

CRYSTAL UNITS SPECIFICATION

Product Type : HC - 49US

Model : 4.000MHz

Description : DIP/4.000MHz/20pF/30ppm

SKC P/N : BHC49S0400020

SPEC No. : 1 - 161227 - BHC49S0400020



DATE : 27-Dec-16

Designer : Sam Lee

Checked By : Tom

Approved By : Sam

REVISION HISTORY

Rev	Revise Page	Revise Contents	Date	Ref. No.	Reviser
A	N/A	Initial Release	27-Dec-16	N/A	Aaron Lee

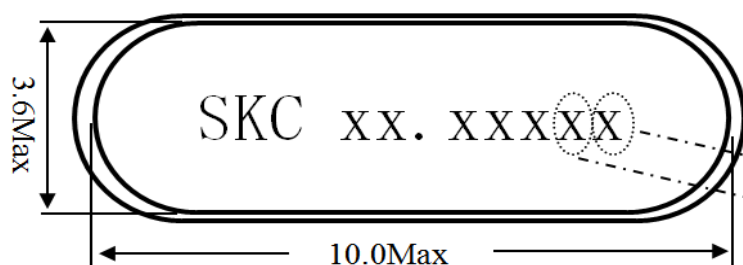
CRYSTAL UNITS SPECIFICATION

■ ELECTRICAL CHARACTERISTICS

1	Holder type		HC - 49US
2	Oscillation mode		<input checked="" type="checkbox"/> Fundamental <input type="checkbox"/> 3rd Overtone <input type="checkbox"/> 5th Overtone
3	Crystal cutting type		AT CUT
4	Nominal frequency	FL	4.000MHz
5	Frequency stability	Tol	± 30 ppm (ref at 25°C)
6	Operating temperature range	TOPR	-20°C to +70°C
7	Storage temperature range		-40°C to +85°C
8	Temperature characteristic		± 30 ppm in item 6
9	Load capacitance	CL	20 PF ± 0.2PF
10	Equivalent series resistance	ESR	120 Ohms max.
11	Drive level	DL	300 uW MAX
12	Shunt capacitance	C0	5.0 PF max.
13	Aging rate per year		Less than ±5ppm / year
14	Insulation resistance		500M Ohms min. at DC 100V ± 10V
15	Test circuit		Measured in S&A 250B / 350B
16	Marking		SKC

■ DIMENSIONS

(Unit:mm)



MARKING:

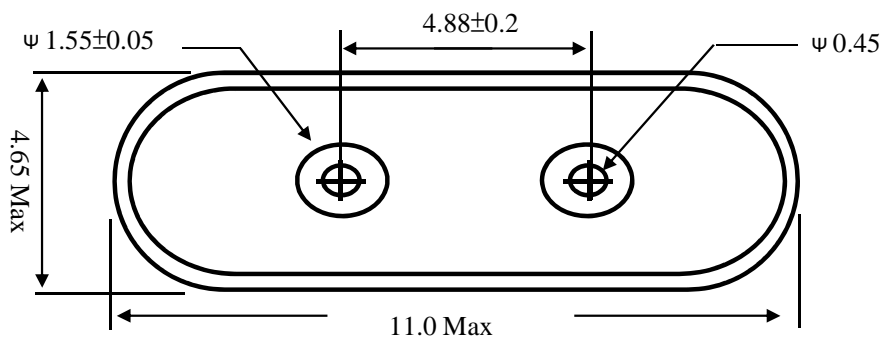
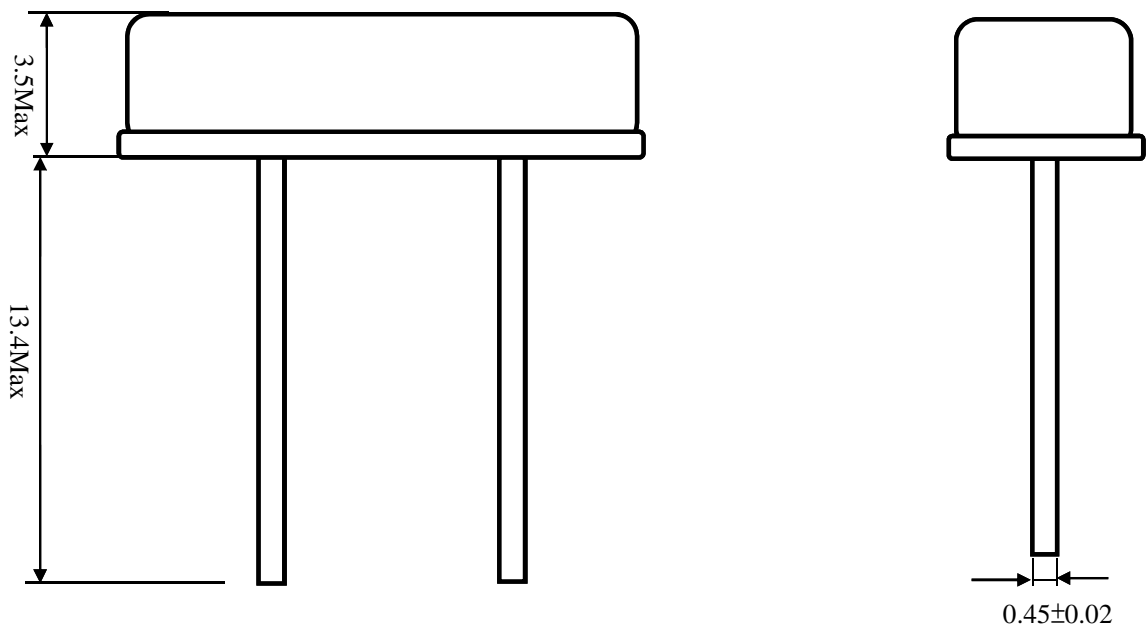
SKC: Marking

