E_v = 1000\text{ lx}$	I_o	0.6	mA
Total power dissipation	$T_{amb} \leq 55\text{ }^{\circ}\text{C}$ $E_v = 1000\text{ lx}$	P_{to}	100	mW
Junction temperature		T_j	100	$^{\circ}\text{C}$
Operating temperature range		T_{opr}	- 40 to + 100	$^{\circ}\text{C}$
Storage temperature range		T_{stg}	-40 to + 100	$^{\circ}\text{C}$
Soldering temperature	Reflow Profile Figure 7	T_{sd}	260	$^{\circ}\text{C}$
Thermal resistance junction/ambient		R_{thJA}	450	K/W

Basic Characteristics

$T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified

Parameter	Test condition	Symbol	Min	Typ	Max	Unit
Output dark current	$V_{CE} = 5\text{ V}$, $E = 0\text{ l}$	I_{DC}		3	50	nA
Output light current	$E_v = 20\text{ lx}$, CIE illuminant A, $V_{CE} = 5\text{ V}$	I_{o1}	3.5	10	16	μA
	$E_v = 100\text{ lx}$, CIE illuminant A, $V_{CE} = 5\text{ V}$	I_{o2}		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

Typical Characteristics

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

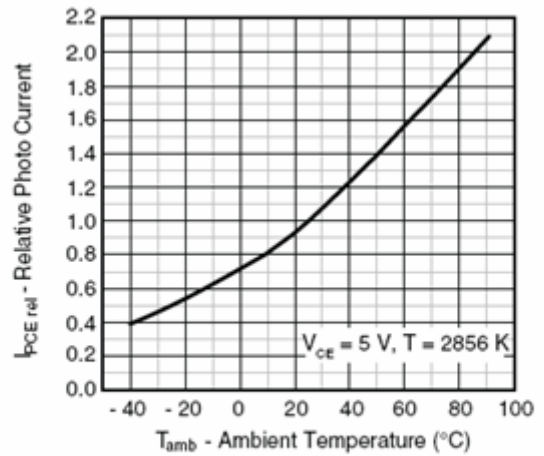
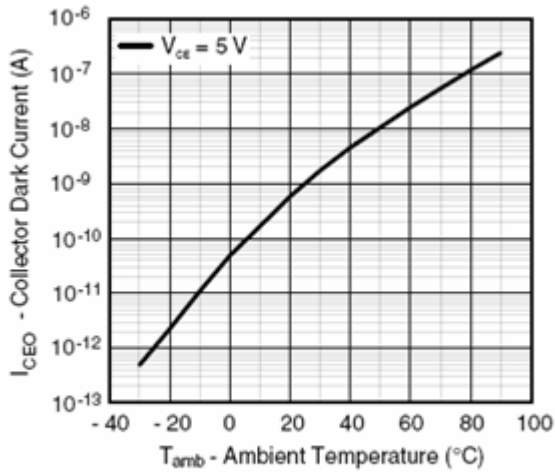


Figure 1. Collector Dark Current vs. Ambient Temperature Figure 2. Relative Photo Current vs. Ambient Temperature

