

# Specification

|              |                             |
|--------------|-----------------------------|
| Drawing No.  | TKY1D-H1-14986-00 [12]-1/13 |
| Issued Date. | December 26, 2014           |

**TO: KED USA**

Note: In case of specification change, KYOCERA Part Number also will be changed.

|                               |  |
|-------------------------------|--|
| Product Name                  | Temperature Compensated Crystal Oscillator |
| Product Model                 | KT2520K                                    |
| Frequency                     | 26.0MHz                                    |
| Customer Part Number          | _____                                      |
| Customer Specification Number | _____                                      |
| KYOCERA Part Number           | KT2520K26000ZAW18TAS                       |
| Remarks                       | RoHS Compliant, MSL=1                      |

**Customer Acceptance**

|                  |                  |  |
|------------------|------------------|--|
| Accept Signature | Accept Date      |  |
|                  | Department       |  |
|                  | Person in charge |  |

**Seller**  
 KYOCERA Crystal Device Corporation  
 (Crystal Products Sales Division)  
 6 Takeda Tobadono-cho, Fushimi-ku, Kyoto  
 612-8501 Japan  
 TEL. No. 075-604-3500  
 FAX. No. 075-604-3501

**Manufacturer**  
 Corporate Production Group  
 Oscillator Division  
 5850, Higashine-koh, Higashine-shi, Yamagata  
 999-3701 Japan  
 TEL. No. 0237-43-5611  
 FAX. No. 0237-43-5615

|  |                   |             |            |           |
|--|-------------------|-------------|------------|-----------|
| Design Department  | Quality Assurance | Approved by | Checked by | Issued by |
| Oscillator Engineering Department<br>Application Engineering Section | Y.Kakuta          | Y.Yokoo     | N.Nakano   | Y.Kato    |



### 1. Purpose and scope

This document contains specification related to CRYSTAL OSCILLATOR model  
KT2520K26000ZAW18TAS for KED USA.

### 2. Nominal condition

|   | Item  | MIN. | TYP.            | MAX  | Unit  | Conditions |
|---|---|------|-----------------|------|-------|------------|
| 1 | Operating temperature range                         | -40  | ---             | +85  | deg.C |            |
| 2 | Storage temperature range                           | -40  | ---             | +85  | deg.C |            |
| 3 | Nominal frequency                                   | ---  | 26.0            | ---  | MHz   |            |
| 4 | Supply voltage (1)                                  | 1.71 | 1.8             | 1.89 | V     | 1.8V+/-5%  |
|   | Supply voltage (2)                                  | 2.66 | 2.8             | 2.94 | V     | 2.8V+/-5%  |
| 5 | Absolute maximum rating voltage<br>(Supply voltage) | -0.6 | ---             | +4.6 | V     |            |
| 6 | Load impedance                                      | 9.5  | 10              | 10.5 | kohm  |            |
|   |   | 9.5  | 10              | 10.5 | pF    |            |
| 7 | Output signal condition                             | ---  | Clipped<br>sine | ---  | ---   |            |

