FEATURES

- Wide Bandwidth 0.5 GHz to 20.48 GHz
- Ultra low phase noise
- Switching speed 50 typical, 100 microseconds maximum
- Phase lockable to 10 MHz or 100 MHz reference
- Low Spurious
- Step sizes from 1 Hz
- Low profile 1U chassis, modular or bench top configuration

DESCRIPTION

Ultra Electronics, Herley series BBFS synthesizers are ideal for Antenna Measurement Systems, with optional configurations available to support EW Simulators, and Broad Band ATE.

This technology permits multi-octave bandwidths, small steps, low phase noise, low spurious, and fast switching.

The break-through in phase noise performance of the BBFS sets a new standard for this class of indirect synthesizers.

The exceptionally fast switching speed enables higher throughput in systems when a large number of measurements is required.

OPTIONS

- Low band extension down to 10 MHz
- Harmonic filters
- Remote control: SPI, RS-232, GPIB, Parallel BCD and Ethernet
- List mode operation with lock/level output and external trigger
- Pulse Mute/RF Mute <-60 dBc typ. on/off; PRI 1 microsecond to CW

The BBFS utilizes cutting edge technology combining Direct Digital and Analog Indirect Synthesis to achieve excellent performance and exceptionally high reliability.

The use of CTI’s proven manufacturing techniques along with state-of-the-art technology makes the series BBFS synthesizer the best value on the market today.
Bringing more benefits to RF, microwave and millimeter-wave technology for defense systems, integrated subsystems, components... and more

**TYPICAL PERFORMANCE SPECIFICATIONS**

- Standard frequency range 2 GHz to 18 GHz
- Output power +12 dBm standard, +10 dBm with harmonic filter option
- Power variation ±2 dB
- Step size 1 Hz
- Switching speed from strobe 50 microseconds for parallel and direct serial, 60 microseconds for SPI, 100 microseconds maximum
- Frequency accuracy ±5 x 10^-11 with respect to the reference
- Spurious -65 dBc
- Harmonics -12 dBc, -50 dBc optional
- Lock alarm TTL high when locked
- Input reference frequency 10 MHz to 100 MHz with ±1 ppm or better frequency stability
- Input reference power level 0 ± 3 dBm
- Internal references available on request
- Reference output for rack mounted units 10 MHz or 100 MHz
- Control interface parallel BCD or direct serial with strobe, SPI, RS-232, GPIB, 10/100 Base T Ethernet

**TYPICAL PHASE NOISE**

<table>
<thead>
<tr>
<th>Offset kHz</th>
<th>F0 2 GHz</th>
<th>F0 18 GHz</th>
<th>F0 40 GHz</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.01</td>
<td>-78</td>
<td>-58</td>
<td>-50</td>
</tr>
<tr>
<td>0.1</td>
<td>-107</td>
<td>-87</td>
<td>-75</td>
</tr>
<tr>
<td>1</td>
<td>-124</td>
<td>-110</td>
<td>-100</td>
</tr>
<tr>
<td>10</td>
<td>-130</td>
<td>-115</td>
<td>-107</td>
</tr>
<tr>
<td>100</td>
<td>-130</td>
<td>-115</td>
<td>-107</td>
</tr>
<tr>
<td>1000</td>
<td>-134</td>
<td>-118</td>
<td>-111</td>
</tr>
<tr>
<td>10000</td>
<td>-145</td>
<td>-133</td>
<td>-127</td>
</tr>
</tbody>
</table>

**CONNECTORS**

- RF output SMA-F to 20 GHz, 2.92 mm above 20 GHz
- Reference input SMA-F
- Control connector for rack configuration is 50 pin 3M 3565-2002 for parallel, 9 pin D-sub for direct serial, SPI and RS-232
- Control connector for modular configuration is 51 pin Micro-D for parallel, Micro-D 9 pin D-sub for SPI

**POWER, DIMENSIONS AND ENVIRONMENTAL**

- Supply voltage +12Vdc @ 2.5 A, ripple <100 mV p-p for modular configuration
- 110/240 VAC 47 to 400 Hz auto switching/38 W for rack configuration
- Operating temperature 0° to +50° C baseplate

**Typical phase noise at F<sub>0</sub>=18 GHz using an external 100 MHz reference**

![Typical phase noise at F<sub>0</sub>=18 GHz using an external 100 MHz reference](image)
### LIST MODE OPTION

<table>
<thead>
<tr>
<th>Mode</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>List:</td>
<td>The operator may program a list of from 1 to 48000 random frequencies via an Ethernet, GPIB or CTI custom interface. The frequencies in the list starting at address A and ending at address B can be swept from A to B, B to A or A to B and back to A.</td>
</tr>
<tr>
<td>Continuous Mode 1:</td>
<td>The unit will perform any of the sweep modes as discussed above, that was previously communicated over Ethernet, GPIB or custom interface. This mode is triggered by an external single start pulse. The unit will perform one sweep and stop. For this mode a previously loaded Dwell Time is required.</td>
</tr>
<tr>
<td>Continuous Mode 2:</td>
<td>The unit will perform any of the sweep modes as discussed above, that was previously communicated over Ethernet, GPIB or custom interface. This mode is triggered by a software command. The unit will perform continuous sweeps until stopped by an Ethernet, GPIB or custom command. For this mode a previously loaded Dwell Time is required.</td>
</tr>
<tr>
<td>External Trigger:</td>
<td>Same as above but each step through the address list requires an external trigger pulse. No Dwell Time required as external pulses control Dwell Time. Lock Signal provided with each step.</td>
</tr>
<tr>
<td>Start, Stop, Step:</td>
<td>Via the interface, a Start, Stop Frequency and Step Size is communicated. The unit starts operation at the start frequency and with each “Trigger In” pulse it will step with an increment of “Step Size”.</td>
</tr>
</tbody>
</table>