#### ETOCXO2020C-10MHz-A-V

High-Temperature and High Stability OCXO

### **Features and Benefits**

Temperature stability: 10 ppb for (-40 to +130)°C Low Phase noise: -170 dBc/Hz @ 100kHz Low aging: ±0.3 ppb/day, 30 ppb/year Allan Variance: ±5 x 10<sup>-12</sup>/s

Frequency range from 5 to 30 MHz

#### **Typical Applications**

Cellular Base Stations Instrumentation Stratum 3 Clock Systems Microwave Communication Radar reference

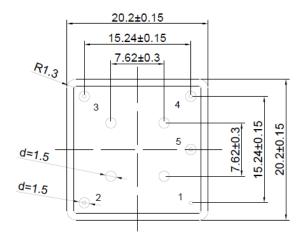
## **Description**

The ETOCXO family of extreme temperature ovenized oscillators is able to maintain low parts per billion stabilities even at ambient temperatures as high as +130°C. Proprietary high temperature materials / processing techniques allow the product to achieve highly stable output and superior long term reliability.

# **Mechanical Drawing & Pin Connections**

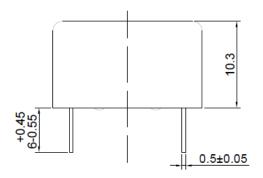
Drawing No:

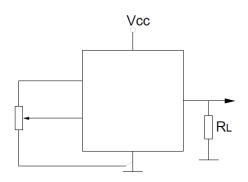
MD140078-2



Pin	Signal					
1	RF OUT					
2	GND					
3	Electrical tuning					
4	Reference voltage					
5	+V Supply					

