

### Ambient Light Sensor – DIP 5mm T-1 3/4 EAALST05RDMA0



#### Features

- Close responsively to the human eye spectrum
- Light to Current, analog output
- Good output linearity across wide illumination range
- Low sensitivity variation across various light sources
- Guaranteed temperature performance, -40°C to 85°C
- Wide supply voltage range, 2.5V to 5.5V
- Size : 5mm Lamp (Flat lens)
- RoHS compliant and Pb Free package
- Compliance with EU REACH.

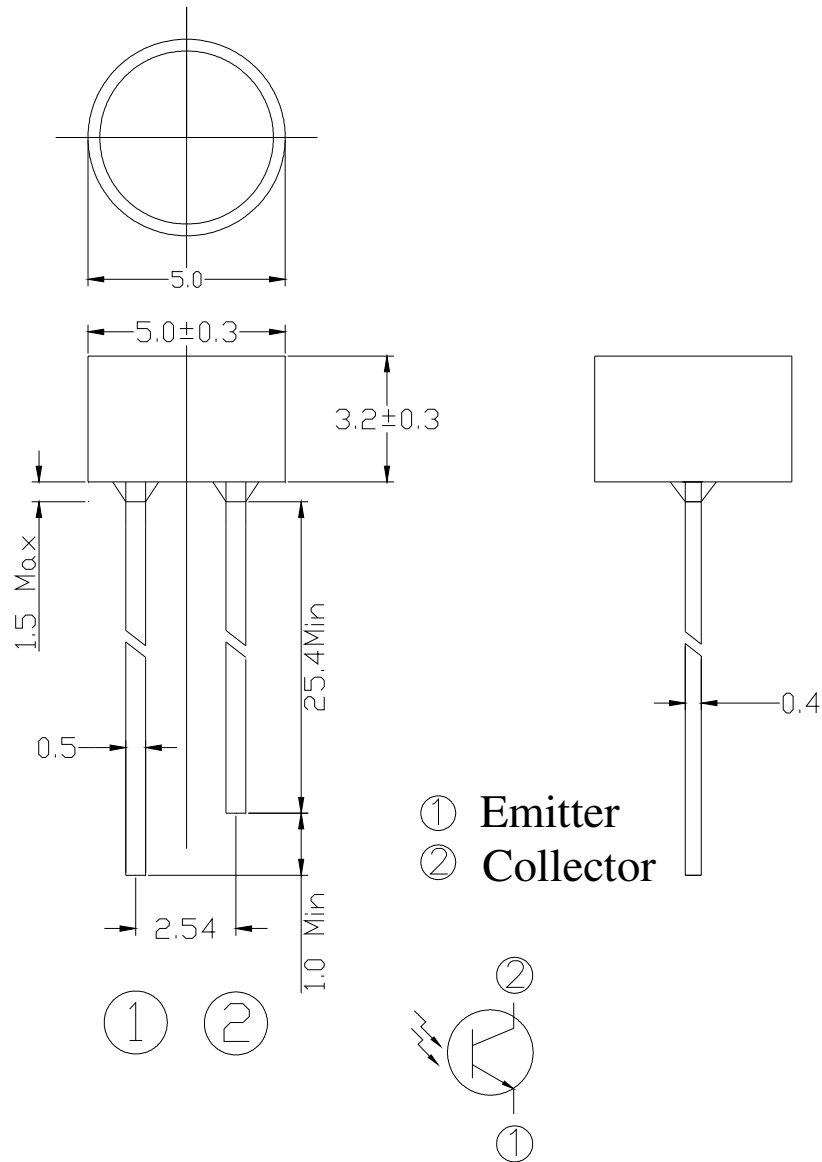
#### Description

The EAALST05RDMA0 is a low cost ambient light sensor, consisting of phototransistor in miniature SMD. Everlight Americas ALS series product are a good effective solution to the power saving of display backlighting of mobile appliances, such as the mobile phones, NB and PDAs. Due to the high rejection ratio of infrared radiation, the spectral response of the ambient light sensor is close to human eyes.

