DATE: 2019/05/27

Guangdong OPPO Mobile Telecommunications Co.,Ltd.

REFERENCE SHEET

ITEM:	CRYSTAL OSCILLATOR
	DSB1612WA
	26.000MHz
Spec.no:	ZZ09506

DAISHINKU CORP.
1389 Shinzaike, Hiraoka-cho,
Kakogawa, Hyogo 675-0194 Japan
Phone(81)794-25-3141
Fax(81)794-25-1134
http://www.kds.info/index_en.htm

C.ENG. T. Hanaki

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1. Device Name TCXO
2. Model Name DSB1612WA
3. Nominal Frequency 26.000 MHz
4. Mass 0.008g max.

5. Absolute Maximum Ratings

	Item	Symbol	Rating	unit
1	Supply Voltage	V_{CC}	-0.3 ~ +4.6	V
2	Storage Temperature Range	T_{STG}	-40 ~ +85	°C

6. Recommended Operating Conditions

	Item	Symbol	min.	typ.	max.	unit
1	Supply Voltage	V_{CC}	+1.71	+1.8	+1.89	V
2	Load Impedance (resistance part)	L_{OAD}_R	9	10	11	kΩ
	(parallel capacitance)	L_{OAD}_C	9	10	11	pF
3	Operating Temperature Range	T_$_{OPR}$	-30	-	+85	°C

7. Electrical Characteristics

(T_A=-30~+85°C, L_{OAD}_R//C=10kΩ//10pF, V_{CC}=+1.8V unless otherwise noted)

	Item	Conditions	Limits			unit	Notes
			min.	typ.	max.		
1	Current Consumption		-	-	+1.5	mA	
2	Output Level		0.8	-	-	V_{P-P}	1
3	Symmetry	GND level (DC cut)	40/60	-	60/40	%	
4	Harmonics		-	-	-5.6	dBc	
5	Frequency Stability 1.Tolerance	After 2 times reflow(T_A=+25°C) Ref. to Nominal Frequency	-	-	±2.0	ppm	2,3
	2.vs Temperature	T_A=-30~+85°C Ref. to Frequency (T_A=+25°C)	-	-	±0.5	ppm	
	3.vs Frequency Slope	T_A=-30~+85°C	-	-	±0.1	ppm/°C	
	4.vs Short Term Stability	First 10 s after start-up (From 0.1s to 10.1s)	-	-	±40	ppb/10s	
		After 10s	-	-	±10	ppb/10s	
		After 10s	-	-	±5	ppb/s	
	5.vs Supply Voltage	V_{CC}=+1.8V±5%	-	-	±0.2	ppm	
	6.vs Load Variation	L_{OAD}_R//C=(10kΩ//10pF)±10%	-	-	±0.2	ppm	
	7.vs Aging	T_A=Room ambient	-	-	±1.0	ppm/year	
6	Start Up Time	@90% of final Vout level	-	-	2.0	ms	
7	SSB Phase Noise	Relative to f0 level offset 10Hz	-	-	-80	dBc/Hz	
		Relative to f0 level offset 100Hz	-	-	-105		
		Relative to f0 level offset 1kHz	-	-	-130		
		Relative to f0 level offset 10kHz	-	-	-140		
		Relative to f0 level offset 100kHz	-	-	-145		
		Relative to f0 level offset 1MHz	-	-	-145		

