

Approval Specification

Commodity: Crystal Unit
Model: TSX-3225
Frequency: 26.000 MHz
X_code: X1E0000210020

No. | T N 4 — 2 6 2 5 1 (Rev.4)

Customer's Received Certificate

Please return this copy as a certification of your recipient.

Checked &
Recipient by: _____

Date. _____

EPSON TOYOCOM CORPORATION

DATE: March.4.2009
DRAW: H. Tamura
APP.: O. Nomizo

登録 REGIST.	Proposal spec.	名称 TITLE	仕番 SPEC. NO.
版 年月日 DATE	作成部門 SECTION	CRYSTAL UNIT	TN4-26251
1	46003	TSX-3225	頁 P.
2	作成年月日 DATE		1 / 11
3	2004.11.11		

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This document contains specifications which apply to TSX-3225 26.000MHz Crystal Unit.

1. General Specification

No.	Item	Description
1.1	Epson Toyocom parts number	TN4-26251
1.2	User's name	
1.3	User's parts number	
1.4	Operating temperature range	-20°C to +75°C

2. Mechanical Characteristics

No.	Item	Description
2.1	Package	TSX-3225
2.2	Dimensions	3.2±0.15 x 2.5±0.15 x 0.6 max. [mm]
2.3	Marking	Laser marking (1)Epson Toyocom's ID / 4 digits (2)Epson Toyocom Mark (3)Lot No./ 4 digits
2.4	Leak rate	1 x 10 ⁻⁹ Pa·m ³ /sec.max.

承認 APP.	H.Konno
照査 CHK'D	A.Inoshita
照査 CHK'D	Y.Kawaguchi
作成 DRAW	T.Inose

改版記事 DESCRIPTION
 Rev.4 2005/10/6. T.Inose
 Changed reel label at 8.Reel, and label (A)and(B) at 9.Packing

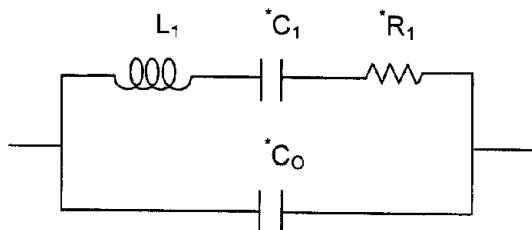
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3. Electrical Characteristics

No.	Item	Specifications
3.1	Nominal frequency	26.000000 MHz
3.2	Resonance mode	Fundamental
3.3	Operating temperature range	-20°C to +75°C
3.4	Storage temperature range	-30°C to +85°C
3.5	Frequency tolerance	±10 ppm (at +25±2°C)
3.6	Frequency stability	±9 ppm (-20°C to +75°C, Ref. at +25±2°C)
3.7	Equivalent series resistance(R1) *See fig.1	40 ohms max
3.8	Operating drive level	0.1 mW max.
3.9	Load capacitance	9 pF
3.10	Shunt capacitance(C0) *See fig.1	1.3pF. typ
3.11	Pulling sensitivity	15.5 ppm/pF +/-10%.(at CL=9pF)
3.12	Aging	±1ppm max/year(at +25±2°C)

