NIHON DEMPA KOGYO CO., LTD.

APPROVAL SHEET

DATE: May 31, 2013

CUSTOMER :

PRODUCT NAME : Surface Mount Crystal Units

NDK Part Number

AT-41CD2-20MHz_18_H32_E_N
This crystal is lead-free and RoHS compliant.

PREPARED BY : _____ **CONFIRMED BY :** _____

CUSTOMER APPROVAL :

CHECKED BY : _____ **APPROVED BY :** _____

SPECIFICATION

PACKAGE : **AT-41CD2**

NDK PART NO. : **AT-41CD2-20MHz_18_H32_E_N**

ELECTRICAL CHARACTERISTICS :

1.	**Nominal Frequency**	**: 20.000000MHz**
2.	**Oscillation Mode**	**: Fundamental**
3.	**Frequency Tolerance**	**: ± 30 ppm at 25°C**
4.	**Tolerance Stability over Temp. range**	**: ± 30 ppm at -40°C to +85°C**
5.	**Equivalent Series Resistance**	**: 50 Ω max.**
6.	**Load Capacitance**	**: 18 ρF**
7.	**Operating Temperature Range**	**: -40°C to +85°C**
8.	**Drive Level**	**: 10 µW typ., 100 µW max.**
9.	**Storage Temperature Range**	**: -55°C to +125°C**
10.	**Aging**	**: ± 3 ppm max. / per year**

Date of specification : May 31, 2013

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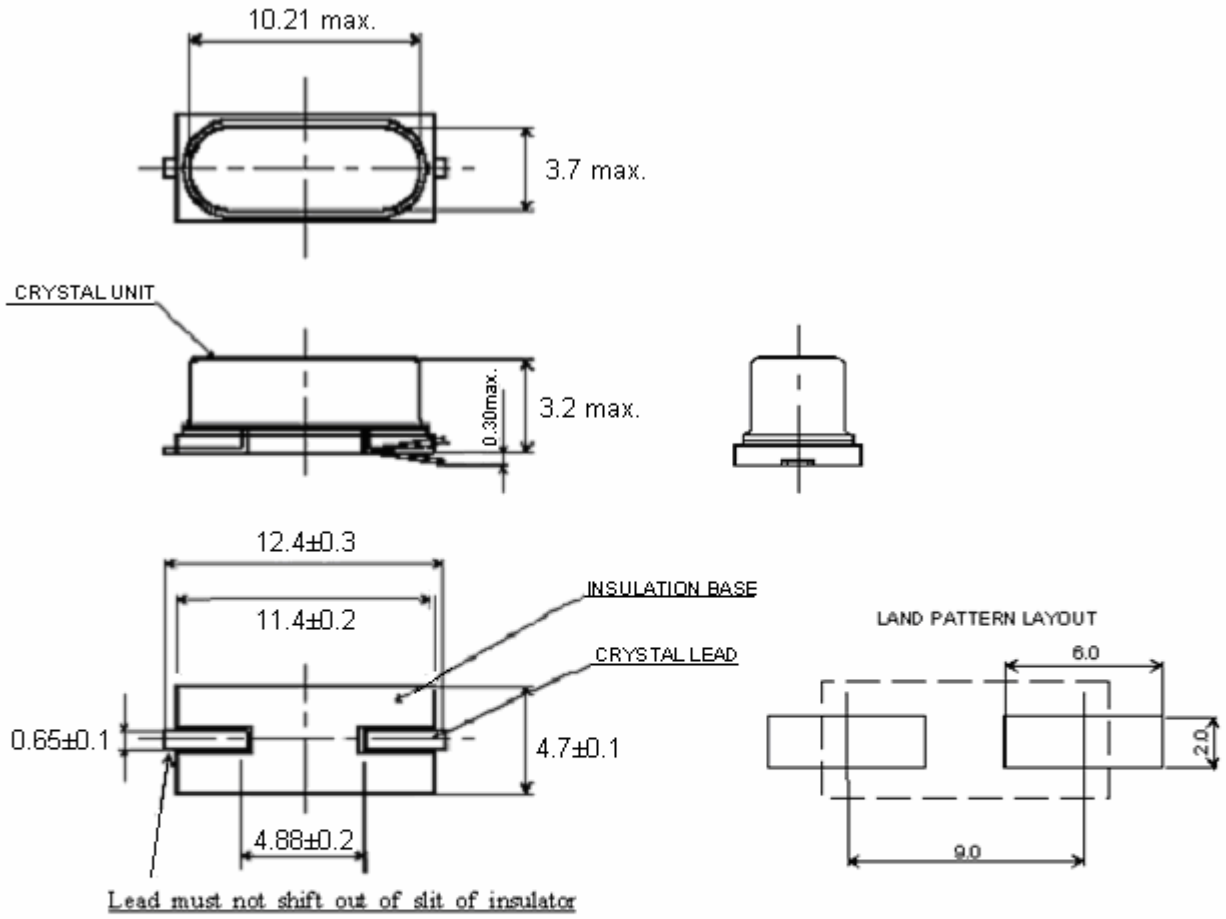
N-AT-41CD2-L12.4-H3.2-11

