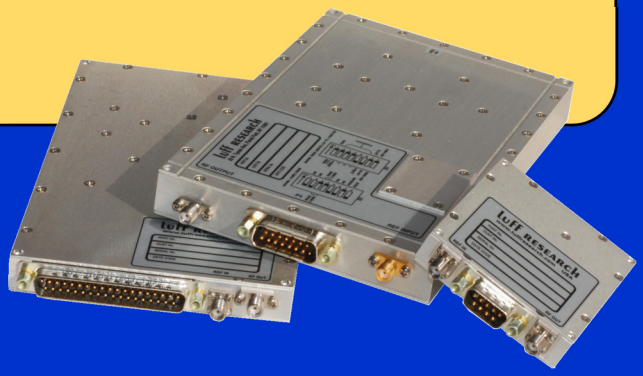
HIGH PERFORMANCE RF SIGNAL GENERATION 2016

Phase-Locked Oscillators

- Crystal Oscillators (PLOX)
- Ceramic Resonator Oscillators (PLCRO)
- Dielectric Resonator Oscillators (PLDRO)
- Low cost Voltage Controlled Oscillators (PLVCO)

Frequency Synthesizers

- Frequencies up to 32 GHz
- Multi-loop designs – Excellent performance
- Single loop designs – Performance and price.
- Flexible designs. System level components.

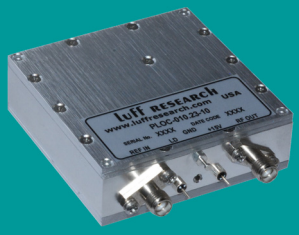


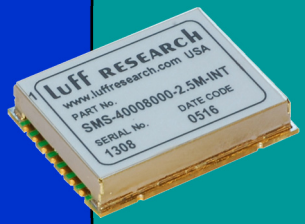
Custom Assemblies

- Frequency sources and converters
- Superior custom design strategies
- Outstanding performance and value

NEW Products

- Phase-locked 10 MHz references with ultra low phase noise (PLOC10-10).





- Surface mount synthesizer for the 4-8 GHz band, with high performance internal TCXO reference.

- Model SLSM5-0520 frequency synthesizer covers the whole 0.5 to 20 GHz band with 1 kHz resolution.

At Luff we specialize in high performance frequency sources, frequency synthesizers and converters.

Custom designs and demanding requirements are our specialty.

Excellence at an affordable price.

Luff RESEARCH, INC.

www.luffresearch.com

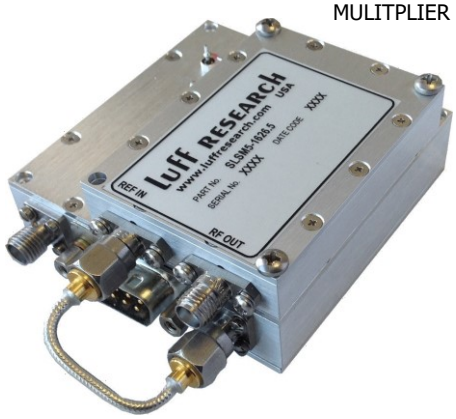
FREQUENCY SYNTHESIZERS
NOW TO 32 GHz

Model SLSM5 Features

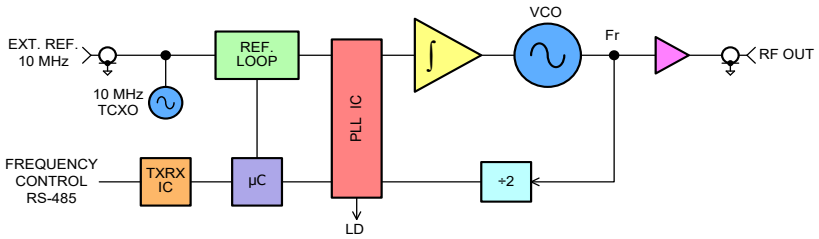
- Output frequency to 32 GHz
- Low phase noise and spurious
- Frequency control via RS-485 interface
  - -Multidrop bus configuration
  - -Non-volatile memory
  - -USB with optional adapter
- 10 MHz external or internal reference
- Low power +5 Vdc operation
- Miniature package
- Great value at low cost

