

NAKAGAWA ELECTRONICS LIMITED**QUARTZ CRYSTAL OSCILLATOR SPECIFICATION**

NKG PART NUMBER	SCO37A100.000NTS
DESCRIPTION:	OSCILLATOR in SMD 7x5 package, 100.0MHz, 1.8V; ±25ppm, 15pF, 0°C to 70°C

CUSTOMER:
CUSTOMER P/N:

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REVISION TABLE:

REV.	DESCRIPTION	PREPARED	APPROVED	DATE
A	Original release	<i>C. Lui</i>	<i>M. Bruech</i>	2007/10/04
B	New spec format	<i>S. Liu</i>	<i>M. Bruech</i>	2011/11/03
C	NO ENTRY			
D	NO ENTRY			

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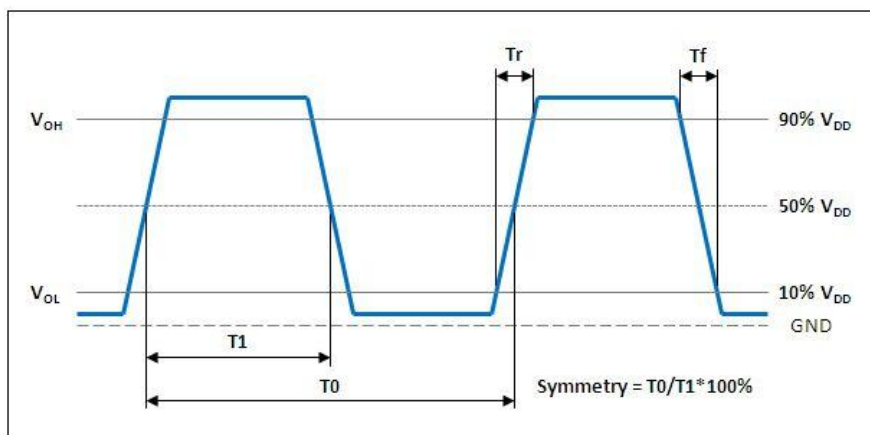
1. ELECTRICAL CHARACTERISTICS

▪ ELECTRICAL PARAMETERS

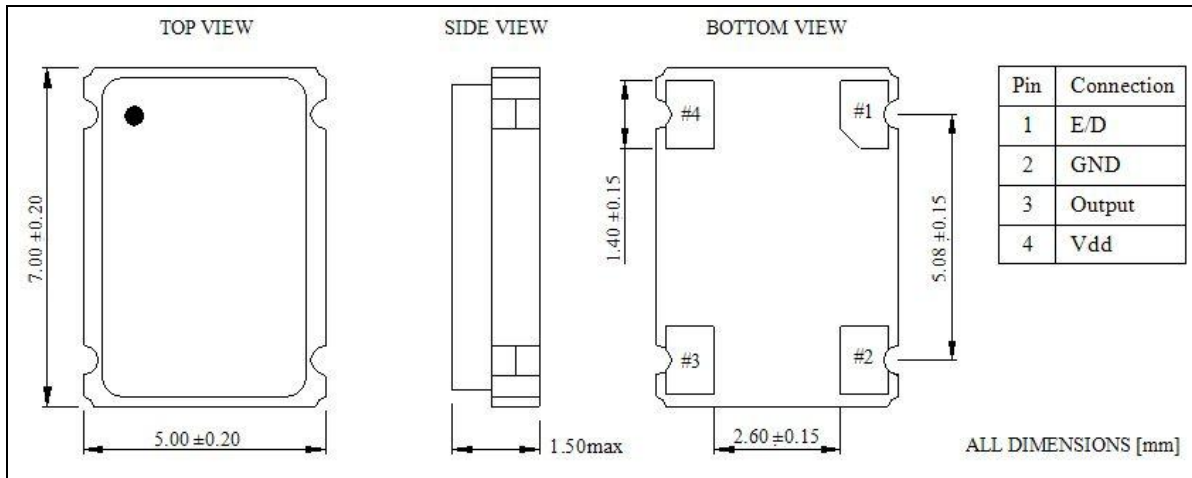
PACKAGE TYPE (SEE DWG NEXT PAGE)	SCO36 (SMD 7x5x1.5)
NOMINAL FREQUENCY	100.000MHz
POWER SUPPLY:	1.8V _{DC} ±10%
INPUT CURRENT	25mA MAX
FREQUENCY STABILITY (SEE NOTE 1)	±25ppm MAX
OPERATION TEMPERATURE	0°C to +70°C
STORAGE TEMPERATURE	-55°C to +125°C
OUTPUT // OUTPUT LOAD	HCMOS // 15pF MAX (or 10 LS-TTL)
OUTPUT SYMMETRY	45~55%
RISE TIME (10%~90%VDD)	6ns MAX
FALL TIME (90%~10%VDD)	6ns MAX
OUTPUT VOLTAGE V _{OH}	90%V _{p-p} MIN
OUTPUT VOLTAGE V _{OL}	10%V _{p-p} MAX
PIN 1 E/D FUNCTION (TRI-STATE)	Pin1 = High or open → Output at pin3 active
	Pin1 = Low → Output at pin3 high impedance
STANDBY CURRENT	10μA MAX
STARTUP TIME	10ms MAX