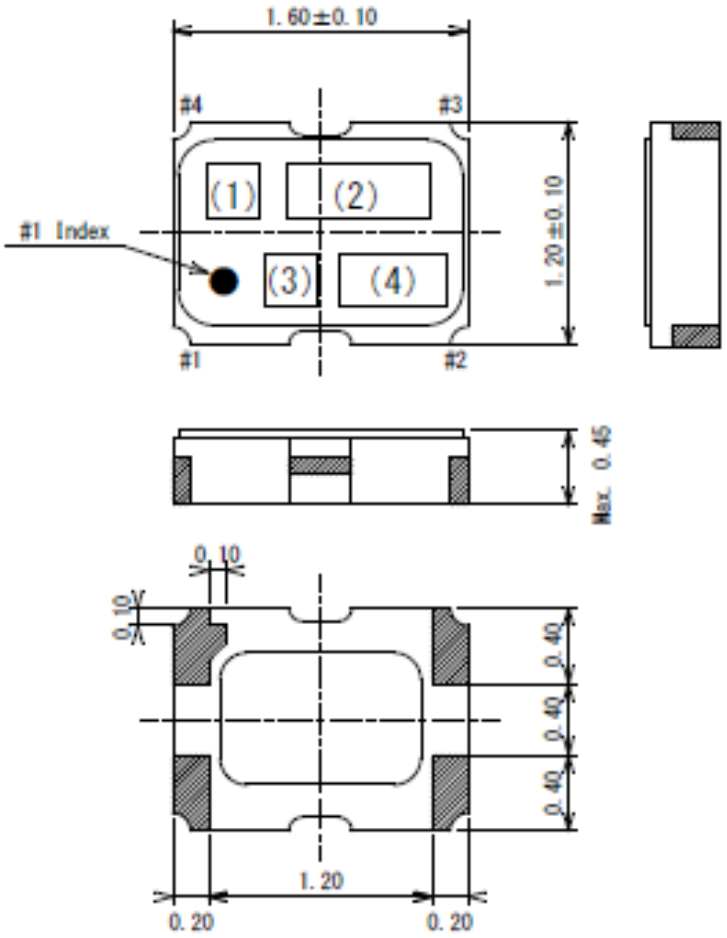
Notes

1. Clipped sine wave (DC-coupled)
2. T_A=+25°C
3. Please leave after reflow in 2h or more at room ambient.

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8. Outline, Pin Connections, Land Pattern Layout

Outline



- Bottom View -

Pin Connections

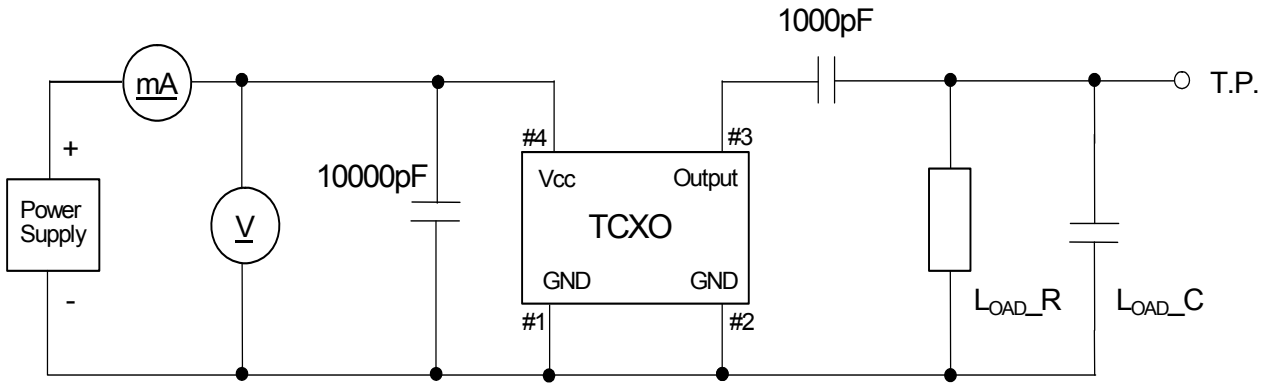
Pin No.	Connection
#1	GND
#2	GND
#3	Output
#4	V_{CC}

Marking

(1) Model code	H
(2) Frequency	26.0 (MHz, 3digits)
(3) Logo	D
(4) Date code	Year (1digit) +Week (2digits)
	e.g.2019/1/1 → 901

unit: mm
Dimensional Tolerance: ±0.1
(Unless otherwise noted)

9. Measurement Circuit



L_{OAD}_R=10kΩ
L_{OAD}_C=10pF (Include Jig stray capacitance)

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10. Mechanical Characteristics

