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# SPECIFICATION

# REFERENCE

ISSUED DATE : **2010. 10. 20**

DOCUMENT NO : PDCM-5638M5-01

CUSTOMER :

DESCRIPTION : 3D SENSOR

MODEL NO. : K3D-5638M5

**[ KODENSHI KOREA CORP. ]**

| ISSUE DEPT. | | | PRODUCTION | | Q/A | |
|---|---|---|---|---|---|---|
| ISSUE | REVIEW | APPR'L | REVIEW | APPR'L | REVIEW | APPR'L |
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**[ CUSTOMER APPROVAL ]**

| ISSUE | REVIEW | | | | | |
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**[ REVISION]**

| NO | DATE | REVISION ITEMS | ISSUED BY | APPR'D BY |
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## 1. Scope

The K3D-5638M5 consist of a PIN Photodiode of high speed and a preamplifier IC in the package as an receiver for Infrared remote control systems

## 2. Features

- ◆ 2.7 ~3.7 Volt supply voltage, low power consumption
- ◆ Shielded against electrical field disturbance
- ◆ High immunity against ambient light
- ◆ Easy interface with the main board
- ◆ TTL and CMOS compatibility
- ◆ One mold package
- ◆ RoHS Compliance

## 3. Applications

Only for 3D TV glesses

## 4. Package Outline

See the attached Drawing No. K3D-56□□M5-ASY-01

## 5. Absolute Maximum Ratings (at 25℃ Unless otherwise notes)

| Parameter | Symbol | Ratings | Unit |
|---|---|---|---|
| Supply Voltage | Vcc | 6 | V |
| Operating Temperature | Topr | -20℃～80℃ | ℃ |
| Storage Temperature | Tstg | -25℃～85℃ | ℃ |
| Manaul soldering Temperature | Tsol | 260(Max 5 sec) | ℃ |
| Reflow Soldering Temperature (Pb free) | Tsol | 245(Max 10 sec) | ℃ |
| Moisture Sensitivity Levels | Level 5a ( ≤30℃ / 60% RH 24hours ) | | |

## 6. Reliability Test

| Parameter | Condition |
|---|---|
| High Temperature *1 | Ta= + 80℃, Vcc=5V t=240H |
| High Temperature/High Humidity *1 | Ta= + 85℃, 85%RH, Vcc=5V t=240H |
| Low Temperature *1 | Ta= − 30℃, Vcc=5V t=240H |
| Heat Cycle *1 | -25℃(0.5H) ～ + 85℃(0.5H) 20cycle |
| Dropping *2 | Test devices shall be dropped 3 time naturally onto hard wooden board from a 75㎝ height position |

Note : *1. electro-optical characteristics shall be satisfied after leaving 2hours in the normal temperature

*2. electro-optical characteristics shall be satisfied and no deforms and destructions of appearance. (excepting deforms of terminals)

## 7. Electrical Characteristics

[ Ta= 25℃, Vcc= 3.3 V

| Parameter | Symbol | Condition | | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|---|
| Supply Voltage Range | Vcc | - | | 2.7 | - | 3.7 | V |
| Current Consumption | Icc | No Input Signal | Vcc=3V | - | 0.56 | 0.73 | mA |
| Application Wavelength *3 | λp | - | | - | 810 | - | nm |
| B.P.F Center Frequency *4 | fo | - | | - | 37.9 | - | kHz |
| Arrival Distance *3 | L | 250Lux | 0 ° | 7 | - | - | m |
| | | | ±30 ° | 4 | - | - | m |
| H Level Output Voltage *3 | $V_{OH}$ | 30cm over the ray axis | | 3.0 | - | - | V |
| L Level Output Voltage *3 | $V_{OL}$ | | | - | - | 0.5 | V |
| H Level Output Pulse Width *3 | $T_{WH}$ | Burst Wave = 132㎲ Period = 1000㎲ | | 493 | 1000 | 989 | ㎲ |
| L Level Output Pulse Width *3 | $T_{WL}$ | | | 11 | 119 | 507 | ㎲ |
| Output Form | Active Low Output | | | | | | |

