



**FEATURES**

- ✓ 135mW steady state power
- ✓ 350mW start-up power
- ✓ -125dBc/Hz @ 10Hz phase noise
- ✓ 0.5ppb/g acceleration sensitivity
- ✓ 20x20mm package

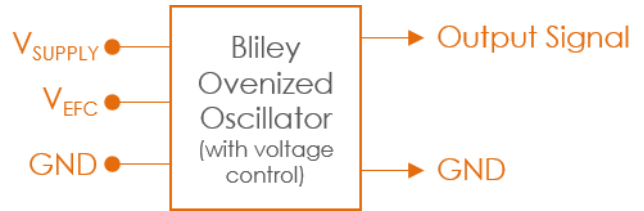
**Low Power Oscillator**

#blileytakesyoufurther

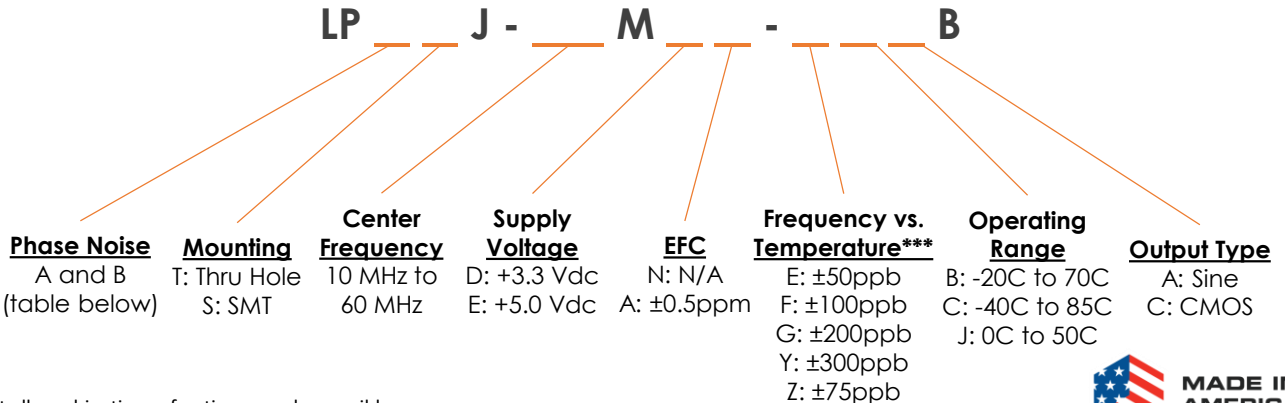
**Description**

The 20x20 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**



\*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)		MIN	TYP	MAX	
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
Output Characteristics (Sinusoid)		MIN	TYP	MAX	
Output Level			9.0		dBm
Harmonics				-30	dBc
Load		45	50	55	Ω

### Temperature Stability Table

	Temp Range	±50	±75	±100	±200	±300		Temp Range	±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

