

ECN/PCN No.: 5007

For Manufacturer			
Product Description: Low Phase Noise OCXO	Abracon Part Number / Part Series: O-LU25AD	☐ Documentation only ☐ ECN ☒ EOL	☒ Series ☐ Part Number
Affected Revision: Rev B	New Revision: EOL	Application:	☐ Safety ☒ Non-Safety
Prior to Change: Active -Rev B			
After Change: EOL			
Cause/Reason for Change: Discontinuation based on manufacturing capabilities.			
Change Plan			
Effective Date: 7/01/2025	Additional Remarks:		
Change Declaration:			
Issued Date: 7/01/2025	Issued By: Stephanie Lopez	Issued Department: Engineering	
Approval: Thomas Culhane Engineering Director	Approval: Reuben Quintanilla Quality Director	Approval: Ying Huang Purchasing Director	
For Abracon EOL only			
Last Time Buy (if applicable): N/A	Alternate Part Number / Part Series: O-LU25ADV		
Additional Approval:	Additional Approval:	Additional Approval:	
Customer Approval (If Applicable)			
Qualification Status: ☐ Approved ☐ Not accepted <i>Note: It is considered approved if there is no feedback from the customer 1 month after ECN/PCN is released.</i>			
Customer Part Number:		Customer Project:	
Company Name:	Company Representative:	Representative Signature:	
Customer Remarks:			

Precision Ultra Low Phase Noise OCXO in 22x22mm Package



ESD Sensitive

20.4 x 20.4 x 13.5 mm
Datasheet #2101A

Features

- SC-cut crystal
- High Stability
- Very Low Power consumption (0.3W)
- Low Aging
- Ultra-Low ADEV 3E-13 @ 1s
- Ultra-Low Phase Noise
Extraordinary(E) -120dBc/Hz at 1Hz
-148dBc/Hz at 10Hz
-170dBc/Hz on the floor
- Sine Wave or HCMOS/TTL output

Applications

- Instrumentation, Test and Measurement
- Battery Powered Equipment
- Radar
- Tele/Data Communications
- GPS

Absolute Maximum Ratings

Parameters	Symbol	Condition	Min	Typ	Max	Unit	Notes
Input Break Down Voltage	V _{cc}	5 V supply	-0.5		5.5	V	
Storage temper.	T _s		-50		90	°C	
Control Voltage	V _c		-1		5.5 11	V	Slope option "P" Slope option "L"

Electrical

Parameters	Symbol	Condition	Min	Typ	Max	Unit	Notes
Frequency	F			10.000		MHz	
Frequency Stability	$\Delta F/F$	vs. Temp.		±20		ppb	See chart below
		vs. Supply		0.2	0.3	ppb/10%V _{cc}	
Aging		per day per year, first year second year		5E-10 5E-8 3E-8			after 30 days of continuous operation
Allan Deviation		0.1s 1s 10s			2E-13 3E-13 2E-12		E grade
		1Hz 10 Hz 100 Hz 1 KHz 10 KHz 100 KHz			-120 -148 -160 -168 -170 -170		Extraordinary version, option E, available with slope option L
Retrace		After 30 minutes			±10	ppb	24 Hours off 3*
G-sensitivity		worst direction			±1.0	ppb/G	
Input Voltage	V _{cc}		4.75	5.0	5.25	V	

Precision Ultra Low Phase Noise OCXO in 22x22mm Package



ESD Sensitive

20.4 x 20.4 x 13.5 mm

Datasheet #2101A

Electrical (cont.)

Parameters	Symbol	Condition	Min	Typ	Max	Unit	Notes
Power consumption, Still air 4*	P	steady state, 25°C, Operating temp range to 70°C start-up @ -30°C		0.6 0.45 0.3 2.0	0.7 0.55 0.4 2.5	W	Grade "N" Grade "A" Grade "X"
Spectral Purity		Subharmonics Spurious Harmonics		none -35	-80 -30	dBc	
Load		10KOhm//15pF (HCMOS/TTL), AC-coupled 50 Ohm (Sine-wave)					Output Code T Output Code S
Warm-up time	τ	to 0.1ppm accuracy		3	5	minutes	
Output Waveform		HCMOS/TTL compatible or Sinewave					
Output Power			+10	+13		dBm	Output Code S
Logic 1 (CMOS)	Voh		3.3			V	Output Code T
Logic 0 (CMOS)	Vol				0.1	V	Output Code T
Control Voltage	Vc		0 0		4.5 10.0	V	Slope option "P" Slope option "L"
Input impedance	Zin	At Vc pin	10			KOhm	
Modulation bandwidth	Fm				1,000	Hz	
Reference Voltage	Vref			4.5		V	
Output Impedance		At Vref pin		100		Ohm	
Pull range		from nominal F	± 0.4	± 0.6	± 0.8	ppm	
Deviation slope		Monotonic, positive Monotonic, positive		1.0/Vref 0.12		ppm/V	Slope option "P" Slope option "L"
Setability	Vc0	@25°C, Fnom. NO Internal Bias		2.25 $\pm$ 0.5 5 $\pm$ 0.5		V	Slope option "P" 3* Slope option "L"

