Crystal Bridge to the Future

RoHS Compliant
Directive 2011/65/EU

REFERENCE SPECIFICATION

Customer:

Item: Quartz Crystal Controlled Oscillators

Type: NT7050BF

Nominal Frequency: 19.440 MHz

Customer's Spec. No.: ---

NDK Spec. No.: END4053D

For your reference we submit this specification.
Please study and keep in your related document file.

Revision Record

Rev.	Date	Items	Contents	Approved	Checked	Drawn
---	6.Apr.2016	Issue	---	T.Matsumoto	A.Nakamura	N.Sekine

This is specification of temperature compensated crystal oscillator.

1. Customer's Spec. No. : ---

2. NDK Spec. No. : END4053D

3. Type : NT7050BF

4. External Dimension : ETD14B-01945

5. Rating

5.1 Nominal Frequency (f_{nom})

19.440 MHz

5.2 Supply Voltage (V_{CC})

DC+3.3 V±5 %

5.3 Output Load Condition (C_L)

15 pF

5.4 Operating Temperature Range (T_{opr})

-40 °C to +85 °C

5.5 Storage Temperature Range (T_{str})

-55 °C to +125 °C

6. Electrical Specification

Unless otherwise specified, measuring condition T = +25±2 °C, V_{CC} =+3.3 V, C_L = 15 pF.

	Item	Symbol	Condition	Rating		Unit
				Min.	Max.	
6.1	Current Consumption	ICC	-	-	6	mA
6.2	Overall Frequency Tolerance	$\Delta f/f_{nom}$		-4.6	+4.6	ppm
	6.2.1 Frequency Tolerance	$\Delta f/f_{nom}$	(*1)	-1.0	+1.0	ppm
	6.2.2 Frequency/Temperature Characteristics	$\Delta f/f$	-40 to +85°C (*2)	-0.28	+0.28	ppm
	6.2.3 Frequency/Voltage Coefficient	$\Delta f/f$	+3.3 V ±5%	-0.1	+0.1	ppm
	6.2.4 Frequency/Load Coefficient	$\Delta f/f$	15 pF ± 5pF	-0.1	+0.1	ppm
	6.2.5 Long-Term Frequency Stability	$\Delta f/f$	24H (*3)	-0.01	+0.01	ppm
		$\Delta f/f$	1year (*2)	-1.0	+1.0	ppm
		$\Delta f/f$	10years (*2)	-3.0	+3.0	ppm
6.3	Output		Square Wave			
	6.3.1 Output Level (C-MOS)	VOL		-	0.1 Vcc	V
		VOH		0.9 Vcc	-	V
	6.3.2 Symmetry	SYM	@0.5 Vcc	45	55	%
	6.3.3 Rise time, Fall time	tr / tf	10 % to 90 %, 90% to 10%		9	ns

	Item	Symbol	Condition	Rating		Unit
				Min.	Max.	
6.4	Phase Noise		10 Hz		-85	dBc/Hz
			100 Hz		-110	dBc/Hz
			1 kHz		-125	dBc/Hz
			10 kHz		-135	dBc/Hz
6.5	Enable/Disable function		No connection	Enable Output		-
			VIH ≧ 70% of VCC	Enable Output		-
			VIL ≦ 30% of VCC	Disable Output		-

(*1) $\Delta f/f_{nom}$: Frequency shift at T=+25 °C, VCC =+3.3 V, CL =15 pF in reference to Nominal frequency (f_{nom})
(*2) $\Delta f/f$: Frequency shift from the reference frequency at T=+25 °C, VCC =+3.3 V, CL =15 pF
(*3) $\Delta f/f$: Frequency shift from the reference frequency at T = +25±2 °C, V_{CC} =+3.3 V, C_L = 15 pF, after 24 h operation.

7. Marking

Nominal Frequency (MHz is not written)
NDK Symbol Mark
Lot No.
Identification Code

8. Moisture Sensitivity Level

Level 3 (Compliant with J-STD-020)

9. Notice

Order items are manufactured according to specification. As to conditions, which are not indicated in the specification and unpredictable such as applied condition and oscillation margin, please check them beforehand.

