Specification

Drawing No.	TKY1D-H1-15171-05 [13]
Issued Date.	November 18, 2016

TO: MediaTek Corporation

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

Product Name	Temperature Compensated Crystal Oscillator
Product Model	KT2016K
Frequency	26.0MHz
Customer Part Number	————
Customer Specification Number	————
KYOCERA Part Number	KT2016K26000ZAW18T5S
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	Examined by	Written by
Oscillator Engineering Department Application Engineering Section	Y.Okuda	N.Nakano	Y.Hosoya	M.Narita

KYOCERA Crystal Device Corporation

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Revision History

Rev.No.	Description of revise	Date	Approved by	Examined by	Written by
00	First Edition	Apr. 3, '15	N.Nakano	Y.Hosoya	M.Narita
01	Add Duty	Jul. 29, '15	N.Nakano	Y.Yokoo	M.Narita
02	Add Frequency drift rate typ.	Aug. 19, '15	N.Nakano	Y.Hosoya	M.Narita
03	o Change Frequency tolerance o Change Reflow profile (Add manual soldering)	Jan. 5, '16	N.Nakano	Y.Hosoya	M.Narita
04	⚠Change Phase noise ⚠Change Marking contents	Aug. 3, '16	N.Nakano	Y.Hosoya	M.Narita
05	⚠ Change Aging characteristics	Nov. 18, '16	N.Nakano	Y.Hosoya	M.Narita

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1. Purpose and scope

This document contains specification related to CRYSTAL OSCILLATOR model KT2016K26000ZAW18T5S for MediaTek Corporation.

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	1.68	---	3.63	V	
5	Absolute maximaum rating voltage (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 sine	---	---	

