RoHS Compliant
Directive 2002/95/EC

SPECIFICATION

Customer:

Item:	Crystal Oscillator
Type:	NAC3055B
Nominal Frequency:	10MHz
Customer's Spec. No.:	
NDK Spec. No.:	NAC3055B

Receipt

Charge:

Sales	NDK-I S. Coco	Tel. +39-02-96702920
Engineer	2nd ENGINEERING DEPT M. Fukuda	Tel. +81-42-900-6616

Approved	T.Uchida
Checked	---
Drawn	M.Fukuda

Revision Record

Rev.	Rev. Date	Items	Contents	Remarks
-----	6.Spe.2004	Issue		
A	11.Nov.2004	Dimensions (ETD14B-00661)	Change from rev. A to rev. B	
B	25.Apr.2006		Add point 5.6 and 6.2.2	
		Dimensions (ETD14B-00661)	Change from rev. B to C	
C	20.Nov.2006	6.2.8(a)	+/-1ppb/day->+/-3ppb/days (average for 10days)	
D	6.Dec.2006	6.2.8(d)	Added : +/-4.6ppm at 15years	
E	14.May.2007	Dimension (EPP14B-0061)	Change from rev. C to D	
		14	Add moisture sensitivity level	
F	3.Jun.2008	15	Add packing dwg	ETK17B-00242
G	29.Jul.2008	6.2.8	Remove:+/-4.6ppm(15years)	
		6.1.2	Add 700mA	
		7	Add conditions	
H	18.Aug.2008	7.1 (b)	Add freq range	

1. Customer's parts number

2. Type
NAC3055B

3. NDK specification number
NAC3055B

4. Dimensions
ETD14B-00661

5. Rating
5.1 Nominal Frequency (F0)
10 MHz (2 digits)
5.2 Supply Voltage (VCC)
DC+ 3.3 V±5%
5.3 Load
1kΩ//15 pF
5.5 Operating Temperature Range 1 ($T_{OPR\,1}$)
-5 ~ +85°C
5.6 Operating Temperature Range 2 ($T_{OPR\,2}$)
-25 ~ -5°C
5.7 Operable Temperature Range (T)
-40 ~ +85°C
5.8 Storage Temperature Range (T_{STG})
-40 ~ +85°C

6. Electrical Characteristics
Unless otherwise specified, meaning condition. T = +25°C, VCC = +3.3V, CL = 1kΩ//15pF

	Item		Symbol	Condition	Spec. Value		Unit
					Min.	Max.	
6.1	Power						
	6.1.1	Warming State	I_{CC}	at +25°C		700	mA
	6.1.2	Steady State	I_{CC}	at -5 to +85°C		350	mA
			I_{CC}	at -25 to -5°C		430	mA
			I_{CC}	at -40 to -25°C		700	mA
6.2	Frequency Stability						
	6.2.1	vs. Temp. Range 1	Δf/f	-5 to +85°C (*1)	-0.1	+0.1	ppm
	6.2.2	vs. Temp. Range 2	Δf/f	-25 to –5°C (*1)	-0.3	+0.3	ppm
	6.2.3	vs. Operable Temp. Range	Δf/f	-40 to +85°C (*1)	-1.0	+1.0	ppm
	6.2.4	vs. Tolerance	$\Delta f/f_0$	R=4.75 kΩ(*2) (after warm-up)	-0.5	+0.5	ppm
	6.2.5	vs. Supply Voltage	Δf/f	DC+3.3V±5% (*1)	-20	+20	ppb
	6.2.6	vs. Load Variation	Δf/f	15pF//1kΩ±5%(*1)	-20	+20	ppb
	6.2.7	Short Term Stability	Δf/f	1 to 10 sec	-1	+1	ppb
	6.2.8	Aging (a)	Δf/f	/day, after 24ha (average for 10days)	-3	+3	ppb
		(b)	Δf/f	/year, after 24h (First year)	-0.3	+0.3	ppm
		(c)	Δf/f	/year, after 24h(Following Year)	-0.2	+0.2	ppm
	6.2.9	Warm-up time		at +25°C Δf/f ≤ ±0.5ppm (Based on Freq. after 1h)		5	min.
				at –5°C Δf/f ≤ ±0.5ppm (Based on Freq. after 1h)		10	min.
6.3	Frequency Adjustment Range		Δf/f	External 10 kΩ trimmer	±2	±10	ppm

