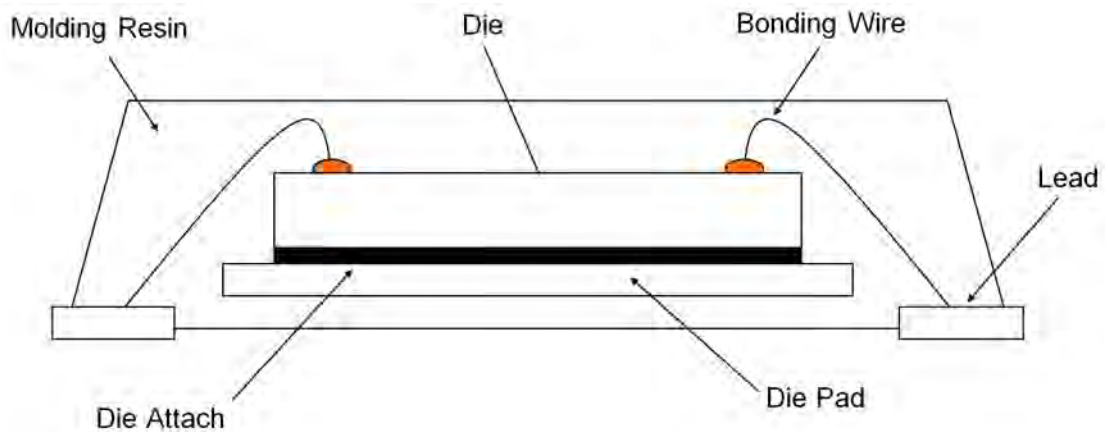


## 1. Package Information

|                    |          |
|--------------------|----------|
| Package Name       | VQFN20   |
| Type               | QFN      |
| Pin Count          | 20       |
| Package Weight [g] | 0.04     |
| Lead Finish        | Pure Tin |
| MSL                | Level3   |

## 2. Package Structure



### 3. Packing Specification

#### 3.1 Packing form, Quantity, PIN1 Orientation

|                   |       |           |
|-------------------|-------|-----------|
| Packing Form      |       | Tape&Reel |
| Packing Quantity  | [pcs] | 2,500     |
| PIN 1 Orientation |       | E2        |

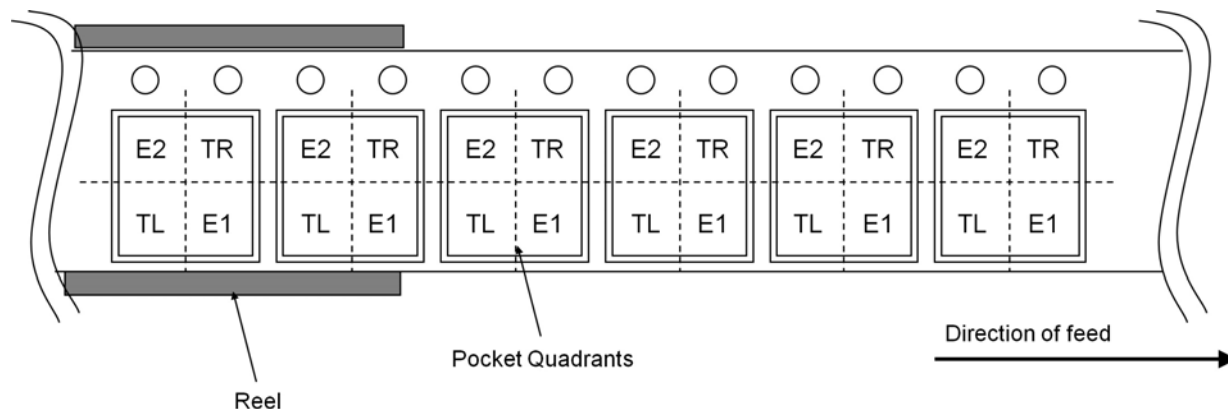


Fig.1 Quadrant Assignments for PIN 1 Orientation in Tape

E2 : PIN1 is placed to the top left corner.

TR : PIN1 is placed to the top right corner.

TL : PIN1 is placed to the lower left.

E1 : PIN1 is placed to the lower right.

