In its 80-year history as a major force in the crystal oscillator market, Bliley Technologies has produced industry standard breakthroughs established worldwide, holds a 45-year track record of space technology contributions, and still produces the most advanced doubly-rotated crystal technology available in the marketplace.

Bliley is a worldwide leader in crystal controlled frequency generation products and today remains one of the very few U.S. based companies performing onsite quartz crystal manufacturing for custom oscillator designs. The company has in-house processes in place to facilitate ease of product and program adaptation.

With integration of microwave/RF engineering in the company's sales and service processes, Bliley seeks to increase customer involvement in system definition and performance selection prior to finalizing and releasing designs for manufacturing.

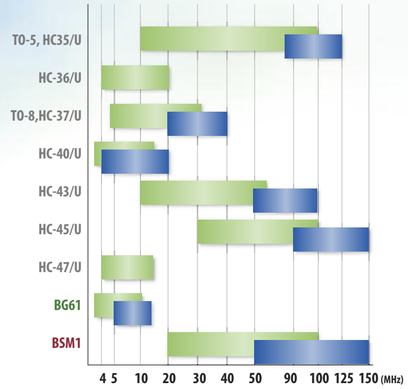
At its state-of-the-art, ISO 9001:2000 certified manufacturing facilities, Bliley designs and produces:

- Oven Controlled Crystal Oscillators (OCXOs)
- Temperature Compensated Crystal Oscillators (TCXOs)

- Voltage Controlled Crystal Oscillators (VCXOs)
- Crystal Oscillators (XOs)
- Precision AT, SC, IT, FC & BT cut crystals
- Quartz Transducers.

Providing quality frequency generation solutions and specializing in frequency control components for demanding applications, Bliley serves customers in these industries: SATCOM/space; military; aerospace electronics; wireless and wireline communications; instrumentation; medical; and consumer electronics.

DOUBLY-ROTATED CRYSTALS - **SC, IT & FC**



COLD WELD
RESISTANCE WELD
GLASS PACKAGE

3RD OT 5TH OT

Transducer & Specialty Blanks

- X Cut
- Y Cut
- Quartz Available in Three Grades
  - Standard; Q of 2.0M Minimum
  - Premium; Q of 2.5M Minimum
  - Swept Quartz
- Alternate material - PZT

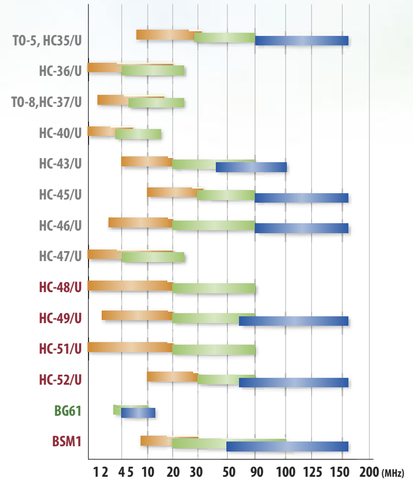
Bliley

Low Phase Noise Frequency Generation Products

2545 West Grandview Boulevard
Erie, PA 16506-4512

PHONE: (814) 838-3571 FAX: (814) 833-2712
WEBSITE: www.bliley.com EMAIL: info@bliley.com

PRECISION **AT**-CUT CRYSTALS



COLD WELD
RESISTANCE WELD
GLASS PACKAGE

FUND 3RD OT 5TH OT

ISO 9001 SGS — ITAR

PRODUCT SELECTION GUIDE

Bliley

Low Phase Noise Frequency Generation Products

www.bliley.com

ENVIRONMENTAL TESTING DATA

Description	MIL-STD-883 Method	MIL-STD-883 Condition	MIL-STD-202 Method	MIL-STD-202 Condition
Burn-in Test	1015	--	--	--
External Visual	2009	--	--	--
Internal Visual and Mechanical	2017	--	--	--
Lead Integrity	2004	--	--	--
Mechanical Shock	2002	--	213	I
Particle Impact Noise Detection	2020	--	217	--
Physical Dimensions	2016	--	--	--
Pre-seal Burn-in	1030	--	--	--
Resistance to Soldering Heat	2036	--	210	B
Resistance to Solvents	2015	--	215	--
Seal Test	1014	--	112	--
Shock (specified pulse)		--	213	--
Solderability	2003	--	208	--
Stabilization (High Temp) Bake	1008	--	--	--
Steady State Life	1005	--	108	D
Temperature Cycling	1010	--	--	--
Terminal Strength		--	211	A
Vibration, High Frequency	2007	--	204	G
Visual & Mechanical	2008	--	--	--

Unique In-House Testing Capabilities

- Phase Noise Testing
- ESS – Environmental Stress Screening
- Quartz Crystal Type Testing Programs
- Product Screening and Qualification Programs
- Mathematical Simulation of Oscillator Aging Characteristics
- Vibration Testing
- Particle Impact Noise Detection (PIND) Testing

CRYSTAL PRODUCTS

Applications

Military
Space
Wireless Communications
Timing Applications
Test & Measurement
Industrial
Avionics
Radar Systems
Specialized Pressure & Sensor Applications
Industrial Timing & Control Functions
Aerospace
Medical

Specialized Crystal Cuts

- Doubly-Rotated Cuts
  - SC
  - IT
  - FC
  - BT
- Precision AT-Cut Crystals
- Specialty Cuts Available

