

<b>Specification</b>	<b>AXPLO10</b>	Rev.: 3	Date: 2019-04-02
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**Oscillator type: Ultra-Low Noise Phase-Locked 10 MHz OCXO (PLOCXO)  
for Clean-up of 10 MHz input reference signal**

Parameter	min.	typ.	max.	Unit	Condition
<b>Nominal output frequency <math>f_{OUT}</math></b>	10.000			MHz	(Note 2)
<b>Frequency stability (free running)</b>					
frequency tolerance at delivery		±50	±100	ppb	
vs. operating temperature range			±10	ppb	
vs. supply voltage variation (pushing)			±2	ppb	$V_S \pm 5\%$
vs. load change (pulling)			±2	ppb	$R_L \pm 5\%$
Long term (aging) per day		±0.1	±1	ppb	after 30 days operation
Long term (aging) per year		±30	±50	ppb	after 30 days operation
<b>Reference input</b>					
Input frequency $f_{REF}$	10.000			MHz	(Note 3)
Frequency accuracy			±0.5	ppm	
Signal waveform	Sine wave				
Input level	0		+13	dBm	
Input impedance	50			$\Omega$	
<b>RF output</b>					
Signal waveform	Sine wave				
Load $R_L$	50			$\Omega$	±5%
Output level	+10	+14		dBm	
Harmonics			-30	dBc	
Spurious			-80	dBc	Including PLL products
<b>Phase noise (Note 4)</b>	See table 1				Option 1
<b>PLL Parameters (Note 4)</b>					
Loop frequency $f_{Loop}$	0.2			Hz	
Channel spacing $f_{Ch}$	100			kHz	
Lock time	10			s	
<b>Lock detect (LD) output</b>		0	1.5	V	Out of lock
	3.5	5		V	Locked
<b>Supply voltage <math>V_S</math> (Note 5)</b>	11.4	12.0	12.6	V	
<b>Current consumption (warm-up)</b>			450	mA	
<b>Current consumption (steady state)</b>			200	mA	@ +25°C
<b>Operating temperature range</b>	-10		+60	°C	
<b>Enclosure (see drawing) (LxWxH)</b>	54x40x19			mm	h = 2.0
<b>Weight</b>			60	g	
<b>Packing</b>	Palette				

**Notes:**

1. Terminology and test conditions are according to IEC60679-1 and MIL-PRF-55310, unless otherwise stated
2. Other output frequency on request with  $f_{OUT} = f_{REF} \cdot M$  or  $f_{OUT} = f_{REF} \cdot M/N$
3. Other input frequency on request
4. Designed to guarantee phase noise clean-up above 1 Hz offset frequencies.  
PLL performance can be tailored to specific application. Please consult factory.
5. Other supply voltage on request

### Absolute Maximum Ratings

Parameter	min.	max.	Unit	Condition
Supply Voltage $V_s$	-0.5	$V_s + 10\%$	V	$V_s$ to GND
Reference Input Level	-	+15	dBm	
Storage Temperature	-55	+105	°C	

### Phase Noise – Option 1:

Offset	10 MHz		Unit
	LN	ULN	
1 Hz	-105	-110	dBc/Hz
10 Hz	-135	-140	dBc/Hz
100 Hz	-150	-158	dBc/Hz
1 kHz	-155	-165	dBc/Hz
10 kHz	-160	-170	dBc/Hz
≥100 kHz	-160	-170	dBc/Hz

**Table 1 – Maximum values free-running**

Note: Phase noise performance at 1 Hz offset in locked state depends on input reference. With reference phase noise of -90 dBc/Hz @ 1 Hz and -120 dBc/Hz @ 10 Hz the typical degradation at 1 Hz offset is about 3 dB. Please consult factory for your specific application.