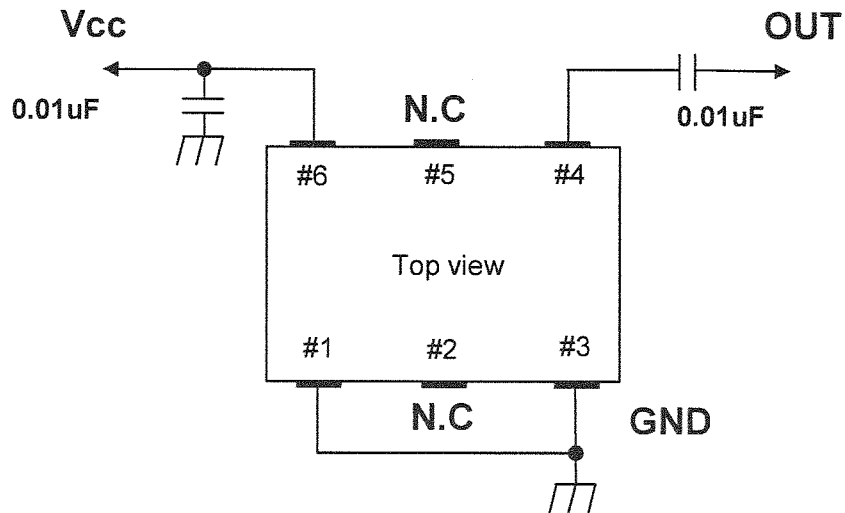
### 3. Electrical characteristics

Ta=-40 to +85deg.C, Vcc=1.8V or 2.8V, Load=10kohm//10pF

|    | Item                    | MIN. | TYP. | MAX  | Unit               | Conditions  | Remarks                              |
|----|-------------------------|------|------|------|--------------------|---|--------------------------------------|
| 1  | Temp characteristics    | -0.5 | ---  | +0.5 | $\times 10^{-6}$   | Ta= -30 to +85 deg.C                              | On the basis of<br>25deg.C frequency |
|    |                         | -3.0 | ---  | +3.0 | $\times 10^{-6}$   | Ta= -40 to -30 deg.C                              |                                      |
| 2  | Voltage characteristics | -0.1 | ---  | +0.1 | $\times 10^{-6}$   | Vcc+/-5%  |                                      |
| 3  | Load characteristics    | -0.1 | ---  | +0.1 | $\times 10^{-6}$   | 10kohm+/-5%,<br>10pF+/-5%                         |                                      |
| 4  | Aging characteristics   | -1.0 | ---  | +1.0 | $\times 10^{-6}/Y$ | 1year   | at 25+/-2 deg.C                      |
| 5  | Frequency tolerance     | -2.0 | ---  | +2.0 | $\times 10^{-6}$   | After 2 times reflow soldering                    | at 25+/-2 deg.C                      |
| 6  | Current                 | ---  | ---  | 1.5  | mA                 |   |                                      |
| 7  | Output voltage          | 0.8  | ---  | ---  | Vp-p               |   |                                      |
| 8  | Harmonics               | ---  | ---  | -8.0 | dBc                |   |                                      |
| 9  | Start up time           | ---  | ---  | 2.0  | msec               | 90% of final output amplitude<br>Within +/-0.5ppm |                                      |
| 10 | Phase noise             | ---  | ---  | -130 | dBc/Hz             | @1kHz offset                                      | at 25+/-2 deg.C                      |
| 11 | Temperature hysteresis  | -0.6 | ---  | +0.6 | $\times 10^{-6}$   |   |                                      |

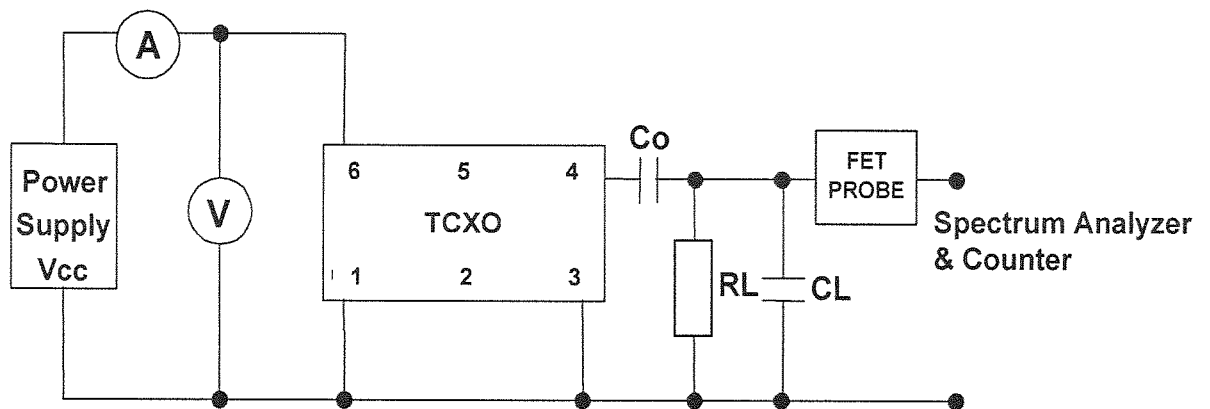
#### 4. Circuit

Bypass Capacitor and DC-Blocking Capacitor do not build in this TCXO.  
So, Bypass Capacitor and DC-Blocking Capacitor are attached outside and please use it.  
And these Capacitor should be placed as close as possible to the pin(No.4 and No.6).



#### 5. Test circuit

\*Load  $10k\Omega//10pF$  contains the internal impedance of FET probe.



