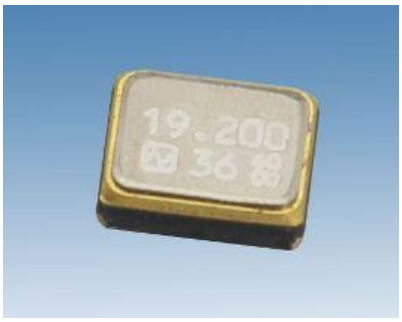
Crystal Unit

■NX2016SF Data Sheet
(for Mobile Communications)

Application
Communications equipment

Features
Crystal unit with built-in Thermistor

- **Integrated with a crystal unit to eliminate space in circuit design (Conventionally, a crystal unit and a temperature sensor are mounted on the same board.)**
- **A crystal element and a temperature sensor (thermistor) are mounted in the same airtight chamber, and the temperature closer to the crystal element can be detected, thereby improving the frequency temperature compensation compared with the conventional crystal unit.**
- **Ultra-compact and low profile (Typ. : 2.0×1.6×0.45 mm)**
- **Surface-mount crystal unit (Available for reflow soldering)**
- **Reflow temperature profile (Available for lead free soldering)**
- **Conforms to AEC-Q200**



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

Pb free

AEC-Q200

1. Item : Crystal Unit

2. Type : NX2016SF

3. Nominal Frequency : 19.200~55.200 MHz

4. NDK Spec. No. : STD-CTZ-1

5. Electrical Specifications

	Parameters	SYM.	Electrical Spec.				Notes
			min	typ	max	Units	
1	Nominal frequency	f_{nom}	19.2	-	55.2	MHz	---
2	Overtone order	-	Fundamental			-	---
3	Frequency tolerance	-	-10	-	+10	$\times 10^{-6}$	@ +25°C
4	Frequency versus temp. characteristics	-	-12	-	+12	$\times 10^{-6}$	The reference temperature shall be +25°C
5	Equivalent resistance	-	-	-	*1	Ω	*1. Refer to Table1 (IEC PI-network / Series)
6	Load capacitance	C_L	-	7	-	pF	IEC PI-network
7	Level of drive	-	-	10	100	μW	---
8	Operating temp. range	T_{opr}	-30	-	+85	°C	---
9	Storage temp. range	T_{str}	-40	-	+105	°C	---
10	Insulation resistance	-	500	-	-	MΩ	When terminal to terminal and terminal to cover were applied at DC100V ±15V.
11	Air-tightness	-	-	-	1.1×10^{-9}	Pa m^3/s	---
12	Thermistor resistance	-	-1%	100	+1%	kΩ	@ +25°C
13	B-Constant	-	-1%	4250	+1%	K	@ +25 / +50 °C

Table.1. List of NDK Spec. No.

NDK Spec. No.	Frequency range [MHz]		Equivalent resistance
	Min.	Max.	[Ω]
STD-CTZ-1	19.2 ≦	< 24	80
	24≦	≦55.2	60

Specifications shown are NDK standard spec. Other specifications than above are also available, so please contact us if you have any request.

Table.2. Supported frequency list

● mark indicates the currently available frequency.

