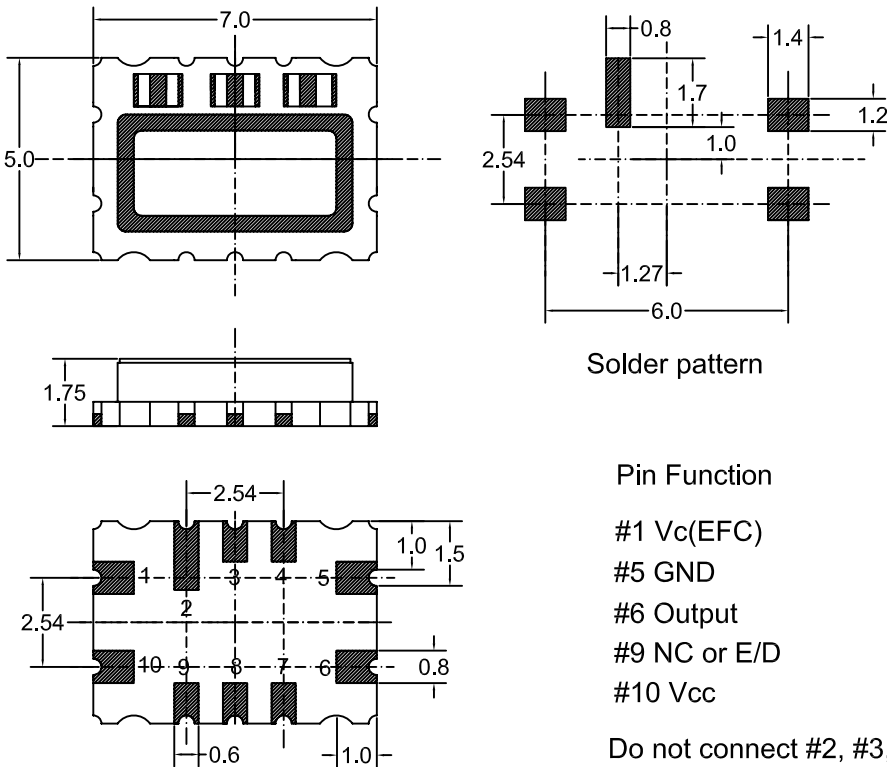**H7 L C+) $$9 HN! &$A < n!5 !J**
High Stability Extended Temperature TCXO

Features and Benefits

Better than ±0.8ppm from -55°C to +85°C
3.3V supply; 3mA maximum
Less than -140dBc/Hz @ 1KHz offset

Typical Applications

Harsh Environment where extended temperature is required
Mobile Radio
Communication Equipment
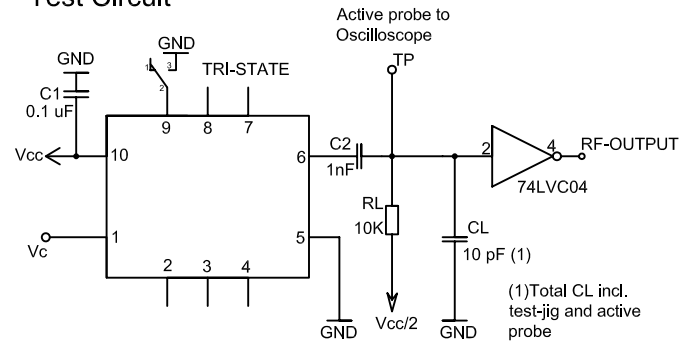
Mechanical Drawing & Pin Connections