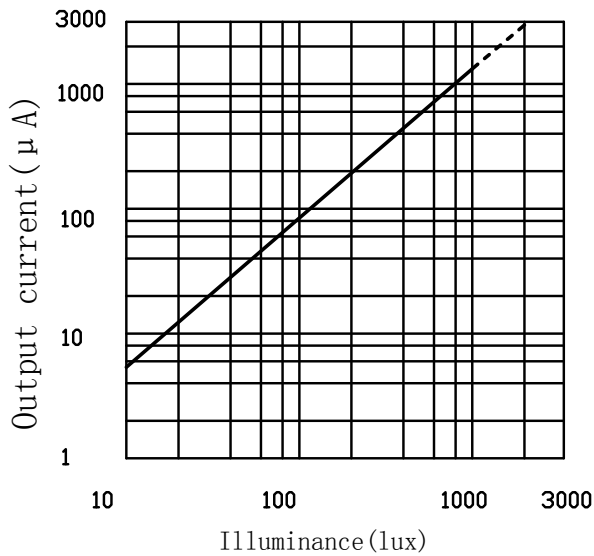


Figure 3. Output Current vs. Illuminance

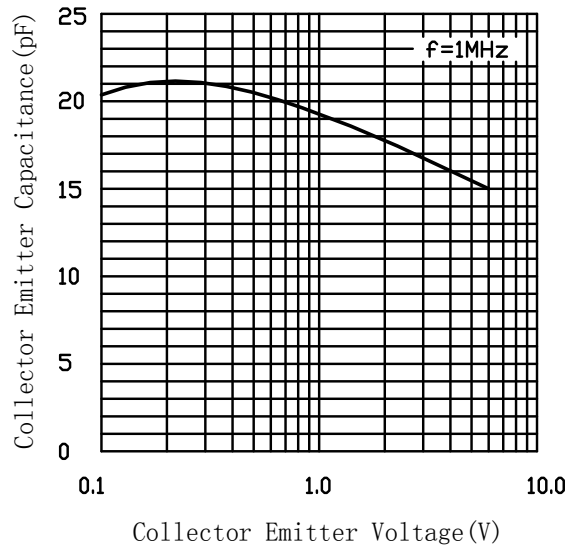


Figure 4. Collector Emitter Capacitance vs. Collector Emitter Voltage

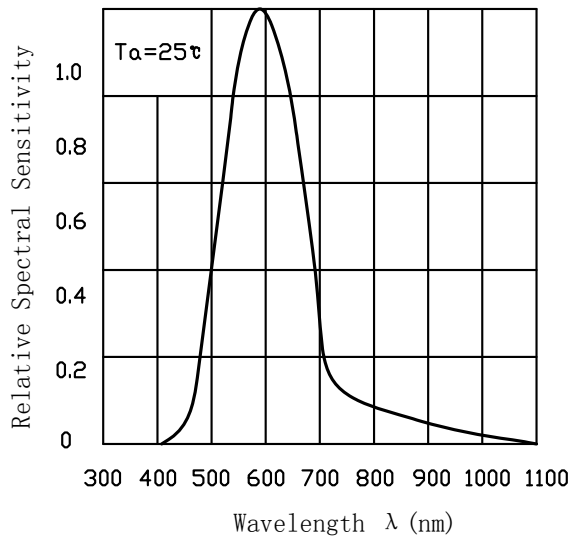


Figure 5. Relative Spectral Sensitivity vs. Wavelength

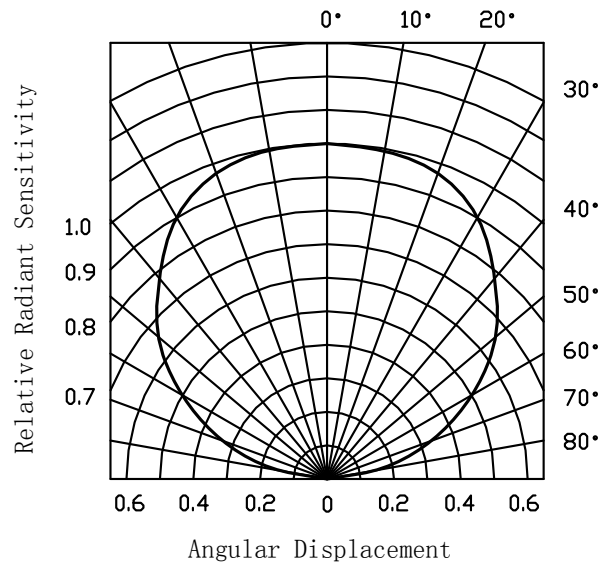
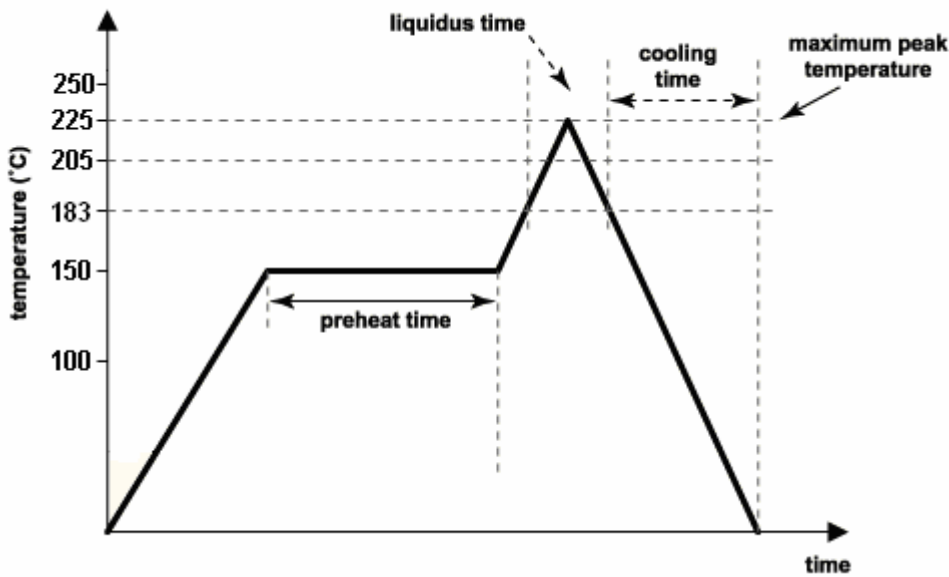


Figure 6. Relative Radiant Sensitivity vs. Angular Displacement

Reflow Solder Profiles



Manual Soldering

- 1) Pb-free solder, the following component is recommended: Sn/Ag 3%/Cu 0.5%