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

Frequency [MHz]	STD-CTZ-1
19.200	●
26.000	●
38.400	●
52.000	●

Mounted conditions

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

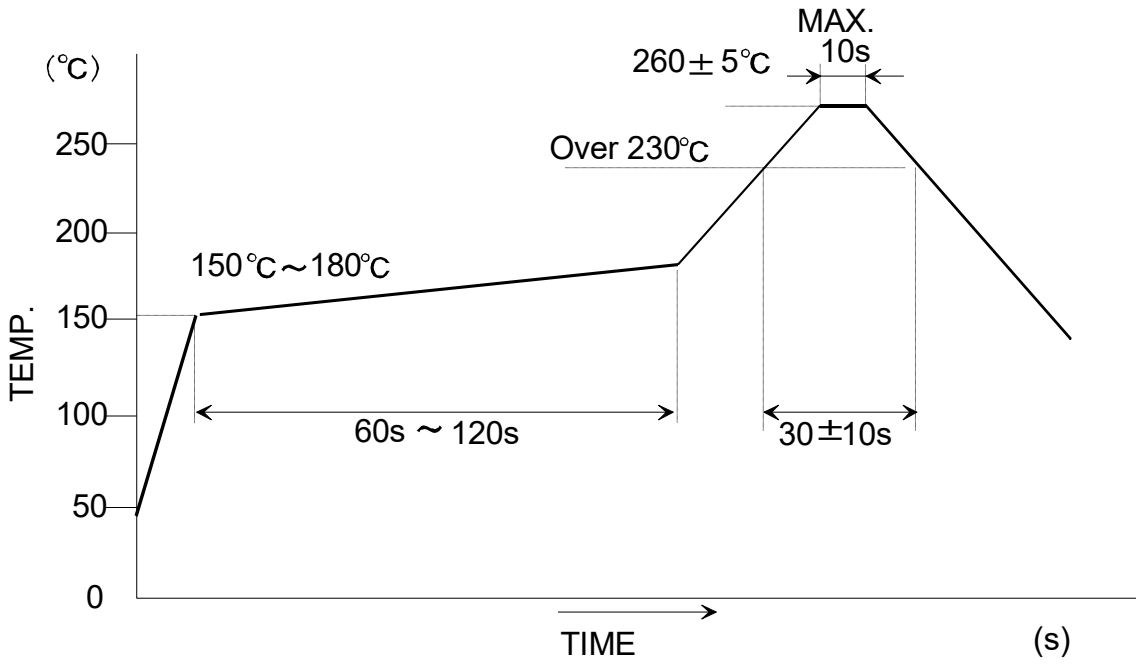
(1) Reflow soldering heat resistance

Peak Temp.	: 265°C, 10sec.
Heating	: 230°C or higher, 40sec.
Preheating	: 150~180°C, 120sec.
Reflow passage times	: twice

(2) Manual soldering heat resistance

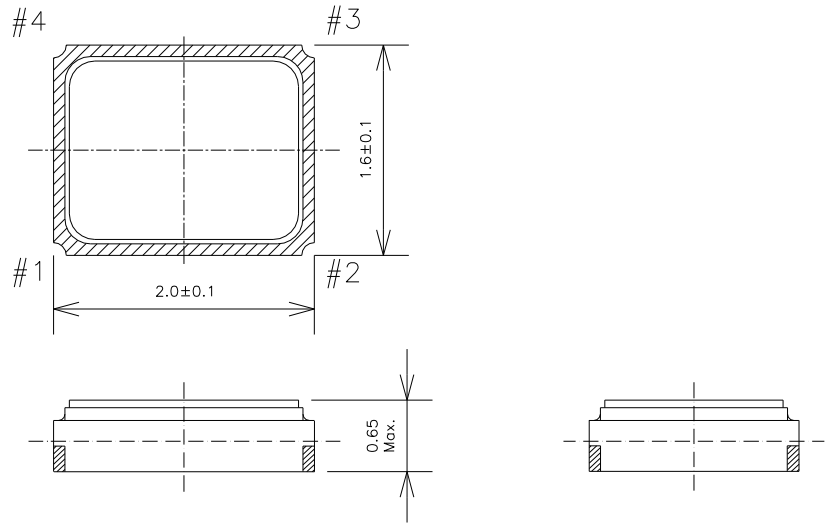
Pressing a soldering iron of 400°C on the terminal electrode for four seconds (twice).