	Test Item	Test Description	Requirements
1	Drop	Natural drop (on concrete) Mounting on the set or test fixture.(Total weight 100g) Height : 150cm Direction : X,Y,Z -6directions Test cycle : 10 cycles Reference specification : EIAJ-ED-4702A Method5	df/f =<±1.0ppm
2	Vibration	Sweep range : 10Hz→500Hz→10Hz Sweep speed : 11min./cycle Amplitude : 1.5mm (10~55Hz) Acceleration : 200m/s^2 (55~500Hz) Direction: X,Y,Z,-3 directions Test cycle : 10 cycles Reference specification : IEC 60068-2-6	df/f =<±0.5ppm
3	Shock	Acceleration: 1000m/s^2 Direction : X,Y,Z -6directions Duration : 6ms Test cycle : 3 times/each directions Reference specification : IEC 60068-2-27	df/f =<±0.5ppm
4	PCB Bend Strength	PWB : t=1.6mm Pressure speed : 1mm/s Bend width : ±3mm Duration : 10±1s Reference specification : IEC 60068-2-21 Ue1	df/f =<±0.5ppm No visible damage.
5	Adherence nature	PWB : t=1.6mm Pressure : 10N Duration : 10±1s Direction: X,Y,-2directions Reference specification : IEC 60068-2-21 Ue3	df/f =<±0.5ppm No visible damage.
6	Package Strength	Pressure : 10N Duration: 10±1s Reference specification : IEC 60068-2-77	df/f =<±0.5ppm No mechanical damage. No leak damage.
7	Gross leak	It is immersed for 3 min into +125±5°C Chlorofluorocarbon (CFCs) liquid. Reference specification : IEC 60068-2-17	No continuous air bubbles.
8	Fine leak	It shall be measured by the helium leak detector after pressurization for 60min by the pressure of (3.92±0.49) x10^5 Pa in a helium gas atmosphere. Reference specification : IEC 60068-2-17	Less than 1.0x10^{-9}Pa m^3/s.
9	Solderability	Solder bath method(Flow soldering) Soldering temperature: +245±5°C Duration: 3±0.3s Reference specification : IEC 60068-2-58	A new uniform coating of solder shall cover a minimum of 90% of the surface being immersed.
10	Resistance to Soldering heat	Solder iron method Bit temperature:+350±10°C Duration: 3+1/-0s /each terminal Reference specification : IEC 60068-2-58	df/f =<±1.0ppm No visible damage.
		Reflow In refer to temperature profile shown in clause 14. Test cycle : 3cycles It shall be measured after 2h at room temperature, humidity.	df/f =<±1.5ppm No visible damage.

11. Environmental Characteristics

	Test Item	Test Description	Requirements
1	Cold	Temperature: -40±3°C Duration: 1000h It shall be measured after 2h at room temperature, humidity. Reference specification : IEC 60068-2-1 Ab	df/f =<±1.0ppm dV_{OUT} =<±0.2V_{P-P}
2	Hot	Temperature: +85±2°C Duration: 1000h It shall be measured after 2h at room temperature, humidity. Reference specification : IEC 60068-2-2 Bb	df/ =<±2.0ppm dV_{OUT} =<±0.2V_{P-P}
3	Humidity	Temperature: +85±2°C R.H. 85±5% Duration: 1000h It shall be measured after 2h at room temperature, humidity. Reference specification : IEC 60068-2-3	df/f =<±2.0ppm dV_{OUT} =<±0.2V_{P-P}
4	HTB	Temperature: +85±2°C Duration: 1000h BIAS : Max value of supply voltage It shall be measured after 2h at room temperature, humidity. Reference specification : IEC 60068-2-2 Bb	df/f =<±2.0ppm dV_{OUT} =<±0.2V_{P-P}
5	THB	Temperature: +40±2°C R.H. 90~95% Duration: 1000h BIAS : Max value of supply voltage It shall be measured after 2h at room temperature, humidity. Reference specification : IEC 60068-2-3	df/f =<±2.0ppm dV_{OUT} =<±0.2V_{P-P}
6	Change in Temperature (Temperature cycling)	200 cycles of Temperature: -40±3°C:0.5h → +85±2°C:0.5h It shall be measured after 2h at room temperature, humidity. Reference specification : IEC pub.68-2-14.Na	df/f =<±2.0ppm dV_{OUT} =<±0.2V_{P-P} Any cracks shall not appear.
7	ESD	Model : Machine Model (MM) Vs=±200V (C1=200pF, R2=0Ω) Number of times : 3times Each terminal except common terminal. (Connect to test terminal) Reference specification : EIA/JESD22-A115	df/f =<±1.0ppm No visible damage.
		Model : Human Body Model (HBM) Vs=±1500V (C1=100pF, R2=1500Ω) Number of times : 3times Each terminal except common terminal. (Connect to test terminal) Reference specification : EIA/JESD22-A114	df/f =<±1.0ppm No visible damage.

