CRYSTAL UNITS

ASK

C Series

- Excellent shock resistance and environmental capability
- Low power consumption
- Suitable for time-keeping of clock and microcomputer

RoHS

PART NUMBER GUIDE

C-146 - 32.768 - 20 - J - 125

PACKAGE TYPE
C-146 : SMD type 7.0x1.5x1.4mm

LOAD CAPACITANCE
125 : 12,5pF

OPERATING TEMPERATURE
TABLE 1

FREQUENCY
32.768KHz

FREQUENCY TOLERANCE AT 25°C
±20 ppm (STD)

ELECTRICAL SPECIFICATIONS

MODEL	C-146 serie
Nominal Frequency	32.768KHz
Frequency Tolerance (at 25°C)	±20ppm
Operating Temperature Range	-40 to +85°C(STD)
Storage Temperature Range	-55°C to +125°C
Turnover Temperature	25°C ±5°C
Temperature Coefficient (frequency)	-0.04ppm/ $°C^2$ Max
Load Capacitance (CL)	12.5pF
Drive Level	1.0 µWMax
Series Resistance (ESR)	65kΩ Max
Motional Capacitance	1.80pF to 2.00pF
Shunt Capacitance (Co)	0.8pF Typ.
Aging (at 25°C)	± 3ppm/year Max

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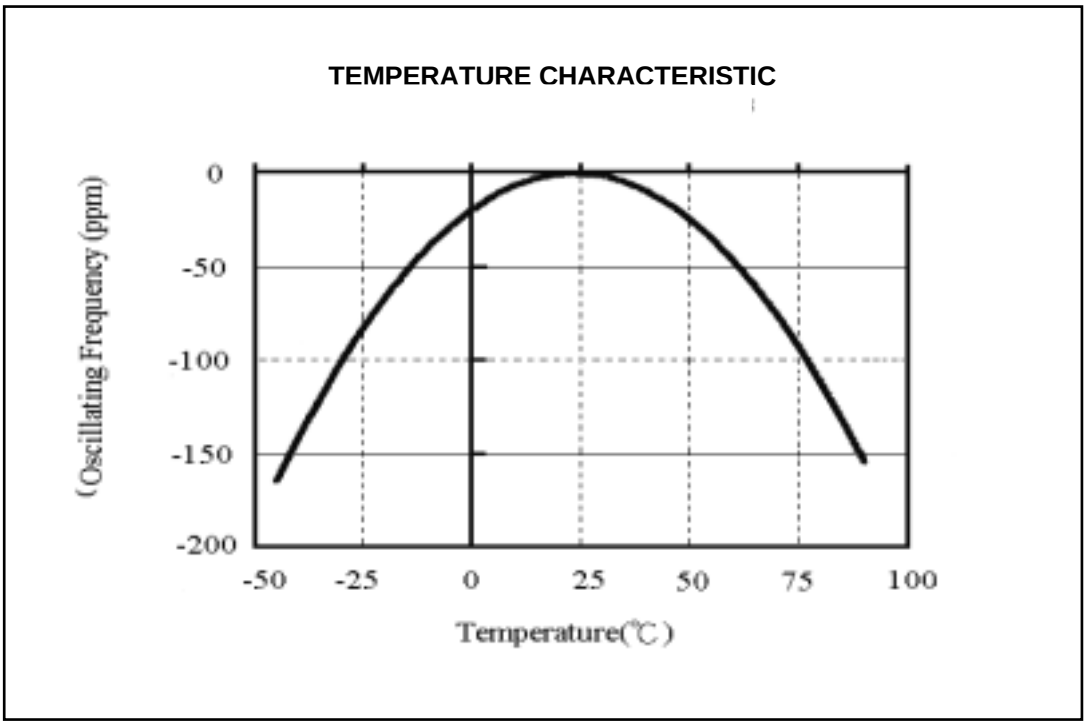
TABLE 1

OPERATING TEMPERATURE RANGE	
-10~+60°C	**A**
-20~+60°C	**B**
0~+70°C	**C**
-10~+70°C	**D**
-20~+70°C	**E**
-30~+60°C	**F**
-20~+85°C	**G**
-30~+70°C	**H**
-30~+85°C	**I**
-40~+85°C	**J**



