

# 500W Ka-Band Antenna Mount High Power Amplifiers



## FEATURES

- *500 watts Ka-band peak or CW*
- *Commercial frequencies between 27.5 and 30.0 GHz*
- *Rugged 58 lb. antenna mount package*
- *Includes linearizer*
- *Complete RS-232/422/485 ethernet interface*
- *-40°C to +60°C ambient*

The **XTD-500Ka** series are compact, self contained antenna mount power amplifiers designed for low cost installation and long life. Comtech Xicom offers both a "Peak" and CW version of this product across a range of commercial frequencies between 27.5 and 30 GHz. The CW version allows the amplifier to be safely driven up to its saturated power output level. The more economical Peak version is limited to operation up to its "linear" power level, which still delivers the equivalent usable multi-carrier RF power.

The **XTD-500** family features high RF efficiency which enables a smaller, lighter amplifier with the ability to operate at up to 60 deg C ambient temperatures.

Comtech Xicom has developed proprietary features to improve performance and life including an automatic bias control system which extends TWT life by maintaining constant beam current over time and a precise system for matching linearizer performance to a specific tube over a wide range of operating conditions maximizing useable linear power.

Optional integrated block upconverters (BUC) are available. They can be ordered with an integral 10 MHz reference module for independent operation or with external 10 MHz input for phase lock to GPS or other system clocks.

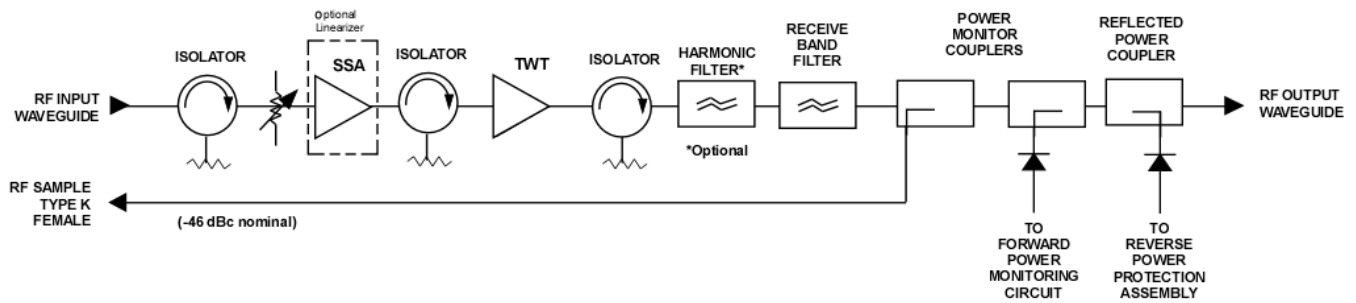
The amplifier is equipped with an internal 1:1 switch control capable of driving an input and output switch for redundancy. Rack mountable controllers are also available.