#### Applications

- Detection of ambient light to control display backlighting
- Mobile devices – mobile phones, PDAs
  - Computing device – TFT LCD monitor for Notebook computer
  - Consumer device – TFT LCD TV, plasma TV, video camera, digital camera, toys
- Automatic residential and commercial management
- Automatic contrast enhancement for electronic signboard
- Ambient light monitoring device for daylight and artificial light
  - Street light, CCD/CCTV

## Package Dimensions



### Notes:

1. All dimensions are in millimeters
2. Tolerances unless dimensions  $\pm 0.1$  mm

### Absolute Maximum Ratings

| Parameter                   | Symbol           | Rating   | Unit |
|-----------------------------|------------------|----------|------|
| Supply Voltage              | V <sub>CC</sub>  | -0.5~6.0 | V    |
| Operating Temperature Range | T <sub>opr</sub> | -40~+85  | °C   |
| Storage Temperature Range   | T <sub>stq</sub> | -40~+100 | °C   |
| Soldering Temperature Range | T <sub>sol</sub> | 260      | °C   |

### Recommended Operating Conditions

| Parameter             | Symbol           | Min. | Max. | Unit |
|-----------------------|------------------|------|------|------|
| Operating Temperature | T <sub>opr</sub> | -40  | +85  | °C   |
| Supply Voltage        | V <sub>CC</sub>  | 2.5  | 5.5  | V    |

### Rankings

| Bin Code | Symbol             | Min. | Max. | Unit | Test Condition                                |
|----------|--------------------|------|------|------|---|
| 1        | I <sub>C(ON)</sub> | 5    | 12   | uA   | V <sub>CE</sub> =5V<br>E <sub>V</sub> =100Lux |
| 2        |                    | 12   | 17   |      |   |
| 3        |                    | 17   | 23   |      |   |

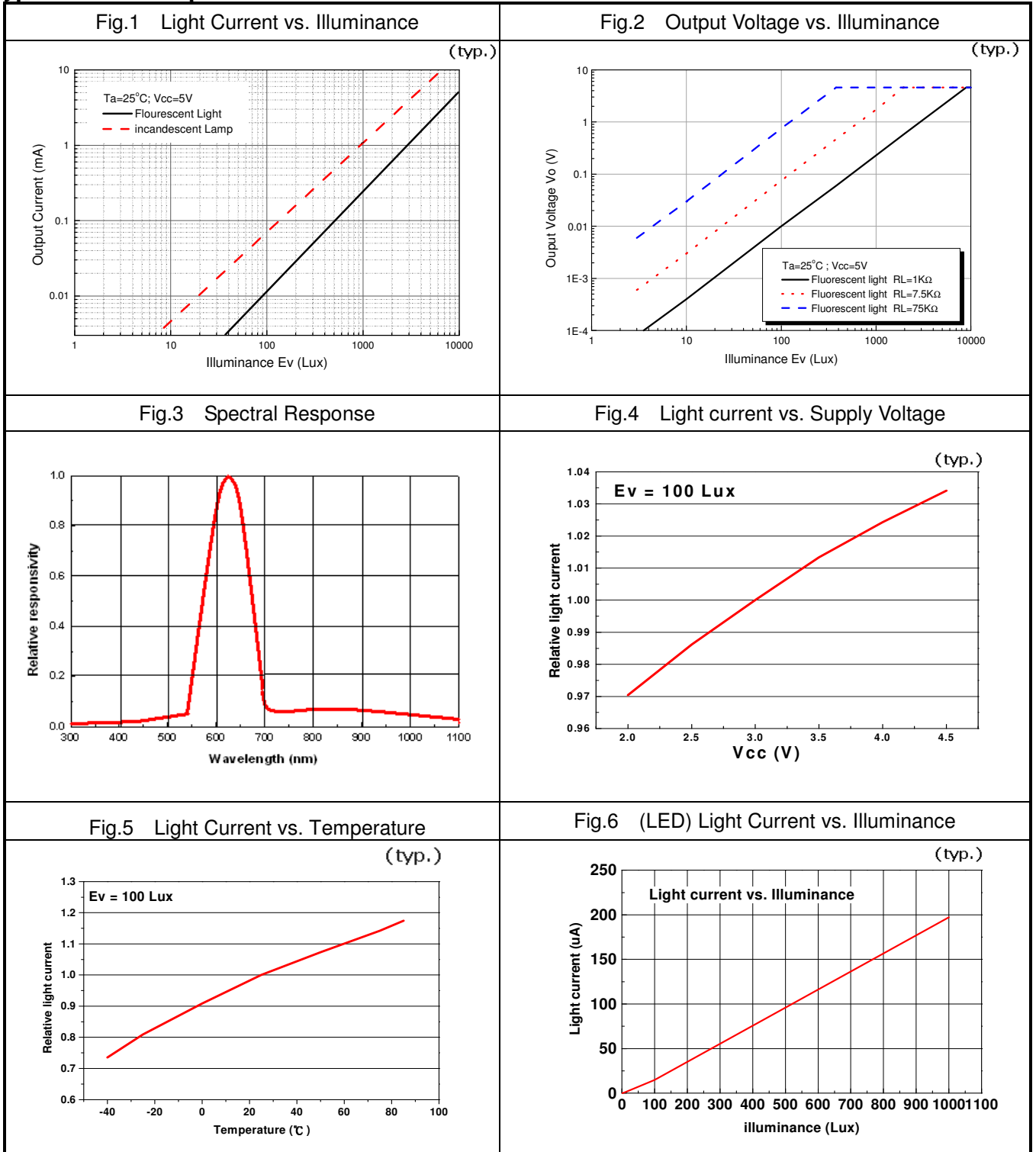
### Electro-Optical Characteristics (Ta=25°C)

