Specifications

<table>
<thead>
<tr>
<th>Drawing No.</th>
<th>UKY1C-H1-14406-01[43]</th>
<th>1/10</th>
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<tbody>
<tr>
<td>Issued Date.</td>
<td>Jul,16,2014</td>
<td></td>
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</tbody>
</table>

TO: Digi-Key

“This part is qualified for Silicon Labs Si534x series.”

Note: In case of specification change, KYOCERA Part Number also will be changed.

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Quartz Crystal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product Model</td>
<td>CX3225SB</td>
</tr>
<tr>
<td>Frequency</td>
<td>48000kHz</td>
</tr>
<tr>
<td>Customer Part Number</td>
<td>-</td>
</tr>
<tr>
<td>Customer Specification Number</td>
<td>-</td>
</tr>
<tr>
<td>KYOCERA Part Number</td>
<td>CX3225SB480000D0FPJC1</td>
</tr>
</tbody>
</table>

Remarks: Pb-Free, RoHS Compliant, MSL 1

Customer Acceptance

<table>
<thead>
<tr>
<th>Accept Signature</th>
<th>Approved Date</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Department

<table>
<thead>
<tr>
<th>Person in charge</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
</tbody>
</table>

Seller

KYOCERA Crystal Device Corporation
(Crystal products Sales Division)
6 Takeda Tobadono-cho, Fushimi-ku, Kyoto
612-8501 Japan
TEL. No. 075-604-3500
FAX. No. 075-604-3501

Manufacturer

Crystal Units Division
5850, Higashine-Koh, Higashine-Shi, Yamagata
999-3701 Japan
TEL. No. 0237-43-5611
FAX. No. 0237-43-5615

Design Department | Quality Assurance | Approved by | Checked by | Issued by |
------------------|------------------|-------------|------------|-----------|
KYOCERA Crystal Device Corporation | A. Kikuchi | Y.Takahashi | T. Nitoube | Y. Kikuchi |
Crystal Units Engineering Section 1 | Crystal Units Division |
## Revision History

<table>
<thead>
<tr>
<th>Rev.No.</th>
<th>Description of revise</th>
<th>Date</th>
<th>Approved by</th>
<th>Checked by</th>
<th>Issued by</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Delete: Pull ability</td>
<td>Jul, 16, 2014</td>
<td>Y. Takahashi</td>
<td>T. Nitoube</td>
<td>Y. Kikuchi</td>
</tr>
</tbody>
</table>
1. APPLICATION
This specification sheet is applied to quartz crystal "CX3225SB"

2. KYOCERA PART NUMBER
CX3225SB48000D0FPJC1

3. RATINGS

<table>
<thead>
<tr>
<th>Items</th>
<th>SYMB.</th>
<th>Rating</th>
<th>Unit</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating Temperature</td>
<td>Topr</td>
<td>-40 to +85</td>
<td>°C</td>
<td></td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>Tstg</td>
<td>-40 to +85</td>
<td>°C</td>
<td></td>
</tr>
</tbody>
</table>

4. CHARACTERISTICS

<table>
<thead>
<tr>
<th>Electrical Characteristics</th>
<th>SYMB.</th>
<th>Min</th>
<th>Typ.</th>
<th>Max</th>
<th>Unit</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mode of Vibration</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nominal Frequency</td>
<td>F0</td>
<td>48</td>
<td></td>
<td></td>
<td>MHz</td>
<td></td>
</tr>
<tr>
<td>Nominal Temperature</td>
<td>T_{NOM}</td>
<td>+25</td>
<td></td>
<td></td>
<td>°C</td>
<td></td>
</tr>
<tr>
<td>Load Capacitance</td>
<td>CL</td>
<td>8.0</td>
<td></td>
<td></td>
<td>pF</td>
<td></td>
</tr>
<tr>
<td>Frequency Tolerance</td>
<td>df/F</td>
<td>-10.0</td>
<td>+10.0</td>
<td></td>
<td>PPM</td>
<td>+25±3°C</td>
</tr>
<tr>
<td>Frequency Temperature</td>
<td>df/F</td>
<td>-15.0</td>
<td></td>
<td>+15.0</td>
<td></td>
<td>-40 to +85°C</td>
</tr>
<tr>
<td>characteristics</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frequency Aging Rate</td>
<td></td>
<td>-1.0</td>
<td></td>
<td>+1.0</td>
<td></td>
<td>1 year</td>
</tr>
<tr>
<td>Equivalent Series Resistance</td>
<td>ESR</td>
<td>23</td>
<td></td>
<td></td>
<td>Ω</td>
<td>+25±3°C</td>
</tr>
<tr>
<td>Shunt Capacitance</td>
<td>C0</td>
<td>2.0</td>
<td></td>
<td></td>
<td>pF</td>
<td></td>
</tr>
<tr>
<td>Drive Level</td>
<td>Pd</td>
<td>0.01</td>
<td></td>
<td>200</td>
<td>μW</td>
<td></td>
</tr>
<tr>
<td>Insulation Resistance</td>
<td>IR</td>
<td>500</td>
<td></td>
<td></td>
<td>MΩ</td>
<td>100V(DC)</td>
</tr>
</tbody>
</table>
5. APPEARANCES, PHYSICAL DIMENSION
OUTLINE DIMENSION (not to scale)

