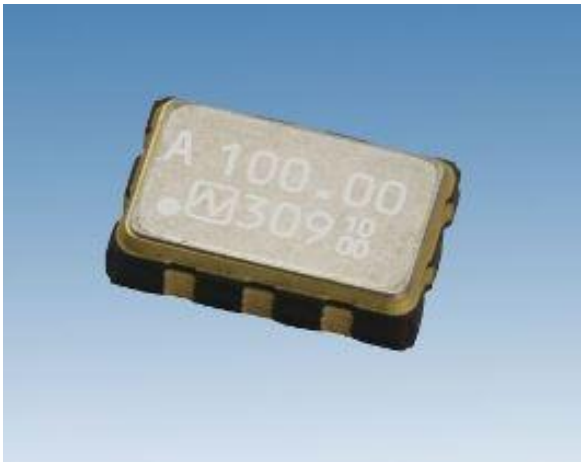
Crystal Bridge to the Future

Simple Packaged Crystal Oscillator

■NP5032SA Data Sheet
(for Fixed Communication)



RoHS Compliant
Directive 2011/65/EU
Directive (EU) 2015/863

Pb free

Main Application

●For SONET-, SDH-, and GbEthernet-related equipment

Features

●Output Specification: LVPECL
●Compact dimension: 5.0 × 3.2 × 1.2 mm
●Supply Voltage: +3.3 V
●Excellent low phase jitter (Typ. 80 fs @148.25 MHz)
●Automatic mounting by taping and IR reflow (lead-free) are possible.
●Lead-free.

1. Item : Simple Packaged Crystal Oscillator

2. Type : NP5032SA

3. Nominal Frequency : 100 to 160 MHz

4. NDK Spec. No. : See Table.1

5. Maximum Ratings

	Item	Ratings			Notes
		min	max	Units	
1	Supply Voltage	-0.3	+4.0	V	
2	Input Voltage	-0.3	V_{CC}+0.3	V	
3	Storage Temperature Range	-55	+125	°C	

6. Electrical Specifications

	Parameters	SYM	Electrical Spec.				Notes
			min	typ	max	Units	
1	Nominal Frequency	f_{nom}	100		160	MHz	See Table.2
2	Supply Voltage	V_{CC}		+3.3		V	See Table.1
3	Current Consumption (Operating)	I_{CC}			60	mA	at 25 °C
4	Current Consumption (Stand-by)	I_{ST}			30	μA	at 25 °C
5	Output Level	-		LVPECL			
6	Load	R_L		50		Ω	Connect to V_{CC} - 2.0 V
7	Operating Temperature Range	T_{opr}		[0 to +70] to [-40 to +85]		°C	See Table.1
8	Overall Frequency Tolerance	$\Delta f/f_{nom}$		± 25 to ± 100		ppm	See Table.1, *1
9	Output Voltage	V_{OL}	V_{CC}-1.81		V_{CC}-1.62	V	
		V_{OH}	V_{CC}-1.025		V_{CC}-0.88	V	
10	Rise Time(t_r), Fall Time(t_f)	t_r/t_f			1	ns	20 % to 80 % waveform
11	Symmetry	SYM	45		55	%	at 50 % Waveform
12	Phase Jitter	t_{pj}			1	ps	*2
13	Output Wave Form	-		Square wave			
14	Stand-by Function	#1 PAD input			#4, 5 PAD output		
		H level (0.7 V_{CC} to V_{CC}) or open			Operating		
		L level (0.3 V_{CC} max)			High impedance		

*1 Inclusive of Freq. tolerance (at 25 °C), frequency/temperature characteristics, frequency/voltage coefficient.
*2 Measured by Agilent E5052A. Offset frequency 12 kHz to 20 MHz, at 25 °C

