Specification	AXIOM145ULN	Rev.: 5	Date: 2021-10-13

Oscillator type: Ultra-Low Noise OCXO in SMD package with Oscillator Enable (OEN) and Oven Alarm (OA)

Parameter	min.	typ.	max.	Unit	Condition
Nominal frequency		10.000		MHz	
Frequency stability					
Initial tolerance @ +25°C			±100	ppb	V_C @ VREF/2
vs. operating temperature range		Option 2 & 3 See tables 2 & 3			steady state
vs. supply voltage variation (pushing)			±0.5	ppb	V_S ±5 %
vs. load change (pulling)			±0.5	ppb	R_L ±5 %
Long term (aging) per day			±0.5	ppb	after 10 days operation
Long term (aging) 1st year			±50	ppb	after 10 days operation
Long term (aging) 15 years			±500	ppb	after 10 days operation
Frequency adjustment range					
Electronic Frequency Control (EFC)	±0.5	±1.0	±1.5	ppm	(Note 2)
EFC voltage V_C	0	VREF/2	VREF	V	
EFC slope		Positive			
EFC input impedance	100			kΩ	
RF output					
Signal waveform		Sine wave			
Load R_L		50		Ω	±5 %
Output level	+12	+14	+16	dBm	
Harmonics		-40	-30	dBc	
Spurious			-90	dBc	
Warm-up time @ +25°C			5	min	$\Delta f_{final}/f_{nominal}$ < ±100 ppb
Phase noise		See table 1			Option 1
Short term stability (Allan deviation)		$2\cdot10^{-12}$ $2\cdot10^{-12}$ $5\cdot10^{-12}$	$5\cdot10^{-12}$ $1\cdot10^{-11}$ $5\cdot10^{-11}$		τ = 1 s τ = 10 s τ = 100 s
Oven alarm output (OA)	 2.4	0 5	0.4	V V	Low = Alarm (Not stable) High = Oven Ready
Oscillator enable input (OEN) (Note 3)	 2.4	0	0.4 V_S	V V	Low = Oscillator OFF High = Oscillator ON
Reference voltage VREF output		5.0		V	
Supply voltage V_S	11.4	12.0	12.6	V	
Current consumption (steady state)			200	mA	@ +25°C
Current consumption (warm-up)			350	mA	
Enclosure (see drawing) (LxWxH)		41x30x16 max.		mm	
Weight			30	g	
Packing		Palette			

Notes:

1. Terminology and test conditions are according to IEC60679-1 and MIL-PRF-55310, unless otherwise stated
2. Tuning range sufficient to compensate for 15 years aging
3. HCMOS/TTL compatible input

Absolute Maximum Ratings

Parameter	min.	max.	Unit	Condition
Supply Voltage V_S	-0.5	V_S + 10%	V	V_S to GND
Control Voltage V_C	-0.5	15	V	V_C to GND
Oscillator Enable Voltage V_{OE}	-0.5	V_S	V	V_{OE} to GND
Storage Temperature	-55	+105	°C	
Resistance to Soldering Heat		10	sec	@ +245°C

Phase Noise – Option 1:

Offset	Option			Unit
	A	B	C	
1 Hz	-110	-112	-115	**dBc/Hz**
10 Hz	-140	-141	-142	**dBc/Hz**
100 Hz	-154	-156	-158	**dBc/Hz**
1 kHz	-163	-163	-163	**dBc/Hz**
≥10 kHz	**-165**	**-165**	**-165**	**dBc/Hz**
Noise floor	**typ. -170**			**dBc/Hz**

Table 1

Frequency stability vs. temperature – Options 2 & 3

Option 2	Stability [ppb]
05	±5
10	±10
25	±25

Table 2

Lower Temperature		Upper Temperature	
Option 3	T [°C]	Option 3	T [°C]
0	0	A	+50
1	-10	B	+60
2	-20	C	+70
3	-30	D	+75