6. Environment mechanical characteristics

|   | Item                                       | Conditions  | Remark  |
|---|--|---|---|
| 1 | High temperature storage                   | Ta=+85deg.C, judge on 240H storage  | It must be met to the characteristics Judging criterion.<br>Measurement shall be taken at room ambient within 2 to 24hours after each test. |
| 2 | Low temperature storage                    | Ta=-40deg.C, judge on 240H storage  |   |
| 3 | High temperature and high humidity storage | Ta=+85deg.C, RH=85%RH, judge on 240H storage  |   |
| 4 | Temperature cycle test                     | Ta=-40 to +85deg.C 30min. each 10cycles   |   |
| 5 | Drop test                                  | A test piece (100g) made of Teflon is dropped 3cycles (1cycle: 6 directions) from the height of 150cm on hard board   |   |
| 6 | Vibration test                             | 10 to 55 to 10Hz 1.5mm constant amplitude 1min. period X, Y, Z direction each 2H total 6H.  |   |
| 7 | Solder heat test                           | All terminal electrode shall be soldered at temperature of 350+/-5deg.C for 3+/-1sec. using a soldering iron.   |   |
| 8 | Solderability                              | Dip each of terminal electrode into 230+/-5deg.C solder pod for 5+/-0.5sec. after close, the test area of loads surfaces must be covered loads 90% by solder. |   |
| 9 | Reflow soldering                           | Reflow solderling at 2times.  |   |

Normal Condition: Temperature 25+/-2deg.C  
Humidity 30 to 70%RH

Judge

| Item                 | Specification                   |
|----------------------|---------------------------------|
| At 25deg.C frequency | +/-2.0ppm max(Before and After) |

## 7. Reflow profile

7-1. Preheat:  $180 \pm 0/-10$ deg.C, 120sec (max)

7-2. Peak Temperature:  $260 \pm 0/-10$ deg.C, 10sec (max)