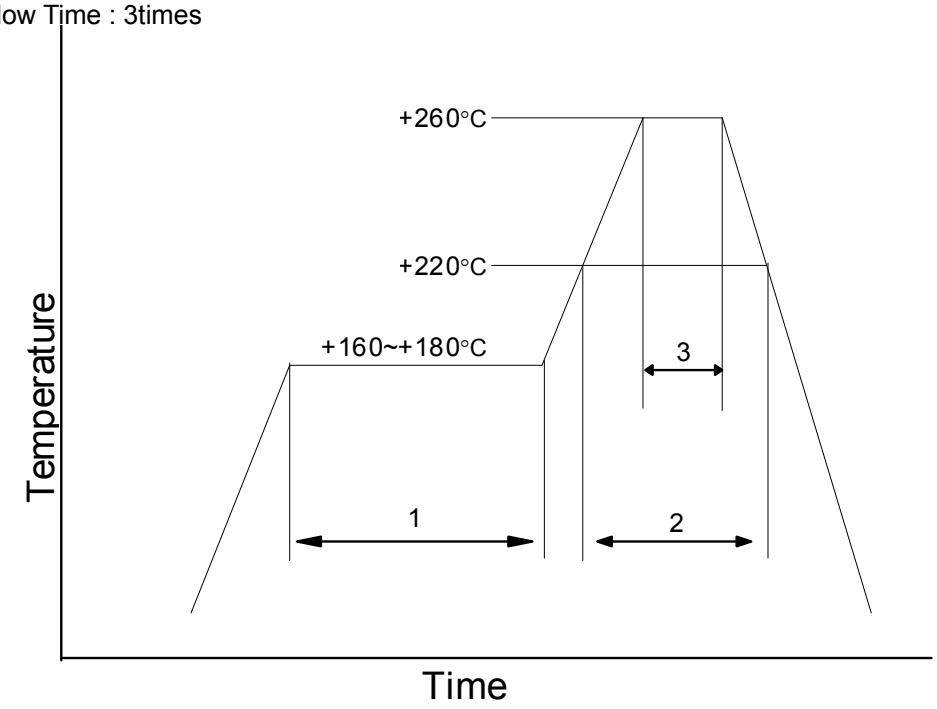
12. Coplanarity

When the component is placed on the flat surface, the gap from the connecting terminal shall not exceed 40um.



13. Reflow Profile

Reflow Time : 3times



1	Preheat	+160~ +180°C 120s.
2	Primary heat	+220°C 60s.
3	Peak	+260°C 10s. max.

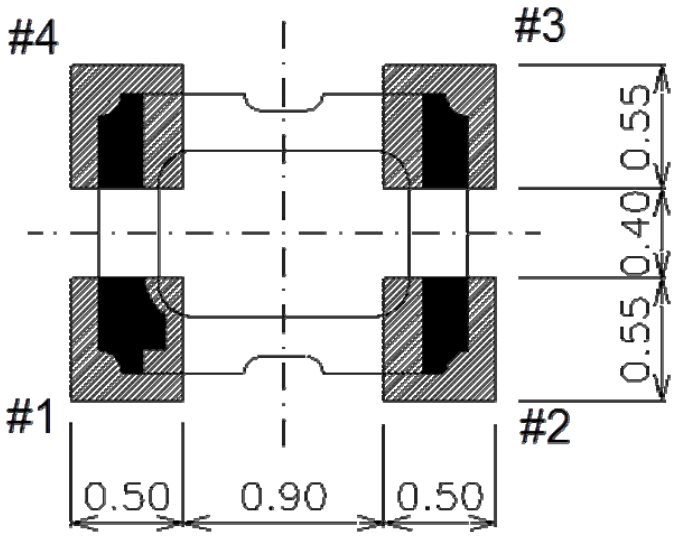
14. Moisture Sensitivity Level

Moisture Sensitivity Level of this device is MSL=2.

Refer to IPC/JEDEC J-STD-033

Level	Floor Life (out of bag)
2	1 year max. at =<30°C/60% RH

15. Land Pattern Layout (Example) <Top View>



16. Packing Specification

16.1 Reel specification

Please see Fig.3.