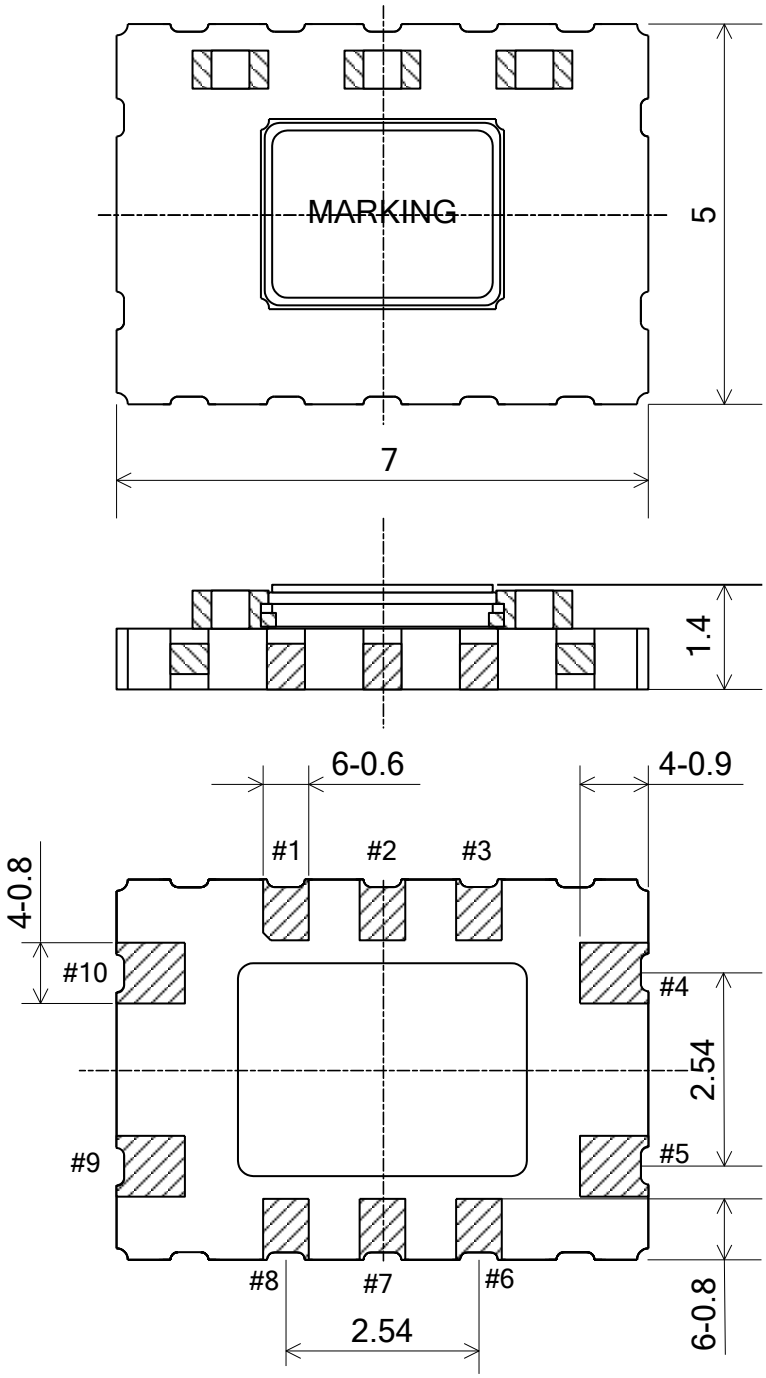
10. Prohibited items

Be sure to use the product under the following conditions. Otherwise, the characteristics deterioration or destruction of the product may result.

(1) Reflow soldering heat resistance
Peak temperature: 260 °C /10 s
Heating: 225 °C or higher/30 s
Preheating: 150 °C to 180 °C /120 s
Reflow passage times: twice
In reflowing, the turning over of mounted boards shall be forbidden.

(2) Manual soldering heat resistance
Press a soldering iron of 350 °C on the terminal electrode for five seconds (twice).

(3) Washing
This product does not correspond to rinsing.



Terminal land connections

#1	Do not connect	*1
#2	NC	
#3	NC	
#4	GND	
#5	OUTPUT	
#6	Do not connect	*1
#7	NC	
#8	Enable/Disable	
#9	V_{CC}	*2
#10	Do not connect	*1

*1 Please do not connect with terminal.

*2 Please connect a 0.01 uF bypass capacitor near the V_{CC} terminal.

	Date of Revise	Charge	Approved	Reason
A				

	Date	Name	Third Angle Projection	Tolerance	Scale
Drawn	6.Apr.2016	N.Sekine	Dimension: mm	±0.2	10/1
Designed	6.Apr.2016	N.Sekine	Title	Drawing No.	Rev.
Checked	6.Apr.2016	A.Nakamura	**External Dimension**	**ETD14B-01960**	
Approved	6.Apr.2016	T.Matsumoto			

NIHON DEMPA KOGYO CO., LTD.