7-3. PC-Board

Material : FR-4

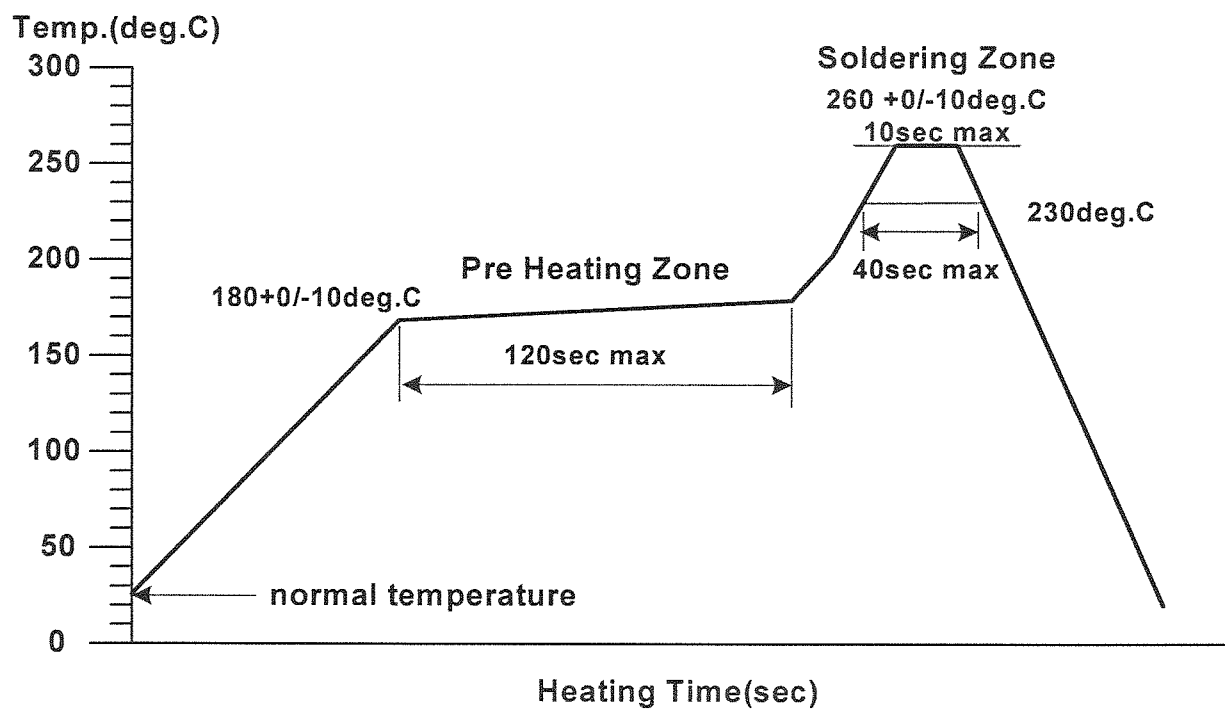
Size : 140mm\*110mm

Thickness :  $t=0.8$ mm

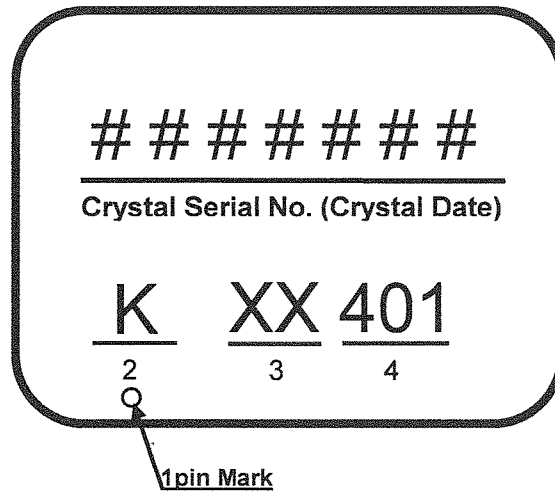
7-4. Condition of Measurement Temperature: Surface of PC-BOARD

7-5. Reflow Number of Time: 2times

### Reflow Soldering Condition



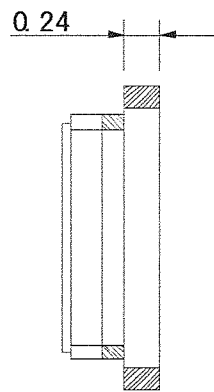
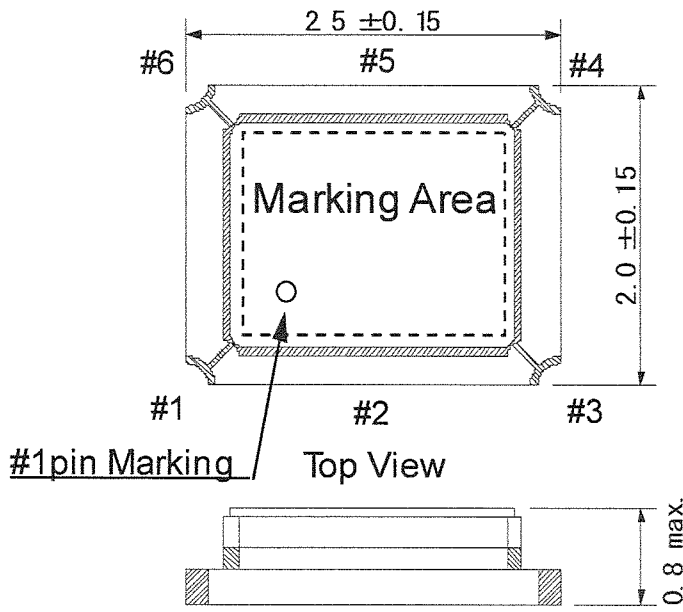
8. Marking contents



\*Laser Marking

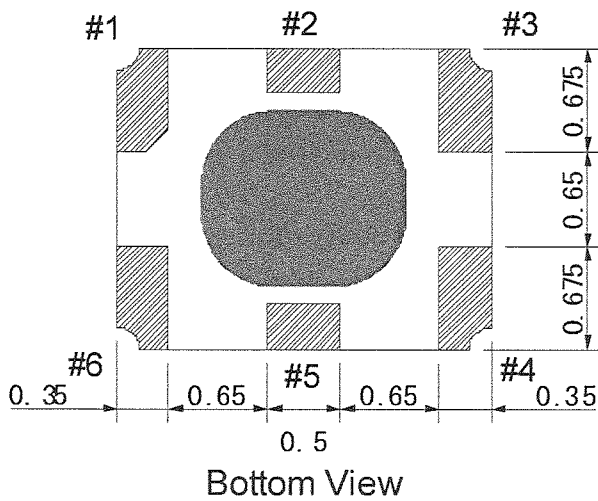
|   | Contents        | Example  |
|---|-----------------|--|
| 1 | 1Pin identifier | ○  |
| 2 | Control Code1   | K  |
| 3 | Control Code2   | XX   |
| 4 | Weekly Code.    | 401 *The 2014 1st week<br>402 *The 2014 2nd week |

