

Approval Sheet

SMD type UV Sensor

GUVA-S12SD

Date : 2010. 4

PREPARED BY : Genicom Co. Ltd.

| R&D | P. M. | Q.A. | Sales |
|-----|-------|------|-------|
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APPROVED BY :

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SPECIFICATIONS

SMD Type UV Sensor

GUVA-S12SD



Genicom Co., Ltd.

5F, Daehan Bldg., #1018 Dunsan-dong, Seo-gu, Daejeon 302-120, Korea

Tel. 82-42-472-7462, Fax. 82-42-472-7459

1. Features

- GaN-based Schottky Photodiode
- Photovoltaic Mode Operation
- Good Visible Blindness
- 3.5 × 2.8 × 1.9 (L×W×H) Small Size Surface Mount Type

2. Applications

- UVA Lamp Monitoring
- UV Index Monitoring

3. Outline Diagrams and Dimensions

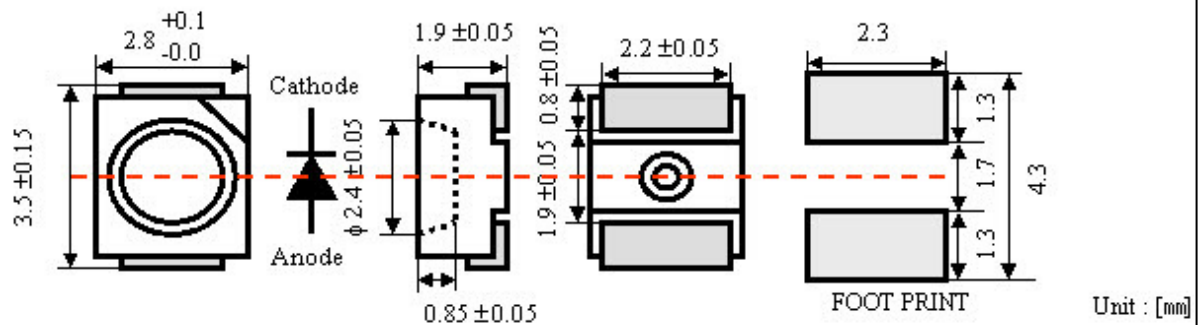
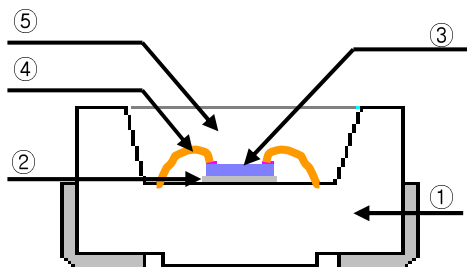


Fig. 1. Outline Diagrams and Dimensions



| No. | Items | Material |
|-----|----------------|------------------------------------|
| ① | Plastic PKG | PPA |
| ② | Paste | Ag |
| ③ | UV Sensor Chip | GaN/Al ₂ O ₃ |
| ④ | Wire | Au |
| ⑤ | Window | Si-Encapsulant |

Fig. 2. Component and Its Material

4. Electro-Optical Characteristics

1) Absolute Maximum Ratings

| Item | Symbol | Min. | Max. | Unit | Test Conditions |
|-----------------------|--------|------|------|------|-----------------|
| Reverse Voltage | V_R | | 5 | V | |
| Operation Temperature | Top | -30 | 85 | °C | |
| Storage Temperature | Ts | -40 | 90 | °C | |
| Soldering Temperature | Tsol | | 260 | °C | < 10 sec |

2) Electro-Optical Characteristics (at 25 °C)

| Item | Symbol | Min. | Typ. | Max. | Unit | Test Conditions |
|--------------------------|--------------------|-------|------|------|---------------|--|
| Dark Current | I_d | | | 1 | nA | $V_r = 0.1 \text{ V}$ |
| Photo Current | I_{ph} | 111 | | 136 | nA | UVA Power : 1 mW/cm^2 |
| Peak Responsivity | R_p | | 0.15 | | A/W | $\lambda_p = 350 \text{ nm}$, $V_r = 0 \text{ V}$ |
| Cutoff Wavelength | λ_{cutoff} | | 370 | | nm | 10 % of R_p |
| Spectral Detection Range | λ | 240 | | 370 | nm | Monochromator Scan |
| Sensitivity Area | A | 0.076 | | | mm^2 | |