NOTE 1: Including 25deg C tolerance, operating temperature range, input voltage changes, aging, output load changes, shock and vibration.

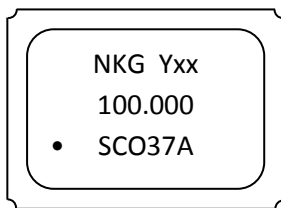
▪ OUTPUT WAVEFORM



2. PACKAGE DIMENSIONS



3. PRODUCT MARKING



NKG = NAKAGAWA logo and DATE CODE "Yxx"

[Y] = alpha YEAR CODE per table below

[xx] = WEEK number

FREQUENCY in MHz (3 digits after decimal point)

MODEL NUMBER

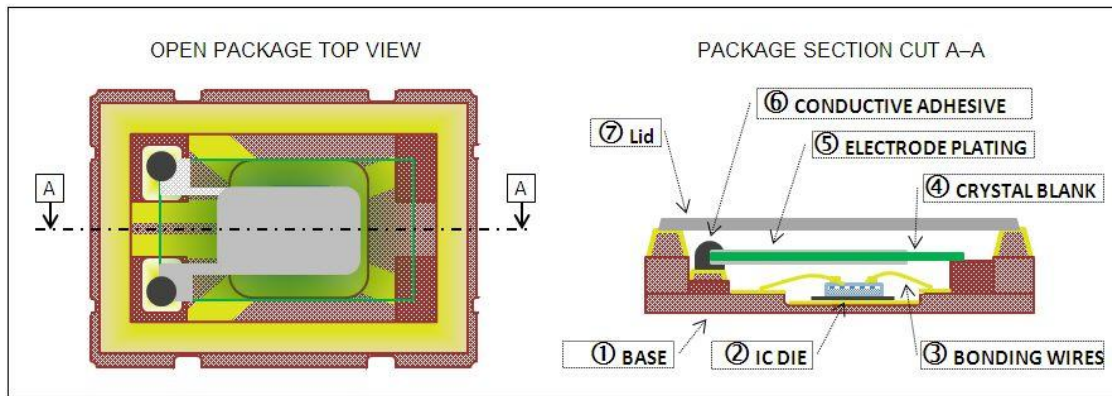
YEAR	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
CODE	K	L	M	N	O	P	Q	R	S	T	U

4. ENVIRONMENTAL COMPLIANCE INFORMATION

The product consists of the following parts and materials:

NO.	PART	MATERIAL	REMARKS
1	BASE (PACKAGE)	Ceramic (Al_2O_3)	Terminals gold plated
2	IC DIE	Silicon (SiO_2)	Semiconductor die
3	BONDING WIRES	Gold (Au)	Pure metal
4	CRYSTAL BLANK	Quartz (SiO_2)	Synthetic material
5	ELECTRODE PLATING	Silver (Ag)	Pure metal
6	CONDUCTIVE ADHESIVE	Silver filled silicon type	Conductive cement
7	LID (COVER)	Kovar (FeNiCo alloy)	Metal alloy

For more detail please refer to Material Declaration Sheet (MDS).