STANDARD
SLSM5

SLSM5 WITH x2
MULITPLIER



Block Diagram



Description

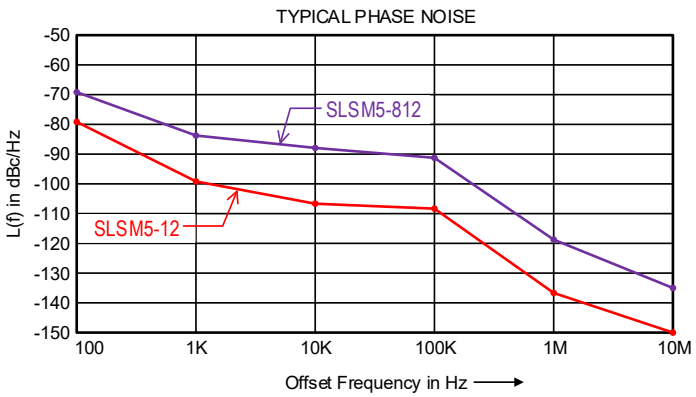
The SLSM5 is a new synthesizer design which employs the latest fractional N technology to realize a miniature high performance frequency synthesizer.

The SLSM5 is ideal for many applications in communications, radar and instrumentation. This versatile synthesizer provides outstanding performance and reliability in a high quality incredibly compact unit.

The SLSM5 is system ready with a minimum of design integration needed. It comes with a custom GUI which allows virtually out of the box operation. Many of the SLSM5 synthesizers are available from stock.

Key Specifications

Standard Bands: 1 – 32 GHz (Custom bands or std. octave bands)	1-2 GHz – SLSM5-12 2-4 GHz – SLSM5-24 1-4 GHz – SLSM5-14 4-8 GHz – SLSM5-48 8-12.5 GHz – SLSM5-812 16-25 GHz – SLSM5-1625 Custom – SLSM5-XXXX
Frequency Steps:	1 kHz
Spurious:	-60 dBc
Harmonics (typ.):	-20 dBc
Output Power (min.):	+13 dBm
Frequency Control:	RS-485
Switching Speed (typ.):	<5 msec.
External Reference:	10 MHz
Internal Reference:	±0.5 PPM (-10°C to +70°C)
Power Requirements:	+5.0 Vdc @ 650 mA
Temperature Range:	-10°C to +70°C
Size:	2.50" x 2.50" x 0.63"



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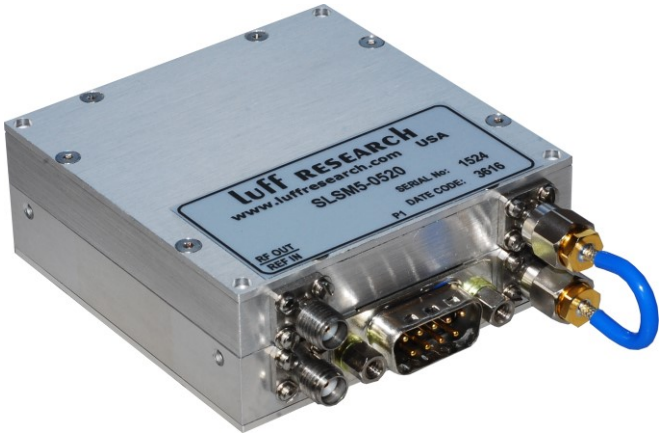
ULTRA BROADBAND FREQUENCY SYNTHESIZER 0.5 TO 20 GHZ

Model SLSM5-0520 Features

- Frequency range: 500 MHz to 20 GHz
- Low phase noise and spurious
- Frequency control via RS-485 interface
  - -Multidrop bus configuration
  - -Non-volatile memory
  - -USB with optional adapter
- 10 MHz external or internal reference
- Miniature package
- Great value at low cost



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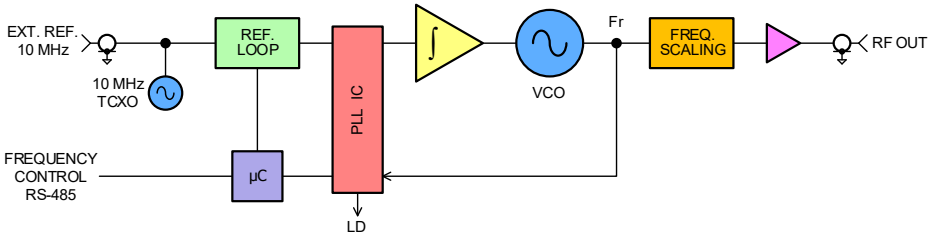