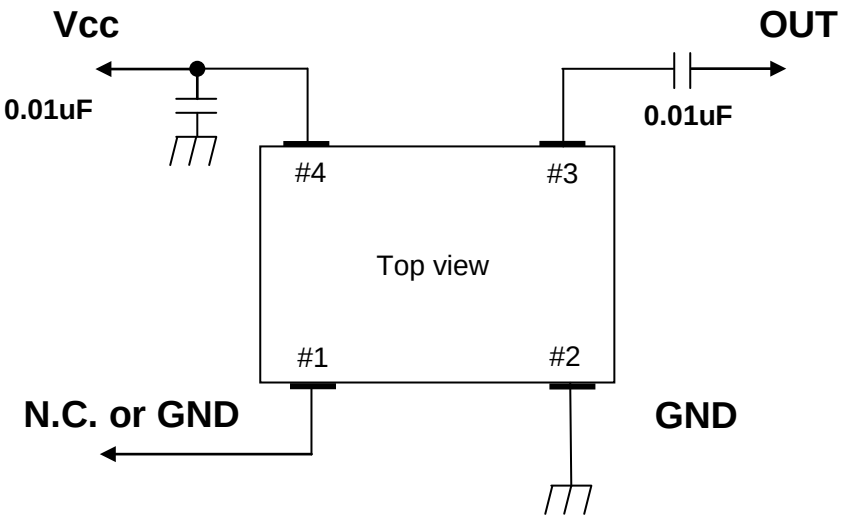
3. Electrical characteristics

Ta=-40 to +85deg.C, Vcc=1.68V to 3.63V, Load=10kohm//10pF

	Item	MIN.	TYP.	MAX	Unit	Conditions	Remarks
1	Temp characteristics	-0.5	---	+0.5	$x10^{-6}$	Ta= -30 to +85 deg.C	On the basis of 25 deg.C frequency
		-3.0	---	+3.0	$x10^{-6}$	Ta= -40 to -30 deg.C	
2	Frequency Slope	-0.05	---	+0.05	$\times10^{-6}$/deg.C	Ta= -20 to +65 deg.C	Every 2 deg.C
		-0.1	---	+0.1	$\times10^{-6}$/deg.C	Ta= -30 to +85 deg.C	
		-0.35	---	+0.35	$\times10^{-6}$/deg.C	Ta= -40 to -30 deg.C	
3	Voltage characteristics	-0.1	---	+0.1	$x10^{-6}$	Vcc+/-5%	Vcc=1.68V+5%min., 3.63V-5%max.
4	Load characteristics	-0.1	---	+0.1	$x10^{-6}$	10kohm//10pF+/-5%	
5	Aging characteristics 1	-0.7	---	+0.7	$x10^{-6}$/Y	1year	at 25+/-2 deg.C
		-1.4	---	+1.4	$x10^{-6}$/2Y	2years	
		-2.5	---	+2.5	$x10^{-6}$/5Y	5years	
		-5.0	---	+5.0	$x10^{-6}$/10Y	10years	
6	Frequency tolerance	-1.0	---	+1.0	$x10^{-6}$	After 2 times reflow soldering	at 25+/-2 deg.C
7	Current	---	---	2.0	mA		
8	Output voltage	1.1	1.23	---	Vp-p		
9	Harmonics	---	---	-8.0	dBc		
10	Start up time	---	---	2.0	msec	90% of final output amplitude	
		---	---	2.0	msec	Within +/-0.5ppm	
11	Temperature hysteresis	-0.6	---	+0.6	$x10^{-6}$		
12	Frequency drift rate	---	5.0	10.0	ppb/sec	Temperature rate change of 0.3deg.C/sec	Ta=-30to+85deg.C
13	Duty	45	---	55	%	@GND	
14	Phase noise	---	---	-50	dBc/Hz	@1Hz offset	at 25+/-2 deg.C
		---	---	-73	dBc/Hz	@5Hz offset	
		---	---	-80	dBc/Hz	@10Hz offset	
		---	---	-106	dBc/Hz	@100Hz offset	
		---	---	-134	dBc/Hz	@1kHz offset	
		---	---	-144	dBc/Hz	@10kHz offset	
		---	---	-152	dBc/Hz	@100kHz offset	

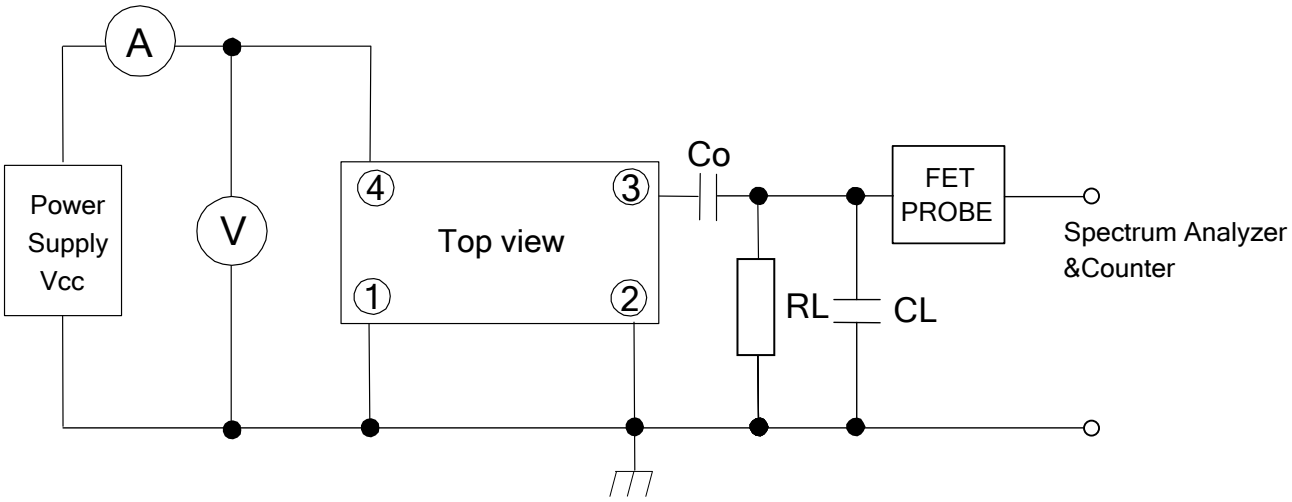
4. Circuit

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.3 and No.4).



5. Test circuit

*Load 10kohm//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. 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 soldering at 2times.	

