

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

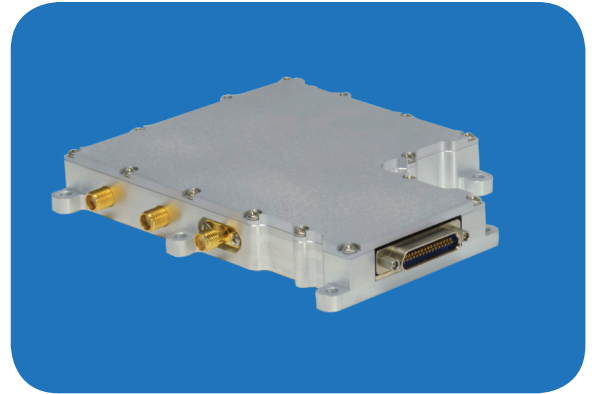


## Application - Airborne • SatCom

- 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

Frequency B1/B2	10.7-11.7 GHz / 11.7 - 12.75 GHz
LO Freq. B1/B2	9.75 GHz / 10.6 GHz
Phase Noise	-95dBc/Hz @100kHz (<3 deg rms)
IF Freq. B1/B2	950-1950 MHz / 1100-2150 MHz
I/O VSWR	1.5:1 Max. (Typ 1.3:1)
Gain	18 - 22 dB
Gain Flatness	+/-1.2 dB (0.7 dB Typ.)
Gain Var. Temp	< 1 dB Typ.
Spurious	<-90dBm Typ.
Harmonics IF	< -40dBc Typ.
Noise Figure	13.5 dB Max (< 9 dB Typ.)
Image Rejection	>40dB (Typ >50dB)
OIP3	> 0dBm (Typ +12dBm)
Group Delay Var.	+/- 1nS Max.

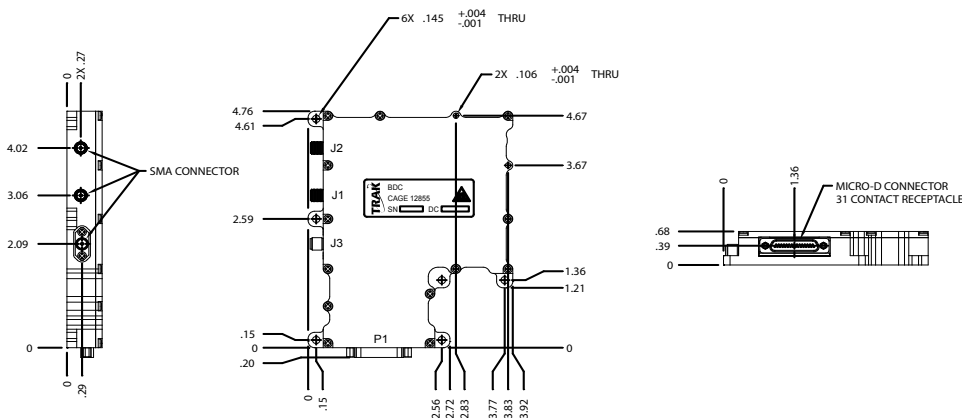
External Ref:	10 MHz, -5 to +10 dBm
DC Power	+7.5 Vdc & +/-12 Vdc
Built In Test	LO Lock and Power Detectors

## Environmental Specifications

Temperature	-20 to +70C
Vibration	Airborne

## Mechanical Specifications

RF Connectors I/O	SMA
DC Control	Micro-D



P1 CONNECTOR	
PIN NO.	DESCRIPTION
18	BDC_BAND_CNT_N
17	BDC_BAND_CNT_P
2	BDC_CLK_N
1	BDC_CLK_P
6	BDC_MOSI_N
5	BDC_MOSI_P
10	BDC_PCLK_N
9	BDC_PCLK_P
14	PLL_LD_PWRK_N
13	PLL_LD_PWRK_P
22	PLL_LOSS_LOCK_N
21	PLL_LOSS_LOCK_P
3	SPARE
4	SPARE
11	SPARE
23	SPARE
24	SPARE
28	V_RX_HIGH_BAND
29	+7.5V
30	V_RX_LOW_BAND
31	+7.5V
7	BDC_RTN
8	SHIELD_GND
12	BDC_RTN
19	GND
26	P12V_ANALOG
27	+12V
15	NT2V_ANALOG
16	-12V
20	NT2V_COM
25	GND

Specifications subject to change without notice.

