

**FEATURES**

- ✓ 135mW steady state power
- ✓ 350mW start-up power
- ✓ -125dBc/Hz @ 10Hz phase noise
- ✓ 0.5ppb/g acceleration sensitivity
- ✓ Miniature Half-DIP Package

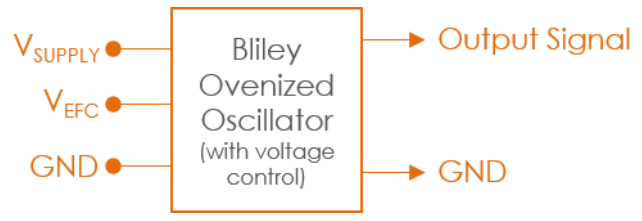
**Low Power Oscillator**

#blileytakesyoufurther

**Description**

Bliley's Half-DIP Low Power Crystal Oscillator Series offers excellent frequency versus temperature in a compact package for applications where size and power are a concern. The LP series achieves low startup power while maintaining a fast warm up of less than one minute.

**Block Diagram**



**Part Number Configuration**

LP - N - M - - C B

<u>Phase Noise</u>	<u>Mounting</u>	<u>Center Frequency</u>	<u>Supply Voltage</u>	<u>EFC</u>	<u>Frequency vs. Temperature***</u>	<u>Operating Range</u>
A and B (table below)	T: Through Hole S: SMT	10 MHz to 60 MHz	D: +3.3 Vdc E: +5.0 Vdc	N: N/A A: ±0.5ppm	E: ±50ppb F: ±100ppb G: ±200ppb Y: ±300ppb Z: ±75ppb	B: -20C to 70C C: -40C to 85C J: 0C to 50C

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

\*\*\*See Table on page 3 for stability availability



## Performance Specifications

Parameter	Conditions	Values			Unit
		MIN	TYP	MAX	
Frequency Range		10		60	MHz
Initial Tolerance	10-35MHz 36-60MHz			±100 ±200	ppb
Warm Up Time	To initial tolerance			1	Min
Frequency Stability					
vs. Temperature	See Options*** (Max) (Fmax-Fmin)/2	±50, ±75, ±100, ±200, ±300			ppb
vs. Load	± 5% Δ in Load	±25			ppb
vs. Supply Voltage	± 5% Δ in supply	±25			ppb
ADEV (Short Term Stability)	T = 1 second (10MHz)	8E-12			
Aging					
1 <sup>st</sup> Year	After 30 Days Operation	±100			ppb
20 Years		±500			ppb
Supply Voltage (Vdd)	Option D	3.13	3.3	3.47	Vdc
	Option E	4.75	5	5.25	Vdc
Power Dissipation					
Start Up	@ +25°C	350			mW
Steady State	@ +25°C, 3.3Vdc	135			mW
Steady State	@ +25°C, 5Vdc	180			mW
Electronic Frequency Control					
Voltage Range		0		Vdd	Vdc
Center Voltage	±10%	Vdd/2			Vdc
Frequency Range	See Options (Min)	±0.5			ppm
Slope		positive			
Input Impedance		100			kΩ
Linearity		10			%

\*Values typical of 10MHz units

\*\*\*See Table on page 3 for stability availability

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## Performance Specifications

Parameter	Conditions	Values			Unit
		MIN	TYP	MAX	
Output Characteristics (CMOS)					
High Output Level	Logic "1"	90% Vdd			Vdc
Low Output Level	Logic "0"	10% Vdd			Vdc
Rise/Fall Time			10		nSec
Duty Cycle		45	50	55	%
Load			15		pF

Parameter	Conditions	Option	Values		Unit
			TYP	TYP	
Phase Noise (CMOS)					
Phase Noise (10 MHz)	Tested at +25°C	Option	A	B	
Phase Noise (60 MHz)	Tested at +25°C	Option	A	B	

### Temperature Stability Table

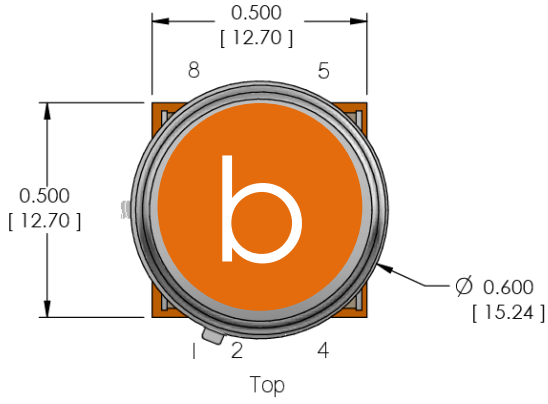
	Temp Range	Temp Range						Temp Range	Temp Range				
		±50	±75	±100	±200	±300			±50	±75	±100	±200	±300
10 to 35 MHz	0~50C	X	X	X	X	X	36 to 60 MHz	0~50C	N/A	X	X	X	X
	-20~70C	X	X	X	X	X		-20~70C	N/A	N/A	X	X	X
	-40~85C	N/A	X	X	X	X		-40~85C	N/A	N/A	N/A	X	X

