

# Iris Series – 1x1 OCXO for LEO orbits



## FEATURES

- ✓ Radiation tolerant for TID and LET
- ✓ 0.3ppb/g acceleration sensitivity
- ✓ ±25ppb Temperature Stability
- ✓ 1"x1" Package

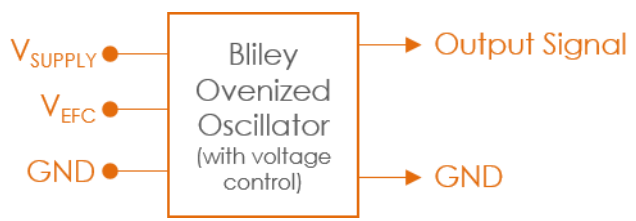
## LEO Orbit Master Reference Oscillator

#blileytakesyoufurther

### Description

The Iris series OCXO is specifically designed for commercial space Low Earth Orbit (LEO) applications, designed to be radiation tolerant for both Total Ionizing Dosage (TOD) and Linear Energy Transfer (LET) typical of LEO orbits. Iris offers excellent phase noise performance and g sensitivity.

### Block Diagram



### Part Number Configuration

SP A E - M E - - A

Phase Noise	Mounting	Center Frequency	Supply Voltage	EFC	Frequency vs. Temperature	Operating Temperature	Output Type	Option <sup>1</sup>	Type-Tested Units
A	T: Thru Hole S: SMT	10MHz to 100MHz	E: +5.0 Vdc	N: N/A A: ±0.5ppm B: ±1.0ppm C: ±2.0ppm	***P: ±25ppb E: ±50ppb F: ±100ppb	B: -20C to 70C S: -10C to 60C	A: Sine	B: Standard V: Vent	M: Eng. E: Flight F: Qual.

\*Not all combinations of options may be possible  
 \*\*Other options may be available

\*\*\*(P) stability available on Operating Temp (S) 1. See drawing page



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## Performance Specifications

Parameter	Conditions	Values			Unit
		MIN	TYP	MAX	
Frequency Range		10		100	MHz
Initial Tolerance	@ +25°C±1°C			±0.25	ppm
Warm Up Time	To initial tolerance			3	Min
Frequency Stability					
vs. Temperature	See Options (Max) Referenced to +25°C		±25***, ±50, ±100		ppb
vs. Load	± 5% Δ in Load		±0.01		ppm
vs. Supply Voltage	± 5% Δ in supply		±0.01		ppm
ADEV (Short Term Stability)	T = 1 second		1.69E-11		
	T = 10 second		8.09E-11		
Aging					
Per Day	After 30 Days Operation		±5.0		ppb
3 Years			±500		ppb
Supply Voltage (Vdd)	Option E	4.75	5	5.25	Vdc
Power Dissipation					
Start Up	@ +25°C		2.5	3.0	W
Steady State	@ +25°C		1.5		W
Electronic Frequency Control					
Voltage Range		0	2.0	4.0	Vdc
Frequency Range	See Options (Min)		±0.5, ±1, ±2		ppm
Slope			positive		
Input Impedance			100		kΩ
Linearity			10		%

Note(s):

1. Frequency accuracy requirement applies over the full operational temp range.
2. Temperature tolerance includes finish tolerance

\*\*\*Stability only available from -10°C to 60°C

## Performance Specifications

Parameter	Conditions	Values			Unit
Output Characteristics (Sinusoid)		MIN	TYP	MAX	
Output Level		8.0	10.0		dBm
Harmonics				-30	dBc
Spurious				-80	dBc
Load		47.5	50	52.5	Ω

Parameter	Conditions	Values		Unit
Phase Noise		MAX	MAX	
Phase Noise (Sinusoid)*	Tested at +25°C	10MHz	100MHz	
	10Hz	-125	-93	dBc/Hz
	100Hz	-152	-125	dBc/Hz
	1kHz	-160	-150	dBc/Hz
	10kHz	-168	-168	dBc/Hz
	100kHz	-168	-168	dBc/Hz

Note: \*Specified phase noise performance is subject to Export Control restrictions

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## Environmental Compliance

Parameter	Conditions	Values			Unit
		MIN	TYP	MAX	
Operating Temperature	Option B	-20		+70	°C
	Option S: Special	-10		+60	°C
Storage Temperature		-40		+85	°C
Seal	MIL-STD-202 Method 112 Test Condition D				
Shock	MIL-STD-202G Method 213 Condition C				
Random Vibration	MIL-STD-810G Method 514 Procedure I				
Sinusoidal Vibration	MIL-STD-202G Method 204 Condition A				
Acceleration Sensitivity	100MHz output Vibration profile: 0.001G <sup>2</sup> /Hz 10Hz to 2kHz		0.3		ppb/g
Radiation Tolerance		MIN			Unit
Total Ionizing Dose (TID)	Radiation tolerant up to total dosage	38**			krad
Single Event Effects (SEE)	SEE Immune by design up to linear energy transfer	60**			MeV-cm <sup>2</sup> /Hg

\*\*Iris is built using AEC qualified (or higher) passives and active components. The parts list is controlled (and available upon request). The active components in the BOM that are subject to radiation degradation have been previously up-screened to the radiation levels listed above; however, due to the potential for lot-to-lot variation, actual radiation tolerance may vary. Radiation Lot Acceptance Testing will be offered as an additional test charge if required by the customer's radiation environment.

