NAKAGAWA ELECTRONICS LIMITED

QUARTZ CRYSTAL UNIT SPECIFICATION

NKG PART NUMBER	**S3M27.0000F18S33**
DESCRIPTION	Quartz Crystal unit in 3.2x2.5 ceramic seam seal package, 27.0MHz, 18pF, 30/30ppm; 0°C to +85°C

CUSTOMER	ANY
CUSTOMER P/N	**TBA**

Please sign and chop for approval of the provided specification sheet and return us this cover page.	**CUSTOMER APPROVAL** Signature(s) and stamp here please.

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REVISION TABLE

REV.	DESCRIPTION	PREPARED	APPROVED	DATE
A	Original release	*Jiang Y. B.*		2012/10/10
B	**Change form, add parameter details**	***Jiang Y. B.***	*M. Bruech*	**2012/11/09**
C	NO ENTRY			
D	NO ENTRY			

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1. ELECTRICAL PARAMETERS AND ENVIRONMENTAL CONDTITIONS

PACKAGE TYPE (SEE NEXT PAGE FOR DETAILS)	CX-3M (3.2x2.5 p4h08)
NOMINAL FREQUENCY (F_N)	**27.000MHz**
MODE OF OSCILLATION	FUNDAMENTAL
CRYSTAL CUT	AT-Cut
LOAD CAPACITANCE (CL)	18pF
FREQUENCY TOLERANCE (Δf/f at +25°C)	±30ppm
FREQUENCY STABILITY (SEE NOTE 1)	±30ppm
OPERATION TEMPERATURE (T_{OP})	0°C to +85°C
AGING PER YEAR	±2ppm
EQUIVALENT SERIES RESISTANCE (ESR)	50Ω MAX
DRIVE LEVEL (DL)	100µW TYP; 300µW MAX
SHUNT CAPACITANCE (C_0)	3.0pF MAX
INSULATION RESISTANCE (IR @100V_{DC})	500MΩ MIN
STORAGE TEMPERATURE (T_{ST})	–40°C to +85°C
TEST IMPEDANCE METER (SEE NOTE 2)	IEC-444 COMPLIANT
REFLOW SOLDERING CONDITIONS	10s MAX AT +260°C±5°C

NOTE 1: Frequency stability is the frequency deviation over operating temperature in reference to the frequency reading at +25°C.

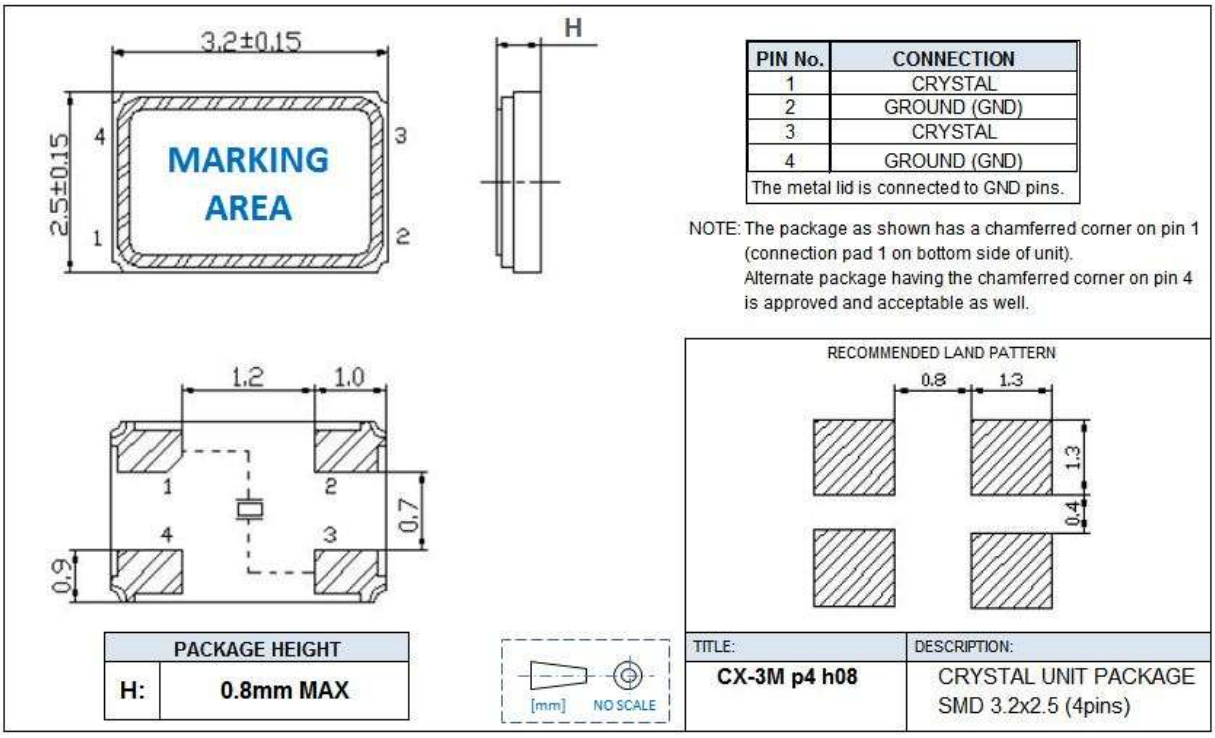
NOTE 2: Test impedance meter such as S&A 250B, KOLINKER KH series or other IEC-444 compliant equipment.

