Ku-Band Airborne Converter

25 WATT GaN SSPA BLOCK UP CONVERTER (BUC)

The airborne converter covers the frequency range of 13.75 to 14.50 GHz

Smith Interconnect's frequency converters provide frequency translation of the input signal to a desired output frequency. They support up and down frequency translations with either fixed local oscillators (block converters), or tunable local oscillators (agile converters).

Ku SSPA design optimized for volume manufacturing and for compliance with phase noise requirements of both commercial and military satellite bands. The design is an ultra rugged design using 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.

Features and Benefits

- Rugged Low Cost all SMT Construction – NO OPEN DIE
- Compact Mechanical Outline
- Programmable Gain Expansion
- 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
- ITAR Free

Applications

- In Flight Entertainment Systems
- FAA Material Safe for In Cabin Hardware
- UAV Woldwide Band Coverage

Technical Characteristics

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 +17 dBm (at Max Gain/Max Input)

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

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

DC Power
SSPA +7.5 Vdc <2.4 amps (typ 2.1 amps)
BUC +7.5 Vdc <1.7 amps (typ 1.5 amps)
SSPA+BUC +12 Vdc < -300 ma (Typ <200 ma)
SSPA External Solder Terminal +24 to +26 Vdc <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 for 2X IF nulling
Voltage and Current fault and level measurement

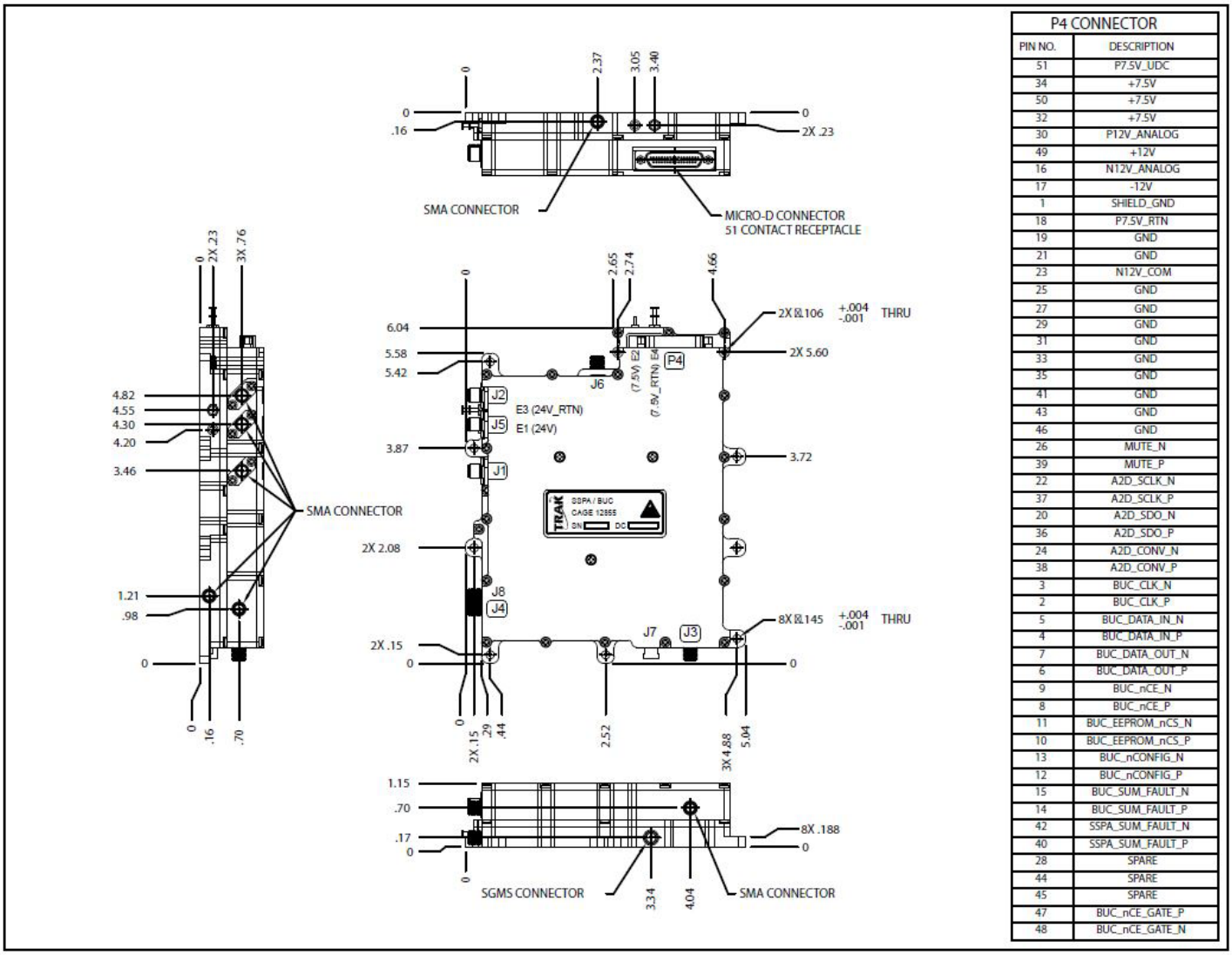
Environmental Specifications	
Temeprature	-20 to +70C
Vibration	Airborne

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

Specifications subject to change without notice.

Mechanical - Test Data Plots

Model: MFC147



P4 CONNECTOR	
PIN NO.	DESCRIPTION
51	P7.5V_UDC
34	+7.5V
50	+7.5V
32	+7.5V
30	P12V_ANALOG
49	+12V
16	N12V_ANALOG
17	-12V
1	SHIELD_GND
18	P7.5V_RTN
19	GND
21	GND
23	N12V_COM
25	GND
27	GND
29	GND
31	GND
33	GND
35	GND
41	GND
43	GND
46	GND
26	MUTE_N
39	MUTE_P
22	A2D_SCLK_N
37	A2D_SCLK_P
20	A2D_SDO_N
36	A2D_SDO_P
24	A2D_CONV_N
38	A2D_CONV_P
3	BUC_CLK_N
2	BUC_CLK_P
5	BUC_DATA_IN_N
4	BUC_DATA_IN_P
7	BUC_DATA_OUT_N
6	BUC_DATA_OUT_P
9	BUC_nCE_N
8	BUC_nCE_P
11	BUC_EEPROM_nCS_N
10	BUC_EEPROM_nCS_P
13	BUC_nCONFIG_N
12	BUC_nCONFIG_P
15	BUC_SUM_FAULT_N
14	BUC_SUM_FAULT_P
42	SSPA_SUM_FAULT_N
40	SSPA_SUM_FAULT_P
28	SPARE
44	SPARE
45	SPARE
47	BUC_nCE_GATE_P
48	BUC_nCE_GATE_N

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