Table.1 NDK Spec. No. List

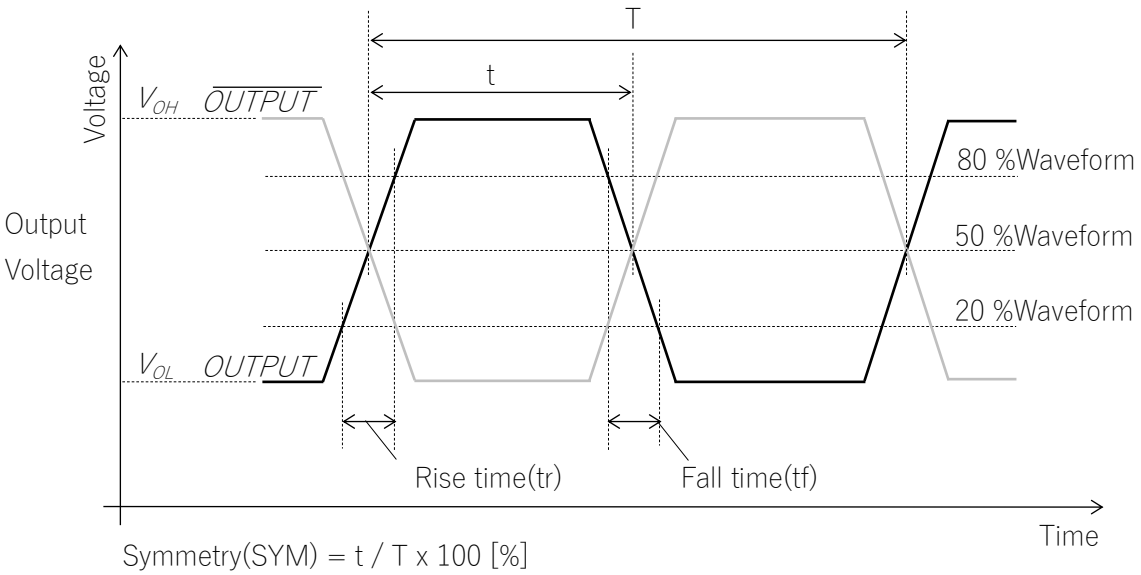
Nominal Frequency	Operating Temperature Range [°C]	Supply Voltage [V]
		3.3 V±10 %
±100 × 10^{-6}	-40 to +85	NSC5400C
±50 × 10^{-6}	0 to +85	NSC5400B
±25 × 10^{-6}	0 to +70	NSC5400A

Table.2 Supported Frequency List

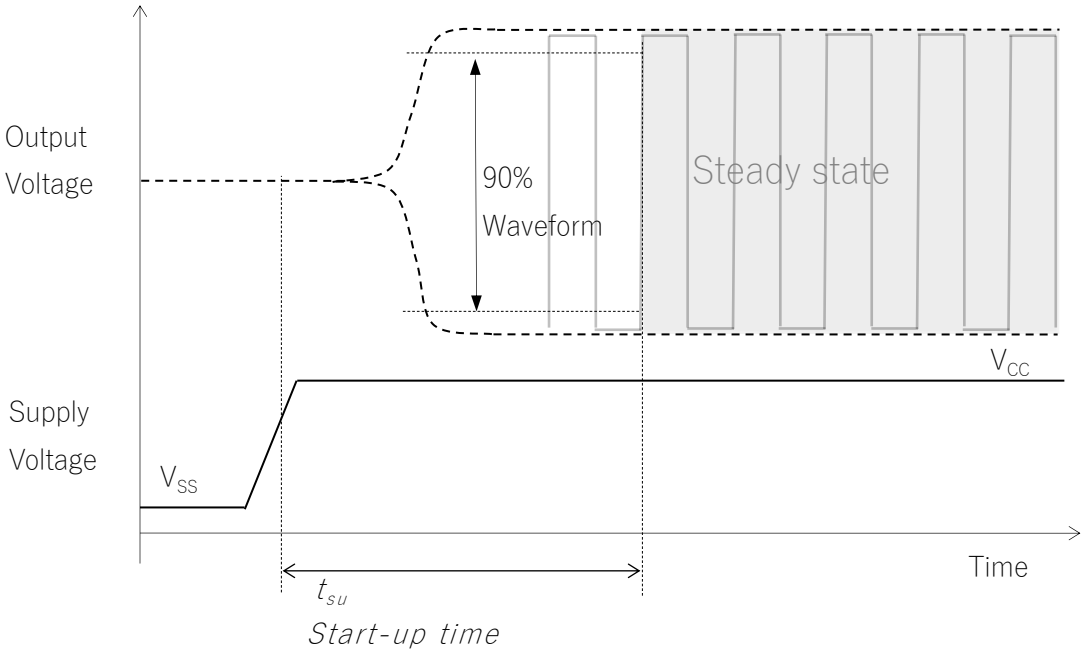
Nominal Frequency [MHz]						
100 MHz						
102.564 MHz						
125 MHz						
133.33 MHz						
133.333 MHz						
148.5 MHz						
156.25MHz						

