

Helping Customers Innovate, Improve & Grow



Features

- 16 pin Double Dip Package
- Ruggedized hybrid thick film construction
- Low Power Consumption
- Frequency Range: 10 MHz to 40 MHz
- Previous Model: EX-245

Applications

- Severe Environmental Conditions

Performance Specifications

Parameter	Min	Typ	Max	Units	Condition
Frequency Stabilities¹					
[10 to 20 MHz]					
vs. operating temperature range (referenced to +25°C)	-50		+50	ppb	0... +60°C
	-75		+75	ppb	-20... +70°C
	-100		+100	ppb	-40... +85°C
Initial tolerance for fixed frequency	-1.0		+1.0	ppm	fixed, no adjust
Stability	-0.2		+0.2	ppm	
vs. supply voltage change	-15		+15	ppb	VS ± 5%
vs. load change	-15		+15	ppb	Load ± 5%
vs. aging / day	-2		+2	ppb	after 7 days of operation
vs. aging / 1 year	-200		+200	ppb	
vs. aging / 10 year (10 to <12 MHz)	-1000		+1000	ppb	
vs. aging / 10 year (12 to <16 MHz)	-1500		+1500	ppb	
vs. aging / 10 year (16 to 20 MHz)	-2000		+2000	ppb	
Warm-up Time ²			120	seconds	to ± 1ppm of final freq. @+25°C
			180	seconds	to ± 100ppb of final freq. @+25°C
Frequency Stabilities¹					
[>20 to 40 MHz]					
vs. operating temperature range (referenced to +25°C)	-75		+75	ppb	0... +60°C
	-100		+100	ppb	-20... +70°C
	-150		-150	ppb	-40... +85°C

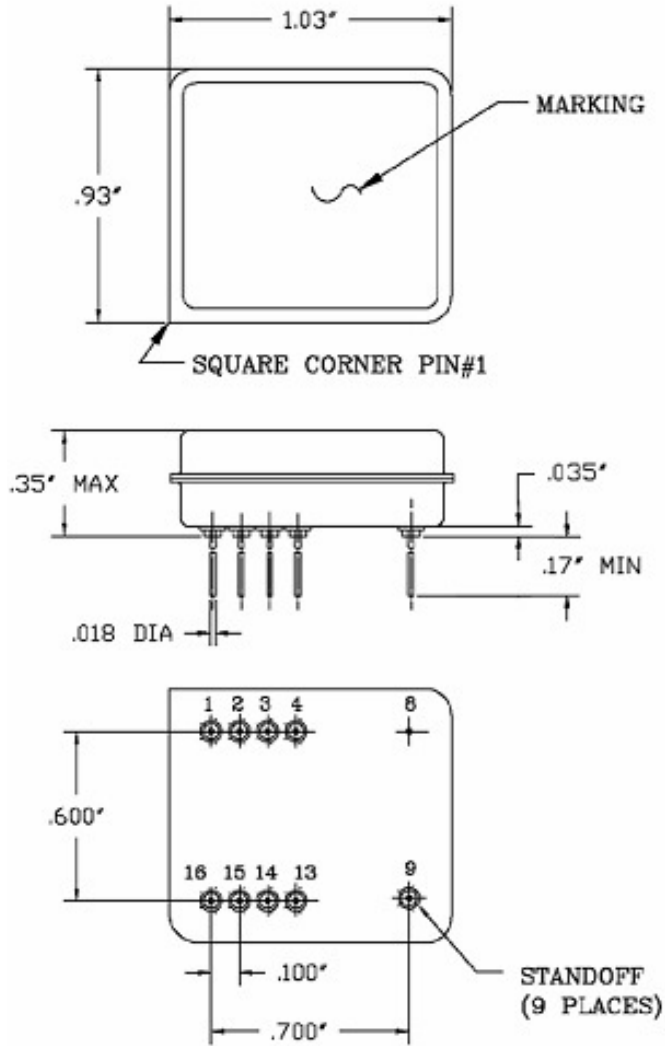
Performance Specifications

Parameter	Min	Typ	Max	Units	Condition
Initial tolerance for fixed frequency	-1.5		+1.5	ppm	fixed, no adjust
Stability	-0.3		+0.3	ppm	
vs. supply voltage change	-25		+25	ppb	VS ± 5%
vs. load change	-25		+25	ppb	Load ± 5%
vs. aging / day	-3		+3	ppb	after 7 days of operation
vs. aging / 1 year	-300		+300	ppb	
vs. aging / 10 year	-3000		+3000	ppb	
Warm-up Time ²			120 180	seconds seconds	to ± 1ppm of final freq. @+25°C to ± 100ppb of final freq. @+25°C
Supply Voltage (Vs)					
Supply voltage (Standard)	4.75	5.0	5.25	VDC	
Power Consumption			2.2 0.7 1.2	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	Vdd	
Signal Level (Voh)	0.9			Vdd	
Rise/Fall Time			+7	ns	(10-90%)
Duty cycle	40		60	%	(Voh-Vol)/2
Signal [Option]	Sinewave				
Load		50		ohm	
Output Power (Standard)	0.0	+2.0	+4.0	dBm	50 ohm load
Output Power (Option)	+3.0	+5.0	+7.0	dBm	50 ohm load
Harmonics			-25	dBc	
Spurious			-60	dBc	
Frequency Tuning (EFC)					
Tuning Range	Fixed OCXO; No adjust				
Tuning Range	Sufficient to compensate for 10 years aging				EFC (0V to 4V)
Vref	+4.0	+4.1	+4.2	VDC	source current 1 mA maximum
Additional Parameters¹ [10 to 20 MHz]					
Phase Noise ³ (10 to 20 MHz)			-100	dBc/Hz	10 Hz
			-125	dBc/Hz	100 Hz
			-140	dBc/Hz	1 kHz
			-145	dBc/Hz	10 kHz
			-145	dBc/Hz	10 kHz
Phase Noise ³ (>20 to 40 MHz)			-90	dBc/Hz	10 Hz
			-115	dBc/Hz	100 Hz
			-130	dBc/Hz	1 kHz
			-140	dBc/Hz	10 kHz
			-140	dBc/Hz	10 kHz
G-Sensitivity			1	ppb/g	Test at 10g sine vibration at 100Hz