Drawing No:MD150075-3

Solder pattern

Test Circuit

Pin Function

#1 Vc(EFC)
#5 GND
#6 Output
#9 NC or E/D
#10 Vcc

Do not connect #2, #3, #4, #7, #8

Unit: mm
1mm=0.0394inch

Specifications

Oscillator Specification	Sym	Condition	Value Min.	Value Typ.	Value Max.	Unit	Note
Nominal Frequency	F$_0$			20.00		MHz	
RF Output							
Output Wave Form		V$_{p-p}$>0.8	Clipped Sine Wave				
Load		±10%		10 10		kΩ pF	
Power Supply							
Voltage	V$_{cc}$			3.3		V	
Current Consumption				<3		mA	
Frequency Control							
Electronic Frequency Control (EFC) Range	ΔF			>±5		ppm	
EFC Control V$_C$		Positive slope		+1.5		V	±1.0 V
Frequency Slope		Over operating temperature		≤0.05		ppm/°C	
Tri-State Function		Pin #6 -> Oscillation		≥2.3 open		V	Pin #9
		Pin #6 -> high impedance		≤0.9 GND		V	Pin #9
Frequency Stability							
VS. Tolerance		@ +25°C	0		1.0	ppm	
VS. Temperature Reference to (F$_{MAX}$+F$_{MIN}$)/2		Over -55°C to +85°C		≤±0.8		ppm	
VS Supply Voltage Change Reference to frequency at nominal supply		±5%		≤±0.1		ppm	
VS.Load Change Reference to frequency at nominal load		±10%		≤±0.1		ppm	
Aging		1st year		≤±1.0		ppm	
		Over 5 years		≤±3.0			
Short Term Stability ADEV		T = 1 s		<1 x 10^{-10}			
Phase Noise							
Phase noise@ 20 MHz carrier frequency		@ 10 Hz		-90		dBc/Hz	
		@ 100 Hz		-120			
		@ 1 kHz		-140			
		@ 10 kHz		-153			
		@ 100 kHz		-155			

Environmental Conditions	
Parameter	**Reference Std.**
Operating temperature range	-55°C to +85°C
Storage temperature range	-55°C to +105°C
Reflow Profiles as per IPC/JEDEC J-STD-020C	≤260°C over 10 sec. max
Moisture Sensitivity	Level 1 (unlimited)

Frequency Deviation vs. Temperature
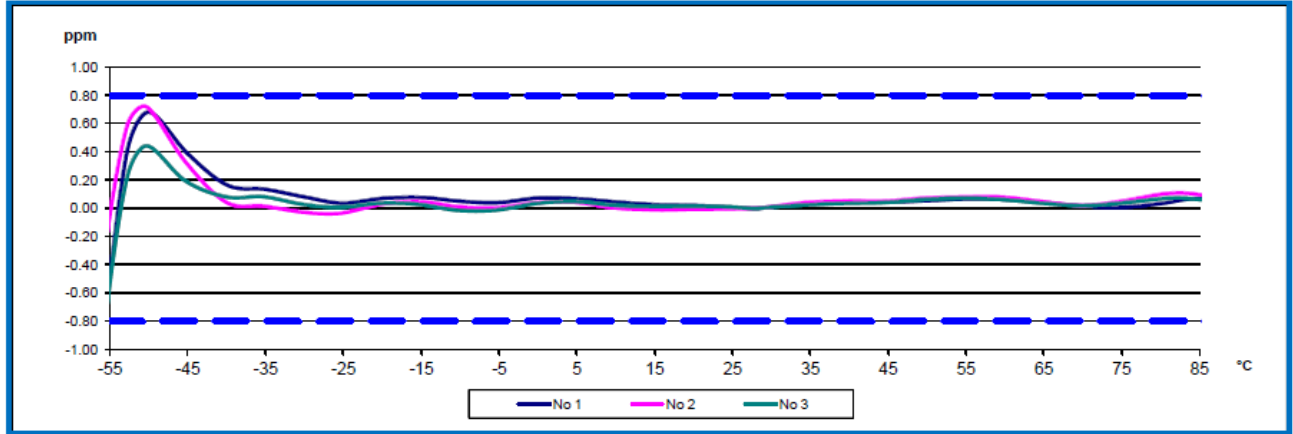
Phase Noise @ 20 MHz Carrier Frequency
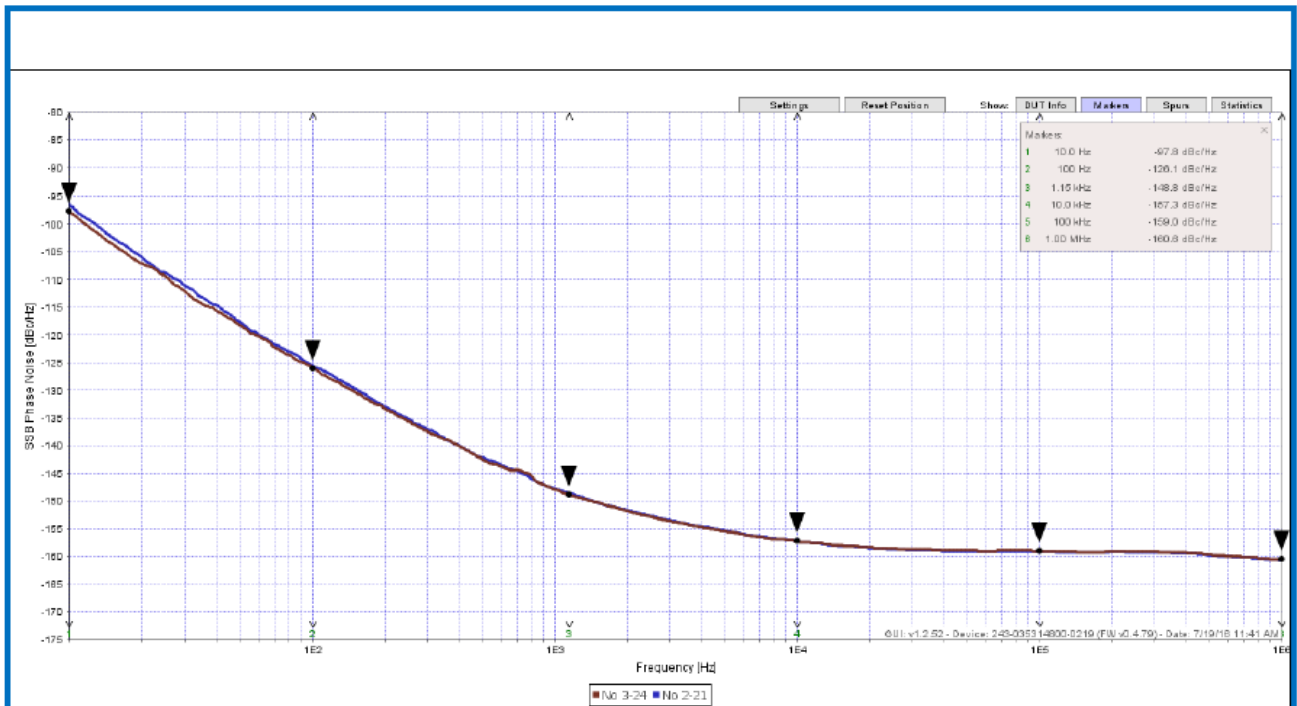
Environmental Conditions