## Performance Specifications

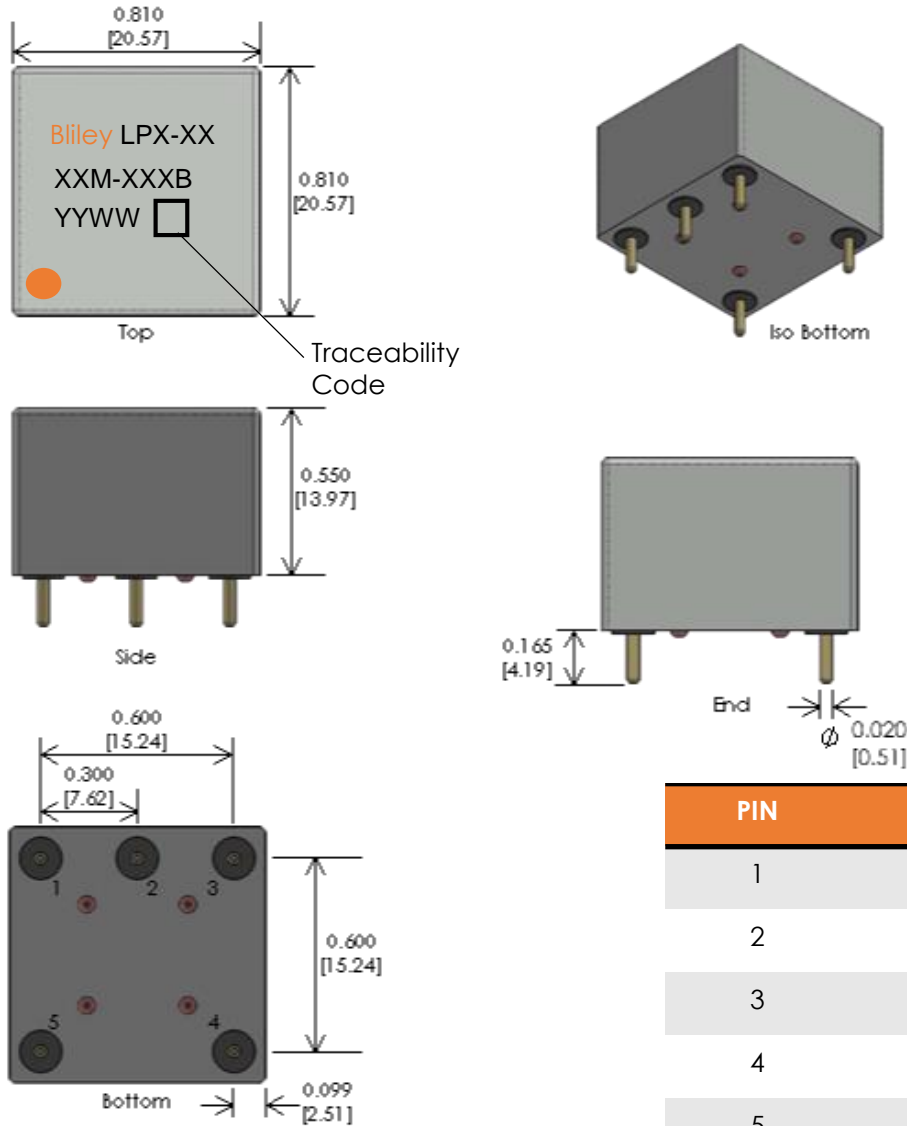
Parameter	Conditions		Values		Unit	
Phase Noise (Sinusoid)			TYP	TYP		
Phase Noise (10 MHz)	Tested at +25°C	Option	A	B		
			10Hz	-125	-120	dBc/Hz
			100Hz	-152	-150	dBc/Hz
			1kHz	-162	-158	dBc/Hz
			10kHz	-165	-162	dBc/Hz
			100kHz	-168	-165	dBc/Hz
Phase Noise (60 MHz)	Tested at +25°C	Option	A	B		
			10Hz	-95	-90	dBc/Hz
			100Hz	-125	-120	dBc/Hz
			1kHz	-152	-150	dBc/Hz
			10kHz	-162	-158	dBc/Hz
			100kHz	-165	-162	dBc/Hz
Phase Noise (CMOS)			TYP	TYP		
Phase Noise (10 MHz)	Tested at +25°C	Option	A	B		
			10Hz	-125	-120	dBc/Hz
			100Hz	-148	-145	dBc/Hz
			1kHz	-152	-150	dBc/Hz
			10kHz	-155	-150	dBc/Hz
			100kHz	-160	-155	dBc/Hz
Phase Noise (60 MHz)	Tested at +25°C	Option	A	B		
			10Hz	-95	-90	dBc/Hz
			100Hz	-125	-120	dBc/Hz
			1kHz	-148	-145	dBc/Hz
			10kHz	-152	-150	dBc/Hz
			100kHz	-155	-150	dBc/Hz

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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
Seal	MIL-STD-202 Method 112 Test Condition D				
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



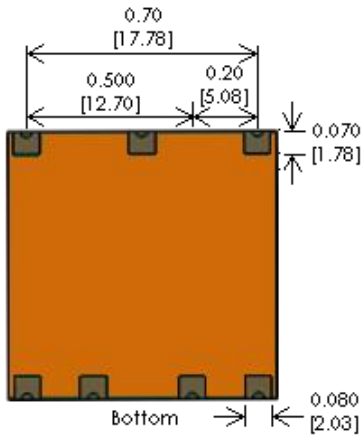
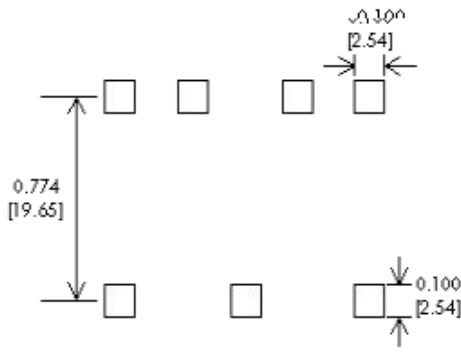
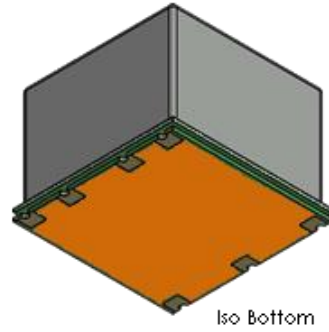
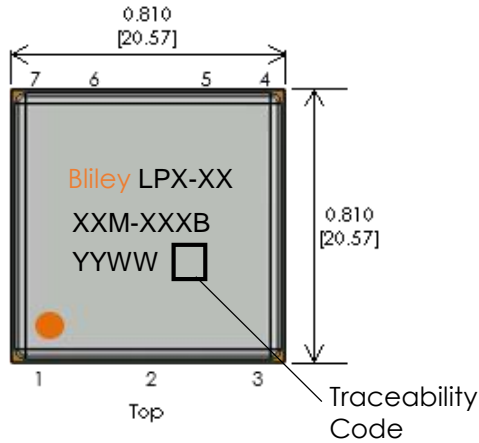
PIN	FUNCTION
1	Supply Voltage
2	N.C.
3	EFC/N.C.
4	RF Output
5	Ground

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



PIN	FUNCTION
1	Supply Voltage
2,5,6	N.C.
3	EFC/N.C.
4	RF Output
7	Ground

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

Notes:  
 • Non-RoHS available upon request