

## RF/Microwave Subsystems

# Frequency Converters and Multipliers

Mercury Systems is renowned for designing highly reliable narrowband/broadband frequency converters and multipliers for both military and high-end commercial applications.

Our modules are densely integrated, complex devices that include many of the following features: synthesized LO's, Automatic Gain Control (AGC), Built-In-Test (BIT) circuitry, log video output level detection, and microprocessor-controlled temperature compensation. Mercury Systems' converters and multipliers utilize the optimal technologies available for the specific frequency range and performance required for each individual application. From 10 MHz to 40 GHz, narrowband or broadband, we will create a converter or multiplier design to meet your needs.

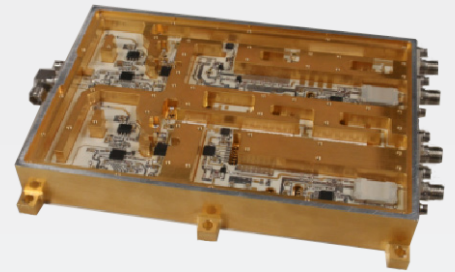
## Complex Designs

Mercury Systems has successfully designed and manufactured a wide variety of highly reliable and complex multifunction converters and multiplier modules. A prime example is the Ku-Band Block Up/Down-converter (BUC/BDC).

In this case, the Block Up-converter enables L-Band to Ku-Band frequency conversion for satellite uplink applications. The Up-converter path includes input and output power level detection, multiple amplification stages, multiple filter stages and programmable temperature compensation. The Block Down-converter enables Ku-Band to L-Band frequency conversion for satellite downlink applications. The Down-converter path includes output power level detection, multiple amplification stages, multiple filter stages and a BIT oscillator. Additionally, the integrated LO's for both the Up-converter and Down-converter sections are generated using Phase Locked Loops (PLLs) optimized for low-phase noise performance. The external 10 MHz reference for the PLLs is supplied in this particular application.

## Features

- 10 MHz to 40 GHz, narrowband or broadband
- High-performance frequency converters that include synthesized LO's, amplification, filtering, BIT circuitry and level detection
- Designed and optimized to suit your application's specific SWaP and configuration requirements





## Broad Range of Capabilities

Here are some additional examples of Mercury-designed frequency converters and multipliers.

### *Dual and Quad Channel Frequency Converters*

Dual channel Ku-Band to C-Band and Quad C-Band to L-Band frequency converters with integrated tunable synthesized LO for use in airborne worldwide Direct Broadcast Satellite (DBS) systems.

### *Broadband Down-Converter/Amplifier*

Broadband, 1 GHz to 8 GHz RF and LO frequency converters with integral IF low-noise amplifiers (LNA) and output level detectors. IF output filtered to 160 MHz.

### *Multi-Channel Broadband Combiner/Converter*

Multi-octave operation through Ku-Band that accepts and combines multiple independent input signals, which are then down-converted to a fixed IF.

### *Amplifier/Up-Converter*

X-Band up-converter that first amplifies and then converts an IF input signal to an RF range.

### *X-Band X16 Frequency Multiplier*

Accepts an input signal in the specific frequency range and multiplies the frequency by a factor of 16.

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2928.00E-1112-TB-frequency



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