Description

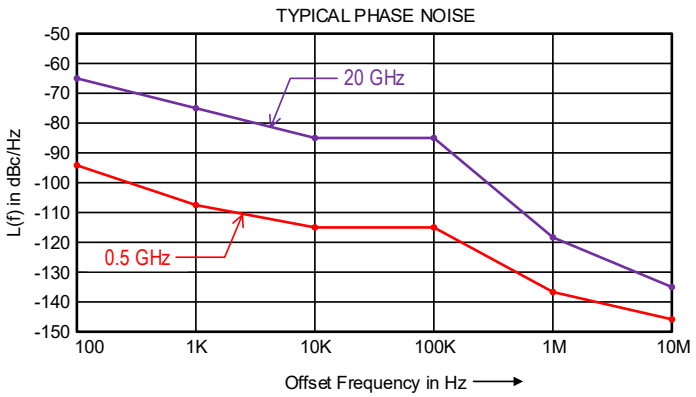
The SLSM5-0520 is a new synthesizer design which employs the latest fractional N technology to realize a miniature high performance ultra-broadband frequency synthesizer. This unit covers the entire 500 MHz to 20 GHz band. This versatile synthesizer provides outstanding performance and reliability in a high quality compact package, at a very attractive low cost.

This unit is ideal for applications in communications, radar and instrumentation.

The SLSM5-0520 comes with a custom GUI which allows virtually out of the box operation.

Key Specifications

Frequency Band:	**500 MHz to 20 GHz**
Frequency Steps:	1 kHz
Spurious:	-60 dBc
Harmonics (typ.):	-20 dBc
Sub-Harmonics:	-20 dBc (10 to 20 GHz band only)
Output Power (min.):	+13 dBm
Frequency Control:	RS-485 USB via converter
Switching Speed:	<5 msec.
External Reference:	10 MHz
Internal Reference:	±0.5 PPM (-10°C to +70°C)
Power Requirements:	+5.0 Vdc @ 1 Amp
Temperature Range:	-10°C to +70°C
Size:	2.50" x 2.50" x 0.63"



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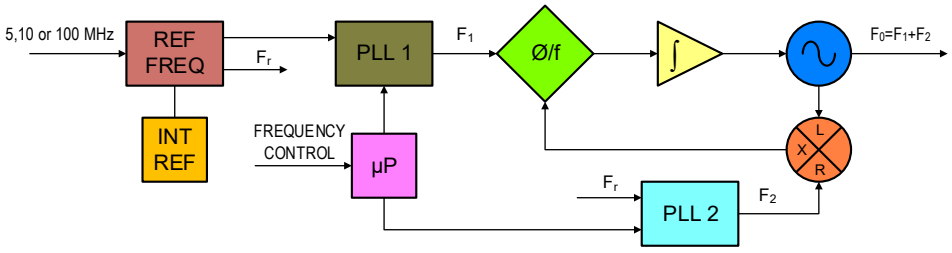
FREQUENCY SYNTHESIZERS

S,C, X & Ku BANDS

Models TLSD & TLSE Features

- Output frequency in bands to 26.5 GHz
- Low phase noise and spurious
- Frequency control via RS-232/422/485
  - -Multidrop bus configuration
  - -USB with optional adapter
- Reference frequencies: 5 ,10, 100 MHz external or internal reference (±0.5 PPM)
- Reliable field proven design
- EMI enclosure
- Cost effective product

Block Diagram



Description

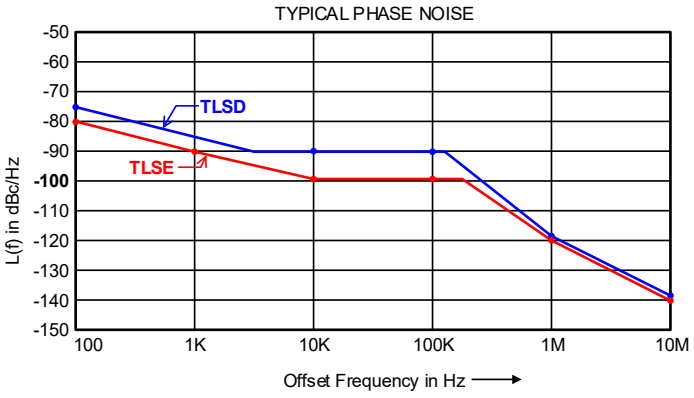
The TLSD & TLSE are improved high performance frequency synthesizers ideal for many **SatCom**, **telecommunication** and **instrumentation** applications. The input reference frequencies are either 5, 10 or 100 MHz. Additionally, the synthesizers are configured to clean-up the input reference signal. With no input present the unit switches automatically to the internal reference.