▪ RoHS COMPLIANCE

We can certify herewith that the product is fully RoHS compliant according to the "DIRECTIVE 2002/95/EC OF THE EUROPEAN COUNCIL OF 27. JANUARY 2003 ON THE RESTRICTION OF THE USE OF CERTAIN HAZARDOUS SUBSTANCES" in electrical and electronic equipment (RoHS) and its amendments.

No exemptions are applicable for this product.

▪ RoHS II COMPLIANCE

The draft COM(2008) 809/4 by Commission of the European Communities proposes 4 new substances in the next generation of RoHS Directive. The product is fully compliant to **RoHS II** as well.

▪ HALOGEN FREE

We can certify that the products are being Halogen-Free per IEC 61249-2-21:2003.

▪ REACH (SVHC) COMPLIANCE

We can certify that the product does not contain substances (SVHC) listed in REACH, Registration, Evaluation, Authorization and Restriction of Chemicals, a European Community Regulation on chemicals and their safe use (Regulation (EC) No 1907/2006) entered into force on June 1st 2007.

▪ JIG-101 Level A & B COMPLIANCE

Declarable substances per **Table A of Joint Industry Guide JIG-101** are NOT being added intentionally into the product, based on the material declarations and certifications provided by our suppliers we can confirm that substances per Table A do not exceed the specified threshold levels and / or being intentionally added.

We can declare that the product is **COMPLIANT to JIG-101 Level A**.

Certain declarable substances per **Table B of Joint Industry Guide JIG-101** are being added intentionally and used on purpose in various ways, product is **NOT compliant**.

▪ PFOS / PFOA FREE

We can certify that the products are being FREE of any PFOS's and PFOA's .

▪ ELECTROSTATIC DISCHARGE (ESD) SENSITIVITY

This product is sensitive to ELECTROSTATIC DISCHARGE (ESD), precautions for handling and storage shall be applied based on suggested internal standards listed below.

(JEITA EIAJ ED-4701 / JSD22 / ANSI-ESD-S20-20 / IEC 61000-4-2)

▪ **MOISTURE SENSITIVITY (MSL) CLASSIFICATION [J-STD-020C]**

This product in a hermetically sealed package does NOT fall under the classification of moisture sensitivity per above stated standard (Standard is for non-hermetically sealed components).

If customers system requires an entry in this regard we suggest to use LEVEL 1.