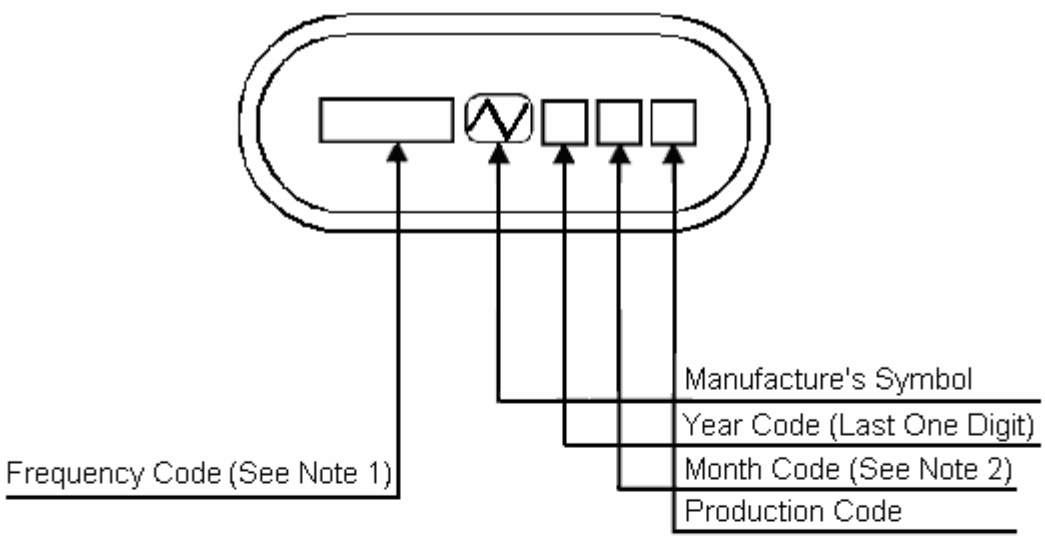
Dimension



Unit : mm

N-AT-41CD2-02

Marking



Note:

1. Frequency Code

Frequency code is consisted of 3 digits, first 3 digits of nominal frequency.

Example

Frequency	4.194304MHz	4MHz
Frequency Code	4.19	4.00

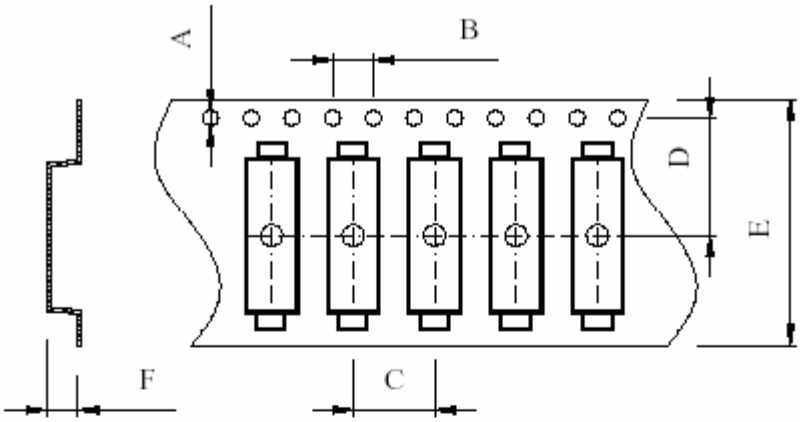
2. Month Code

Month	1	2	3	4	5	6	7	8	9	10	11	12
Month Code	1	2	3	4	5	6	7	8	9	X	Y	Z

Marking digits do not include a decimal point and dot mark.

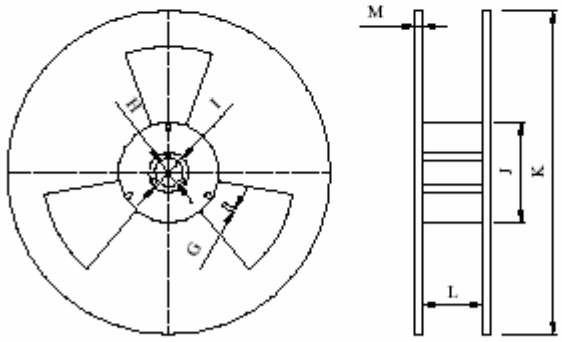
N-AT-41CD2-03

Packaging



A	B	C	D	E	F
ϕ1.5	4.0	12.0	11.5	24.0	4.6

Reel Dimensions(unit: mm)



G	H	I	J	K	L	M
2.5	ϕ13.5	21.6	99.5	330	25.4	2.3

***1000pcs/Reel**

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N-AT-41CD2-02

Guarantee Reliability Conditions

No	TEST ITEM	TEST METHODS	SPECIFICATION CODE
1	DROP	Device are dropped form the height 75cm onto wooden block (more than 3cm thickness) Execution 3 times random drops.	A
2	VIBRATION	Frequency : 10~55Hz Amplitude : 1.5mm Circuit : 1~2min Testing Period : 2h each direction	A
3	TERMINAL STRENGTH(1)Pull Test	A tensile force shall be applied to the termination in the direction of its draw-out axis gradually up to the specified value (10N), and maintained as it is for 10 s.	B
	TERMINAL STRENGTH(1)Bend Test	A weight of 0.45kg in mass is suspended from the end of termination. The body shall be turned through approx. 90 degrees per 2 to 3 s and then returned to the original position at the same rate.	B
4	SOLDERABILITY	235+/-5deg C, 5+/-0.5 s Dip	C
5	HEAT RESISTANCE OF SOLDERING	260+/-10deg C, 10 s max. Immersion	A
6	COLD RESISTANCE	-40+/-3deg C, 96 h	A
7	HUMIDITY	60deg C, 90~95%RH, 500h	A, D
8	THERMAL SHOCK	85+/-2deg C, -40+/-3deg C, each 30 min. 10 cycles	A
9	AGING	85+/-3deg C, 500h No operation	A

SPECIFICATION CODE	SPECIFICATION
A	(1) △f/f <= +/-5ppm (2) △CI/CI <= 15% or 2 ohm make use larger value
B	After testing unless cracking of materials view of eyes and unless break of seal, breaking of termination.
C	The leads shall acquire a new solder coat over at least 95% of immersed area.
D	Insulation resistance shall be greater than 500 M ohms.