



EX-240 Series

Evacuated Miniature Crystal Oscillator
EMXO™

Description

The EX-240 Series offers a ruggedized hybrid thick film construction in a low profile hermetically sealed 16pin DQIL package, which can withstand severe environmental conditions. This product utilizes VI's EMXO™ technology resulting in excellent stability performance and fast warm-up with low power consumption.

Features

- Temperature Stability to $\pm 3 \times 10^{-8}$ over -20°C to $+70^{\circ}\text{C}$
- Low power consumption: $<0.7\text{W}$ @ 25°C , $<1.1\text{W}$ @ -40°C
- Low profile package: $0.93''(\text{W}) \times 1.03''(\text{L}) \times 0.35''(\text{H})$
- Fast warm-up: 2 minutes @ 25°C
- Frequencies: 10 to 20MHz
- Patented Technique (U.S. Patent 5,917,272)

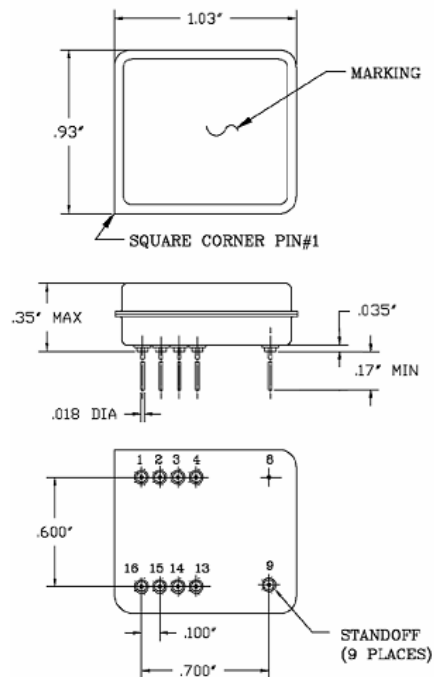
Performance Characteristics

Parameters	Options	Conditions	units	Minimum	Typical	Maximum
Frequency			MHz	10		20
Supply Voltage	D		V	3.135	3.3	3.465
	C		V	4.75	5.0	5.25
Power Consumption		Turn-on Power for 2 minutes @ 25°C	W			2.5
		Steady State @ 25°C	W			0.70
		Steady State @ -40°C	W			1.10
Warm-up Time @ 25°C		$<1 \times 10^{-6}$	Sec			90
		$<1 \times 10^{-7}$	Sec			120
Temperature		Operating	$^{\circ}\text{C}$	-55		+85
		Storage	$^{\circ}\text{C}$	-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-208	0°C to $+70^{\circ}\text{C}$ Reference to Frequency @ 25°C	ppb			± 20
	D-308	-20°C to $+70^{\circ}\text{C}$ Reference to Frequency @ 25°C	ppb			± 30
	F-508	-40°C to $+85^{\circ}\text{C}$ Reference to Frequency @ 25°C	ppb			± 50
		$\pm 5\%$ of Supply Voltage	ppb			± 10
		$\pm 5\%$ of Load Change	ppb			± 10
Aging		After 7 days of operation	ppb/day			2
		1 st Year	ppb/year			200
		10 to $<12\text{MHz}$	ppb/10year			1000
		12 to $<16\text{MHz}$	ppb/10year			1500
		16 to 20MHz	ppb/10year			2000
Allan Deviation		$\text{Tau} = 1$ second				2×10^{-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 Vdd)	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
G-Sensitivity		Test at 10g sine vibration at 100Hz	/g			1×10^{-9}

Environmental Conditions (Designed to meet)

- 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-H (20Grms, 3 minutes/axis)
- Vibration Sine (survive): MIL-STD-202, Test Method 204, Condition D (20Grms, 20 minutes/axis)
- Thermal Shock (survive): MIL-STD-202, Test Method 107, Condition A-2 (50 Cycles, -55°C to +85°C)

Package Outline

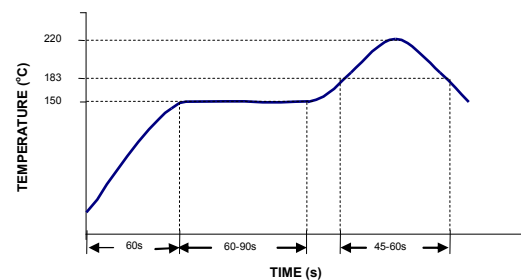


Pin Function

Pin #	With EFC	Fixed Frequency
1	EFC	No Connection
2-4	No Connection (Internal use only)	No Connection (Internal use only)
8	Case/GND	Case/GND
9	Output	Output
13-15	No Connection	No Connection
16	Supply	Supply

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

Reflow Profile



Ordering Information