	Item		Symbol	Condition	Spec. Value		Unit
					Min.	Max.	
6.4	Output Characteristics						
	6.4.1	Output Voltage	V_{OL}	-		0.4	V
			V_{OH}	-	2.4		V
	6.4.2	Rise & Fall Time	t_r,t_f			4	ns
	6.4.3	Duty Cycle	-	at 1/2V_{CC}	40	60	%
	6.4.4	Phase Noise		@ 10 Hz		-95	dBc/Hz
				@ 100 Hz		-120	dBc/Hz
				@ 1 kHz		-125	dBc/Hz
				@ 10 kHz		-130	dBc/Hz

(*1) ΔF/F: Frequency shift from the reference frequency.
T= +25°C, VCC= +3.3V, CL= 1kΩ//15pF
(*2) ΔF/F0: Frequency shift at T = +25°C, VCC = +3.3V, CL = 1kΩ//15pF

7. Environmental Specification

7.1 Vibration

(a)

After the test, shall meet electrical specification
Condition : IEC 68-2-6, test Fc :
Ac : 10g
Freq. : 10 ~ 500Hz
Each 2 hours for 3 planes

(b)

During vibration cycles : ΔF/Fo : <± 0.1 ppm
Jitter rms max : 20ps (10 - 100Hz)
Jitter pk-pk max. : 240ps (10 - 100Hz)
Condition : IEC 68-2-6, test Fc :
Freq. 5 ~ 62Hz, with velocity 5mm/sec
Freq. 62 ~ 200Hz, with acceleration 2 m/s^2
3x5 sweep cycles, 3 planes

7.2 Mechanical Shocks

(a)

After the test, shall meet electrical specification
Condition : IEC 68-2-27, test Ea :
100g, half sine, 3 bumps, 6 directions

(b)

During shock : ΔF/Fo : <± 0.1 ppm
Condition : IEC 68-2-27, test Ea :
30m/s^2 , 11msec, half sine, 3 bumps, 6 directions

7.3 Rapid Change of Temperature

ΔF/Fo : <± 0.5 ppm
Condition : IEC 68-2-14, test Na :
Temp : -40 to +85°C
Each 0.5H temp, 5 cycles

7.4 Damp Heat Steady State

ΔF/Fo : <± 1 ppm
Condition : IEC 68-2-3 :
40°C, 93%, 21gg

7.5 Forced Air conditions

During force air conditions, part6.1, 6.2.1, 6.2.8 and 6.4.4 shall be met.

Conditions :

Air speed : 0 ~ 5 m/sec

Temperature range : -5 ~ 85°C

8. Inspection Parameter

Item 4, 5.1, 6.1.1, 6.2.1, 6.2.2, 6.2.3, 6.2.4, 6.2.5, 6.3, 6.4.1 and 6.4.3

9. Guarantees Parameter

Item 6.1.2, 6.2.6, 6.2.7, 6.2.8(a), 6.2.8(b), 6.2.8(c), 6.2.8(d), 6.2.9, 6.4.2, 6.4.4 and 7

10. Test data

Inspection data is not submitted for mass production lot.

But only if requested, a copy of first lot production data will be submitted

11. Marking

(a) Type
(b) Frequency
(c) Serial number
(d) Manufacturer's Symbol
(e) Manufacture data

12. Notice

12.1 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.

12.2 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.

12.3 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.

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

12.5 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.

12.6 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.

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

12.8 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.