| Parameter                            | Symbol              | Min. | Typ. | Max. | Unit | Condition  |
|--------------------------------------|---------------------|------|------|------|------|--|
| Dark Current                         | $I_{CEO}$           | ---  | ---  | 0.1  | uA   | $V_{CE}=10V$<br>$E_V=0Lux$                                 |
| Collector-Emitter Saturation Voltage | $V_{CE(sat)}$       | ---  | ---  | 0.4  | V    | $I_C=2mA$<br>$E_V=1000Lux$                                 |
| Light Current                        | $I_{PH1}$           | 7    | 10   | ---  | uA   | $V_{CE}=5V$<br>$E_V=100Lux$<br>[Note1]                     |
|                                      | $I_{PH2}$           | 70   | 100  | ---  |      | $V_{CE}=5V$<br>$E_V=1000Lux$<br>[Note1]                    |
|                                      | $I_{PH3}$           | ---  | 480  | ---  |      | $V_{CE}=5V$<br>$E_V=1000Lux$<br>[Note2]                    |
| Photocurrent Ratio                   | $I_{PH3} / I_{PH2}$ | ---  | 4.8  | ---  | ---  | $V_{CE}=5V$<br>$E_V=1000Lux$                               |
| Saturation Output Voltage            | $V_O$               | 4.5  | 4.6  | ---  | V    | $V_{CE}=5V$<br>$E_V=1000Lux$<br>$R_L=75K\Omega$<br>[Note2] |
| Peak Sensitivity Wavelength          | $\lambda_p$         | ---  | 630  | ---  | nm   | ---  |
| Sensitivity Wavelength Range         | $\lambda$           | 390  | ---  | 700  | nm   | ---  |
| Rise Time                            | $t_r$               | ---  | 0.11 | ---  | ms   | $V_{CE}=5V$  |
| Fall Time                            | $t_f$               | ---  | 0.22 | ---  | ms   | $R_L = 7.5K\Omega$   |
| Angle of half Sensitivity            | $2\theta_{1/2}$     | ---  | 143  | ---  | Deg  | $I_F = 20 mA$  |