#### 3.2 Use material

| Item                  | Material           |
|-----------------------|--------------------|
| Embossed carrier tape | PS                 |
| Cover tape            | PET+PE             |
| Reel                  | PS                 |
| Desiccant             | Clay               |
| Envelope              | Aluminum-laminated |
| Unit box              | Cardboard          |
| Shipping box          | Cardboard          |

#### 3.3 Leader specification

No component pockets are 200 mm or more.

#### 3.4 Trailer specification

No component pockets are 80 mm or more. Tape is free from reel.

#### 3.5 Peelback strength

Cover tape peelback strength is 0.2 N to 0.7 N.

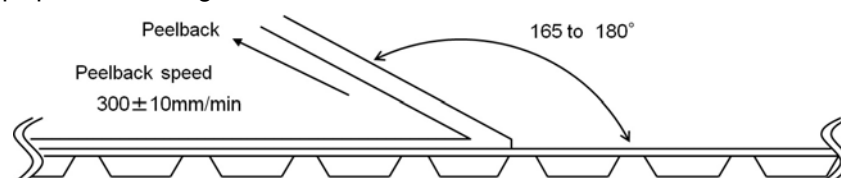


Fig. 2 Test method

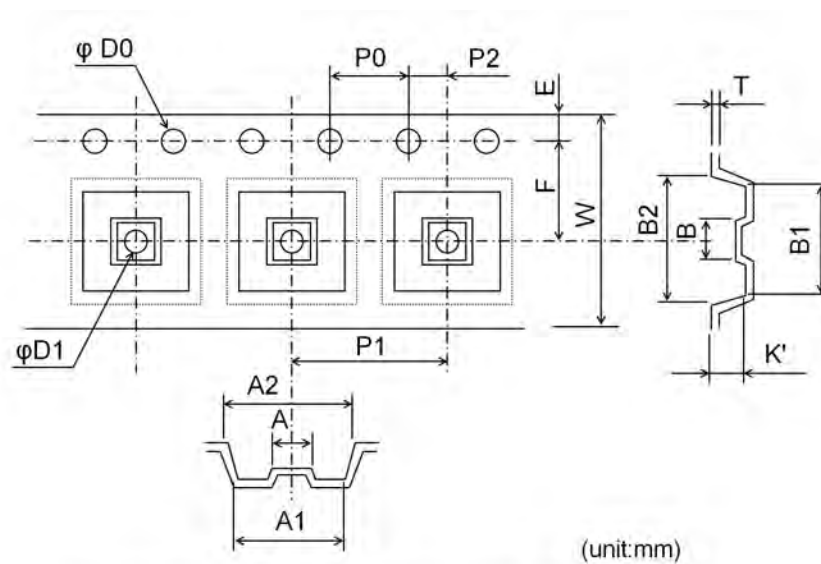
#### 3.6 Missing lcs

(1) No consecutive dropouts.

(2) A maximum 0.1 % of specified number of products in each packing may be missing.