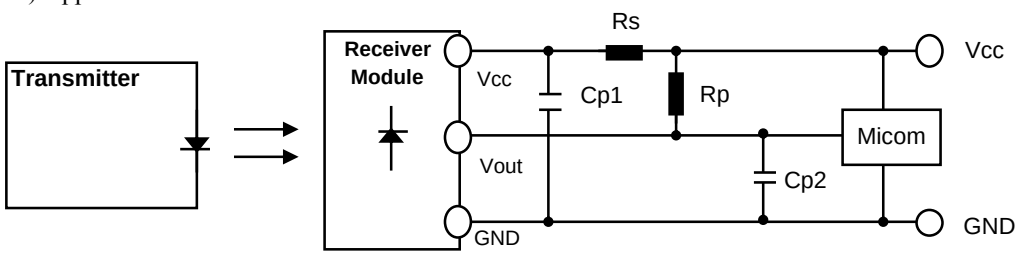
Note : *3. It specifies the maximum distance between emitter and detector that the output waveform satisfies the standard(8-2,3) under the conditions below against the standard transmitter

1) Measuring place : Indoor without extreme reflection of light

2) Ambient light source : Detecting surface illumination shall be irradiate 200±50Lux under ordinary white fluorescence lamp without high frequency lightning

3) Standard transmitter : Burst wave indicated in drawing(8-1) of standard transmitter shall be arranged to 800㎷p-p under the measuring circuit specified in drawing(8-2,3)

4) Application Circuit




* Don't recommend Rp & Cp2

1) Rs (Vcc input series resistor) : 100 ohm ~ 470ohm

2) Cp1(Vcc-GND terminal series Condenser) : 47uF ~ 100uF

3) Rp (Vcc-Vout terminal Pullup resistor) : Optional (when using 10K ohm or more )
When Rp is lower than 10k, Micom can't reply by a VoL rise.

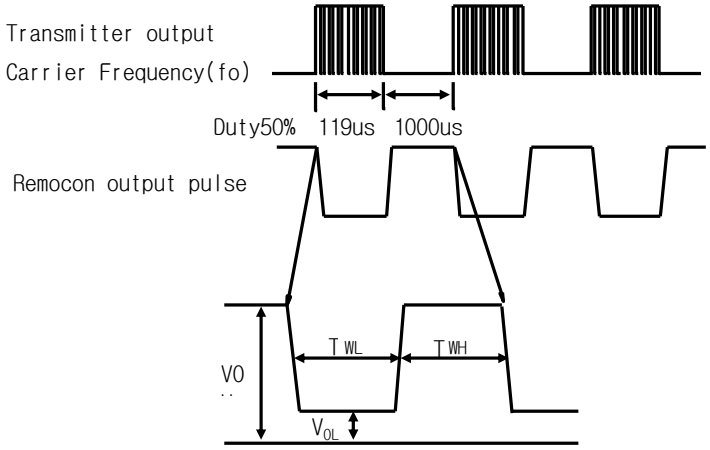
4) Cp2(Vout-GND terminal pararllel Condenser) : Optional (when using 100pF less than)

*4. B.P.F Center Frequency(fo) of each model is shown below

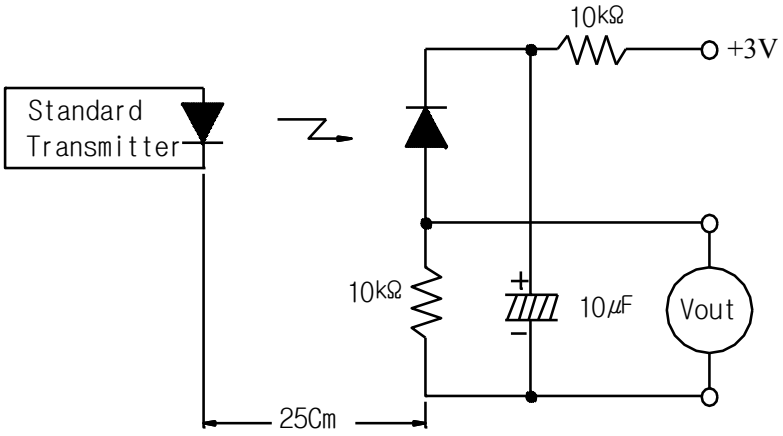
| Model NO. | B.P.F Center Frequency(㎑) |
|---|---|
| KSM-5638 Series | 37.9 |