Test	IEC 60068 Part …	IEC 60679-1 Clause	MIL-STD-202G Method	MIL-STD-810F Method	MIL-PRF-55310D Clause	Test Conditions (IEC)
Sealing Tests (if applicable)	2-17	5.6.2	112E		3.6.1.2	Gross leak: Test Qc. Fine leak. Test Qk
Solderablility Resistance to Soldering Heat	2-20 2-58	5.6.3	208H 210F		3.6.52 3.6.48	Test Ta method 1 Test Td_1 method 2 Test Td_2 method 2
Shock	2-27	5.6.8	213B	516.4	3.6.40	Test Ea, 3 x per axis, 100 g 6 ms half-sine pulse
Vibration Sinusoidal	2-6	5.6.7.1	201A 204D	516.4-4	3.6.38.1 3.6.38.2	Test Fc, 30 min per axis, 1 oct/min 10 Hz – 55 Hz 0.75 mm; 55 Hz – 2 kHz 10g
Vibration Random	2-64	5.6.7.3	214A	514.5	3.6.38.3 3.6.38.4	Test Fdb
Endurance Tests - Aging - Extended Aging		5.7.1 5.7.2	108A		4.8.35	30 days @ 85°C 1000 h, 2000 h, 8000 h @ 85°C

Handling Precautions

Flux Residue Resistance

Yes, even an unclean board can affect analog circuit performance.

Be aware if the circuit has very high resistances – even in the low MΩ - special attention may need to be paid to cleaning. A finished assembly may be adversely affected by flux or cleansing residue. The electronics industry in the past few years has joined the rest of the world in becoming environmentally responsible. Hazardous chemicals are being removed from the manufacturing process – including flux that has to be cleaned with organic solvents. Water-soluble fluxes are becoming more common, but water itself can become contaminated easily with impurities. These impurities will lower the insulation characteristics of the PCB substrate. It is vitally important to clean with freshly distilled water every time a high-impedance circuit is cleaned. There are applications that may call for the older organic fluxes and solvents, such as very low power battery powered equipment with resistors in the 10s of MΩ range. Nothing can beat a good vapor defluxing machine for ensuring that the board is clean