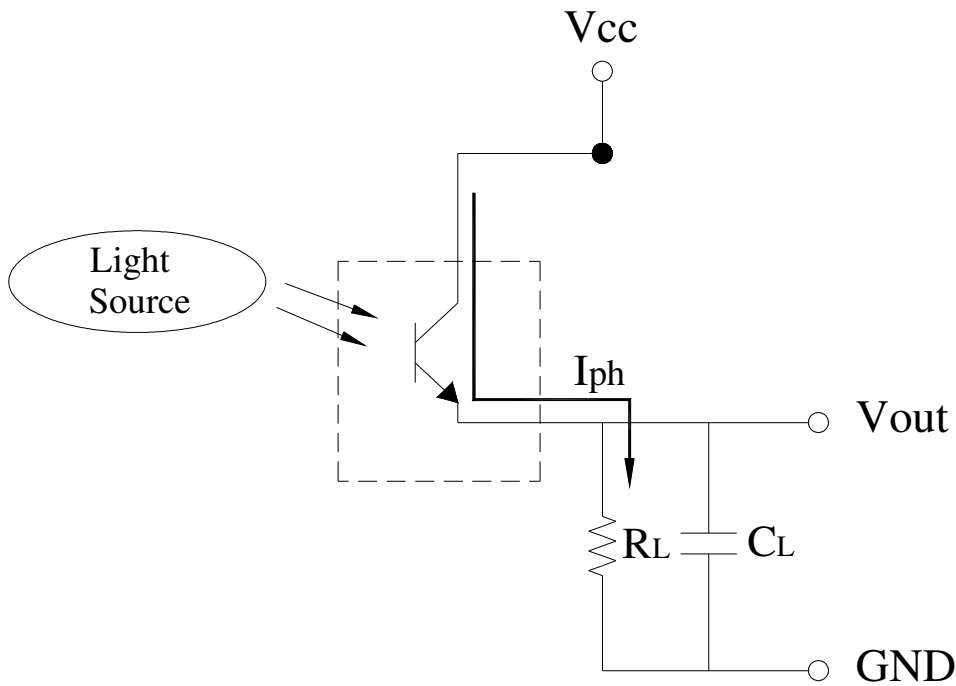
Note:

1. White Fluorescent light (Color Temperature = 6500K) is used as light source. However, White LED is substituted in mass production.
2. Illuminance by CIE standard illuminant-A / 2856K, incandescent lamp.

**Typical Electro-Optical Characteristics Curves**



## Converting Photocurrent to Voltage



### Note :

1. The output voltage ( $V_{out}$ ) is the product of photocurrent ( $I_{PH}$ ) and loading resistor ( $R_L$ )
2. A right loading resistor shall be chosen to meet the requirement of maximum ambient light, and output saturation voltage:

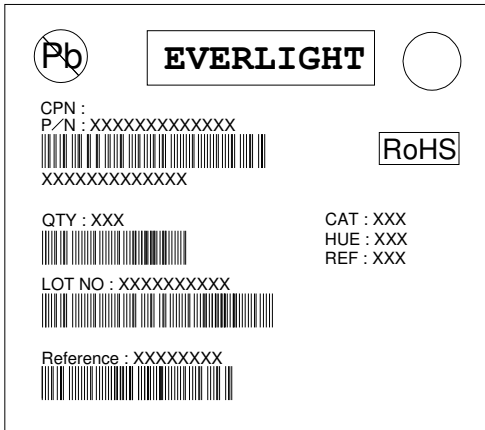
$$V_{out(max.)} = I_{out(max.)} \times R_L \leq V_{out(saturation)} = V_{cc} - 0.4V$$

## Packing Quantity Specification

1.500PCS/1Bag · 5Bags/1Box

2.10Boxes/1Carton

## Label Format



- CPN : Customer's Product Number
- P/N : Product Number
- QTY : Packing Quantity
- CAT : Ranks
- HUE : Peak Wavelength
- REF : Reference
- LOT No : Lot Number

## Note :

1. Above specification may be changed without notice. Everlight Americas will reserve authority on material change for above specification.
2. When using this product, please observe the absolute maximum ratings and the instructions for using outlined in these specification sheets. Everlight Americas assumes no responsibility for any damage resulting from use of the product which does not comply with the absolute maximum ratings and instructions included in these specification sheets.
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