- 2) Use a soldering iron of 25W or smaller. Adjust the temperature of the soldering iron below 350°C.
- 3) Finish soldering within 3 seconds.
- 4) Handle products only after the temperature is cooled off.

Pb-free solder

Pb-free soldering paste, melting temperature: 230~235°C

Components: Sn/Ag 3%/ Cu 0.5%

Antistatic packing

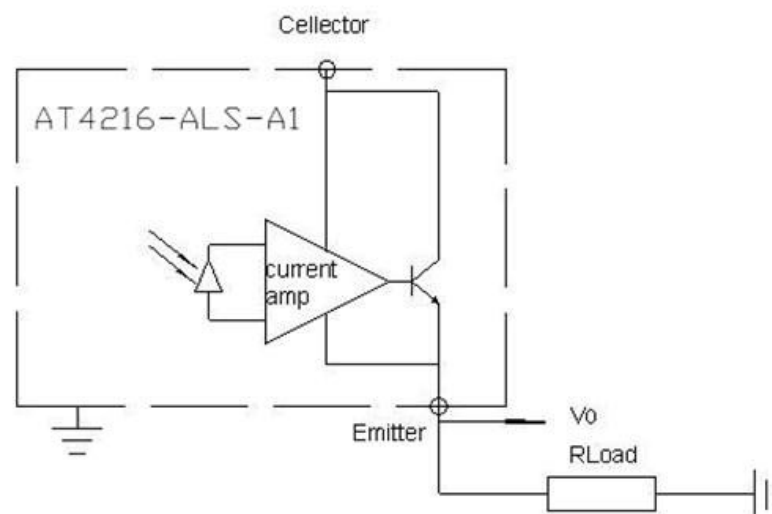
AT4216-ALS-A1 is not sensitive to moisture. However, devices are tape & reeled in antistatic bag with silica gel desiccants. Standard packing is 1,000 pcs per reel