13. Prohibited items

13.1 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: once

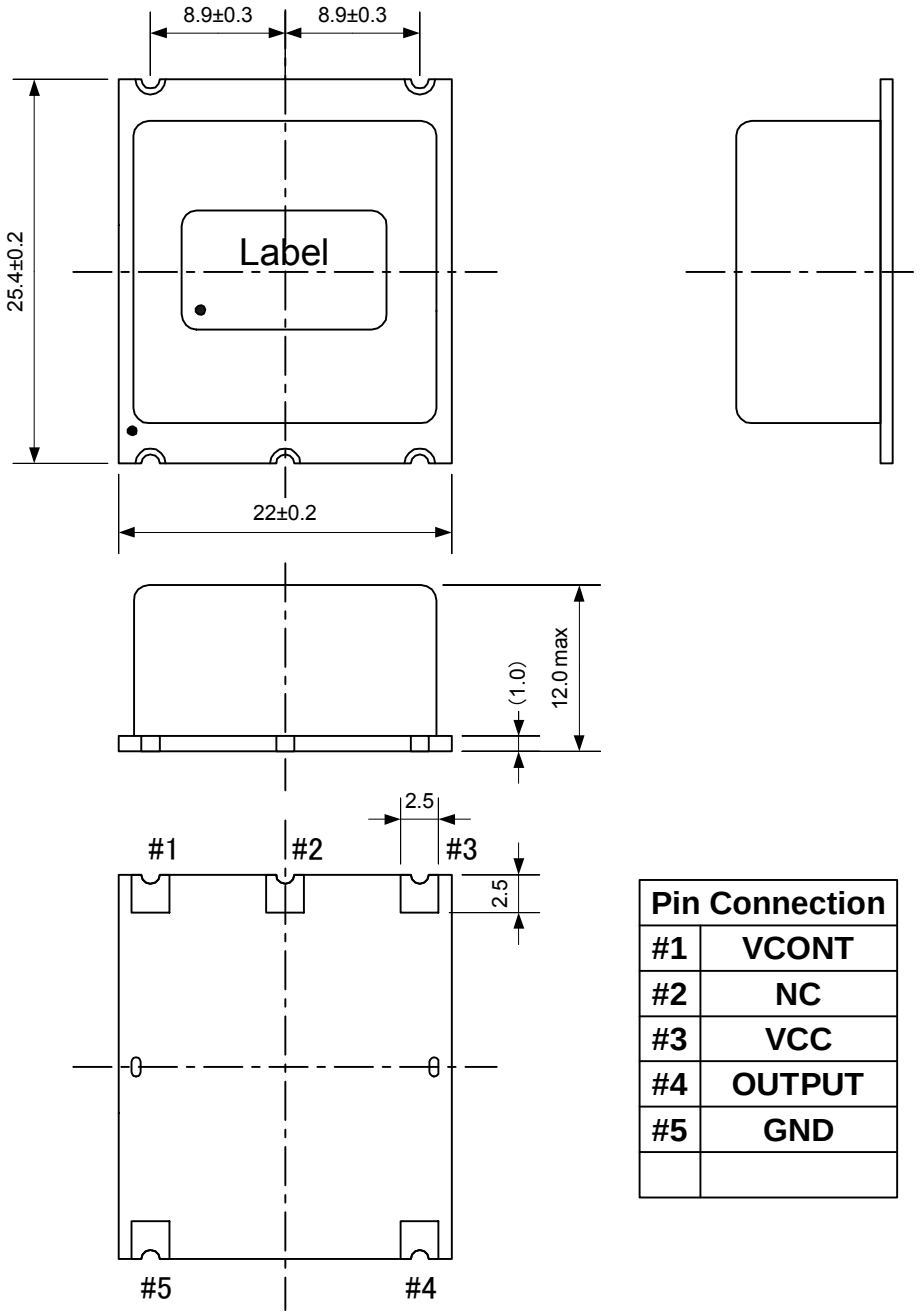
13.2 In reflowing, the turning over of mounted boards shall be forbidden.

14. Moisture sensitivity level

Moisture sensitivity level is 4.

15. Packing

ETK17B-00242



Pin Connection	
#1	VCONT
#2	NC
#3	VCC
#4	OUTPUT
#5	GND

Note) Termination finishing: non-electrolysis flash gold plating

	Date of Revise	Charge	Approved	Reason
D	14.May.2007	M.Fukuda	T.Uchida	Add note

	Date	Name	Third Angle Projection	Tolerance	Scale
Drawn	26.Jun.2003	M.Fukuda	Dimension:mm	±0.5	2/1
Designed	26.Jun.2003	M.Fukuda	Title	Drawing No.	Rev.
Checked	-------	------	**External Dimension**	**ETD14B-00661**	**D**
Approved	26.Jun.2003	T.Uchida			

