

■ Product Summary

| | |
|-------------|---------------------------------|
| Type | Bipolar IC with Photo Detectors |
| Application | OEIC for BD Front Monitor |
| Structure | Silicon Monolithic Bipolar IC |

■ Absolute Maximum Ratings

| Item | Symbol | Ratings | Unit | Remarks |
|-------------------------------|------------------|-----------|------|---------|
| Operating supply voltage | V _{CC} | 6 | V | |
| Power dissipation | P _D | 250 | mW | |
| Operating ambient temperature | T _{opr} | -10 ~ +75 | °C | |
| Storage temperature | T _{stg} | -40 ~ +85 | °C | |

■ Operating Conditions

| Item | Symbol | Condition | Min. | Typ. | Max. | Unit |
|--------------------------|-----------------|-----------|------|------|------|------|
| Operating supply voltage | V _{CC} | | 4.3 | 5.0 | 5.5 | V |

■ Electrical-Optical Characteristics

(T_a=25 °C±3 °C, V_{CC}=5.0 V, R_L=10 kΩ, C_L=20 pF, V_R=BFh)

| Item | Symbol | Mode | Condition | Min. | Typ. | Max. | Unit |
|--------------------------------|---------------------|-------------|---|-------|------|-----------------|-------|
| Reference voltage | V _{ref} | | T _a =25 °C, V _{CC} =5 V | 1.9 | 2.0 | 2.1 | V |
| Supply current | I _{CC} | | No Signal Condition | — | 14 | 24 | mA |
| Supply current (Sleep) | I _{CC(SL)} | Sleep mode | No Signal Condition | — | 850 | — | μA |
| High level input voltage | V _{IH} | | (Serial interface) | 2.4 | — | V _{CC} | V |
| Low level input voltage | V _{IL} | | (Serial interface) | 0 | — | 0.7 | V |
| Output sensitivity1 (Note1) | Gain1 | High mode | λ =405 nm (BD) | -20 % | 4.65 | +20 % | mV/μW |
| | | Middle mode | λ =405 nm (BD) | -20 % | 2.39 | +20 % | mV/μW |
| | | Low mode | λ =405 nm (BD) | -20 % | 1.24 | +20 % | mV/μW |
| Output sensitivity2 (Note1) | Gain2 | High mode | λ =650 nm(DVD) | -20 % | 7.83 | +20 % | mV/μW |
| | | Middle mode | λ =650 nm(DVD) | -20 % | 4.04 | +20 % | mV/μW |
| | | Low mode | λ =650 nm(DVD) | -20 % | 2.08 | +20 % | mV/μW |
| Output sensitivity3 (Note1) | Gain3 | High mode | λ =780 nm(CD) | -20 % | 7.0 | +20 % | mV/μW |
| | | Middle mode | λ =780 nm(CD) | -20 % | 3.61 | +20 % | mV/μW |
| | | Low mode | λ =780 nm(CD) | -20 % | 1.86 | +20 % | mV/μW |

(Note1) The offset voltage is not contained.

■ Electrical-Optical Characteristics

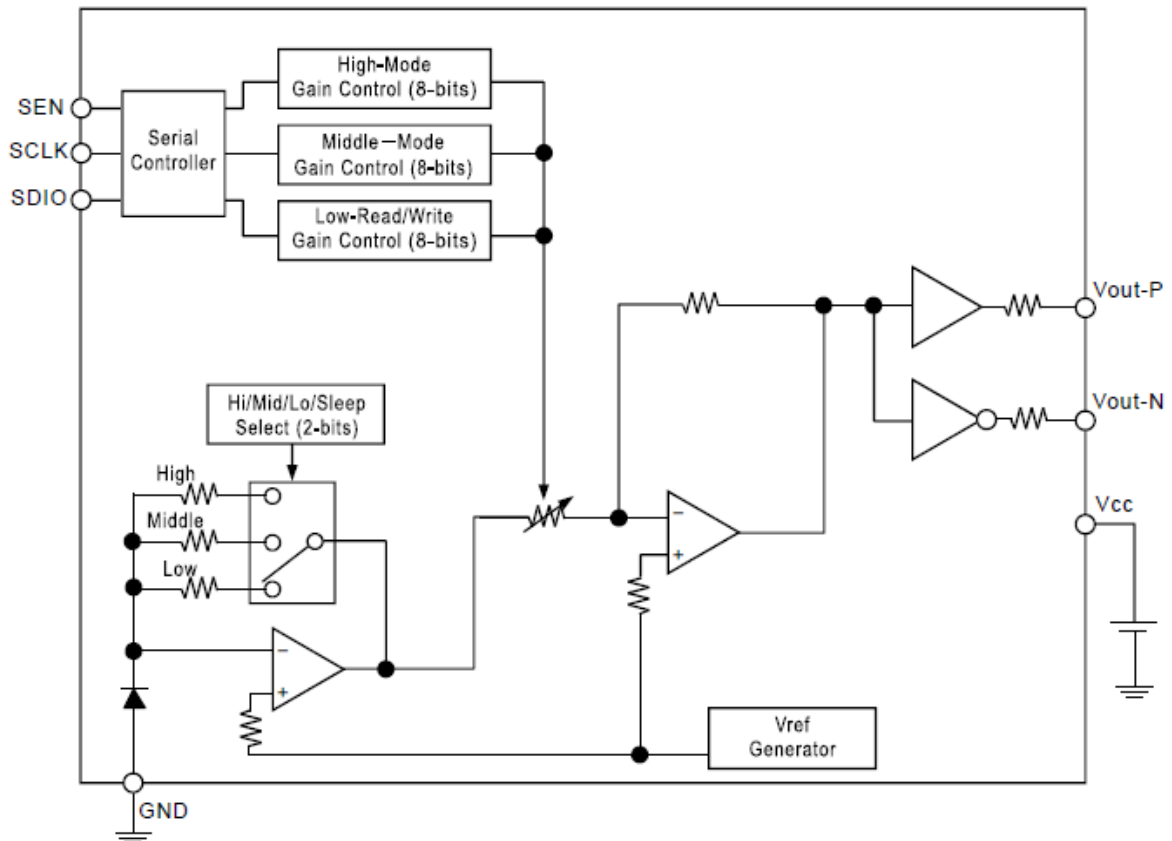
(Ta=25 °C±3 °C, Vcc=5.0 V, RL=10 kΩ, CL=20 pF, VR=BFh)

| Item | Symbol | Mode | Condition | Min. | Typ. | Max. | Unit |
|--|-----------------------|-------------|--------------------------------------|------------|------------|---------------|-------|
| Drift of output offset voltage | dV _{OFF} | High mode | No Signal Condition, VoP-VoN | -30 | 0 | +30 | mV |
| | | Middle mode | No Signal Condition, VoP-VoN | -30 | 0 | +30 | mV |
| | | Low mode | No Signal Condition, VoP-VoN | -30 | 0 | +30 | mV |
| Maximum output voltage (Note2) | V _{OM} | High mode | No Signal Condition, VoP-VoN | 2.0 | 2.2 | — | V |
| | | Middle mode | No Signal Condition, VoP-VoN | 2.0 | 2.2 | — | V |
| | | Low mode | No Signal Condition, VoP-VoN | 2.0 | 2.2 | — | V |
| Drift of output offset voltage by temperature (Note3) | dV _{OFF} /Ta | High mode | No Signal Condition, Ta=-10 °C~75 °C | -100 | 0 | +100 | μV/°C |
| | | Middle mode | No Signal Condition, Ta=-10 °C~75 °C | -100 | 0 | +100 | μV/°C |
| | | Low mode | No Signal Condition, Ta=-10 °C~75 °C | -100 | 0 | +100 | μV/°C |
| Cutoff frequency (Note3) | f _c | High mode | f-3dB (Base 1 MHz) | 70 | 100 | — | MHz |
| | | Middle mode | f-3dB (Base 1 MHz) | 70 | 100 | — | MHz |
| | | Low mode | f-3dB (Base 1 MHz) | 70 | 100 | — | MHz |
| Settling time (Note3) | t _{sel} | High mode | | — | 9 | 12 | ns |
| | | Middle mode | | — | 9 | 12 | ns |
| | | Low mode | | — | 9 | 12 | ns |
| Range of Gain width (2nd Amp) | V _{odH} | | Gain : FFh~BFh~00h | (0) FFh | (6) BFh | (13.8) 00h | dB |

(Note2) Saturation value

(Note3) Design guaranteeing item.