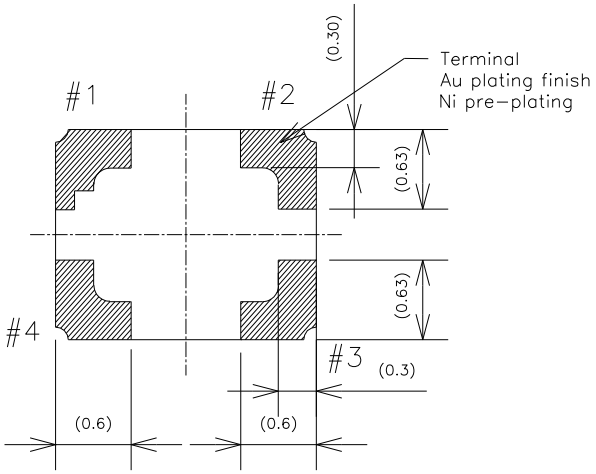
Recommendation reflow condition



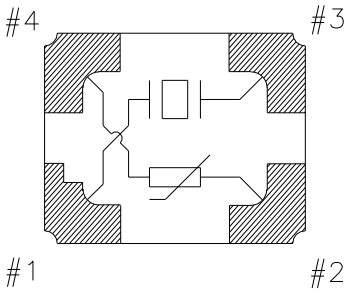
Dimension drawing

Unit : mm
Tolerance : +/-0.1mm



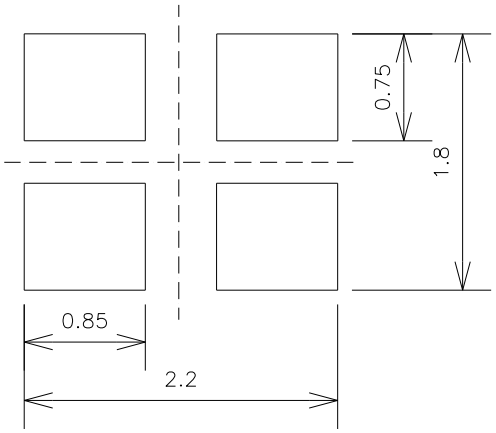


Terminal land connection (TOP VIEW)



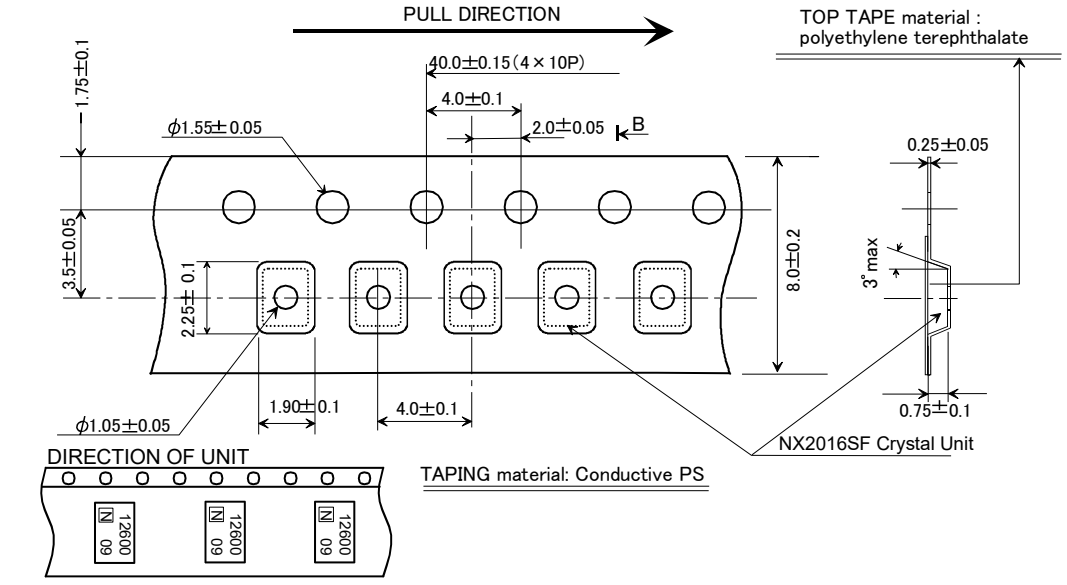
#1	XTAL IN
#2	THERMISTOR OUT, GND
#3	XTAL OUT
#4	THERMISTOR IN