## 8. Measure Method

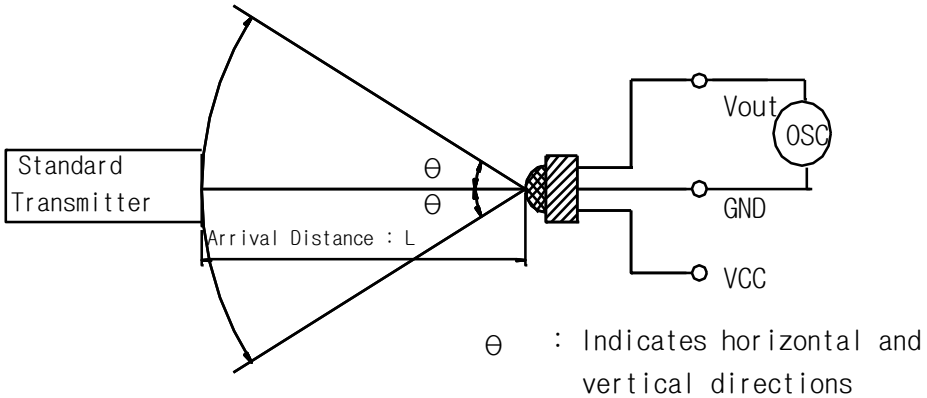
8-1. Output Pulse Width




8-2. Standard Transmitter




8-3. Test Condition of Arrival Distance



## 9. Standard Inspection

Among electrical characteristics, total quantity shall be inspected as below

9-1. Front distance between emitter and detector

9-2. Current consumption

9-3. H level output voltage

9-4. L level output voltage

## 10. Customer must check below clauses before using

10-1. When this infrared remote control detecting unit shall be adopted for wireless remote control, please keep the following standards.

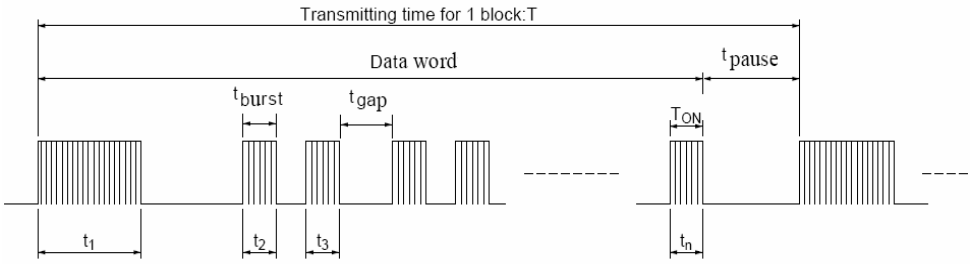
1) Data word length = Max. 1.2msec

2) tpause = Min. 16 msec ( Min tpause > 60Hz )

3) tBurst = Min. 145.1usec (if fc=37.9Hz, Min = 6Pulse, Duty=50'

4) tGap = Min.1000usec

5) above (1)~(4) should be all meet and all remote control button should be operated properly.




10-2. We recommand minimum 30cm distance between RC-M and transmitter for normal operating.
If the distance between RC-M and Transmitter is too near, it might not respond.

10-3. LCD Dimming have to be higher than Duty 3O% And frquency 100㎐(= period 10㎳)
Ex) Good (100㎐ Duty 3O%, 120㎐ Duty 2O%), No Good ( 100㎐ Duty 1O%, 80㎐ Duty 3O%)

10-4. If your condition doesn't meet the above statement, it might not operate properly.

## 11. Caution(When use and storage of this device)

11-1. Store and use where there is no force causing transformation or change in quality

11-2. Reflow maximum temperatuer is 250+0/-5℃ within max 10seconds within 24 hours From 30℃/60% humidity.

11-3. From 30℃/60% humidity there is not the reflowing problem within 24 hours, but when the temperature condition is higher or 24 hours lapse after opening, product guideline is encouraged to dry from 60 degree during 96 hours which are a temperatre where has not become the damage of reel packing.

11-4. Do not wash this device. Wipe the stains of diode side with a soft cloth.

11-5. The shield case shall be grounded on the PCB pattern. There are two cases, one is that shield case
If the receiver modules of shield case is not becoming ground connection, there is a possibility of being weak in the EMI(Electronic Microwave Interperence) condition.

11-6 Solder pad within the condition of ratings. after soldering do not add extrorse force.