2. PRODUCT MARKING

NKG = NAKAGAWA logo and DATE CODE "Yww"
[Y] = alpha YEAR CODE per table below
[ww] = WEEK number
FREQUENCY in MHz (2+3 digits or 3+2 for OT mode units)

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

3. PACKAGE DIMENSIONS



PIN No.	CONNECTION
1	CRYSTAL
2	GROUND (GND)
3	CRYSTAL
4	GROUND (GND)

The metal lid is connected to GND pins.

NOTE: The package as shown has a chamferred corner on pin 1 (connection pad 1 on bottom side of unit).
Alternate package having the chamferred corner on pin 4 is approved and acceptable as well.

PACKAGE HEIGHT	
H:	0.8mm MAX

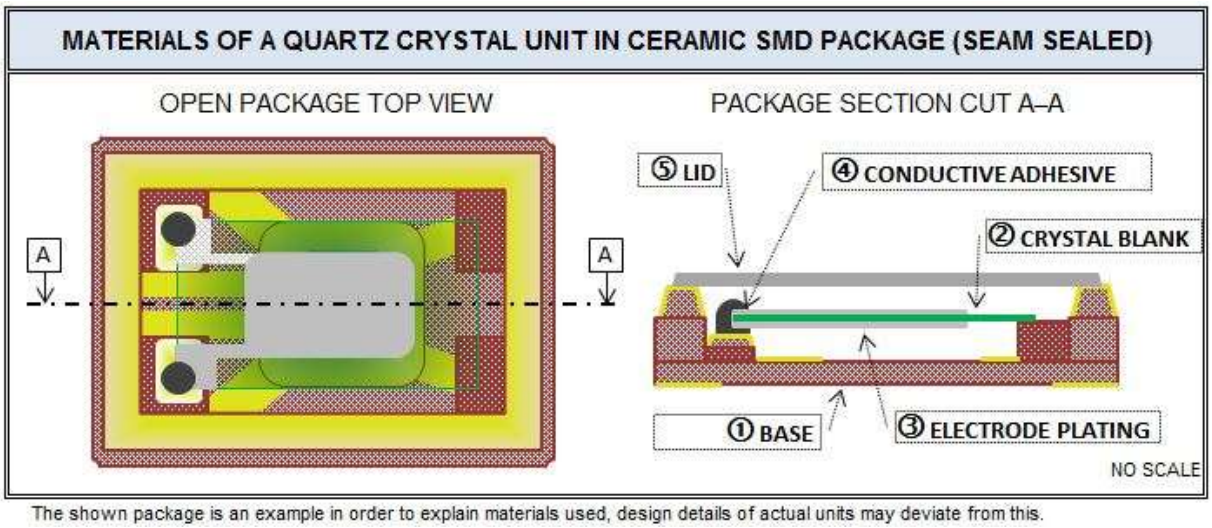
TITLE:	DESCRIPTION:
CX-3M p4 h08	CRYSTAL UNIT PACKAGE SMD 3.2x2.5 (4pins)