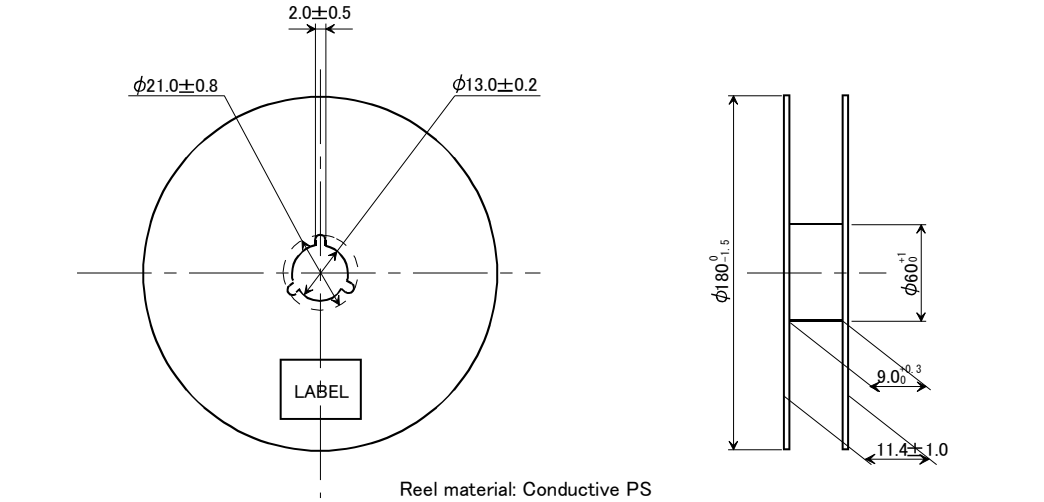
LAND PATTERN (Recommended)

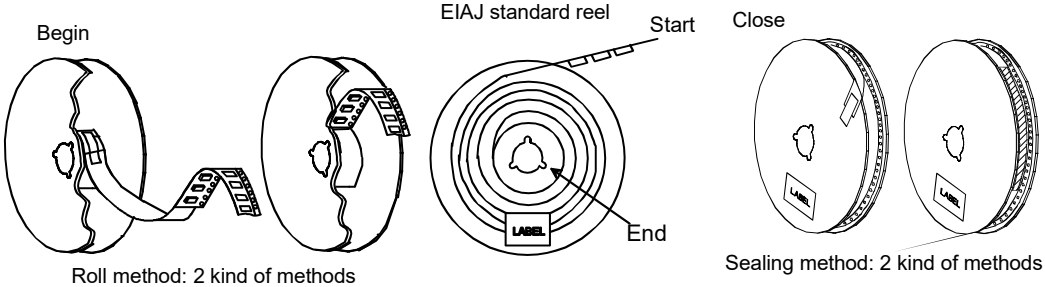


Taping and reel spec. ①

3,000pcs / reel (Reel dimension : φ180 mm)