Frequencies not listed in the list are also available, so please contact us if you have any request.

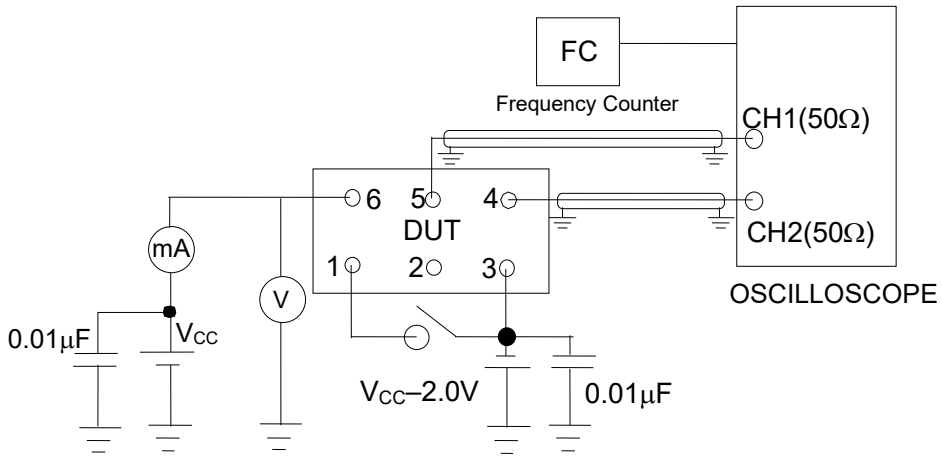
Output Voltage



Start-up Time

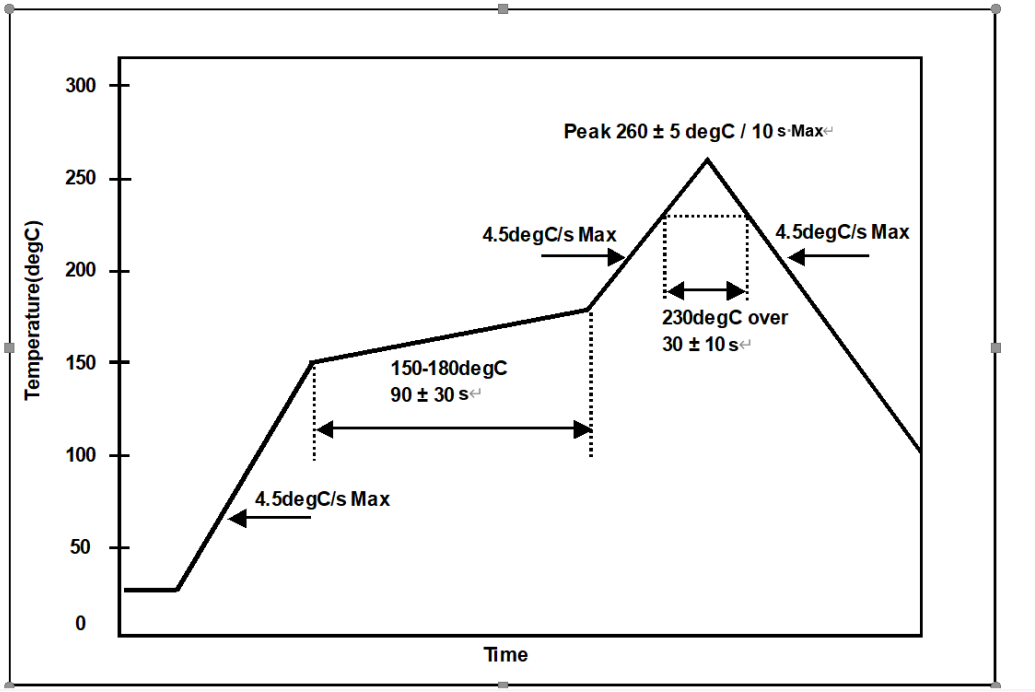


Measuring circuits



7. Prohibited items

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