The frequency control is via standard industrial busses and has a multi-drop capability.

These designs are field proven and have been deployed in critical applications throughout the world. The TLSD offers excellent performance and value while the TLSE offers even better phase noise and spectral quality.

Key Specifications

Output In Bands:	to 26.5 GHz
Frequency Steps:	100 kHz
Spurious (max.):	-60 dBc
Harmonics (typ.):	-20 dBc
Output Power (min.):	+13 dBm
Frequency Control:	RS-232/422/485
Switching Speed (typ.):	<10 msec.
External Reference:	5, 10 or 100 MHz
Internal Reference:	±0.5 PPM (-10°C to +70°C)
Power Requirements:	+5.2 Vdc @ 650 mA +15.0 Vdc @ 150 mA
Temperature Range:	-10°C to +70°C
Enclosure:	EMI to -90 dBm
Size:	6.80" x 4.40" x 0.83"



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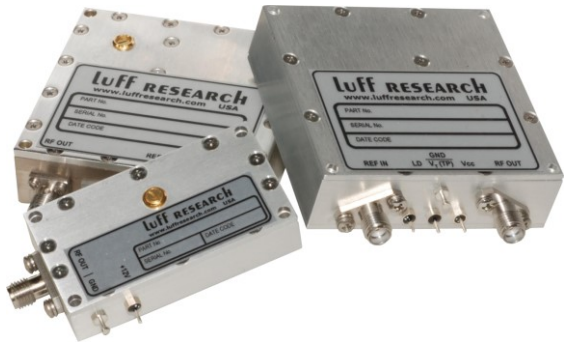
PHASE-LOCKED OSCILLATORS OVERVIEW

PLO Features

- Fixed frequency sources to **32 GHz**
- Phase-Locked to:
  - -External reference 5, 10 or 100 MHz or
  - -Internal reference (TCXO or OCXO)
- Very low phase noise and spurious
- Low power consumption, single +5 Vdc operation
- Rugged, compact, connectorized package
- Standard product line and fully customized units
- Low cost



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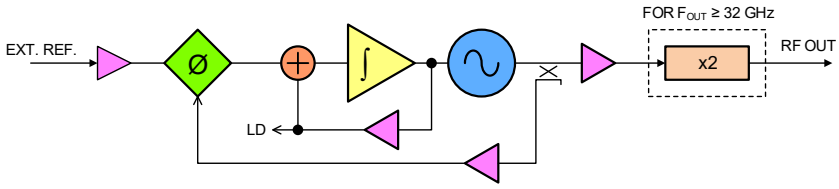


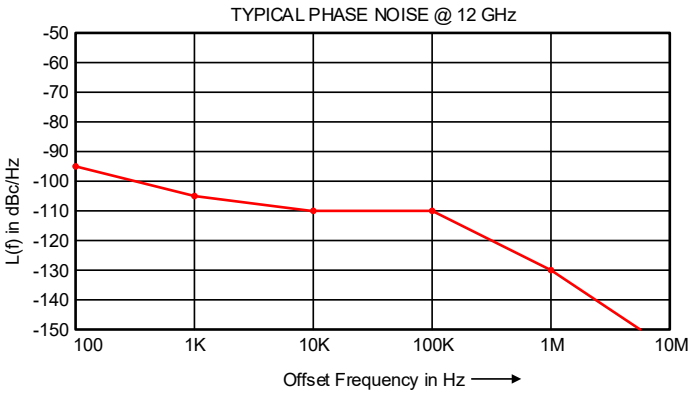
Description

Luff Research manufactures frequency sources that are designed for demanding applications in commercial and industrial communication and test equipment. Units are developed to fulfill specific requirements from our generic product line of designs which incorporate the latest technologies.

Our designs are always high performance, high reliability and are cost effective. We pride ourselves on working closely with our customers so that the end product fulfills all the design objectives.

