NIHON DEMPA KOGYO CO., LTD

TUNING FORK SPECIFICATION

Date: September 28th, 2010

THIS SPECIFICATION SHEET IS PROVIDED TO:

For specifying specifications of following product:

(NDK Part Number)	**(Your Part Number)**
DT-26SMD 32.768KHZ Heat-resistant	

Prepared By: Ivy Wang Checked By: David Jiang	CONFIRMED BY: David Jiang For future reference, we thank you to confirm the specifications and send one copy back to us.

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TUNING FORK SPECIFICATION

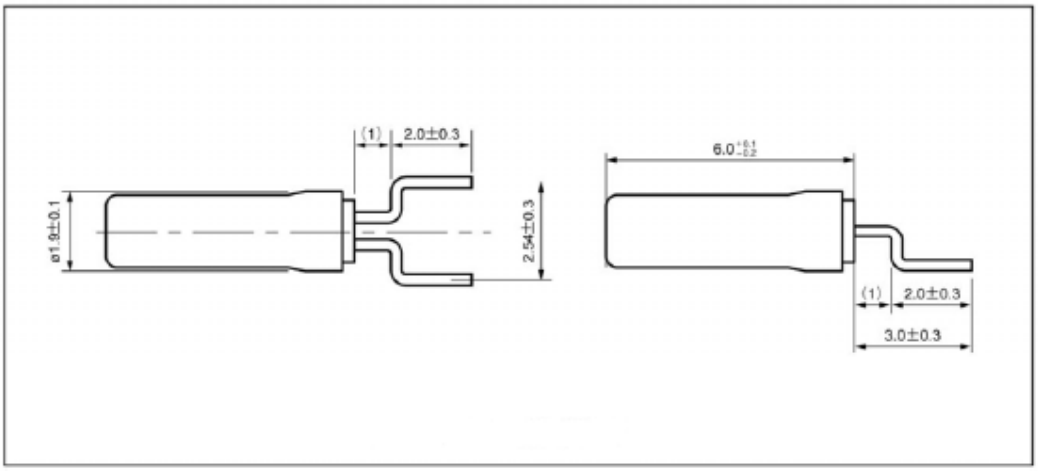
RoHS 2002/95/EC

1. QUARTZ CRYSTAL UNIT SPECIFICATION

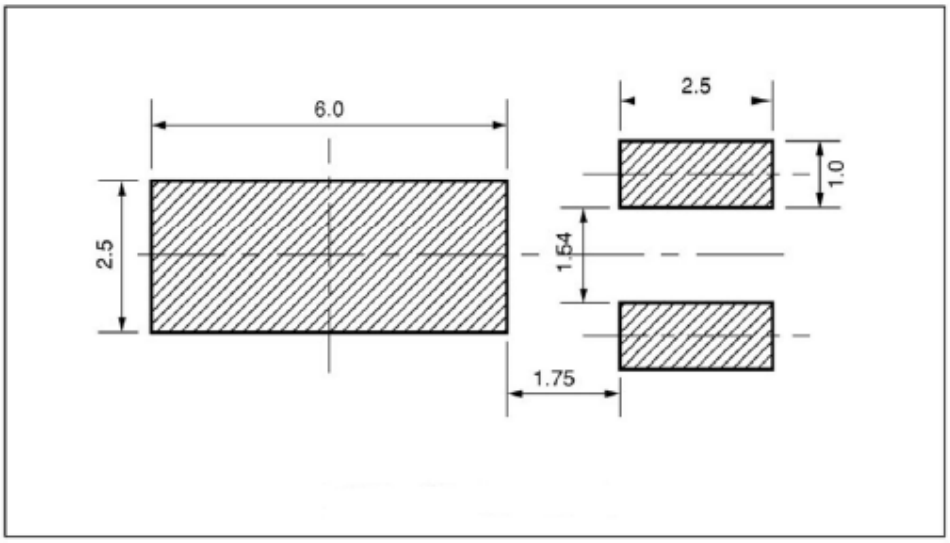
1.1 Frequency:	32.768KHz
1.2 Holder type:	DT-26SMD
1.3 Frequency tolerance:	±20ppm at 25℃
1.4 Equivalent resistance:	40Kohms Max
1.5 Operating temperature range:	-40℃ To +85℃
1.6 Storage temperature range:	-55℃ To +125℃
1.7 Temperature Coefficient:	$-0.04\times10^{-6}/\ ℃^2$ max
1.8 Loading capacitance (CL):	12.5pF
1.9 Drive level:	1.0uW max
1.10 Shunt Capacitance:	2.0 pF max
1.11 Motional Capacitance:	2.8 fF Typical (Depend on frequency)
1.12 Insulation resistance:	More than 500MΩ (100 ± 10 Vdc)
1.13 Aging:	Less than ±3 ppm
	Ta=+25℃±3℃, first year
1.14 Dimensions and marking:	Refer to page.3

