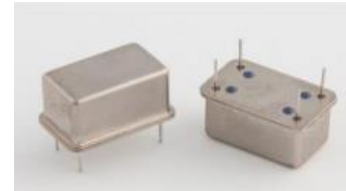


### OCXO SERIES IEEE 2100

#### FEATURES

IEEE 1588 compatible  
 Miniature OCXO in standard 14-pin DIP package  
 Fast warm up  
 Frequencies up to 100 MHz



#### ELECTRICAL SPECIFICATIONS

PARAMETER	SYMBOL	CONDITION	VALUE			UNIT
			Min.	Typ.	Max.	
Frequency Range*	$f_0$		5.000		100.000	MHz
Supply Voltage	$V_s$	$V_s \pm 5\%$	3.135	3.3	3.465	V
			4.75	5.0	5.25	
			11.40	12.0	12.60	
Power Consumption	$P_s$	Steady state, @ 25°C			0.7	W
	$P_{s,w}$	During warm-up, @ 25°C			2.8	
Warm-up Time	$t_w$	$V_s, T_a = +25^\circ\text{C}$ , within $\pm 100$ ppb of final frequency with reference after 1 hour on			5	min
Frequency Calibration	$\Delta f/f_0$	$T_a = +25^\circ\text{C}$ , after 15mins power on ref. to nominal frequency	-200		+200	ppb
Frequency Stability vs. Temperature*	$\Delta f/f_0 (T_a)$	Measurement referenced to $(f_{max} + f_{min})/2$ . See Table	-5		+5	ppb
Frequency Stability vs. Supply Voltage	$\Delta f/f_0 (\Delta V_{CC})$	$T_a = 25^\circ\text{C}$ , $V_s \pm 5\%$ , load = 15pF	-5		+5	ppb
Frequency Stability vs. Load Variation	$\Delta f/f_0 (\Delta I)$	$T_a = 25^\circ\text{C}$ , $V_s$ , load = 15pF $\pm 5\%$	-5		+5	ppb
Aging, after 30 days of operation	$\Delta f/\Delta t_d$	Per day	-1		+1	ppb
	$\Delta f/\Delta t_y$	First year	-150		+150	ppb
	$\Delta f/\Delta t_y$	10 years	-1.2		+1.2	ppm
Operating Temperature Range*		See Table 1	-40		+85	°C
Storage Temperature	$T_{(stg)}$		-40		+105	°C
Short Term Stability		$\tau = 1s$			0.05	ppb
Control Voltage Range	$V_C$		0	1.65	3.0	V
Frequency Tuning Range		$V_C = 0V$	-4		-2	ppm
		$V_C = 1.65V$	-200		+200	ppb
		$V_C = 3.3V$	+2		+4	ppm
Linearity			-10		+10	%

\*Not any Combination Frequency-Operating Temperature Range- Stability is available. Please consult factory

\*\*The above Specification is an example for 20.000MHz, 3.3V

**OCXO SERIES IEEE 2100**

**PHASE NOISE**

PARAMETER	SYMBOL	CONDITION	VALUE			UNIT
			Min.	Typ.	Max.	
@1 Hz Offset	$\mathcal{E} (\Delta f)$				-85	dBc/Hz
@10 Hz Offset	$\mathcal{E} (\Delta f)$				-115	dBc/Hz
@100 Hz Offset	$\mathcal{E} (\Delta f)$				-135	dBc/Hz
@1 kHz Offset	$\mathcal{E} (\Delta f)$				-148	dBc/Hz
@10 kHz Offset	$\mathcal{E} (\Delta f)$				-152	dBc/Hz
@100 kHz Offset	$\mathcal{E} (\Delta f)$				-155	dBc/Hz

**CMOS OUTPUT CHARACTERISTICS**

PARAMETER	SYMBOL	CONDITION	VALUE			UNIT
			Min.	Typ.	Max.	
Output Levels	$V_{OH}/V_{OL}$	$V_{CC} = 3.3V, \text{load} = 15pF$		2.4/0.4		V
Duty Cycle	DC	load = 15pF		45/55		%
Rise/Fall Time	$t_r/t_f$	10% ~ 90% $V_{out}$			5	ns
Load				15		pF