3) Responsivity Curve (at 25 °C)

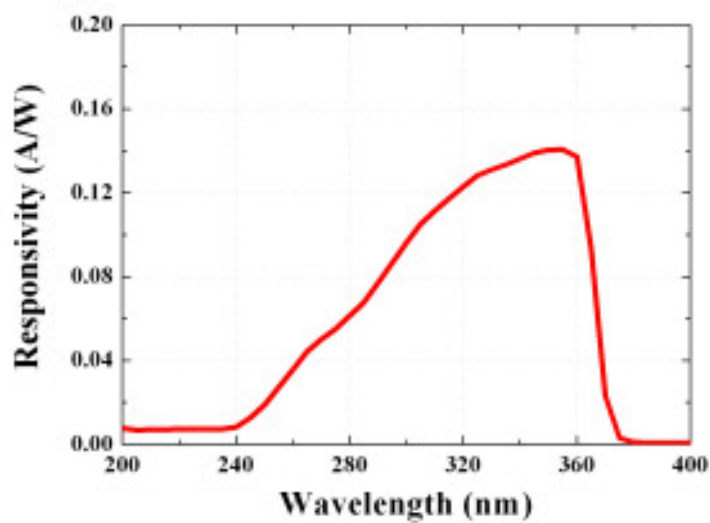


Fig. 3. Typical Spectral Responsivity

5. Reliability

1) Criterion for Judging

| Item | Symbol | Min | Max | Unit | Test Conditions |
|---------------|-----------------|-----|-----|------|-----------------------|
| Dark Current | Id | - | 1 | nA | V _r = 0.1V |
| Photo Current | I _{ph} | 90 | 110 | % | V _r = 0 V |

2) Test Results

| Classification / Item | Test Conditions | Fail / Pass | Reference standard |
|--|--|-------------|--------------------|
| High Temperature Storage | 90 °C, 1000 hrs | 0 / 100 | JIS-C-7021:B-10 |
| Low Temperature Storage | -40 °C, 1000 hrs | 0 / 100 | JIS-C-7021:B-12 |
| High Temperature & High Humidity Storage | 60 °C, 95 % RH, 240 hrs | 0 / 100 | MIL-STD-202:103B |
| Thermal Shock | -40 °C / 90 °C (15 cycles) Transfer Time < 10 s | 0 / 100 | MIL-STD-750:1056 |
| Temperature Cycling | -40 °C / 90 °C (10 cycles) Transfer Time < 1 min Holding Time = 10 min | 0 / 100 | MIL-STD-750:1051 |
| Pressure Cooker Test (PCT) | 120 °C, 100 % RH, 2 atm (4 hrs) | 0 / 100 | JESD22-A102-C |
| Soldering Resistance | T _{sol} = 260±5 °C Dwell time = 10±1 s | 0 / 100 | MIL-STD-750:2031 |
| ESD (HBM) | Class 1A : 300 V | 0 / 100 | JESD22-A114-B |
| UV Exposure | 100 UVI, 500 hrs (UVB Lamp) | 0 / 100 | |

