



# XTRD-450KD Ku and DBS-Band Rack Mount High Power Amplifier



- **Dual Band —  
450 Watts Ku-Band  
450 Watts DBS-Band**
- **Digital Display &  
Control Interface**
- **Compact 7 Inch Package**
- **High Efficiency**

The XTRD-450KD is a highly efficient rack mountable traveling wave tube amplifier (TWTA) designed to cover both Ku-Band and DBS-Band in fixed and mobile uplink applications.

The units include RF gain control, a solid state pre-amplifier, RF filters, cooling and monitoring and control (M&C) systems.

Rack space is conserved because the amplifiers occupy only 4 rack units (7 Inches) of a standard 19-inch rack cabinet. Nominal weight is 75 pounds.

The units feature a menu driven front panel display and RS-232/422/485 serial port interfaces for complete computer control. RF, traveling wave tube, and default parameters are easily monitored on the four-line front panel display.

Gain control is provided via the front panel or through the serial interface.

The XTRD-450KD incorporates high efficiency, multistage collector TWT. Reliability is enhanced because the prime power consumption and internal operating temperatures are reduced for both the linear and saturated modes of operation.

Power factor correction circuitry is also included which minimizes line current distortion and reduces the required Volt-Amps input.

The automatic features of the high frequency resonant conversion power supply include quick recovery from prime power outages and multiple helix fault resets (three fault cycles.)

Depending upon user requirements, these amplifiers can be configured for either single thread or redundant system operation.

# PERFORMANCE SPECIFICATIONS

Parameter	XTRD-450KD
FREQUENCY RANGE	Ku-Band 13.75 - 14.5 GHz DBS-Band 17.30 - 18.4 GHz
OUTPUT POWER	
Traveling Wave Tube	450W
Rated Power @ Amplifier Flange	
Ku-Band (13.75 - 14.5 GHz)	400W
DBS-Band (17.30 - 18.4 GHz)	400W
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 dBc
Stability, Temperature	±1.0 dB maximum over temperature range at any frequency
INTERMODULATION, 4 dB Total B.O.	
13.75 - 14.5 GHz Band	-16 dBc with two equal carriers maximum
Optional 12.75 - 14.5 GHz Band	-16 dBc with two equal carriers maximum
17.30 - 18.4 GHz Band	-16 dBc with two equal carriers maximum
HARMONIC OUTPUT, maximum	-60 dBc
AM/PM CONVERSION, maximum	3.0°/dB @ 6 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 14.5 GHz)**
	-70 dBw/4 kHz (10.95 to 13.25 GHz)***
	<small>*Applicable to optional Ku-Band transmit frequency (12.75 - 14.5). **Applicable to optional Ku-Band transmit frequency (10.95 to 14.5 GHz). ***An External Filter is available for (10.95-13.25 GHz) to achieve -150 dBw/4 kHz.</small>
GROUP DELAY, maximum	
Bandwidth	Any 80 MHz
Linear	0.01 nsec/MHz
Parabolic	0.005 nS/MHz <sup>2</sup>
Ripple	0.5 nsec/Pk-Pk
RESIDUAL AM NOISE, maximum	-50 dBc to 10 kHz -20 (1.5 + log f) dBc 10 to 500 kHz -85 dBc above 500 kHz
PHASE NOISE, maximum	10 dB below IESS phase noise profile AC fundamental -50 dBc    Sum of all spurs -47 dBc
VSWR	
Input, maximum	1.3:1
Output, maximum	1.3:1

## PRIME POWER

180-260 VAC  
47 to 63 Hz, single phase  
Maximum 2400 VA  
0.95 Minimum Prime Power Factor

## OPTIONS

Extended Frequency Coverage  
1:1, 1:2, 1:N Redundancy



## ENVIRONMENT

NONOPERATING TEMPERATURE RANGE	-50° C to +70° C
OPERATING TEMPERATURE RANGE	-10° C to +50° C
HUMIDITY	Up to 95% Condensing
ALTITUDE	10,000 feet MSL maximum
SHOCK AND VIBRATION	Normal Transportation
COOLING	Forced Air: 200 CFM (typical)