9. Dimensions



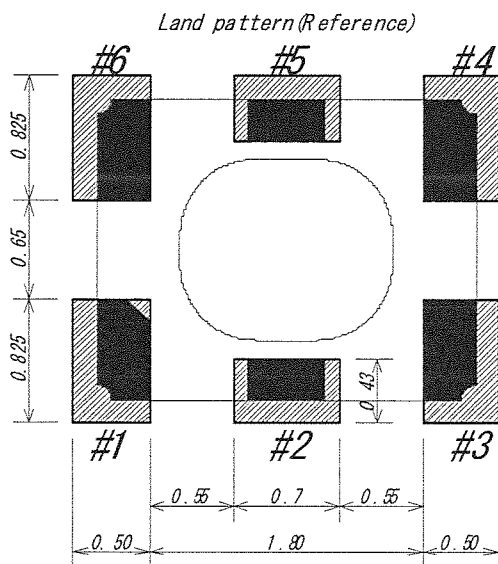
Note1  
Terminal Coplanarity: 100um max

Note2  
Electrode : Cu + Ni + Au  
(15μ min+3μ min+0.03μ min)



|         | Pin Connection |
|---------|----------------|
| # 1 pin | GND            |
| # 2 pin | N.C            |
| # 3 pin | GND            |
| # 4 pin | Output         |
| # 5 pin | N.C            |
| # 6 pin | Vcc            |

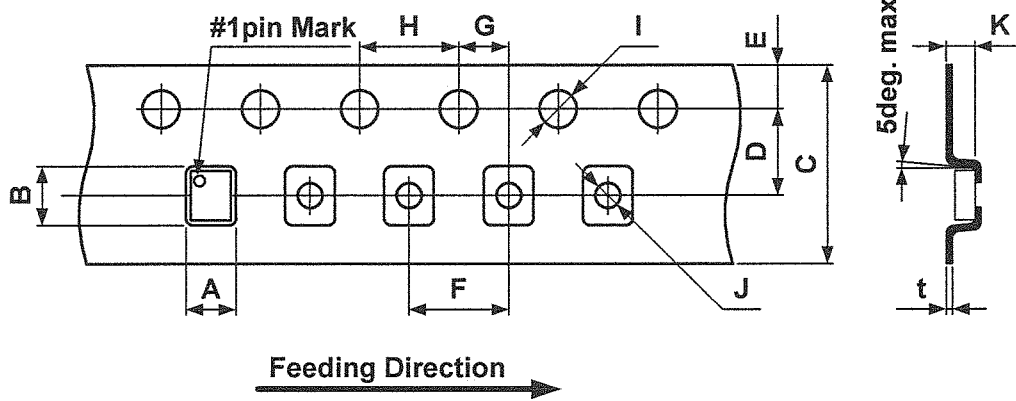
Unit: mm





## 10. Tape & Reel

### 10-1. Tape specification



10-1-1. Carrier Tape material : PS Included Carbon

10-1-2. 1pin Mark is positioned on right side against the direction of feed.