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

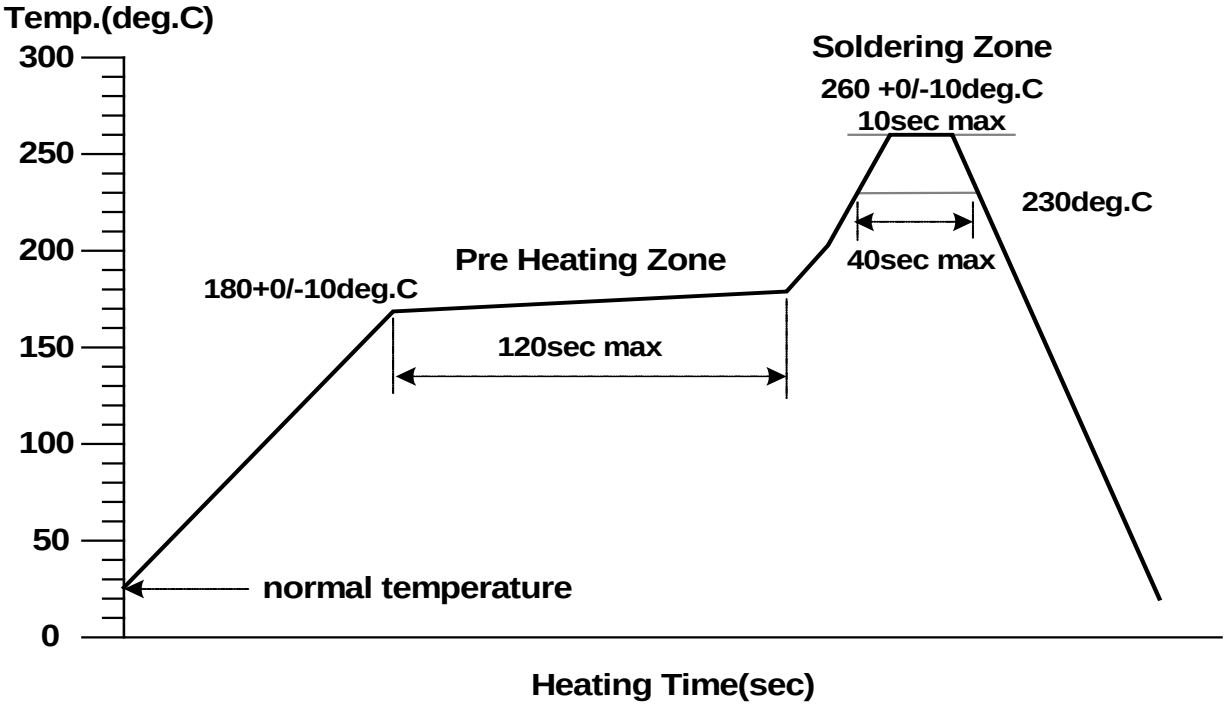
Judge

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

7. Reflow profile

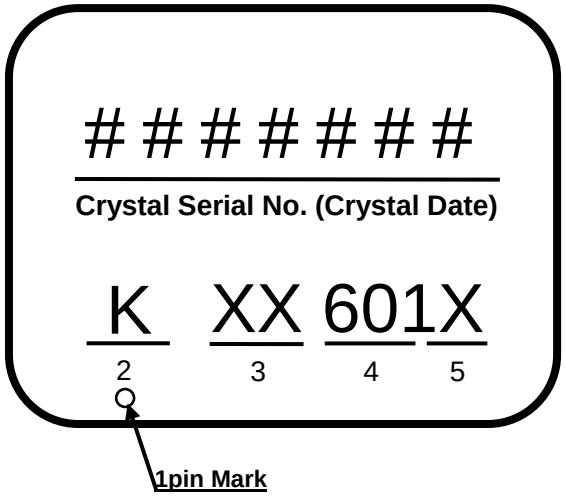
7-1. Preheat: 180+0/-10deg.C, 120sec (max)
7-2. Peak Temperature: 260+0/-10deg.C, 10sec (max)
7-3. PC-Board
Material : FR-4
Size : 140mm*110mm
Thickness : t=0.8mm
7-4. Condition of Measurement Temperature: Surface of PC-BOARD
7-5. Reflow Number of Time: 2times

Reflow Soldering Condition



7-6. Manual soldering : 350+/-5deg.C for 3+/-1sec.

