VECTRON INTERNATIONAL
A DOVER COMPANY

EX-420

Evacuated Miniature Crystal Oscillator

Description

The EX-420 provides exceptionally low aging rates and tight temperature stabilities in an extremely small package over a wide range of environmental conditions. This EMXO series bridges the gap between current large, high precision OCXO's and smaller TCXO's. The EX-420 Series becomes the most economical choice where there is a need for spectral purity, short and long term stability, along with small size and dramatically reduced power consumption.

Features

- 4-Pin Half Dip
- Fast Warmup
- Low Power Consumption
- Previous Model Number: EX-620 series
- Frequency Range: 10 MHz - 30 MHz

Applications

- SONET/SDH, DWDM, FDM, ATM, 3G
- Telecom Transmission and Switching Equipment
- Wireless Communication Equipment
- Military Airborne and Mobile systems

Performance Specifications

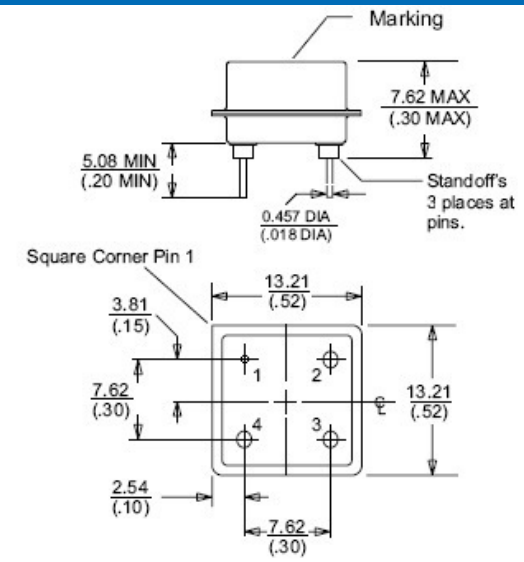
Frequency Stabilities[1]					
Parameter	Min	Typ	Max	Units	Condition
vs. operating temperature range (referenced to +25°C)	-50 -75 -100		+50 +75 +100	ppb ppb ppb	0… +70°C -20… +70°C -40… +85°C

Performance Specifications

Frequency Stabilities[1]						
Parameter		Min	Typ	Max	Units	Condition
vs. Stratum 3 per GR-1244-CORE	Operating Temp	-140 -140		+140 +140	ppb ppb	-20… +70°C -40… +85°C
	Holdover	-370		+370	ppb	24 hours
	Drift	-4.63		+4.63	ppb	Over 7100 seconds
	MTIE			+1	10-13/sec ppm	0.16 sec < Observe Times < 64 sec
Warm-up Time				1 1.5	minutes minutes	to ± 100 ppb of final frequency (1 hour) @+25°C to ± 100ppb of final frequency (1 hour) @-40°C
Initial Accuracy		-1		+1	ppm	fixed frequency, no EFC input
vs. supply voltage change		-20		+20	ppb	VS ± 5%
vs. load change		-10		+10	ppb	Load ± 5%
vs. aging / day		-2.0		+2.0	ppb	after 30 days of operation
vs. aging / 1 year		-300		+300	ppb	after 30 days of operation
Supply Voltage (Vs)						
Supply voltage (Standard)		4.75	5.0	5.25	VDC	
Supply voltage (Option)		3.135	3.3	3.465	VDC	
Power Consumption				1.5 0.3 0.6	Watts Watts Watts	during warm-up steady state @ +25°C steady state @ -40°C
RF Output						
Signal [Standard]		HCMOS				
Load			15		pF	
Signal Level (Vol)				0.1	VDC	
Signal Level (Voh)		0.8			VDC	
Duty cycle		40		60	%	(Voh-Vol)/2
Signal [Standard]		Sinewave				
Load			50		ohm	
Output Power [Standard] Output Power [Option]		0 +3		+4 +7	dBm dBm	50 Ohm load 50 Ohm load
Harmonics				-30	dBc	50 Ohm load
Spurs				-60	dBc	50 Ohm load
Frequency Tuning (EFC) 10 to 80 MHz						
Tuning Range		Fixed EMXO; No adjust				
Tuning Range		±3.0		±10.0	ppm	from 0V to Vs
Linearity				20	%	
Tuning Slope		Positive				
Additional Parameters						
Phase Noise				-100 -130 -140 -145	dBc/Hz dBc/Hz dBc/Hz dBc/Hz	10 Hz 100 Hz 1 KHz 10 KHz
Allan Deviation				0.2	ppb	Tau = 1 sec to 10 sec
Weight				3	g	
Processing & Packing		Handling & processing note				
Absolute Maximum Ratings						
Supply Voltage				5.5	VDC	
Output Load				30	pF	

Frequency Stabilities[1]					
Parameter	Min	Typ	Max	Units	Condition
Operable temperature range	-55		+85	°C	
Storage temperature range	-55		+85	°C	
Environmental Conditions					
• Mechanical Shock (survive)	MIL-STD-202, Test Method 213, Condition E (100G, 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)				

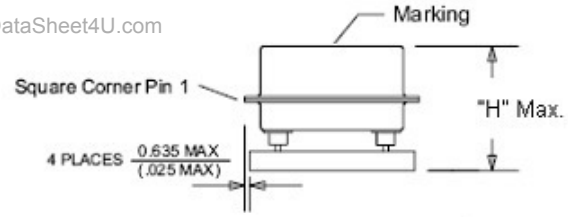
Outline Drawing / Enclosure



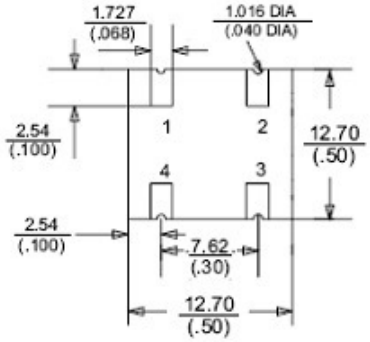
mm
(in.)