Fig.1 Equivalent circuit



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1	<table border="1"> <thead> <tr> <th>No.</th> <th>Item</th> <th>Conditions</th> <th>Contents</th> </tr> </thead> <tbody> <tr> <td>4.1</td> <td>Drop Shock</td> <td></td> <td rowspan="6">The components shall remain within the table 1 and mechanical specifications after test.</td> </tr> <tr> <td></td> <td>method</td> <td>fallen on the concrete with 100g dummy. (thickness is 3cm or more)</td> </tr> <tr> <td></td> <td>height</td> <td>150 cm</td> </tr> <tr> <td></td> <td>direction</td> <td>each direction of 3 mutually perpendicular (x,y,z) axis.</td> </tr> <tr> <td></td> <td>number of shocks</td> <td>10shocks in each direction</td> </tr> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td>4.2</td> <td>Vibration</td> <td></td> </tr> <tr> <td></td> <td></td> <td>frequency/sweep time</td> <td>10 to 55Hz/1 minute</td> </tr> <tr> <td></td> <td></td> <td>amplitude/freq.</td> <td>1.5 mm (p-p) / 10 to 55Hz</td> </tr> <tr> <td></td> <td></td> <td>acceleration/freq.</td> <td>----</td> </tr> <tr> <td></td> <td></td> <td>direction</td> <td>each direction of 3 mutually perpendicular axis</td> </tr> <tr> <td></td> <td></td> <td>duration</td> <td>2 hours in each direction</td> </tr> <tr> <td></td> <td>4.3</td> <td>Thermal shock</td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td>low temperature: -40°C for 0.5 h high temperature: +85°C for 0.5 h duration: 1000 cycles</td> </tr> <tr> <td></td> <td>4.4</td> <td>Cold</td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td>temperature: -35°C±3°C duration: 1000 hours</td> </tr> <tr> <td></td> <td>4.5</td> <td>Heat</td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td>temperature: +85±3°C duration: 1000 hours</td> </tr> <tr> <td></td> <td>4.6</td> <td>Static humidity</td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td>temperature: +40°C±3°C humidity: 90 to 95% duration: 500 hours</td> </tr> </tbody> </table>					No.	Item	Conditions	Contents	4.1	Drop Shock		The components shall remain within the table 1 and mechanical specifications after test.		method	fallen on the concrete with 100g dummy. (thickness is 3cm or more)		height	150 cm		direction	each direction of 3 mutually perpendicular (x,y,z) axis.		number of shocks	10shocks in each direction					4.2	Vibration				frequency/sweep time	10 to 55Hz/1 minute			amplitude/freq.	1.5 mm (p-p) / 10 to 55Hz			acceleration/freq.	----			direction	each direction of 3 mutually perpendicular axis			duration	2 hours in each direction		4.3	Thermal shock					low temperature: -40°C for 0.5 h high temperature: +85°C for 0.5 h duration: 1000 cycles		4.4	Cold					temperature: -35°C±3°C duration: 1000 hours		4.5	Heat					temperature: +85±3°C duration: 1000 hours		4.6	Static humidity					temperature: +40°C±3°C humidity: 90 to 95% duration: 500 hours
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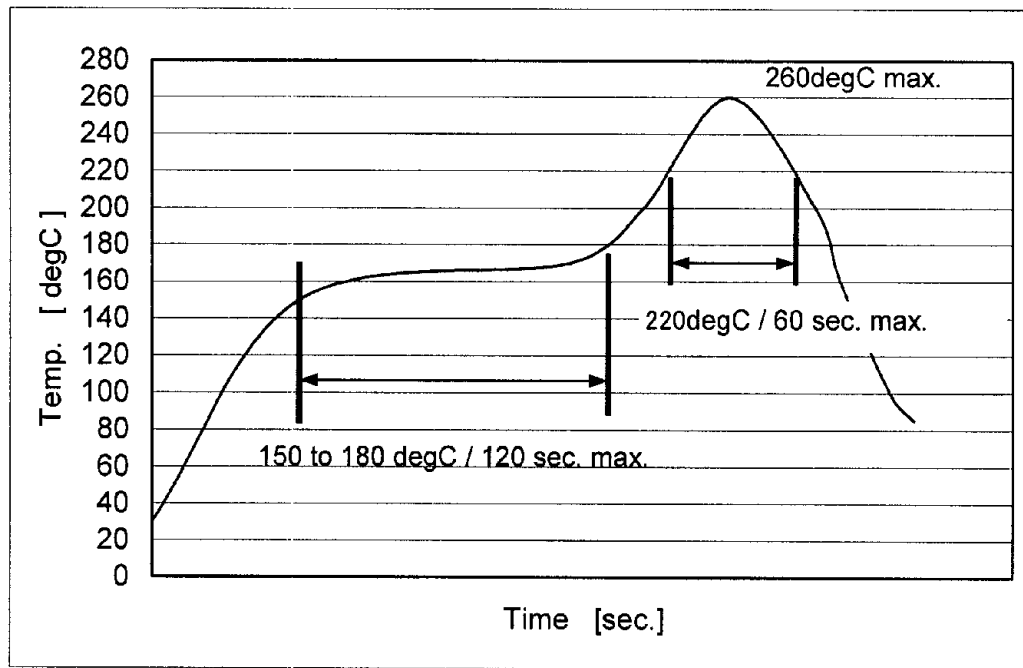
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No.	Item	Conditions	Contents
4.7	Resistance to solder heat (Reflow)	pre-heat: 150°C to 180°C, 120 sec. max. top-heat: 220°C, 60 sec. max. peak: 260°C max. time: 2 times *See fig.1	The components shall remain within No. 3.5 and mechanical specifications after test.
4.8	Solderability	Immerse in soldering bath. temperature: 230°C±5°C time: 5±0.5 sec.	More than 3/4 area of the soldering pad must be covered with new solder.