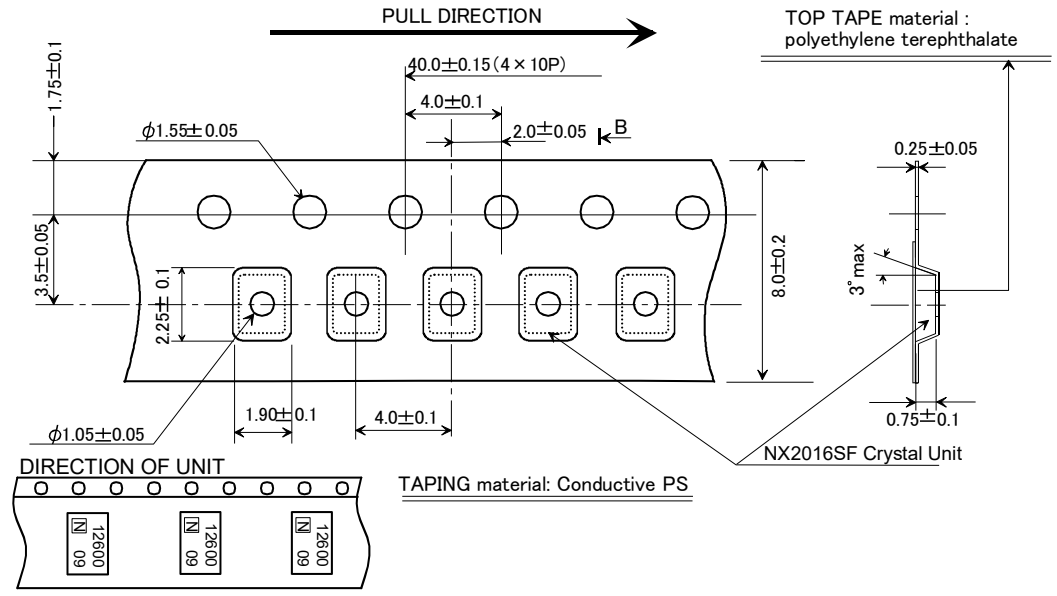
Roll method: 2 kind of methods

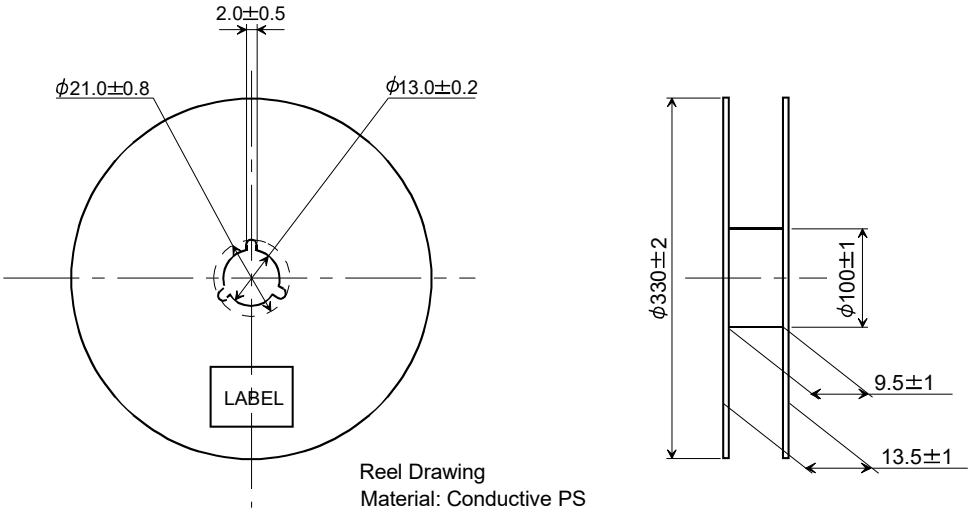
3000pcs-Product Tape

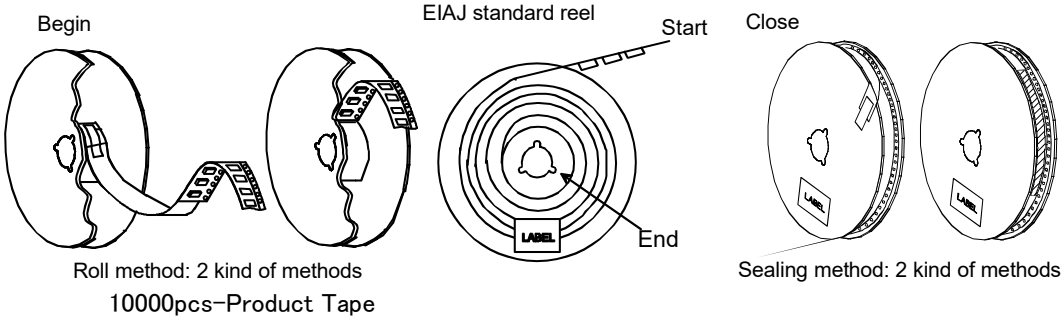
Sealing method: 2 kind of methods

Taping and reel spec.②

10,000pcs / reel (Reel dimension : φ330 mm)

