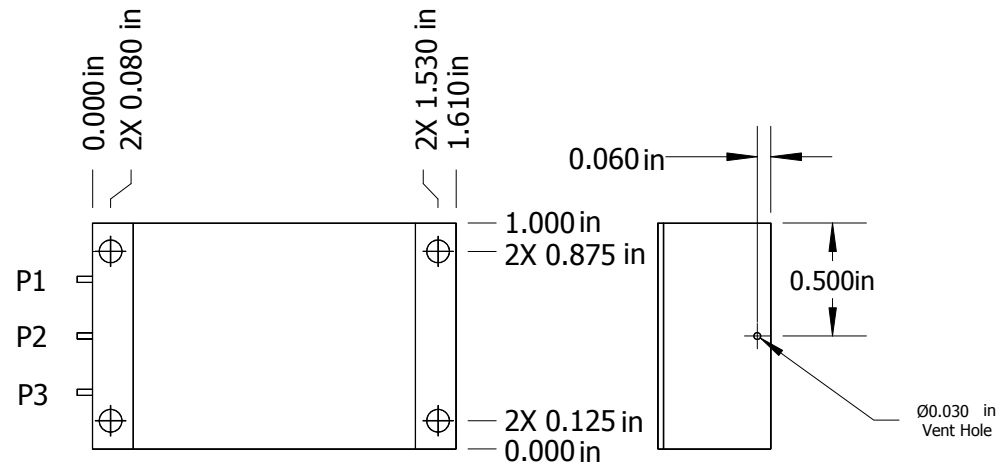
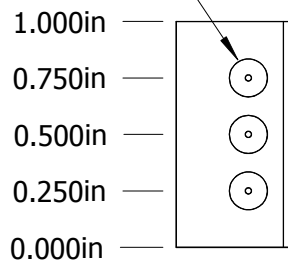
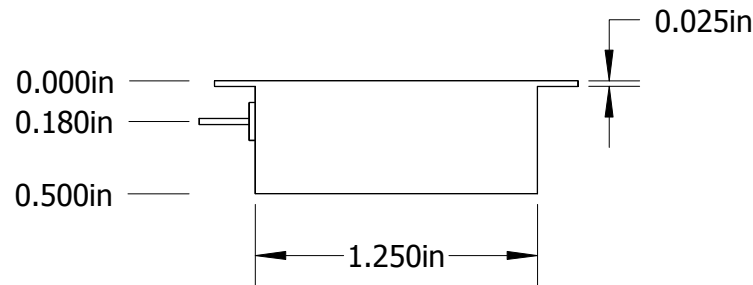



REV	DATE	REVISION RECORD	DWN	AUTH
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3X Ø0.030  
LENGTH 0.185  
TYP.



PIN	SIGNAL
P1	Supply Voltage
P2	Ground
P3	RF Out



 <b>Wenzel Associates, Inc.</b> Austin, Texas				
Title:				
<b>50.0 MHz Space Crystal Oscillator</b>				
P/N:	Rev:	Date:	Drawn:	Ref:
<b>501-28039</b>	-	<b>04-24-14</b>		15895
Tolerances: (except as noted) Dimensions are in inches	0.XX Dec: <b>±0.030"</b>	0.XXX Dec: <b>±0.010"</b>	FSCM: <b>62821</b>	Page 1 of 3

**GENERAL REQUIREMENTS**

Material, Design and Construction MIL-PRF-55310  
 Parts and Materials List Supplied  
 Parts, Materials  
 Class S Passives and ICs, when available.  
 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 steel housing  
 Finish Electroless nickel per MIL-C-26074

REV	DATE	REVISION RECORD	DWN	AUTH
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**ELECTRICAL PERFORMANCE**

RF Output Frequency 50.0 MHz, sine wave  
 Frequency Accuracy (initial)  $\pm 1 \times 10^{-6}$  at +25°C  
 Frequency Stability  $\pm 8 \times 10^{-6}$  for -10°C to +50°C (ref +25°C)  
 Aging Rate (after 90 days operating)  
     1 year  $\pm 2 \times 10^{-6}$   
 RF Output Power +7 dBm  $\pm 2.5$ dB into 50Ω  
 RF Output Harmonics -30 dBc  
 RF Output Spurious <-80 dBc  
 Phase Noise, Static  
     100 Hz -115 dBc/Hz  
     1 KHz -135 dBc/Hz  
     10 KHz -163 dBc/Hz  
 Supply voltage +10  $\pm 0.5$  VDC, regulated and filtered  
 Input power <0.5 watts steady state at ambient pressure <5 x 10<sup>-5</sup> torr

500-28039-01 EM Engineering Model  
 500-28039-02 Qualification Model  
 500-28039-03 FM Flight Model

**ENVIRONMENTAL CONDITIONS**

Operating temperature -10°C to +50°C  
 Storage temperature -40°C to +105°C  
 Design / Qualification -10°C to +50°C  
 Ambient pressure Atmospheric (760 torr), Vacuum (<5 x 10<sup>-5</sup> torr)  
 Radiation, design to meet TID 100 krad Si

**MECHANICAL SPECIFICATIONS**


Size 1.610" x 1.0" x 0.5"  
 Weight <150 grams  
 Physical Pressure relief hole

**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 commercial parts and materials. EM shall be subjected only to electrical tests, with no environmental testing performed.

FM (Flight Model) Fabricated to meet all design, construction, and test requirements. FM shall be subjected to the entire compliment of electrical and environmental acceptance tests.

QM(Qualification Model) Fabricated and tested as an FM unit with the addition of Qualification tests.

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**QUALIFICATION TESTS** (Non-flight model, only)

Group I (6 samples) Visual, Electrical Tests\*  
 Burn-In (operational) 240 hours minimum at +60°C  
 Group II (6 samples) Aging 30 Days

Group III Subgroup 1 (6 samples)  
 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 (3 samples)  
 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<sup>-5</sup> 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\*  
 Thermal Shock MIL-STD-202, Method 107, Condition A,  
 5 Cycles, -55°C to +85°C

Random Vibration (non-operational) 7.56 Grms overall, 50 to 2000 Method 214 I-B,  
 50 to 2000 Hz, 5 min per axis

Electrical Tests\*  
 Burn-In (operational) 240 hours minimum at +60°C  
 Aging Rate Projected after 30 days operating  
 Electrical Tests\*  
 Radiographics MIL-STD-202, method 209


**\*ELECTRICAL TESTS**

*Tested at standard pressure and at -10, +10, +25, +40, +50 °C unless otherwise noted*

Input Power  
 Cold Start (-10 °C)  
 Hot Start (+50 °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

 <b>Wenzel Associates, Inc.</b> Austin, Texas				
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