Preliminary Specification

Drawing No.	TKY1D-H2-16241-00[14]
Issued Date.	April 6, 2016

TO: KED USA

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

Product Name	Temperature Compensated Crystal Oscillator
Product Model	KT1612A
Frequency	26.0MHz
Customer Part Number	————————
Customer Specification Number	————————
KYOCERA Part Number	KT1612A26000CCW18ZHT
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.Kakuta	H.Mae	Y.Hosoya	M.Narita

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Revision History

Rev. No.	Description of revise	Date	Approved by	Examined by	Written by
00	First Edition.	Apr. 6, ’16	H.Mae	Y.Hosoya	M. Narita

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1. Purpose and scope

This document contains specification related to CRYSTAL OSCILLATOR model KT1612A26000CCW18ZHT for KED USA.

2. Nominal condition

	Item	MIN.	TYP.	MAX	Unit	Conditions
1	Operating temperature range	-30	---	+85	deg.C	
2	Storage temperature range	-40	---	+85	deg.C	
3	Nominal frequency	---	26.0	---	MHz	
4	Supply voltage	1.7	1.8	1.9	V	1.8V+/-0.1V
5	Absolute maximum ratings voltage (Supply voltage)	-0.6	---	+4.6	V	
	Absolute maximum ratings voltage (Control voltage)	-0.6	---	Vcc+0.6	V	
6	Load impedance	9	10	11	kohm	
		9	10	11	pF	
7	Output signal condition	---	Clipped sine	---		
8	Control voltage range	0.1	0.8	1.7	V	0.8V+0.9/-0.7V

3. Electrical characteristics

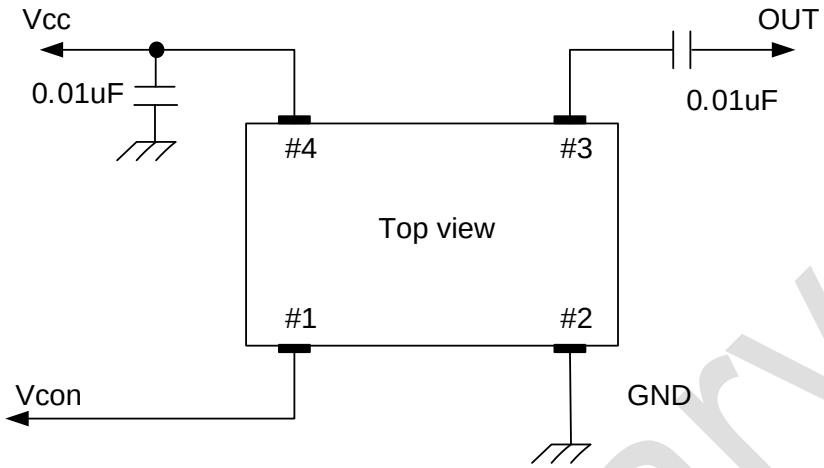
Ta=-30 to +85deg.C, Vcc=1.8V , Vcon=0.8V , Load=10kohm//10pF

	Item	MIN.	TYP.	MAX	Unit	Conditions	Remarks
1	Temp characteristics	-1.5	---	+1.5	$x10^{-6}$	On the basis of 25deg.C frequency	
2	Frequency Slope	-0.05	---	+0.05	$\times 10^{-6}$/deg.C	-20 to+70 deg.C	
3	Voltage characteristics	-0.2	---	+0.2	$x10^{-6}$	1.8V+/-0.1V	
4	Load characteristics	-0.2	---	+0.2	$x10^{-6}$	10kohm//10pF+/-10%	
5	Humidity	-1.0	---	+1.0	$x10^{-6}$	85deg.C/85%RH , 120H	
6	Aging characteristics	-1.0	---	+0.5	$x10^{-6}$/Y	1year	at 25+/-2 deg.C
		-4.0	---	+1.0	$x10^{-6}$/8Y	8years	
7	Frequency tolerance	-1.0	---	+1.0	$x10^{-6}$	Preset Frequency	at 25+/-2 deg.C
		-1.0	---	+1.0	$x10^{-6}$	Frequency shift after 2times reflow soldering	
8	Current	---	1.1	1.5	mA		
9	Output voltage	0.7	---	1.2	Vp-p		
		-0.1	---	+1.5	V	Absolute maximum rating	
10	Harmonics	---	---	-20	dBc	2^{nd}	
		---	---	-10	dBc	3^{rd}	
		---	---	-60	dBc	34^{th} , 36^{th} , $>69^{th}$	
		---	---	-18	dBc	other	
11	Start up time	---	---	0.75	msec	output amplitude>=350mV Within +/-20ppm	
		---	---	1.5	msec	90% of final output amplitude Within +/-2ppm	
		---	---	2.5	msec	95% of final output amplitude Within +/-0.1ppm	
		---	---	5.0	msec	100% of final output amplitude Within +/-0.05ppm	