■ Circuit Function Block Diagram



■ Explanation for Terminal Function

| No. | Terminal Name | No. | Terminal Name |
|-----|---------------|-----|---------------|
| ① | GND | ⑤ | NC(GND) |
| ② | SEN | ⑥ | Vout-N |
| ③ | SDIO | ⑦ | Vout-P |
| ④ | SCLK | ⑧ | Vcc |

■ Technical Data

1. Serial interface timing specification

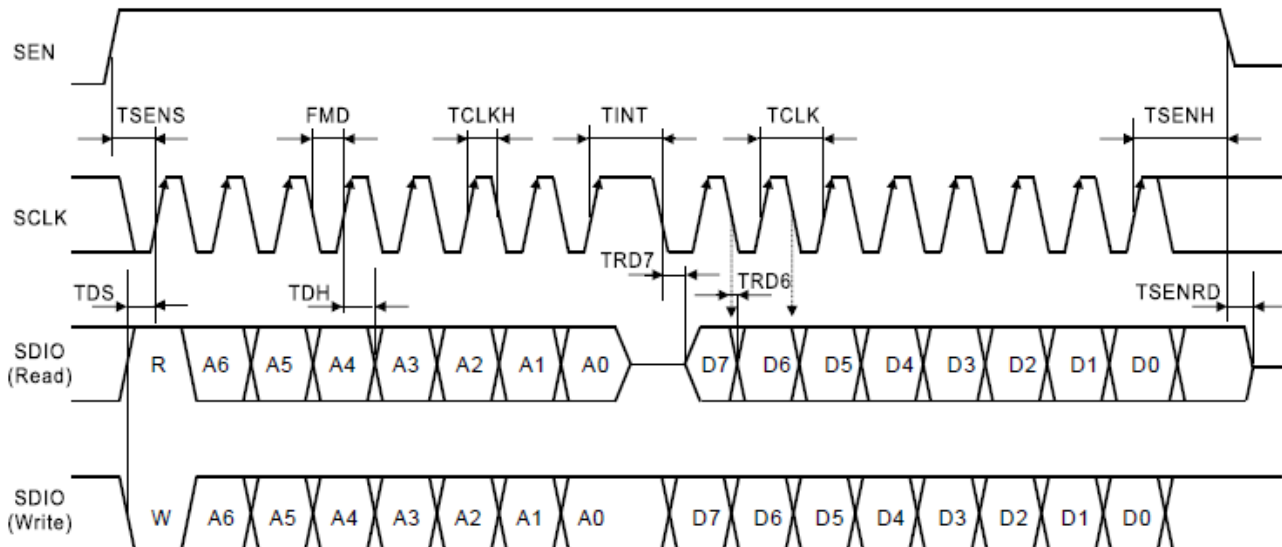


Figure Serial interface protocol (Register write & read)

The program register that sets operation in FMD is composed of the 7-bit address and the 8-bit data, the address and data are input to the serial from the SDIO terminal.

It is input from the SDIO terminal in order of RWB (=“L”), the address, and data at “Write” when SEN=“H” period. Please input the address and data with MSB first.

The address and the data input from the SDIO terminal are taken into the register synchronizing with rising edge of SCLK.

It is input from the SDIO terminal in order of RWB (=“H”), the address, and data at “Read” when SEN=“H” period. Please input the address with MSB first.

The input address is loaded into the inside at the rising edge of SCLK. Then the data that corresponds to the set address is output from the SDIO terminal.

Output data outputs D7 synchronizing with the falling edge of SCLK that took A0, then it's output synchronizing with the falling edge of SCLK(D6~D7).

| Item | Symbol | Reference value | | | Unit |
|-------------------------------|---------|-----------------------|-----------------|------------------------|------|
| | | Min. | Typ. | Max. | |
| SCLK cycle | TCLK | 1 000 | — | — | ns |
| SDIO setup time | TDS | 150 | — | — | ns |
| SDIO hold time | TDH | 150 | — | — | ns |
| SCLK,SEN setup time | TSENS | 350 | — | — | ns |
| SEN hold time (Write mode) | TSENH | 750 | — | — | ns |
| SCLK High time | TCLKH | 400 | — | — | ns |
| SCLK Low time | TCLKL | 400 | — | — | ns |
| Write - Read interval | TINT | 400 | — | — | ns |
| Read(D7) output time | TRD7 | — | — | 20 | ns |
| Read(D6) output time | TRD6 | — | — | 15 | ns |
| SDIO Hi-Z output time | TSENRD | — | — | 10 | ns |
| Output voltage (Read mode Lo) | VRD(Lo) | -0.3 | 0 | V _{cc} +15 % | V |
| Output voltage (Read mode Hi) | VRD(Hi) | V _{cc} +85 % | V _{cc} | V _{cc} +0.3 V | V |

2. Register Map

2.1 Table

| Address A6 : A0 | Application | D7 | D6 | D5 | D4 | D3 | D2 | D1 | D0 | Access | Gain setup Remarks | |
|---------------------|-------------|-------------------------------|----------------------|-------|----|----|----|----|----|--------|----------------------------------|-----------------------------------|
| 1110000 (70 hex) | CONTROL | Spare | High/Middle/Lo/Sleep | Spare | | | | | | | R/W | Register for various mode setting |
| 1110001 (71 hex) | High-Gain | High-Gain 256 level (8 bit) | | | | | | | | R/W | Register for High-Gain setting | |
| 1110010 (72 hex) | Middle-Gain | Middle-Gain 256 level (8 bit) | | | | | | | | R/W | Register for Middle-Gain setting | |
| 1110011 (73 hex) | Low-Gain | Low-Gain 256 level (8 bit) | | | | | | | | R/W | Register for Low-Gain setting | |

(1) Initial value

All bit is "0" in the default value after the power supply is turned on.

(2) Register reset

An initial value is only decided when the power supply is turned on, and Register reset isn't especially installed.

The former state is held at the sleep.

(3) An address other than 70, 71, 72, 73hex

In case of access to unused address.

At the showing of "Write" : The mode is not stored in the register.