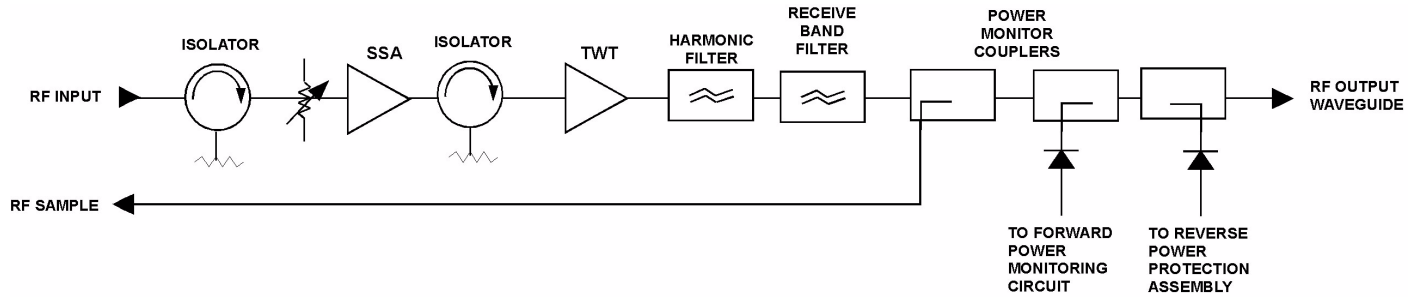
## INTERFACE

	TYPE	FUNCTION		
CONTROLS	Local	Local/Remote	AC Power ON/OFF	
	Local and Remote	Gain	High Voltage ON/OFF	Fault Reset
		Min/Max Power Alarm/Fault	Audio Alarm ON/OFF	Lamp Test
		Reflected Power Alarm/Fault	Units (Watts, dBm, dBW)	Heater Standby ON/OFF
STATUS	Front Panel LEDs	Standby	Heater Standby	High Voltage
		Local	Remote	Power
		Summary Fault	Heater Time Out (FTD)	
	Front Panel Digital Display	Power Out	Attenuator Setting	Faults:
		Reflected Power	Units Selection	High VSWR
		TWT Temperature	Standby Hours	High Voltage
		Heater Hours	Beam Hours	Helix Current
		Helix Current	Heater Voltage	TWT Temperature
Dry Form-C Relay Contacts (Two)		Summary Fault		
COMPUTER	Hardware Interface	2 ports: RS-232 & RS-422/RS-485		
SERIAL PORT	Xicom Command Set	ASCII Commands		
RF SAMPLE PORT COUPLING		-43 dB Nominal		

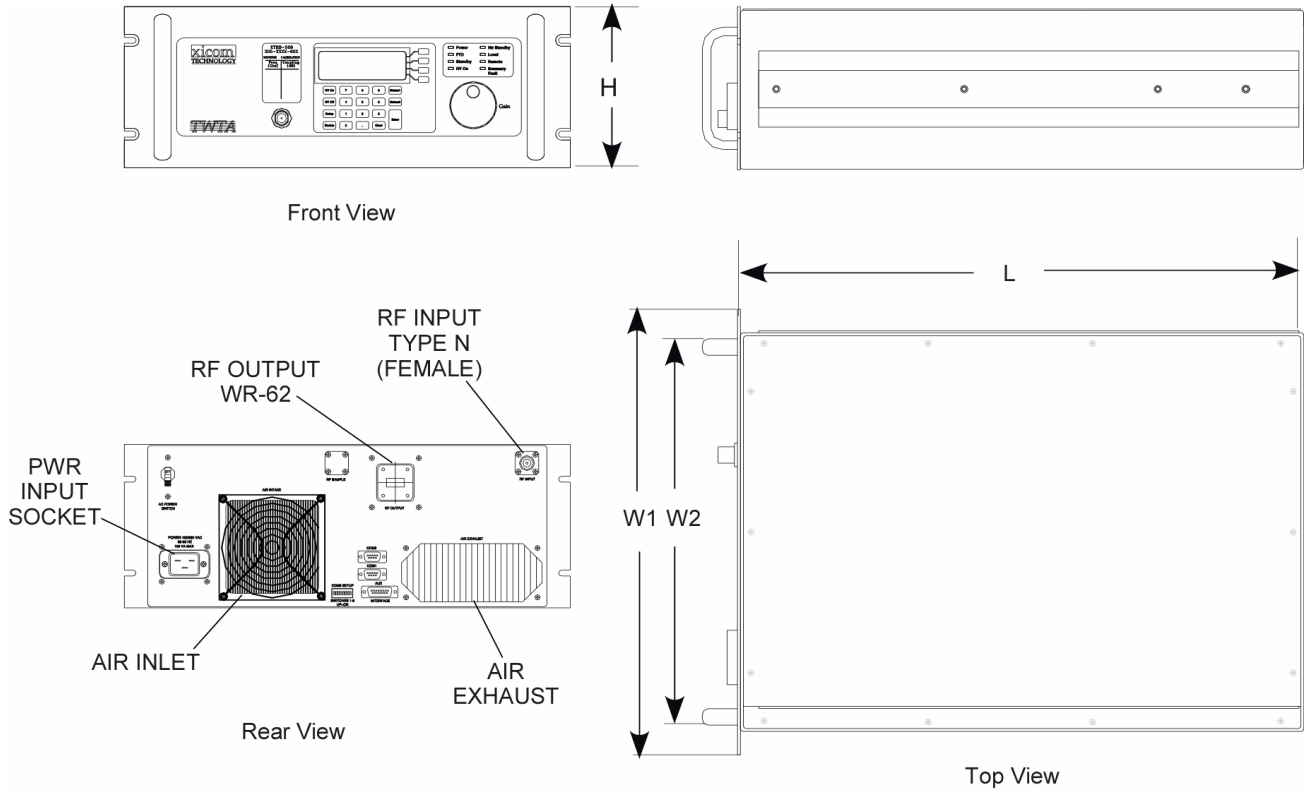
# XTRD-450KD High Power Amplifiers



# Block Diagram



# Outline Drawing



Nominal Weight = 75 lb (34.02 kg)

DIMENSIONS		
	INCHES	CENTIMETERS
L	24.00	60.96
H	6.97	17.70
W1	19.00	48.26
W2	17.00	43.18