

**RoHS Compliant**  
Directive 2011/65/EU

## REFERENCE SPECIFICATION

Customer: Common

Item	Crystal Clock Oscillators
Type	NZ2520SB
Nominal Frequency	50 MHz
Customer's Spec. No.	-----
NDK Spec. No.	NSA3415E

For your reference we submit this specification.  
Please study and keep in your related document file.

### Charge

Sales	NDK-I S.Coco	Tel. +39-02-96702920
Engineer	Engineering Dept.2 Y.Oishi	Tel. +81-4-2900-6662

Approved	C.Ishimaru
Checked	-----
Drawn	Y.Oishi

### Revision Record

Rev.	Rev. Date	Item	Contents	Remarks
----	28.Nov.2012	Issue		

- 1. Type  
NZ2520SB
- 2. NDK Spec. No.  
NSA3415E
- 3. Maximum Ratings
  - 3.1 Supply Voltage ( $V_{CC}$ )  
-0.5 ~ +4.0 V DC
  - 3.2 Storage Temp.  
-55 ~ +125 °C
- 4. Operating Temp. Range  
-40 ~ +85 °C

- 5. Performance
  - 5.1 Nominal Frequency  
50 MHz
  - 5.2 Standard Supply Voltage ( $V_{CC}$ )  
DC +3.3V ± 10 %
  - 5.3 Current Consumption

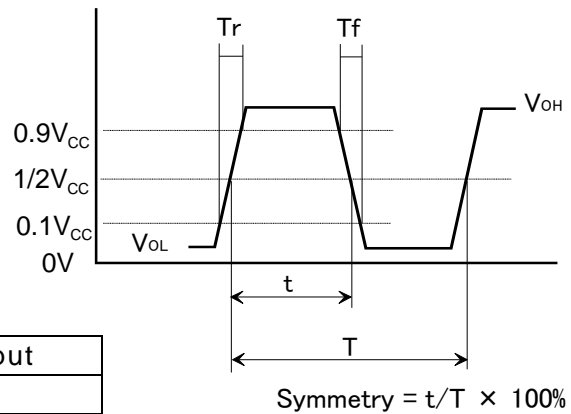
Operating: See below table. (at 3.3V, 25°C)

Freq. range (MHz)	1.5≤F<10	10≤F<20	20≤F<30	30≤F<40	40≤F<50	50≤F<60	60≤F<70	70≤F≤80
Current consumption (mA)	3.5 Max.	4.0 Max.	4.5 Max.	5.5 Max.	6.0 Max.	7.0 Max.	8.0 Max.	9.0 Max.

Stand-by: 10µA Max. (at 3.3V, 25°C)

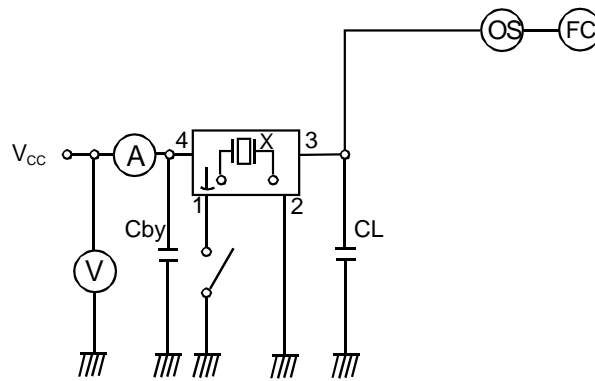
- 5.4 Output Level  
C-MOS
- 5.5 Load Capacitance  
15pF