At the showing of "Read" : No output data. (Hi-Z)

2.2 Detailed explanation

(1)Address 70 hex

| A6 | A5 | A4 | A3 | A2 | A1 | A0 | D7 | D6 | D5 | D4 | D3 | D2 | D1 | D0 |
|----|----|----|----|----|----|----|-----------------|----|----|----|----|----|----|----|
| 1 | 1 | 1 | 0 | 0 | 0 | 0 | Hi/Mid/Lo/Sleep | | | | | | | |

| D6 | D5 | Mode |
|----|----|-------------|
| 0 | 0 | Sleep Mode |
| 0 | 1 | High Mode |
| 1 | 0 | Middle Mode |
| 1 | 1 | Low Mode |

| A6 | A5 | A4 | A3 | A2 | A1 | A0 | D7 | D6 | D5 | D4 | D3 | D2 | D1 | D0 |
|----|----|----|----|----|----|----|-------|----|----|-------|----|----|----|----|
| 1 | 1 | 1 | 0 | 0 | 0 | 0 | Spare | | | Spare | | | | |

Spare data bit

(2)Address 71 hex

| A6 | A5 | A4 | A3 | A2 | A1 | A0 | D7 | D6 | D5 | D4 | D3 | D2 | D1 | D0 |
|----|----|----|----|----|----|----|-------------|----|----|----|----|----|----|----|
| 1 | 1 | 1 | 0 | 0 | 0 | 1 | High - Mode | | | | | | | |

The gain setting of the High-mode is done.

(3)Address 72 hex

| A6 | A5 | A4 | A3 | A2 | A1 | A0 | | D7 | D6 | D5 | D4 | D3 | D2 | D1 | D0 |
|----|----|----|----|----|----|----|--|---------------|----|----|----|----|----|----|----|
| 1 | 1 | 1 | 0 | 0 | 1 | 0 | | Middle - Mode | | | | | | | |

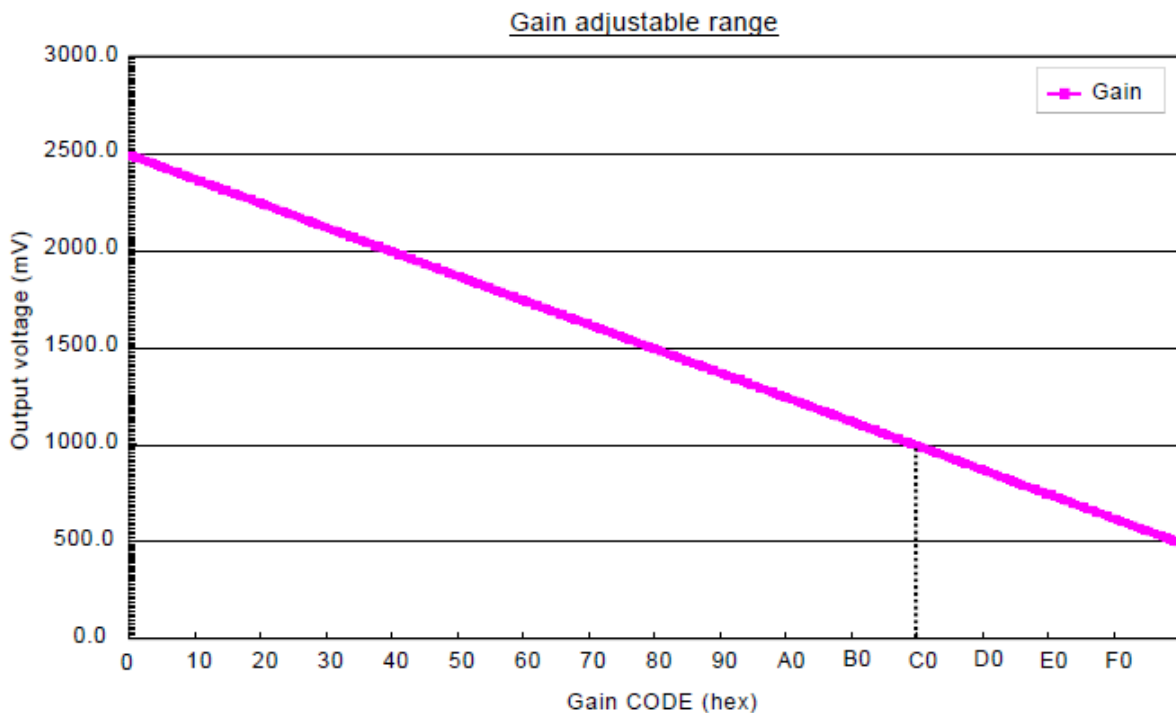
The gain setting of the Middle-mode is done.

(4)Address 73 hex

| A6 | A5 | A4 | A3 | A2 | A1 | A0 | | D7 | D6 | D5 | D4 | D3 | D2 | D1 | D0 |
|----|----|----|----|----|----|----|--|------------|----|----|----|----|----|----|----|
| 1 | 1 | 1 | 0 | 0 | 1 | 1 | | Low - Mode | | | | | | | |

The gain setting of the Low-mode is done.

3. DC Sensitivity setting (Reference)



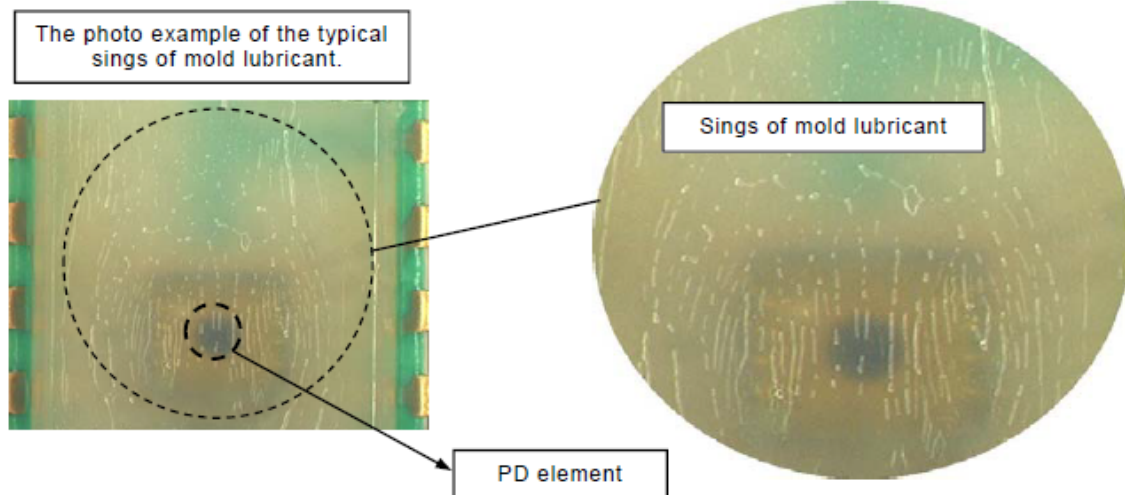
The gain can be adjusted within the range of +7.8 dB from -6 dB based on BFh (0 dB). Vertical axis is plotted Gain. This chart shows that Vout-P–Vout-N is 1V at BFh.

■ Visual Inspection Standard

- Visual inspection is executed to find out the foreign particles or spots on the PD element, externals related to electricity or optical characteristic defect.
- Inspection equipment: With magnifying glass (×4)

| Item | | Limit standard |
|--|------------------------|--|
| Foreign particles Spots Scratches on surface | On the PD element | The foreign particles, spots or scratches of 0.1 mm~0.2 mm × 0.1 mm ~0.2 mm are OK up to 1. The foreign particles, spots or scratches within 0.1 mm × 0.1 mm are OK up to 4. No movable foreign particles. |
| | The Other parts | The foreign particles, spots or scratches of 0.25 mm~0.5 mm × 0.25 mm~0.5 mm are OK up to 2. The foreign particles, spots or scratches within 0.25 mm × 0.25 mm are OK up to 4. No movable foreign particles. |
| Void or lacks of resin Bubbles | On the PD element | The voids, lacks or bubbles of 0.1 mm~0.2 mm × 0.1 mm~0.2 mm are OK up to 1. The voids, lacks or bubbles within 0.1 mm × 0.1 mm are OK up to 4. |
| | The Other parts | The voids, lacks or bubbles of 0.25 mm~0.5 mm × 0.25 mm~0.5 mm are OK up to 2. The voids, lacks or bubbles within 0.25 mm × 0.25 mm are OK up to 4. |
| Delaminations of resin Crack | All parts of the resin | No cracks or delaminations identified with magnifying glass inspection of all aspects of the package. |
| Signs of mold lubricant | All parts of the resin | Signs of the mold lubricant on the aspects of package are all acceptable. |

(About signs of mold lubricant)



The ruggedness on the surface of the resin seen in the photograph above is the signs of the mold lubricant, not scratches.