	Frequency	Equivalent series resistance
table 1	±2 ppm max.	±15% max.

Fig.1 Temperature profile of reflow soldering



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5. Shipment

Crystal units will be shipped in tape and reel.

6. Remarks

6.1 Ultrasonic cleaning

Ultrasonic vibration may cause deterioration and destruction of the components.

Please avoid ultrasonic cleaning.

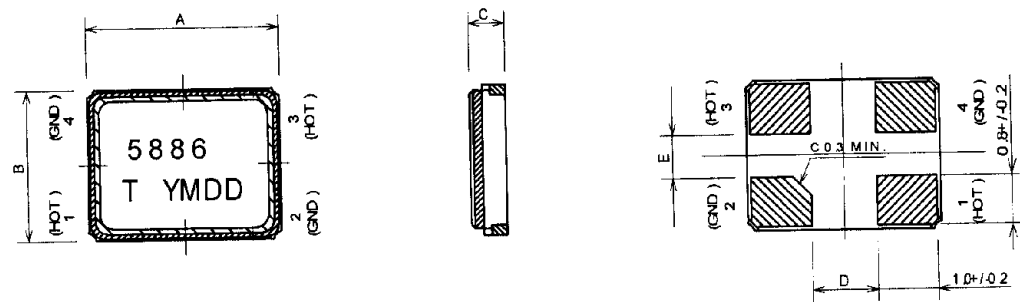


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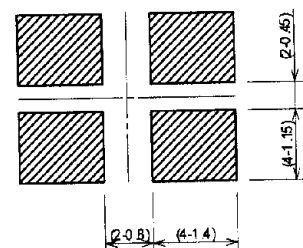
7.Package outlines and Marking(Example)



Size in mm

A	B	C	D	E
3.20	2.50	0.60	1.00	0.70
±0.15	±0.15	max.	±0.20	±0.20

[LAND PATTERN]



Marking

Laser marking

Description

Epson Toyocom's ID(4 digits)

Epson Toyocom Mark(T)

Lot No.(4 digits)

Y: the last 1 digit of year

M: 1 digit of month(Jan to Sept; 1 to 9, Oct;X, Nov;Y, Dec;Z)

