Crystal Bridge to the Future

RoHS Compliant
Directive 2011/65/EU

SPECIFICATION

Customer:

Item:	Crystal Oscillator
Type:	NT7050BB
Nominal Frequency:	40.000 MHz
Customer's Spec. No.:	-----
NDK Spec. No.:	END4670A

Receipt

Charge:

Sales	NDK Italy Srl Paola Bandera	Tel. + 39-02-96702920 e-Mail bandera@it.ndk.com
Engineer	Engineering Dept.2 N. Sekine	Tel. +81 4 2900 6619 e-Mail sekine@ndk.com

Revision Record

Rev.	Date	Items	Contents	Approved	Checked	Drawn
---	18.Feb.2014	Issue	---	T. Matsumoto	---	N.Sekine
A	5.Mar.2014	5.6 Phase Noise	Add	T. Matsumoto	---	N.Sekine

This is specification of Temperature compensated crystal oscillator.

1. Customer's Spec. No.
   -----
2. Type
   NT7050BB
3. External Dimension
   ETD14B-01393
4. Rating
   4.1 Nominal Frequency (fnom)
   40.000 MHz
   4.2 Supply Voltage (Vcc)
   +3.3 V ± 5 %
   4.3 Load (C_L)
   15 pF ± 10 %
   4.4 Controlled Voltage (Vcont)
   +1.65 V±1.35 V
   4.5 Operating Temp. Range (Topr)
   -40 to +85 °C
   4.6 Storage Temp. Range (Tstr)
   -55 to +125 °C
5. Electrical Specification

Unless otherwise specified, measuring condition T =+25 °C, Vcc =+3.3 V, Vcont = =+1.65 V, C_L =15 pF

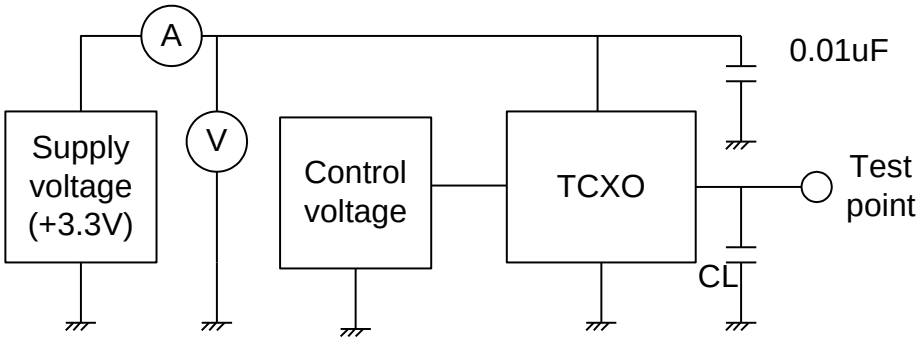
	Item		Symbol	Condition	Rating		Unit
					Min.	Max.	
5.1	Current Consumption		Icc	-	-	6	mA
5.2	Frequency Stability						
	5.2.1	Frequency Tolerance	df/fnom	At the shipment (*1)	-1.0	+1.0	ppm
	5.2.2	Frequency/Temperature Characteristics	df/f	-40 to +85 °C (*2)	-0.4	+0.4	ppm
	5.2.3	Frequency/Voltage Coefficient	df/f	+3.3 V± 5 % (*2)	-0.1	+0.1	ppm
	5.2.4	Long-Term Frequency Stability	df/f	1st year (*3)	-1.0	+1.0	ppm
5.3	Output			Square Wave			
	5.3.1	Output voltage (C-MOS)	V_{OL}	-	-	0.1 Vcc	V
			V_{OH}	-	0.9 Vcc	-	V
	5.3.2	Symmetry	-	@50%Vout	45	55	%
	5.3.3	Rise time / Fall time	tr / tf	10% to 90%	-	5	ns
5.4	Frequency Controlled Characteristic						
	5.4.1	Control Voltage	Vcont		+0.3	+3.0	V
	5.4.2	Frequency Control Range	df/f	Vcont =+0.3 V	-15	-5	ppm
				Vcont =+3.0 V	+5	+15	ppm
	5.4.3	Input Impedance	Zin	-	100	-	kΩ
5.5	Start-up time		tsu	-	-	10	ms
5.6	Phase Noise (Typ. value)		L(f)	10 Hz offset	-85		dBc/Hz
				100 Hz offset	-115		dBc/Hz
				1 kHz offset	-138		dBc/Hz
				10 kHz offset	-151		dBc/Hz
				100 kHz offset	-156		dBc/Hz
				1 MHz offset	-156		dBc/Hz

