450 Watt Ku and DBS-Band Antenna Mount HPA for Satellite Communications

FEATURES

- *No shelter required*
- *Extended frequency bands available*
- *Variable gain corrected*
- *High efficiency*
- *RS-232/422/ 485 interface*
- *Optional integrated linearizer*

The **XTD-450KD** is a compact, self-contained, antenna mountable power amplifier designed for low cost installation and long life. Its design eliminates the need for an amplifier shelter as well as a long waveguide run between the amplifier and the antenna feed horn. RF filters, cooling, and monitoring & control (M&C) systems are all self-contained within the High Power Amplifier (HPA). These features provide high reliability, low maintenance costs, and low replacement costs.

The **XTD-450KD** uses high efficiency, dual-stage collector Traveling Wave Tubes (TWT). Some benefits of this type of TWT are: reduced prime power consumption, lower internal operating temperatures, reliability enhancement. These benefits are obtained for both the linear and saturated modes of operation.

The **XTD-450KD** incorporates power factor correction circuitry, which minimizes line current distortion and reduces the required volt-amps. The combination of power factor correction and high efficiency TWTs reduces input Volt-Amps by 45% when compared to equivalent amplifiers. A high efficiency resonant conversion power supply is used that accepts a wide range of prime power (180 to 260 VAC). The automatic features of the power supply include quick recovery from prime power outages and multiple helix fault resets (three fault cycles). A complete serial M&C system is built into the unit. The unit may be configured for single-thread, redundant, phase-combined, or linearized operation. A remote external controller is available to operate the HPA from a user selected location. Mounting brackets can be supplied to mount the HPA to most popular antennas

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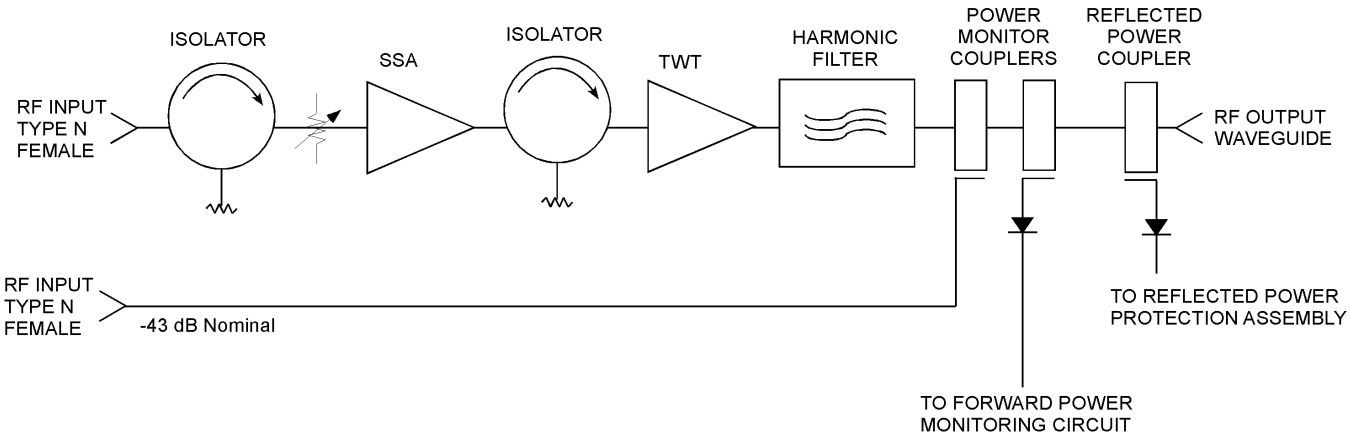
PERFORMANCE SPECIFICATION