xx.xxx:Frequency

X: Year

X: Months

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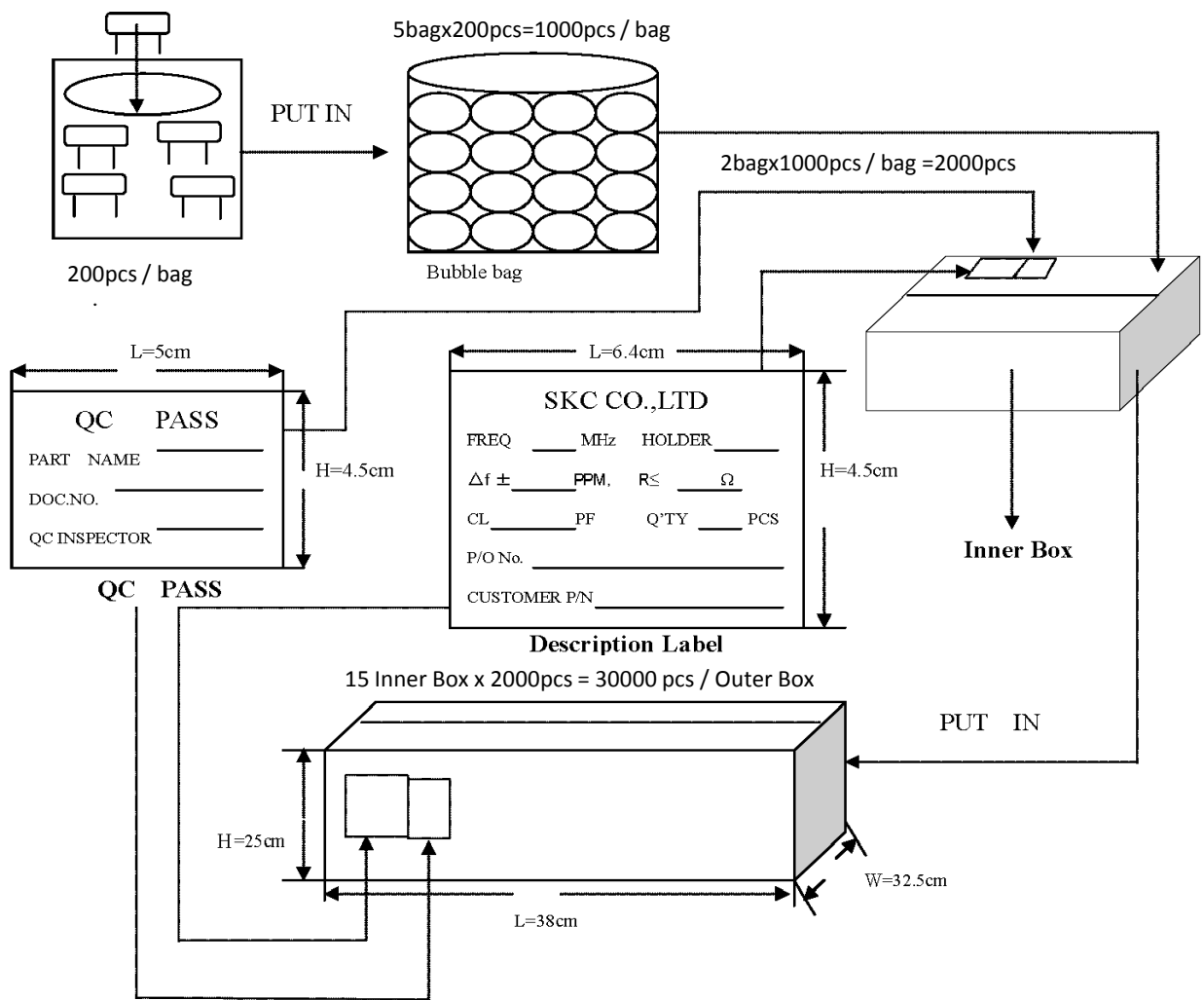
■ Date Code:

YEAR	:	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020		
CODE	:	1	2	3	4	5	6	7	8	9	0		
MONTH	:	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
CODE	:	A	B	C	D	E	F	G	H	K	L	M	N

*This date code will be cycled every ten years.

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■ PACKAGE



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MECHANICAL ENDURANCE : Provide that measurement shall be carried out after letting it alone in the room temperature for 1 hour.		
ENVIRONMENTAL STABILITY		SPECIFICATION
1	Shock test	Dropping from 75 cm height 3 times on firm wood variation frequency less than $\pm 5\text{ppm}$, and resistance less than $\pm 10\%$.
2	Sealing test	Less than $2.0 \times 10^{-9} \text{ Pa} \cdot \text{m}^3/\text{sec}$.
3	Soldering heat resistance	Method : Put lead wire through 260°C for 10 seconds. 95% be covered with solder. Judging : Test $\Delta F/F \leq \pm 5\text{ppm}$ $\Delta F/R_r \leq \pm 10\%$ or $\pm 2\Omega$
4	Solderability	At $235^\circ\text{C} \pm 5^\circ\text{C}$ for 5 sec. must more than 95% be covered with solder.
5	Humidity	Temperature : $40 \pm 2^\circ\text{C}$ Length of Test : 96 Hrs Relative Humidity : 83% - 88%
6	Frequency drift	Method : Place crystal in a -20°C to 70°C constant temperature trough for 5 minutes then use 250B testing instrument to its is frequency tolerance variation. Judging reference : In accordance with customer specification.
7	Air tightness test	Soak crystal in alcohol. Place it in a compression room and compress at $0.4 \sim 0.45\text{Mpa}$ for 30 minutes. Then take it out and put it at room temperature to blow dry for 5 minutes. Judging : Insulation resistance $> 500\text{M}\Omega$
8	Mechanical test	a. Lead pull Method : Fix the crystal. Add 1KG heavy weight on the lead-in axle for 10 ± 1 seconds. Judging : There should be on loosening , break , and poor contact of lead-in axle.

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ENVIRONMENTAL STABILITY		SPECIFICATION
9	Mechanical test	<p>b. Lead bend</p> <p>Method : Fix the crystal. Add 1KG weight at $2.5 \pm 0.5\text{mm}$ from the crystal and bend the lead wire to 90°.</p> <p>Repeat this method 3 times.</p> <p>Judging : There should be on loosening 、 break 、 and poor contact of lead-in axle.</p>
10	Insulation resistance	<p>Method : Use a megavar (Dc $100 \pm 15\text{V}$) to measure insulation resistance between lead wire and metal case for 1 minute ± 5 seconds.</p> <p>Judging : Insulation resistance $> 500\text{M}\Omega$</p>
11	Aging	<p>Method : Place crystal at $85^\circ\text{C} \pm 2^\circ\text{C}$ for 1000 hours.</p> <p>Conduct the test twice a week, 2 days $< \text{interval} < 4$ days.</p> <p>Conduct the first test after the first 24 hours.</p> <p>Conduct final measuring (measure under testing temperature) when the test is concluded.</p> <p>Judging : Test $\Delta f/f < \pm 5\text{ppm}$</p>
12	Temperature & Humidity cycling	<p>Cycle : 5 cycles</p> <p>Temp : High Temp. $+85^\circ\text{C}$ Low Temp. -40°C</p> <p>HUM : $93\% \pm 3\%$</p> <p>Judging : Test $\Delta F/F < \pm 5\text{ppm}$</p> <p>Freq. Drift $\pm 5\text{ppm Max.}$</p> <p>Resistance Drift $\pm 10\% \text{ Max. or } \pm 2\Omega$</p> 