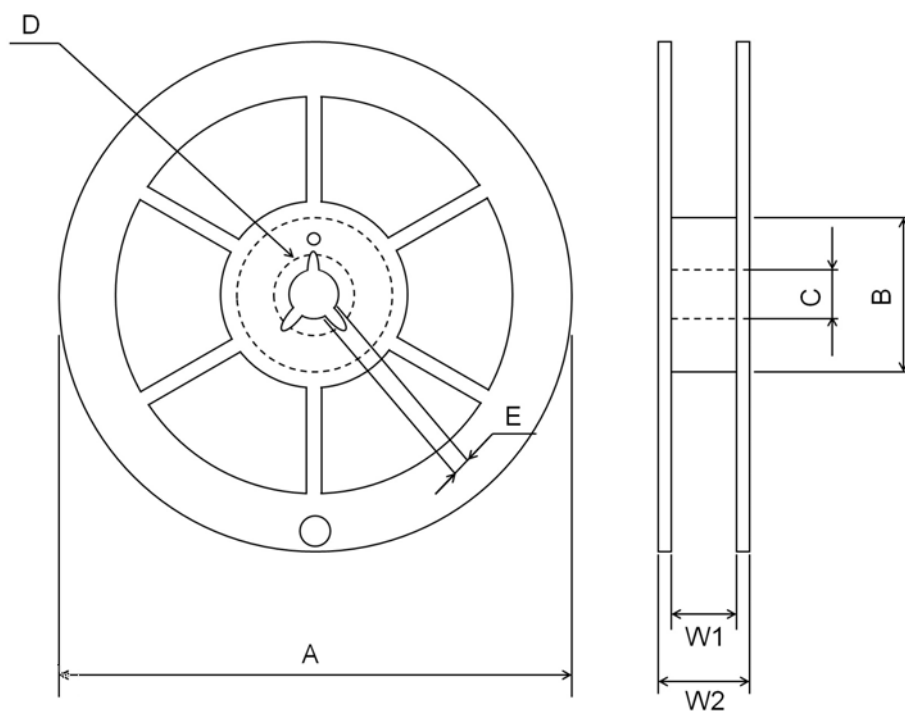
## 3.7 Tape and Reel Specification

## 3.7.1 Tape Dimension



|    | Tape Dimension | Tape Tolerance |
|----|----------------|----------------|
| A  | 2.10           | $\pm 0.2$      |
| A1 | 4.46           | $\pm 0.1$      |
| A2 | 4.63           | $\pm 0.2$      |
| B  | 2.10           | $\pm 0.2$      |
| B1 | 4.46           | $\pm 0.1$      |
| B2 | 4.63           | $\pm 0.2$      |
| D0 | $\phi 1.5$     | $+0.1/-0$      |
| D1 | $\phi 1.0$     | $\pm 0.1$      |
| E  | 1.75           | $\pm 0.1$      |
| F  | 5.50           | $\pm 0.05$     |
| K' | 1.60           | $\pm 0.2$      |
| P0 | 4.00           | $\pm 0.1$      |
| P1 | 8.00           | $\pm 0.1$      |
| P2 | 2.00           | $\pm 0.05$     |
| T  | 0.30           | $\pm 0.05$     |
| W  | 12.0           | $\pm 0.2$      |

## 3.7.2 Reel Dimension

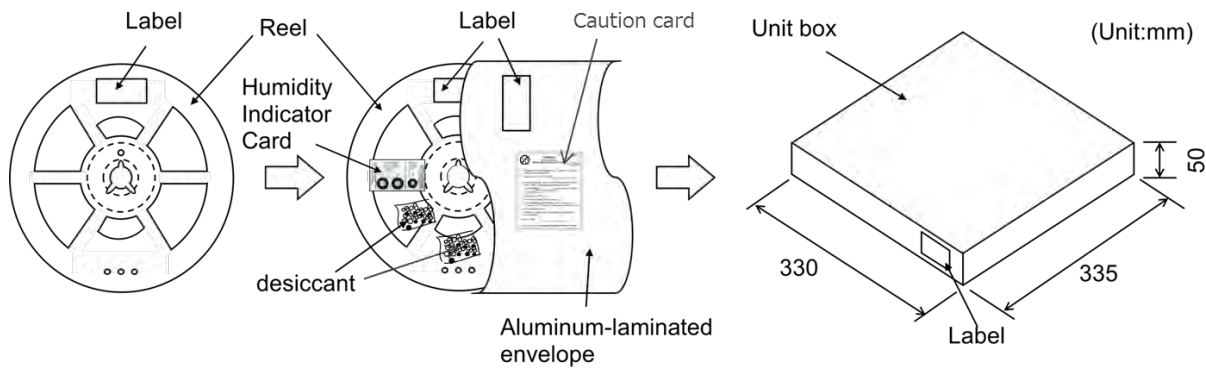


(unit:mm)

| Reel Dimension |      | Reel Tolerance |
|----------------|------|----------------|
| A              | 330  | -              |
| B              | 50   | MIN            |
| C              | 13   | ±0.2           |
| D              | 20.2 | MIN            |
| E              | 1.5  | MIN            |
| W1             | 13.4 | ±1.0           |
| W2             | 17.4 | ±1.0           |