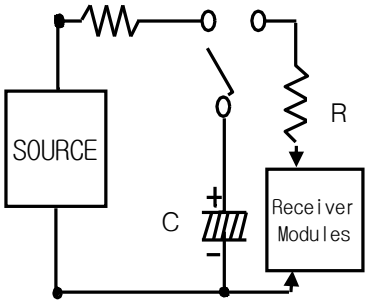
11-7. Put decoupling device between Vcc and GND for reduce the noise from power supply line.
recommand Vcc-GND 47㎌ and Vcc- 100Ω. Decoupling device should be near receiver modules.

11-8. The decrease in distance, the output noise, the malfunction, etc. might occur because of a surrounding electromagnetic environment.

11-9. To prevent static electricity damage to the Pre-AMP make sure that the human body, the soldering iron is connected to ground before using

11-10. This device has to control of static electricity

KODENSHI Korea Corp. guarantees a K3D-5638M5 up to M.M 200V , HBM 2KV




M.M = MACHINE MODEL(Resistance: 0KΩ Capacitor: 200pF)

HBM = HUMAN BODY MODEL( Resistance: 1.5kΩ Capacitor: 100pF)

11-11. This device is not design to endure radiate rays and heavily charged particles.

## 12. Period of Guarantee and Extent of Guarantee

12-1.Period of Guarantee

1 year after designated place.

12-2.Extent of Guarantee

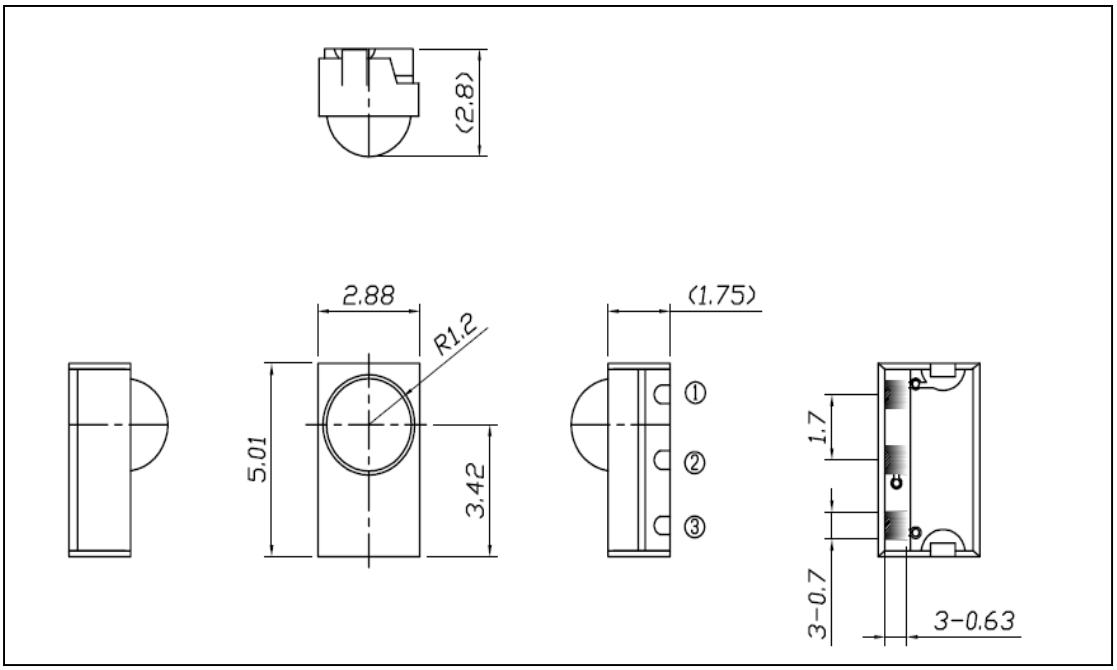
KODENSHI Korea Corp. Shall supply the replacements against defects that will caused from KODENSHI fault.