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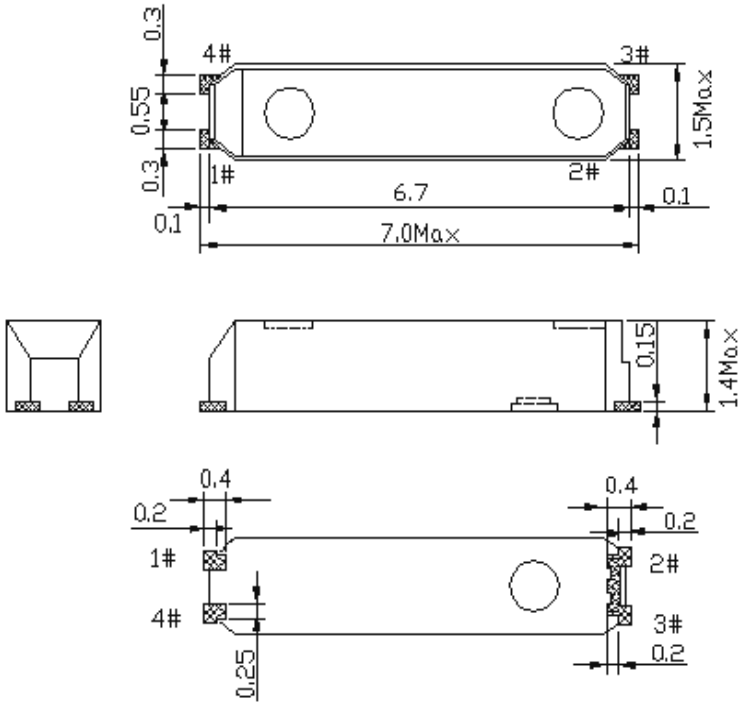
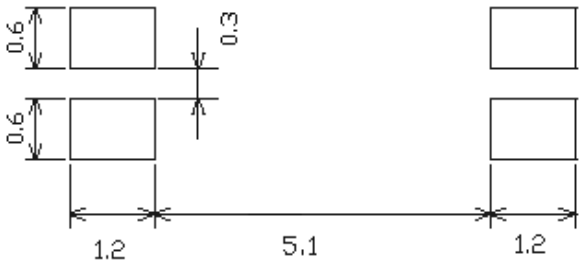
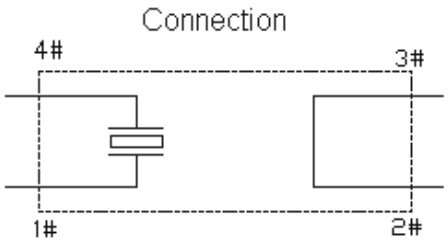
MECHANICAL DIMENSION

C-146

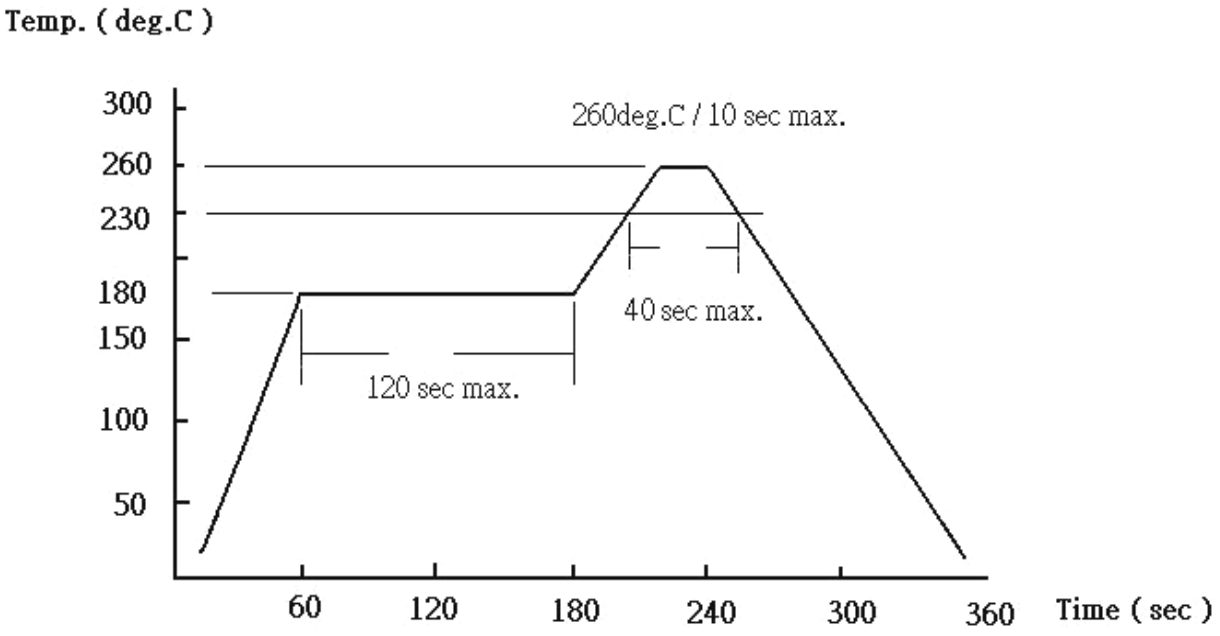


Land pattern (unit : mm)