## Type Unit Tested

Bliley Part Number	Description	Group Testing Performed		
SPxxExxxMxxxxxx <b>M</b>	Engineering Unit	I		
SPxxExxxMxxxxxx <b>E</b>	Flight Unit	I	II	
SPxxExxxMxxxxxx <b>F</b>	Qualification Unit	I	II	III

### Group I – Tests

Test	Method
Pre-Cap Inspection (Optional)	N/A
Electrical Testing	Per Bliley Datasheet

### Group II – Tests

Test	Method
Thermal Shock	MIL-STD-202 Method 107, Condition A
Burn In	MIL-STD-883 Method 1015, Condition B 160 Hrs.
Electrical Testing	Per Bliley Datasheet

### Group III – Tests

Test	Method
Sinusoidal Vibration	MIL-STD-202G Method 204, Condition A
Shock	MIL-STD-202G Method 213, Condition C
Thermal Shock	MIL-STD-202 Method 107 Condition B-1
Storage Temperature	24 Hrs. Soak at -40°C and +85°C
Resist to Soldering Heat	MIL-STD-202 Method 210, Condition A-D
Terminal Strength	MIL-STD-202 Method 211A, Condition A-E
Solderability	MIL-STD-202 Method 208
Electrical Testing	Per Bliley Datasheet

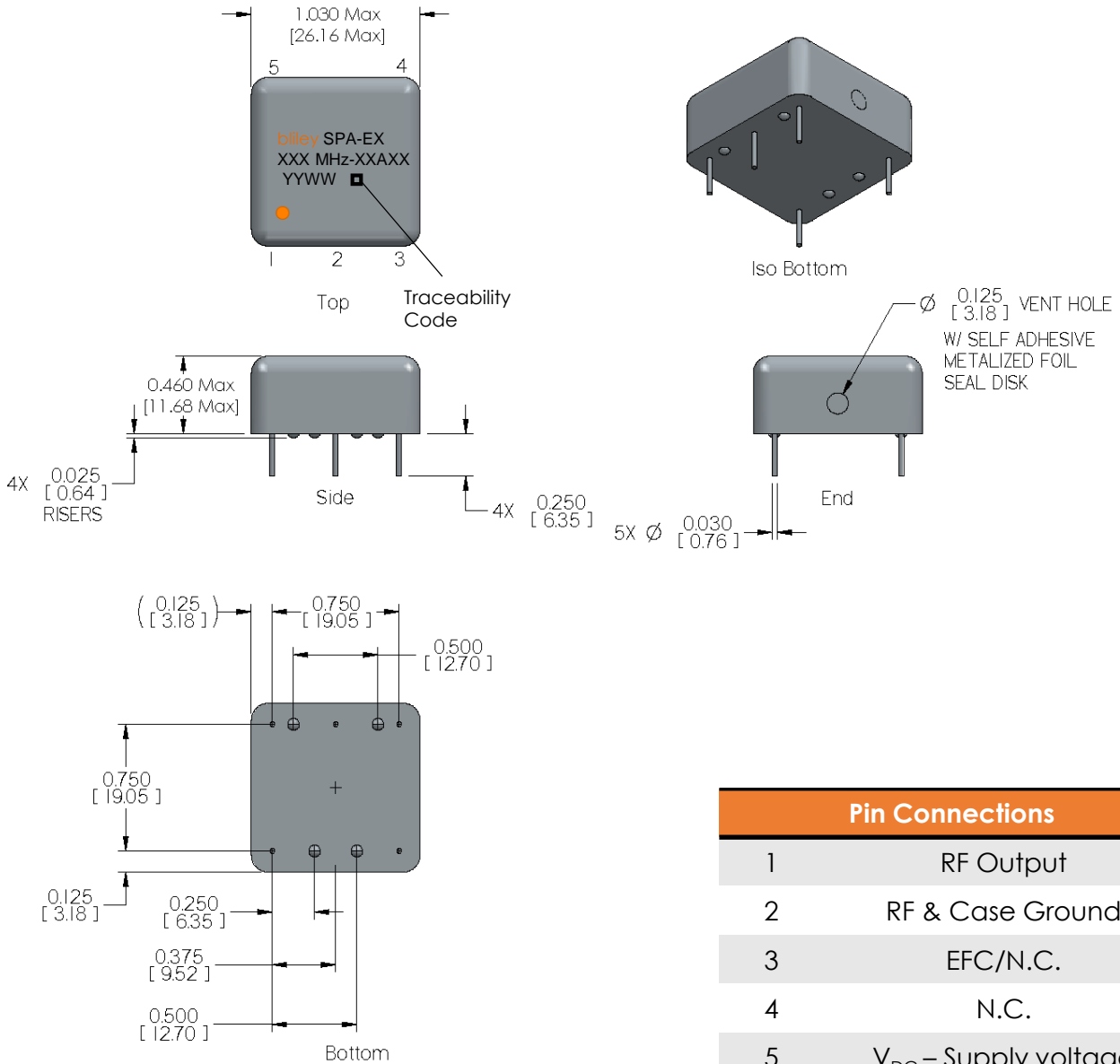
**Additional testing can be performed at an additional charge upon request**