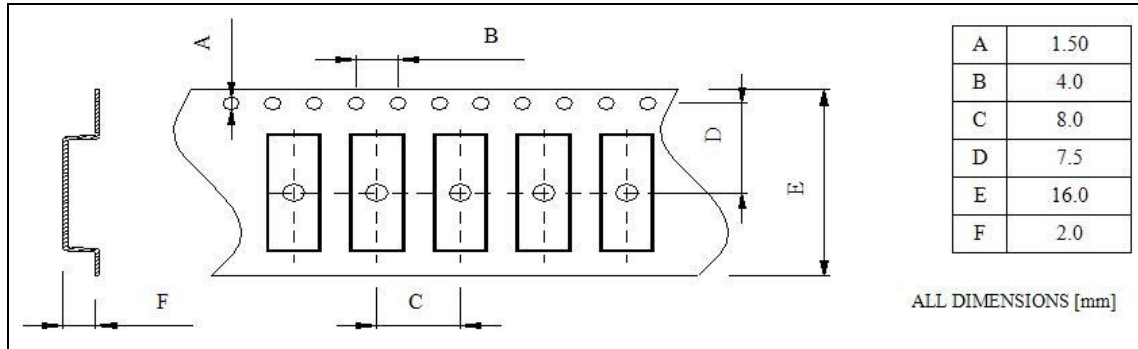
5. RELIABILITY TEST INFORMATION

NO.	TEST ITEM	TEST CONDITIONS	REFERENCE
1	High Temperature Storage	Temperature: 125°C ±10°C Time: 1000 ±24 Hours	MIL-STD-883E
2	Temperature Cycling	Temperature 1: -55°C±10°C Temperature 2: 125°C±10°C Temperature change between T1 and T2 at soonest Run 10 cycles, maintain T1 and T2 30minutes each in one cycle	MIL-STD-883E
3	Solder Heat Resistance	Pre-heat: 125°C 60~120 Seconds Solder Temperature: 260°C±10°C Time: 5 Seconds	MIL-STD-202F
4	Drop Test	3 Times Free Fall from 75cm height onto 3cm thick hard wood board	MIL-STD-202F
5	High Temperature, High Humidity Storage	Temperature: 40°C ± 5°C Relative Humidity: 90% ± 95% Time: 1344 ± 24Hours	MIL-STD-202F
6	Steam Aging	Temperature: 97°C Time: 8 Hours 230°C solder pot to check solderability	MIL-STD-883E
7	Solderability	Dip in flux 5~10 seconds Temperature: 230°C±10°C Time: 5 Seconds	MIL-STD-883E
8	Aging	Temperature: 85°C±5°C Time: 250 ±12 Hours	MIL-STD-202F
9	Thermal Shock	Temperature 1: -55°C±10°C Temperature 2: 125°C±10°C Temperature change between T1 and T2: 5 seconds 10 cycles, maintain T1 and T2 for 30 minutes each in one cycle	MIL-STD-883E
10	Vibration	Frequency Range: 10Hz~1000Hz Amplitude: 1.5mm 40mins in each direction, total 120mins	MIL-STD-202F

6. PACKAGING INFORMATION

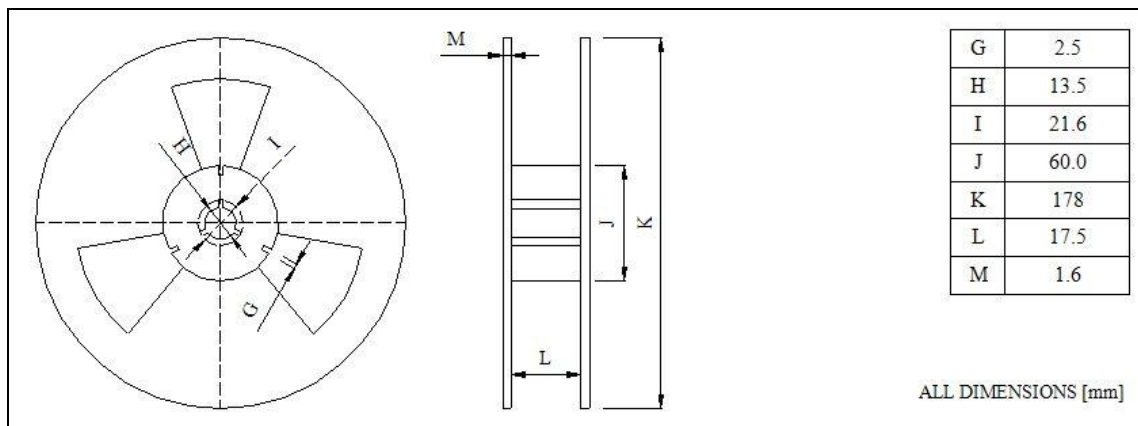
ALL NON-SPECIFIED DIMENSIONS AND T&R PARAMETERS ARE IN COMPLIANCE TO EIA-481.