Performance Specifications

Parameter	Min	Typ	Max	Units	Condition
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					
Screening Options					
Ordering Code	S			B	
Test Inspection	S-Level Screening			B-Level Screening	
Nondestructive Bond Pull	MIL-STD-883 Method 2023			N/A	
Internal Visual Per Mil-PRF-55310 Requirement	Internal Visual Per Mil-PRF-55310 Requirement			Internal Visual Per Mil-PRF-55310 Requirement	
Stabilization Bake	MIL-STD-883 Method 1008, Condition C	150°C for 48hrs		MIL-STD-883 Method 1008, Condition C	150°C for 48hrs
Thermal Shock	MIL-STD-883 Method 1011, Condition A	0°C to 100°C for 15cycles		N/A	
Temperature Cycling (1)	MIL-STD-883 Method 1010, Condition A	-55°C to 85°C (2) for 10cycles		MIL-STD-883 Method 1010, Condition A	-55°C to 85°C (2) for 10cycles
Constant Acceleration (1)	MIL-STD-883 Method 2001	1000g's (3) Y1 Only		MIL-STD-883 Method 2001	1000g's (3) Y1 Only
PIND	MIL-STD-883 Method 2020, Condition B	10g peak at 60Hz minimum		N/A	
Electrical Test	Per Mil-PRF-55310 Requirement			Per Mil-PRF-55310 Requirement	
Burn-in (1)	85°C (2) for 240hrs			85°C (2) for 240hrs	
Radiographic	MIL-STD-883 Method 2012			N/A	
Note: (1) These test inspections deviate from screening requirements for class 2 oscillator in MIL-PRF-55310. (2) The maximum operating and storage temperature of the EX-209 is +85°C. The EX-209 shall not be exposed to temperature higher than +85°C at length of time. (3) The design and construction of the EX-209 can withstand up to 1000g's constant acceleration					

Outline Drawing / Enclosure

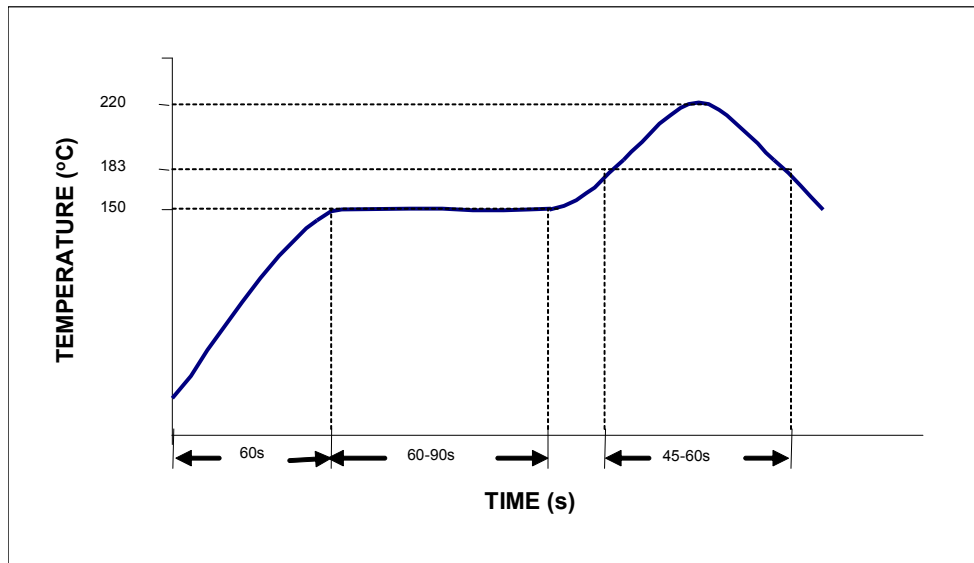


Dimensions in inches (mm)

Type A		
Code	Height "H"	Pin Length "L"
0	0.35 (8.9 mm)	0.17

Pin Connections	
1	EFC \ No Connect
2-4	No Connect
8	Ground (Case)
9	Output
13-14	No Connect
15	Vref \ No Connect
16	Supply Voltage Input

Recommended Reflow Profile



Ordering Information

EX - 209 0 - D A J - 002S - 10M0000000

Product Family
EX: EMXO

Package
25 x 25 mm

Height
0: A0.35"

Supply Voltage
D: 5 Vdc

RF Output Code
A: HCMOS
E: Sinewave

Temperature Range
E: -40°C to +85°C
J: -20°C to +70°C
S: 0°C to +60°C

Frequency

Platform Code

Tuning Option (1st digit):
0: Fixed Frequency
1: Electrical Tuning

Output Power (2nd digit)
0: 0 dBm
1: +3 dBm

Stability Code (3rd digit)
0: ±50ppb
1: ±75ppb
2: ±100ppb
3: ±150ppb

Screening Option (4th digit)
S: "S" Level screening, Swept Quartz
C: "B" Level screening, Swept Quartz
B: "B" Level screening, Un-Swept Quartz
E: "EM" Engineering Model, Un-Swept Quartz
P: Proof of Design "POD-Prototype", Un-Swept Quartz

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.

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