SOLDERING REFLOW



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SPECIFICATIONS OF CRYSTAL UNITS

Reliability Test (applicable to 49(50) type .U type and Tuning Fork X'tal)

Test Items	Test Condition	Specification	
		Dip	SMD
1. Gross Leak Test	FC-40 125°C/30sec	No continuous bubble	
2. Fine Leak Test	Bombing of He 4kg/cm^2 for 2 hours	Less than 5*10^-8atm.c.c./sec, Helium	
3. Drop Test	Free dropped a ~19.999MHz(Fund.) →100 cm height b. 20~29.999MHz(Fund.) →50 cm height c. 30~ MHz(Fund.) →20 cm height on a hard wooden board for 3 times (board is thickness more than 30 mm)	△F≦± 10PPM , C.I within spec.	△F≦±10PPM , C.I within spec.
4. Vibration Test	Freq. range: 10~55Hz Peak to peak amplitude:1.5mm 3 direction(X,Y,Z), each 60min.	△F≦± 10PPM , C.I within spec.	△F≦±10PPM , C.I within spec.
5. Resistance to Soldering Test	a. IR Reflow furnace with the condition 2 times. Peak temp.260±3°C, 10sec(Min.)	NA	△F≦±10PPM , C.I within spec. For SMD type only.
	b. Dip terminals in a 260±5°C solder bath for 5±0.5 sec.	At least 90% of each dipped area shall be covered by fresh solder. For DIP type only.	NA
6. Bending Test	Bending cycle : 1 cycle 0° - > 45° -> 0° -> 45° - > 0°	△F≦±5PPM , C.I within spec. For DIP type only.	NA
7. Share Test	Weight : 10N, Test duration : 10±1 sec	NA	△F≦±10PPM , C.I within spec. For SMD type only.
8. Low Temp. Exposure Test	-40±3°C, 240±12 hrs	△F≦± 10PPM , C.I within spec.	△F≦±10PPM , C.I within spec.
9. Aging Test	85±3°C, 240±12hrs	△F≦± 10PPM , C.I within spec.	△F≦±10PPM , C.I within spec.
10. High Temp. & Humidity Test	+85°C±5°C& 85%±5% R.H. , 240±12 hrs	△F≦± 10PPM , C.I within spec.	△F≦±10PPM , C.I within spec.
11. Temperature Cycling Test	-25±3°C/15±3min ~ +85±3°C/15±3min 15cycles	△F≦± 10PPM , C.I within spec.	△F≦±10PPM , C.I within spec.

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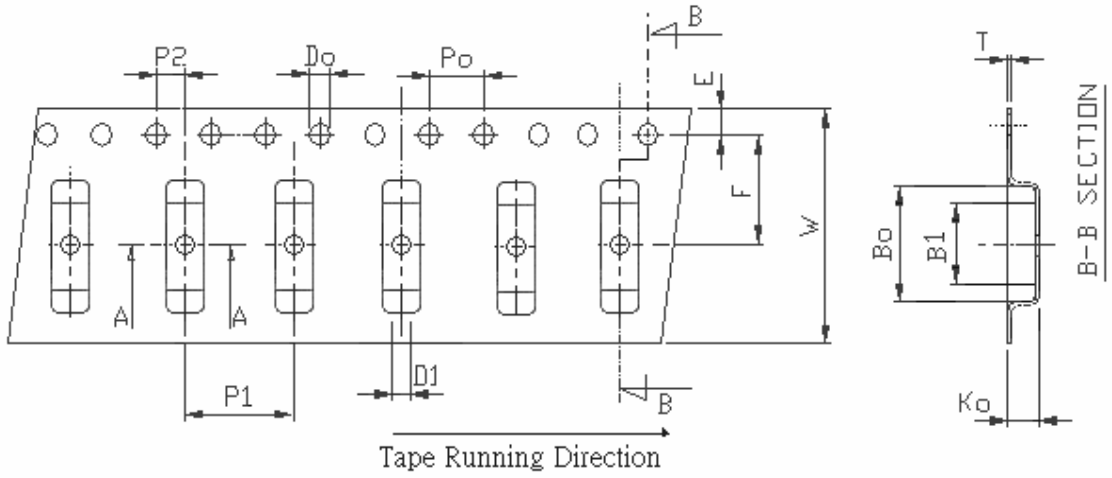
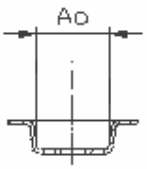
SPECIFICATIONS OF TAPE & REEL

Taping





Ao= 1.55±0.10 mm

Bo= 7.20±0.10 mm

Ko= 1.50±0.10 mm

Unit: mm

Symbol	Spec.
B1	4.80± 0.20
Po	4.00± 0.10
P1	8.00± 0.10
P2	2.00± 0.10
Do	$1.50^{+0.1}_{0}$
D1	1.0 (min)
E	1.75± 0.10
F	7.50± 0.10
10Po	40.0±0.10
W	16.0± 0.30
T	0.30± 0.05

