Specifications

Messrs: Digi-Key

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

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Crystal Units with Thermistor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product Model</td>
<td>CT1612DB</td>
</tr>
<tr>
<td>Frequency</td>
<td>38400kHz</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>CT1612DB38400C0FLHA1</td>
</tr>
</tbody>
</table>

Remarks: Pb-Free, RoHS Compliant, MSL 1

Customer Acceptance

<table>
<thead>
<tr>
<th>Accept Signature</th>
<th>Approved Date</th>
<th>Department</th>
<th>Person in charge</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

Seller
KYOCERA Crystal Device Corporation
(Sales Division)
6 Takeda Tobadono-cho, Fushimi-ku, Kyoto
612-8501 Japan
TEL. No. 075-604-3421
FAX. No. 075-604-3469

Manufacturer
KYOCERA Crystal Device Corporation
(Marketing & Sales Engineering Division)
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999-3701 Japan
TEL. No. 0237-43-5611
FAX. No. 0237-43-5615

Design Department
KYOCERA Crystal Device Corporation
Crystal Unit Application Engineering Section
Crystal Units Division

Quality Assurance
Approved by
Checked by
Issued by
S.Itoh
T.Soda
A.Muraoka
Y.Nozaki

KYOCERA Crystal Device Corporation
# 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>
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<tbody>
<tr>
<td>00</td>
<td>First Edition</td>
<td>Jun 14, 2016</td>
<td>T. Soda</td>
<td>A. Muraoka</td>
<td>Y. Nozaki</td>
</tr>
</tbody>
</table>
1. APPLICATION
This specification sheet is applied to Crystal Units with Thermistor “CT1612DB”

2. KYOCERA PART NUMBER
CT1612DB38400C0FLHA1

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>-30→+105</td>
<td>°C</td>
<td></td>
</tr>
<tr>
<td>Storage Temperature</td>
<td>Tstg</td>
<td>-40→+105</td>
<td>°C</td>
<td></td>
</tr>
</tbody>
</table>

4. CHARACTERISTICS

4-1 ELECTRICAL CHARACTERISTICS

<table>
<thead>
<tr>
<th>Items</th>
<th>Electrical Specification</th>
<th>Test Condition</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mode of Vibration</td>
<td>SYMB. Min Typ. Max Unit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nominal Frequency</td>
<td>F0 38.4 MHz</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nominal Temperature</td>
<td>T_NOM 29 °C</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Load Capacitance</td>
<td>CL 7.0 pF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Frequency Tolerance</td>
<td>dF -10.0 +10.0 ppm</td>
<td></td>
<td>+25±3°C</td>
</tr>
<tr>
<td>Frequency Temperature Characteristics</td>
<td>dF_T -12.0 +12.0 ppm</td>
<td></td>
<td>-30→+85°C</td>
</tr>
<tr>
<td>Equivalent Series Resistance</td>
<td>ESR 80 Ω</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drive Level</td>
<td>Pd 0.01 0.05 0.1 mW</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Insulation Resistance</td>
<td>IR 500 MΩ</td>
<td></td>
<td>100V(DC)</td>
</tr>
</tbody>
</table>

4-2 ELECTRICAL CHARACTERISTICS (Thermistor)

<table>
<thead>
<tr>
<th>Items</th>
<th>Electrical Specification</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>SYMB.</td>
<td>Min Typ. Max Unit</td>
<td></td>
</tr>
<tr>
<td>Resistance</td>
<td>100 kΩ</td>
<td>25°C</td>
</tr>
<tr>
<td>B-Constant</td>
<td>4250 K</td>
<td>25°C - 50°C</td>
</tr>
<tr>
<td>Tolerance</td>
<td>-1.0 1.0 %</td>
<td></td>
</tr>
</tbody>
</table>
5. APPEARANCES, DIMENSIONS

OUTLINE DIMENSION (not to scale)

(KYOCERA Crystal Device Corporation)