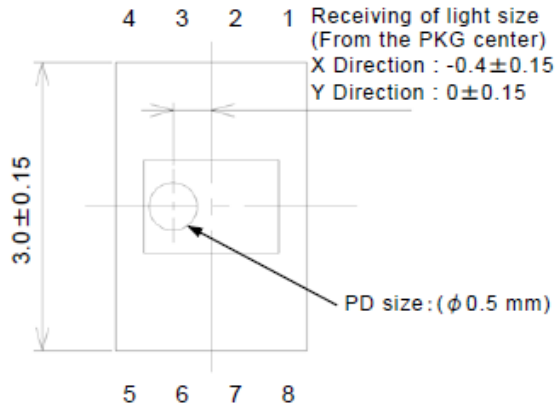
To improve friction of the resin when molding is built, mold lubricant is coated.

Finally, As it all numbers is executed for an optical or electricity characteristic inspection, there is no problem for the performance.

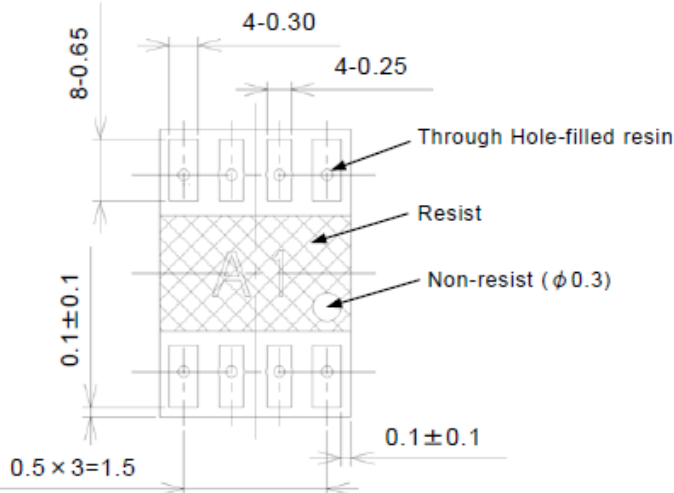
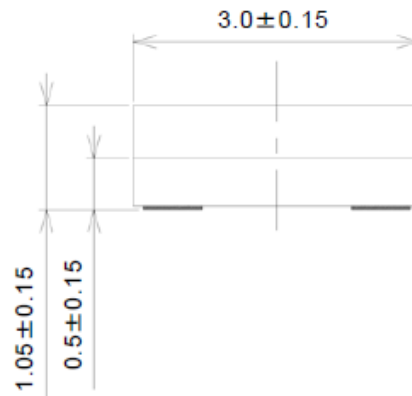
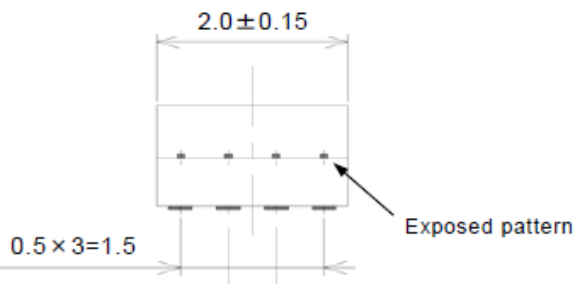
When the doubt of other externals is caused, it is assumed the one on which it separately confers.

Outline

Unit:mm



| Item | Contents |
|----------------------|-----------------|
| Pin Material | Cu |
| Mold Material | Epoxy |
| Print Board Material | BT Resin |
| Pin Process | Ni and Au plate |



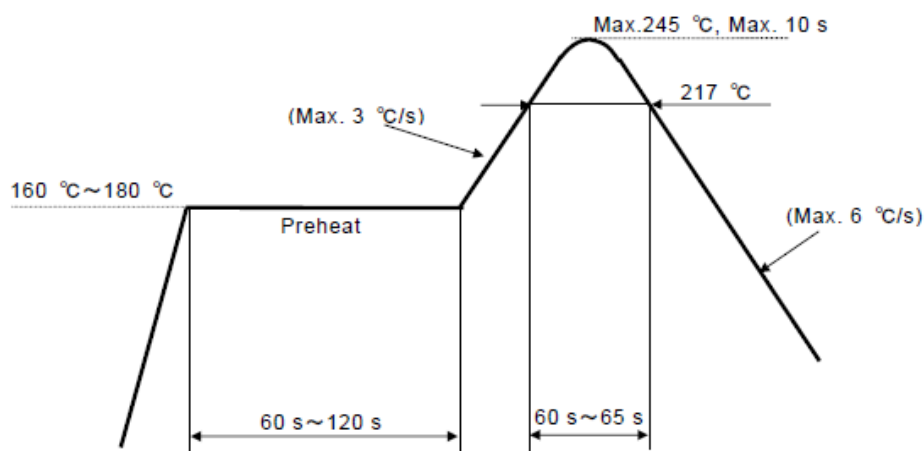
- 1: GND
- 2: SEN
- 3: SDIO
- 4: SCLK
- 5: NC(GND)
- 6: Vout-N
- 7: Vout-P
- 8: Vcc

- (Note1) Dimension tolerance without instructions should be ± 0.075 mm.
- (Note2) Cutting pattern rest: Max. 0.1 mm
- (Note3) Isolate electrically: both end sides of 3.0 mm direction.
- (Note4) Please do not connect the Pin No.5 NC terminal with the ground.

■ Recommended Soldering Conditions

1. Reflow soldering

Show recommendable conditions.



(Soldering time : Maximum 1 time)

It is temperature profile at surface of printed board.

2. Hand soldering

- Please use the soldering iron within 350 °C and 3 s. (1 time)
It's recommended to use soldering iron with temperature controller.
- Please don't give mechanical stress to the package or the terminal when soldering.
Especially, please be careful pattern disconnection, because gold pattern is weak to mechanical stress.
- Do not also give a mechanical stress to the device and the board adjusted right after soldering.
(Please avoid reusing the product to which once has been mounted.)

■ Handling Instructions

1. Storage limit of un-opened product

To prevent humid absorption while transporting or storing the product, humidity proof packing is made using a Al laminate bag (with a silica gel).

Pay attention because that a indicator in a silica gel change color.

Be complete to unseal every 1 bag and carry out reflow soldering promptly, because moisture absorption of a product advances rapidly and characteristic defectiveness occurs by a heat stress of reflow soldering in the case that it is worst.

It is recommended the product be used within a year.

Storage condition: Un-opened, 10 °C~30 °C, less than 60 %RH

2. Storage limit of opened product

Humidity proof packing is made using a Al laminate bag (with a silica gel).

After unpacking, It is recommended the product be used within 48 h under 10 °C~30 °C and less than 60 %RH.

3. Baking processing of to that eliminates humidity

The product that passed total 48 hours after unpacking, it must be baked in the following condition before soldering.