- 6. Electrical characteristics
  - 6.1 Frequency Stability (Inclusive of 25°C tolerance, temp. characteristics, and supply voltage change)  
±50×10<sup>-6</sup> Max.
  - 6.2 Output Voltage  
V<sub>OL</sub>: 0.1V<sub>CC</sub> Max.  
V<sub>OH</sub>: 0.9V<sub>CC</sub> Min.
  - 6.3 Rise Time(Tr) / Fall Time(Tf)  
5ns max. (0.1V<sub>CC</sub>~0.9V<sub>CC</sub>)
  - 6.4 Symmetry  
45 ~ 55 % (at 1/2V<sub>CC</sub>)
  - 6.5 Output Wave Form  
Rectangular
  - 6.6 Start-up Time  
4ms max.
  - 6.7 Stand-by Function



#1 PAD input	# 3 PAD output
H level (0.7 V <sub>CC</sub> ~ V <sub>CC</sub> ) or open	Operating
L level (0.3 V <sub>CC</sub> max)	High impedance

## 7. Measuring circuits



CL ; 15pF MAX including input capacity of oscilloscope  
 Cby ; Bypass capacitor (0.01 $\mu$ F)

## 8. Test data will not be submitted

## 9. Application drawing

## 9.1 Dimension drawing

EKD14B-00027

## 9.2 Marking drawing

EKH11B-00052

## 9.3 Reliability assurance Item

EKS30B-00060

## 9.4 Taping &amp; Reel drawing

EKK17B-00032

EEK17B-00015

## 10. Instruction Notice

## 10.1 Noise

When the NZ2520S series are used, the 0.01 $\mu$ F capacitor should be connected between  $V_{CC}$  and GND line.  
 (Closer to the product terminal is desirable.)

## 10.2 Resistance to dropping

The NZ2520S series is designed to be impactproof so that no damage occurs. However, if dropped from a desk etc., it is advisable to check their performance or contact us to check it.

## 10.3 Electrostatic protection

The NZ2520S series employ C-MOS ICs for the active element. Please use them in static-free environments.

## 10.4 High temperature

Normal operation cannot be guaranteed for the NZ2520S series at +125 $^{\circ}$ C(for 24 hours).Be sure that the units are kept within the specified temperature range.

## 10.5 Cleaning

Basically, the NZ2520S series are applicable for ultrasonic wave cleaning. However, in some case, during ultrasonic wave cleanings, internal design may get damage. Please check condition carefully beforehand.

## 10.6 Other

The NZ2520S series are C-MOS applied products. And careful handling(same as with C-MOS IC) are needed to avoid electrostatic problems.

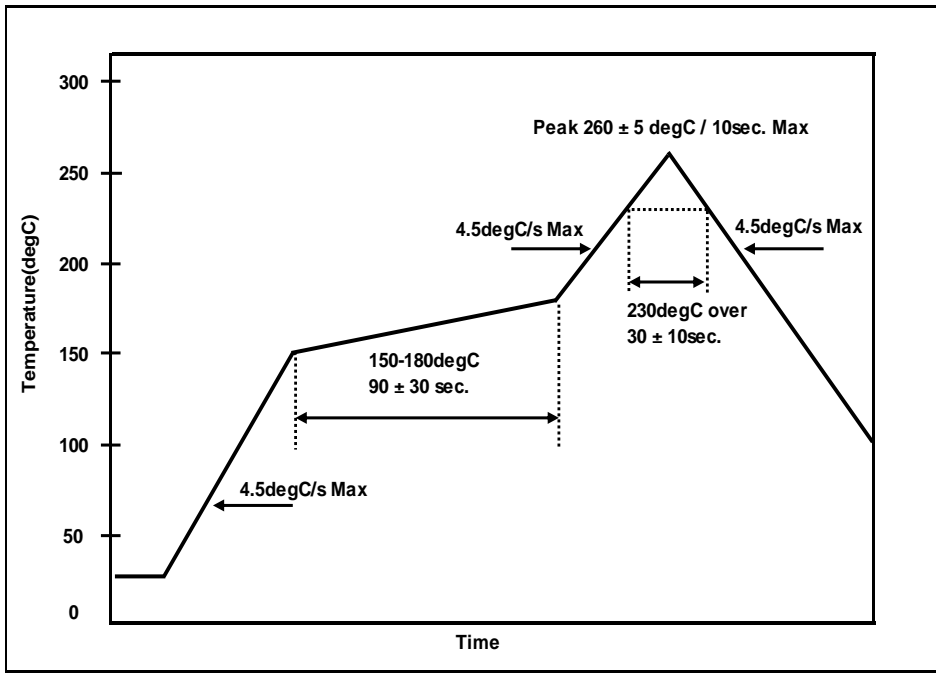
Incorrect PAD connection is cause of trouble. Please make sure to connect correctly as below.

