Converter
VSAT Dual Band BDC ITAR Free Airborne Compact Block Down Converter MFC146

Application - Airborne • SatCom
• In Flight Entertainment Systems
• FAA Material Safe for In Cabin Hardware
• UAV Worldwide Band Coverage

Features
• Rugged Low Cost all SMT Construction – NO OPEN DIE
• Low Profile Mechanical Outline
• Digital Band Selection and internal BIT
• Flexible Voltage Operation

Description:
VSAT dual band block down converter design optimized for volume manufacturing and compliance with phase noise requirements of both commercial and military satellite bands. The design is an ultra rugged design using sealed parts (NO OPEN DIE) to withstand demanding airborne altitude and high moisture environments. The wideband design supports agile hopping of Ku SatCom bands in mobile platform applications. External BPF's are available for specialty spectral compliance.

Electrical

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frequency B1/B2</td>
<td>10.7-11.7 GHz / 11.7 - 12.75 GHz</td>
</tr>
<tr>
<td>Phase Noise</td>
<td>-95dBC/Hz @100kHz (&lt;3 deg rms)</td>
</tr>
<tr>
<td>IF Freq. B1/B2</td>
<td>950-1950 MHz / 1100-2150 MHz</td>
</tr>
<tr>
<td>I/O VSWR</td>
<td>1.5:1 Max. (Typ 1.3:1)</td>
</tr>
<tr>
<td>Gain</td>
<td>18 - 22 dB</td>
</tr>
<tr>
<td>Gain Flatness</td>
<td>+/-1.2 dB (0.7 dB Typ.)</td>
</tr>
<tr>
<td>Gain Var. Temp</td>
<td>&lt; 1 dB Typ.</td>
</tr>
<tr>
<td>Spurious</td>
<td>&lt;-90dBm Typ.</td>
</tr>
<tr>
<td>Harmonics IF</td>
<td>&lt;-40dBC Typ.</td>
</tr>
<tr>
<td>Noise Figure</td>
<td>13.5 dB Max [&lt; 9 dB Typ.]</td>
</tr>
<tr>
<td>Image Rejection</td>
<td>&gt;40dB (Typ &gt;50dB)</td>
</tr>
<tr>
<td>OIP3</td>
<td>&gt; 0dBm (Typ +12dBm)</td>
</tr>
<tr>
<td>Group Delay Var.</td>
<td>+/- 1nS Max.</td>
</tr>
</tbody>
</table>

Environmental Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature</td>
<td>-20 to +70C</td>
</tr>
<tr>
<td>Vibration</td>
<td>Airborne</td>
</tr>
</tbody>
</table>

Mechanical Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>RF Connectors I/O</td>
<td>SMA</td>
</tr>
<tr>
<td>DC Control</td>
<td>Micro-D</td>
</tr>
</tbody>
</table>

Specifications subject to change without notice.
Converter
VSAT Airborne BUC/SSPA ITAR Free Block Up Conv. with 25 Watt GaN SSPA  MFC147

Application - Airborne  •  SatCom
- In Flight Entertainment Systems
- FAA Material Safe for In Cabin Hardware
- UAV Worldwide Band Coverage

Features
- Rugged Low Cost all SMT Construction – NO OPEN DIE
- Compact Mechanical Outline
- External 10MHz Ref. input through Modem IF or External Coax.
- Digital Bias Control and internal BIT
- Flexible Voltage Operation
- >16% eff. % Total DC-RF
- Built-In Fwd/Rev Power Detection with BIT and Fault Protection

Description:
Completely new concept in Ku SSPA design optimized for volume manufacturing at a low price point for compliance with phase noise requirements of both commercial and military satellite bands. The design is an ultra rugged design using NO OPEN DIE and sealed parts to withstand demanding airborne altitude and high moisture environments. SSPA supports drain voltage stepping for reduced thermal dissipation during lower Tx power operational needs or in high temperature operation on the ground. All BIT, Temp Sens and Fwd/Rev detectors can be read through standard serial commands. An external waveguide filter and Isolator is available in WR-62 for additional LO rejection and reverse power detection. The optimized matched BUC has equalization and gain expansion to improve GaN device gain compression transfer function.

Electrical
<table>
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<tr>
<th>Parameter</th>
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</thead>
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<tr>
<td>RF Freq. Output</td>
<td>13.75 to 14.5 GHz</td>
</tr>
<tr>
<td>BUC IF Input</td>
<td>950 - 1700 MHz</td>
</tr>
<tr>
<td>IF Power In</td>
<td>-9 to -30 dBm</td>
</tr>
<tr>
<td>BUC RF Power Out</td>
<td>+12 to +17dBm (at Max Gain)</td>
</tr>
</tbody>
</table>

BUC Gain Control Characteristics
- Gain Expansion: 0 to +7dB (Vs IF Pin)
- Gain Vs Temp: +/-8 dB Selectable Pos or Neg slope
- Total Digital Cont.: 30dB nominal
- Spurious: BUC 2xIF Control -60dBc typical with digital
- I/Q nulling: -20 dBc typ.
- I/O VSWR: 1.5:1 Typical

SSPA Characteristics
- Noise Power Out: <-120dBc/Hz [-140dBc/Hz typ.]
- Second Harmonic: <-40dBc [-60dBc Typ]
- Small Sig. Gain: 40 to 48 dB (over 55dB with BUC)
- Power Output: 25 watt min at +10dBm Input from BUC (Gain Comp <5dB)
- Power Flatness: +/- 1dB over 1GHz BW
- Spectral Re-Growth: < -22 dBc [QPSK]

DC Power
- SSPA +7.5 Vdc <2.4amps (typ 2.1amps)
- BUC +7.5Vdc <1.7amps (typ. 1.5 amps)
- SSPA+BUC -12 Vdc < -300ma (Typ <200ma)
- SSPA External Solder Terminal +24 to +26Vdc <7.2 amps

Digital Control
- Serial SPI
- LO Power and Lock BITS
- Forward/Reverse SSPA Power Detect
- Multiple Temp Sensors
- External Mute and Self Mute to prevent damage
- Gain Vs Temp Control, Expansion, Range
- I/O Bias Control for2xIF nulling
- Voltage and Current fault and level measurement

Environmental Specifications
- Temperature: -20 to +70°C
- Vibration: Airborne

Mechanical Specifications
- RF Connectors I/O: SMA
- DC Control: Micro-D
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