4. ENVIRONMENTAL COMPLIANCE INFORMATION

The product consists of the following parts and materials:

NO.	PART	MATERIAL(S)	REMARKS
1	BASE (PACKAGE)	Ceramic (Al_2O_3)	Terminals gold plated
2	CRYSTAL BLANK	Quartz (SiO_2)	Synthetic material, pure
3	ELECTRODE PLATING	Silver (Ag)	High purity metal
4	CONDUCTIVE ADHESIVE	Silver filled epoxy type	Conductive cement
5	LID (COVER)	Metal alloy (Kovar)	Surface Nickel coated

For more details please request our Material Declaration Sheet (MDS) for this product family.



The shown package is an example in order to explain materials used, design details of actual units may deviate from this.

- **RoHS COMPLIANCE**

  We can certify herewith that the product is fully RoHS complaint according the "DIRECTIVE 2002/95/EC OF THE EURPPEAN 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.

  This product is considered LEAD-FREE, Lead (Pb) contamination guaranteed to be below 500ppm.

- **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 this product is Halogen-Free per IEC 61249-2-21:2003.

- **REACH (SVHC) COMPLIANCE**

  We have verified and continue monitoring the usage of 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. We keep continuously monitoring the ongoing updates made by REACH and verify that the products stay compliant; if contained substances may become added to the list of SVHCs we will act accordingly. As a more recent compliant confirmation please request our CoC.

- **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 can we confirm that substances per Table A do not exceed the specified threshold levels 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. These materials we can declare accordingly, please request our Material Declaration Sheet (MDS) if needed.

- **PFOS / PFOA FREE**

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

- **ELECTROSTATIC DISCHARGE (ESD) SENSITIVTY**

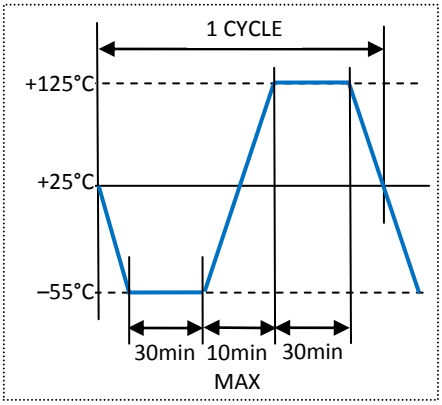
  This product is NOT sensitive to ELECTROSTATIC DISCHARGE (ESD), no specific precautions for handling and storage are required.

- **MOISTURE SENSITIVTY (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 customer's system requires an entry in this regard we suggest using LEVEL 1.