#2 terminal  $\rightarrow$  GND

#4 terminal  $\rightarrow$   $V_{CC}$

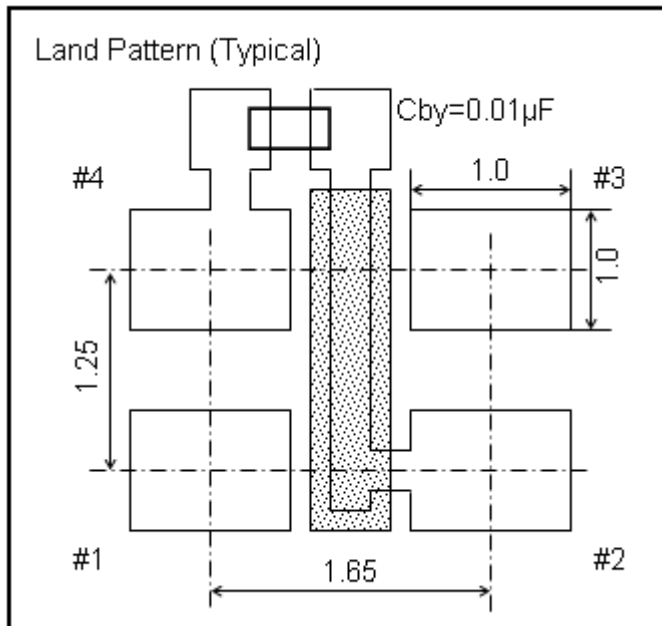
11. Order items are manufactured according to specification. As to conditions, which are not indicated in this specification and unpredictable such as applied condition and oscillation margin, please check them beforehand.

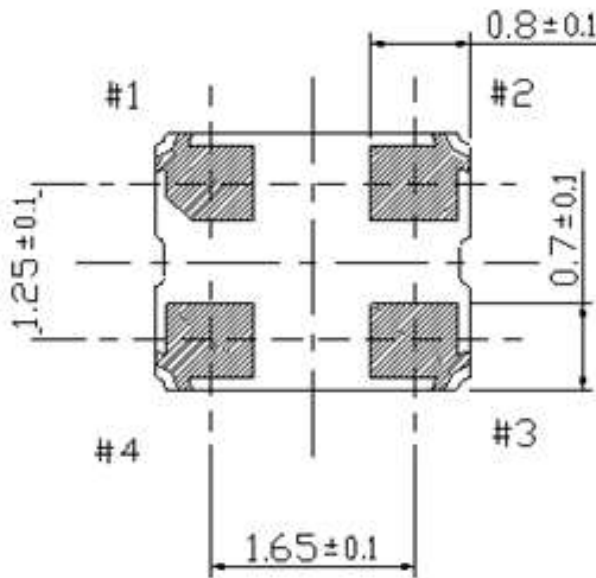
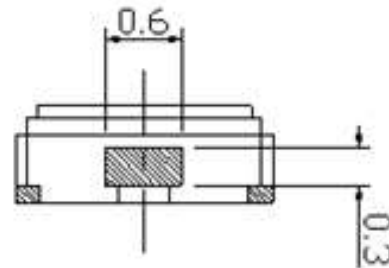
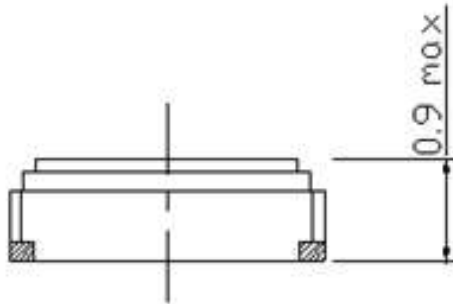
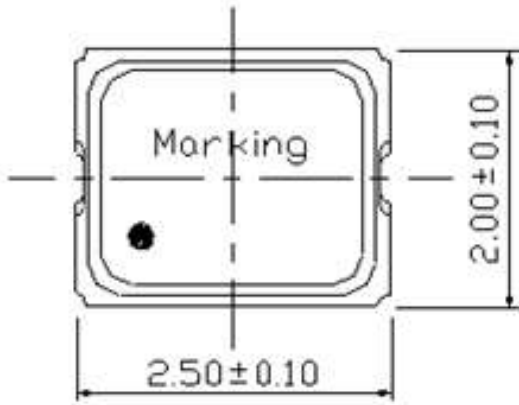
\*Example For Soldering Conditions (The below graph corresponds to Pb free solder)