16.2 Emboss tape format and dimensions

Please see Fig.2.

16.3 Taping specifications

Please see Fig.1.

16.4 Quantity

3000pcs.max per reel.

16.5 Taping Material List

Please see below table.

Taping material List

Item	Materials	Disposition	Static electricity	Surface resistance
Cover Tape	PET+olefinic Resin (Conductive layer)	Conductive	Under 10V	10^{7} to 10^{10} Ω
Emboss Tape	PS	Conductive	Under 10V	10^{5} to 10^{6} Ω
Reel	PS	Conductive	Under 10V	10^{8} Ω max.

16.6 Packaging Procedure

Please see below figure

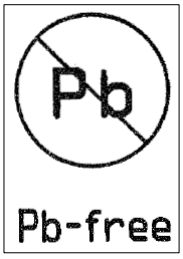
Lot label

TYPE	(Model Name)
SPEC NO.	(Spec. Number)
PARTS NO.	(User's Parts Number)
LOT NO.	(Lot Number)
FREQ.	(Nominal Frequency)
Q'TY	(Quantity)
CTL NO.	(Control Number)
KDS	DAISHINKU CORP.

Shipping label

ITEM	(Model Name)
SPEC	(Spec. Number)
DELIVERY DATE	(Delivery Date)
Q'TY	(Quantity)
NOTES	(User's Parts Number)
DAISHINKU CORP.	

Pb-free Label



Lot label (Example)

TYPE	XXXXXXXX
SPEC NO.	XXXXXXXXXXXX
PARTS NO.	XXXXXXXXXXXX
LOT NO.	XXXXXXXXX
FREQ	XX.XXX MHz
Q'TY	XXXX pcs
CTL NO.	XXXXXXXXXXXX
KDS	Made in Japan

Formation of a lot number

e.g. AH9101001

A	H	9101	001
Manufacturing site code	Product code	year/ month/ day	Serial No.

The notation method of a manufacture year, month, and day. (4digits alphanumeric character)

YMDD (4digits) e.g.) 2019 /01 /01→ 9101

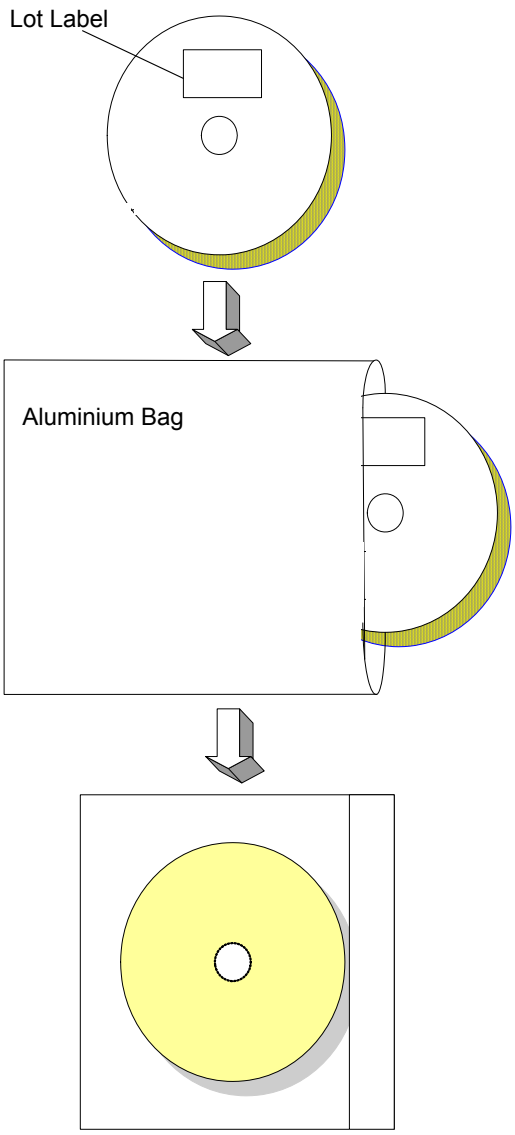
Y Year 1digit (Last digit of Year)