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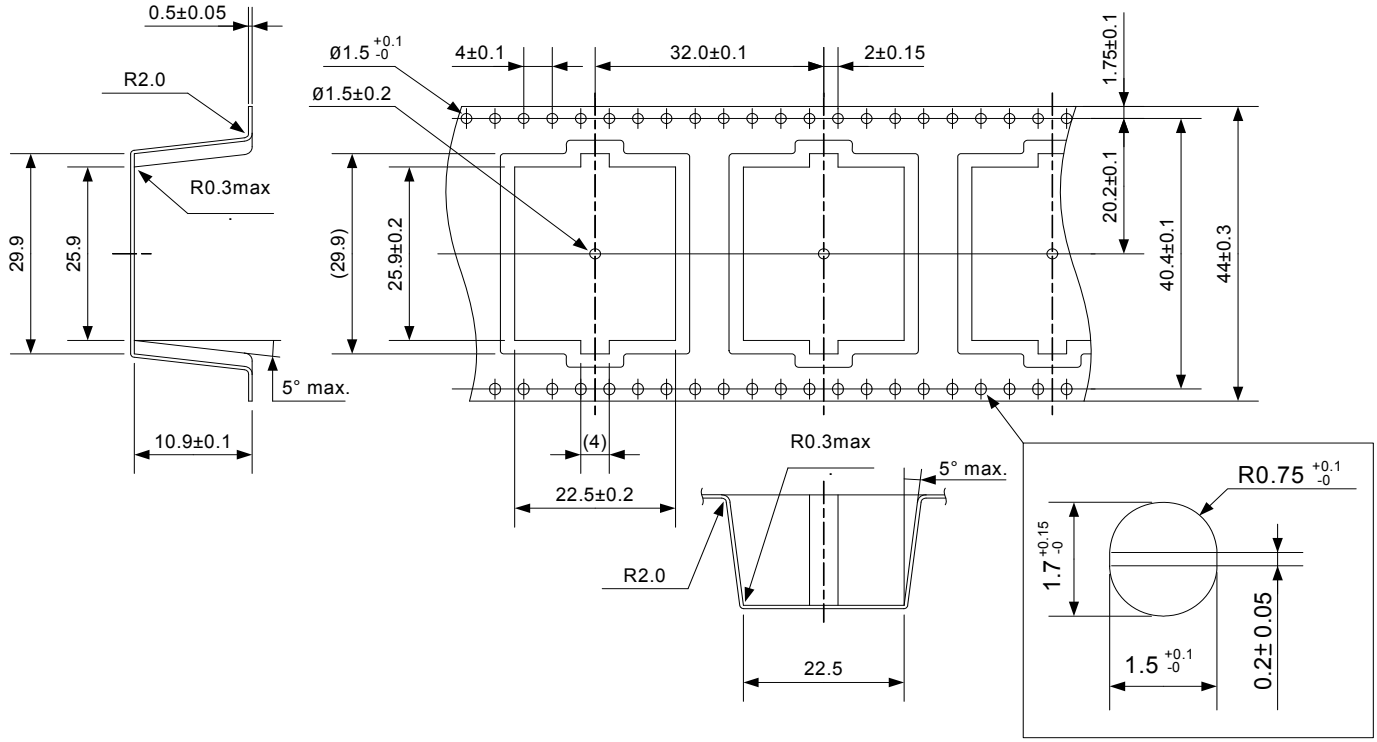

	Embossed carrier tape	Top cover tape
Materials	PS+Carbon	PS
Disposition	Conductivity	Antistatic

	Date of Revise	Charge	Approved	Reason
A				

	Date	Name	Third Angle Projection	Tolerance	Scale
Drawn	2.Jun.2008	M.Fukuda	Dimension:mm	-----	-----
Designed	2.Jun.2008	M.Fukuda	Title	Drawing No.	Rev.
Checked	2.Jun.2008	-----	**Packing**	**ETK17B-00242 (1/3)**	
Approved	2.Jun.2008	T.Uchida			