Recommended Footprint

[mm]



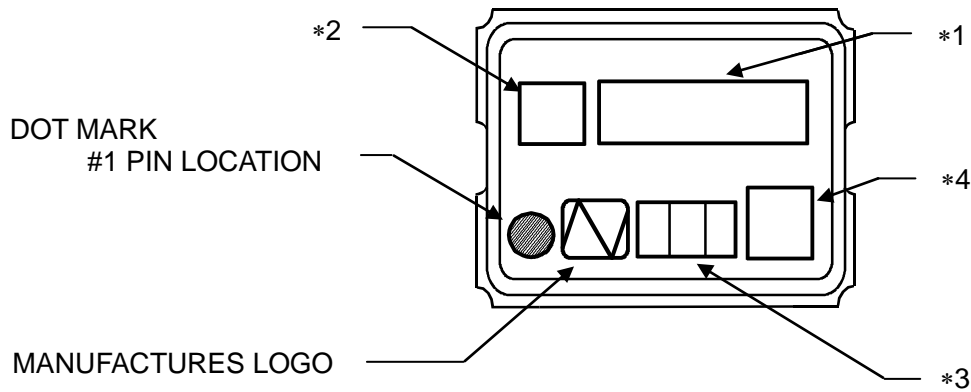


Terminal land connections

#1	STAND-BY
#2	GND
#3	OUTPUT
#4	V <sub>CC</sub>

	Date of Revise	Charge	Approved	Reason	
C	2.Aug.2012	Y.Oishi	C.Ishimaru	Change V <sub>DD</sub> →V <sub>CC</sub> , PAD CONNECTIONS→Terminal land connections	
	Date	Name	Third Angle Projection	Tolerance	
Drawn	23.Oct.2003	M.Yamaguchi	Dimension : mm	-----	
Designed	27.Jun.2003	M.Yamaguchi	Title <b>NZ2520S</b> <b>Dimension of External</b>	Drawing No. <b>EKD14B-00027</b>	
Checked	-----	-----			Rev. C
Approved	23.Oct.2003	H.Omata			

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**\*1 [FREQUENCY]**

Digits are five and 6TH digit will be omitted.  
 MHz unit sign is not marked.  
 ex, ) 28.63636MHz → 28.636 [Unit sign not marked]