Options

- Technologies used:
  - -Crystal oscillators (PLOX)
  - -Ceramic resonator oscillators (PLCRO)
  - -Coaxial resonator oscillators (PLO)
  - -Dielectric resonator oscillators (PLDRO)
  - -Voltage controlled oscillators (PLVCO)
- Dual-loop configurations
- High performance internal reference oscillators
- Hermetically sealed oscillators



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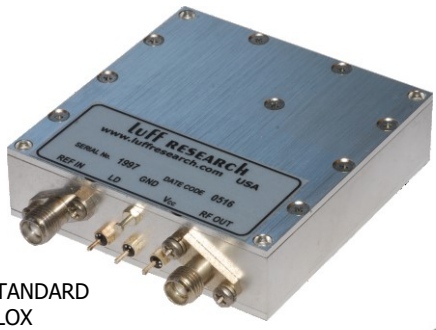
PHASE-LOCKED CRYSTAL OSCILLATORS

Model PLOX Features

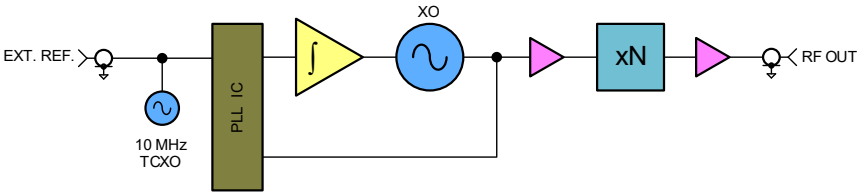
- Fixed frequencies: 10 - 1400 MHz
- Very low phase noise
- Spurious: -80 dBc
- Harmonics: -30 dBc
- Internal TCXO (0.5± PPM) or phase-locked to an external reference
- Low cost



STANDARD PLOX

PLOX WITH xN MULITPLIER

Block Diagram



Description

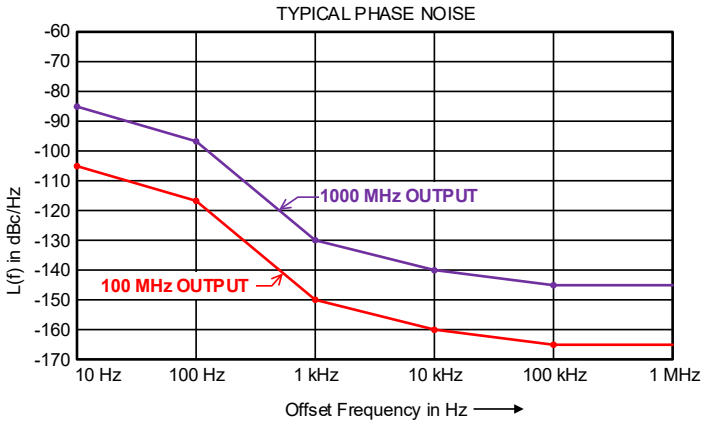
Multiplied low noise crystal oscillators offer the lowest phase noise frequency sources available. The new series PLOX are high quality crystal oscillators multiplied to any desired frequency between 10 and 1400 MHz. These units offer excellent phase noise and harmonic and sub-harmonic performance.

The output frequency from these units can be phase-locked to an input reference frequency or the unit can be configured with an internal TCXO. These units offer many options and can easily be customized to a specific requirement.

The PLOX is a rugged and economical solution for many demanding communication and instrumentation applications.

Key Specifications

Output Frequency:	10 – 1400 MHz
Stability and Accuracy:	Same as input or ±0.5 PPM
Phase Noise:	As shown in plot
Spurious (typ.):	-80 dBc
Harmonics (typ.):	-30 dBc
Output Power (min.):	+13 dBm
Input Reference Freq.:	5 MHz, 10 MHz or Custom
Power Requirements:	+5.0 Vdc @ 350 mA
Temperature Range:	-10°C to +70°C
Size:	2.25" x 2.25" x 0.60" 2.25" x 2.25" x 1.17" (with xN)



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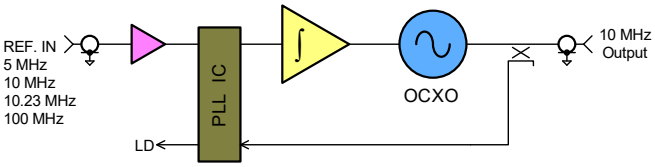
NEW! PHASE-LOCKED 10 MHz CLEAN-UP OSCILLATORS

Model PLOC10-10 Features

- 10 MHz output with **ultra-low** phase noise.
- Output stability and accuracy is same as input.
- With no input present, this module becomes a self-contained 10 MHz standard.
- Available as a small module (2.5" x 2.5" x 0.86") or as a system ready 1U rack mountable assembly (P/N: suffix –RX)
- Great value at a low cost.

