



EX-245 Series

Hi-Reliability Evacuated Miniature Crystal Oscillator
EMXO™



Features

- Radiation Tolerant to > 100krad (SI) total dose
- Low power consumption: <0.7W @ 25°C, <1.1W @ -40°C
- Low profile package: 0.93"(W) x 1.03" (L) x 0.35" (H)
- Fast warm-up: 3 minutes @ 25°C
- Frequencies: 10 to 20MHz
- Screen to Class S* per MIL-PRF-55310
- Patented Technique**

Applications

- Reference clock for space application
- Military airborne and Mobile system

Note: * Limit upper temperature to 85°C and Constant Acceleration to 1000Gs
* Fine Leak test is not applicable due to the package seal under vacuum
** U.S. Patent 5,917,272

Performance Characteristics

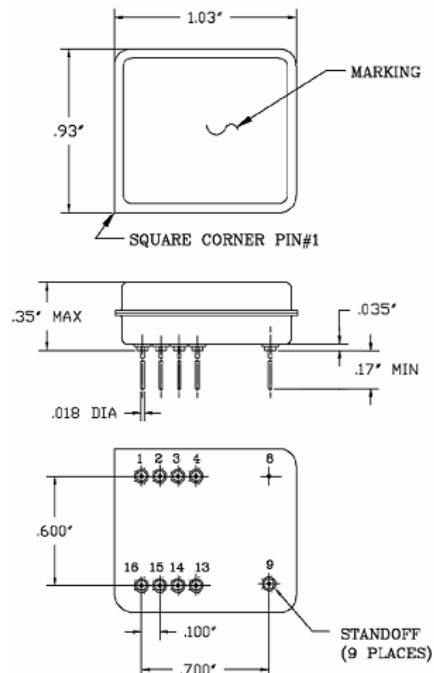
Parameters	Options	Conditions	units	Minimum	Typical	Maximum
Frequency			MHz	10		20
Supply Voltage	C		V	4.75	5.0	5.25
Power Consumption		Turn-on Power for 2 minutes @ 25°C	W			2
		Steady State @ 25°C	W			0.70
		Steady State @ -40°C	W			1.10
Warm-up Time @ 25°C		<1 x 10 ⁻⁶	Sec			120
		<1 x 10 ⁻⁷	Sec			180
Temperature		Operating	°C	-40		+85
		Storage	°C	-55		+85
CMOS Output	A	Duty Cycle	%	40		60
		Rise/Fall Time (10% to 90% Vdd) with 15pF Load	nSec			7
		Logic Level "0"	Volt			0.1Vdd
		Logic Level "1"	Volt	0.9Vdd		
Sine Output	G	Sine into 50Ohms Load	dBm	0.0	1.5	3
	H	Sine into 50Ohms Load	dBm	3.0	4.5	6
		Harmonics	dBc			-25
		Spurious	dBc			-60
Stability	C-308	0°C to +70°C Reference to Frequency @ 25°C	ppb			+/-30
	D-508	-20°C to +70°C Reference to Frequency @ 25°C	ppb			+/-50
	F-107	-40°C to +85°C Reference to Frequency @ 25°C	ppb			+/-100
		+/-5% of Supply Voltage	ppb			+/-10
		+/-5% of Load Change	ppb			+/-10
Aging		After 7 days of operation	ppb/day			2
		1 st Year	ppb/year			200
		10 to <12MHz	ppb/10year			1000
		12 to <16MHz	ppb/10year			1500
		16 to 20MHz	ppb/10year			2000
Allan Deviation		Tau = 1 second				2 x 10 ⁻¹⁰
Phase Noise		@ 10Hz	dBc/Hz			-100
		@ 100Hz	dBc/Hz			-130
		@ 1kHz	dBc/Hz			-140
		@ 10kHz	dBc/Hz			-145
		@ 100kHz	dBc/Hz			-150
EFC (0V to 4V)	A	Reference to nominal frequency		Sufficient to compensate 10 years aging		
Fixed Frequency	F	Initial Accuracy reference to nominal frequency	ppm	-1.0		+1.0
Vref		Source Current 1mA maximum	Vdc	4.0	4.1	4.2
G-Sensitivity		Test at 10g sine vibration at 100Hz	/g			1 x 10 ⁻⁹

Environmental Conditions (Designed to meet)

- Radiation Tolerant (operating): Active devices are selected from a family of product that is inherently radiation tolerant to meet 100krad (SI) total dose
- Mechanical Shock (survive)***: MIL-STD-202, Test Method 213, Condition E (1000G, 0.5msec)
- Vibration Random (survive)***: MIL-STD-202, Test Method 214, Condition I-F (20Grms, 3 minutes/axis)
- Vibration Sine (survive)***: MIL-STD-202, Test Method 204, Condition D (20Grms, 20 minutes/axis)

Note: *** Met by design, not tested

Package Outline

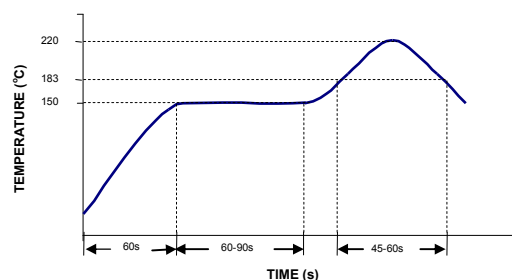


Pin Function

Pin #	With EFC	Fixed Frequency
1	EFC	No Connection
2-4	No Connection	No Connection
8	Case/GND	Case/GND
9	Output	Output
13-14	No Connection	No Connection
15	Vref	No Connection
16	Supply	Supply

Pin numbers are for reference only. They do not appear on unit

Reflow Profile



Ordering Information

