Temperature Compensated Crystal Oscillators

NTC-2000 SERIES TCXO (EPIC) SURFACE MOUNT

Combined Oscillator/Synthesizer



The NTC-2000 (Combined Oscillator/Synthesizer with Modulation, Integrated Circuit) Series combines the features of the NTC-1000 TCXO and a frequency synthesizer in a package size identical to the NTC-1000 TCXO alone. With the addition of an external VCO, a loop filter and a single or dual-modulus prescaler, the functions of a Phase Locked Loop (PLL) frequency synthesizer are obtained. The frequency synthesizer in NTC-2000 is an improved version of the MC145158, with the addition of a phase modulator and a charge pump. The module is programmable via the Serial Peripheral Interface (SPI) and contains the following:

- ☐ The NTC-1000 TCXO capable of 1 ppm temperature stability.
- ☐ R, N and A dividers similar to the MC145158. The N divider in NTC-2000 is 11 bit rather than the 10 bit in the MC145158. The R divider is 14 bit, and the A divider is 7 bit with circuitry to control a dual-modulus prescaler.
- ☐ A phase detector similar to the MC145158.
- ☐ A factory programmable 330uA PLL charge pump.
- ☐ A phase modulator at the output of the R divider that can be enabled or disabled by the user. The phase modulator can output a frequency modulated signal with the addition of an integrator at the modulation input.
- ☐ A pulsed and/or level lock detect output. The Lock Detect Pulsed output pulses high when the PLL is in lock and low when it is out of lock. The Lock Detect Level output is high when the phase difference between FR and FV is less than 20% and low when the phase difference is greater than 20%.
- ☐ Three latches (synchronized to the N divider) are available for aid in bandshifting.

Specifications

Reference Oscillator Frequency
12.8 MHz to 20.0 MHz
with output frequency dividers of 1, 2, 4, 6, 8
Standard Frequencies (MHz): 12.8, 14.4, 15.36, 16.8

Frequency Stability
vs temperature: 1, 2 or 5 ppm

Operating Temperature Range
–30°C to +85°C

Output Signal (C_L=20pF)

Waveshape	Squarewave
Rise/Fall Time	15 ns
High Level	V_{DD}-0.4 VDC
Low Level	0.4 VDC
Duty Cycle	40/60 (divide by 1)
	49/51 (divide by 2, 4, 6, 8)

Charge Pump

sink current (Iup):	330 uA±10%
source current (Idown)	330 uA±10%
Iup rise/fall time:	<20 ns
Idown rise/fall time:	<20 ns
Iup/Idown (0.75V from rail):	1.0±5%
Iup/Idown (0.50V from rail):	1.0±10%

Supply Voltage
+5V ±10%

Supply Current
3 mA (typical)

Aging
< ±1 ppm/year max
< ±7 ppm/10 years

Phase Noise
–125 dBc at 10 kHz offset

Fin (signal requirements)

Level (AC coupled)	0.5 Vp-p minimum
duty cycle:	60/40 maximum
input frequency:	15 MHz maximum
waveform:	sine/square

Phase Modulator

input level (DC biased @ 2.5 V):	1.0 Vp-p maximum
deviation level:	5 kHz
distortion (Freq=10Hz to 3 kHz):	±3%

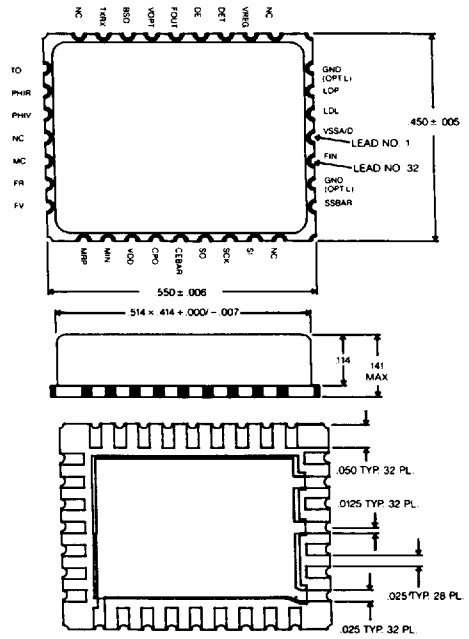
Reflowable in IR assist furnaces

Powered by ICminer.com Electronic-Library Service CopyRight 2003

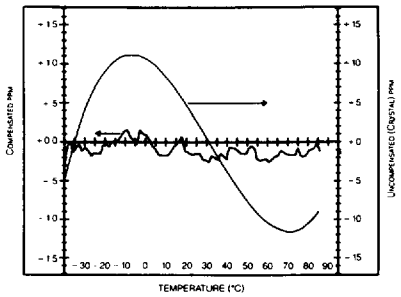
Temperature Compensated Crystal Oscillators

NTC-2000 SERIES
TCXO
(EPIC)
SURFACE MOUNT

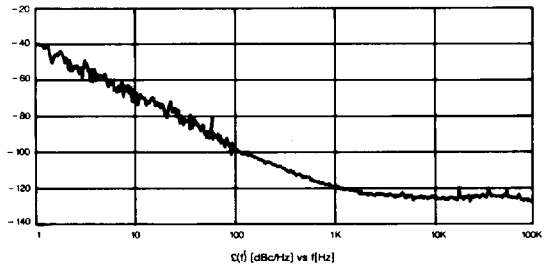
PACKAGE (DIMENSIONS IN INCHES)



FREQUENCY VS TEMPERATURE



PHASE NOISE



NEL TCXO PART NUMBER DEVELOPMENT

NTC – 2 X X X at X X X X X

NEL TCXO SERIES

2000 SERIES

DRIFT TOLERANCE

1= ± 1 ppm
2= ± 2 ppm
3= ± 2.5 ppm
4= ± 5 ppm
5= ± 10 ppm
6, 7, 8= TBD
9= SPECIAL TO CUSTOMER DRAWING

OPERATING TEMPERATURE RANGE

1= 0°C to 50°C
2= 0°C to 70°C
3= –20°C to +70°C
4= –30°C to +75°C
5= –30°C to +85°C
6= –40°C to +85°C
7= –55°C to +85°C
8= TBD 9= SPECIAL TO CUSTOMER DRAWING

OTHER PARAMETERS

0=STANDARD TO NEL DATA SHEET
1=SPECIAL TO CUSTOMER DWG.

FREQUENCY

NEL FREQUENCY CONTROLS, INC. 357 Beloit Street, Burlington WI 53105 U.S.A. Phone 414/763-3591 FAX 414/763-2881

Powered by ICminer.com Electronic-Library Service CopyRight 2003