400 Watt Ku-Band High Efficiency Antenna Mount High Power Amplifier with Block Upconverter

Green Power
by XICOM TECHNOLOGY

FEATURES

- *13.75 to 14.5 GHz*

- *High efficiency: draws 850W @ linear output*

- *Light weight, compact package: 31 lbs.*

- *Includes L-band BUC*

The XTD-400KHE-B1 series is a compact, antenna mountable, traveling wave tube amplifier designed for low cost installation and long life. Intended for outdoor operation, the self contained XTD-400KHE-B1 is designed for transportable applications where high efficiency, light weight, and high ambient temperature operation are required.
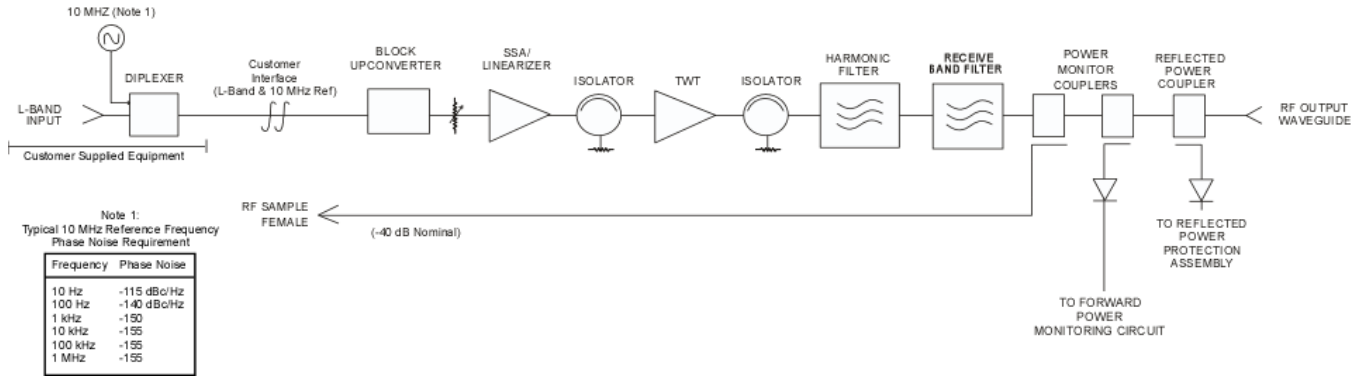
RF filters, cooling, and monitor & control (M&C) systems are all self contained within the package. A high frequency resonant conversion power supply is used that accepts a wide range of prime power (100 to 240 VAC). A remote external controller is available to operate the HPA from a user selected location. Depending upon user requirements, these high power amplifiers can be configured for single thread, redundant, or phase combined configurations.
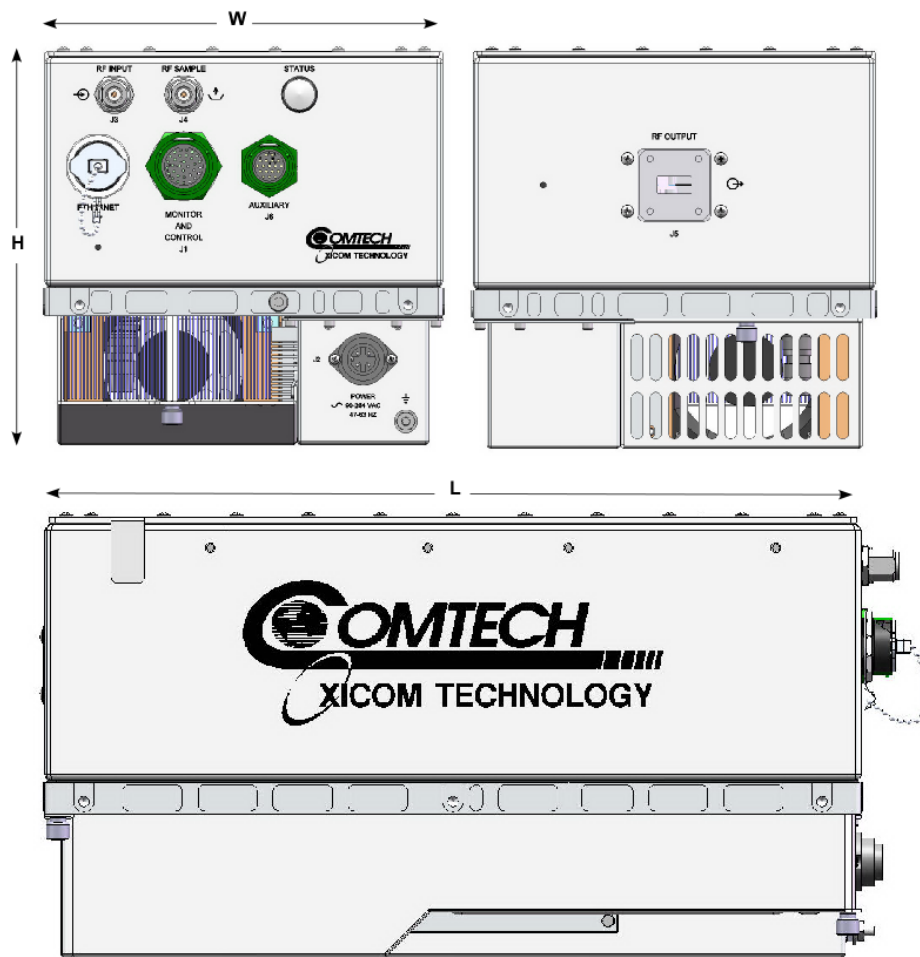
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PERFORMANCE SPECIFICATION

