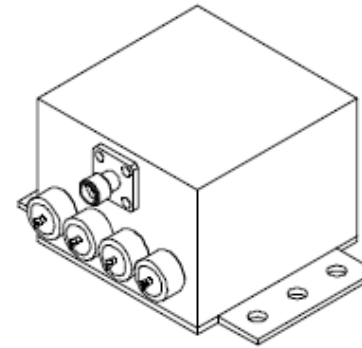
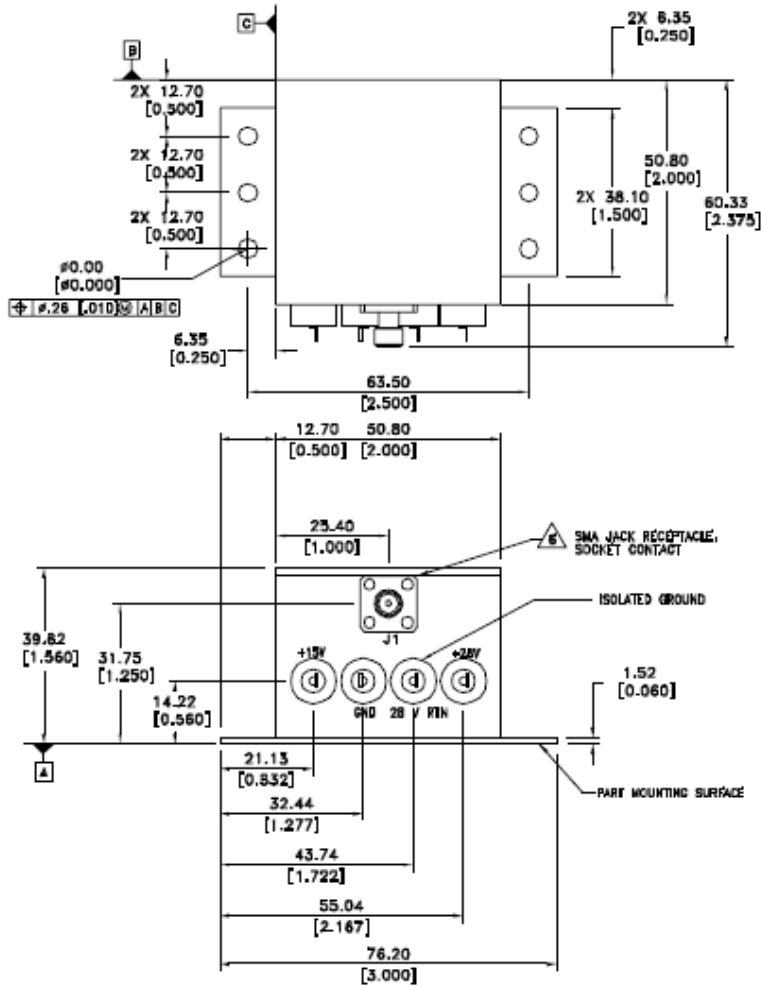


REV	DATE	REVISION RECORD	DWN	AUTH
-	09-30-13	Draft	Liz	
A	12-21-22	Updated Finish Spec; added COTS model	MAS	



ISOMETRIC FOR REFERENCE ONLY



Wenzel Associates, Inc.
Austin, Texas

Title: 100.0 MHz-SC Space Crystal Oscillator				
P/N: 501-27273	Rev: A	Date: 09-30-13	Drawn:	Ref: OCXO-1
Tolerances: (except as noted) Dimensions are in inches	0.XX Dec: ±0.030"	0.XXX Dec: ±0.010"	FSCM: 62821	Page 1 of 3

GENERAL REQUIREMENTS

Material, Design and Construction MIL-PRF-55310
 Parts and Materials List Supplied
 Crystal Premium Q, Z-swept, synthetic quartz
 Outgassing TML<1% and CVCM <0.1% per SP-R-002A
 Traceability Semiconductor and passive lot and date code tracking
 De-rating per EEE-INST-002, (JPL-D-8545, alternative)
 Soldering J-STD-001 class 3
 Case Nickel-plated aluminum housing
 Finish Electroless nickel per AMS 2404, Class I

ELECTRICAL PERFORMANCE

RF Output Frequency 100 MHz (fixed, please specify), sine wave
 Frequency Accuracy (initial) $\pm 2 \times 10^{-8}$ at +25°C
 Frequency Stability $\pm 1 \times 10^{-7}$ for -10°C to +50°C (ref +25°C)
 Aging Rate (after 90 days operating)
 1 day $\pm 2 \times 10^{-9}$
 1 month $\pm 5 \times 10^{-8}$
 RF Output Power +13 dBm ± 1.5 dB into 50Ω
 RF Output 2nd Harmonic -30 dBc
 RF Output Sub-harmonics ≤ -40 dBc
 RF Output Spurious ≤ -100 dBc, 100 KHz to 1 GHz
 Phase Noise (Static)
 100 MHz
 100 Hz -100 dBc/Hz
 1 KHz -130 dBc/Hz
 10 KHz -160 dBc/Hz
 Supply voltage +15 VDC $\pm 5\%$
 Warm-up power ≤ 5 watts
 Warm-up time ≤ 20 minutes at ambient pressure $\leq 5 \times 10^{-5}$ torr
 Input power ≤ 2 watts steady state at ambient pressure $\leq 5 \times 10^{-5}$ torr