Storage

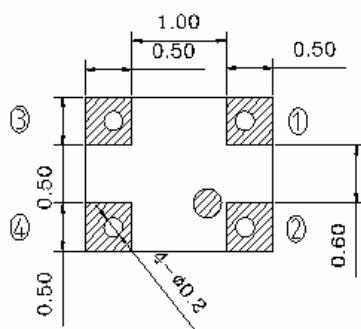
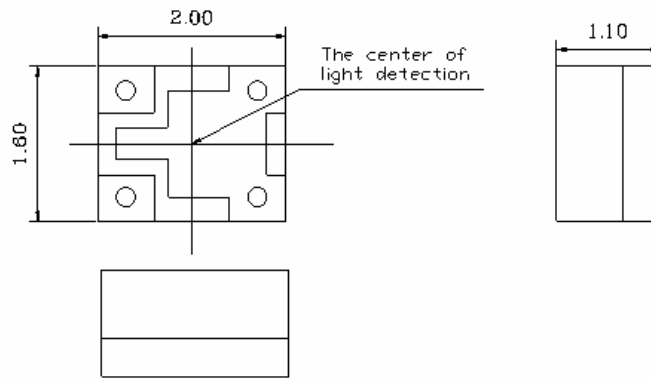
Shelf life & floor life: AT4216-ALS-A1 should be stored in an environment with the temperature less than 40°C and the relative humidity less than 60 percent. Suggested shelf life is 12 months.

Floor life – When package has opened for exceeding 72 hours, unused devices should be repacked into original antistatic bag with desiccant.

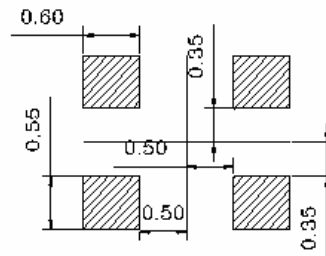
Application circuit



Package Dimensions in millimeters



Soldering Pack Example



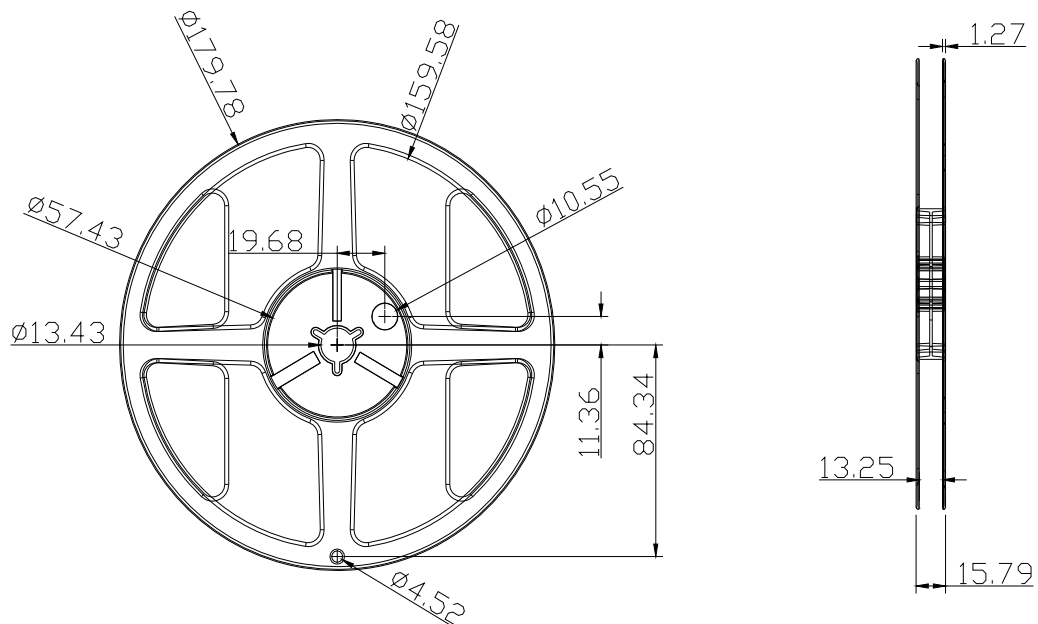
Pin out Config.