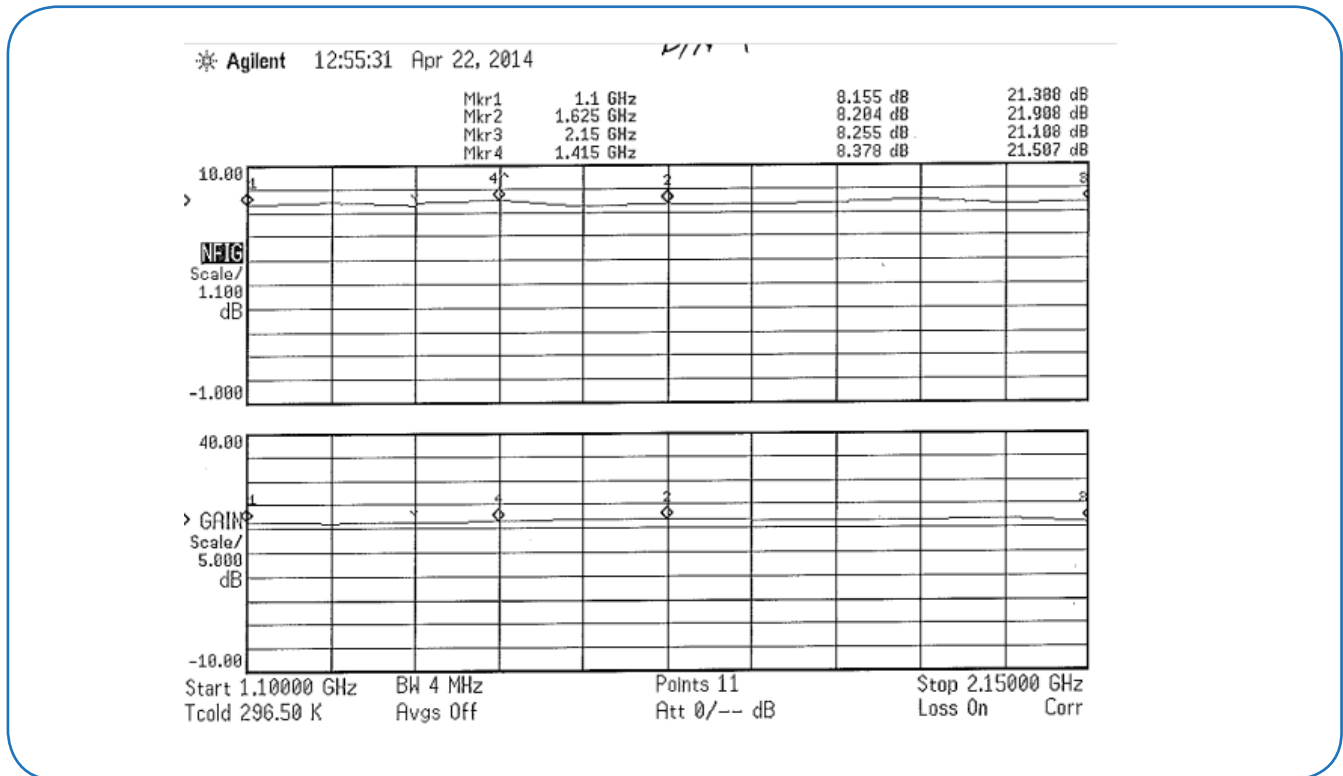
