

Rubidium Frequency Standard

AR61A-08

Full Military Qualifications/ Low Temp. Radiation Hardening

Key Features

- ❖ MIL-E-5400 and MIL-STD -810F
- ❖ Low phase noise under vibration
- ❖ Wide temperature range -54 °C to +71 °C (95 °C Emergency)
- ❖ Radiation Hardening
- ❖ 26VDC per MIL-STD-704D
- ❖ Vibrations: MIL-STD-810F
- ❖ Shock: 15g
- ❖ Humidity: 100% Sealed Enclosure
- ❖ EMI/RFI: MIL-STD-461E
- ❖ Fast Warm Up < 3.8 min to lock at -55 °C
- ❖ Altitude: 50,000 ft
- ❖ Low Power: 10W @ steady state
- ❖ MTBF: > 150,000 hours @ 50°C, AIC
- ❖ 82.5 x 82.5 x 114.3 mm (3.25 x 3.25 x 4.5 inch)
- ❖ 2.2Kg / 4.6 lbs
- ❖ Excellent for Airborne applications



Introduction

AR61A-08 is a very high performance Rubidium Frequency Standard, designed to operate reliably in demanding application and harsh environment. It performs over a very wide temperature range, provides high stability, even under sever vibration and very fast warm-up, even at -54 °C. The unit meets or exceeds the most severe military requirements. This rugged unit is especially useful in airborne applications as well as mobile ground operation. The AR61A-08 also includes a microprocessor, which optimizes its performance vs. external disturbances. It has a unique holdover mode, which keeps the internal OCXO running with the last memorized frequency when lock is lost. In addition, a built in synthesizer allows a very fine digital frequency control over a wide range.

Applications

- ❖ Communication
 - ❖ Telemetry test fields
 - ❖ Field calibration
- Any other applications which requires accurate source of frequency & time



SPECIFICATION

All specs are at room temperature, quiescent conditions, sea level ambient unless otherwise specified
Some combinations of options are not available

Outputs	
Frequency	5MHz, Square wave

Output Performance			
Accuracy	±5E-11 @ Shipping		
Long Term Stability (Aging)	4E-11 / month		
	3.6 E-10 / year		
Short Term Stability (Allan Deviation)	3E-11 @ 1 sec		
	1E-11 @ 10 sec		
	3E-12 @ 100 sec		
Waveform	Square wave		
Output Level	+1.3 Vp-p to +2.25 Vp-p / 50Ω load (50 ohm + 2%), Duty Cycle (D.C.) 50+5% without DC voltage.		
Phase Noise dBc / Hz from Carrier	<u>Frequency</u>	<u>Quiescent</u>	<u>Vibration</u>
	1Hz	≤ -80	≤ -70
	10Hz	≤ -115	≤ -85
	100Hz	≤ -140	≤ -103
	300Hz	≤ -148	≤ -116
	1000Hz	≤ -150	≤ -130
Non-Harmonic Distortion dBc / Hz from Carrier	100Hz to 100KHz	≤ -138	≤ -130
	100 KHz to 3MHz	≤ -80	≤ -80
Warm-Up Stability	To lock, @ -54°C, 3.8 minutes To 5E-10 @ -54°C, 10 minutes		

Power Supply		
Input Voltage	23.4 to 28.6 VDC (MIL-STD-704D) typ. 26VDC	
Power	Warm-up @ -55°C	161 W Peak Max @ 27.3V
	@Steady State	<20W @ 26 VDC, 25°C <28 W @ -54°C

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THE BINDING SPECIFICATIONS ARE ONLY THOSE STATED IN OUR QUOTATION/PROPOSAL/CONTRACT.
THIS PRODUCT IS COVERED BY THE FOLLOWING U.S. PATENTS: 6130583. OTHER PATENTS PENDING.

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Environmental			
		Operating	None Operating
Temperature (MIL-E-5400 Class 2)	Temperature	-54°C to +71°C	
	Stability Over Temperature	±5E-10	
	Emergency Temperature	95°C 30 minutes Intermittent	
Altitude	Test in accordance with MIL-STD-810, Method 500.4, Procedure II. Up to 50,000ft		Test in accordance with MIL-STD-810, Method 500.4, Procedure I.
Acceleration	N/A		18 G forward, 6.1 G side, 11 G up, 12 G down, 2.7 G aft
Explosive Decompression:	Test in accordance with MIL-STD-810, Method 500.4, Procedure III, except in Step 1, the module is operating.		Test in accordance with MIL-STD-810, Method 500.4, and Procedure III.
Radiation	Contact factory for more details		
Humidity:	MIL-E-5400	Up to 100%, including condensation	
Random Vibration	Units: x E-3 g2/Hz @ 10 Hz 3.36 @ 30 Hz 0.84 @ 50 Hz 0.088 @ 100 Hz 0.051 @ 500 Hz 0.030 @ 1000 Hz 0.012 @ 2000 Hz 0.005 Total: 0.24 grms		
Mechanical Shock (Including Shock Mount)	Test in accordance with MIL-STD-810, Method 516.5, Procedure I.		
Explosive Atmosphere	MIL-STD-810, Method 511.4, Procedure I.		
Vibration	Test in accordance with MIL-STD-810, Method 514.5, Procedure I, and duration of 1 hour per axis in each of three mutually perpendicular axes.		Test in accordance with MIL-STD-810, Method 514.5, Procedure I, and duration of 2 hours per axis in each of three mutually perpendicular axes.
Fungus	Show no signs of fungal growth after prolonged exposure to fungus growth as encountered in tropical climates		
Acoustic Noise:	MIL-STD-810, Method 515.5, Total SPL 140dB		
EMI/RFI	MIL-STD-461E	RE102, CS101, CS114, CS115, CS116	

Dimensions & Weight		
Size:	Inches, nom, h/w/d	3.25 / 3.25 / 4.5
	cm, h/w/d	8.25 / 8.25 / 11.43
Weight/Volume:	Lbs./cubic inches	4.6 max / 47.5
	Kg/cubic cm	2.2 max / 779

Unit Diagnostics, Control and Calibration	
BIT Output	Composite Lock (98 %)
	No-Fault Logic Level – 0/1 TTL Compatible
Frequency Trim Range	3E-9
Setting Resolution	2E-11
Digital Frequency adjust	Digital Frequency adjusts via TxD Rx D, <E-12 steps, >1E-6 range.

Reliability		
Reliability	MIL-HDBK-217F Airborne Inhabited Cargo (AIC).	150,000 hours @ 50°C ambient temp
		114,000 hours @ 60°C ambient temp.
		80,000 hours @ 71°C ambient temp

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