1). Storage condition

·Temperature: 10 °C~30 °C, Humidity: under 60 %

2). Baking

·The product without taping.

Baking condition ... 115 °C/4 h~5 h.

And baking should be one time.

·The products with taping.

Baking condition ... 90 °C/24 h~36 h

And baking should be one time.

However, the product that passed 48 h~72 h after opening the aluminum lamination bag can do baking processing only one times at 50 °C~60 °C, 72 h~96 h.

(Note)

The poor characteristic may generate on the products when a great deal of neglect time after the opening in your process.

Also under the products with taping, there is a possibility that the strength of cover tape peeling fluctuates and the mounting error occurs after baking.

Therefore, please take sufficient advance checks and control in your process.

Meanwhile, please note that we are not responsible for the problem occurred except in the condition above.

4. Cleaning

- Do not wash the product which is to be reflow soldering.
- Enforce in the following condition without fail when a washing is done after reflow soldering.
 - (1) Alcohol is recommended for cleaning.

Do not use a chlorine solvent, which may cause damage to the epoxy and product and deterioration of the elements.
 - (2) The condition of "below 28 kHz/10 W per liter and within 30 s" is generally recommended for ultrasonic, cleaning, however, please confirm that the test result on mounting condition after assembly has no problem before it's actually adapted.
 - (3) Avoid the use of brushing because it sometime damages detector surfaces.

5. Noise

Please consider that the use in the place where the influence can be predicted by the noise.
(Electromagnet Noise, power supply noise, outside rebellion light noise etc.)

6. Static electricity

- Take the adequate static electricity measures .

Give the static electricity measures that is enough at use consideration.

 - (1) Please earth the user when the products are handled by Hand.
 - (2) Do not insert or remove the products when the source voltage is supplied, otherwise it would break them.
 - (3) Please insert the terminal in place, otherwise the product would be broken.

If it's once inserted improperly, please do not use it.

7. Others

- Do not add an abnormal voltage such as reverse voltage, over shoot voltage, under shoot voltage, etc.
- Photo-IC is the product which easy to be influenced by the noise.

Therefore, it may be affected by the perimeter circuit and the change of electronic parts to have an operation problem.
Careful study and discussion are required in the case of specification change.
- Optical-electrical characteristics are guaranteed as being based on our measurement condition.

Consequently, please check it sufficiently with your set for use.
- Please note that the stress doesn't join the product when it mounts on the set substrate etc. , and the substrate is divided.

The back electrode peels off when an excessive stress joins and it becomes destruction.

■ Thermal Stress to Optical Device

Since light transmissivity is important for the package resin of optical devices (LED's, photodiodes, photo ICs, Photosensors, photocouplers), it is necessary for resin to contain additives in it.

For this reason, it has a lower thermal deformation temperature, compared with the package resin for ICs, LSI's and so on and is in the vicinity of the maximum storage temperature.

Unless it is designed under the operating conditions, taking into an operating current and ambient conditions into account, the optical devices may be destroyed due to thermal stress caused to the operating optical devices and this may cause lower light output and disconnection.

■ Guarantee

The warranty will be valid only within the reliability test results or the items and terms of the reliability assurance standard.

It is also limited to that of the delivered product itself and we are not responsible for the labor cost for replacement work, compensation for loss and the like.

The following cases are onerous since they are out of our guarantee even during the guarantee period:

- Troubles resulting from careless handling or erroneous use.
- Troubles resulting from unreasonable repair or improvement.
- Troubles resulting from irresistible force such as natural disasters.

Should there be any doubt, we will verify it to clarify the cause in the presence of both parties in principle and take a proper action.

■ Others

1) For matters on quality agreed between you and as those mentioned in these delivery specifications only are valid basically and matters decided between you and us before the receipt of these specifications become invalid unless they are mentioned in these specifications.

But, if any inadequacy is present, we are ready for a discussion with you to settle the matter.

In case any modification is required after the receipt of those specifications, only matters agreed by you and us are valid.

2) For a special application or question, contact us before the fact and without delay.

3) Though we will deliver the products for which we guarantee the matters on quality mentioned in these specifications, please investigate on your side the incorporation into actual sets, duration under actual working conditions and other matters on quality of the products sufficiently.

4) If these delivery specifications are not returned to us within two weeks after the issue, we regard them as received, which please understand.

5) For the doubts or necessity of change in this specification, mutual discussion will be made for the solution

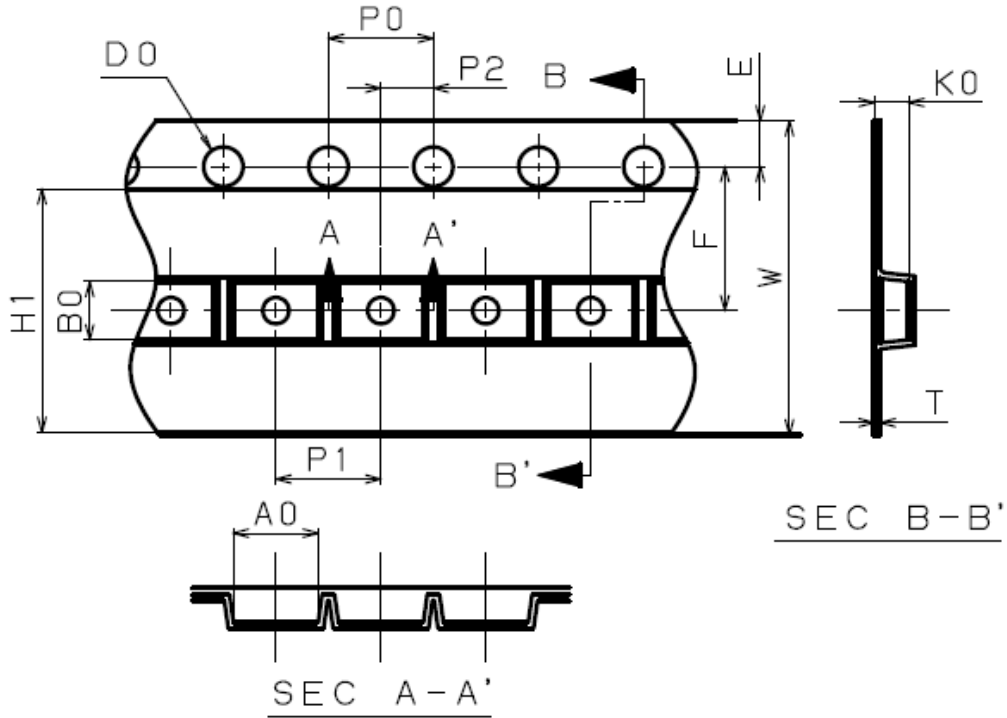
6) UL Standard

Since epoxy resin which is superior in optical characteristics is adopted for the LED, UL standard is not gained.

7) The specifications will be changed after prior discussion.

8) This product is RoHS-free supported.