Standard and Custom Packages

- Glass, Metal & Ceramic
  - HC-33U
  - HC-35U
  - HC-36U
  - HC-37U
  - HC-40U
  - HC-43U
  - HC-45U
  - HC-46U
  - HC-49U
  - HC-51U
  - HC-52U
  - BG-61
  - BR25M
  - BSM1

Frequency Ranges

- Fundamental – 1 MHz to 24 MHz
- 3rd Overtone – 15 MHz to 60 MHz
- 5th Overtone – 40 MHz to 160 MHz

Transducer & Specialty Blanks

- X Cut
- Y Cut
- Quartz Available in Three Grades
  - Standard; Q of 2.0M Minimum
  - Premium; Q of 2.5M Minimum
  - Swept Quartz
- Alternate material - PZT

LOW COST OSCILLATORS

Applications

Military
Wireless Communications
Medical
Test & Measurement
Industrial
Avionics
Radar
Phase-Lock Microwave Signal Sources

Oscillator Types

- Crystal Oscillators (XO)
- Temperature Compensated Crystal Oscillators (TCXO)
- Voltage Controlled Crystal Oscillators (VCXO)
- Temperature Compensated Voltage Controlled Crystal Oscillators (TCVCXO)

Small Package Size

- 2.5 mm x 2.0 mm
- 5.0 mm x 3.2 mm
- 7.0 mm x 5.0 mm

Wide Temperature Range

- -40C to +85C Operating
- -55C to +125C Storage

Features

- Wide Range of Frequencies Available
- Several Output Options
- Low Power Consumption
- Excellent Aging Characteristics
- Tri-State Controls
- RoHS-6/Lead-Free Compliant
- Hermetically Sealed

Frequency Ranges

- Clock Oscillators (XO), 1 – 200 MHz
- Temperature Compensated Crystal Oscillators (TCXO), 5 – 150 MHz
- Voltage Controlled Crystal Oscillators (VCXO), 1 – 700 MHz

Frequency Vs. Temperature Performance

- As low as ± 0.28 ppm
- -40C to +85C

Guaranteed Phase Noise Available

- Referenced in dBc/Hz offset from Carrier

PRECISION OSCILLATORS

Applications

Military
Wireless Communications
Precision Medical
Test & Measurement Equipment
Avionics
Radar
Satellite Links
Up/Down Converters

Oscillator Types

- Temperature Compensated Crystal Oscillators (TCXO)
- Voltage Controlled Crystal Oscillators (VCXO)
- Temperature Compensated Voltage Controlled Crystal Oscillators (TCVCXO)
- Oven Controlled Crystal Oscillators (OCXO)
- Oven Controlled Voltage Controlled Crystal Oscillators (OCVCXO)

Custom Package Sizes

- SMT Designs
- Through-Hole Designs
- Output Connector
- Low Profile Packages Available

Wide Temperature Ranges

- -55C to +175C Operating
- -65C to +185C Storage

Features

- Wide Frequency Ranges
- Custom Output Types Available
- Excellent Aging Characteristics
- Excellent Temperature Stability
- Superior Phase Noise Performance
- Configurable to Customer Specifications
- RoHS-6 Compliant Parts Available

Frequency Range

- 1 MHz to 1.5 GHz

Frequency Stability as low as 1 ppb

Phase Noise Performance @ 100 MHz

- Floor > -175 dBc
- Close in phase noise > -130 dBc @ 100 Hz

MILITARY/SPACE OSCILLATORS

Applications

Military
Wireless Communications
Avionics
Radar
Space Flight Hardware

Oscillator Types

- Temperature Compensated Crystal Oscillators (TCXO)
- Voltage Controlled Crystal Oscillators (VCXO)
- Temperature Compensated Voltage Controlled Crystal Oscillators (TCVCXO)
- Oven Controlled Crystal Oscillators (OCXO)
- Oven Controlled Voltage Controlled Crystal Oscillators (OCVCXO)

Custom Package Designs

- SMT Mounting Configurations
- Through-Hole Mounting Configurations
- Custom RF Output Connectors Available

High Reliability/Workmanship

- Up to MTBF 500,000 Hours
- Special Screening/Reliability Programs Available to Customer Specification
- Various Workmanship Programs/ Certification Available

Frequency Range

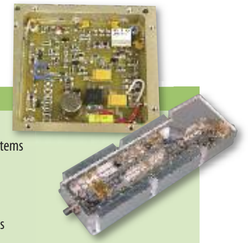
- 1 MHz to 1.5 GHz

Frequency Stability as low as 1 ppb

Phase Noise Performance @ 100 MHz

- Floor > -175 dBc
- Close in phase noise > -130 dBc @ 100 Hz

INTEGRATED ASSEMBLIES



Applications

GPS
Airborne and Ground Radar Systems
Test Verification Sets
Microwave Sources
RF Communication Systems
Specialized Custom Applications

Modular Functions

- Crystal References with Additional Amplification and Filtering
- Lower Phase Noise Performance using Mixer rather than Multiplication Methods
- Crystal Controlled Frequency Sources
- Multiple Output Frequency References
- Digitally Controlled Frequency References

Features

- Improved Performance due to Higher Levels of Integration
- Reduced Cost
- Reduced Size
- Enhanced Environmental Performance
- Multi-Function Assemblies
- Extended Crystal Controlled Output
- Frequency Ranges Available

Frequency Range

- 100 KHz to 4 GHz

Frequency Stability as low as 10 ppb

High Reliability

DC Input & Logic Protection

Completely Customized & Configurable Applications