Environmental and Mechanical

Parameter	Description
Operating temp. range	0°C to 70°C Standard, Other options-see chart below
Mechanical Shock	Per MIL-STD-202, 30G, 11ms
Vibration	Per MIL-STD-202, 5G to 2000 Hz
Soldering Conditions	260°C for 10s Max leads only



Creating a Part Number

O - **L** **U25AD** - **X** **X** **YZ** **XX** - **X** - **X** - **X** - **X** - **XX.XXX** MHz - **X**

OCXO

Low Power

Package Code

5 pin 22x22, ultra-low noise

Supply Voltage	
Code	Specification
0	5V ± 5%

Output	
Code	Specification
T	CMOS/TTL
S	Sinewave

Temperature stability	
Code	Specification
17	±1x10 ⁻⁷
58	±5x10 ⁻⁸
28	±2x10 ⁻⁸
18	±1x10 ⁻⁸
YZ	±Yx10 ^{-Z}

Temperature Range	
Code	In 5°C steps
First letter	Lowest temperature from A = -40°C
Second letter	Highest temperature to Z = 85°C
Examples	
IS	0°C to 50°C
GU	-10°C to 60°C
EW	-20°C to 70°C

Packaging

Blank Bulk

Output Frequency

Please specify the frequency in units of MHz out to 3-digit accuracy after the decimal.
Example: 10.000MHZ

Environmental	
Code	Specification
L	Contains level of lead that is in excess of RoHS directive and is not designed for reflow
R	RoHS compliant, not designed for reflow

Power Consumption 4*

Code	P at RT, TYP, W
N	0.6
A	0.45
X	0.3

Phase Noise (See Table)

Code	Specification
E	Extraordinary

Deviation Slope

Code	Specification
P	Positive, 0 to Vref
L	Positive, 0 to 10V

Not all combinations are available. Consult Factory.

Temperature Code Table

Letter	Temp °C	Letter	Temp °C	Letter	Temp °C	Letter	Temp °C	Letter	Temp °C	Letter	Temp °C
A	-40	F	-15	K	10	P	35	U	60	Z	85
B	-35	G	-10	L	15	Q	40	V	65		
C	-30	H	-5	M	20	R	45	W	70		
D	-25	I	0	N	25	S	50	X	75		
E	-20	J	5	O	30	T	55	Y	80		