8. Marking contents

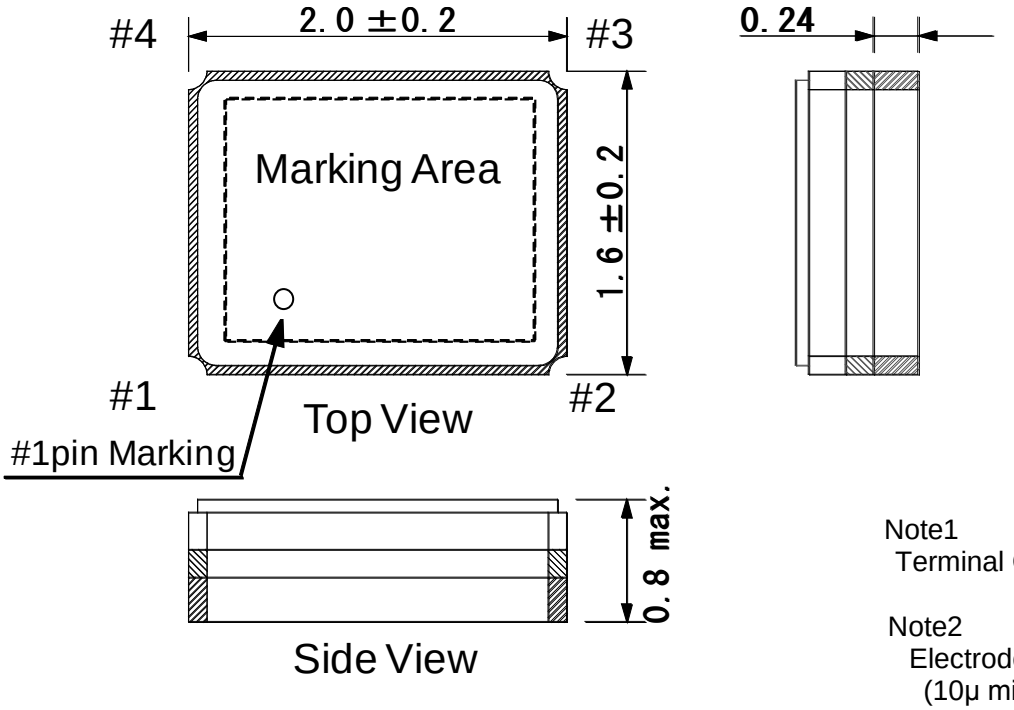


*Laser Marking

	Contents	Example
1	1Pin identifier	○
2	Control Code1	K
3	Control Code2	XX
4	Weekly Code.	601 *The 2016 1st week 602 *The 2016 2nd week
5	Control Code3	X *Specification Code (Blank or alphanumeric)

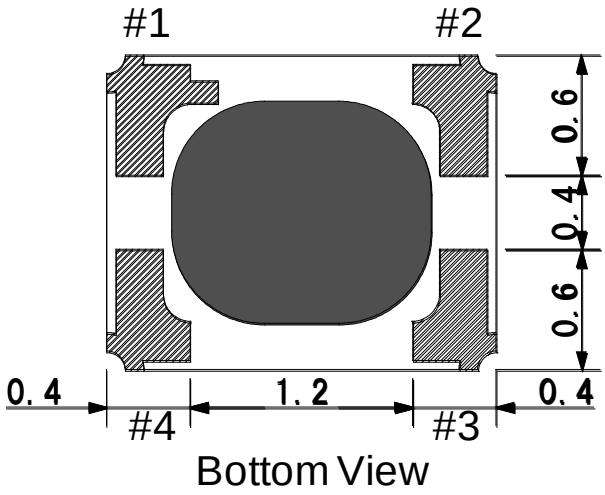
Drawing No.	TKY1D-H1-15171-05 [13]

9. Dimensions



Note1
Terminal Coplanarity:80um max

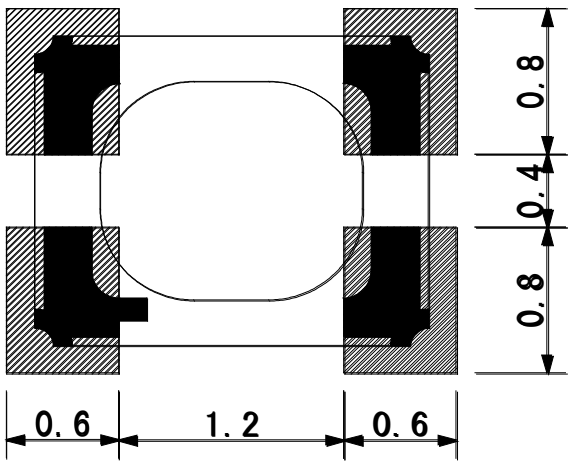
Note2
Electrode : Cu + Ni + Au
(10μ min+3μ min+0.03μ min)



