

Specification	AXIOM145ULN	Rev.: 3	Date: 2017-01-07
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Oscillator type: Ultra-Low Noise OCXO in SMD package

Parameter	min.	typ.	max.	Unit	Condition
Nominal frequency (Note 2)	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 ±100 mV
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) 1 st year			±30	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	
EFC voltage V _C	0	VREF/2	VREF	V	
EFC slope	Positive				
EFC non-linearity			10	%	
EFC input impedance	100			kΩ	
Modulation bandwidth	1			kHz	@ -3 dB
RF output					
Signal waveform	Sine wave				
Load R _L	50			Ω	±5 %
Output level	+5		+10	dBm	
Harmonics			-20	dBc	
Spurious			-90	dBc	@ 9 ~ 11 MHz
Warm-up time @ +25°C			5	min	Δf _{final} /f _{nominal} < ±100 ppb
Phase noise	See table 1				Option 1
Short term stability (Allan deviation)			5·10 ⁻¹² 1·10 ⁻¹¹ 1·10 ⁻¹⁰		τ = 1 s τ = 10 s τ = 100 s
Oven alarm output	LOW = alarm (not stable) HIGH = ready				0 ... 0.4 V 2.4 ... 5 V
Oscillator enable input (Note 3)	LOW = Oscillator OFF HIGH = Oscillator ON				0 ... 0.4 V 2.4 ... 12.6 V
Reference voltage VREF output		5.0		V	
Supply voltage V_S	10.5	12.0	12.6	V	
Current consumption (steady state)			200	mA	@ +25°C
Current consumption (warm-up)			340	mA	
Marking	AXTAL Logo AXIOM145ULN 10.000MHz S/N wwyy				ww = week, yy = year
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. Other frequencies on request
3. HCMOS 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	+125	°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	-142	-144	-146	dBc/Hz
100 Hz	-155	-156	-157	dBc/Hz
1 kHz	-160	-160	-160	dBc/Hz
≥10 kHz	-165	-165	-165	dBc/Hz

Table 1

Frequency stability vs. temperature – Options 2 & 3

Option 2	Stability [ppb]
05	±5
10	±10
25	±25
50	±50
100	±100
200	±200

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
4	-40	E	+80
5	-55	F	+85

Table 3

Standard: "1B" = -10°C to +60°C

Temperature range [°C]	Frequency stability [Option 2]					
	05	10	25	50	100	200
0 ~ +50	X	X	X	X	X	X
-10 ~ +60	X	X	X	X	X	X
-20 ~ +70	X	X	X	X	X	X
-30 ~ +70	O	X	X	X	X	X
-40 ~ +75	O	O	X	X	X	X
-40 ~ +85	O	O	X	X	X	X
-55 ~ +85	-	O	O	X	X	X

Table 4 "Availability" X = available, O = available on request, - not available

Ordering Code

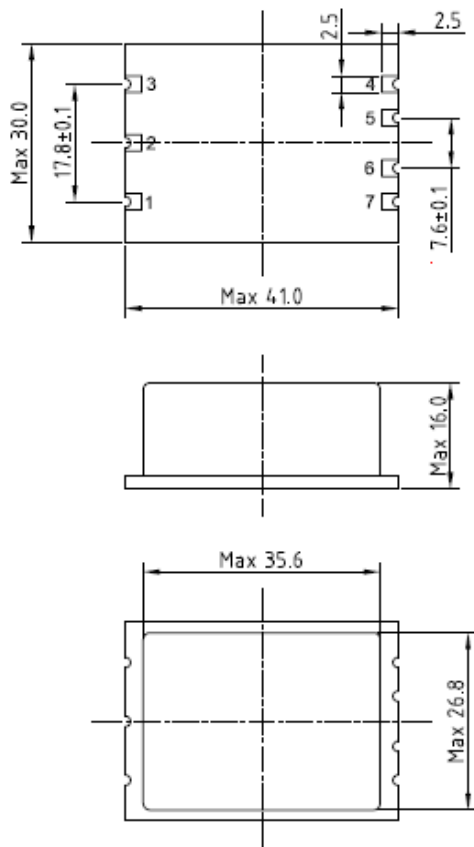
Model	Option 1 [Phase noise]	Option 2 [Stability]	Option 3 [Temperature range]	Revision	Frequency [MHz]
AXIOM145ULN	Table 1	Table 2	Table 3	Rev.3	10.000

Example: AXIOM145ULN-A-50-1B_Rev.3 – 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	OE	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