**SINE-WAVE OUTPUT CHARACTERISTICS**

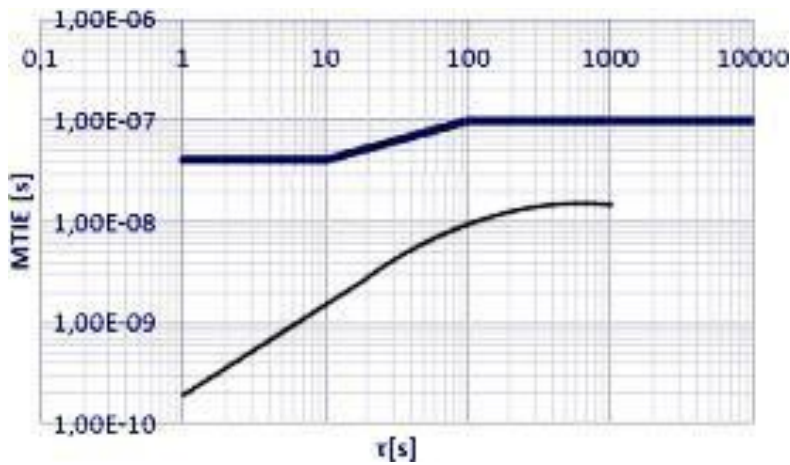
PARAMETER	SYMBOL	CONDITION	VALUE			UNIT
			Min.	Typ.	Max.	
Output Levels			5	7	9	dBm
Harmonics					-40	dBc
Spurious					-70	dBc
Load				50		$\Omega$

Table 1

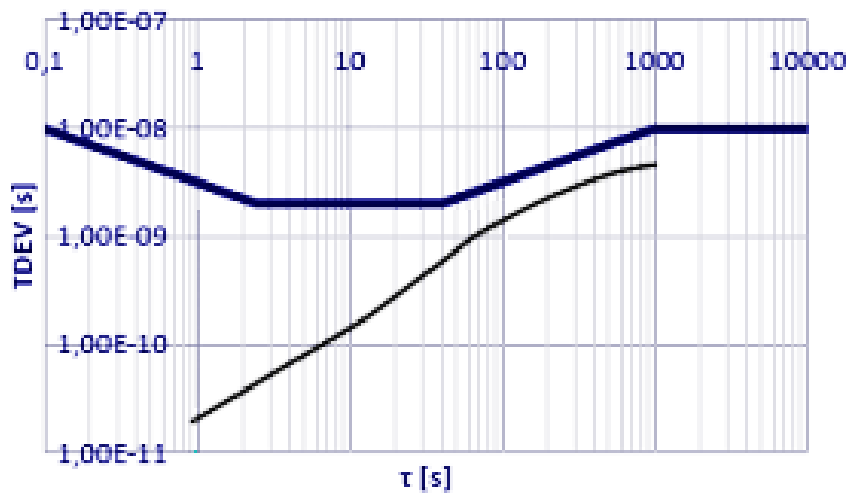
TEMPERATURE RANGE °C	FREQUENCY STABILITY (ppb)						
	5	10	20	30	50	100	200
0 ~ +60	Y	Y	Y	Y	Y	Y	Y
-10 ~ +60	Y	Y	Y	Y	Y	Y	Y
-20 ~ +70	Y	Y	Y	Y	Y	Y	Y
-30 ~ +70	Y	Y	Y	Y	Y	Y	Y
-40 ~ +75	Y	Y	Y	Y	Y	Y	Y
-40 ~ +85	Y	Y	Y	Y	Y	Y	Y
-55 ~ +85	-	-	Y	Y	Y	Y	Y