▪ CARRIER TAPE



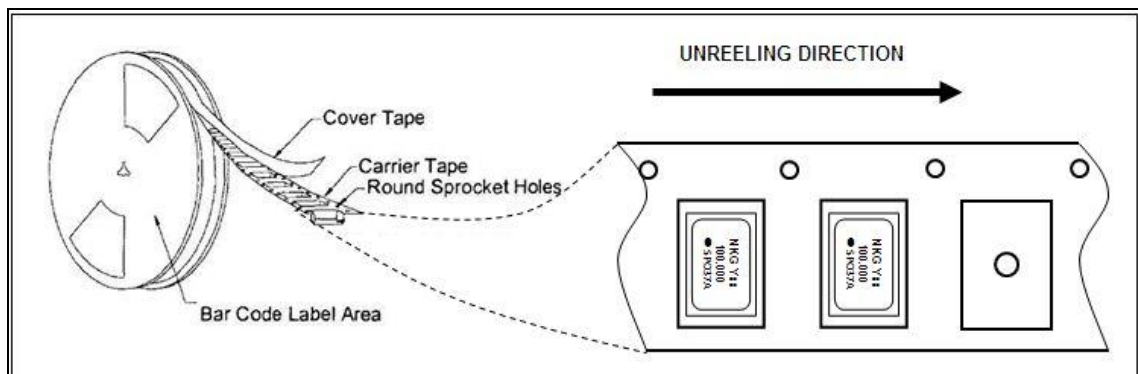
▪ REEL

QTY per reel: 1,000pcs



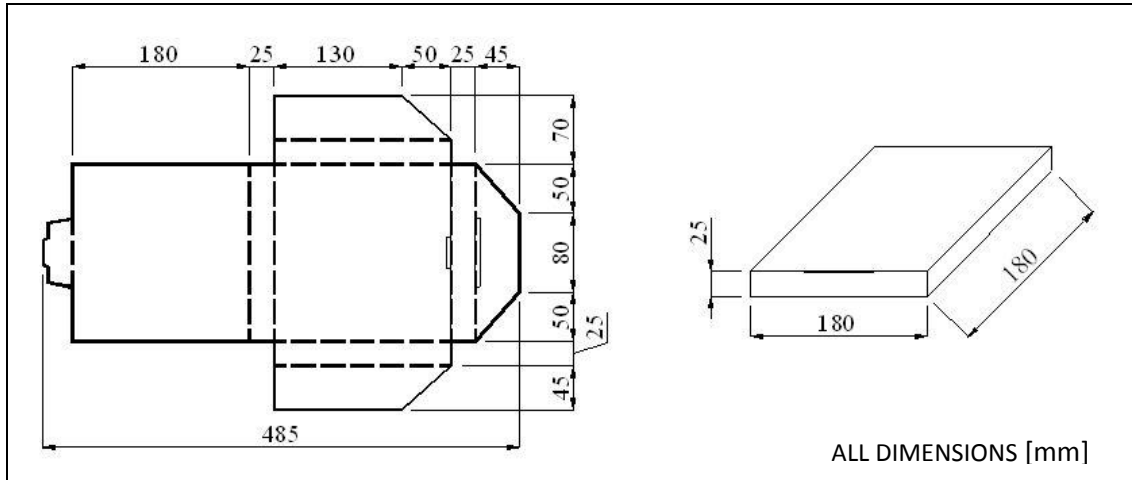
▪ UNREELING AND PRODUCT ORIENTATION

Quartz crystal oscillators are polarized components; therefore **PIN 1** is identified with a **DOT**. Orientation in T&R as shown below, PIN 1 and therefore the marking is oriented as shown.

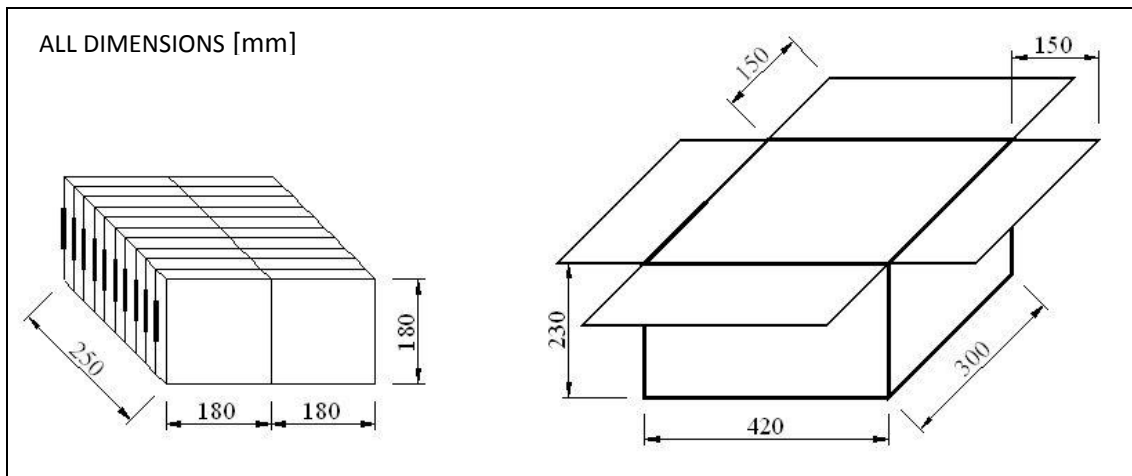


■ INNER BOX (Pizza box)

QTY per box: 1 reel

**■ CARTON**

QTY per carton: 20 Inner boxes (Pizza boxes)

**END OF DOCUMENT**