PIN	PIN Layout
NO.
#1	HOT
#2	GND
#3	HOT
#4	GND

UNIT: mm

MARKING
1 Nominal Frequency Move the number of maximum indication beams of the frequency to five digits, and omit less than kHz.
2 Identification [K] mark is surely 1Pin direction.
3 Date Code Year-LAST 1 DIGIT of YEAR AND WEEK (Ex) Jan, 01, 2014 → 401
4 Manufacturing Location
Y··Japan(Yamagata)
Z··Japan(Shiga Yohkaichi)
T··Thailand
F··Philippines
※The font of marking is reference.
KYOCERA Crystal Device Corporation
6. RECOMMENDED LAND PATTERN (not to scale)
7. TAPPING & REEL

7-1. Dimensions

7-2. Leader and trailer tape

7-3. Direction (The direction shall be seen from the top cover tape side)

7-4. Specification
1. Material of the carrier tape shall be polystyrene or A-PET (ESD).
2. Material of the seal tape shall be polyester (ESD).
3. The seal tape shall not cover the sprocket holes and not protrude from the carrier tape.
4. Tensile strength of the tape: 10N or more.
5. The R of the corner without designation is 0.2RMAX.
6. Disalignment between centers of the cavity and sprocket hole shall be 0.05mm or less.
7. Cumulative pitch tolerance of "P0" shall be ±0.2mm at 10 pitches.
8. Suppose that it unifies as shown in the above-mentioned figure to the directivity of printing in an embossing tape.
9. Peeling force of the seal tape: 0.1 to 1.0N.
10. The component can fall headlong naturally from taping in the environment, such dry conditions, when this components were transferred to, cover was removed and the component was moved upside down.
### 7-5. Reel Specification

In the case of Φ180 Reel (3,000 pcs max, every 1,000 pcs)

<table>
<thead>
<tr>
<th>Symbol</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimension</td>
<td>φ 180 +0/-3</td>
<td>φ 60 +1/-0</td>
<td>φ 13±0.2</td>
<td>φ 21±0.8</td>
</tr>
<tr>
<td>Symbol</td>
<td>E</td>
<td>W</td>
<td>t</td>
<td></td>
</tr>
<tr>
<td>Dimension</td>
<td>2.0±0.5</td>
<td>9±1</td>
<td>2.0±0.5</td>
<td></td>
</tr>
</tbody>
</table>

(Unit : mm)

In the case of Φ330 Reel (10,000 pcs max, every 1,000 pcs)

<table>
<thead>
<tr>
<th>Symbol</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimension</td>
<td>φ 330±2.0</td>
<td>φ 100±1.0</td>
<td>φ 13±0.2</td>
<td>φ 21±0.8</td>
</tr>
<tr>
<td>Symbol</td>
<td>E</td>
<td>W</td>
<td>t</td>
<td></td>
</tr>
<tr>
<td>Dimension</td>
<td>2.0±0.5</td>
<td>9.5±0.5</td>
<td>2.2±0.1</td>
<td></td>
</tr>
</tbody>
</table>

(Unit : mm)
8. Environmental requirements

After following test, frequency shall not change more than $\pm 10 \times 10^{-6}$
And Cl, $\pm 20\%$ or 5\(\Omega\) of large value.