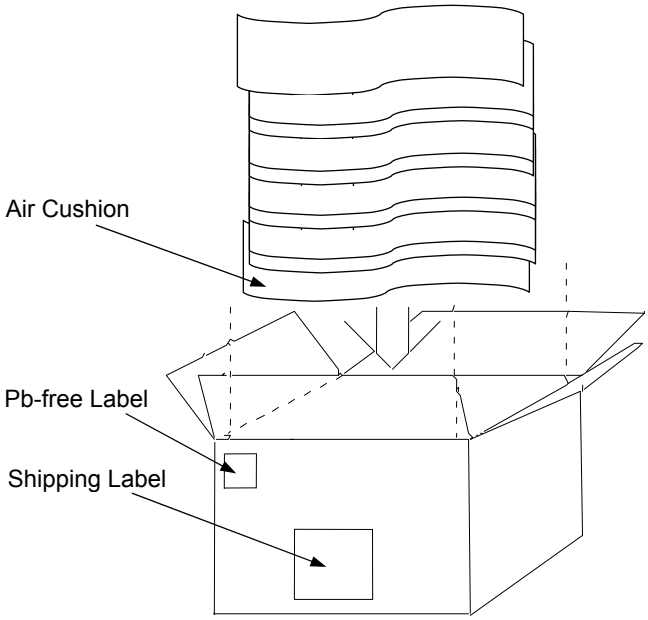
*Beginning in April 2019, make 2-digit display with natural switching.

M Month 1digit alphanumeric symbol

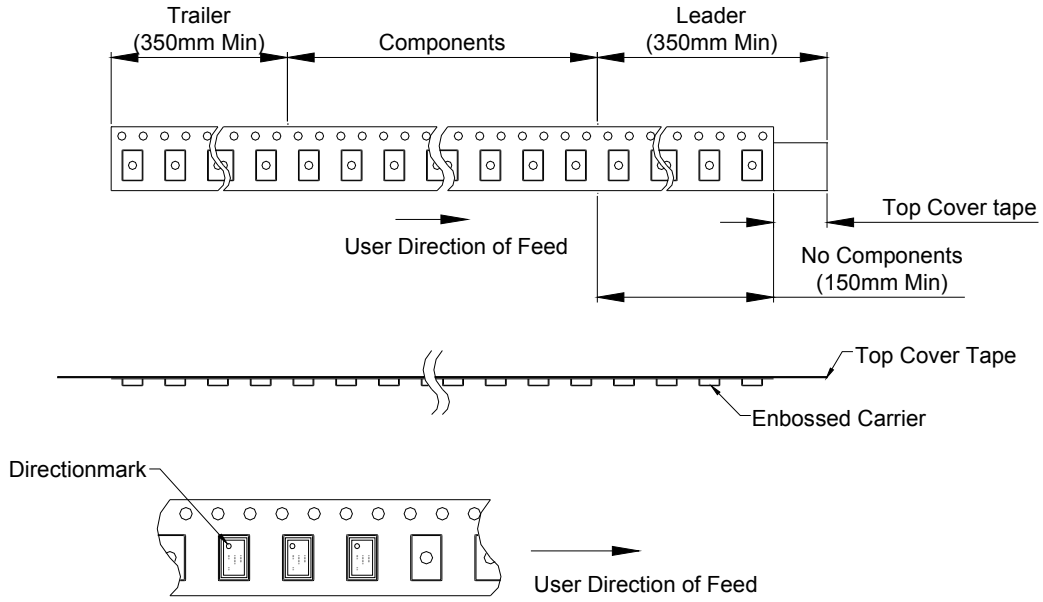
DD Day 2digits numerical characters of day

Month	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Symbol	1	2	3	4	5	6	7	8	9	O	N	D





The product is packed up with the method which does not break in the handling by a shipping agent.

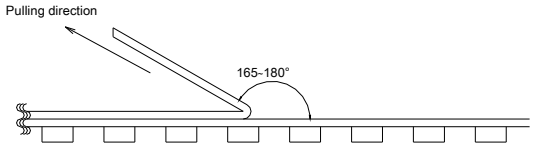


Direction of taking up reel is clock-wise as above.

There are sprocket holes on the right hand side of the tape when it is pulled out as shown above.