MARKING

1 Nominal Frequency
   First 3 digits of the frequency are indicated.

2 Identification
   [K] is to indicate 1Pin direction

3 Date Code
   Last 1 Digit of YEAR and WEEK
   (Ex) 2016, Jan, 5 \( \rightarrow \) 601

4 Manufacturing Location
   Y \( \rightarrow \) Japan(Yamagata)  Z \( \rightarrow \) Japan(Shiga Yohkaichi)

5 Option Code
   Alphabet & Number 2 digits or blank.(For T-Sensor)

6 1Pin mark

UNIT: mm
6. RECOMMENDED LAND PATTERN (not to scale)
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 is either polystyrene or A-PET (ESD).
2. Material of the cover tape is polyester (ESD).
3. The seal tape shall not cover the sprocket holes and not protrude from the carrier tape.
4. Tensile strength of carrier tape: 10N or more.
5. The R of the corner of each cavity is 0.2RMAX.
6. The alignment between centers of the cavity and sprocket hole shall be 0.05mm or less.
7. The orientation shall be checked from the top cover tape side as shown in 7-3.
8. Peeling force of cover tape: 0.1 to 1.0N.
9. The component will fall out naturally when cover tape is removed and set upside down.
10. Surface resistivity → Carrier tape: ≥1×10⁷, Cover tape: >1×10¹¹
Reel specifications

φ180 Reel (3,000 pcs)

<table>
<thead>
<tr>
<th>Symbol</th>
<th>P</th>
<th>Q</th>
<th>R</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimension</td>
<td>φ180 +0/-3</td>
<td>φ60 +1/-0</td>
<td>φ13±0.2</td>
</tr>
<tr>
<td>Symbol</td>
<td>S</td>
<td>U</td>
<td>W</td>
</tr>
<tr>
<td>Dimension</td>
<td>φ21±0.8</td>
<td>2.0±0.5</td>
<td>9±1</td>
</tr>
</tbody>
</table>

(Unit: mm)

φ330 Reel (15000 pcs)

<table>
<thead>
<tr>
<th>Symbol</th>
<th>P</th>
<th>Q</th>
<th>R</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimension</td>
<td>φ330±2.0</td>
<td>φ100±1.0</td>
<td>φ13±0.2</td>
</tr>
<tr>
<td>Symbol</td>
<td>S</td>
<td>U</td>
<td>W</td>
</tr>
<tr>
<td>Dimension</td>
<td>φ21±0.8</td>
<td>2.0±0.5</td>
<td>9.4±0.5</td>
</tr>
</tbody>
</table>

(Unit: mm)
8. Cautions for use
   (1) Soldering upon mounting
       There is a possibility to influence product characteristics when Solder paste or conductive glue comes in
       contact with product lid or surface.

   (2) When using mounting machine
       Please minimize the shock when using mounting machine to avoid any excess stress to the product.

   (3) Conformity of a circuit
       We strongly recommend to make sure that Negative resistance (Gain) of IC is designed to be 3 times the
       ESR (Equivalent Series Resistance) of crystal unit.

9. Storage conditions
   Please store product in below conditions, and use within 6 months.
   Temperature +18 to +30°C, and Humidity of 20 to 70 % in the packaging condition.

10. Manufacturing location
    Kyocera Crystal Device Corporation Yamagata Plant
    Kyocera Crystal Device Corporation Shiga Yohkaichi Plant
    Kyocera Crystal Device (Thailand) Co., Ltd

11. Quality Assurance
    To be guaranteed by Kyocera Crystal Device Quality Assurance Division

12. Quality guarantee
    In case when Kyocera Crystal Device Corporation rooted failure occurred within 1year after its delivery,
    substitute product will be arranged based on discussion. Quality guarantee of product after 1year of its delivery is
    waived.

13. Others
    In case of any questions or opinions regarding the Specification, please have it in written manner
    within 45 days after issued date.