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: 265 °C, 10 s
Heating: 230 °C or higher, 40 s
Preheating: 150 °C to 180 °C, 120 s
Reflow passage times: 3 times

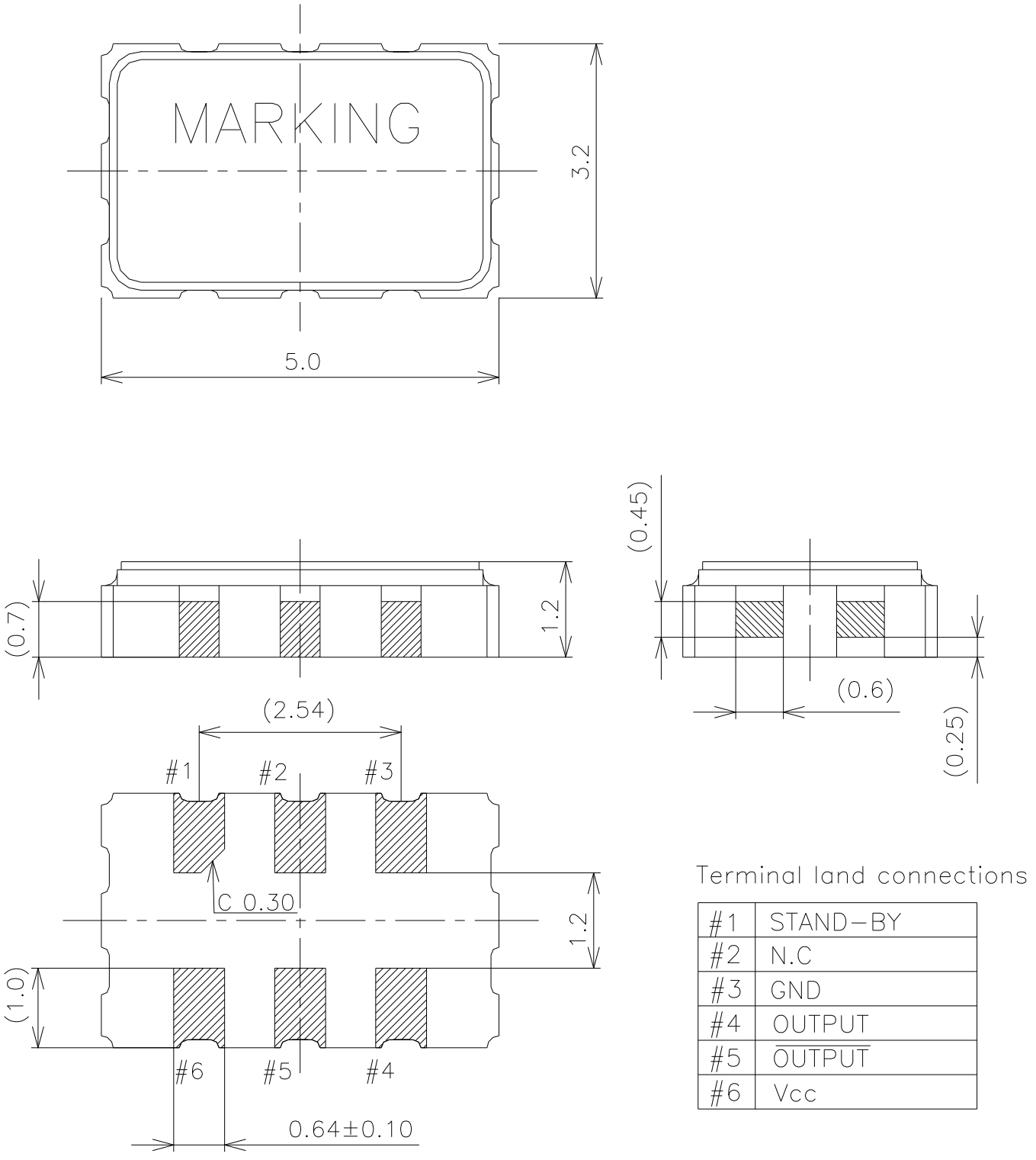
(2) Manual soldering heat resistance
Pressing a soldering iron of 410 °C on the terminal electrode for 4 s. (twice)