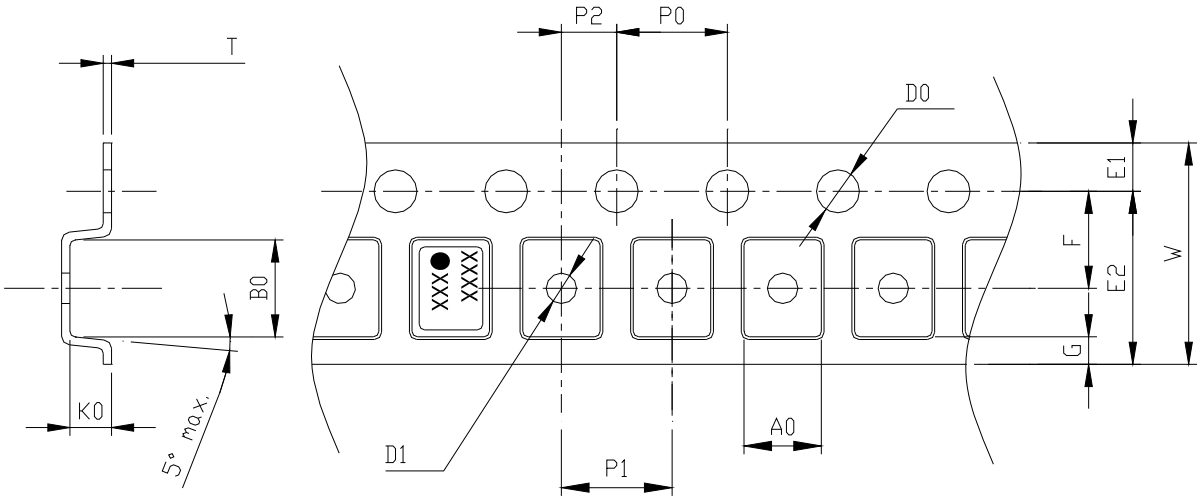
Peel strength

Pulling angle 165~180°, pulling speed at 300mm/min, strengthPeel strength should be 0.2~0.7N.



Specification	**Standard (100V)**
Cover tape	1*10^7 ~ 1*10^10 Ω
Carrier tape	1*10^5 ~ 1*10^6 Ω
Tray(Reel)	1*10^8 Ω max.
Bonding method	Thermo-compression method