	Pin Connection
# 1 pin	N.C. or GND
# 2 pin	GND
# 3 pin	Output
# 4 pin	Vcc

Unit: mm

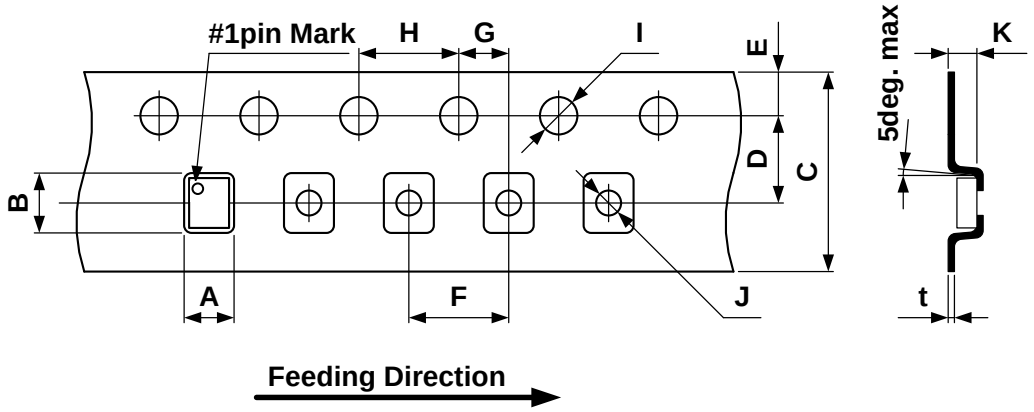
Recommended Land Pattern



Drawing No.	TKY1D-H1-15171-05 [13]

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.

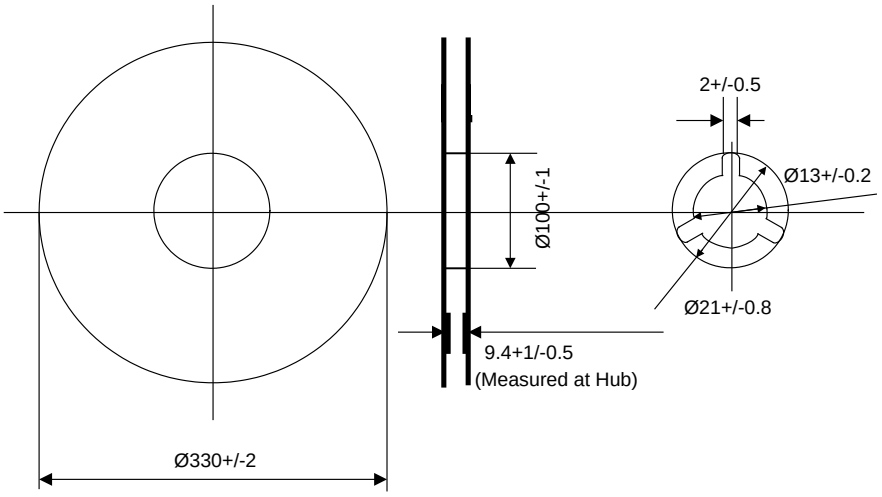
Unit: mm

Symbol	A	B	C	D	E
Dimension	2.0+/-0.05	2.4+/-0.05	8.0+/-0.2	3.5+/-0.05	1.75+/-0.1

Symbol	F	G	H	I	J
Dimension	4.0+/-0.1	2.0+/-0.05	4.0+/-0.1	Φ1.5+0.1/-0	Φ1.0+0.1/-0