8. Electrostatic Discharge

MM: 200 V
HBM: 2000 V
CDM: 500 V

■Dimension of External

Unit : mm
Tolerance : ±0.2



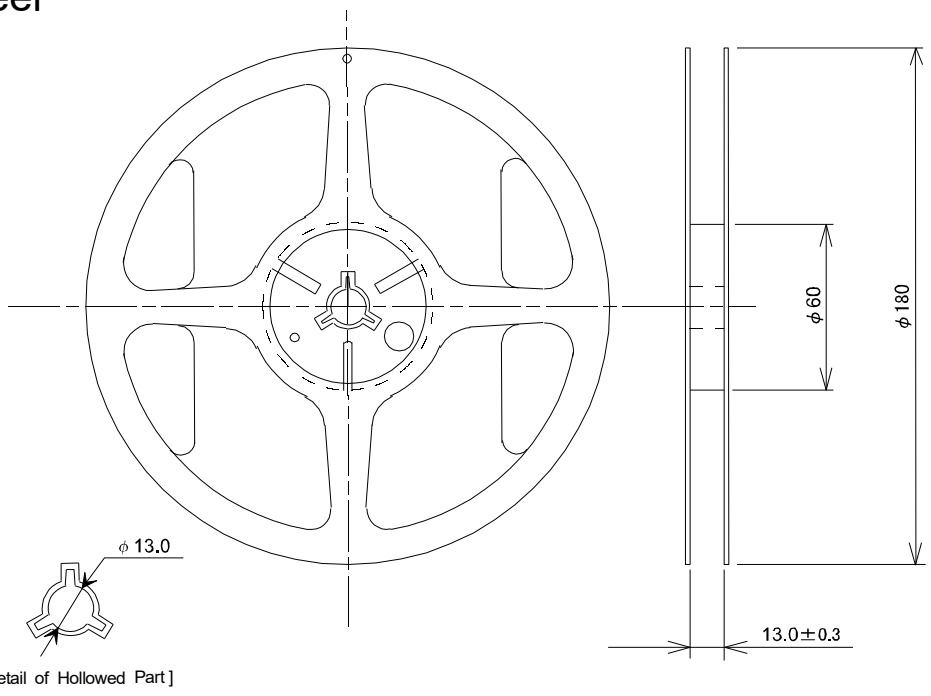
Terminal land connections

#1	STAND−BY
#2	N.C
#3	GND
#4	OUTPUT
#5	$\overline{\text{OUTPUT}}$
#6	Vcc

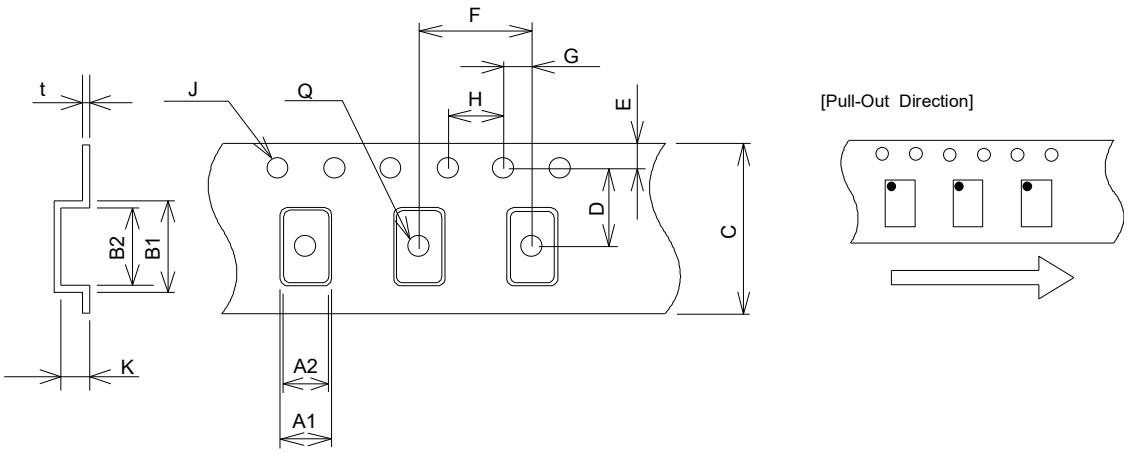