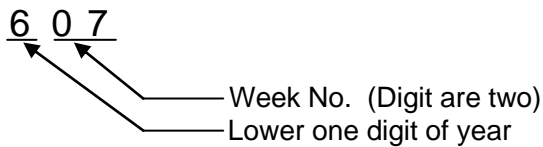
**\*2 [MODEL MARK]**

A last digit of model is marked. →

[MODEL MARK]	
NZ2520SA	→ Space
NZ2520SB	→ B
NZ2520SC	→ C
NZ2520SD	→ D
NZ2520SEA	→ E
NZ2520SF	→ F
NZ2520SG	→ G

**\*3 [WEEK CODE (Digit are three)]**

ex1,) In case of 7TH week of 2006



ex2,) In case of 31<sup>TH</sup> week of 2006

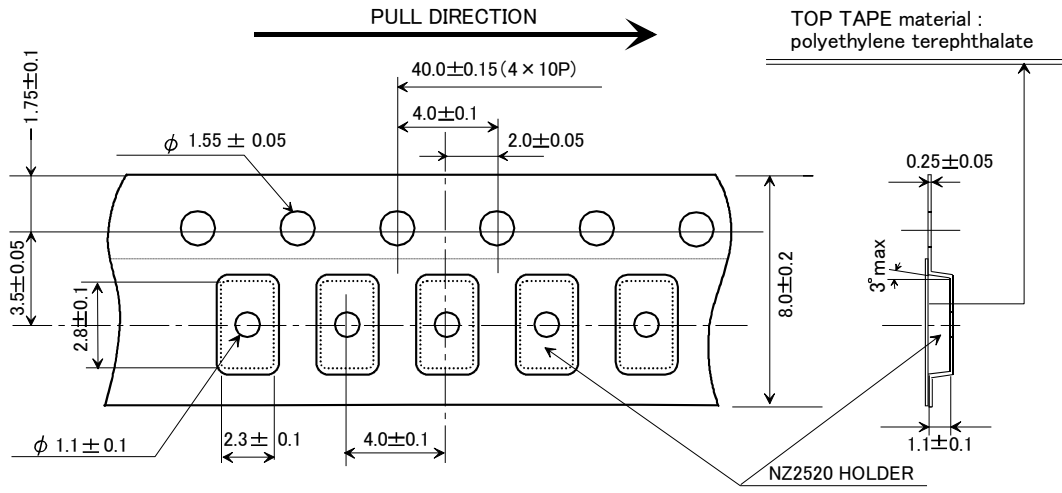
6 3 1

**\*4 [Trace code]**

Trace code consists of four digits number or letter.  
 This code indicates production date and production line number.

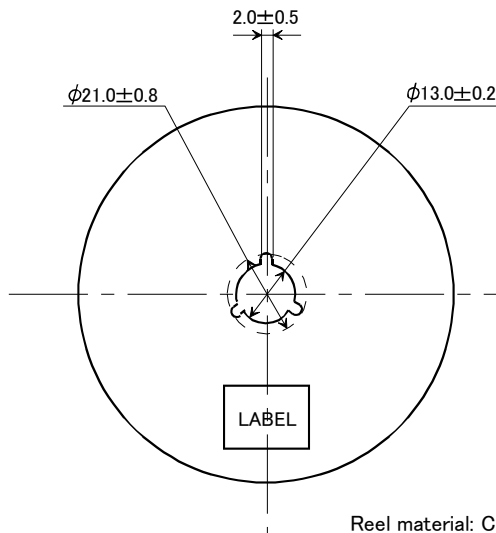
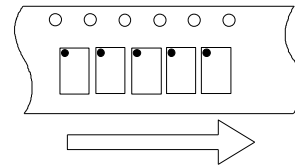
	Date of Revise	Charge	Approved	Reason	
F	30.Mar.2011	Y.Oishi	C.Ishimaru	Model mark change.(NZ2520SE→NZ2520SEA)	
	Date	Name	Third Angle Projection	Tolerance	
Drawn	27.Jan.2006	Y.Oishi	mm	-----	
Designed	27.Jan.2006	Y.Okajima	Title  NZ2520S Marking	Drawing No.  <b>EKH11B-00052</b>	
Checked	27.Jan.2006	C.Ishimaru			Rev.
Approved	27.Jan.2006	H.Omata			F