Precision Ultra Low Phase Noise OCXO in 22x22mm Package

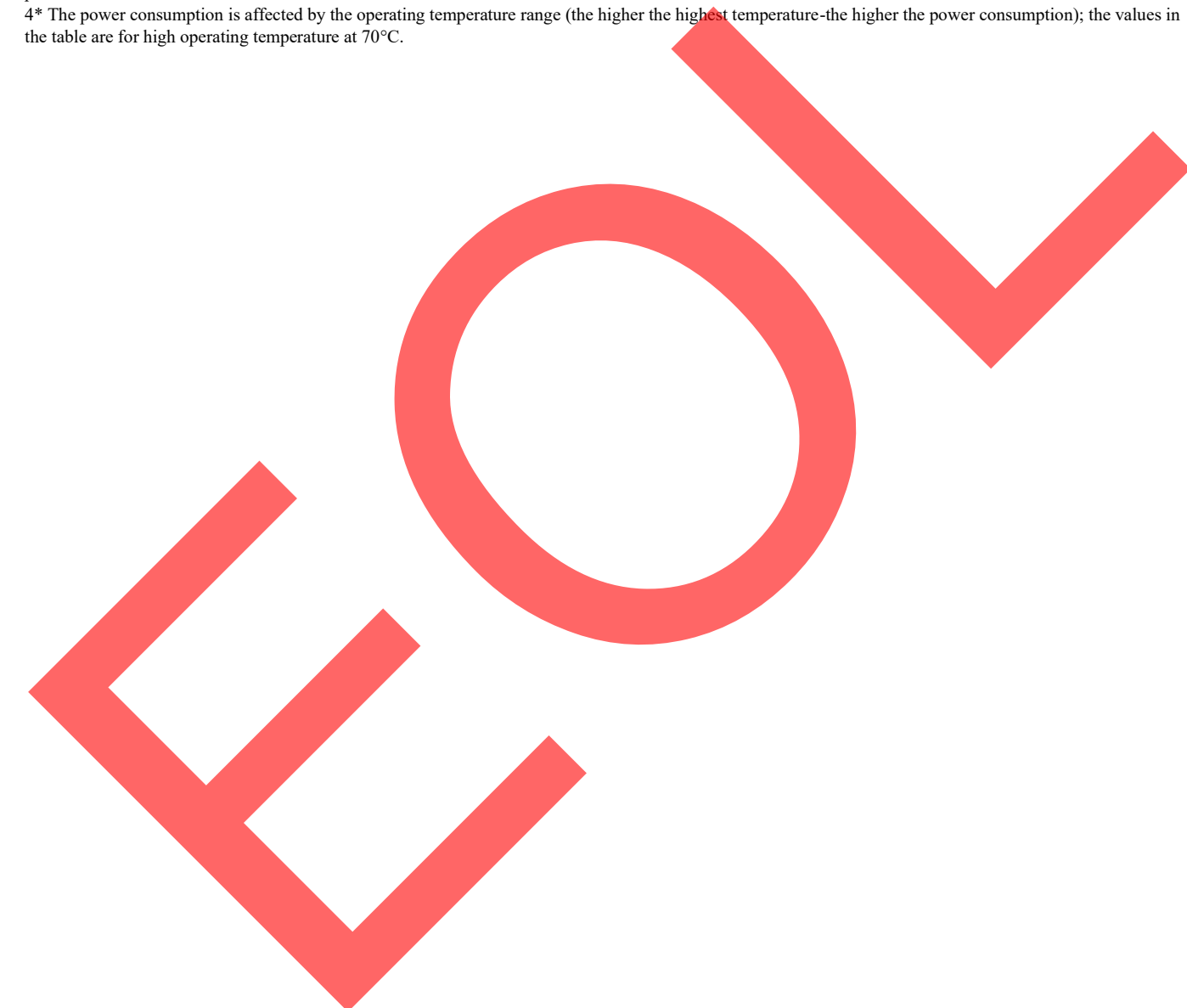


ESD Sensitive

20.4 x 20.4 x 13.5 mm
Datasheet #2101A

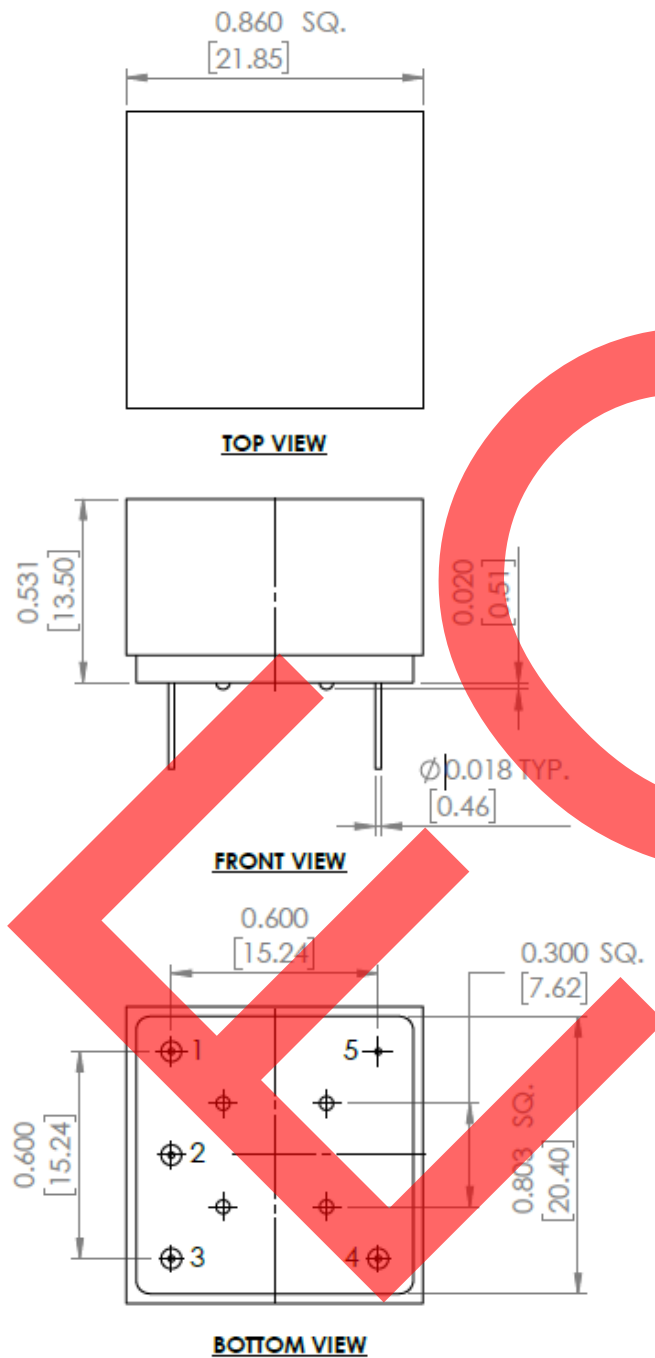
Notes:

- 1) For highest operating temperature higher than 70°C the power consumption will be higher (about 20% for 85°C). Values listed are for test in still air environment, the values will go up while testing in the temperature chamber.
- 2) It is recommended to specify Slope option "L" for Ultimate Phase noise performance. Recommended test equipment- Symmetricom (Microchip) 5120A-01 Phase noise and Allan Deviation Test Set (be aware of limitations on the floor). "Clean" analog power supply i.e., HP E3610A or equivalent. It's assumed that phase noise test is performed under static conditions (no vibration), in still air, and care is taken for minimizing EMI. The Vc port should be either grounded or connected to extremely low noise source (for example NiCd battery)
- 3* Longer storage time, especially at low temperatures, may affect retrace, stability and long averaging times ADEV parameters. It may require a few days on power re-stabilization.
- 4* The power consumption is affected by the operating temperature range (the higher the highest temperature-the higher the power consumption); the values in the table are for high operating temperature at 70°C.