**OCXO SERIES IEEE 2100**

**MTIE**



**TDEV**

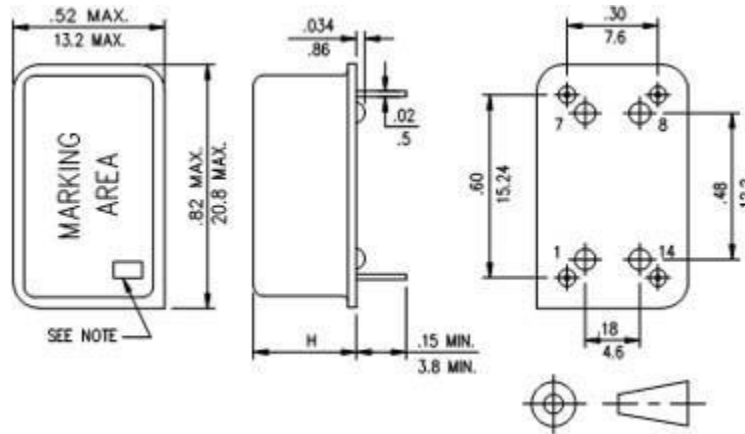


**OCXO SERIES IEEE 2100**

**ENVIRONMENTAL MECHANICAL CONDITIONS**

Storage temperature range	-55°C to +105°C
Drop Test	The test shall be carried out as the provisions of the IEC60028-2-32 test Ed. 10cm height, 3 times on hard board with thickness of 3cm
Bumping Test	Device are bumped to three mutually perpendicular axes at peak acceleration of 400m/s <sup>2</sup> , each 4000±10times, 6ms pulse duration time
Vibration Test	Frequency range: 1Hz-4Hz-100Hz-200Hz Acceleration: 0.0001g <sup>2</sup> /Hz-0.01g <sup>2</sup> /Hz-0.01g <sup>2</sup> /Hz-0.001g <sup>2</sup> /Hz Grms=1.15g Sweep time: 30 minutes (perpendicular axes each sweep time)
Mechanical Shock	100g, 6mS duration, 1/2 sine wave, 3 shocks each direction along 3 mutually perpendicular planes.
Thermal shock	0.5h@-40°C, 0.5h@+85°C, Note: the changing time < 30 seconds, cycling for 100 times

**MECHANICAL DIMENSIONS AND PIN FUNCTIONING**



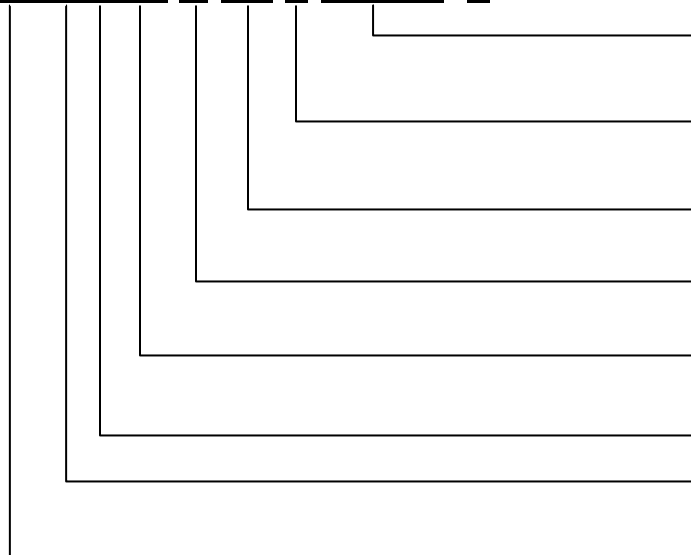
PIN	SYMBOL	FUNCTION
1	N/C or Vc	No connect or Control Voltage
7	GND	Ground
8	OUTPUT	RF Output
14	Vs	Supply Voltage

**OCXO SERIES IEEE 2100**

■ PART NUMBERING SYSTEM

Prefix	Output Type	Control Voltage	Series	Revision	Temperature Range	Stability	Frequency	Supply Voltage
OX	4: LVCMOS 6: SINE	1: No Control Voltage 5: Control Voltage	20:2000	A	First letter: Lowest Temperature, Second letter: Highest Temperature: From A=-55°C to Z=+70°C, Then: 1=+75°C, 2=+80°C, 3=+85°C... in 5°C Steps Example: HZ: -20°C to +70°C LZ: 0°C to +70°C D3: -40°C to +85°C	Value x 10E-2 in ppm  Example: 0.5= 5 ppb 1= 0.01 ppm	In MHz	3: 3.3 V 5: 5.0 V 12: 12.0 V

**OX 4 5 20 A-D3-1-20.000- 5**



Supply Voltage: 5 V

Frequency: 20 MHz

Temp Stability:  $1 \times 10E^{-2} = \pm 0.01$  ppm

Operating Temp Range: -40° C to 85°C

Revision: "A"

SERIES: 2000

Electrical Control Voltage

Output: LVCMOS

Prefix: OCXO

March, 2021