Symbol	K	t
Dimension	0.9+/-0.05	0.25+/-0.05

10-2.Reel specification



Unit:mm

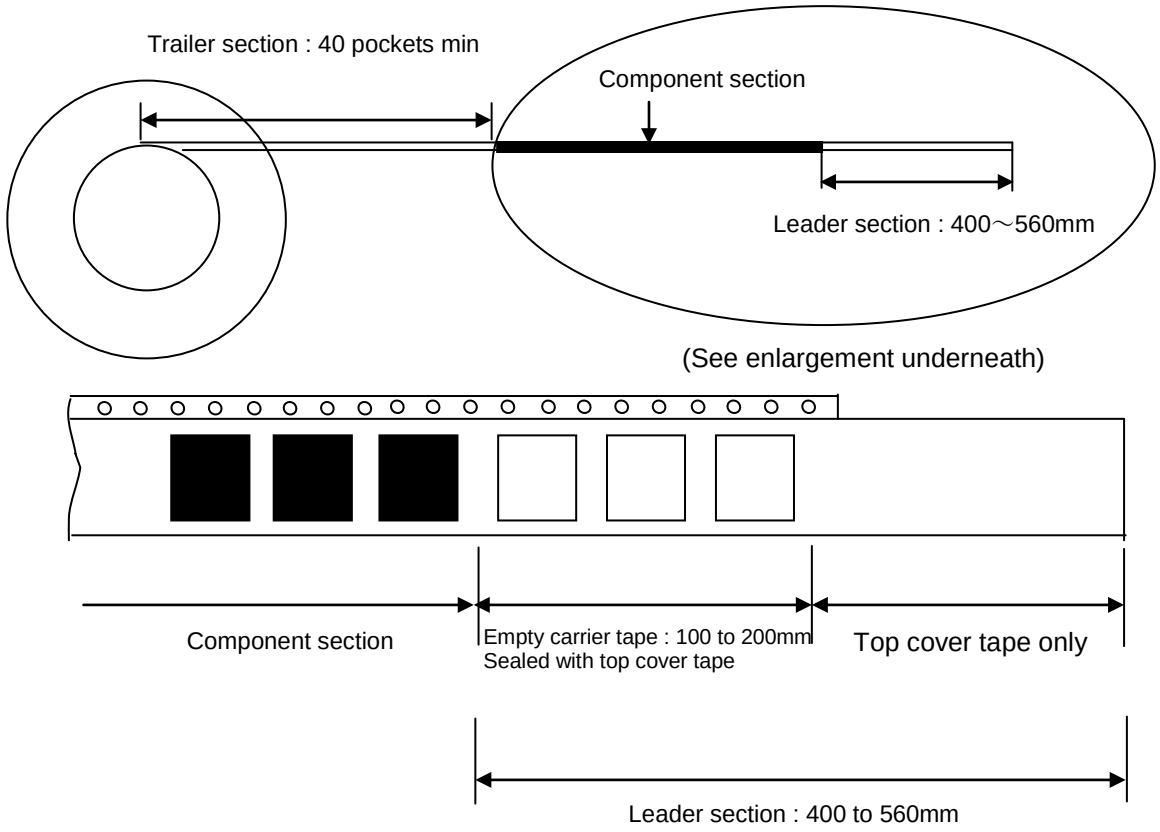
10-2-1. Reel material: PS Included Carbon

10-2-2. Reel unit: 15,000pcs 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

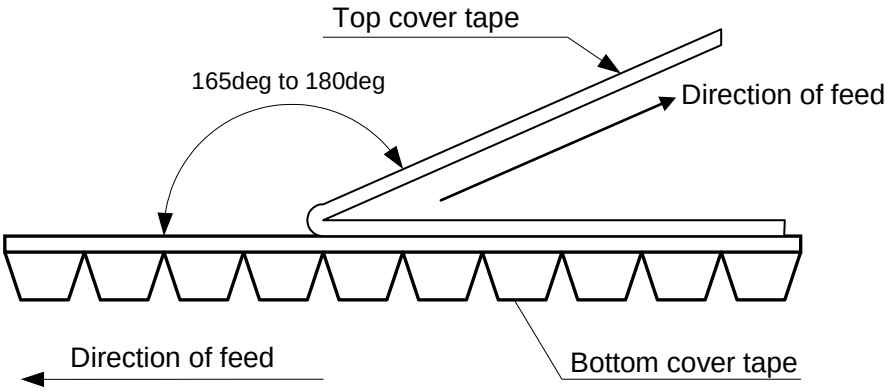
11-1. Reel Angle: 165 to 180deg

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

1)5850 Higasine-Koh, Higasine-shi, Yamagata, 999-3701, Japan

2) 3-11-1 Osachi Kohagi, Okaya-shi, Nagano, 394-8550, Japan

14. Parts Numbering Guide

KT2016K 26000 Z A W 18 T 5S

A B C D E F G H

A. Series (2.0x1.6 SMD KT2016K)
B. Frequency (26.0MHz)
C. Frequency temperature accuracy (Z: Special specification)
D. Minimum temperature range (A: -40deg.C)
E. Maximum temperature range (W: +85deg.C)
F. Supply voltage (18: 1.8V)
G. Control voltage stability (T: TCXO)
H. Customer special model Suffix