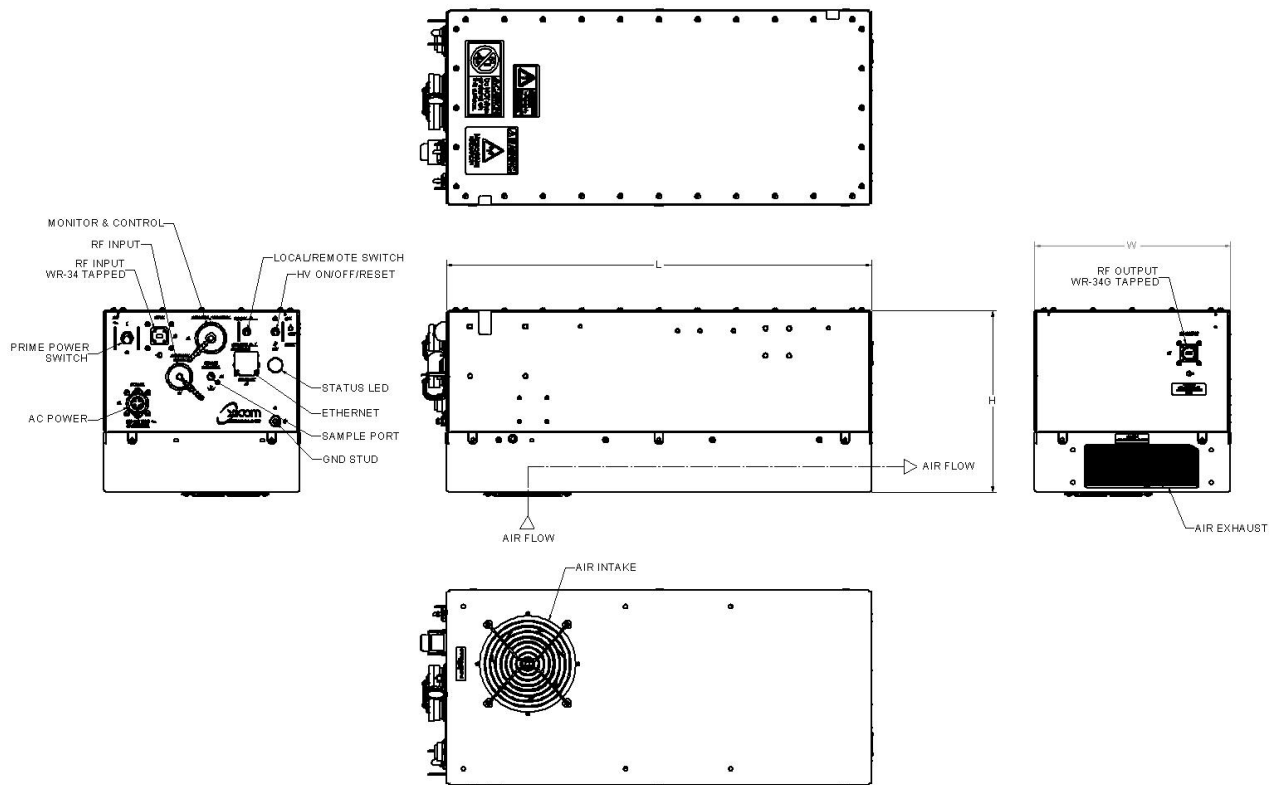
# PERFORMANCE SPECIFICATION

Parameters	XTD-500Ka	XTD-500KaL
FREQUENCY RANGE	28 to 30 GHz (Optional 27.5 to 30 GHz)	
OUTPUT POWER		
Traveling Wave Tube	500W (57 dBm) CW	500W (57 dBm) Peak 350W (55.5 dBm) CW max.
Rated Power @ Amplifier Flange	415W (56.2 dBm)	250W (54 dBm)
GAIN		
Large Signal (minimum)	70 dB	
Small Signal (minimum)	70 dB	
Attenuator range (0.1 dB steps)	30 dB	
Maximum SSG Variation Over		
Any Narrow Band	0.80 dB per 60 MHz	
Any 1 GHz Band (maximum)	2.5 dB	
Slope (maximum)	± 0.04 dB/MHz	
Stability, 24 hr. (maximum)	± 0.25 dB	
Stability, Temperature (maximum)	± 1.0 dB at any frequency	
INTERMODULATION (maximum) with two equal carriers	-26 dBc @ 175W (52.4 dBm) with Linearizer	
HARMONIC OUTPUT (maximum)	-15 dBc (-60 dBc with optional filter)	
AM/PM Conversion (maximum)	2.5 deg/dB at 4 dB below rated output power (1 deg/dB with Linearizer)	
NOISE POWER (maximum)		
Transmit Band	-75 dBW/4 kHz	
Receive Band (<21.2 GHz)	-150 dBW/4 kHz	
GROUP DELAY (maximum)		
Bandwidth	Any 60 MHz	
Linear	0.01 nS/MHz	
Parabolic	0.001 nS/MHz <sup>2</sup>	
Ripple	0.5 nS/Pk-Pk	
RESIDUAL AM NOISE (maximum)	-55 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 -45 dBc	
VSWR		
Input (maximum)	1.3:1	
Output (maximum)	1.3:1	

# BLOCK DIAGRAM



# OUTLINE DRAWING



DIMENSIONS		
	INCHES	CENTIMETERS
L	22.25	56.52
H	9.50	24.13
W	10.25	26.04
Typical Weight = 58 lb (26.31 kg)		

## PRIME POWER

90 to 264 VAC  
 47 to 66 Hz, Single Phase  
 1400 VA Typical  
 0.95 Min. Prime Power Factor



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## ENVIRONMENT

NONOPERATING TEMPERATURE RANGE -50°C to +70°C  
 OPERATING TEMPERATURE RANGE -40°C to +60°C  
 HUMIDITY Up to 100% Condensing  
 ALTITUDE 10,000 feet MSL maximum with standard adiabatic derating  
 SHOCK AND VIBRATION Normal Transportation  
 COOLING Forced Air (self cooled)

## 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	
REMOTE CONTROL	HV ON/OFF	RF Inhibit (HV OFF)
	RF Attenuation	Fault Reset
	Heater Standby	Constant Power
REMOTE STATUS	HV ON	Heater/Beam Hours
	RF Output Power	Fault Identification
	Reflected Power	TWT Temperature
	Filament Time Delay	Helix Current
	Helix Voltage	
DISCRETE STATUS	Summary Fault (2X Form C Dry Contact Closure)	
RF MONITOR PORT	-50 dB Coupling Value (nominal)	
INTERFACE	Serial 232/422/485	
	Ethernet	

## OPTIONS

- WR-28 Waveguide
- Alternate Frequency Coverage (27.5 to 30 GHz)
- Remote External Controller
- 1:1, 1:2, 1:N Redundancy
- Phase Combined
- L-Band Block Upconverter
- Harmonic Filter (.25 dB output power reduction)
- Nonlinearized