■Taping and Reel Spec.

Unit : mm

Reel



Tape



	A1	A2	B1	B2	C	D	E
Size	3.70±0.10	3.50±0.10	5.60±0.10	5.40±0.10	12.0±0.20	5.50±0.10	1.75±0.10

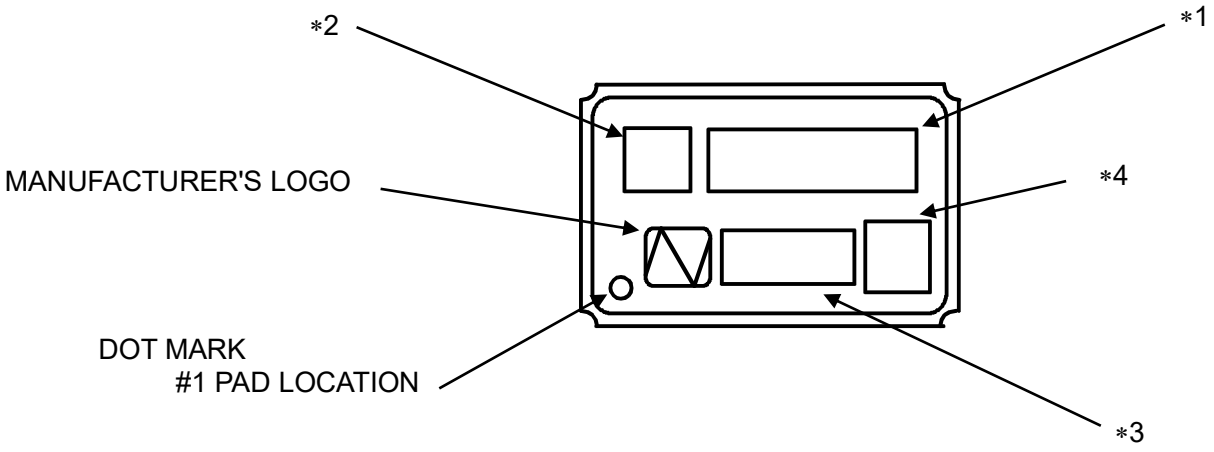
	F	G	H	J	K	Q	t
Size	8.00±0.10	2.00±0.10	4.00±0.10	$1.50^{+0.1}_{-0}$	1.40±0.10	$1.50^{+0.1}_{-0}$	0.30±0.05