Table 3 **Standard: "1B" = -10°C to +60°C**

Ordering Code

Model	Option 1 [Phase noise]	Option 2 [Stability]	Option 3 [Temperature range]	Revision	Frequency [MHz]
AXIOM145ULN	Table 1	Table 2	Table 3	Rev.5	10.000

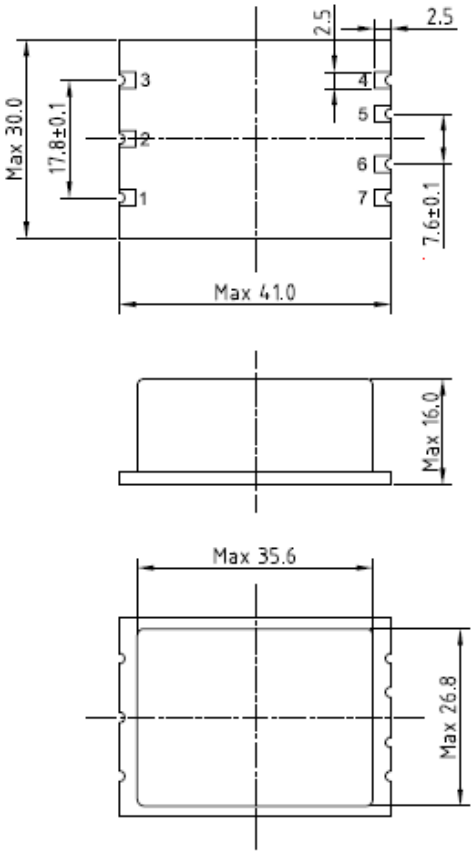
Example: AXIOM145ULN-A-10-1B_Rev.5 – 10.000 MHz

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		

Enclosure drawing:



Pin connections

Pin #	Symbol	Function
1	RF OUT	RF Output
2	OA	Oven Alarm Output
3	GND	Ground
4	VREF	Reference Voltage
5	V_C	Control Voltage (EFC)
6	OEN	Oscillator Enable Input
7	V_S	Supply Voltage

Environmental conditions

Test	IEC 60068 Part …	IEC 60679-1 Clause	MIL-STD-202G Method	MIL-STD-810F Method	MIL-PRF-55310D Clause	Test conditions (IEC)
Sealing tests (if applicable)	2-17	5.6.2	112E		3.6.1.2	Gross leak: Test Qc, Fine leak: Test Qk
Solderability Resistance to soldering heat	2-20 2-58	5.6.3	208H 210F		3.6.52 3.6.48	Test Ta Method 1 Test Td_1 Method 2 Test Td_2 Method 2
Shock	2-27	5.6.8	213B	516.4	3.6.40	Test Ea, 3 x per axes 100g, 6 ms half-sine pulse
Vibration, sinusoidal	2-6	5.6.7.1	201A 204D	516.4-4	3.6.38.1 3.6.38.2	Test Fc, 30 min per axes, 10 Hz - 55 Hz 0,75mm; 55 Hz - 2 kHz, 10g
Vibration, random	2-64	5.6.7.3	214A	514.5	3.6.38.3 3.6.38.4	Test Fdb
Endurance tests - ageing - extended aging		 5.7.1 5.7.2	108A		 4.8.35	 30 days @ 85°C, OCXO @25°C 1000h, 2000h, 8000h @85°C

Other environmental conditions on request

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	10.12.2013	First issue preliminary version AXIOM15ULN	HH	BN
2	D0	12.12.2013	Changes: operating temp rang, supply voltage. Added: modulation bandwidth	HH	BN
1	D0	03.02.2014	New package, new P/N AXIOM145ULN	HH	BN
1	D1	16.01.2015	Editorial changes, environmental changes updated	HH	HH
2	D0	11.01.2016	Phase noise options added	HH	HH
3	D0	07.01.2017	Temperature stability options added	BN	BN
4	D0	15.08.2019	Various parameters updated, editorial changes	HH	HH
5	D0	13.10.2021	Phase noise options updated	HH	HH