(*1) df/fnom: Frequency shift at T=+25 °C, Vcc =+3.3 V, Vcont = =+1.65 V, C_L =15 pF in reference to Nominal frequency (fnom).

(*2) df/f: Frequency shift from the reference frequency at T=+25 °C, Vcc =+3.3 V, Vcont = =+1.65 V, C_L =15 pF .

(*3) df/f: Frequency shift from the reference frequency at T=+25 °C, Vcc =+3.3 V, Vcont =+1.65 V, C_L =15 pF, after 24 hours of operation.

6. Test circuit



CL: Including capacitance probe and jig.

7. Marking

Type No.
Nominal Frequency (MHz is not written)
1pin dot
NDK Symbol Mark
LOT No.

8. Notice

8.1 Order items are manufactured according to specification. As to conditions, which are not indicated in this specification and unpredictable such as applied condition and oscillation margin, please check them beforehand.

8.2 Unless we receive request for modification within 3 weeks from the issue date of this NDK 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 request within 3 weeks from the issue data of this specification sheet, we would like to discuss with you separately.

8.3 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.

8.4 Where any change to the process condition is made due to the change(s) in the production line, inform personnel of the specifications.

8.5 Should this specification data give rise to any disputes relating to any intellectual property rights or any other rights of a third person, the company shall not indemnify anyone for any damage. Their disclosure must not be construed as the grant of a license to use any of the intellectual property rights owned by the company.

8.6 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.

8.7 In the company's production process whatever amount of ozone depleting substances (ODS) as specified in the Montreal protocol is not used.

8.8 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.

9. Prohibited items

Be sure to use the product under the following conditions. Otherwise, the characteristics deterioration or destruction of the product may result.

(1) Reflow soldering heat resistance

Peak temperature: 260°C, 10 sec

Heating: 225°C or higher, 30 sec

Preheating: 150°C to 180°C, 120 sec

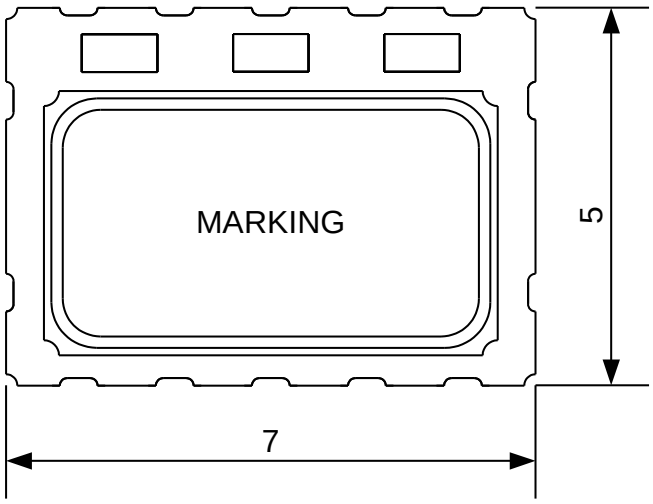
Reflow passage times: twice

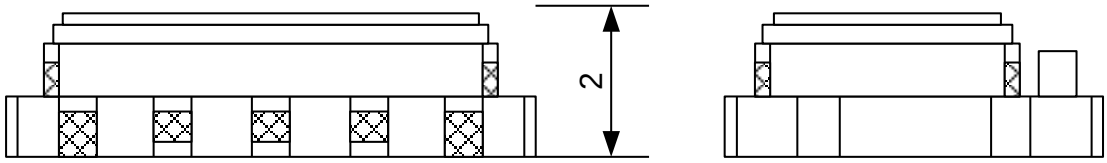
In reflowing, the turning over of mounted boards shall be forbidden.