Mechanical Dimensions



Pin #	Function
1	Vc
2	Vref
3	Vcc
4	Output
5	GND

Dimensions: inches [mm]

Precision Ultra Low Phase Noise OCXO in 22x22mm Package



ESD Sensitive

 20.4 x 20.4 x 13.5 mm
 Datasheet #2101A

Features

- SC-cut crystal
- High Stability
- Very Low Power consumption (0.3W)
- Low Aging
- Ultra-Low ADEV 3E-13 @ 1s
- Ultra-Low Phase Noise
Extraordinary(E) -120dBc/Hz at 1Hz
-148dBc/Hz at 10Hz
-170dBc/Hz on the floor
- Sine Wave or HCMOS/TTL output

Applications

- Instrumentation, Test and Measurement
- Battery Powered Equipment
- Radar
- Tele/Data Communications
- GPS

Absolute Maximum Ratings

Parameters	Symbol	Condition	Min	Typ	Max	Unit	Notes
Input Break Down Voltage	V _{cc}	5 V supply	-0.5		5.5	V	
Storage temper.	T _s		-50		90	°C	
Control Voltage	V _c		-1		5.5 11	V	Slope option "P" Slope option "L"

Electrical

Parameters	Symbol	Condition	Min	Typ	Max	Unit	Notes
Frequency	F			10.000		MHz	
Frequency Stability	$\Delta F/F$	vs. Temp.		±20		ppb	See chart below
		vs. Supply		0.2	0.3	ppb/10%V _{cc}	
Aging		per day per year, first year second year		5E-10 5E-8 3E-8			after 30 days of continuous operation
Allan Deviation		0.1s			2E-13		E grade
		1s			3E-13		
		10s			2E-12		
		1Hz			-120		Extraordinary version, option E, available with slope option L
		10 Hz			-148		
		100 Hz			-160		
		1 KHz			-168		
		10 KHz			-170		
		100 KHz			-170		
Retrace		After 30 minutes			±10	ppb	24 Hours off 3*
G-sensitivity		worst direction			±1.0	ppb/G	
Input Voltage	V _{cc}		4.75	5.0	5.25	V	

Precision Ultra Low Phase Noise OCXO in 22x22mm Package



ESD Sensitive

20.4 x 20.4 x 13.5 mm

Datasheet #2101A

Electrical (cont.)

Parameters	Symbol	Condition	Min	Typ	Max	Unit	Notes
Power consumption, Still air 4*	P	steady state, 25°C, Operating temp range to 70°C start-up @ -30°C		0.6 0.45 0.3 2.0	0.7 0.55 0.4 2.5	W	Grade "N" Grade "A" Grade "X"
Spectral Purity		Subharmonics Spurious Harmonics		none -35	-80 -30	dBc	
Load		10KOhm//15pF (HCMOS/TTL), AC-coupled 50 Ohm (Sine-wave)					Output Code T Output Code S
Warm-up time	τ	to 0.1ppm accuracy		3	5	minutes	
Output Waveform		HCMOS/TTL compatible or Sinewave					
Output Power			+10	+13		dBm	Output Code S
Logic 1 (CMOS)	Voh		3.3			V	Output Code T
Logic 0 (CMOS)	Vol				0.1	V	Output Code T
Control Voltage	Vc		0 0		4.5 10.0	V	Slope option "P" Slope option "L"
Input impedance	Zin	At Vc pin	10			KOhm	
Modulation bandwidth	Fm				1,000	Hz	
Reference Voltage	Vref			4.5		V	
Output Impedance		At Vref pin		100		Ohm	
Pull range		from nominal F	± 0.4	± 0.6	± 0.8	ppm	
Deviation slope		Monotonic, positive Monotonic, positive		1.0/Vref 0.12		ppm/V	Slope option "P" Slope option "L"
Setability	Vc0	@25°C, Fnom. NO Internal Bias		2.25 $\pm$ 0.5 5 $\pm$ 0.5		V	Slope option "P" 3* Slope option "L"

Environmental and Mechanical

Parameter	Description
Operating temp. range	0°C to 70°C Standard, Other options-see chart below
Mechanical Shock	Per MIL-STD-202, 30G, 11ms
Vibration	Per MIL-STD-202, 5G to 2000 Hz
Soldering Conditions	260°C for 10s Max leads only