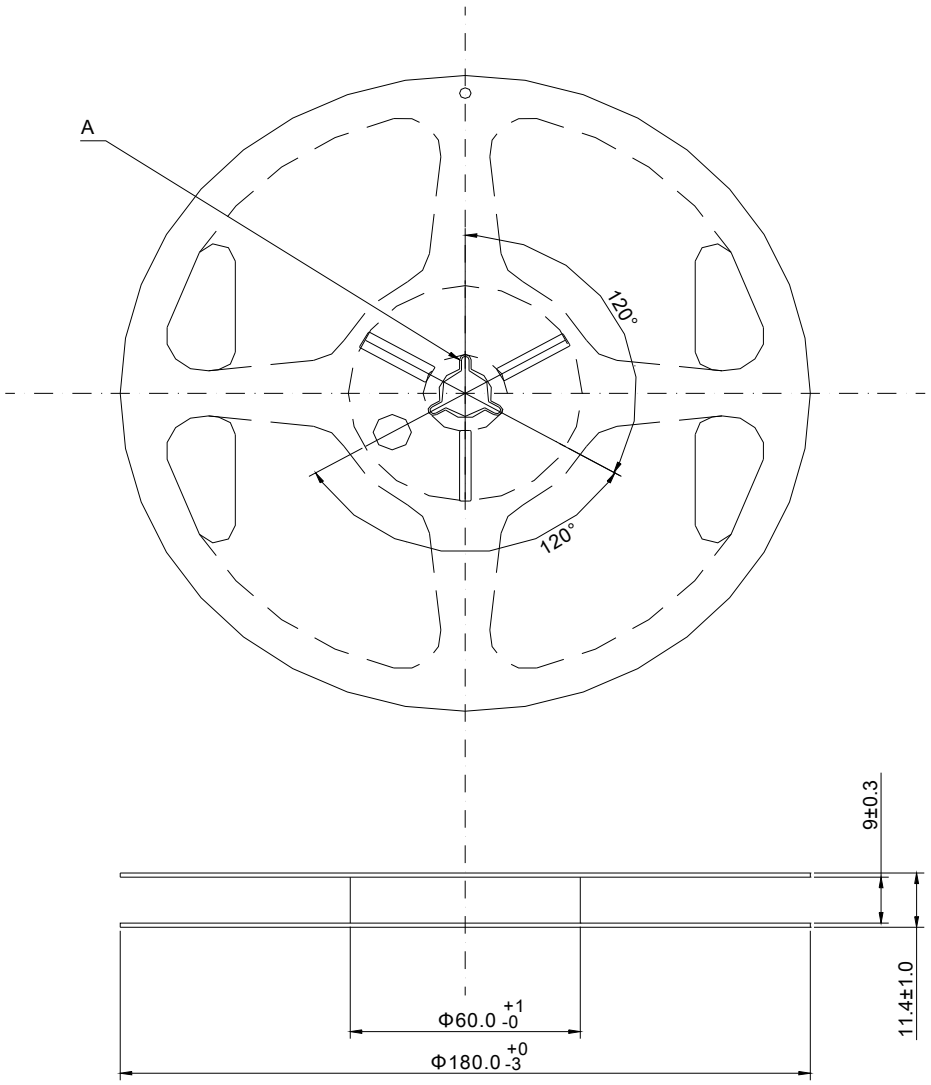
Fig.1 Taping Specification



Dimensions	
A0	1.40±0.05
B0	1.80±0.05
K0	0.7±0.05
P1	4.00±0.10
T	0.25±0.05
W	8.00±0.20
D0	φ1.5+0.10/-0.00

Dimensions	
D1	φ1.5±0.10
E1	1.75±0.10
E2	6.25±0.10
F	3.50±0.05
G	1.65±0.10
P0	4.00±0.10
P2	2.00±0.05

Fig.2. Emboss tape format and dimensions



Material:Polystyrene (Conductivity)
unit:mm

Section A

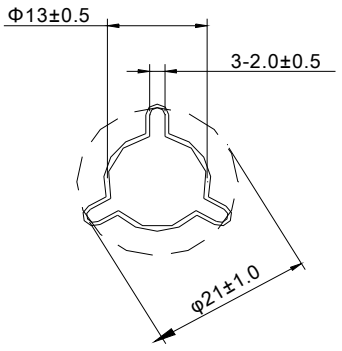


Fig.3. Reel specification

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17. Notes on mounting and handling

17.1 Storage environment

(1) The temperature and humidity of a storage place, Please give +5~ +40˚C and 40 ~85% as a standard.

(2) Please use this product within one year from the packing label date of issue.

(3) Please avoid the place which generates corrosive gas, and the place with much dirt.

(4) Please keep it in a place with little temperature change.

Dew condensation arises owing to a rapid temperature change and solderability becomes bad.

17.2 Be cautions to static electricity and high voltage.

17.3 This product has sufficient durability to fall and vibration. However, conditions may change to the fall after mounting to a PWB, and vibration. When you should drop on a floor the PWB which mounted the product or too much shock is added. Please use after a performance check.

17.4 Please check that the curvature of the substrate at the time of substrate cutting does not affect a product. Moreover, especially when a product is near the position of a PWB guide pin, and the position of a PWB break, be careful.

17.5 The part concerned does not correspond to washing.

17.6 Please repair at +260˚C in 10s with hot air.

18. Mandatory control

18.1 Ozone-depleting substance

It regulates by the U.S. air purifying method (November, 1990 establishment). ODS of CLASS1 and CLASS2 is not contained or used.

18.2 PBDE, PBBs

PBDE, PBBs are not contained into all the material currently used for this product.

18.3 RoHS

Following material restricted by RoHS (2011/65/EU, (EU)2015/863) is not included or used..

18.4 Law Concerning Examination and Regulation of Manufacture, etc. of Chemical Substances

All the material currently used for this product is based on "Law Concerning Examination and Regulation of Manufacture, etc. of Chemical Substances". It is a registered material.

18.5 Lead

Leads, such as solder, are not used for this product. (Lead Free)

18.6 About the existence of silver and mercury use

The silver of very small quantity is contained in the conductive adhesives used for adhesion of Blank.
Moreover, mercury is used. It does not get down.

19. The country of origin / factory name / address

Country of origin: Japan
Factory name: DAISHINKU Corp. Tottori Production Div.
Address: 7-3-21 Wakabadai minami, Tottori 689-1112