ITEM	REQUIREMENT
Measurement	Standard condition: (1) Temperature 25 ±3℃ (2) Relative humidity 60± 10% R.H
Condition	The measurement shall be in the temperature range of 5℃ to 35℃ and relative humidify range of 45% to 85% when there are no faults

2.1 DIMENSIONS (Unit: mm)



2.2 SOLDER PAD LAYOUT (Umit:mm)



3. Mechanical Endurance: Provided that measurement shall be carried out afterletting it alone in the room temperature for 1 hour.

<table>
<tr><th>Test Item</th><th>Condition of test</th><th>Performance Requirements</th></tr>
<tr><td>Shock
(Destructive)</td><td>Resonator shall be tested after 3 times random drops from the height of 75 cm onto hard wooden broad of thickness more than 30 mm.</td><td>No visible damage,
and measured Values shall meet Table 1.</td></tr>
<tr><td>Vibration
(Destructive)</td><td>Subject resonator to following vibration
Frequency: 10-55Hz
Amplitude: 0.75mm
Cycle time: 1~2min(10-55-10Hz)
Duration: 3 mutually perpendicular
Planes in each 2 hours
Direction: X, Y, Z</td><td>No visible damage,
and measured Values shall meet Table 1.</td></tr>
<tr><td rowspan="2">Terminal Strength
(Destructive)</td><td>Pulling: body of resonator shall be fixed, and 0.5kg of tension weight shall be supplied gradually to axial direction of lead terminals for 30 seconds</td><td rowspan="2">The lead shall not be broken ,
and measured Values shall meet Table 1.</td></tr>
<tr><td>Bending: body of resonator shall be fixed, And 90℃ bending at a distance of 2.5±0.5 mm from crystal main body shall be given being supplied 250g tension weight. after that, lead terminals shall be straightened gradually. Then, the same bending and straightening shall be supplied to the opposite direction in the same axial.</td></tr>
<tr><td>Solder Heating
(Destructive)</td><td>Reflow solder:
1. Reflow Profile: see page 6
2. 2 times max
<table>
<tr><td>(1)</td><td>Preheat</td><td>160~180℃</td><td>120±20sec.</td></tr>
<tr><td>(2)</td><td>Primary heat</td><td>220℃</td><td>60sec. max</td></tr>
<tr><td>(3)</td><td>Peak</td><td>260℃</td><td>10sec. max.</td></tr>
</table></td><td>No visible damage,
and measured Values shall meet Table 1.</td></tr>
<tr><td>Solder ability
(Destructive)</td><td>Dip the lead in liquid solder for 2± 0.5 seconds, at 230±5℃ and 2.0mm from the root , after this dipping , 90% min of dipped parts shall be covered with solder.</td><td>No visible damage,
and measured Values shall meet Table 1.</td></tr>
<tr><td>Leakage
(non-destructive)</td><td>The resonator is to be soaked in the alcohol and enforced with the pressure of 25N/cm^2 for 5 minutes Next , the resonator shall be tested after being taken out and dried with a dryer.</td><td>The Ir between the wire and the shell must be more than 500MΩ (DC100V).</td></tr>
</table>

5. Environmental Endurance: Provided that measurement shall be carried out afterletting it alone in the room temperature for 1 hour.

	Test Item	Condition of test	Performance Requirements
5.1	Humidity	Should be satisfied after letting it alone at +40℃±2℃ in humidity of 90~95% for 48 hours.	No visible damage, measured Values shall meet Table1.
5.2	Storage in Low Temperature	Should be satisfied after letting it alone at -25℃±2℃ for 2 hours.	No visible damage, measured Values shall meet Table1.
5.3	Storage in High Temperature	Should be satisfied after letting it alone at +85℃±2℃ for 16 hours.	No visible damage, measured Values shall meet Table1.
5.4	Temperature Cycle	Should be satisfied after supplying the following temperature cycle (5 cycles). (Refer to Fig-4). Temperature shift from low to high, high to low shall be done in 1℃/min.	No visible damage, measured Values shall meet Table1.