Block Diagram



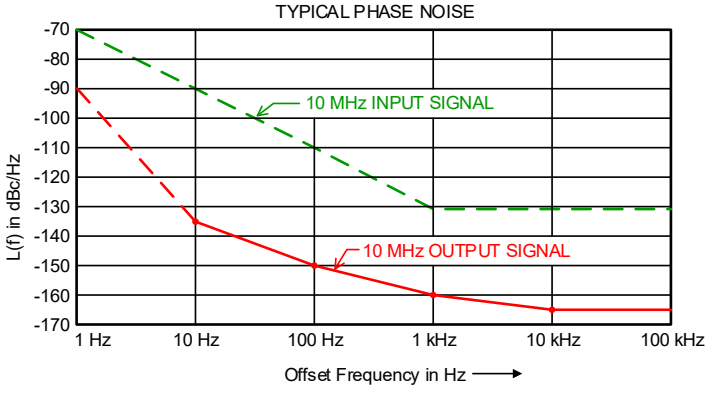
Description

The PLOC10-10 is a miniature assembly designed to phase-lock the internal high performance 10 MHz OCXO to the input reference signal. The internal 10 MHz OCXO has exceptionally good phase noise performance. When phase locked to a source with outstanding long term stability such as an atomic standard or GPS, this module is an ideal 10 MHz frequency source for systems requiring excellent phase noise performance. When the 10 MHz input is not present the internal OCXO acts as a standalone precision source.

This assembly can be used as a 10 MHz reference for frequency synthesizers and PLO's used in high performance SatCom, telecommunications and instrumentation.

Key Specifications

Output Frequency:	10 MHz
Optional Output Frequencies:	5, 10.23 or 100 MHz
Stability and Accuracy:	Same as input
Spurious (max.):	-80 dBc
Harmonics (typ.):	-30 dBc
Output Power (min.):	+13 dBm
VSWR:	1.5:1
Input Reference Freq.:	5, 10, 10.23 or 100 MHz
Power Requirements:	+15.0 Vdc
Temperature Range:	-20°C to +70°C



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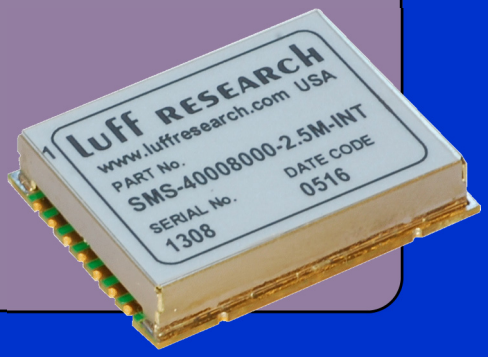
ADDITIONAL NEW PRODUCTS

SURFACE MOUNT SYNTHESIZER

Model SMS Features

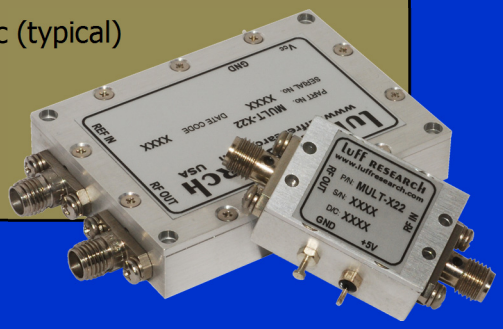
- Frequency range: **up to 8 GHz**
- Frequency bands: **up to octave bands**
- Frequency reference
  - External 10 MHz or
  - Internal TCXO (±1 PPM)
- Single DC 5.0V operation
- Low phase noise & spurious
- Miniature SMD package
  -1.25" x 1.00" x .25"
- RoHS Compliant available



FREQUENCY MULTIPLIERS

Models MX-21, MX-22 & MX-23 Features

- Broadband performance Fout: 10 - 32 GHz
- Output Power: +13 dBm min
- Harmonics & Sub-Harmonics -15 dBc (typical)
- Single +5.0 Vdc (150 mA) operation
- Connectorized package
- Low cost



Customer Support, quotes and orders

We look forward to discussing your high performance RF signal source requirements. Please email your requirements to sales@luffresearch.com or call us at (516) 358-2880 and we will respond either immediately or within 24 to 48 hours.

Please order directly from Luff Research or through our factory representatives (where available).

Contact Information

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