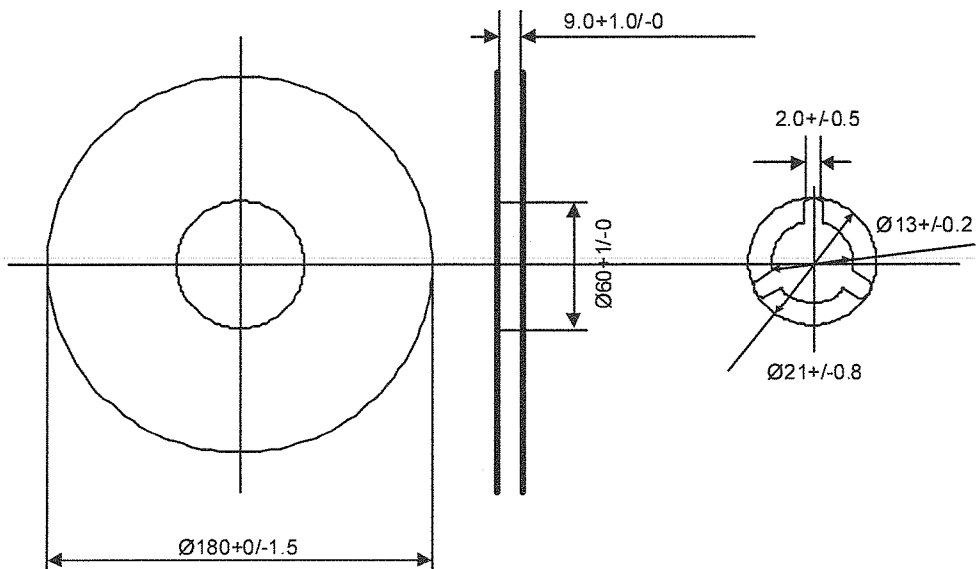
Unit: mm

| Symbol    | A              | B              | C                    | D               | E              |
|-----------|----------------|----------------|----------------------|-----------------|----------------|
| Dimension | $2.40 \pm 0.1$ | $2.90 \pm 0.1$ | $8.00 + 0.3 / - 0.2$ | $3.50 \pm 0.05$ | $1.75 \pm 0.1$ |

| Symbol    | F              | G               | H              | I                        | J                  |
|-----------|----------------|-----------------|----------------|--------------------------|--------------------|
| Dimension | $4.00 \pm 0.1$ | $2.00 \pm 0.05$ | $4.00 \pm 0.1$ | $\Phi 1.5 \pm 0.1 / - 0$ | $\Phi 1.1 \pm 0.1$ |

| Symbol    | K              | t               |
|-----------|----------------|-----------------|
| Dimension | $1.15 \pm 0.1$ | $0.25 \pm 0.05$ |

### 10-2. Reel specification



Unit: mm

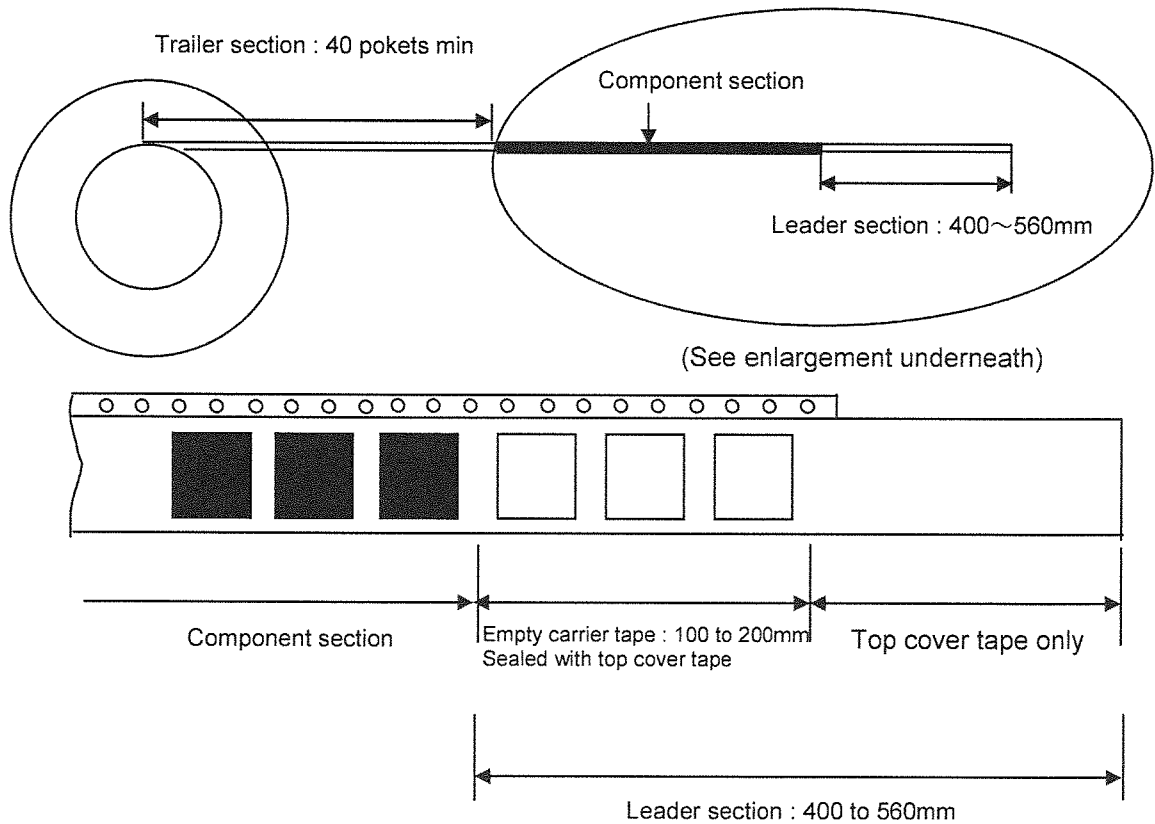
10-2-1. Reel material: PS Included Carbon

10-2-2. Reel unit: 3,000pcs max. /1Reel

### 10-3.Packing

#### 10-3-1.Trailer & Leader

As for the trailer and leader of taping, there are empty pockets as following drawing.  
Sprocket hole is positioned on upper side against the direction of feed.  
No missing components, excluding empty place.