Environmental Test Conditions	Specification
1. Thermal Shock Test 1 cycle: -40°C (30 minutes) ~ +85°C(30 minutes) Number of cycle: 100 cycle.	*1
2. High Temperature High Humidity Test Temperature : +85°C, Humidity : 80 ~ 85%, Time : 250 hours.	*1
3. +85°C Aging (Non Operating) Temperature : +85°C, Time : 500 Hours.	*1
4. Vibration Test MIL-STD-202F test method: 204D Test condition : D 10 ~ 2000Hz, 1.52mmp-p, or 196m/s <sup>2</sup> 20 minutes/cycle, XYZ 3 directions 4 times.	*1
5. Shock Test MIL-STD-202F test method : 213B Test condition : Half sinusoidal wave 29400m/s <sup>2</sup> , 0.3ms, 3 directions, 3 times each.	*1
6. Drop Test (JIG attachment ) Dummy load : 200g, Height : 1.5m, Fall conditions : On concrete The number of times of fall : Six directions and 1 time each are made into 1 cycle, and it is 10 cycle.	*1
7. Soldering Test (Reflow ) Pre heat : 150±10°C, 60~120sec. Main heat : 30±1 seconds after amounting to 215 °C. Peak temperature : 240°C	More than 90% of should be covered by solder.
8. Soldering Resistance ( Reflow ) Pre heat : 180±10°C, 120 sec min, Main heat : 225°C min, 70sec max. Peak temperature : 260°C . Reflow time : 3 times.	*1
<p>*1 After the test mentioned above, the electrical specifications are satisfied. Also frequency deviation before and after test should be</p> $\Delta F/F \leq \pm 10 \times 10^{-6}$ <p>The electrical specifications are <math>I_{CC}</math>, <math>T_r/T_f</math>, <math>V_{OL}/V_{OH}</math>, duty cycle, stand-by function, stand-by current consumption.</p>	

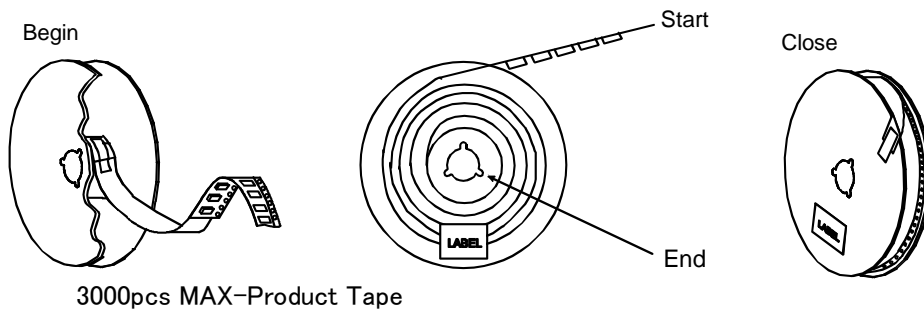
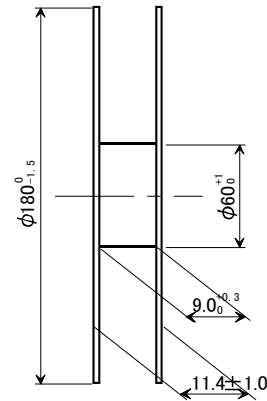


TAPING material: Conductive PS

DIRECTION OF UNIT



Reel material: Conductive PS  
EIAJ standard reel



	Date of Revise	Charge	Approved	Reason		
C	5.Sep.2012	Y.Oishi	C.Ishimaru	3000pcs-Product Tape→3000pcs MAX-Product Tape.		
	Date	Name	Third Angle Projection	Tolerance		
Drawn	7.Oct.2003	Y.Okajima	Dimension:mm	Scale		
Designed	7.Oct.2003	Y.Okajima	Title	Drawing No.		
Checked					EKK17B-00032	Rev.
Approved	7.Oct.2003	H.Omata				C

**NZ2520**  
**Taping and Reel Spec.**

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