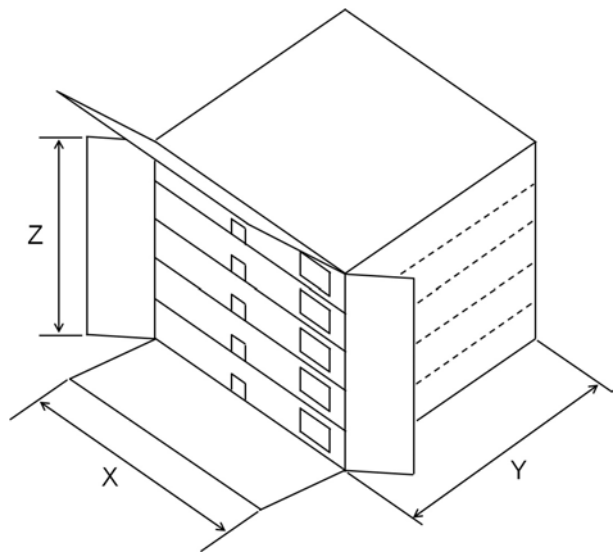
3.8 Packing Method

1 reel(s) or less per unit box



3.9 Packing Style

5 unit boxes or less per shipping box



(unit:mm)

| Shipping Box Dimension |     |
|------------------------|-----|
| X                      | 347 |
| Y                      | 353 |
| Z                      | 287 |

3.10 Label Specification



3.11 Caution card specification

Caution

This bag contains

MOISTURE-SENSITIVE DEVICES

LEVEL

If blank, see adjacent bar code label

1. Calculated shelf life in sealed bag: 72 months at <40°C and <90% relative humidity (RH)

2. Peak package body temperature:  °C  
If blank, see adjacent bar code label

3. After bag is opened, devices that will be subjected to reflow solder or other high temperature process must be

a) Mounted within:  hours of factory conditions  
If blank, see adjacent bar code label  
≤30°C/60% RH, or

b) Stored per J-STD-033

4. Devices require bake, before mounting, if:

a) Humidity Indicator Card reads >10% for level 2a - 5a devices or >60% for level 2 devices when read at 23 ± 5 °C

b) 3a or 3b are not met

5. If baking is required, refer to IPC/JEDEC J-STD-033 for bake procedure

Bag Seal Date:   
If blank, see adjacent bar code label

Note: Level and body temperature defined by IPC/JEDEC J-STD-020

Remark ) Standard item 1. calculated shelf life in caution card is not applied for MSL1 product.