## 13. Others

In case where any trouble or questions arise, both parties agree to make full discussion covering the said problem

## 14. DIMENSION

14-1. DIMENSION




Drawing No : K3D-56□□M5-ASY-01

- Pin configuration

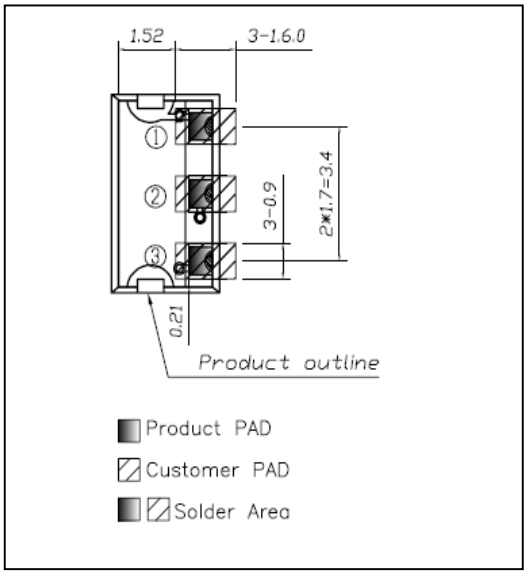
① GND

② Vcc

③ Vout

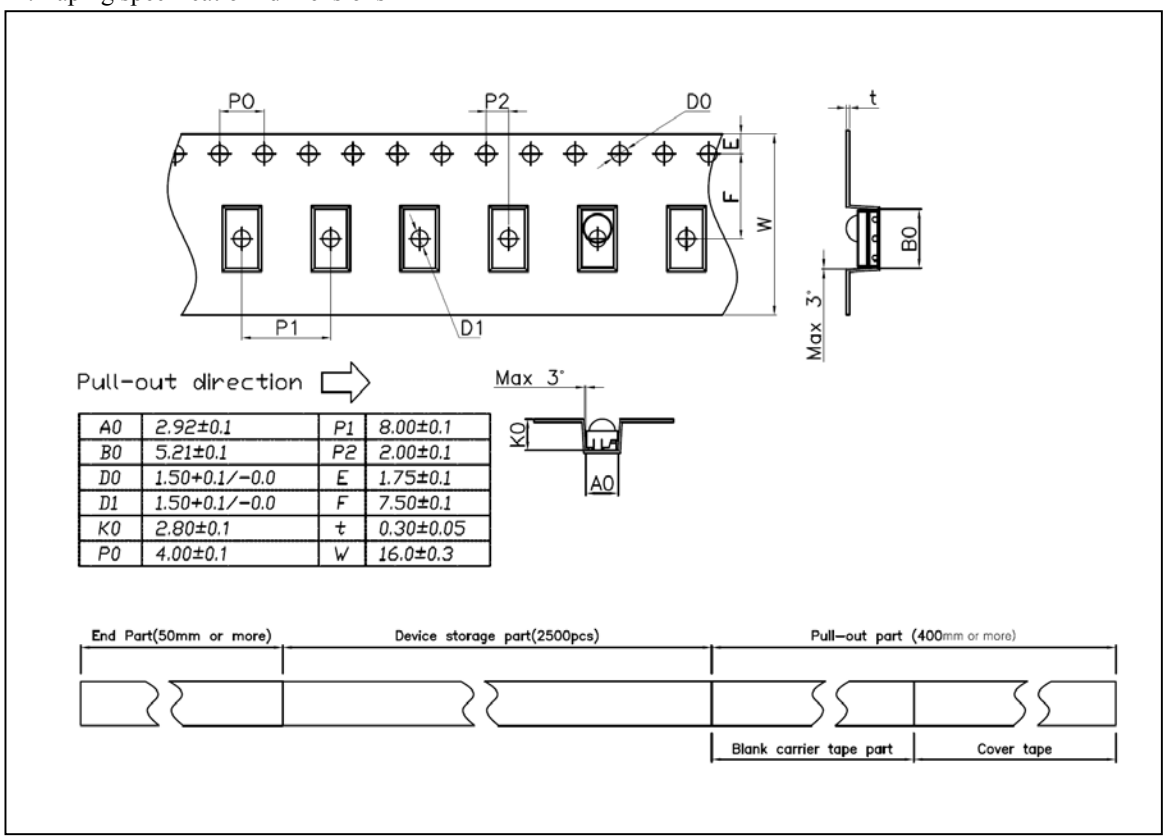
1. Unspecified tolerance : ± 0.3mm
2. Reference dimension : ( )
3. Case material : SPTE
4. Case thickness : 0.15mm±0.02mm
5. Electrode material : Cu
6. Electrode terminal finish (■ ▨ area) : Gold plating
7. Mold resin : Epoxy resin
8. Product mass : 0.07g ± 0.015g