10 pitch : 40.0±0.15mm

D and G are taken as the value between a pocket center

1000pcs MAX-Product Tape

■Marking



∗1 [FREQUENCY]

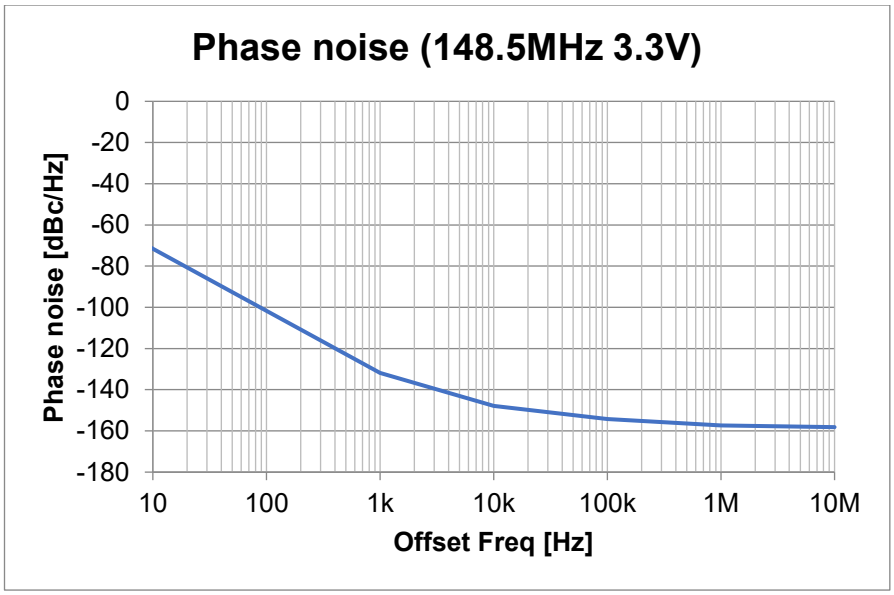
∗2 [MODEL MARK]
NP5032SA → A

∗3 [WEEK CODE (Digit are three)]

∗4 [Trace code]

■Data

- Phase noise



- Phase jitter : Typ. 80 fs (Offset frequency : 12 kHz to 20 MHz)@148.25 MHz, 3.3 V

Instruction Notice

1 Noise

When using this product, please insert a bypass capacitor between the power supply and GND. (Closer to the product terminal is desirable.)
The bypass capacitor values shown in our specifications and drawings are for reference only. (They are not guaranteed values.)
In actual use, please select the appropriate bypass capacitor value for your circuit.
NDK shall not be liable for any and all events resulting from or in connection with the use of this product in a manner that does not comply with the above instruction.

2 Resistance to dropping

The NP3225S series is designed to be impactproof so that no damage occurs when dropped a height (75 cm) three times. However, if dropped from a desk etc., it is advisable to check their performance or contact us to check it.

3 Electrostatic protection

The NP3225S series employ C-MOS ICs for the active element. Please use them in static-free environments.

4 High temperature

Normal operation cannot be guaranteed for the NP3225S series at +125 °C (for 24 h). Be sure that the units are kept within the specified temperature range.

5 Cleaning

Basically, the NP3225S 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.

6 Other

The NP3225S 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.

#3 terminal → GND
#6 terminal → V_{CC}

Notes On Use

1 Even if the appearance color etc. of the product differs by purchasing the component parts by more than two companies, there is no influence on the characteristics and reliability.