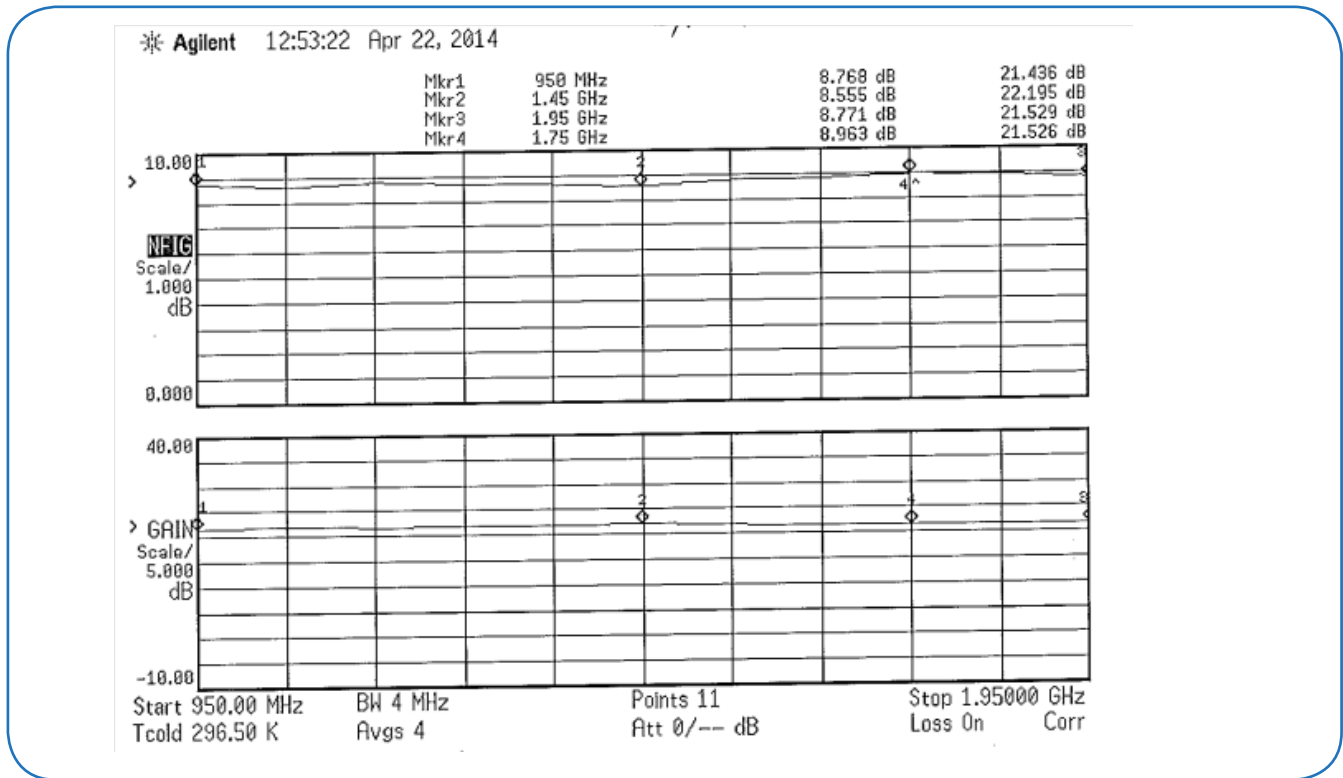
**TRAK Microwave Corporation**