14-2. PCB Pattern Guide



## 15. TAPING

15-1. Taping specification·dimensions

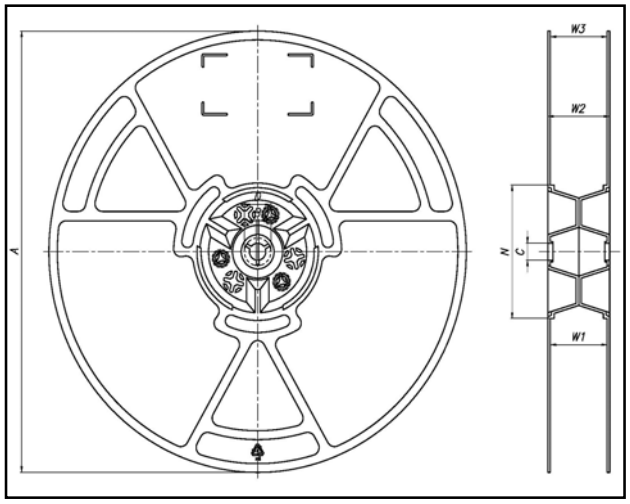



| | | | |
|---|---|---|---|
| A0 | 2.92±0.1 | P1 | 8.00±0.1 |
| B0 | 5.21±0.1 | P2 | 2.00±0.1 |
| D0 | 1.50+0.1/−0.0 | E | 1.75±0.1 |
| D1 | 1.50+0.1/−0.0 | F | 7.50±0.1 |
| K0 | 2.80±0.1 | t | 0.30±0.05 |
| P0 | 4.00±0.1 | W | 16.0±0.3 |