	Item	MIN.	TYP.	MAX	Unit	Conditions	Remarks
12	Duty	45	50	55	%	@GND	
13	Voltage control range	---	---	-8.0	$x10^{-6}$	Vcon=0.1V	ref.:Vcon=0.8V
		+10.5	---	---	$x10^{-6}$	Vcon=1.7V	
14	Input Impedance	500	---	---	kohm		
15	Tuning range margin vs. total freq. tolerance	0.9	---	---	$x10^{-6}$	Total frequency tolerance = sum of all items acc.	
16	Tuning linearity	-20	---	+20	%	Relative to mean df/dVcon	
17	Tuning Sensitivity	---	---	16	$x10^{-6}$/V		
18	Output level drift	-10	---	+10	%	Over temp. & supply range	
19	Allan Variance	---	---	1.0	$x10^{-9}$	tau=1s	
20	Phase noise	---	-118	-114	dBc/Hz	@100Hz offset	Ta=-30 to +85 deg.C
		---	-140	-136	dBc/Hz	@1kHz offset	
		---	-155	-148	dBc/Hz	@10kHz offset	
		---	-158	-153	dBc/Hz	@100kHz offset	
		---	-158	-153	dBc/Hz	@1MHz offset	

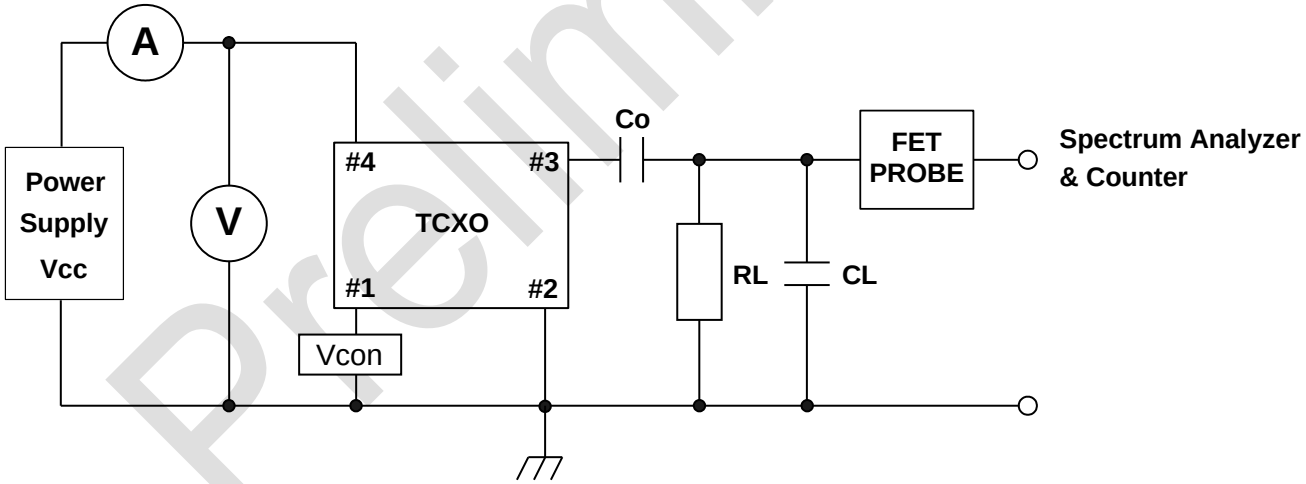
4. Circuit

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(#3 and #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