6. Soldering

1) Soldering Pattern

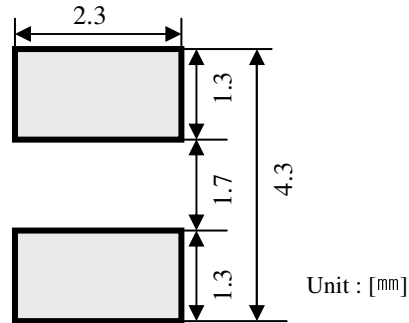


Fig. 4. Recommended Soldering Pattern

2) Reflow Soldering Profile

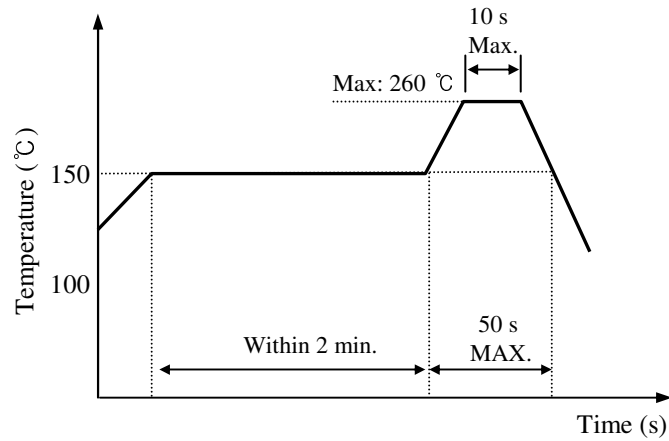


Fig. 5. Recommended Reflow Soldering Profile

3) Manual Soldering Conditions

- Temperature : Max. 260 °C
- Time : Max. 10 s
- Caution : You must put to earth and shield the package from ESD damage.
(ex.: wrist strap or anti-electrostatic gloves)