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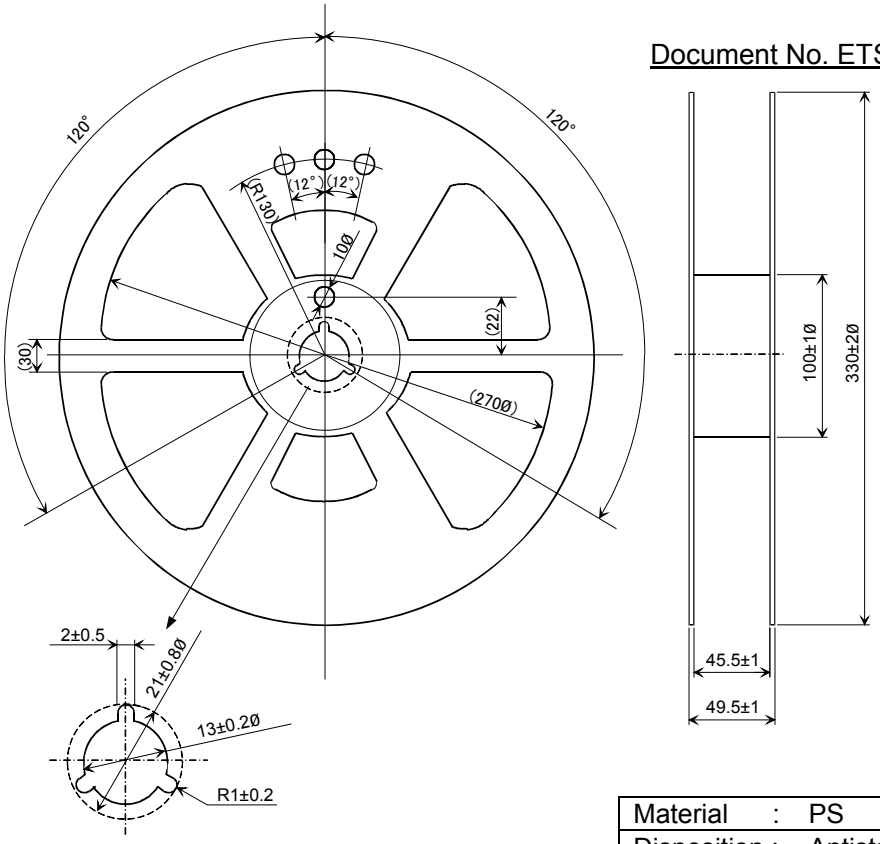
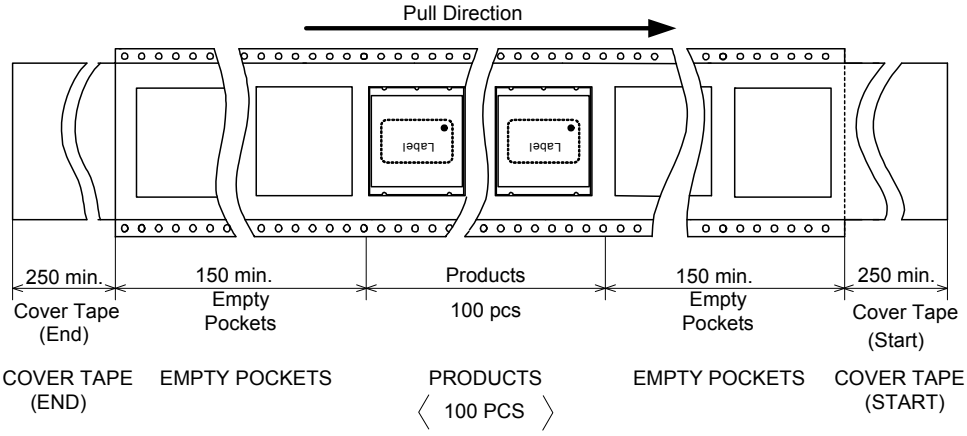
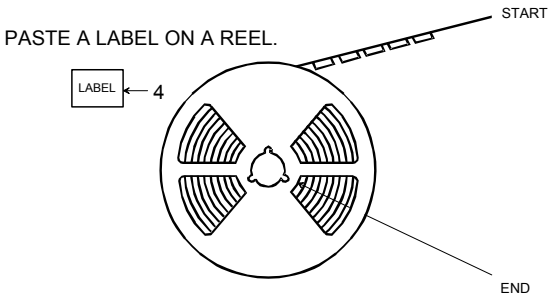
Form M-1



Material	: PS
Disposition	: Antistatic





	Date of Revise	Charge	Approved	Reason
A				

	Date	Name	Third Angle Projection	Tolerance	Scale
Drawn	2.Jun.2007	M.Fukuda	Dimension:mm	-----	-----
Designed	2.Jun.2007	M.Fukuda	Title	Drawing No.	Rev.
Checked	2.Jun.2007	-----	**Packing**	**ETK17B-00242 (2/3)**	
Approved	2.Jun.2007	T.Uchida			