DD: 2 digits of day

Package

Lid; KOVAR, Electrolytic Ni plating

Base; Ceramic, W+Ni+Au plated

Seal; Seam weld, N₂ gas

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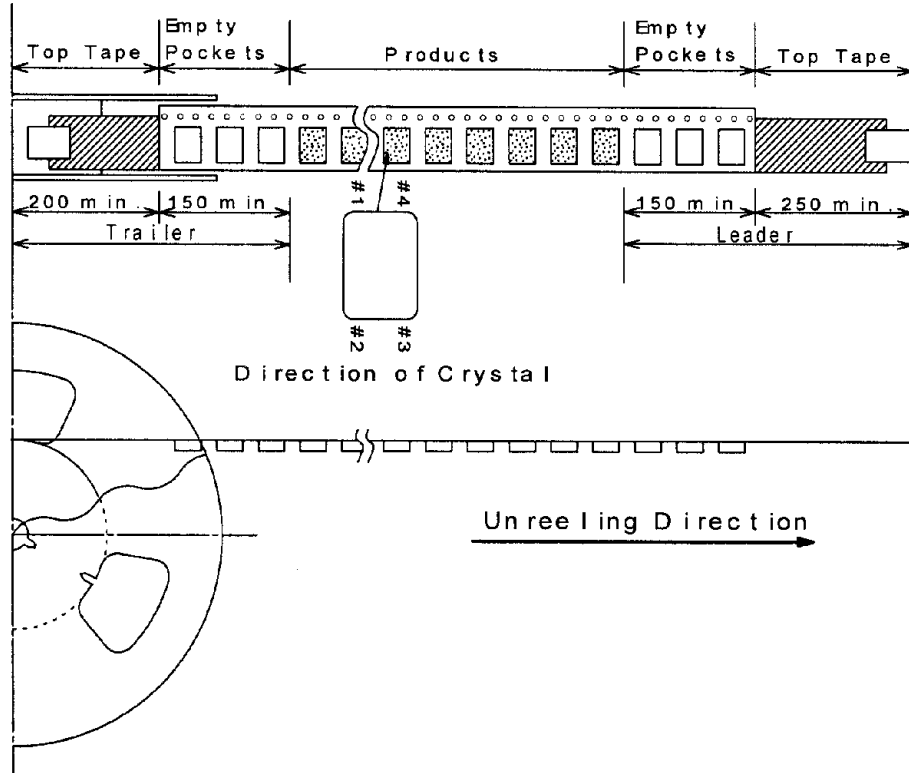
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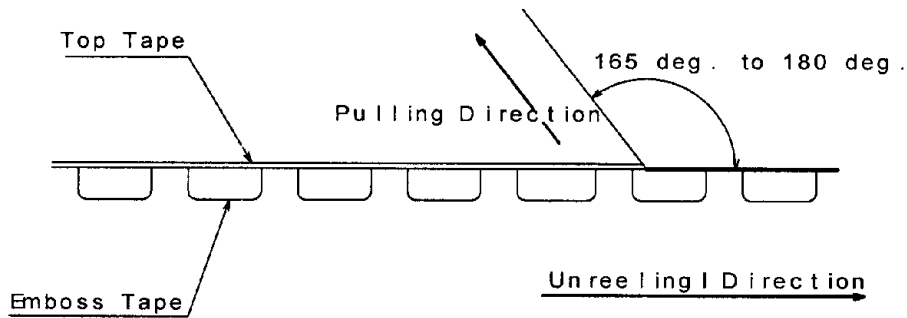
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8. Tape and Reel
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Tap ing



Top Tape Pulling-off Strength



- (1) Angle: 165 deg. to 185 deg. from unreeling direction
- (2) Speed: 300 mm/min.
- (3) Power: 20g to 70g
- (4) Others: The top tape shall not be torn while pulled off.

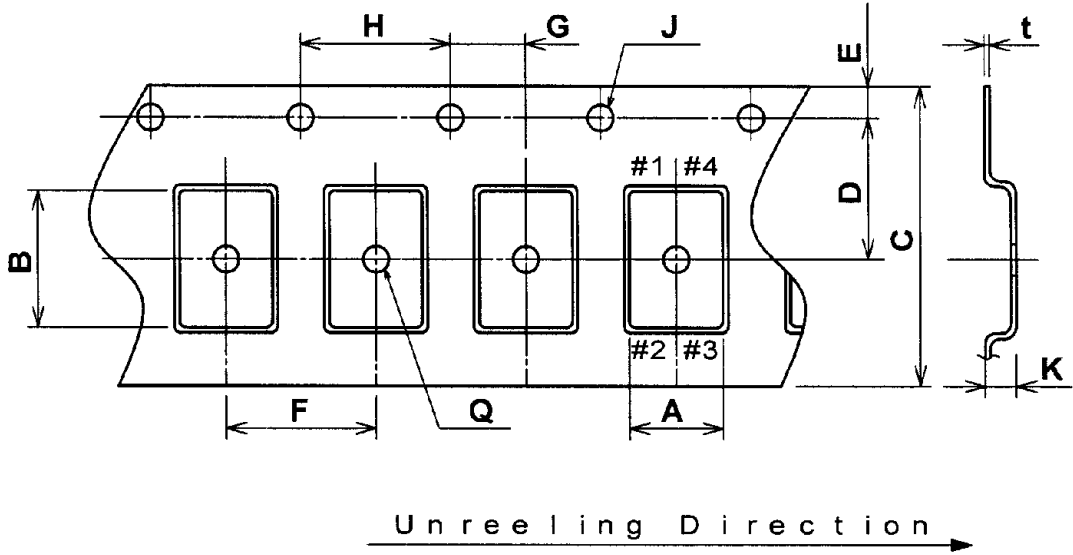
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Emboss Tape