2 IN THE CASE OF THE FOLLOWING ITEMS, WE ARE NOT RESPONSIBLE FOR WARRANTY / COMPENSATION.

(1) WHEN PRODUCTS OF THIS SPECIFICATION ARE USED FOR EQUIPMENT RELATED TO HUMAN LIFE OR PROPERTY, IT IS THE RESPONSIBILITY OF THE CUSTOMER TO CONFIRM THE INFLUENCE ON THIS PRODUCT AND EQUIPMENT TO BE USED BEFOREHAND, CONDUCT NECESSARY SAFETY DESIGN (INCLUDING REDUNDANT DESIGN, MALFUNCTION PREVENTION DESIGN, etc.), PLEASE USE IT AFTER SECURING SUFFICIENT SAFETY OF EQUIPMENT.

1.SAFETY-RELATED EQUIPMENT SUCH AS AUTOMOBILES, TRAINS, SHIPS, etc., OR EQUIPMENT DIRECTLY INVOLVED IN OPERATION
2.AIRCRAFT EQUIPMENT
3.SPACE EQUIPMENT
4.MEDICAL EQUIPMENT
5.MILITARY EQUIPMENT
6.DISASTER PREVENTION / CRIME PREVENTION EQUIPMENT
7.TRAFFIC LIGHT
8.OTHER EQUIPMENT REQUIRING THE SAME PERFORMANCE AS THE ABOVE-MENTIONED EQUIPMENT

(2) IN CASES WHERE IT IS NOT INDICATED IN THE REQUESTED STANDARD AND IS USED UNDER CONDITIONS OF USE (INCLUDING CIRCUIT MARGIN etc.) THAT CAN NOT BE PREDICTED AT THE PRODUCTION STAGE.

(3) WHEN USING ULTRASONIC WELDING MACHINE.(THERE IS A POSSIBILITY THAT THE CHARACTERISTIC DEGRADATION IS CAUSED BY THE RESONANCE PHENOMENON OF THE PIEZOELECTORIC MATERIAL.(EXAMPLE;CRYSTAL PIECE))
WE WILL NOT TAKE ANY RESPONSIBILITY FOR THE INFLUENCE OF THE CUSTOMERS' PROCESS.

SO, PLEASE SUFFICIENTLY EVALUATE AT A SAMPLE STEP WHEN YOU USE ULTRASONIC WELDING MACHINE.

(4) USING RESIN MOLD MAY AFFECT THE PRODUCT CHARACTERISTIC.
PLEASE MAKE SURE TO TELL OUR SALES CONTACT WHEN YOU USE RESIN MOLD. WE WILL PERFORM INDIVIDUAL CORRESPONDENCE ABOUT A DELIVERY SPECIFICATION AND A EVALUATION METHOD.
IN ADDITION, IF YOU USE RESIN MOLD WITHOUT CONTACTING US, AND CAUSES DAMAGES AGAINST A CUSTOMER OR A THIRD PARTY, WE WILL NOT BE LIABLE FOR THE DAMAGES AND OTHER RESPONSIBILITIES BECAUSE WE CONSIDER IT IS UNDER ELF-RESPONSIBILITY USING RESIN MOLD.
WE WILL NOT TAKE ANY RESPONSIBILITY FOR THE INFLUENCE OF THE CUSTOMERS' PROCESS. PLEASE EFFICIENTLY EVALUATE AT A SAMPLE STEP WHEN YOU USE RESIN MOLD.

(5) WHEN PERFORMING IMPROPER HANDLING THAT EXCEEDS THE GUARANTEED RANGE.

3 This product can not be used for automotive applications.
We have other products available for automotive applications so please contact us.

Notes on storage

1 When storing the product in high temperature and high humidity condition for a long time, product characteristics (solderability etc.) and packaging condition may be deteriorated. Please store product at temperature + 5 °C to + 35 °C, humidity 85 % RH or less. The product is an electronic component, so please do not storage and use, under a dewing state.

2 The product storage deadline is 12 months after delivery in unopened state. Please use within storage deadline. If you exceed storage deadline, please check the product characteristics etc, please use.

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