3.12 Indicator card specification

HUMIDITY INDICATOR

Complies with IPC/JEDEC J-STD-033

LEVEL

2 PARTS

Bake parts if 60% is NOT blue

60%

Lot Number

LEVEL

2A-5A PARTS

Bake parts if 10% is NOT blue and 5% is pink

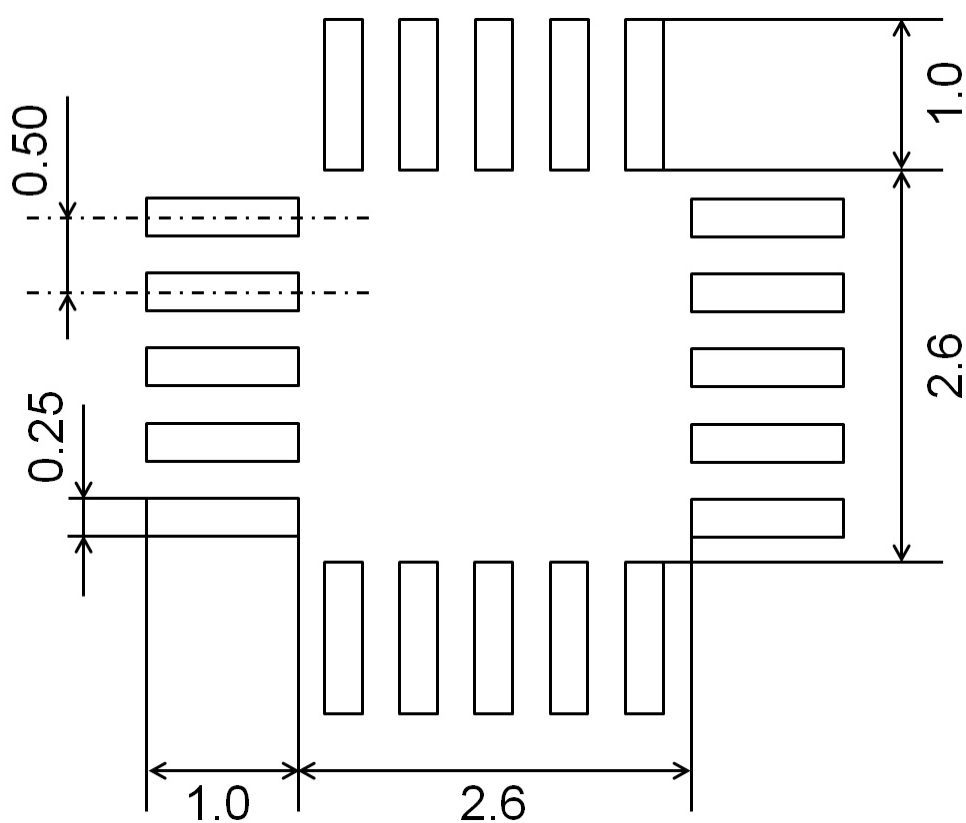
10%

Manufacturer Identification

5%

Do not put this card into a bag if 60% is pink

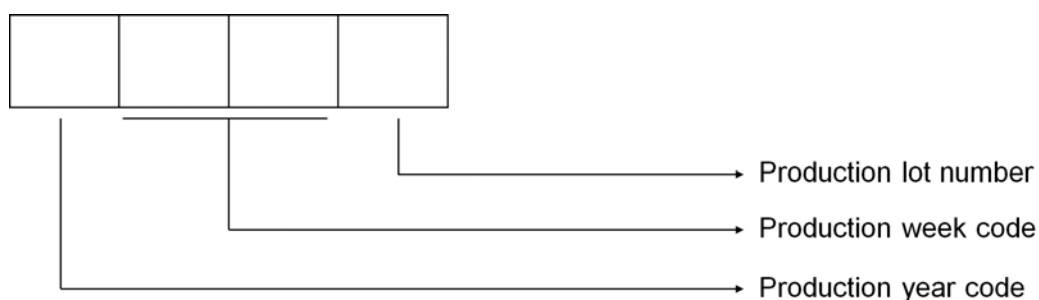
## 4. Footprint dimensions



(unit:mm)

In actual design, please optimize in accordance with the situation of your board design and soldering condition.

## 5. Marking Specification



## 6. Storage conditions

### 6.1 Storage environment

Recommended storage conditions

|             | Min. | Max. | Unit |
|-------------|------|------|------|
| Temperature | 5    | 30   | °C   |
| Humidity    | -    | 70   | % RH |

### 6.2 Storage period(Start to count since delivery date)

|                | Min. | Max. | Unit |
|----------------|------|------|------|
| Storage period | -    | 1    | year |

### 6.3 Specified storage period until soldering

|                 | Min. | Max. | Unit |
|-----------------|------|------|------|
| Acceptable time | -    | 168  | h    |

The above value is a time from opening the moisture-proof packaging until the soldering. Cases where it is necessary to perform the drying process is the following.

Case 1 : in excess of the above-mentioned "Acceptable time"

Case 2 : it has passed more than 6 years not open

Recommended the dry process conditions

|                            | Temperature [°C] | Time [h] |
|----------------------------|------------------|----------|
| Reel (Note1)               | 60               | 72       |
| Other Heat-proof container | 125              | 24       |

(Note1) When carrying out the dry process in a "Reel" state, the peelback strength will change. Please refer to the following values:

|                   | Min. | Max. | Unit |
|-------------------|------|------|------|
| Peelback strength | 0.2  | 0.9  | N    |