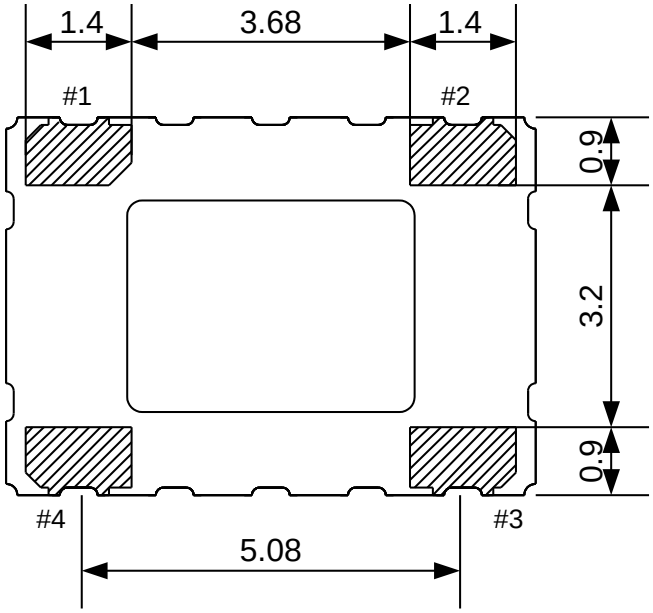
Reliability assurance item

No.	Test Item	Test Methods	Specification Code
1	Vibration	IEC 60068-2-6, test Fc, 10 to 500 Hz, 98.1 m/s^2, 2 hours, 3 directions	A
2	Shock	IEC 60068-2-27, test Ea, 981 m/s^2, half sine, 3 bumps, 6 directions	A

Specification code	Specification
A	All parameters within initial limits







Terminal land Connections

#1	VCONT
#2	GND
#3	OUTPUT
#4	VCC

*1 Please connect a 0.01uF capacitor near the VCC terminal.

	Date of Revise	Charge	Approved	Reason
A	1.Apr.2011	N.Sekine	Y.Yokozeki	Change 'Pin Connection' to 'Terminal land connections'

	Date	Name	Third Angle Projection	Tolerance	Third Angle Projection
Drawn	18.May.2010	Y.Yokozeki	Dimension:mm	±0.2	Dimension:mm
Designed	18.May.2010	Y.Yokozeki	Title	Drawing No.	Rev.
Checked	-----	-----	**External Dimension**	**ETD14B-01393**	A
Approved	18.May.2010	Y.Yokozeki			