#### Note(s):

1. All units will be delivered with traceability documentation.
2. Upon request Bliley will provide a copy of the DPL, DCL and DML.

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## Physical Specifications – Through Hole



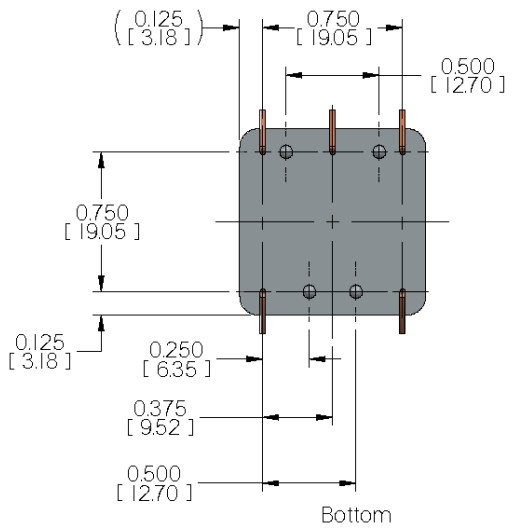
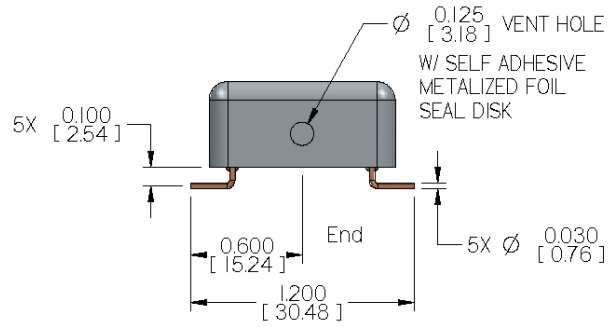
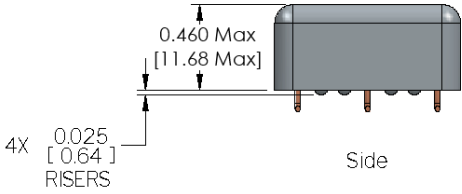
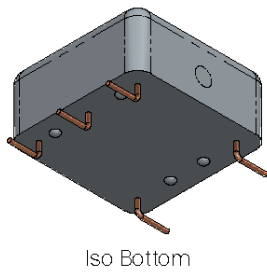
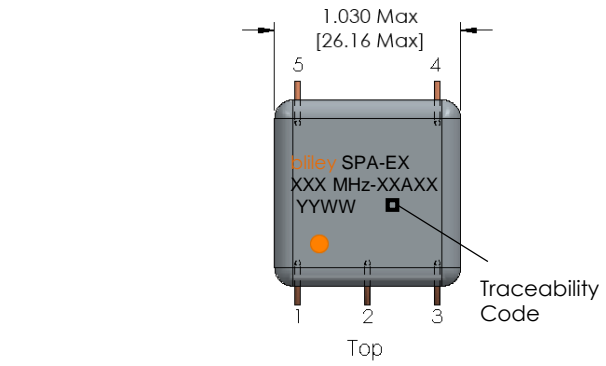
Tolerances (mm) .X = ± 0.5, .XX = ± 0.2 unless otherwise specified

Pin Connections	
1	RF Output
2	RF & Case Ground
3	EFC/N.C.
4	N.C.
5	V <sub>DC</sub> – Supply voltage



Notes:  
 • Order option V for a vented enclosure, option B for standard enclosure bulk packaging

## Physical Specifications – Surface Mount



Tolerances (mm) .X = ± 0.5, .XX = ± 0.2 unless otherwise specified

Pin Connections	
1	RF Output
2	RF & Case Ground
3	EFC/N.C.
4	N.C.
5	V <sub>DC</sub> – Supply voltage



Notes:  
 • Order option V for a vented enclosure, option B for standard enclosure bulk packaging