### Ordering Code

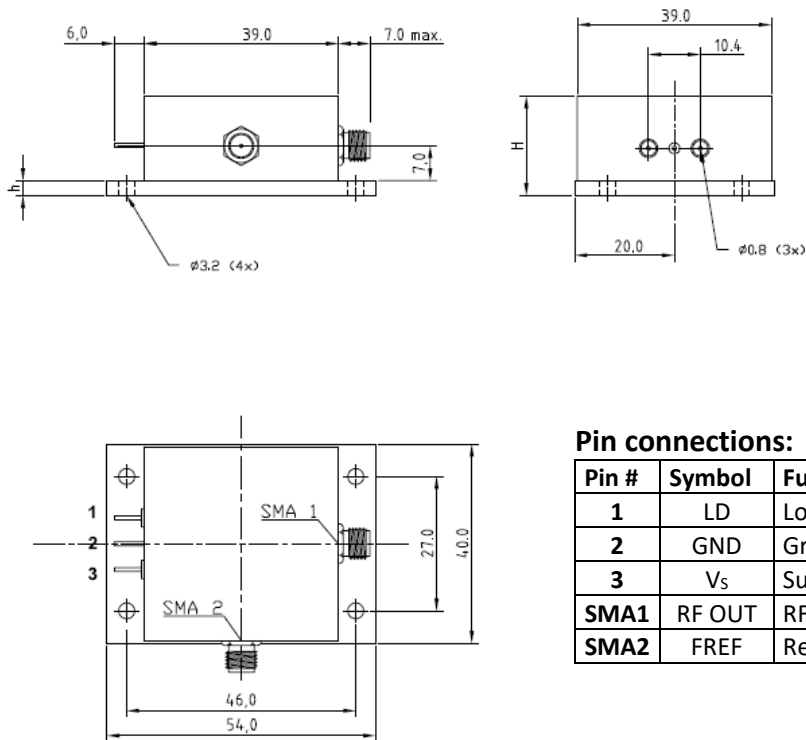
Model	Option 1 [Phase noise]	Revision	Frequency [MHz]
AXPLO10	Table 1	Rev.3	10.000

**Example: AXPLO10-LN\_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		

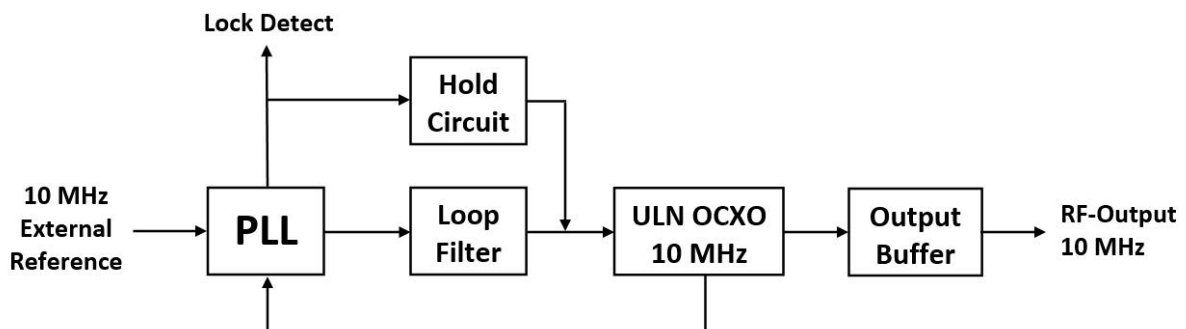
**Enclosure drawing**



**Pin connections:**

Pin #	Symbol	Function
1	LD	Lock Detect Output
2	GND	Ground
3	V <sub>s</sub>	Supply Voltage
SMA1	RF OUT	RF Output
SMA2	FREF	Reference Frequency Input

**Block diagram & Functional description**



- (1) Ultra-Low Noise OCXO is locked to external reference. Low frequency loop filter guarantees phase noise clean-up for offset frequencies above 1 Hz.
- (2) In free-running mode, the hold circuit sets the OCXO tuning voltage close to the nominal frequency
- (3) The high output level guarantees best performance, when used with **AXDA9000** Low Noise Frequency Distribution Amplifier

### 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 <sub>1</sub> Method 2 Test Td <sub>2</sub> 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	29.01.2011	First issue	BN	BN
1	D1	01.10.2012	Minor editorial changes	BN	BN
2	D0	20.06.2014	Various parameters updated, environmental conditions updated, editorial changes	HH	HH
3	D0	05.02.2019	Design update (various parameters updated), Phase noise options added	HH	HH
3	D1	02.04.2019	Channel spacing corrected	HH	HH