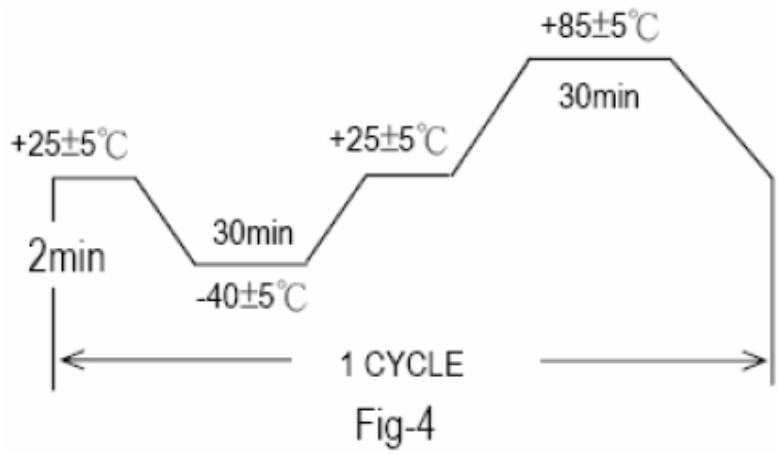
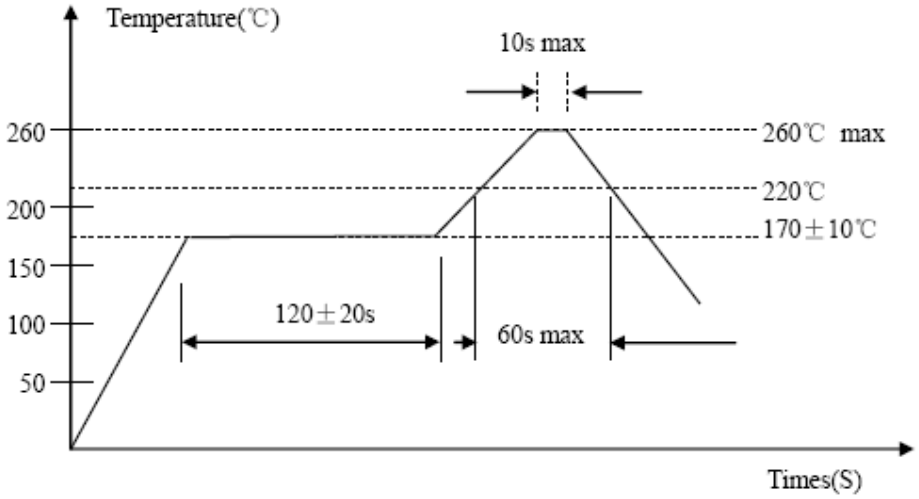


Fig-4

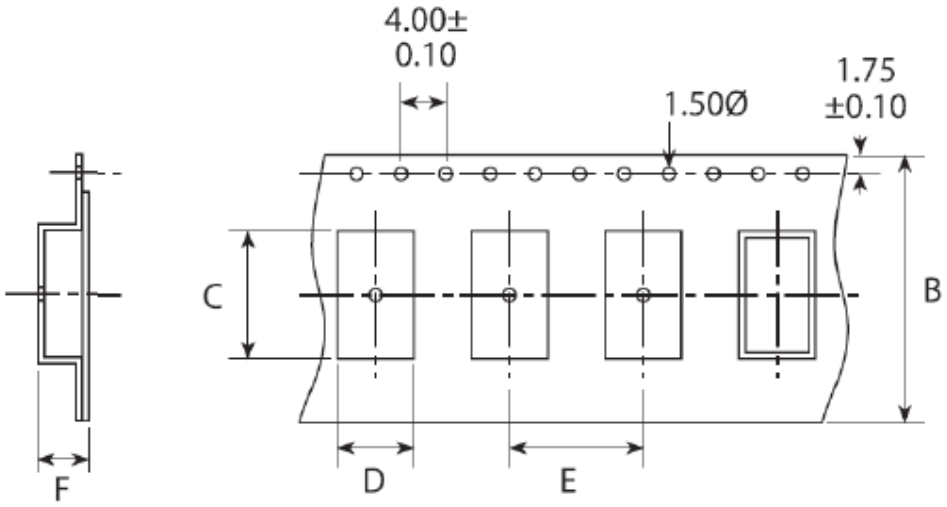
Table 1

Test Item	Specification	Note
Frequency change (△f/fo)	10ppm	Reference to the initial value
C.I. (R)	15%	Reference to the initial value

6. Reflow Profile



7. Taping Specification



A	B	C	D	E	F	G
330±2.0	16.0±0.3	9.7±0.1	4.0±0.1	8.0±0.1	2.3±0.1	100±1.0

Reel Quantity: 1,000pcs