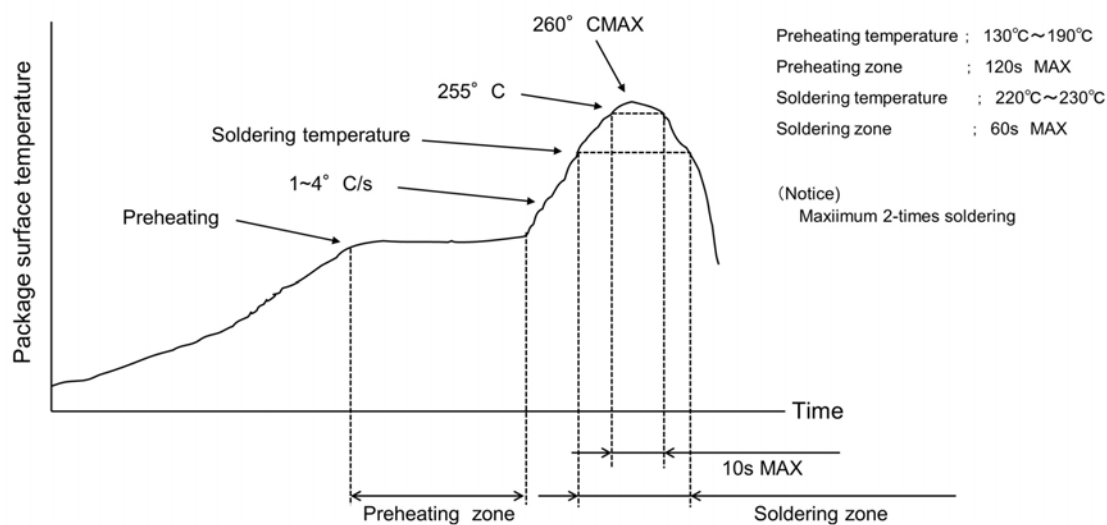
The drying process is the impact on the solderability because the oxidation of the terminal portion will occur. Therefore, specify the maximum times of the dry processing as follows:

Recommended execution count of the dry process

|                            |   | Unit  |
|----------------------------|---|-------|
| Reel                       | 1 | times |
| Other Heat-proof container | 2 | times |

## 7. Soldering conditions

## 7.1 Recommended temperature profile for reflow

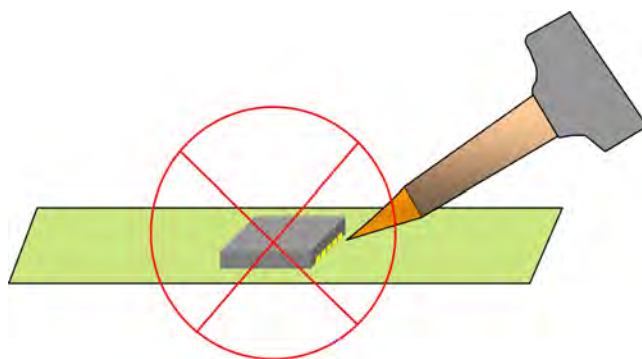


## 7.2 For wave soldering

The wave soldering method is not supported.

## 7.3 For solder iron

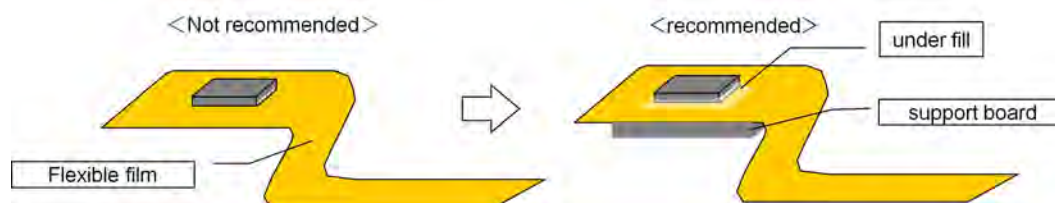
Rework by soldering iron is not allowed or it may cause mold crack and terminal open.



## 7.4 Caution for solder mounting

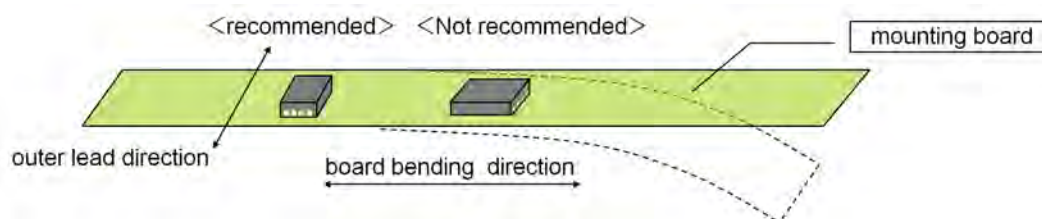
### 7.4.1 For mounting on flexible film

Mounting on flexible film, film bend may occur lack of lead from package, usage of support board and under fill is recommended.



### 7.4.2 For Mounting long and narrow board

Mounting on long and narrow board, bending stress may occur a lack of lead from package, bending board direction and outer lead direction is recommended as drawing (vertically layout) and under fill usage is recommended.



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