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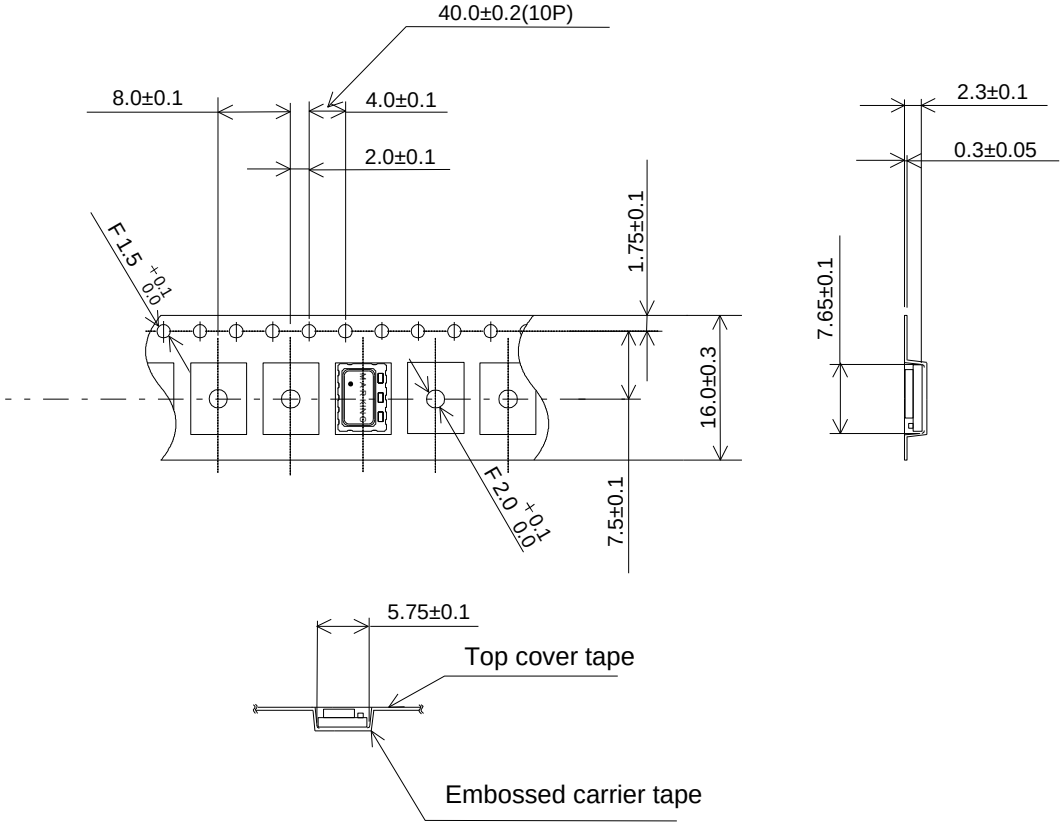

	Embossed carrier tape	Top cover tape
Materials	PS	PET+PE+Adhesive layer
Disposition	Antistatic	Antistatic

	Date of Revise	Charge	Approved	Reason

	Date	Name	Third Angle Projection	Tolerance	Scale
Drawn	07.Jan.2011	T.Terashima	Dimension : mm	---	---
Designed	07.Jan.2011	T.Terashima	Title	Drawing No.	Rev.
Checked	-----	-----	**Packing**	**ETK17B-00338(1/4)**	
Approved	07.Jan.2011	Y.Yokozeki			