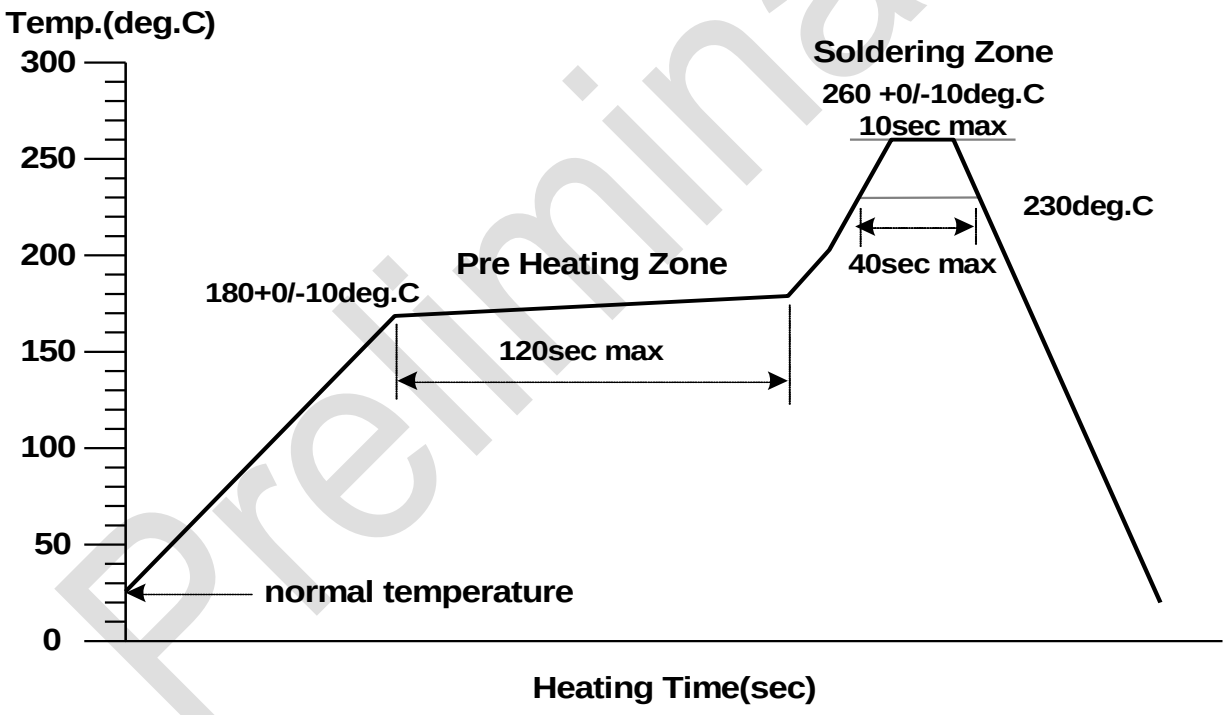
7-1. Preheat: 180+0/-10deg.C, 120sec (max)

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

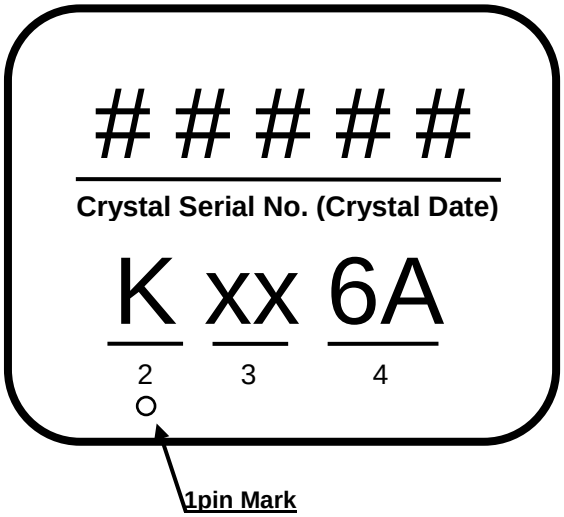
7-3. PC-Board
Material: FR-4
Size: 140mm*110mm
Thickness: t=0.8mm

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

Reflow Soldering Condition



8. Marking contents



*Laser Marking

	Contents	Example
1	Pin-1 identifier	○
2	Control Code1	K
3	Control Code2	XX
4	Monthly Code	6A *The 2016 January 6B *The 2016 February