A	B	C	D	E	F
2.9±0.1	3.6±0.1	8.0±0.2	3.5±0.1	1.75±0.1	4.0±0.1
G	H	J	K	Q	t
2.0±0.1	4.0±0.1	dia.1.5+0.10	1.0±0.1	dia.1.0±0.1	0.25±0.05

Size in mm

Note

- 1)Cumulative pitch tolerance: ±0.15mm at 10 pitches
- 2)Material: PS(Antistatic material)

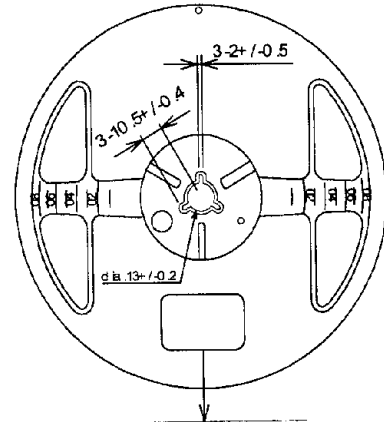
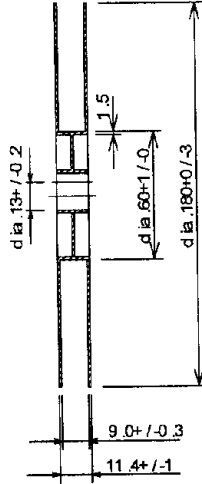
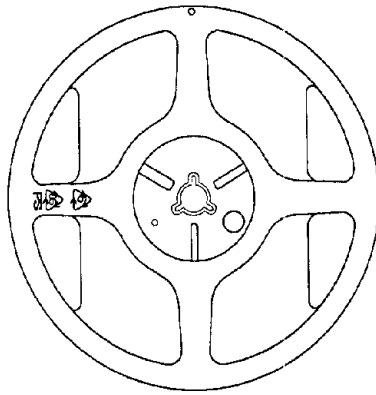
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Reel



Order No.	1
Item	2
Spec. No.	3
Quant	4(5)
EPSON TOYOCOM	
RoHS Compliant	

Note

- 1) Reel is recyclable
- 2) Material: PS (Antistatic material)
- 3) Label: 1. Order number
 2. Package & Nominal frequency
 3. Specification number
 4. Quantity
 5. Lot number (YMDD)

*The label should be stuck on the reel.

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9. Packing

Put one reel(2000pcs max.) into an anti-static bag separately, and in the case of some reels, put them into a poly bag together.

Put the following label(A) on the both bags.

(A)

EPSON TOYOCOM	
TYPE	
FREQ	MHZ
QUANTITY	PCS
Product Lot. NO	

RoHS Compliant

MADE IN JAPAN

Put the wrapped reels with cushion into outer cardboard box and seal by gum tape.

Carton size varies according to the order quantity and the following are main carton styles. And Crystal Unit quantity is 80000pcs max./Carton.

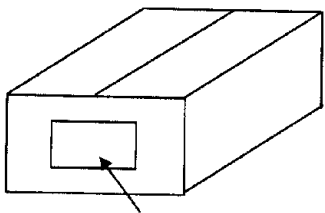
Carton Style	Size (mm)	Quantity
T-2	L:294 x W:194 x H:171	3reels max.
KB	L:400 x W:300 x H:170	10reels max.
T-4W	L:400 x W:300 x H:316	22reels max.
KD	L:441 x W:339 x H:333	40reels max.

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Put the following label(B) on the face of the cardboard.



(B)

(B)

EPSON TOYOCOM	
PURCHASE ORDER. NO	
PART. NO	
FREQUENCY	MHz
QUANTITY	PCS
O/C. NO	
CARTON. NO	

RoHS Compliant

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