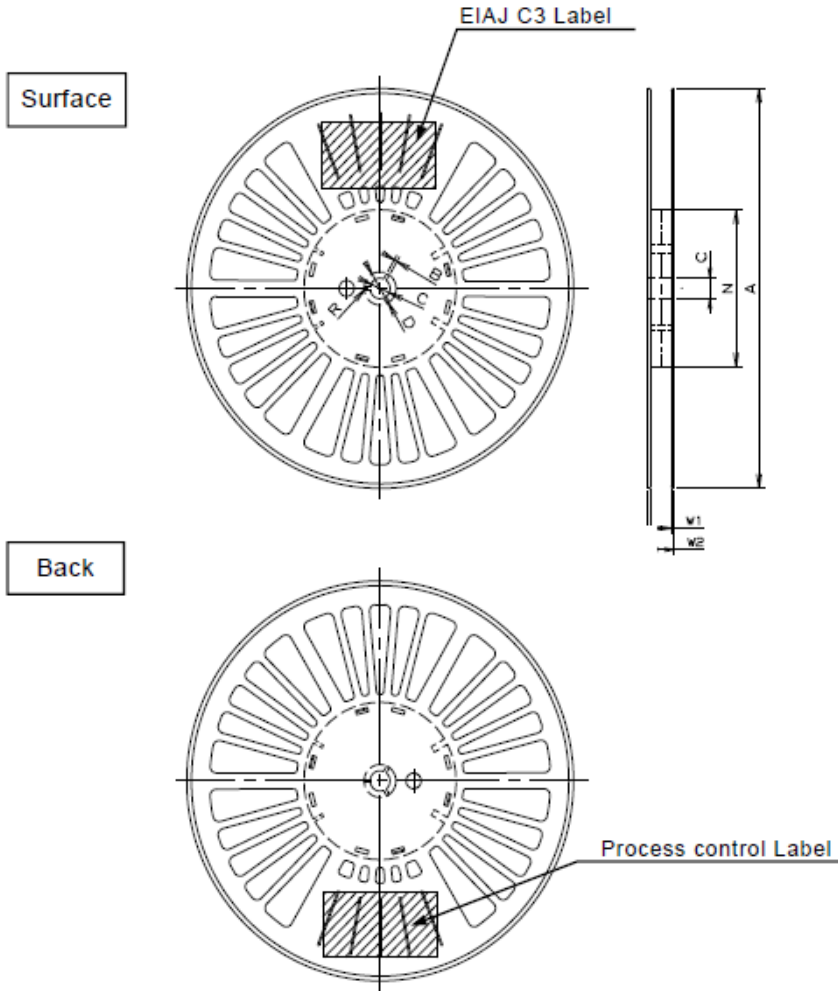
■ Taping form and Dimensions



Unit : mm

| Item | Symbol | Dimensions | Remarks | |
|--|--------------|------------------------|---------------------------------------|---------------------------------------|
| Dented square hole for product insertion | Length | A0 | 3.23±0.1 | |
| | Width | B0 | 2.23±0.1 | |
| | Depth | K0 | 1.32±0.1 | |
| | Pitch | P1 | 4.0±0.1 | Accumulated error ±0.2 max/10 pitches |
| Sprocket hole | Diameter | D0 | 1.5 ^{+0.1} / _{-0.0} | |
| | Pitch | P0 | 4.0±0.1 | Accumulated error ±0.2 max/10 pitches |
| | Position | E1 | 1.75±0.1 | |
| Center-to-centerline distance | Longitudinal | P2 | 2.0±0.1 | |
| | Traverse | F | 5.5±0.1 | |
| Cover tape | Width | H1 | 9.3±0.1 | |
| | Material | Polyester | | Anti-static |
| Carrier tape | Width | W | 12.0±0.3 | |
| | Thickness | T | 0.23±0.05 | |
| | Material | Polycarbonate + Carbon | | Anti-static |

■ Reel and Dimensions



Unit:mm

※The designs of the reel other than the size description part are assumed to be pretermission.

| Item | | Symbol | Dimensions | Remarks | |
|-----------------------------|---|-------------|------------|----------|--|
| Flange | Diameter | A | 180±2.0 | | |
| | Inner width of flanges | W1 | 13.5±1.0 | | |
| | Outer width of flanges | W2 | 17.1±1.0 | | |
| Hub | Outer diameter | N | 60±1.0 | | |
| | Spindle hole diameter | C | 13.0±0.2 | | |
| | Keyway | Width | E | 2.0±0.5 | |
| | | Depth | D | 21.0±0.8 | |
| Radius at corner | | R | 1.0±0.2 | | |
| Material | PPE | Anti-static | | | |
| Indication of the name etc. | To be printed on the side of a flange. | | | | |
| | Name, Quantity, Serial No. etc are to be shown. | | | | |

■ **Structure**

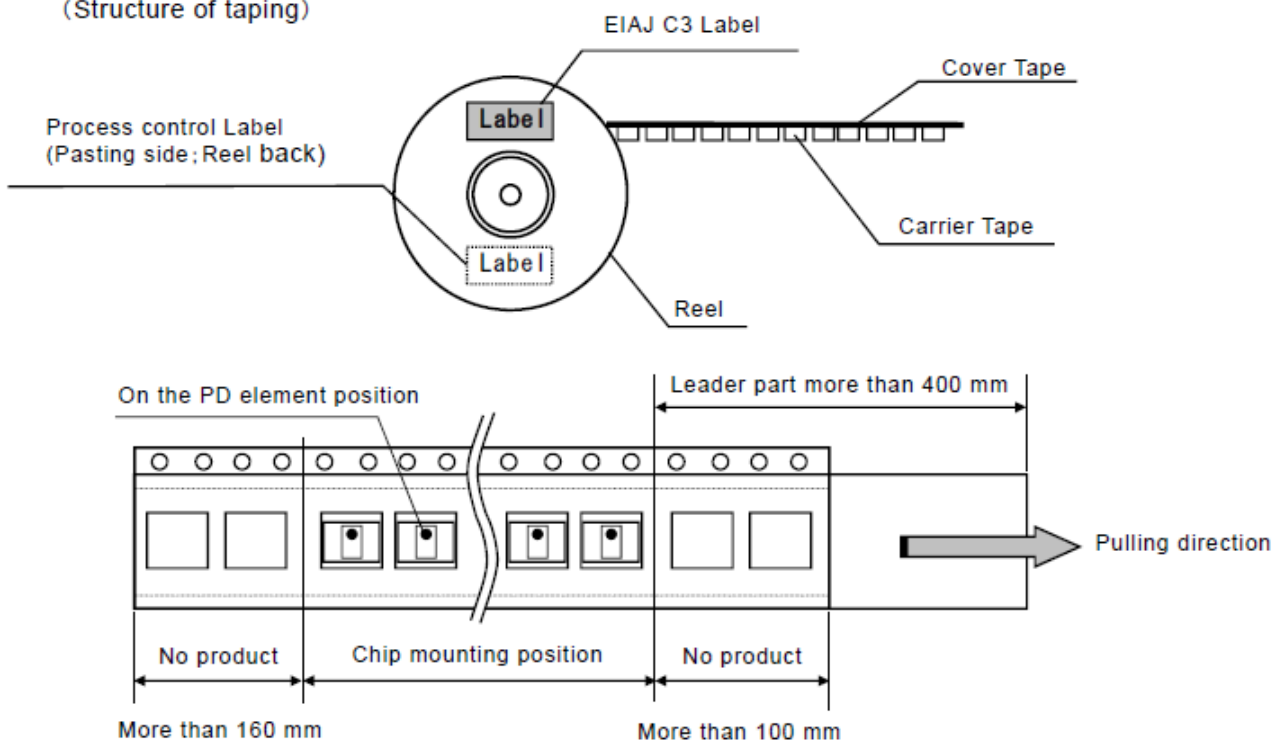
1) Structure and Dimensions

It is conformed to IEC 60286.

(Structure)

- ① Carrier tape For dimensions, refer to sheet No.1.
- ② Cover tape For dimensions, refer to sheet No.1.
- ③ Reel For dimensions, refer to sheet No.2.

