

Features

- Qualified for Commercial Airborne Use
- Modular BUC, BDC, SSPA, Power Supply and Controller in Compact Package
- Integrated High Performance Frequency Reference (optional)
- Advanced features for System Interoperability



TRAK HPT Product Description

The TRAK HPT is a complete airborne Satcom solution in a compact package, including a high power SSPA, a wideband block upconverter, a dual band downconverter, all necessary power conditioning, plus digital control and status interfaces. The upconverter and downconverter can use either an external reference source accepted through the Tx IF input or an integrated high stability vibration isolated frequency reference (optional). The HPT is configurable to work with a wide range of satcom modems.

TRAK uses GaN SSPA technology to achieve the specified output power at high efficiency with fewer active devices. This approach results in reduced size and complexity and allows a planar SSPA layout with improved thermal performance and lower device stress. The SSPA bias circuits also allow power dissipation to track output power, resulting in lower thermal load when operating below maximum output power. The SSPA output incorporates isolation from load faults for improved reliability. The TRAK HPT meets all relevant specs for commercial air transport use, including DO-160G, Boeing and Airbus.

TRAK Ku Band HPT Design Benefits

- SSPA employs GaN devices for higher power efficiency than GaAs devices
- GaN provides lower Θ_{jc} and higher maximum channel temperature limit than GaAs devices
- Meets the spectral mask requirement with no complex linearization
- Built-in SSPA protection against high VSWR loads
- Externally controlled SSPA mute function
- External visual indicators for HPT operational status

Optional Internal Reference Ensures Compliance When HPT is Exposed to Random Vibration DO-160 Profiles

- Low vibration sensitive 10 MHz OCXO installed on a vibration isolation platform
- 10 MHz OCXO isolation system attenuates vibration from cable and fan
- 10 MHz OCXO isolation system has high shock tolerance allowing for standard shipment without special handling

Modular Approach for Improved Maintainability and Quick Turnaround Repairs

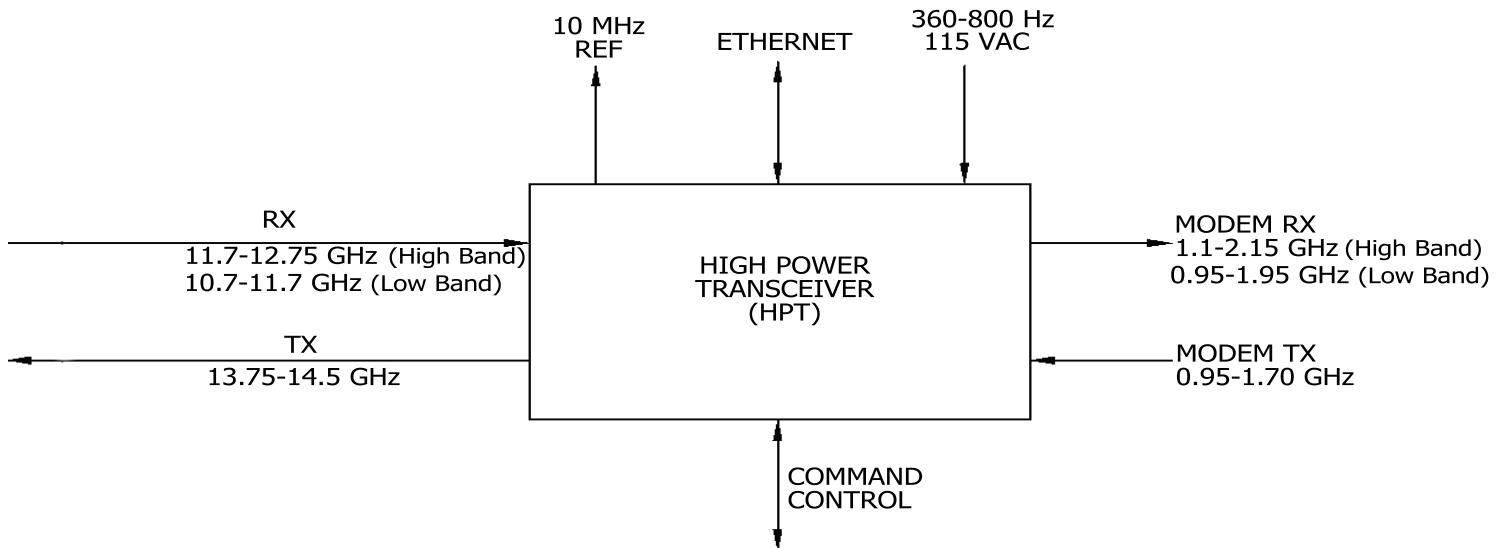
- Each module contains multiple Built-in-Test (BIT) functions
- Modularity allows for quick troubleshooting & replacement of stocked modules (if needed)