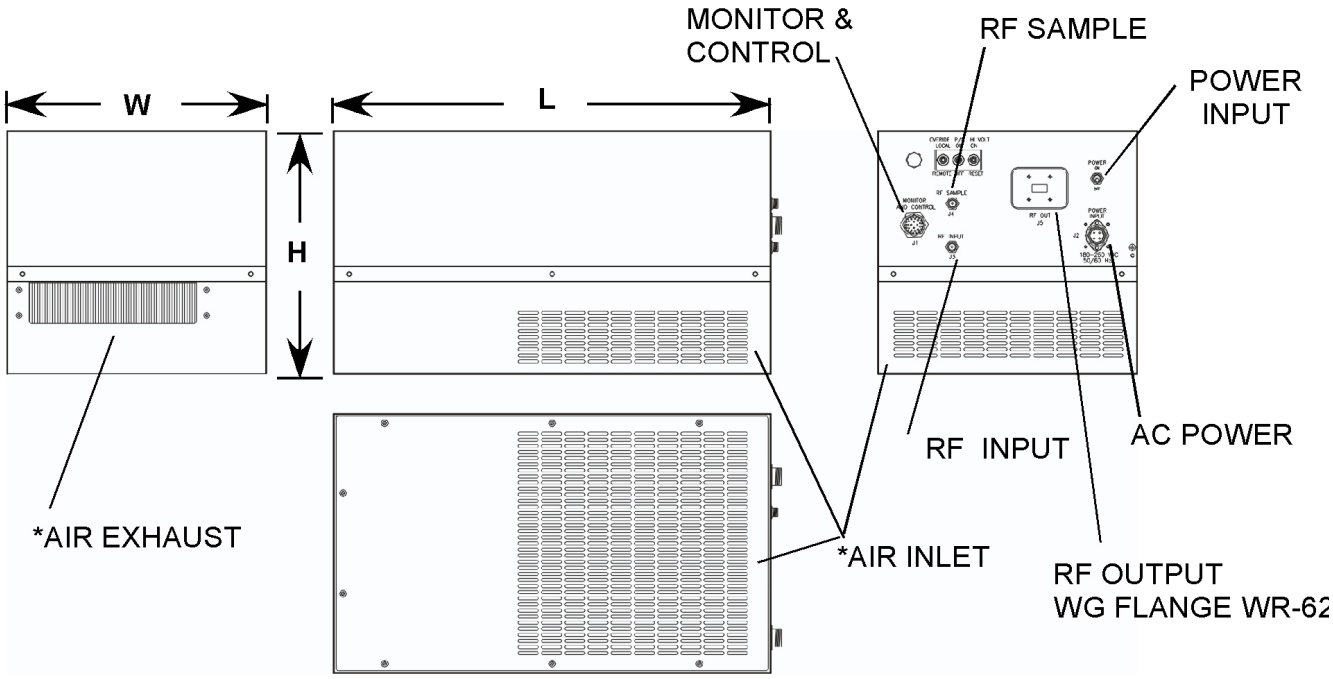
Parameters	Ku-Band	DBS-Band
FREQUENCY RANGE (extended frequency coverage available)	13.75 to 14.5 GHz (Optional: 12.75 to 14.5 GHz)	17.3 to 18.4 GHz
OUTPUT POWER		
Traveling Wave Tube	450 W	
Rated Power @ Amplifier Flange (minimum)	400 W (13.75 to 14.5 GHz)	400 W (17.3 to 18.4 GHz)
GAIN		
Large Signal (minimum)	70 dB	
Small Signal (minimum)	75 dB	
Attenuator Range (continuous)	25 dB	
Maximum SSG Variation Over		
Any Narrow Band	1.0 dB per 80 MHz	
Full Band	4.0 dB	
Slope (maximum)	± 0.04 dB/MHz	
Stability, 24 hr. (maximum)	± 0.25 dB	
Stability, Temperature (maximum)	± 1.0 dB maximum over temperature at any frequency	
INTERMODULATION (maximum) with two equal carriers	13.75 to 14.5 GHz: -17 dBc @ 4 dB total output power backoff from rated power	17.3 to 18.1 GHz: -16 dBc 18.1 to 18.4 GHz: -15 dBc
HARMONIC OUTPUT (maximum)	-60 dBc	
AM/PM CONVERSION (maximum)	3.0 deg/dB below rated power	
NOISE POWER (maximum)		
Transmit Band	-70 dBW/4 kHz	
Receive Band	-150 dBw/4 kHz (10.95 to 11.75 GHz)* -150 dBw/4 kHz (10.95 to 12.75 GHz)** -70 dBw/ 4 kHz (10.95 to 13.25 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)	-50 dBc to 10 kHz -20 (1.5 + logf) dBc 10 to 500 kHz -85 dBc above 500 kHz	
PHASE NOISE (maximum)	12 dB below IESS phase noise profile AC fundamental -50 dBc Sum of all spurs -47 dBc	
VSWR		
Input (maximum)	1.3:1	
Output (maximum)	2.4:1	

* Applicable to optional Ku-Band transmit frequency (12.75 to 14.5 GHz)
** Applicable to optional Ku-Band transmit frequency (13.75 to 14.5 GHz)
*** An external filter is available for 10.95 to 13.25 GHz to achieve -150 dBW/4 kHz.

BLOCK DIAGRAM



OUTLINE DRAWING



Note:
Mounting Brackets Not Shown
* Requires Air Flow Clearance

WEIGHT (TYPICAL)
75 lbs

DIMENSIONS (MAX)	
L	21.50 INCHES
W	11.95 INCHES
H	12.75 INCHES

PRIME POWER

180 to 260 VAC
47 to 63 Hz, Single Phase
2400 VA (maximum)
0.95 Minimum Prime Power Factor

CE

ENVIRONMENT

NONOPERATING TEMPERATURE RANGE	-50°C to +70°C
OPERATING TEMPERATURE RANGE	-40°C to +50°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

Type	Function	
LOCAL CONTROL	Prime Power ON/OFF	Local/Remote
	Power Supply ON/OFF	HV ON/OFF
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)
	RF Attenuation (w/preamp)	Fault Reset
	Heater Standby	
REMOTE STATUS	HV ON	Heater/Beam Hours
	RF Output Power	Fault Identification
	Reflected Power	TWT Temperature
	Filament Time Delay	Helix Current
	Helix Voltage	
FORM C DRY CONTACT CLOSURE	Summary Fault	
RF MONITOR PORT	-43 dB Coupling Value (nominal)	

OPTIONS

- Extended Frequency Coverage
- Linearizer
- Parallel (Discrete) Interface
- Remote External Controller
- 1:1, 1:2, 1:N Redundancy
- Variable Phase Combined

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