AXTAL ADVANCED XTAL PRODUCTS

Specification	AXRB1021	Rev.: 3	Date: 2022-09-07

Oscillator type: High Stability Rubidium Oscillator

Features:

- **High Stability Rubidium Oscillator**
- **Compact 89 x 76 mm Connectorized Package**
- **Replacement for obsolete Microsemi X72 and SA.22c**
- **RS-232 Communication and external 1 PPS disciplining**
- **Applications: UMTS, LTE, 5G, CDMA, WiMAX etc.**
- **Equivalent to ELECSPN XHTF1021**

Ordering Code

Model	Revision	Frequency [MHz]
AXRB1021	Rev.3	10.000

Example: AXRB1021_Rev.3 – 10.000 MHz

Parameter	min.	typ.	max.	Unit	Condition
Nominal output frequency		10.000		MHz	
Frequency stability					
Initial tolerance at delivery @ +25°C			±0.05	ppb	
vs. operating temperature range			±0.60	ppb	steady state
Long term (aging) per day			±0.005	ppb	
Long term (aging) per month			±0.05	ppb	
Retrace @ +25°C			±0.02	ppb	1 h after 24 hrs OFF
Frequency adjustment range					
RS-232 Frequency Control (MFC)	±1			ppb	(Note 3)
Electronic Frequency Control (EFC)	±1			ppb	
EFC voltage V_C	0		5	V	
EFC slope ($\Delta f / \Delta V_C$)		Positive			
EFC input impedance	10			kΩ	
RF output					
Signal waveform		Sine wave			
Load R_L		50		Ω	±5%
Output level	+7		+13	dBm	
Harmonics			-30	dBc	
Phase noise		-110 -140 -150	-100 -130 -140	dBc/Hz dBc/Hz dBc/Hz	@ 10 Hz @ 100 Hz @ 1 kHz
Short-term stability (ADEV)			$3\cdot10^{-11}$ $1\cdot10^{-11}$ $3\cdot10^{-12}$		@ τ = 1 sec @ τ = 10 sec @ τ = 100 sec
Warm-up time @ +25°C			7	min	Time to lock
1 PPS output					
Signal waveform		LVCMOS			
Load R_L		15		pF	
1 PPS reference input (Note 2)	External disciplining				
Signal waveform		LVCMOS			
Input impedance		>10 kOhm / 4 pF			
Lock Detect	 3.5	0 5	1.5	V V	Locked Not locked
Supply voltage V_S	11.4	12.0	18.0	V	
Power consumption (steady state)		8	15	W	@ V_S=12V
Power consumption (warm-up)		21	30	W	@ V_S=12V
Operating temperature range	-20		+50	°C	
Enclosure (see drawing) (WxDxH)		89x76x28		mm	
Drawing number		AXZ10.01124.01			
RF Connector		SMA female			
Communication Connector (Note 2)		9-Pin D-Sub male with jack posts			
Weight		260	280	g	
MTBF		100,000		hrs	

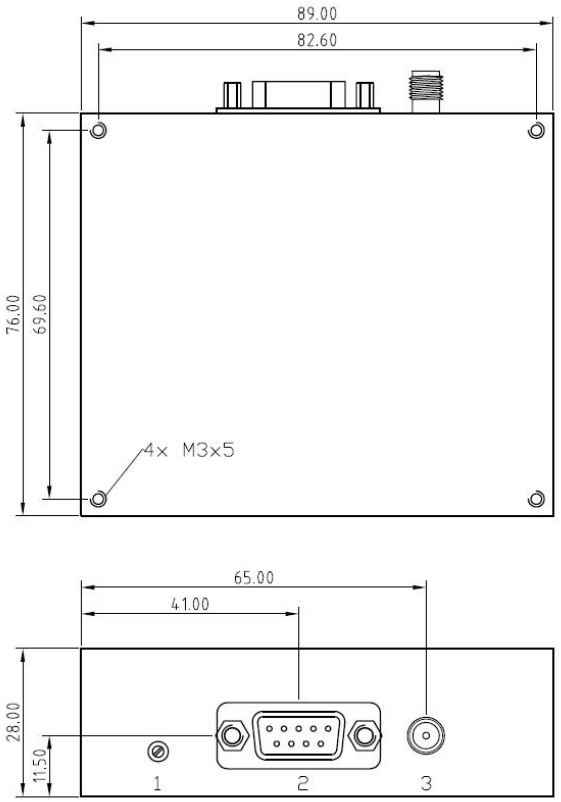
Notes:

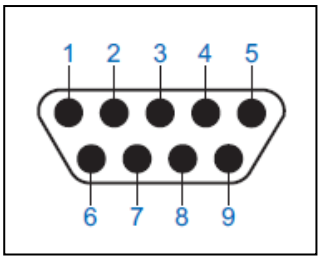
1. Terminology and test conditions are according to IEC60679-1 and MIL-PRF-55310, unless otherwise stated
2. Rubidium clock is disciplined as soon as external 1PPS signal is present (no programming required)
3. Please consult factory for programming manual

Absolute Maximum Ratings

Parameter	min.	max.	Unit	Condition
Supply Voltage V_S	0	18	V	V_S to GND
Control Voltage V_C	0	5.5	V	V_C to GND
Storage Temperature	-40	+70	°C	

Enclosure drawing





Front View D-Sub connector

Pin connections D-Sub connector (COMM):

Pin #	Symbol	Function
1	LD	Lock Detect
2	GND	Ground
3	RX	Serial Receive RS-232
4	TX	Serial Transmit RS-232
5	V_C	Control Voltage (EFC)
6	1PPS IN	External 1PPS Input
7	V_S	Supply Voltage
8	1PPS OUT	1PPS Output
9	D.N.C.	Do Not Connect

Pin connections:

Pin #	Symbol	Function
1	ADJUST	Adjustment Trimmer (MFC)
2	COMM	Interface
3	RF OUT	10 MHz Output

Handling and Testing

Parameter	Procedure		Source
Handling and Testing	Application Note AXAN-011		www.axtal.com
Processing	Application Note AXAN-012		www.axtal.com
Parameter	**Procedure**		**Condition**
Electrostatic discharge (ESD)			
THD devices	IEC60749-26	HBM	2000 V
SMD devices	IEC60749-27	MM	200 V
Washable	✖ Yes ☐ No		
RoHS- Compliant	✖ Yes ☐ No		

Data sheet is for information purposes only and may be subject to modifications or may be discontinued without notice.

Revision History

Rev.	Drawing	Date [dd.mm.yyyy]	Remarks	Author	Checked
1	D0	30.10.2018	First issue	HH	ME
2	D0	27.11.2018	Tuning range, output level, warm-up time and typical power consumption changed	HH	HH
2	D1	24.04.2019	Editorial changes	JH	HH
2	D2	10.11.2021	Description for 1PPS input corrected.	HH	HH
3	D0	07.09.2022	Mechanical frequency control (MFC) removed, typo of typ. and max. output level corrected	HH	HH