Software Calibration for Improved Factory Yield

- Gain is factory calibrated over temperature and frequency and digitally controlled inside the HPT

Specifications subject to change without notice.

Ku-Band High Power Transceiver 25W



Transmit Specifications	
Rated Output Power	25W (+44dBm)
Transmit RF Frequency	13.75 – 14.5 GHz
IF Frequency	950 – 1700 MHz
IF Input VSWR	< 1.5:1
Small Signal Gain	53 ± 2dB
Gain Variation (over frequency at fixed temperature)	±1.0 dB over any 36 MHz band
Gain Variation (over temperature at fixed frequency)	<±0.1 dB/°C
Output P1dB	> +44 dBm
Spectral Regrowth (Guaranteed over temperature and frequency at rated output power)	< -30 dBc (OQPSK at 2x symbol rate offset)
RF Output VSWR	< 1.5:1
Phase Noise (with optional internal reference)	1 kHz < -69 dBc/Hz 10 kHz < -69 dBc/Hz 100 kHz < -81 dBc/Hz 1 MHz < -87 dBc/Hz 10 MHz < -122 dBc/Hz
Noise Power Density – Transmit	< -110 dBm/Hz (14.47 - 14.5 GHz)
Output Spurious (unmodulated CW@ Rated Output Power)	< -60 dBc(13.75 - 14.5 GHz)
Receive Specifications	
Receive RF Frequency	
Low Band	10.7-11.7 GHz
High Band	11.7-12.75 GHz
IF FREQUENCIES	
IF Frequencies	
Low Band	950-1950 MHz
High Band	1100-2150 MHz
Small Signal Gain	20 ± 2dB

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Ku-Band High Power Transceiver 25W

Gain Variation (over temperature at fixed frequency)	± 0.5 dB (in any 36 MHz Band) ± 1.2 dB (over operating frequency range)
Gain Variation (over temperature at fixed frequency)	±1.2 dB over operating temperature range
3rd Order Intermodulation Products (OIP ₃)	> 0 dBm
Phase Noise (with optional internal reference)	10 Hz < - 30 dBc/Hz 100 Hz < -50 dBc/Hz 1kHz < -55 dBc/Hz 10 kHz < -70 dBc/Hz 100 kHz < -95 dBc/Hz 1MHz < -120 dBc/Hz 10 MHz < -120 dBc/Hz
Image Rejection	40 dB (minimum)
Group Delay (linear)	± 1.0 ns (over any 36 MHz band)
IF Leakage (Input Terminated)	-88 dBm (maximum)
In-Band Spurious (@ -50dBm input)	< -56 dBc
RF Input VSWR	< 1.5:1
IF Output VSWR	< 1.5:1
10 MHz Reference (Optional)	
Accuracy	0.03 ppm at 25 °C, 0.01 ppm over operating temperature
Stability	0.03 ppm first year, better than 0.16 ppm over 20 years
Output Level	+7.5 ± 1.5 dBm
Power	
AC Power (typical)	115 VAC, 360 - 800 Hz
AC Power Draw (typical at Rated Output Power)	< 345 W
Interfaces	
Input Power	3-pin Circular (38999 Compliant)
Ethernet	4-pin Circular (38999 Compliant)
ACU Discrete	6-pin Circular (38999 Compliant)
TX IF	TNC
RX IF	TNC
Reference	TNC
RF Output	Type N
RX Input	Type N
Maintenance	RJ-45 Circular (38999 Compliant)
Debug	9-Pin D-Sub
Physical	
Size	17.5"L X 13.6" X 2.5"H
Weight	21 lbs Max
Operating Temperature (Ambient Air)	-15°C to +55°C
Relative Humidity	DO-160G 6.3.1A Compliant

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