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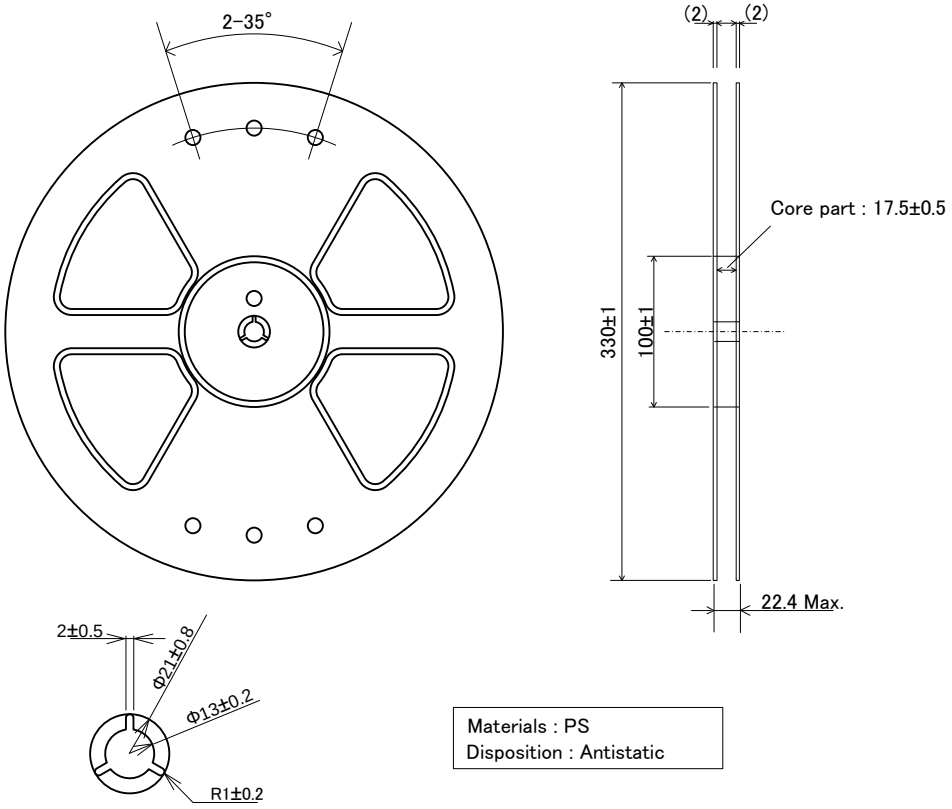
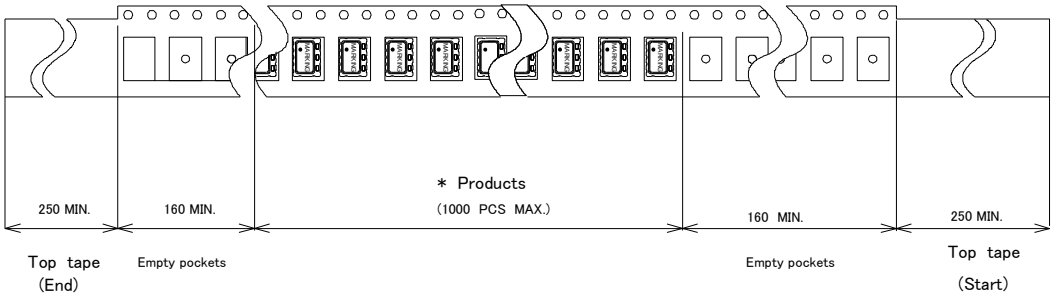
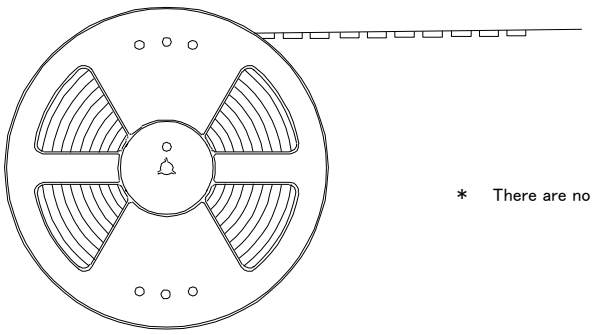


Materials : PS
Disposition : Antistatic





＊ There are no vacant pockets for this area.

	Date of Revise	Charge	Approved	Reason

	Date	Name	Third Angle Projection	Tolerance	Scale
Drawn	07.Jan.2011	T.Terashima	Dimension : mm	---	---
Designed	07.Jan.2011	T.Terashima	Title	Drawing No.	Rev.
Checked	-----	-----	**Packing**	**ETK17B-00338(2/4)**	
Approved	07.Jan.2011	Y.Yokozeki			

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Tape break force, peel strength and angle

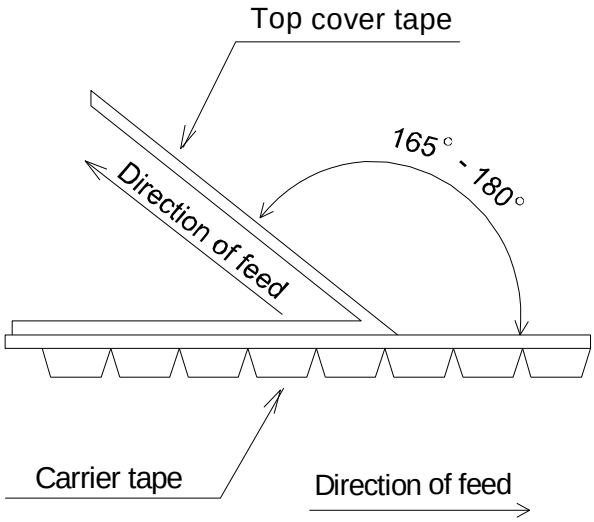
Required setting:

Tape break force: min 10N

Top cover tape strength: min 10N

Top cover tape peel force : 0.1-1.3N(0.1-1.0 for 8mm carrier tapes),at a peel speed of 300 +/-10mm/min.

Angle between the top cover tape and the direction of feed during peel off.
165-180°



The cover tapes not extend over the edge of the carrier tape or cover any part of the sprocket holes.

	Date of Revise	Charge	Approved	Reason

	Date	Name	Third Angle Projection	Tolerance	Scale
Drawn	07.Jan.2011	T.Terashima	Dimension : mm	---	---
Designed	07.Jan.2011	T.Terashima	Title	Drawing No.	Rev.
Checked	-----	-----	**Packing**	**ETK17B-00338(3/4)**	
Approved	07.Jan.2011	Y.Yokozeki			

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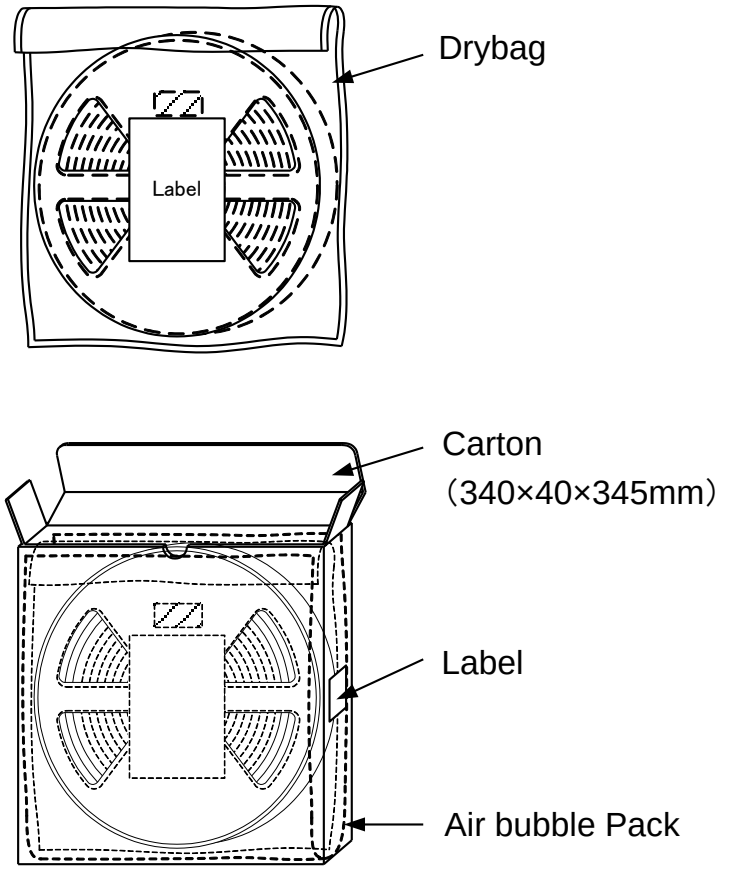
〈Inner packing〉

Max. 1000pcs./ Reel



	Date of Revise	Charge	Approved	Reason

	Date	Name	Third Angle Projection	Tolerance	Scale
Drawn	07.Jan.2011	T.Terashima	Dimension : mm	---	---
Designed	07.Jan.2011	T.Terashima	Title	Drawing No.	Rev.
Checked	-----	-----	**Packing**	**ETK17B-00338(4/4)**	
Approved	07.Jan.2011	Y.Yokozeki			

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