Creating a Part Number

O - **L** **U25AD** - **X** **X** **YZ** **XX** - **X** - **X** - **X** - **X** - **XX.XXX** MHz - **X**

OCXO

Low Power

Package Code

5 pin 22x22, ultra-low noise

Supply Voltage	
Code	Specification
0	5V ± 5%

Output	
Code	Specification
T	CMOS/TTL
S	Sinewave

Temperature stability	
Code	Specification
17	±1x10 ⁻⁷
58	±5x10 ⁻⁸
28	±2x10 ⁻⁸
18	±1x10 ⁻⁸
YZ	±Yx10 ^{-Z}

Temperature Range	
Code	In 5°C steps
First letter	Lowest temperature from A = -40°C
Second letter	Highest temperature to Z = 85°C
Examples	
IS	0°C to 50°C
GU	-10°C to 60°C
EW	-20°C to 70°C

Packaging

Blank	Bulk
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Output Frequency

Please specify the frequency in units of MHz out to 3-digit accuracy after the decimal.
Example: 10.000MHZ

Environmental	
Code	Specification
L	Contains level of lead that is in excess of RoHS directive and is not designed for reflow
R	RoHS compliant, not designed for reflow

Power Consumption 4*

Code	P at RT, TYP, W
N	0.6
A	0.45
X	0.3

Phase Noise (See Table)

Code	Specification
E	Extraordinary

Deviation Slope

Code	Specification
P	Positive, 0 to Vref
L	Positive, 0 to 10V

Not all combinations are available. Consult Factory.

Temperature Code Table

Letter	Temp °C	Letter	Temp °C	Letter	Temp °C	Letter	Temp °C	Letter	Temp °C	Letter	Temp °C
A	-40	F	-15	K	10	P	35	U	60	Z	85
B	-35	G	-10	L	15	Q	40	V	65		
C	-30	H	-5	M	20	R	45	W	70		
D	-25	I	0	N	25	S	50	X	75		
E	-20	J	5	O	30	T	55	Y	80		

Precision Ultra Low Phase Noise OCXO in 22x22mm Package



ESD Sensitive

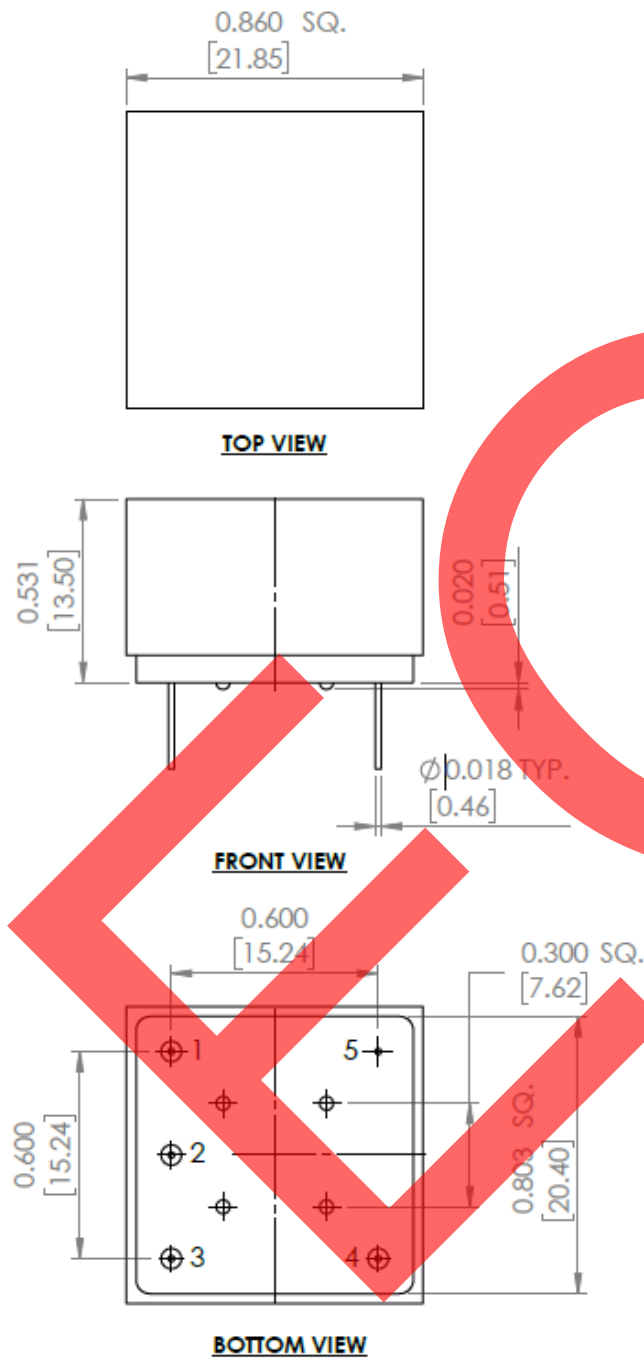
20.4 x 20.4 x 13.5 mm
Datasheet #2101A

Notes:

- 1) For highest operating temperature higher than 70°C the power consumption will be higher (about 20% for 85°C). Values listed are for test in still air environment, the values will go up while testing in the temperature chamber.
- 2) It is recommended to specify Slope option "L" for Ultimate Phase noise performance. Recommended test equipment- Symmetricom (Microchip) 5120A-01 Phase noise and Allan Deviation Test Set (be aware of limitations on the floor). "Clean" analog power supply i.e., HP E3610A or equivalent. It's assumed that phase noise test is performed under static conditions (no vibration), in still air, and care is taken for minimizing EMI. The Vc port should be either grounded or connected to extremely low noise source (for example NiCd battery)
- 3* Longer storage time, especially at low temperatures, may affect retrace, stability and long averaging times ADEV parameters. It may require a few days on power re-stabilization.
- 4* The power consumption is affected by the operating temperature range (the higher the highest temperature-the higher the power consumption); the values in the table are for high operating temperature at 70°C.



Mechanical Dimensions



Pin #	Function
1	Vc
2	Vref
3	Vcc
4	Output
5	GND

Dimensions: inches [mm]

Precision Ultra Low Phase Noise OCXO in 22x22 mm Package Improved Vibration



ESD Sensitive

22 x 22 x 12.7 mm
Datasheet #2101A

Features

- SC-Cut crystal
- High Stability
- Low to Very Low Power consumption (0.3 W)
- Low Aging
- Ultra-Low ADEV 3E-13 @ 1s
- Ultra Low Phase Noise Option:
Extraordinary(E) -120dBc/Hz at 1Hz
 -148dBc/Hz at 10Hz
 -170dBc/Hz on the floor
- Sine wave or HCMOS/TTL output

Applications

- Instrumentation, Test and Measurement
- Battery Powered Equipment
- Tele/Data Communications
- GPS

Absolute Maximum Ratings

Parameters	Symbol	Condition	Min	Typ	Max	Unit	Notes
Input Break Down Voltage	V _{cc}	5 V supply	-0.5		5.5	V	
Storage temper.	T _s		-50		90	°C	
Control Voltage	V _c		-1 -1		5.5 11	V	Slope option "P" Slope option "L"

Precision Ultra Low Phase Noise OCXO in 22x22 mm Package Improved Vibration



ESD Sensitive

22 x 22 x 12.7 mm

Datasheet #2101A

Electrical

Parameters	Symbol	Condition	Min	Typ	Max	Unit	Notes
Frequency	F			10.000		MHz	
Frequency stability	$\Delta F/F$	vs. Temp.		± 20		ppb	See chart below
		vs. Supply		0.2	0.3	ppb/10%Vcc	
Aging		per day per year, first year second year		5E-10 5E-8 3E-8			after 30 days of continuous operation
Allan Deviation		0.1s 1s 10s			2E-13 3E-12 2E-12		Premium version, Option "P"
SSB Phase Noise 2* (achieved after 10 minutes warm-up)	S _p	1Hz 10 Hz 100 Hz 1 KHz 10 KHz 100 KHz			-120 -148 -160 -168 -170 -170		Extraordinary version, option E, available with slope option L
Retrace 3*		After 30 minutes			± 10	ppb	24 hours off 3*
G-sensitivity		worst direction			± 1.0	ppb/G	
Input Voltage	V _{cc}		4.75	5.0	5.25	V	
Power consumption, Still air 1* 4*	P	steady state, 25°C, Operating temp range to 70°C start-up @ -30°C		0.6 0.45 0.3 2.0	0.7 0.55 0.4 2.5	W	Grade "N" Grade "A" Grade "X"
Spectral purity		Subharmonics Spurious Harmonics		none -35	-80 -30	dBc	
Output Load		10K Ohm//15pF (HCMOS/TTL), AC-coupled 50 Ohm (Sine-wave)					Output code T Output code S
Warm-up time	τ	to 0.1ppm accuracy		3	5	minutes	
Output Waveform		HCMOS/TTL compatible or Sinewave					
Output Power			+10	+13		dBm	Output code S
Logic 1 (CMOS)	V _{oh}		3.3			V	Output code T
Logic 0 (CMOS)	V _{ol}				0.1	V	Output code T
Control Voltage	V _c		0 0		4.5 10.0	V	Slope option "P" Slope option "L"
Input impedance	Z _{in}	At V _c pin	10			KOhm	
Modulation bandwidth	F _m				1,000	Hz	
Reference Voltage	V _{ref}			4.5		V	
Output Impedance		At V _{ref} pin		100		Ohm	
Pull range		from nominal F	± 0.4	± 0.6	± 0.8	ppm	
Deviation slope		Monotonic, positive Monotonic, positive		1.0/V _{ref} 0.12		ppm/V	Slope option "P" Slope option "L"
Setability	V _{c0}	@25°C, F _{nom} . Internal bias is optional, specify on PO 2.25 V for "P", 4.5 V for "L"	2.25 $\pm$ 0.5 5 $\pm$ 0.5	V			Slope option "P" 3* Slope option "L"