### 10-4. Shipping label

Following item shall be listed on reel, bag and box.

"Customer's name", "Parts No", "Lot No", "Quantity", "Order No", "Date of manufacture"  
The form of the label conforms to JEITA standard pattern C-3.

## 11. Top Cover breaking and peeling force

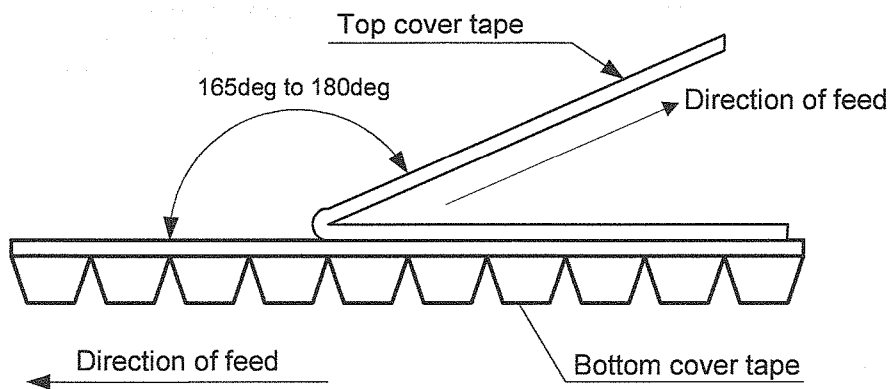
11-1. Reel Angle: 165 to 180deg

11-2. Tape Break Force: 10N min

11-3. Top Cover Tape Strength: 10N min

11-4. Top Cover Tape Peel Force: 0.1 to 1.0N

11-5. Top Cover Tape Peel Speed: 300+/-10mm / minute



## 12. Notice

12-1. Please use soldering iron and the spot heater within the range of a solder heat test condition.

12-2. Units should be stored in a dry environment keeping away from the sun.

12-3. Don't leave units in High-temperature and High-humidity environment due to terminal solderability.

(Please keep 0 to 40deg.C and 30 to 70%RH for recommendable storage condition)

12-4. The term of a guarantee of taping packing is 6 months. (0 deg.C to 40 deg.C,RH30% to 70%)

12-5. Disapprove of washing.

12-6. Unless we receive request for modification within 1 month from the issue date of this KCD specification sheet, we will supply products according to this specification.

Also, if you'd like to modify specification of order, which has been placed with delivery within 1 month from the issue data of this specification sheet, we would like to discuss with you separately.

12-7. If you intend to use products listed on this specification for applications that may result in loss of life or assets (controls relating to safety, medical equipment, aeronautical equipment, space equipment, etc.), please do not fail to advise us of your intention beforehand.

12-8. In no event shall the company be liable for any product failure resulting from an inappropriate handling or operation of the product beyond the scope of its guarantee.

12-9. Information contained in this specification must not be quoted, reproduced or used for other purposes including processing either in part or in full without obtaining prior approval from the company.

12-10. Please keep it at the place that was the ESD protective.

Human model 1.5kohm 100pF : +/-1000V

Machine model 0kohm 200pF : +/-200V

13. Production place

13-1 Manufacturer

KYOCERA Crystal Device Corporation.

13-2 The site of the Factory

5850 Higasine-Koh, Higasine-shi, Yamagata, 999-3701, Japan

14. Parts Numbering Guide

**KT2520K 26000 Z A W 18 T AS**  
A B C D E F G H

- A. Series (2.5x2.0 SMD KT2520K)
- B. Frequency (26.0MHz)
- C. Frequency temperature accuracy ( Z: Special specification )
- D. Minimum temperature range ( A: -40degC)
- E. Maximum temperature range ( W: +85deg.C )
- F. Supply voltage (18: 1.8V)
- G. Control voltage stability (T: TCXO)
- H. Customer special model Suffix



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