7. Taping

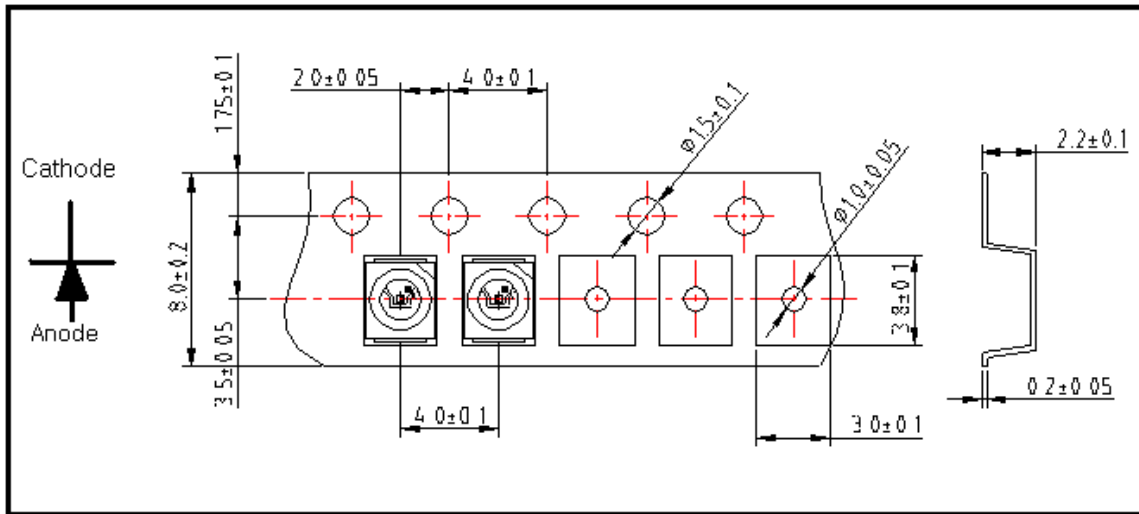


Fig. 6. Standardization of Carrier Tape

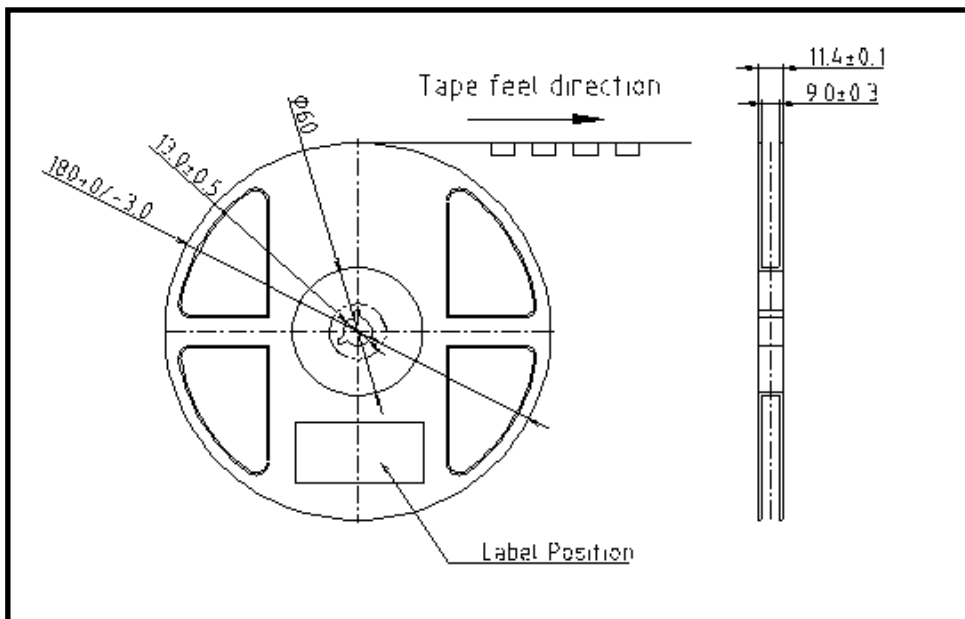
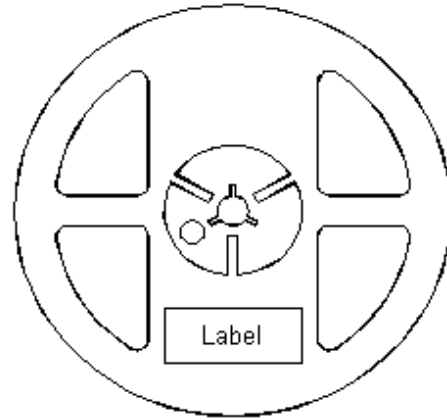
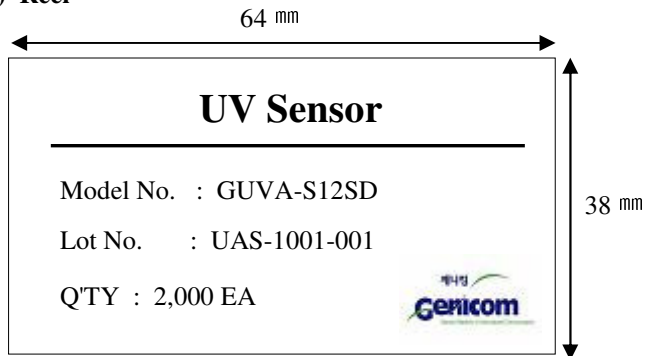


Fig. 7. Diagram and Standardization of Reel

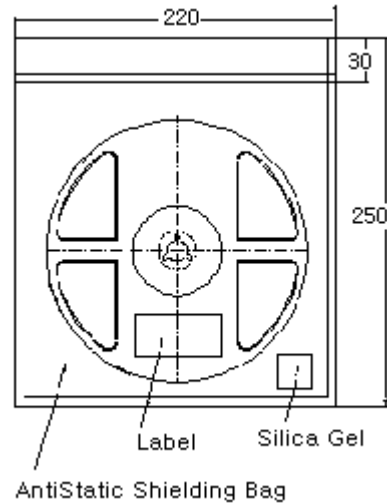
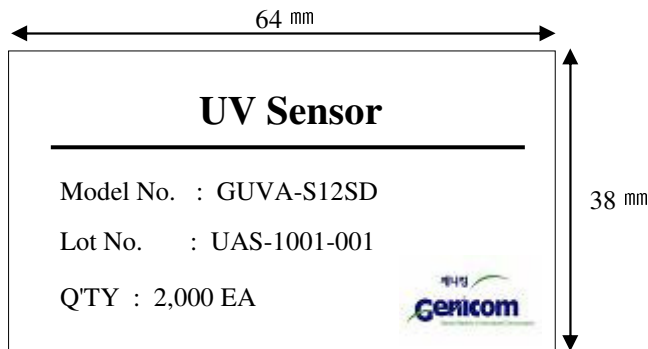
- Quantity : Max. 2000EA/reel
- Label : Model Name, Lot Number, Quantity
- The packing materials such as reel, carrier tape, cover tape and shielding bag are antistatic.