All parameters for 10 MHz

Precision Ultra Low Phase Noise OCXO in 22x22 mm Package Improved Vibration

**ESD Sensitive****22 x 22 x 12.7 mm**
Datasheet #2101A

Environmental and Mechanical

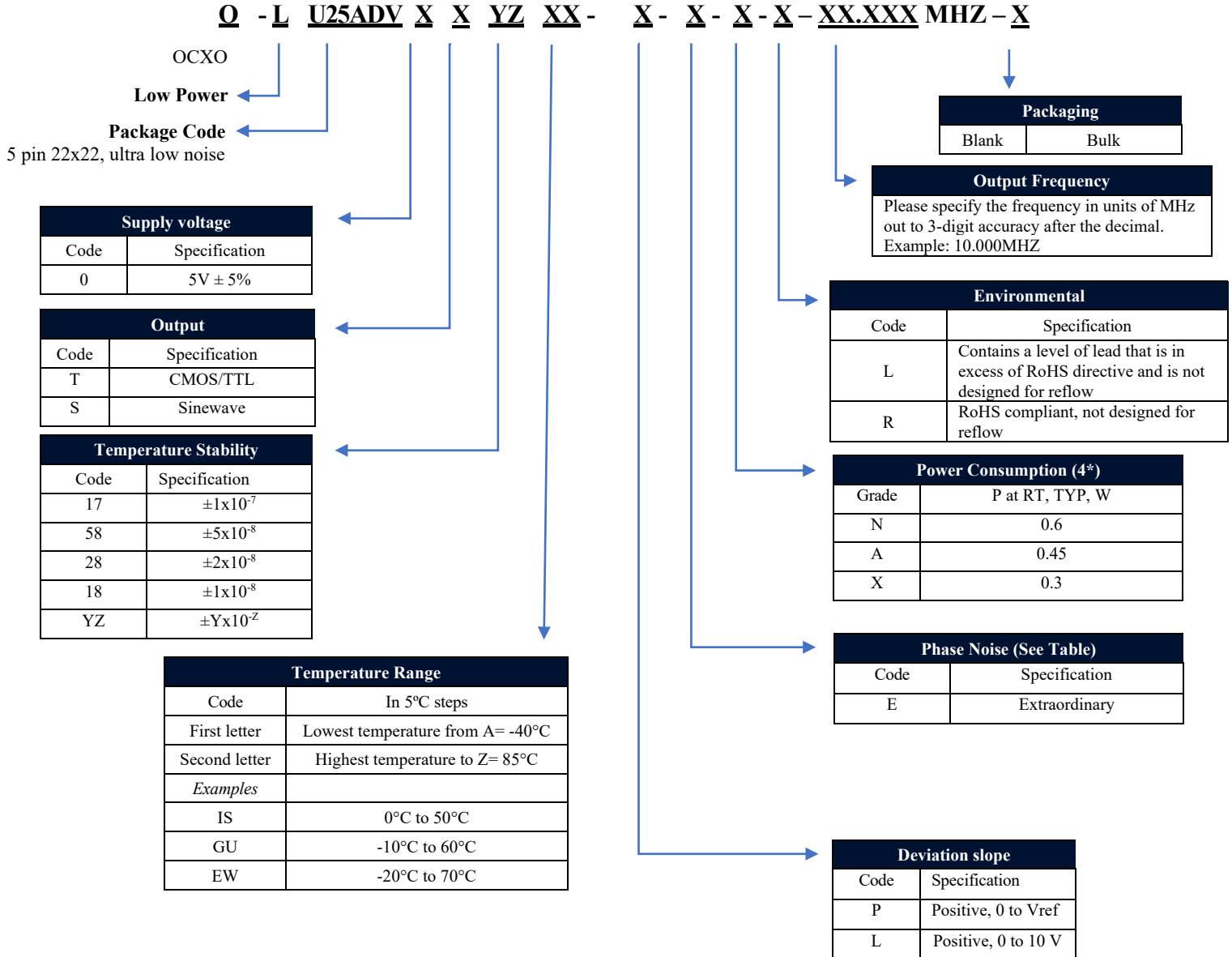
Parameter	Description
Operating temp. range	0°C to 70°C standard, Other options -see chart below
Mechanical Shock	Per MIL-STD-202, 30G, 11ms
Vibration	Per MIL-STD-202, 5G TO 2000 Hz
Soldering conditions	260°C for 10s Max leads only

Precision Ultra Low Phase Noise OCXO in 22x22 mm Package Improved Vibration



22 x 22 x 12.7 mm
Datasheet #2101A

Creating a Part Number**



***Not all combinations are available. Consult Factory**

Please see the table below for developed part numbers.