Dimensions in mm (inches)

Type A		
Code	Height "H"	Pin Length "L"
0	7.62	5.08
Type B		
Code	Height "H"	Pin Length "L"
1	8.89	NA
2	9.65	NA

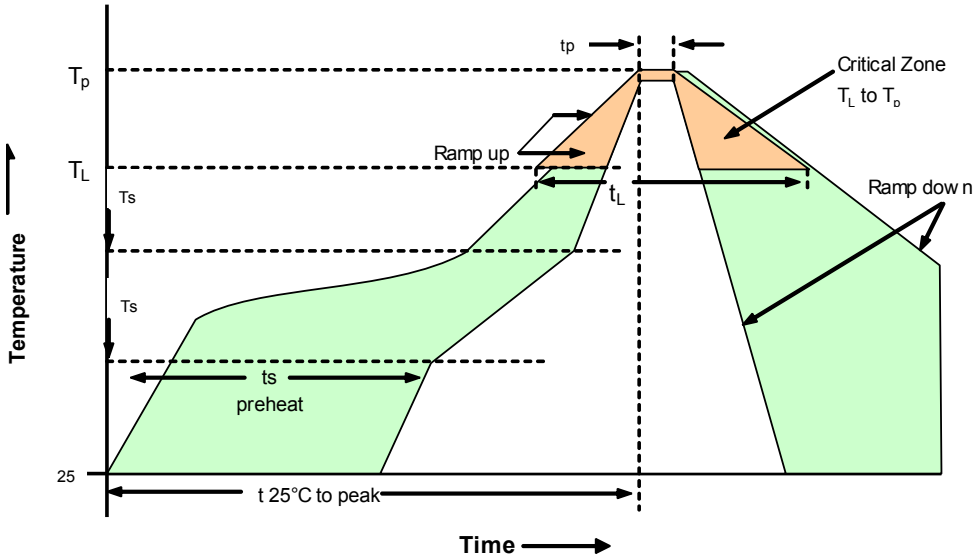


Pin Connections	
1	EFC \ No Connect
2	Ground (Case)
3	RF Output
4	Supply Voltage Input



mm
(in.)

Recommended Reflow Profile



Profile Feature	Sn-Pb Assembly	Profile Feature	Sn-Pb Assembly
PRECAUTION: Series shall not expose to temperature higher than 230°C. If exposing to temperature higher than 230°C, stability and power consumption may permanently degrade.			
Average ramp-up rate (TL to Tp)	3°C/second max.	Time 25°C to Peak Temperature	4 minutes max.
Preheat -Temperature Min Tsmin) -Temperature Min Tsmax) -Time (min to max) (ts)	135°c 155°c 60-90 seconds	Time maintained above - Temperature (TL) - Time (tL)	 183°C 45-60 seconds
Tsmax to TL - Ramp-up Rate	3°C/second max.		
Time maintained above - Temperature (TL) - Time (tL)	 183°C 45-60 seconds	 Time within 5°C of actual Peak Temperature (tp)	 10-20 seconds max.
Peak Temperature (Tp)	max 220°C	Ramp-down Rate	6°C/second max.
Note: All temperatures refer to topside of the package, measured on the package body surface.			

Ordering Information

EX - 420 0 - D A J - 107 0 - 10M0000000

Product Family
EX: EMXO

Package
13x 13mm

Height
0: A 7.62mm (HCMOS only)
1: B 8.89mm (HCMOS only)
2: B 9.65mm (Sinewave only)

Supply Voltage
D: 5 Vdc
E: 3.3 Vdc

RF Output Code
A: HCMOS
E: Sinewave

Temperature Range
E: -40°C to +85°C
J: -20°C to +70°C
T: 0°C to +70°C

Stability Code
508: ±50ppb
758: ±75ppb
107: ±100ppb
147: ±140ppb(ST3)

Frequency Control
0: Fixed Frequency (HCMOS)
1: Fixed Frequency (0 dBm)
2: Fixed Frequency (+3 dBm)
3: Electrical Tuning (HCMOS)
4: Electrical Tuning (0 dBm)
5: Electrical Tuning (+3 dBm)

Frequency

Notes:

1. Contact factory for improved stabilities or additional product options. Not all options and codes are available at all frequencies.
2. Unless other stated all values are valid after warm-up time and refer to typical conditions for supply voltage, frequency control voltage, load, temperature (25°C).
3. Phase noise degrades with increasing output frequency.
4. Subject to technical modification.
5. Contact factory for availability.

For Additional Information, Please Contact

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