8. Packing

1) Reel



2) Al Shielding Bag

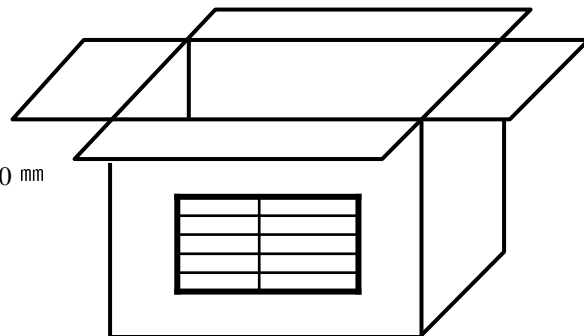


3) Outer Box

190 mm

| | |
|---------------|----|
| Name of Goods | |
| Model No. | |
| Order No. | |
| Quantity | EA |
| C/T No. | |

80 mm



Size : 280 x 300 x 250 mm³

4) Definition of Lot No.

【 EX. 】 : UAS - 1001 - 001

UAS : Product Model (UVA Sensor with Si-Encapsulant)

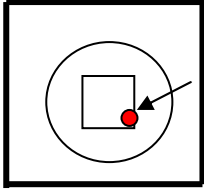
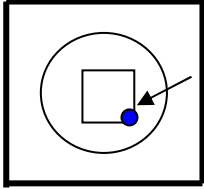
1001 : Product Year and Month