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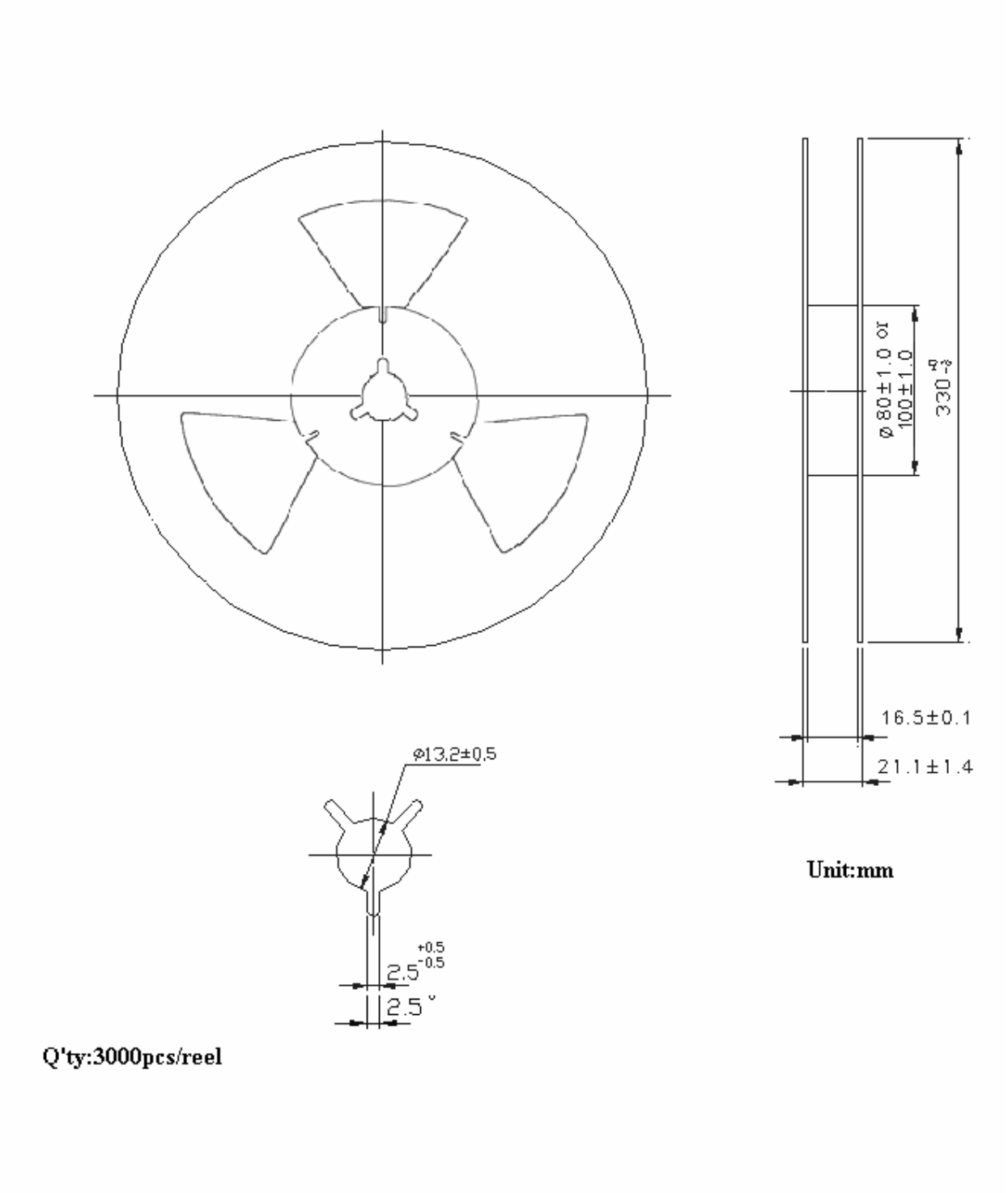
SPECIFICATIONS OF TAPE & REEL

Reel



Unit:mm

Q'ty:3000pcs/reel

ASK

Pb-free compliance

Component and Assembly Pb content shall be less than 0.1% by weight of the device (in accordance with IPC/EIA J-STD-006, European ROHS 3 Directive (EU) 2015/865).

Product Information

For a product to be RoHS compliant, it must satisfy several conditions:

- Contain no more than the specified limits of the target hazardous substances set out in the RoHS Directive
- Able to withstand Pb-free 260°C solder reflow profile below
- External packaging and terminations are Pb-free
- Internal PCB, components, solders, and terminations are Pb-free