MINIATURE BLOCK DOWN CONVERTER
SERIES MBDC

DESCRIPTION
Ultra Electronics Herley series MBDC block down converters offer broadband frequency coverage with very low phase noise in a compact package. This series offers products specifically designed for commercial and military SatCom ground terminal and man pack applications and can convert C, X, Ku or Ka-Band signals to L-Band frequencies from 950 MHz to 2150 MHz. Ultra Electronics Herley Industries series MBDC utilizes proprietary technology enabling excellent performance and ultra low phase performance. The phase noise for a 14 to 14.5 GHz MBDC is typically -105 dBc/Hz at 10 kHz and -110 dBc/Hz at 100 kHz offset.

The series MBDC offers an optional adjustable conversion gain of 0 to 30 dB in 0.5 dB steps.

Several standard models are available that provide high quality signals for both military and commercial applications.

Contact the factory to discuss your special requirements.

FEATURES
- Broadband coverage
- Wide operating temperature
- Low phase noise
- Low Spurious
- Excellent gain flatness
- High output power
- Phase locks to references from 10 MHz to 100 MHz

OPTIONS
- Adjustable gain
- Frequencies to Ka band
- DC multiplexed on IF input
- Custom frequency plans
- Extended temperature ranges
Bringing more benefits to RF, microwave and millimeter-wave technology for defense systems, integrated subsystems, components... and more

**TYPICAL PERFORMANCE SPECIFICATIONS**

- RF input range C, X, Ku and Ka band in bands up to 1 GHz wide
- RF input power level up to -25 dBm/carrier, 10 carriers maximum
- RF input power with no damage 0 dBm Maximum
- Input return loss 2:1 Maximum, 1.5:1 typical
- IF output frequency ranges 950 to 2150 MHz in bands up to 1 GHz wide
- Output return loss >15 dB
- Output power @ P 1 dB, 10 dBm
- Output IP3, 20 dBm
- 2 tone IM3, -50 dBC, assumes carriers @ -10 dBm each
- Spurious - Non-carrier related -70 dBm
- Spurious - carrier related -50 dBc with -20 dBm input
- LO leakage -70 dBm
- Conversion gain 20 to 30 dB with ±1 dB stability at center frequency
- Gain stability ±0.5 dB from 0˚ to 40˚ C (0.025 dB per degree C)
- Variation over temperature ±1.5 dB
- Gain flatness ±1 dB full band, ±0.5 dB over any 40 MHz band
- Noise figure 15 dB maximum
- External reference input 10 MHz to 100 MHz @ 0 dBm nominal, specify at time of order
- Frequency stability same as external reference stability
- Alarm TTL high in lock
- Input return loss 2:1 Maximum, 1.5:1 typical
- IF output frequency ranges 950 to 2150 MHz in bands up to 1 GHz wide
- Output return loss >15 dB
- Output power @ P 1 dB, 10 dBm
- Output IP3, 20 dBm
- 2 tone IM3, -50 dBC, assumes carriers @ -10 dBm each
- Spurious - Non-carrier related -70 dBm
- Spurious - carrier related -50 dBc with -20 dBm input
- LO leakage -70 dBm
- Conversion gain 20 to 30 dB with ±1 dB stability at center frequency
- Gain stability ±0.5 dB from 0˚ to 40˚ C (0.025 dB per degree C)
- Variation over temperature ±1.5 dB
- Gain flatness ±1 dB full band, ±0.5 dB over any 40 MHz band

**TYPICAL LO PHASE NOISE**

<table>
<thead>
<tr>
<th>Offset kHz</th>
<th>X Band</th>
<th>Ku Band</th>
<th>Ka Band</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.1</td>
<td>-75</td>
<td>-75</td>
<td>-65</td>
</tr>
<tr>
<td>1</td>
<td>-104</td>
<td>-100</td>
<td>-95</td>
</tr>
<tr>
<td>10</td>
<td>-109</td>
<td>-105</td>
<td>-100</td>
</tr>
<tr>
<td>100</td>
<td>-114</td>
<td>-110</td>
<td>-105</td>
</tr>
<tr>
<td>1000</td>
<td>-129</td>
<td>-125</td>
<td>-120</td>
</tr>
</tbody>
</table>

Note: Phase noise <100 kHz is reference dependent

**CONNECTORS**

- Reference input SMA-F
- IF output SMA-F
- RF input SMA-F or K-type 2.92 mm female
- Supply voltage, alarm filter feed-thru
- Ground solder lug

**POWER AND ENVIRONMENTAL**

- DC input voltage +12 V to +15 V
- Supply current 450 to 550 mA for C, X and Ku band models, 550 to 650 mA for Ka band models
- Operating temperature -20˚ to +70˚ centigrade baseplate
- Non-operating temperature -40˚ to +85˚ centigrade
- Humidity 0% to 95% non-condensing
- Altitude 10,000 feet ASML maximum
- Operating temperature 0˚ to +50˚ centigrade
- Non-operating temperature -30˚ to +70˚ centigrade

**STANDARD OUTLINE DRAWING**

Ultra Electronics reserves the right to vary these specifications without notice.
Printed in USA
August 2015