001 : Consecutive Number

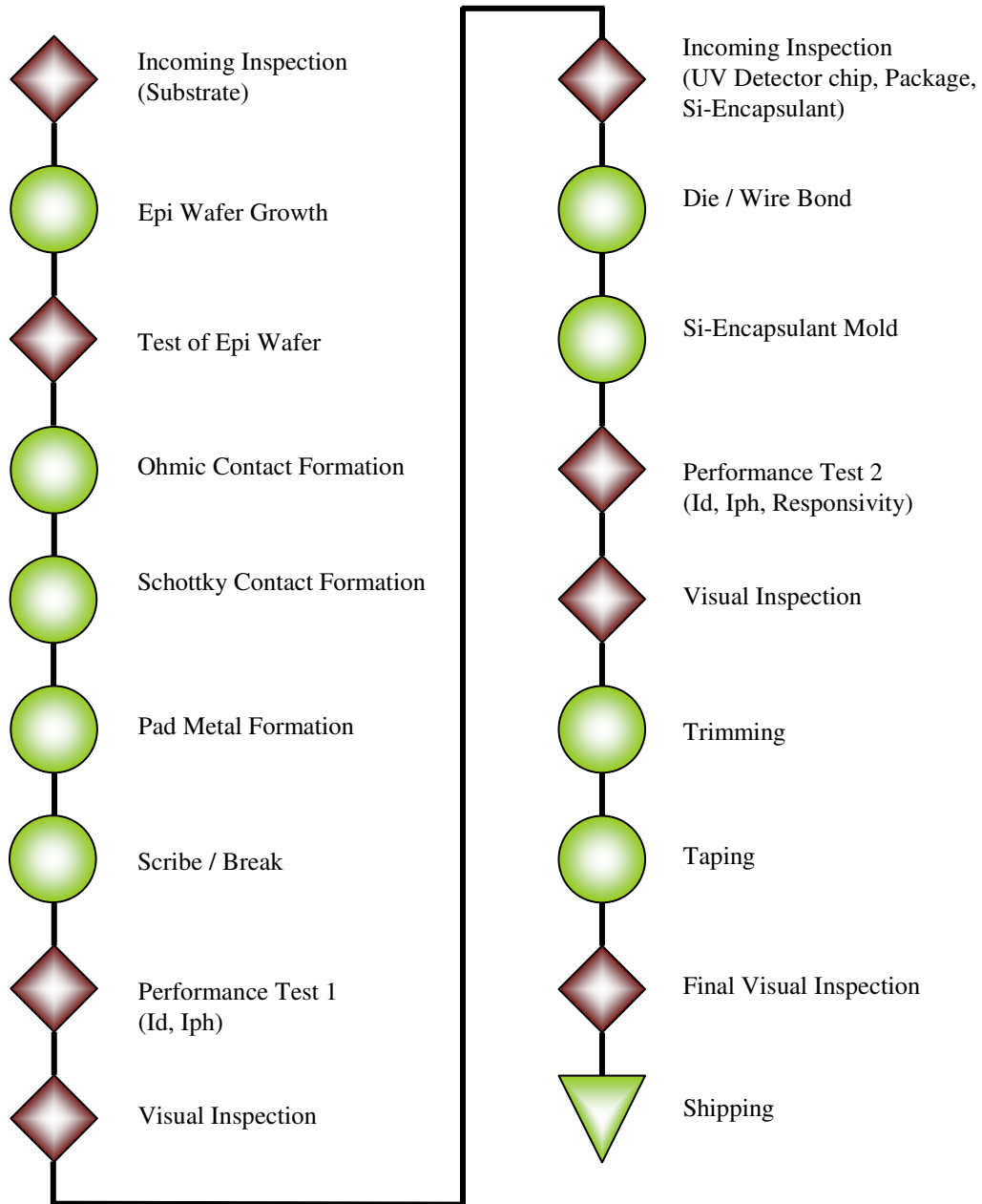
9. Cautions For Use UV Detector

- In case of cleaning, use only IPA.
- To be kept under clean environment.
For more than 3months storage, put in sealed containers
- It should be soldered within 7days after opening a seal.
- Use a wrist strap or anti-electrostatic gloves for handling, to protect from a static electricity and surge
- If you operate it over the absolute maximum ratings, that may cause a permanent damage.
- It can be damaged by working environment which is not shielded from a static electricity.
- Damaged products show unusual characteristics such as large leakage current, or do not work.

Appendix 1. Visual Inspection of Microscope (Defect limited sample)

| No. | Item | Image | Criterion of Judging |
|-----|--|---|--|
| 1 | Foreign Object (To apply same Criterion inside and outside Package) |  | < Top View > Fixed Foreign Object : < 0.3 mm •Not to be Foreign Objects on the Chip and Si-Encapsulant directly above Chip |
| 2 | Air Bubble |  | •Not to be Air Bubble in PKG |

■ Appendix 2. QC Flowchart



■ Appendix 3. UV sensor measurement method & caution

1) Equipment for measurement

- Jig for SMD3528 measure
- Picoammeter (Low current measuring instrument) (Ex. Keithley 6485)
- UV Lamp (Ex. Sankyo Denki UVA lamp, F4T5BLB)
- Standard sample (Genicom can offer about 10 samples)

2) Measurement method

- Turn on the UV Lamp and hold down about 10 minutes.
- Fixed regular distance between UV Lamp and Jig.
- Confirm the Photocurrent of standard sample.
Photocurrent of standard sample vary according optical power of UV lamp (distance from UV Lamp). For example, photocurrent is 200 nA.
- UV sensor (you should measure) put up the jig and read the photocurrent.

3) Precaution when measuring

- Distance between UV Lamp and UV sensor must be constant.
- When changing UV sensor, jig do not move.
- If there have vibration or movement, photocurrent may measure differently.
- We recommend you wear antistatic glove or wrist strip in order to protect UV sensor from static electricity.

4) Precaution when use the UV Lamp

- Limit coming and going to place UV Lamp is used & set up warning sign at entrance.
- Wearing a sunglass & glove . (UV cut off ratio : 99 ~ 100 %)
- Be careful that your body are not exposure to UV directly & limit time to exposure to UV.
- Do not watch the UV lamp without any protective outfit.
- If you do not use UV lamp, set up shutter can suspend UV and then attend to not exposure to outside.