Parameters	XTD-400KHE-B1
FREQUENCY RANGE (extended frequency coverage available)	
Output	13.75 to 14.5 GHz
Input	950 to 1700 MHz
LO Frequency	12800 MHz
Input Level, w/o damage (maximum)	10 dBm
Reference Signal Frequency	external 10 MHz
10 MHz Power Level	2 dBm ± 5 dB
OUTPUT POWER	
Traveling Wave Tube	400 Watts
Maximum Transmit Power	200 Watts
Linear Power @ Amplifier Flange (minimum)	170 Watts with optional linearizer 90 Watts without linearizer
GAIN	
Large Signal (minimum)	67 dB
Small Signal (minimum)	67 dB
Attenuator Range (continuous)	25 dB, 0.1 dB steps
Maximum SSG Variation Over	
Any Narrow Band	1.0 dB per 80 MHz
Full Band	± 2 dB
Slope (maximum)	± 0.04 dB/MHz
Stability, 24 hr. (maximum)	± 0.25 dB
Stability, Temperature (maximum)	± 1.0 dB over temperature range at any frequency
INTERMODULATION (maximum) relative to the sum of two equal carriers	-26 dBc @ P_{LINEAR} with optional linearizer
SPECTRAL REGROWTH @ 1 SR offset	-30 dBc @ P_{LINEAR}
AM/PM CONVERSION (maximum)	2.0 deg/dB @ P_{LINEAR}
HARMONIC OUTPUT (maximum)	-60 dBc
NOISE POWER (maximum)	
Transmit Band	-70 dBW/4 kHz
Receive Band	-150 dBW/4 kHz 10.95 to 12.75 GHz
GROUP DELAY (maximum)	
Bandwidth	Any 80 MHz
Linear	0.01 nS/MHz
Parabolic	0.005 nS/MHz^2
Ripple	0.5 nS/Pk-Pk
RESIDUAL AM NOISE (maximum)	-60 dBc > 100 kHz from carrier AC fundamental -50 dBc Sum of all spurs -47 dBc
PHASE NOISE (maximum	5 dB below IESS phase noise profile
VSWR	
Input (maximum)	1.6:1
Output (maximum)	1.3:1

BLOCK DIAGRAM

10 MHZ (Note 1)

L-BAND INPUT

Customer Supplied Equipment

DIPLEXER

Customer Interface (L-Band & 10 MHz Ref)

BLOCK UPCONVERTER

SSA/LINEARIZER

ISOLATOR

TWT

ISOLATOR

HARMONIC FILTER

RECEIVE BAND FILTER

POWER MONITOR COUPLERS

REFLECTED POWER COUPLER

RF OUTPUT WAVEGUIDE

RF SAMPLE FEMALE

(~40 dB Nominal)

TO REFLECTED POWER PROTECTION ASSEMBLY

TO FORWARD POWER MONITORING CIRCUIT

Note 1:
Typical 10 MHz Reference Frequency
Phase Noise Requirement

Frequency	Phase Noise
10 Hz	-115 dBc/Hz
100 Hz	-140 dBc/Hz
1 kHz	-150
10 kHz	-155
100 kHz	-155
1 MHz	-155

OUTLINE DRAWING

DIMENSIONS		
	Inches	Centimeters
H	8.50	21.59
W	8.60	21.84
L	15.75	40.00
WEIGHT = 31 lbs (14.1 kg)		

XTD-400KHE-B1

PRIME POWER

100-240 VAC
47 to 63 Hz, Single Phase
850 VA Typical
1000 VA Maximum
0.95 Typical Prime Power Factor

CE

ENVIRONMENT

NONOPERATING TEMPERATURE RANGE	-50°C to +70°C
OPERATING TEMPERATURE RANGE	-40°C to +60°C (2°C/1000 Feet Derating)
HUMIDITY	Up to 100% Condensing
ALTITUDE	10,000 feet MSL (maximum)
SHOCK AND VIBRATION	Normal Transportation
COOLING	Forced Air

INTERFACE - ETHERNET

Type	Function		
LOCAL STATUS	Tri-Color LED:		
	Fault Red	Standby: Continuous Amber	
	HV ON: Green	FTD: Flashing Amber	
REMOTE CONTROL	HV ON/OFF	RF Inhibit (HV OFF)	Heater Standby
	RF Attenuation (w/preamp)	Fault Reset	
REMOTE STATUS	HV ON	Heater/Beam Hours	Filament Time Delay
	RF OUtput Power	Fault Identification	Helix Current
	Reflected Power	TWT Temperature	Helix Voltage
FORM A CONTACT CLOSURE	Summary Fault		
RF MONITOR PORT	-37 dB Coupling Value (Approx)		

OPTIONS

- Remote External Controller
- 1:1, 1:2, 1:N Redundancy
- Variable Phase Combined
- Alternate Frequency Coverage

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