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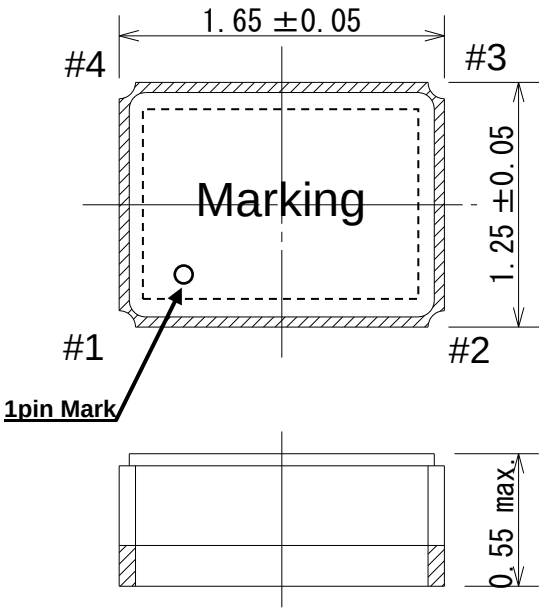
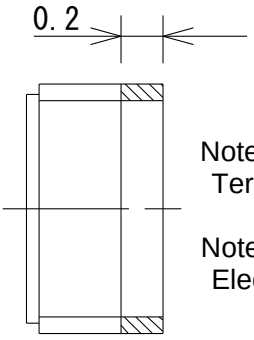
9. Dimensions (T.B.D)

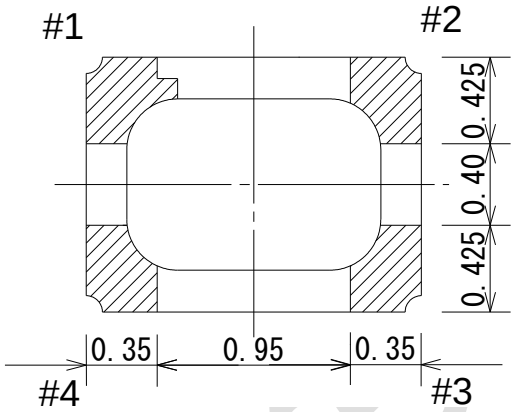




Note1
Terminal Coplanarity: 60um max

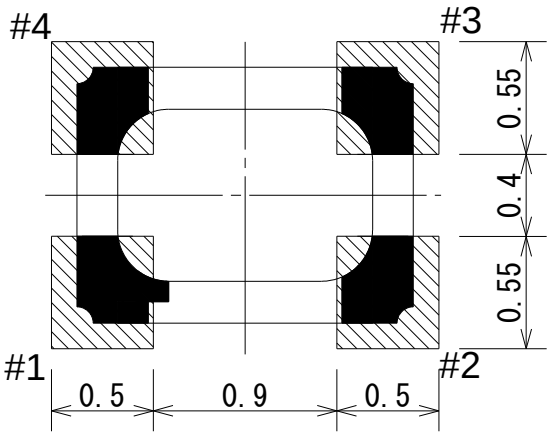
Note2
Electrode: Mo + Ni 2.0 to 8.89um
+ Au 0.3 to 1.0um

	Pin Connection
#1 pin	Vcon
#2 pin	GND
#3 pin	Output
#4 pin	Vcc



Unit: mm

Recommended Land Pattern



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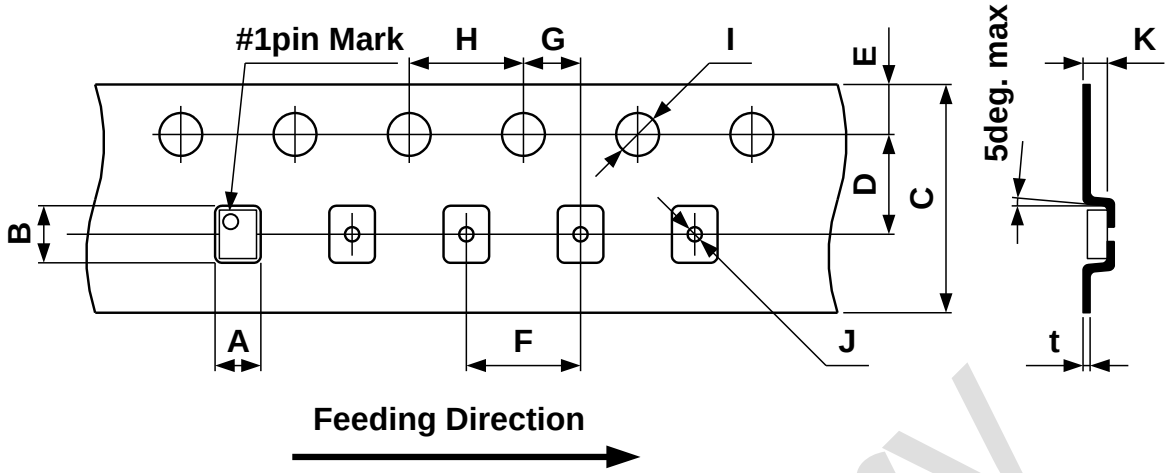
10. Tape & Reel