Developed Part Numbers
O-LU25ADV-0S18GU-L-E-X-R-10.000MHz

**Precision Ultra Low Phase Noise OCXO in 22x22 mm Package Improved
Vibration**
**ESD Sensitive**
22 x 22 x 12.7 mm
Datasheet #2101A
Temperature Code Table

Letter	Temp °C	Letter	Temp °C	Letter	Temp °C	Letter	Temp °C	Letter	Temp °C	Letter	Temp °C
A	-40	F	-15	K	10	P	35	U	60	Z	85
B	-35	G	-10	L	15	Q	40	V	65		
C	-30	H	-5	M	20	R	45	W	70		
D	-25	I	0	N	25	S	50	X	75		
E	-20	J	5	O	30	T	55	Y	80		

Notes:

1) For highest operating temperature higher than 70°C the power consumption will be higher (about 20% for 85°C). Values listed are for test in still air environment, the values will go up while testing in the temperature chamber.

2* It is recommended to specify Slope option “L” for Ultimate Phase noise performance. Recommended test equipment – Symmetricom 5120A-01 Phase Noise and Allan Deviation Test Set (be aware of limitations on the floor, especially if the DUT frequency is not 10.000 MHz), Noise XT DCNTS, or Holtzworth HA 7000B series. “Clean” analog power supply i.e. HP E3610A or equivalent. It’s assumed that phase noise test is performed under static conditions (no vibration), in still air, and care is taken for minimizing EMI.

3* Longer storage time, especially at low temperatures, may affect both retrace and stability parameters. It may require few days on power for re-stabilization.

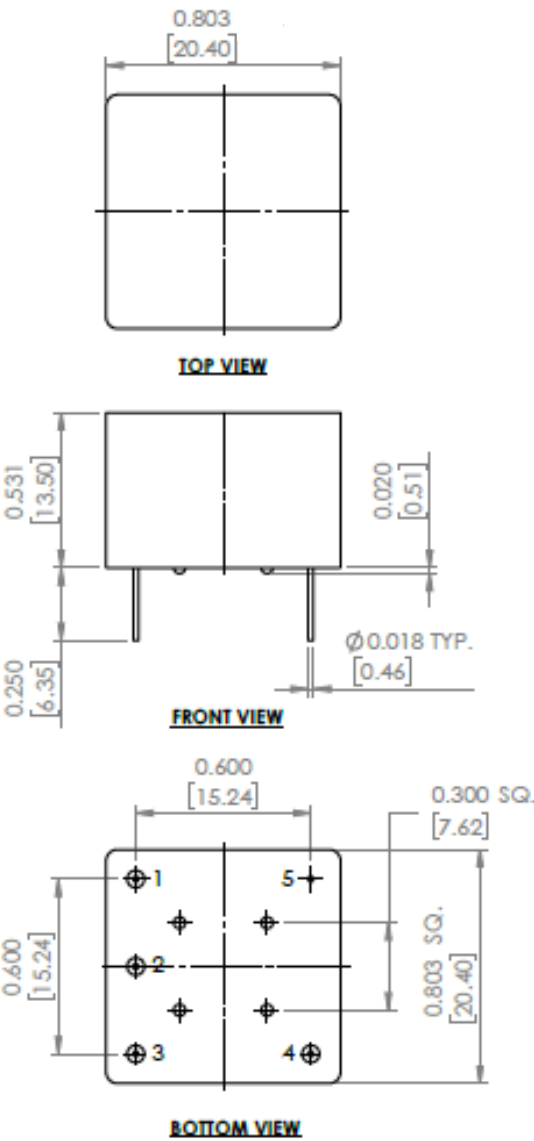
4* The power consumption is affected by the operating temperature range (the higher the highest temperature – the higher the power consumption), and by the height of the cover (the shorter the cover – the higher the power). The values in the table are for high operating temperature at 70°C, and a height of 13.5mm.

Precision Ultra Low Phase Noise OCXO in 22x22 mm Package Improved
Vibration



22 x 22 x 12.7 mm
Datasheet #2101A

Mechanical Dimensions



Pin #	Function
1	Vc
2	Vref
3	Vcc
4	Output
5	GND

Dimensions: inches [mm]

0-LU25AD-0S17IS-P-E-N-R-10.000MHZ
0-LU25AD-0S18GU-L-E-X-R-10.000MHZ
0-LU25AD-0S18IS-L-E-X-R-10.000MHZ

Brand	Part Numbers	Series	EC0#
NEL	0-LU25AD-0S17IS-P-E-N-R-10.000MHZ	0-LU25AD	5007
NEL	0-LU25AD-0S18GU-L-E-X-R-10.000MHZ	0-LU25AD	5007
NEL	0-LU25AD-0S18IS-L-E-X-R-10.000MHZ	0-LU25AD	5007

Datasheet Link

https://abracon.com/datasheets/O-LU25AD.pdf

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ECN Notification Link

<https://abracon.com/downloads/ECN-PCN/7020-ECN-EOL-5007-O-LU25AD.pdf>

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Discontinued?

Yes

Yes

Yes