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

RF Freq. Output  13.75 to 14.5 GHz  
BUC IF Input  950 - 1700 MHz  
IF Power In  -9 to -30 dBm  
BUC RF Power Out  +12 to +17dBm (at Max Gain)

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  
LO Leakage  -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 [OQPSK]  
At Max Op Power and symbol rate

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/Q Bias Control for2xIF nulling  
Voltage and Current fault and level measurement

Environmental Specifications

Temperature  -20 to +70C  
Vibration  Airborne

Mechanical Specifications

RF Connectors I/O  SMA  
DC Control  Micro-D
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