(Structure of taping)



- The sprocket holes shall be on the right side against the pull-out direction.
- The space of more than 100 mm shall be provided on each front of the tape mounting.
- The space of more than 160 mm shall be provided on each rear of the tape mounting.
- The leader of more than 400 mm by the cover tape shall be provided at the front portion of the pull-out.

■ **Quantity and indication on the package.**

1) Taping quantity

The standard quantity shall be 2 500 pcs/reel.
2 reels shall be packed in the specified carton box.

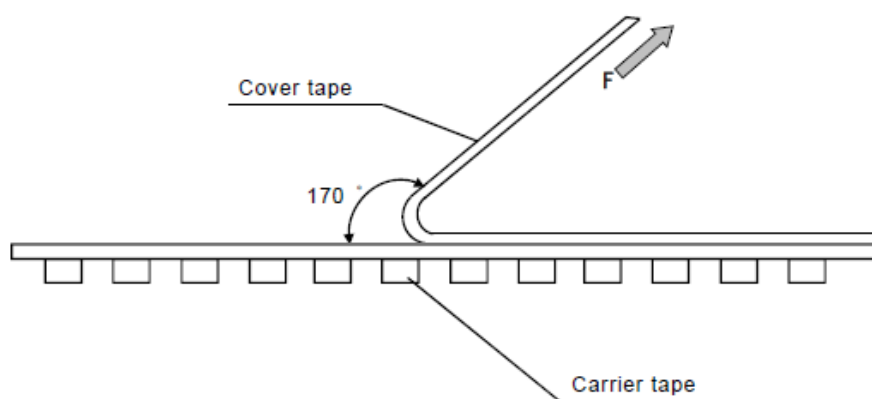
2) Indication

The type, quantity, serial No. shall be shown on the side of the reel.

■ Mechanical characteristics and specifications

1) Peeling strength of cover tape.

$F=0.2\text{ N} \sim 0.7\text{ N}$ (Measured by peel back tester)

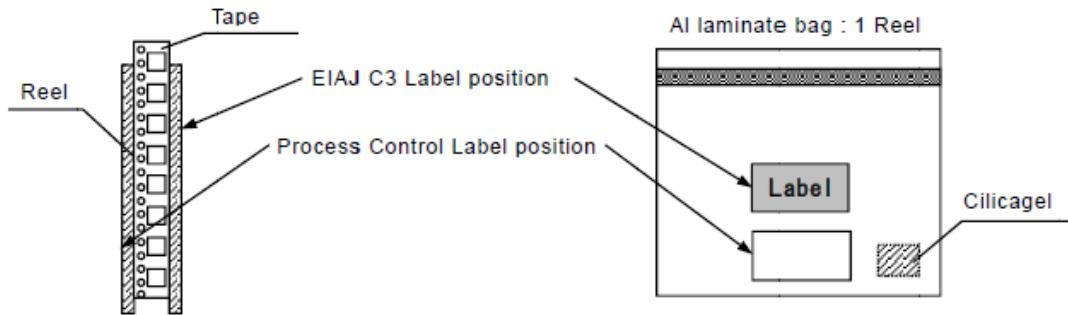


2) Specifications

- When the tape is bent to radius 30 mm, the products do not fall down from the tape and the tape doesn't get any damage.
- During the peeling, the products shall not stick to the cover tape.
- The taped products shall not be turned upside down, reversed or partial absence in the arrangement of the product.

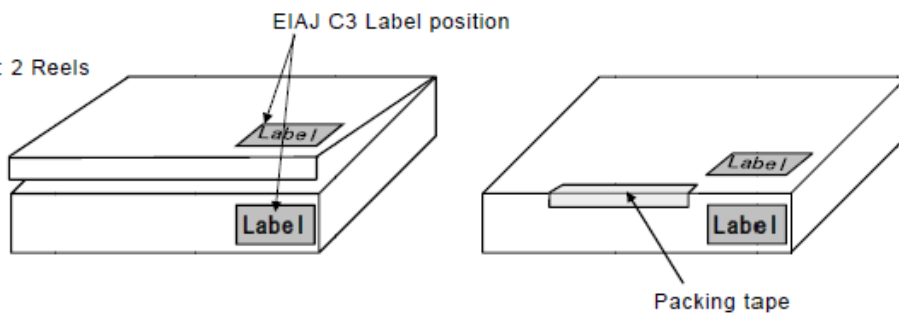
■ Packing Specification

1) Reel



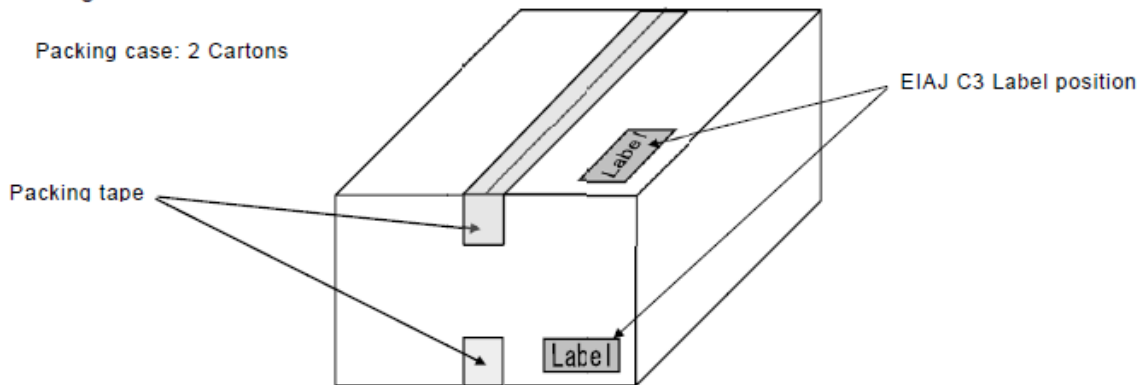
2) Carton

Carton: 2 Reels



3) Packing Case

Packing case: 2 Cartons



4) Quantity & Contents

| Form | Quantity | Contents | Material |
|-----------------|------------|-----------|------------------|
| Al laminate bag | 2 500 pcs | 1 Reel | Al |
| Carton | 5 000 pcs | 2 Reels | Corrugated paper |
| Packing case | 10 000 pcs | 2 Cartons | Corrugated paper |

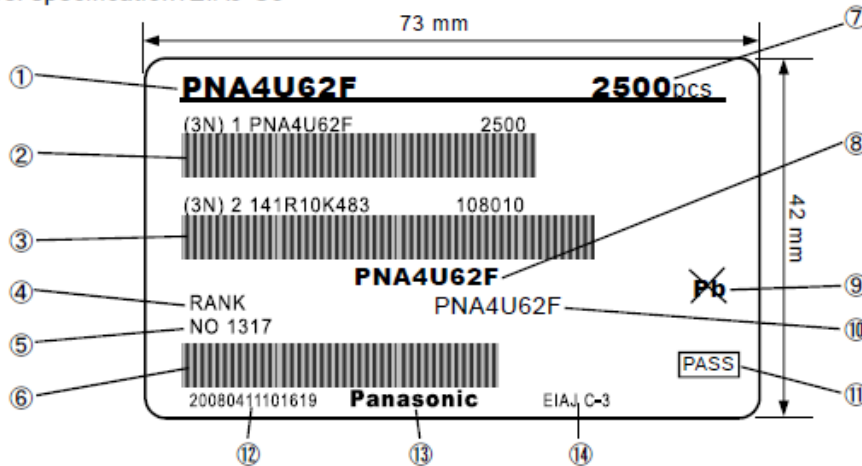
(Note1) Type No., the quantity, and production date (Date code) are printed on the label.