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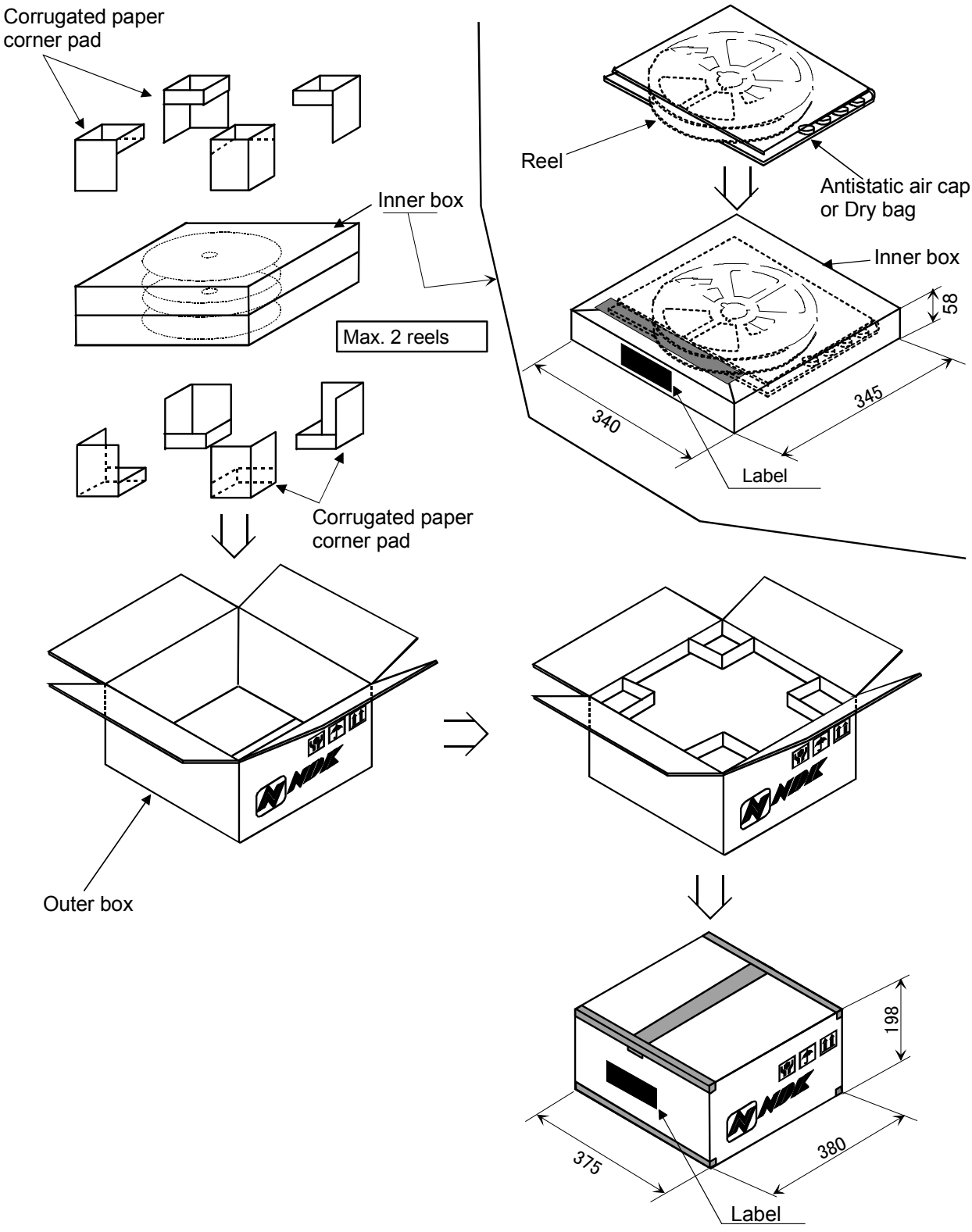
Form M-1

Packaging method for 32mm/44mm Carrier tape



	Date of Revise	Charge	Approved	Reason
A				

	Date	Name	Third Angle Projection	Tolerance	Scale
Drawn	2.Jun.2008	M.Fukuda	Dimension:mm	-----	-----
Designed	2.Jun.2008	M.Fukuda	Title	Drawing No.	Rev.
Checked	2.Jun.2008	-----	**Packing**	**ETK17B-00242 (3/3)**	
Approved	2.Jun.2008	T.Uchida			

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