8.1 Resistance to Shock Test condition
Natural dropped from height 100cm onto hard wood board in 3 times

8.2 Resistance to Vibration Test condition
frequency : 10 - 55 - 10 Hz
Amplitude : 1.5mm
Cycle time : 15 minutes
Direction : X,Y,Z (3direction), 2 h each.

8.3 Resistance to Heat Test condition
The quartz crystal unit shall be stored at a temperature of $+85 \pm 2°C$ for 500 h.
Then it shall be subjected to standard atmospheric conditions for 1 h, after which measurement shall be made.

8.4 Resistance to Cold Test condition
The quartz crystal unit shall be stored at a temperature of $-40 \pm 2°C$ for 500 h.
Then it shall be subjected to standard atmospheric conditions for 1 h, after which measurement shall be made.

8.5 Thermal Shock Test condition
The quartz crystal unit shall be subjected to 500 successive change of temperature cycles, each as shown in table below. Then it shall be subjected to standard atmospheric conditions for 1 h, after which measurements shall be made.
Cycle : $-40 \pm 2°C$ (30min.) to $+25 \pm 2°C$ (5min.)
to $+85 \pm 2°C$ (30min.) to $+25 \pm 2°C$ (5min.)
8.6 Resistance to Moisture  
Test condition
The quartz crystal unit shall be stored at a temperature of +60±2°C with relative humidity of 90% to 95% for 240 h. Then it shall be subjected to standard atmospheric conditions for 1h, after which measurements shall be made.

8.7 Soldering condition
1.) Material of solder
Kind … lead free solder paste
Melting point … +220±5°C
2.) Reflow temp.profile

<table>
<thead>
<tr>
<th>Temp [°C]</th>
<th>Time [sec]</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preheating</td>
<td>+150 to +180</td>
</tr>
<tr>
<td>Peak</td>
<td>+260±5</td>
</tr>
<tr>
<td>Total</td>
<td>—</td>
</tr>
</tbody>
</table>

Frequency shift : ±2ppm
3.) Hand Soldering +350°C 3 sec MAX
4.) Reflow Times 2 times

8.8 Intensity for bending in circuit board
Solder this product in center of the circuit board of 40mm × 100mm, and add the deflection of 3mm as the bottom figure.
Test board : t=1.6mm

KYOCERA Crystal Device Corporation

KBS-5079F
9. Cautions for use
   (1) Soldering in mounting
       In case of Solder paste and conductive glue contact product lid or product side face exception for product
terminal it’s possible to influence product characteristics.
       Please be careful above contents.
   (2) Automatic mounting machine use
       Please use after affirmation that select the mounting machine model with a shock small if possible in the
case of use of an automatic mounting machine, and it does not have breakage. There is a risk of a crystal
oscillating child's breakage occurring and not functioning normally by too much shock etc.
   (3) Conformity of a circuit
       In case of use of an oscillation circuit, please insert in a crystal oscillating child in series resistance 5 times
as many as the standard value of equivalent in-series resistance, and confirm oscillating. Please remove
resistance which inserted after the notes above-mentioned examination in the crystal oscillating child in
series, and use it.

10. Storage conditions
    Storage at prolonged high temperature or low temperature and the storage by high humidity cause degradation
of frequency accuracy, and degradation of soldering nature. Storage is performed at the temperature of
+18 to +30°C, and the humidity of 20 to 70 % in the state of packing, and a term is 6 months.

11. Manufacturing location
    Kyocera Crystal Device Corporation
    Kyocera Crystal Device Corporation Shiga Yohkaichi Plant
    Kyocera Crystal Device (Thailand) Co., Ltd
    Kyocera Crystal Device Philippines, Inc.

12. Quality Assurance
    Kyocera Crystal Device Quality Assurance Division

13. Quality guarantee
    When the failure by the responsibility of our company occurs clearly after delivery within 1 year, a substitute
article etc. is appropriated gratuitously and this is guaranteed. However, when passing 1 year after delivery,
there is a case where I am allowed to consider as onerous repair after both consultation.

14. Others
    When any questions and opinions are in the written matter of these delivery specifications, I will ask connection
of you from the company issue day within 45 days. In a connection no case, a written matter is consented to it
and employed within a term.

KYOCERA Crystal Device Corporation

KBS-5079F