ENVIRONMENTAL CONDITIONS

Operating temperature -10°C to +50°C
 Storage temperature -40°C to +105°C
 Ambient pressure Atmospheric (760 torr), Vacuum ($\leq 5 \times 10^{-5}$ torr)

MECHANICAL SPECIFICATIONS

Size 3" x 2" x 1.44"
 Weight ≤ 300 grams
 Physical Pressure relief holes, vented

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MODEL DEFINITIONS

EM (Engineering Model) Design and Construction similar in appearance and identical in form, fit, and function to FM. Developed using best commercial practice, including some commercial parts and materials. EM shall be subjected only to electrical tests, with some environmental testing performed.

FM (Flight Model) Fabricated to meet all design, construction, and test requirements reference MIL-PRF-55310, Class 1, Product level S. FM shall be subjected to the entire compliment of electrical and environmental acceptance tests listed.

Qualification Model EM unit, when specified, using EEE-INST-002, Level 1,2,3 parts where available. Testing for (1) unit.

COTS Form/Fit/Function COTS equivalent. Electrical performance only, room ambient pressure and temperature.

501-27273-01 EM Engineering Model

501-27273-02 Qualification Model

501-27273-03 FM Flight Model

501-27273-COTS Commercial Model

Flight Model Space Level, Parts EEE-INST-002, Level 1,2,3
 MIL-PRF-3098 Level 2 Crystals, Tested to Table 2, Qual Table 3 by similarity
 MIL-PRF-19500 / MIL-STD-750 Semiconductors,
 JANTXV with PIN D, JANTX with PIN D and DPA (5 ea)

Wenzel Associates, Inc.				
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QUALIFICATION TESTS (Non-flight model, only)

Group I (1 samples)	Visual, Electrical Tests*
Burn-In (operational)	240 hours minimum at +75°C
Group II (1 samples)	
Aging	30 Days
Group III Subgroup 1 (1 sample)	
Random Vibration	11.95 Grms, MIL-STD-202, method 214 I-D, 50 to 2000 Hz, 5 min per axis
Shock	MIL-STD-202, Method 213, Condition A, 50G, 11msec
Group III Subgroup 2 (1 sample)	
Thermal Shock	MIL-STD-202, Method 107, Condition A-1, 25 cycles, -55°C to +85°C
Ambient Pressure	MIL-STD-202, Method 105, at <5 x 10 ⁻⁵ torr
Group III Subgroup 3 (1 sample)	
Resistance to Soldering Heat	MIL-STD-202, Method 210, Condition A
Group III Subgroup 4 (1 sample)	
Terminal Strength	MIL-STD-202, Method 211, Condition C, Not applicable for pins <0.25"
Solderability	MIL-STD-202, Method 208
Resistance to Solvents	MIL-STD-202, Method 215 Not applicable when marking is electro-etched
Electrical Tests*	
Radiographics	MIL-STD-202, method 209

ACCEPTANCE TESTS (Flight Model)

Electrical Tests*	
Random Vibration (non-operational)	7.56 Grms overall, MIL-STD-202 Method 214 Test Cond I-B, 50 to 2000 Hz, 5 min per axis
Thermal Shock	MIL-STD-202, Method 107, Condition A, 5 Cycles, -55°C to +85°C
Electrical Tests*	
Burn-In (operational)	240 hours minimum at +75°C
Aging Rate	Projected to 30 days operating
Electrical Tests*	
Radiographics	MIL-STD-202, method 209

***ELECTRICAL TESTS**

Tested at ambient pressure ≤5 x 10⁻⁵ torr and at -40, +25, and 75°C unless otherwise noted

Warm-Up Power (-40°C only)
Warm-Up Time (-40°C only)
Input Power
Cold Start (-40°C)
Hot Start (+75°C)
RF Output Power
RF Output Harmonics
RF Output Spurious
Frequency Accuracy (+25°C only)
Frequency Stability
Phase Noise - Static (+25°C only, 760 torr)

ANALYSES

Thermal Analysis, Component Stress Analysis

REV	DATE	REVISION RECORD	DWN	AUTH
-	11-16-08	Draft	Liz	
A	12-21-22	Updated Finish Spec; added COTS model	MAS	

Wenzel Associates, Inc.

Austin, Texas

Title:

100.0 MHz-SC Space Crystal Oscillator

P/N:

501-27273

Rev:

A

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±0.030"

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FSCM:

62821Page **3** of **3**