



NIHON DEMPA KOGYO CO., LTD  
TUNING FORK CRYSTAL SPECIFICATION



Date: June 04th, 2013

**THIS SPECIFICATION SHEET IS PROVIDED TO:**

For specifying specifications of following product:

**(NDK Part Number)**

DT-38 PIN TYPE 20PPM -6pF

**(Your Part Number)**

Prepared By:

Checked By:

CONFIRMED BY:

For future reference, we thank you to confirm the specifications and send one copy back to us.



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● ELECTRICAL PARAMETERS

No.	Item	Symb.	Electrical Specification				Remark
			Min.	Typ.	Max.	Units	
1	Nominal Frequency	F0	32.768			KHz	
2	Mode of Vibration		Fundamental				
3	Frequency Tolerance	$\Delta F/F0$	-20	-	20	ppm	at 25°C±3°C
4	Operating Temperature Range	T <sub>OPR</sub>	-40	-	85	°C	
5	Frequency Stability	TC	$-0.042*(\Delta^{\circ}C)^2$			ppm	ppm*( $\Delta^{\circ}C$ ) <sup>2</sup>
6	Storage Temperature	T <sub>STG</sub>	-55	-	125	°C	
7	Load capacitance	CL	-	6	-	pF	
8	Equivalent Series Resistance	ESR	-	-	30	K $\Omega$	
9	Drive Level	DL	-	-	1	$\mu$ W	
10	Insulation Resistance	IR	500	-	-	M $\Omega$	At 100V <sub>DC</sub>
11	Shunt Capacitance	C0	-	-	2	pF	
12	Aging Per Year	Fa	-5	-	5	ppm	First Year
13	Package type	DT-38					

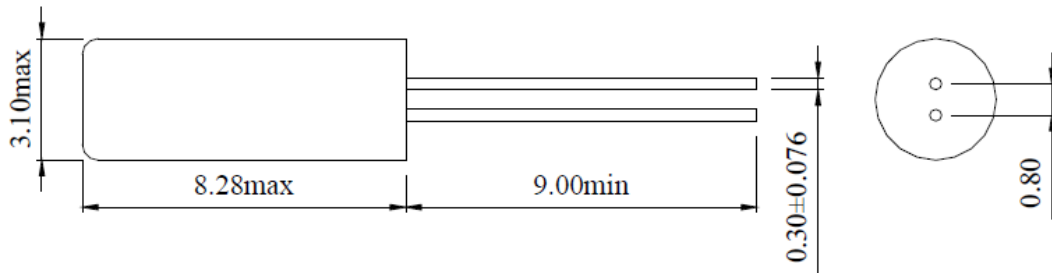


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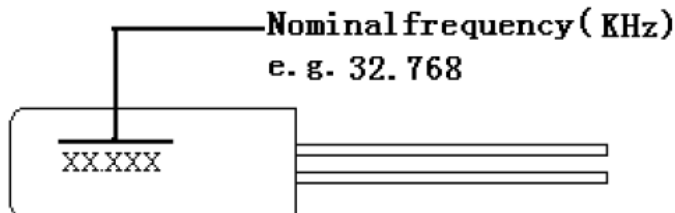
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- Outline Dimensions (unit: mm)



- MARKING





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No.	Test Item	Test Conditions	Reference
1	High Temperature Storage	Temperature: $125^{\circ}\text{C} \pm 5^{\circ}\text{C}$ Time: $1000 \pm 12$ Hours	MIL-STD-883E-1016
2	Temperature Cycle	Temperature 1: $-55^{\circ}\text{C} \pm 5^{\circ}\text{C}$ Temperature 2: $125^{\circ}\text{C} \pm 5^{\circ}\text{C}$ Temperature change between T1 and T2 at soonest Run 1000 cycles, maintain T1 and T2 5minutes each in one cycle	JESD22 Method JA-104
3	Solder Heat Resistance	Pre-heat: $125^{\circ}\text{C}$ 60~120 Seconds Solder Temperature: $260^{\circ}\text{C} \pm 5^{\circ}\text{C}$ Time: 30 Seconds	MIL-STD-202F 210 E
4	Drop Test	3 Times Free Fall from 75cm height table to 3cm thickness hard wood board	MIL-STD-202F-203B
5	High Temperature, High Humidity Storage	Temperature: $85^{\circ}\text{C} \pm 5^{\circ}\text{C}$ Relative Humidity: 80%--85% Time: 250Hours $\pm 24$ Hours	MIL-STD-202F-103B
6	Steam Aging	Temperature: $97^{\circ}\text{C} \pm 5^{\circ}\text{C}$ Time: 24 Hours $260^{\circ}\text{C}$ solder pot to check solderability	MIL-STD-883 C-1008.2B
7	Solderability	Dip in flux 5~10 seconds Temperature: $245^{\circ}\text{C} \pm 5^{\circ}\text{C}$ Time: 10 Seconds	MIL-STD-202F-208H
8	Aging	Temperature: $85^{\circ}\text{C} \pm 5^{\circ}\text{C}$ Time: $250 \pm 12$ Hours	MIL-STD-202 F-108A
9	Thermal Shock	Temperature 1: $-55^{\circ}\text{C} \pm 5^{\circ}\text{C}$ Temperature 2: $125^{\circ}\text{C} \pm 5^{\circ}\text{C}$ Temperature change between T1 and T2: 5 seconds 100 cycles, maintain T1 and T2 for 30 minutes each in one cycle	MIL-STD-883E-1011.9B
10	Vibration	Frequency Range: 10Hz~2000Hz Amplitude: 1.5mm or 20G 4Hours in each direction, total 12Hours	MIL-STD-202F-204D