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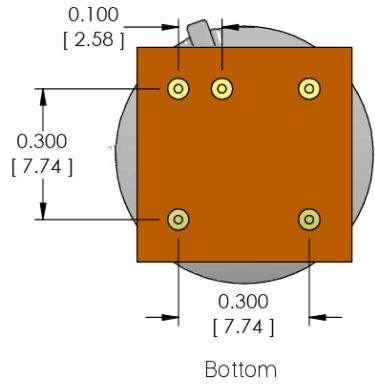
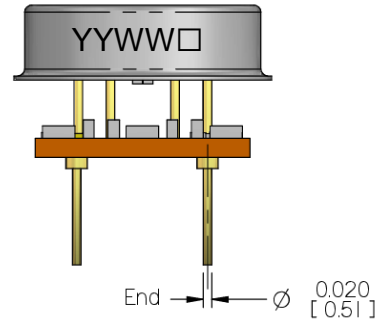
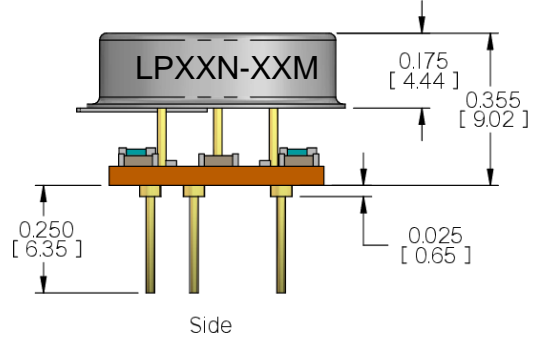
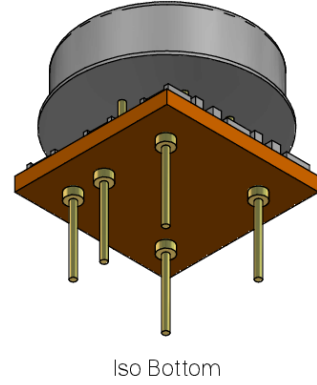
## Environmental Compliance

Parameter	Conditions	Values			Unit
		MIN	TYP	MAX	
Environmental & Reliability		MIN	TYP	MAX	
Operating Temperature	Option B	-20		+70	°C
	Option C	-40		+85	°C
	Option J	0		+50	°C
Storage Temperature		-55		+95	°C
Shock	MIL-STD-202 Method 213, Test Condition C	Survive			
Sinusoidal Vibration	MIL-STD-202 Method 204, Test Condition A	Survive			
Random Vibration	MIL-STD-202 Method 214, Test Condition 1B, 15min	Survive			
MTTF	Calculated using MIL-HDBK-217	153,300			Hrs
Acceleration Sensitivity	10MHz output Vibration profile: 0.001G <sup>2</sup> /Hz 10Hz to 2kHz	0.5			ppb/g

# Physical Specifications – Through Hole



Full part number marked around side of crystal:  
LPXXN-XXMXX-XXCB YYWW-SN



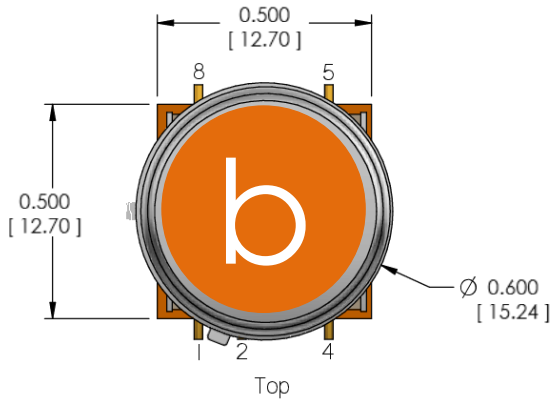
PIN	FUNCTION
1	EFC/N.C.
2	Reference Voltage/N.C.
4	Ground
5	RF Output
8	Supply Voltage

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

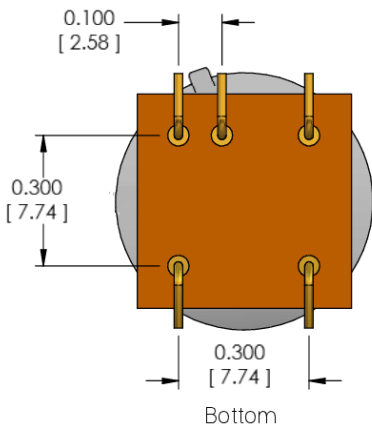
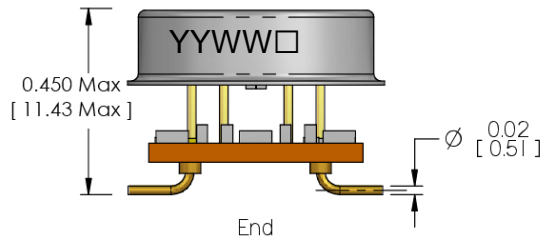
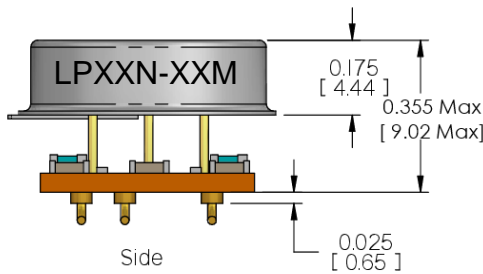
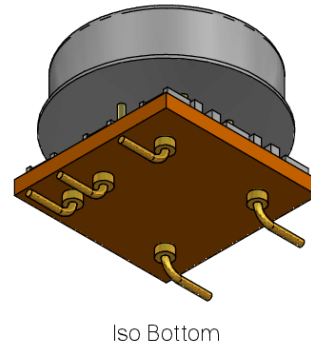
Notes:  
• Non-RoHS available upon request

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# Physical Specifications – Surface Mount



Full part number marked around side of crystal:  
LPXXN-XXMXX-XXCB YYWW-SN



PIN	FUNCTION
1	EFC/N.C.
2	Reference Voltage/N.C.
4	Ground
5	RF Output
8	Supply Voltage

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

Notes:  
• Non-RoHS available upon request