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## Converter

# VSAT Airborne BUC/SSPA ITAR Free Block Up Conv. with 25 Watt GaN SSPA MFC147

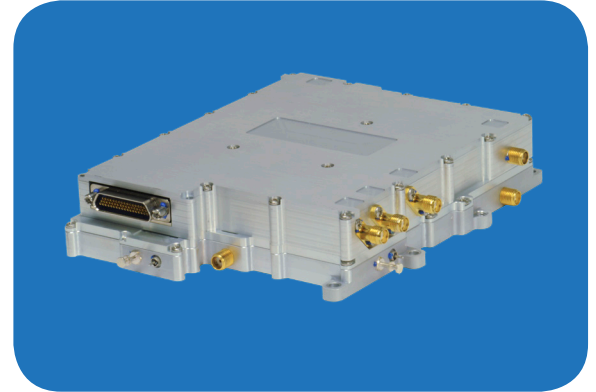


### Application - Airborne • SatCom

- 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 for 2xIF 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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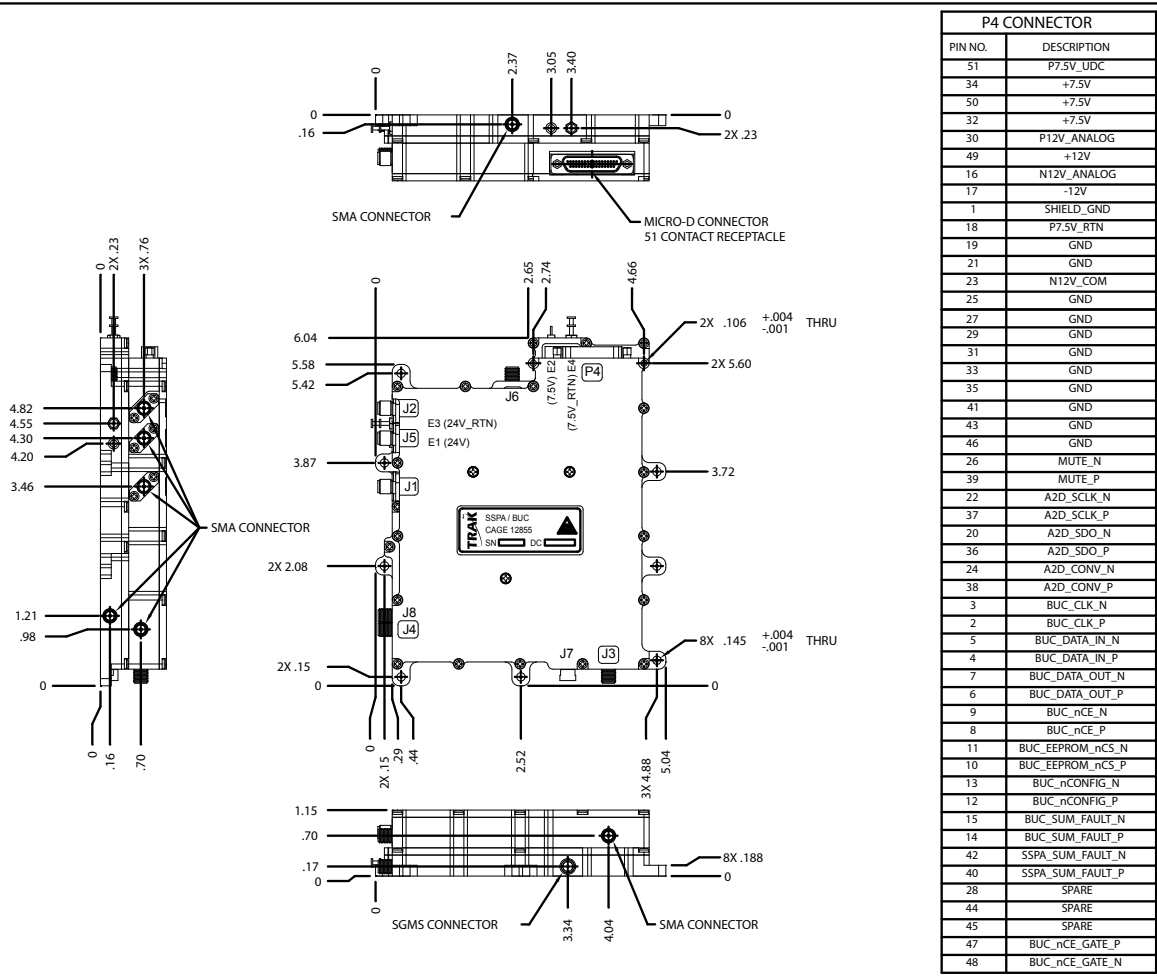
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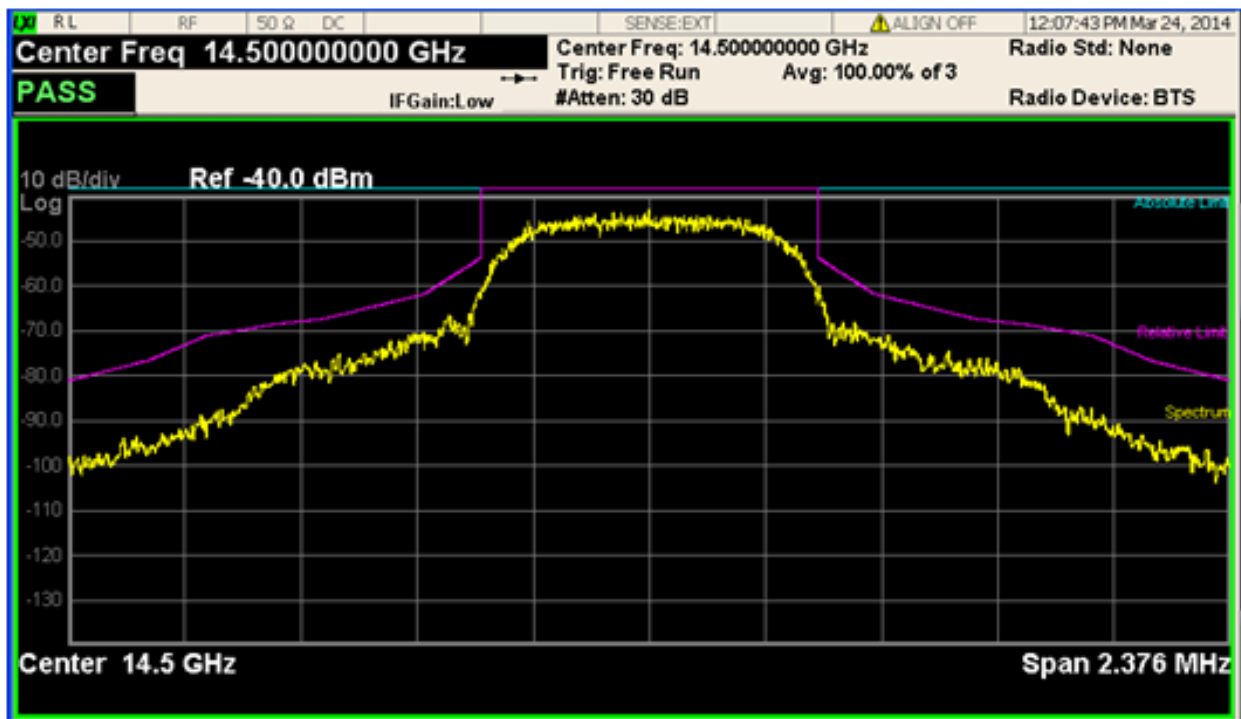
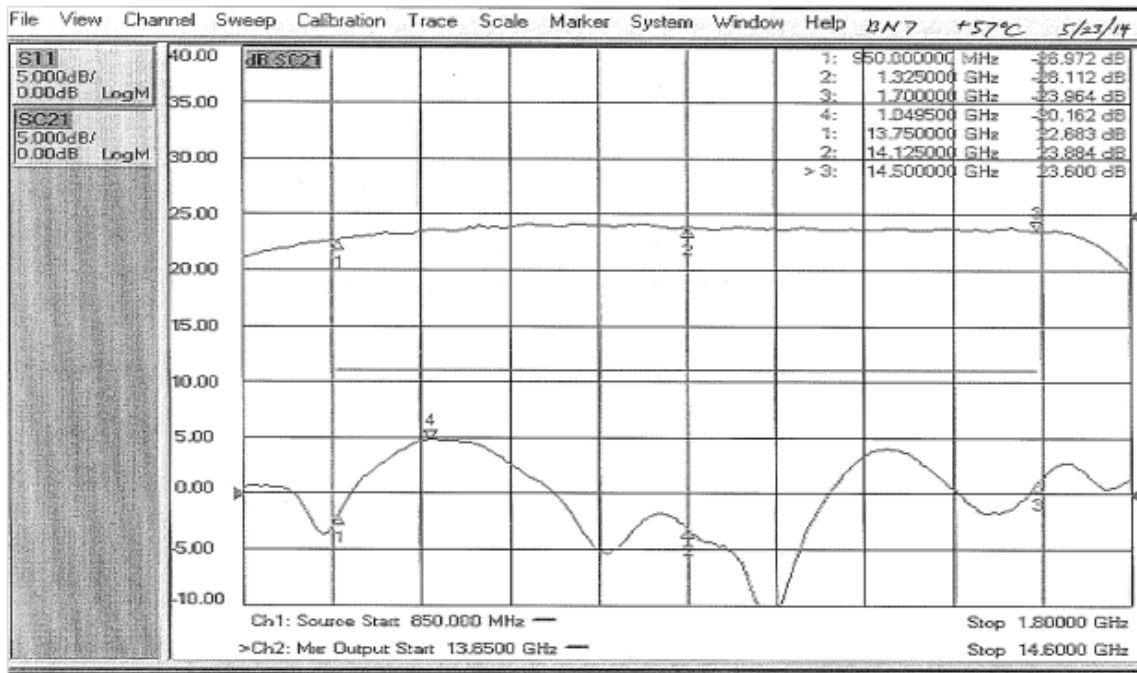
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