①	GND
②	GND
③	I _o
④	V _{cc}

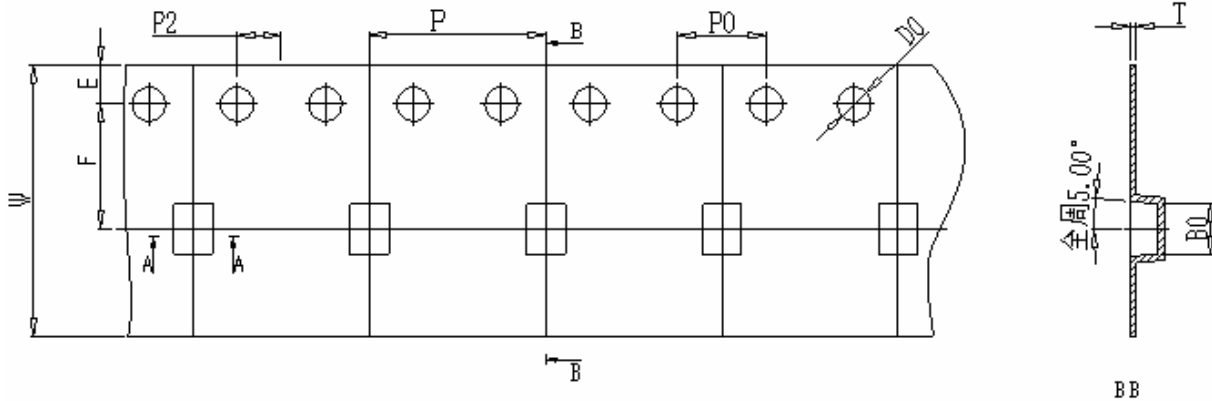
Unspecified tolerance: $\pm 0.2\text{mm}$

Taping Specifications

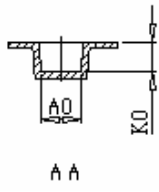
(1) Shape and dimensions of reels :unit in mm



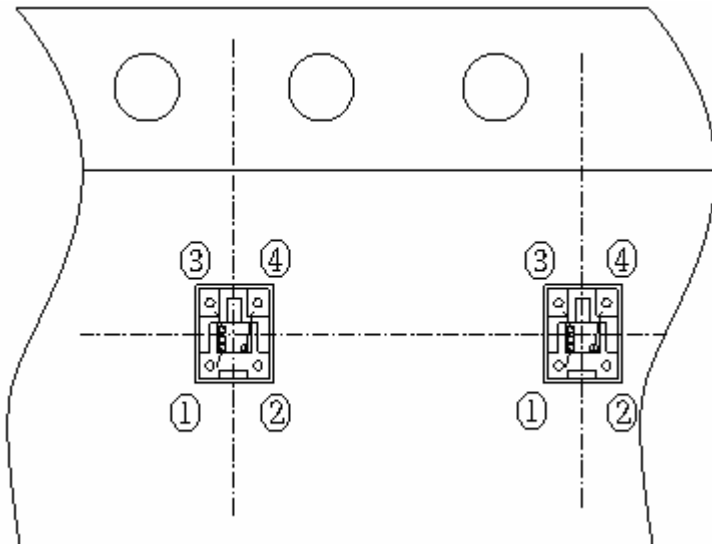
(2) Dimensions of tape



W	12 ± 0.3	P	8 ± 0.1	A0	1.8 ± 0.1
F	5.5 ± 0.1	P0	4 ± 0.1	B0	2.2 ± 0.1
T	0.3 ± 0.05	P2	2 ± 0.1	K0	1.3 ± 0.1
D0	1.50 ^{+0.1} _{-0.1}	E	1.75 ± 0.1		



(3) Direction of product insertion



Direction of feed

Terminal

①	GND
②	GND
③	I _o
④	Vcc