(Note2) Please refer the product traceability with date code on the packing label.

| | |
|---|--|
| 1 | Print a proper product name in principle. [PNA4U62F] |
| 2 | The number indicates the following : 1317 (17-March.2011) Provided that, an English initial is used in <u>December</u> <u>November</u> <u>October</u> . |

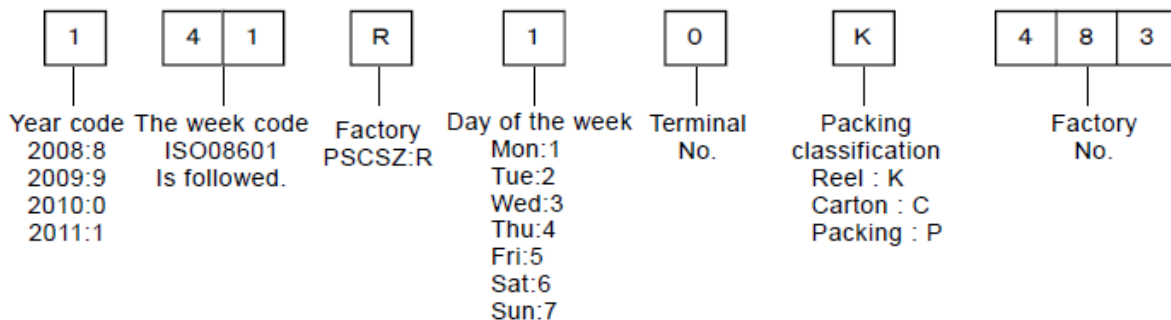
Label indication

1) Label specification: EIAJ-C3



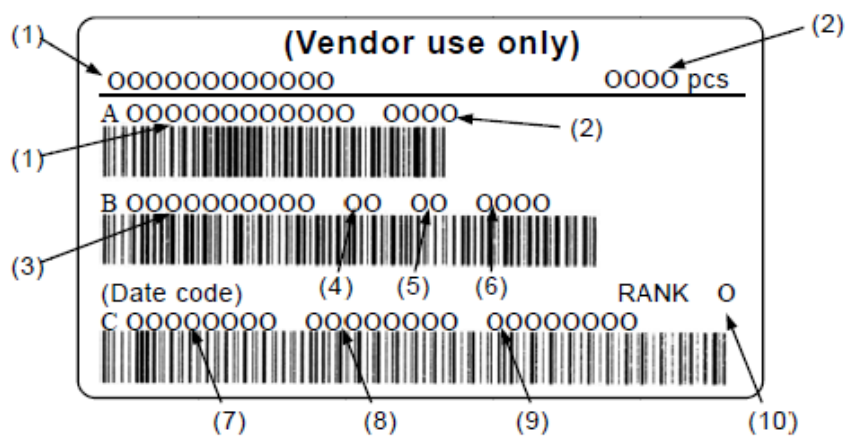
| No. | The Contents of display | Contents explanation |
|-----|-----------------------------------|---|
| ① | Order person part number | Part number of a user setup Etc. |
| ② | The first step bar code | [(3N)1]+[Order person part number]+[Space]+[Quantity] |
| ③ | The second step bar code | [(3N)1]+[Space]+[Serial number]+[Space]+[108010] |
| ④ | Rank | Rank |
| ⑤ | Date code | Product date code |
| ⑥ | The third step bar code | [1P]+[Panasonic unification part number] |
| ⑦ | Quantity | Quantity of package |
| ⑧ | Panasonic unification part number | Panasonic group unification part number |
| ⑨ | Lead free mark | Indicate the lead free product |
| ⑩ | Panasonic part number | Panasonic semiconductor company part number |
| ⑪ | Shipment acceptable display | - |
| ⑫ | Printing time | - |
| ⑬ | Brand mark | - |
| ⑭ | EIAJ-C3 display | (Only a not packing case is displayed.) |

《Serial number》



2) Production control label

<Reference>



| | | | |
|-----|-----------------|------|------------------|
| (1) | SC Type name | (6) | Inside pack code |
| (2) | Quantity | (7) | Date code |
| (3) | Assemble Lot No | (8) | Date code |
| (4) | Department code | (9) | Date code |
| (5) | Ridge code | (10) | Rank |

Bar code "B" Detailed explanation
 Department code : 40 (Dis)
 Ridge code : A (Nagaoka)
 Inside pack code : No setting.

■ Place of production

Diffusion Factory : TowerJazz Panasonic Semiconductor Co., Ltd.

Address : 800 Higashiyama, Uozu-city, Toyama, Japan

Assembly Factory : Panasonic Semiconductor Suzhou Co., Ltd.


Address : No.666 Lushan Road,Suzhou New District Jiangsu Proviince,China

■ Country of origin

Diffusion : Japan

Assembly : China

Product Name : PNA4U62F

| | |
|--|---|
| Issued by | Reaffirmed by |
| Panasonic Semiconductor Solutions Co., Ltd. Global Quality Assurance Center |  |

◆ Reliability Assurance Criterion (MIL-STD-19500H LTPD 15 %)

| Test items | Test conditions | Test results | Judgment criteria |
|--|---|--------------|--|
| High Temperature Bias Operating Life Test | ※1) Ta=75 °C, Vcc=5.0 V, t=1 000 h | 0/15 | Refer to the following and the failure criterions. |
| High Temperature Humidity Bias Operating Life Test | ※1) Ta=60 °C, RH=90 %, Vcc=5.0 V, t=500 h | 0/15 | |
| High Temperature Humidity Storage Test | ※1) Ta=60 °C, RH=90 %, t=1 000 h | 0/15 | |
| High Temperature Storage Test | ※1) Ta=85 °C, t=1 000 h | 0/15 | |
| Low Temperature Storage Test | ※1) Ta=-40 °C, t=1 000 h | 0/15 | |
| Thermal Shock Test | ※1) Ta = -40 °C ~ 85 °C , 100 Cycles (30 min) (30 min) | 0/15 | |
| Reflow Soldering Heat Resistance Test | Test for 1 time under the condition described in Product specification sheet No.14/11 | 0/15 | |
| Solderability Test | Pre processing : Ta=85 °C, RH=85 %, t=16 h Refer to Reflow profile Product specification sheet No.14/11 Reflow : 1 time | 0/15 | |
| Drop Test | Drop distance : 1 m Drop the device 3 times on a maple board of 3 cm or more in thickness. | 0/15 | |
| Static Electricity Resisting Pressure Test | C=100 pF, RL=1.5 kΩ, 3 Shots, 1 s Min. ±2 000 V (MIL-STD-19500H LTPD:50 %) | 0/5 | |

※1) This test is done after pre processing Ta=30 °C, RH=60 %, t=48 h, 1time reflow at sheet No.14/11's condition.

◆ Failure Criterion

| Electrical Characteristics | | | | |
|---|---|------------------|-------------|------|
| Item | Symbol | Criterion (Note) | | Unit |
| | | Lower Limit | Upper Limit | |
| Output voltage sensibility rate of change | Δ Gain1 (*1) | -50 | +50 | % |
| | Δ Gain2 (*1) | -50 | +50 | % |
| | Δ Gain3 (*1) | -50 | +50 | % |
| Appearance, etc | | | | |
| Appearance | According to visual spec | | | |
| Rusting, Discoloring | No rusting, discoloring (Terminal) | | | |
| Solderability | Solder adheres by 90 % or more of area of electrode terminal. | | | |

(Notes) If you have any special requirement, please inquire for us.

(*1) It doesn't contain the measurement error.

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