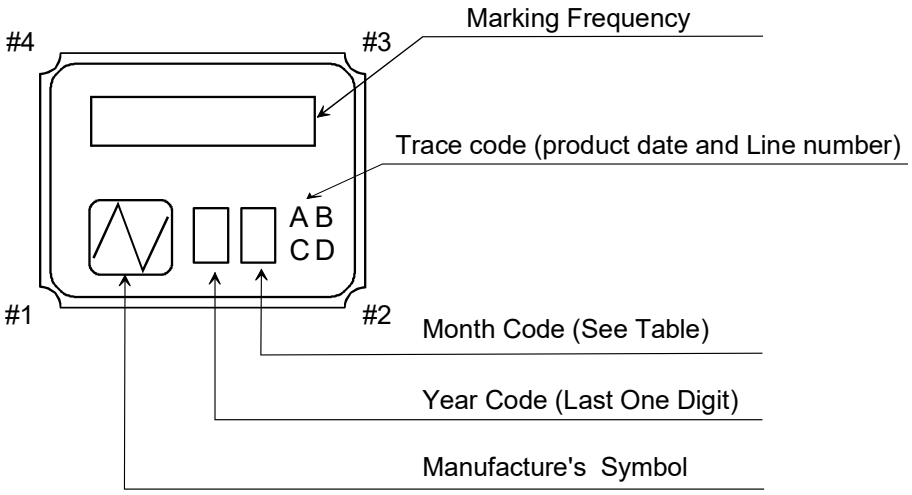






10000pcs-Product Tape

Marking spec.



NOTE

1. Frequency Code

Marking Frequency is consist of five digits, first five digits of Nominal Frequency

Example

Nominal Frequency	28.636363 MHz
Frequency Code	28.636

2. Month Code Table

Month	1 Jan.	2 Feb.	3 Mar.	4 Apr.	5 May.	6 Jun.	7 Jul.	8 Aug.	9 Sep.	10 Oct.	11 Nov.	12 Dec.
Month Code	1	2	3	4	5	6	7	8	9	X	Y	Z

*Marking digits are not include a decimal point and dot mark.

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. Since the crystal unit is a passive component, it is important to have appropriate circuit conditions. Please be sure to check the circuit conditions before using the crystal units, and ensure the necessary circuit margin, and confirm that the desired frequency is output. Moreover, please check the circuit conditions when using an existing crystal unit for another model or board. If the circuit conditions are not appropriate, there is a risk of oscillation stop or frequency deviation.

3. IN THE CASE OF THE FOLLOWING ITEMS, WE ARE NOT RESPONSIBLE FOR WARRANTY / COMPENSATION. IN THE EVENT THAT WE RECEIVE CLAIMS FOR COMPENSATION OR OTHER DEMANDS FROM THIRD PARTIES (OTHER THAN CUSTOMER) REGARDING THE FOLLOWING ITEMS, CUSTOMER SHALL BE RESPONSIBLE FOR HANDLING AND COMPENSATING SUCH CLAIMS.
   (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.), AND 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) WHEN USING UNDER ENVIRONMENTAL AND CONDITIONS OF USE (INCLUDING CIRCUIT MARGIN etc.) THAT CAN NOT BE PREDICTED IN OUR DESIGN SPECIFICATIONS.
   (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.

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 AN 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 SELF-RESPONSIBILITY USING RESIN MOLD.
WE WILL NOT TAKE ANY RESPONSIBILITY FOR THE INFLUENCE OF THE CUSTOMERS' PROCESS. PLEASE SUFFICIENTLY EVALUATE AT A SAMPLE STEP WHEN YOU USE RESIN MOLD.

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

4. This product cannot be used for equipment related to the safety of automobiles or equipment directly involved in operation.(example: air bag, TPMS, engine control, steering control, brake control etc.)

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 ~ + 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 before use.

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