15-2. Reel specification·dimensions

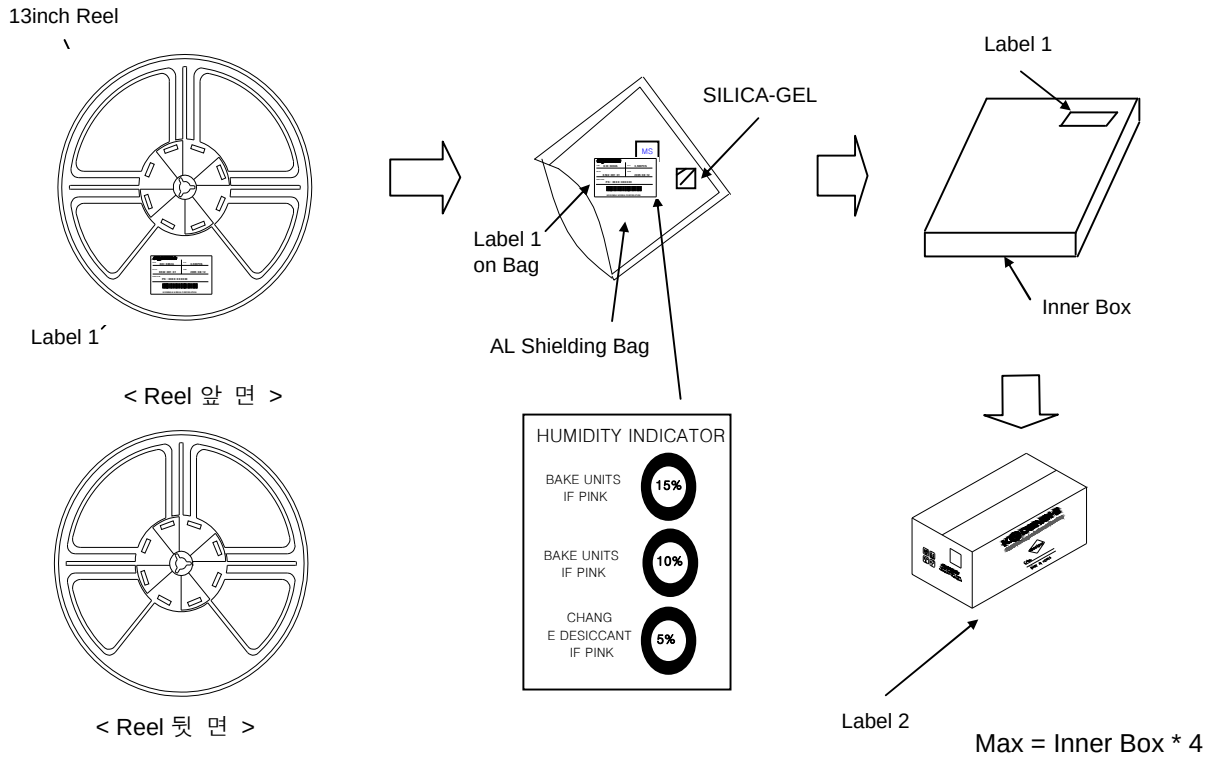
Material : PS Conductivity

The minimum packing quantity : 2,500pcs/reel




| Size | A | B | C | D | N | W1 | W2 | W3 |
|---|---|---|---|---|---|---|---|---|
| 16mm | 330±3.0 | 1.5min. | min.12.8 | 20.2min. | 100+5.0-1.0 | 16.4+3.0,-0.0 | 20.4±2.0 | 17.65+1.75,-1.0 |

## 16. PACKING




Tapping & Inner Box Label

| KODENSHI AUK | |
|---|---|
| TYPE<br>**K3D-5638M5** | Q'TY<br>**2,500 PCS** |
| LOT No. **K901-001-01** | DATA **2009. 01. 01** |
| USER CODE | **RoHS** |
| S | |
| AUK CORP. | |

*Lot No. = K 9 0 1 - 001 - 01

Box Number
Product Week
Product Year
KODENSHI

Box(3) Label

| KODENSHI AUK | |
|---|---|
| TYPE<br>**K3D-5638M5** | Q'TY<br>**10,000 PCS** |
| LOT No. **K901-M0001** | DATA **2009. 01. 01** |
| USER CODE | **RoHS** |
| M | |
| AUK CORP. | |

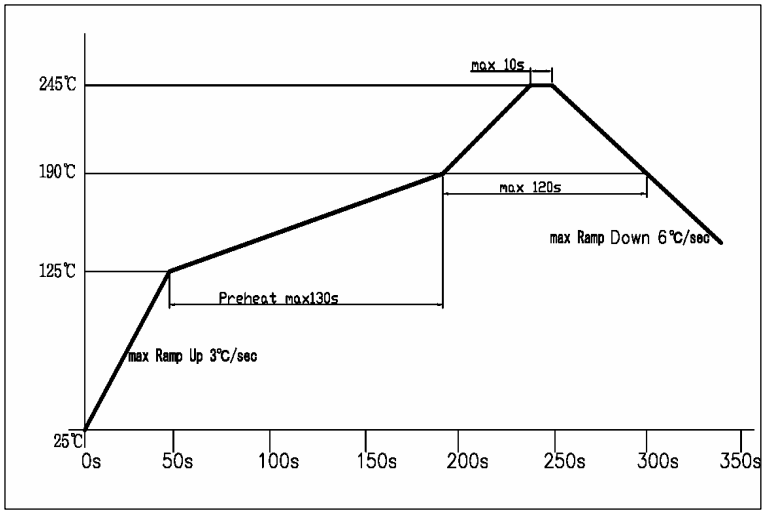
| | size (W*L*H ㎜) | count |
|---|---|---|
| Tapping | 13inch Reel | 2,500 PCS |
| Inner Box | 335*342*50 | 2,500 PCS |
| Box3 | 530*370*270 | 10,000 PCS |

## 17. REFLOW

17-1. Regarding preheat and main heating, please set the temperature according to the reflow temperature profile as below.

17-2. Even it is within the temperature profile condition as below, the disconnection of wire in the package might be caused by the stress join the package due to the PCB's curving and bending.

Please take care about the condition of reflow machine when use.




Recommended lead free reflow soldering temperature profile.

17-3. Set the fumace temperatures for per-heating and heating in accorance with the reflow temperature profile as shown in the diagram.

Exercise extreme care to keep the maximum temperature below 245℃.

The temperature shown in the profile means the temperature at the device surface.

Since there is a temperature difference between the component and the circuit board. It should be verified that the temperature of the device is accurately being measured.

17-4. Please do not pile something on the product at reflow soldering because the transformation of the package resin may caused.

17-5. When you do the reflow soldering twice, please process second reflow soldering within 8 hours after finish the first soldering

17-6. Handing after reflow should be done only after the work surface has been cooled off.

## 18. MANUAL SOLDERING

18-1. Use a soldering iron of 25W or less. Adjust the temperature of the soldering iron below 300 ℃.

18-2. Finish sodering within three seconds.

18-3. Handle products only after the temperature has cooled off.

18-4. To avoid the product is transformed and breakdown, it needs to take care that the power should not join to the product at soldering or immediately after soldering.