Unit: mm







#### ETOCXO2020C-10MHz-A-V

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## **Specifications**

Specification	OCXO Specification		Sym	Condition	Value			Unit	Nete
Sine   Level   Load   R <sub>L</sub>   Sine   Level   Load   R <sub>L</sub>   Sine   Load   R <sub>L</sub>   Sine   Load   R <sub>L</sub>   Sine   Load   R <sub>L</sub>   Sine   Sine   Load   R <sub>L</sub>   Sine   Sine   Load   R <sub>L</sub>   Sine   Sine			Sylli	Condition	Min.	Тур.	Max.	Unit	Note
Level	Frequency Range		Fo			10		MHz	
Mave	RF Output								
Option         Harmonics Level         None         -25         dBc           Spurious Level         None         None         Power Supply           Voltage         V <sub>cc</sub> 4.75         5.0         5.25         ∨           Power Consumption         Warm-up state Steady state, +25°C         1         1.2         W           Warm-up Time         t <sub>up</sub> To Δff <sub>0</sub> = 1e-7 at 25°C         1         1.2         W           Frequency Control           Control Voltage Range         V <sub>c</sub> 0         4.2         V         Positive tuning slope           Tuning Range         1.4.1         4.2         4.3         V         Positive tuning slope           Reference Voltage         V <sub>ref</sub> 4.1         4.2         4.3         V           Frequency Stability           **S. Temperature         **Positive tuning slope           vs. Temperature         **Positive tuning slope         **Positive tuning slope           vs. Supply Voltage         Ref. V <sub>cc</sub> Vp.         **I-1         ppb           vs. Supply Voltage         Ref. V <sub>cc</sub> Vp.         **I-1         ppb           vs. Supply Voltage         Ref. V <sub>cc</sub> Vp.         **I-1         ppb	Sine	Level			+6	+8	+10	dBm	
Spurious Level   Power Supply	Wave	Load	R∟			50		Ohm	
Voltage	Option	Harmonics Level					-25	dBc	
Variable		Spurious Level				None			
Power Consumption   Warm-up state   Steady state , ±25°C   1   1.2   W	Power Sup	pply							
Steady state, +25°C	Voltage		V <sub>cc</sub>		4.75				
SteBady State, +25°C   1   1.2   W	Power Con	eumption				3.2			
Varm-up Time	rower Consumption			Steady state, +25°C		11	1.2	W	
Control Voltage Range	Warm-up Time		t <sub>up</sub>				180	s	frequency after
Tuning Range	Frequency	Control							
Tuning Range         +/-0.35         +/-1         ppm           Reference Voltage         V <sub>ref</sub> 4.1         4.2         4.3         V           Frequency Stability           vs. Temperature         -40°C to +130°C, ref. 25°C         +/-10         ppb           vs. Supply Voltage         Ref. V <sub>cc</sub> typ.         +/-1         ppb           vs. Acceleration         Worst direction         +/-0.5         +/-1         ppb/G           Aging         Per Day         After 30 days of operation         0.3         0.5         ppb           First Year         Operation         0.5         ppb           Phase Noise         1Hz         -110         -100         ppb           10Hz         -135         -125         dBc/Hz           10Hz         -163         -155         -145         dBc/Hz           Allan Variance         1s         5         e-12         e-12           Environmental         -60°C to +130°C         -40°C to +130°C	, ,		V <sub>c</sub>		0		4.2	V	
Reference Voltage	Tuning Range				+/-0.35	+/-1		ppm	
vs. Temperature         -40°C to +130°C, ref. 25°C         +/-10         ppb           vs. Supply Voltage         Ref. V <sub>cc</sub> typ.         +/-1         ppb           vs. Acceleration         Worst direction         +/-0.5         +/-1         ppb/G           vs. Acceleration         Worst direction         +/-0.5         +/-1         ppb/G           Aging         Per Day         After 30 days of operation         0.3         0.5         ppb           First Year         Popb         30         50         ppb           Phase Noise         1Hz         -110         -100         100           10Hz         -135         -125         100			$V_{ref}$		4.1	4.2	4.3		
Vs. Supply Voltage         Ref. V <sub>oc</sub> typ.         +/-1         ppb           vs. Acceleration         Worst direction         +/-0.5         +/-1         ppb           Vs. Acceleration         Worst direction         +/-0.5         +/-1         ppb           Aging         Per Day First Year         0.3         0.5         ppb           For 20 Years         Poperation         0.5         ppb           Phase Noise         1Hz         -110         -100         100         100Hz         -135         -125         100Hz         11Hz         -110         -100         100Hz         100Hz         -155         -145         100Hz         -155         -145         100Hz         -155         -145         100Hz         -155         -145         100Hz         -170         -168         100Hz         -170         -									
Vos. Acceleration	vs. Temperature						+/-10	ppb	
Per Day   After 30 days of operation   30   50   ppb   ppb	vs. Supply Voltage			Ref. V <sub>cc</sub> typ.		+/-1		ppb	
Aging   First Year   For 20 Years	vs. Acceler	vs. Acceleration		Worst direction	+/-0.5		+/-1	ppb/G	
Phase Noise				After 20 days of				ppb	
Phase Noise	Aging				30			ppb	
Phase Noise				operation		0.5		ppm	
Note	Phase Nois	se	<u> </u>						
100Hz									
1kHz									
1kHz	Phase Noise							dBc/Hz	
100kHz								4	
Allan Variance         1s         5         e-12           Environmental           Operating Temperature Range         -40°C to +130°C           Storage Temperature Range         -60°C to +130°C           Humidity         Hermetically sealed           Mechanical Shock         Per MIL-STD-202, 30G half sine pulse, 11ms (500G, 1ms - optionally)           Vibration         Per MIL-STD-202, 10G swept sine 10 to 500Hz								4	
Environmental       Operating Temperature Range     -40°C to +130°C       Storage Temperature Range     -60°C to +130°C       Humidity     Hermetically sealed       Mechanical Shock     Per MIL-STD-202, 30G half sine pulse, 11ms (500G, 1ms - optionally)       Vibration     Per MIL-STD-202, 10G swept sine 10 to 500Hz	Allen Verience					-1/0		- 10	
Operating Temperature Range Storage Temperature Range -60°C to +130°C Humidity Hermetically sealed Mechanical Shock Per MIL-STD-202, 30G half sine pulse, 11ms (500G, 1ms - optionally) Vibration Per MIL-STD-202, 10G swept sine 10 to 500Hz				18	5	<u></u>	<u> </u>	e-12	
Storage Temperature Range -60°C to +130°C Humidity Hermetically sealed Mechanical Shock Per MIL-STD-202, 30G half sine pulse, 11ms (500G, 1ms - optionally) Vibration Per MIL-STD-202, 10G swept sine 10 to 500Hz			40°C to 1	120°C					
Humidity     Hermetically sealed       Mechanical Shock     Per MIL-STD-202, 30G half sine pulse, 11ms (500G, 1ms - optionally)       Vibration     Per MIL-STD-202, 10G swept sine 10 to 500Hz			-60°C to +130°C						
Mechanical ShockPer MIL-STD-202, 30G half sine pulse, 11ms (500G, 1ms - optionally)VibrationPer MIL-STD-202, 10G swept sine 10 to 500Hz		imperature ivarige							
Vibration Per MIL-STD-202, 10G swept sine 10 to 500Hz		I Shock							
		Conditions							