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.

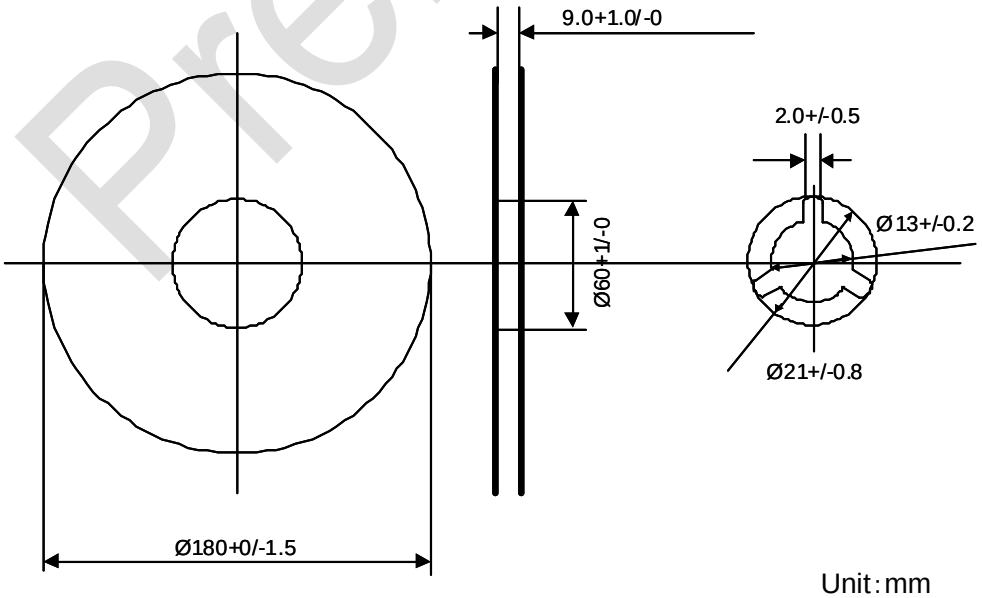
Unit: mm

Symbol	A	B	C	D	E
Dimension	1.45+/-0.1	1.85+/-0.1	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+/-0.05	Φ1.5+0.1/-0	Φ0.5+0.05