5. RELIABILITY TEST INFORMATION

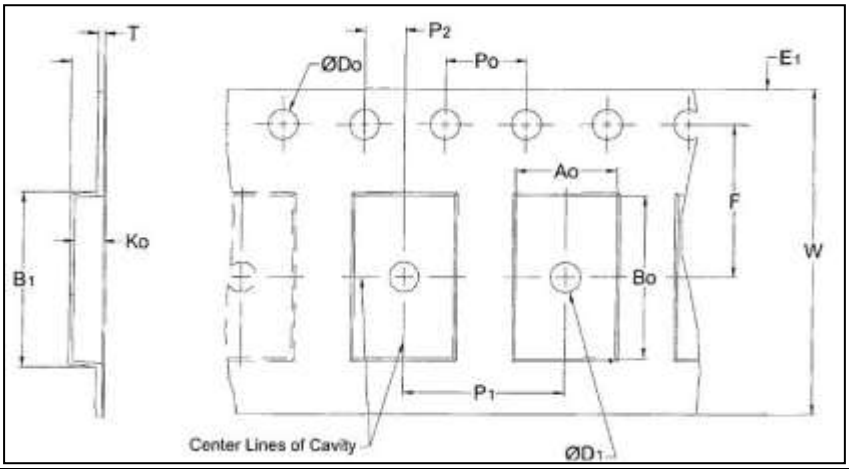
NO.	TEST ITEM	TEST CONDITIONS	CRITERIA
1	High Temperature Storage	1,000 hours ±12 hours @125°C ±2°C 6 hours rest before electrical test	Specification shall be met
2	Low Temperature Storage	1,000 hours ±12 hours @-40°C ±2°C 6 hours rest before electrical test	Specification shall be met
3	Shock Test (Mechanical)	Devices are shocked with 1,000G, half since wave in three perpendicular axis for three times each direction with 0.5s duration time	Specification shall be met No visible damages
4	Shock Test (Drop Test)	3 times drop from 100cm height onto concrete floor	Specification shall be met
5	Vibration	Frequency range 10~2,000Hz Amplitude 1.52mm Sweep time 20 min Test time per axis 4 hours (Total testing time 12 hours)	Specification shall be met No visible damages
6	Temperature Cycling	Total of 100 cycles per below profile with a tolerance of ±3°C for both temperature points 	Specification shall be met No visible damages
7	Exposure to Solder Heat	Pre-heat temp. +125°C Pre-heat time 60~120s Test temperature +260°C ±5°C Test time 5s ±1s	Specification shall be met
8	Solderability	After dip into resin based flux for 5s ±0.5s, dip into solder bath @255°C ±5°C for 10s ±0.5s with immersion depth of 0.5mm minimum	95% solder coverage

For more details you may request our Reliability Test procedure or the bi-annual test reports.

6. PACKAGING INFOMRATION

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

- **CARRIER TAPE**

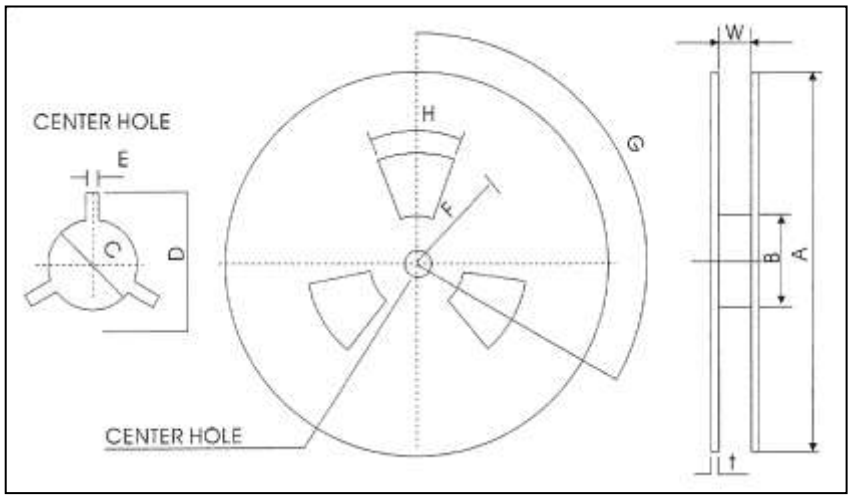


Symbol	Ao	Bo	B1	D0	D1	E1	F	Ko	P0	P1	P2	T	W
Dim.	**2.7**	**3.6**	**3.9**	**1.5**	**1.5**	**1.75**	**3.5**	**1.4**	**4.0**	**4.0**	**2.0**	**0.3**	**8.0±0.3**

ALL DIMENSIONS [mm]; ALL TOLERANCES ±0.1 IF NOT STATED OTHERWISE.

- **REEL**

QTY per reel: 2,000pcs
or optional 3,000pcs



Symbol	A	B	C	D	E	G	t	W
Dim.	**Ø178±1.0**	**Ø60**	**Ø13.0±0.5**	**22.2±1.0**	**2.5+0.5**	**120°**	**1.75±02**	**8.0+0.5**

ALL DIMENSIONS [mm] (except G)

- **UNREELING AND PRODUCT ORIENTATION**

Quartz crystal units are non-polarized components; there is no pin identification or specific orientation in the carrier tape required. Products may insert in the carrier tape with their marking all in same direction for cosmetic reasons only.

- **PACKAGING BOX (Pizza box)**

Box size: 185x185x25 MAX
QTY per box: 1 Reel

END OF DOCUMENT