Symbol	K	t
Dimension	0.65+/-0.05	0.20+/-0.05

10-2.Reel specification



Unit:mm

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

10-2-2. Reel unit: 4,000pcs max. /1Reel

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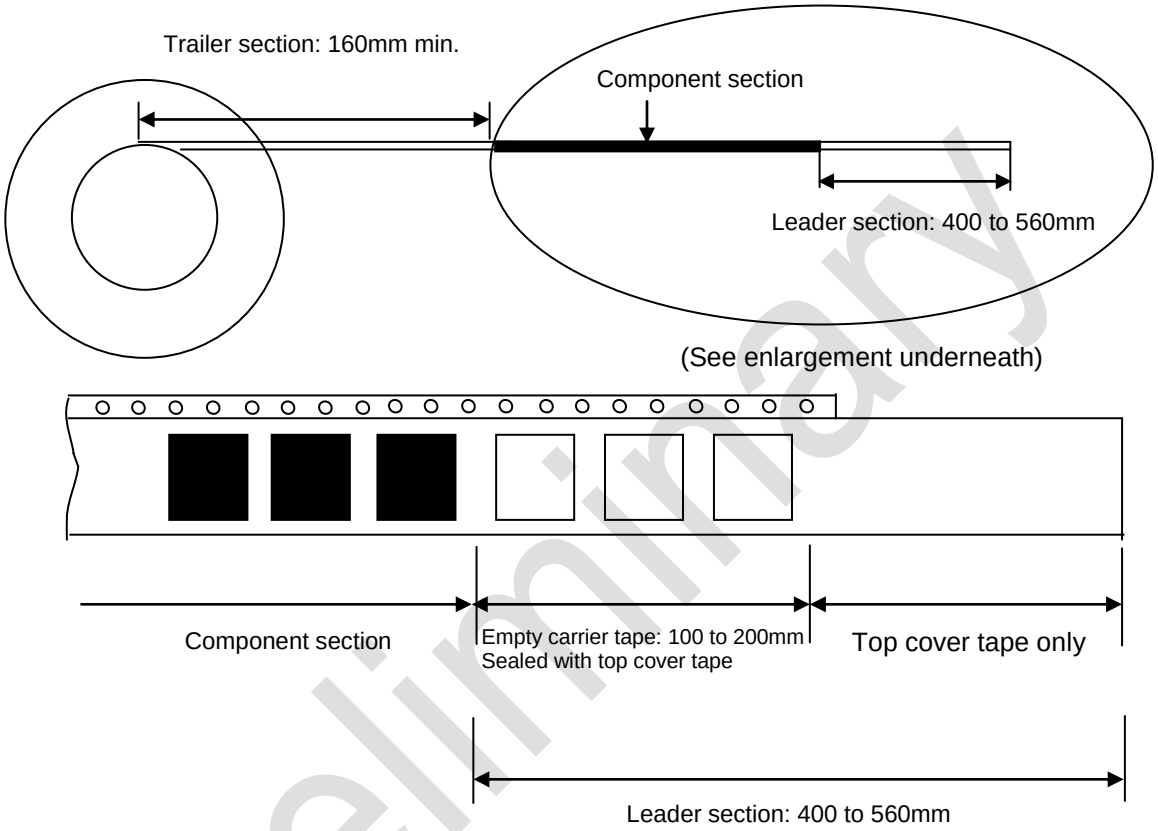
10-3. Packing

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

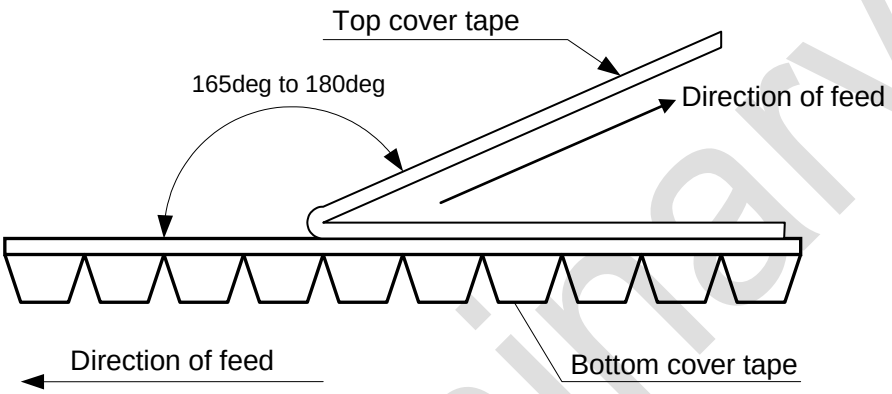
11-1. Reel Angle: 165 to 180deg

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

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 KKC 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 Higashine-Koh, Higashine-shi, Yamagata, 999-3701, Japan

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

14. Parts Numbering Guide

KT1612A	**26000**	**C**	**C**	**W**	**18**	**Z**	**HT**
A	B	C	D	E	F	G	H

A. Series (1.6x1.2 SMD KT1612A)
B. Frequency (26.0MHz)
C. Frequency temperature accuracy (C: +/-1.5ppm)
D. Minimum temperature range (C: -30deg.C)
E. Maximum temperature range (W: +85deg.C)
F. Supply voltage (18: 1.8V)
G. Control voltage stability (Z: Special specification)
H. Customer special model Suffix

Mouser Electronics

Authorized Distributor

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AVX:
KT1612A26000CCW18ZHT