

500W Ka-Band Antenna Mount High Power Amplifiers



FEATURES

- *500 watts Ka-band*
- *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-500KaL** is a compact, self contained antenna mount power amplifier designed for low cost installation and long life. Comtech Xicom offers this "Peak" amplifier across a range of commercial frequencies between 27.5 and 30 GHz. The amplifier is limited to operation up to its "linear" power level, which still delivers the equivalent useable multi-carrier RF power.

The **XTD-500KaL** 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.

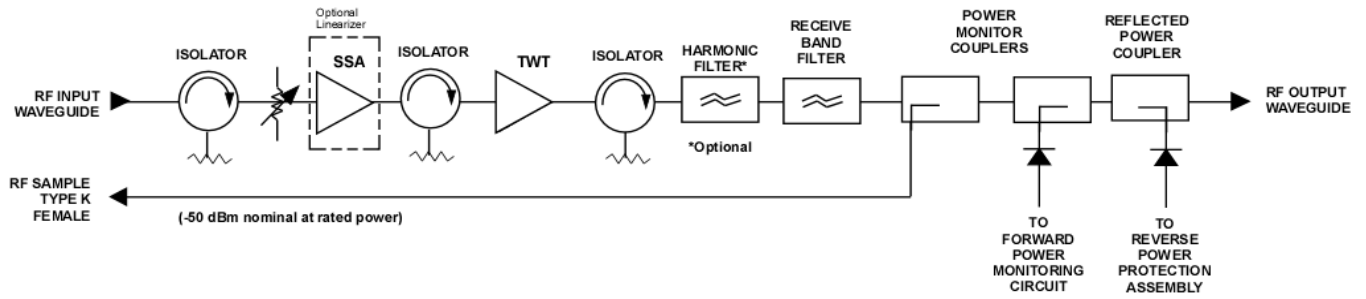


PERFORMANCE SPECIFICATION

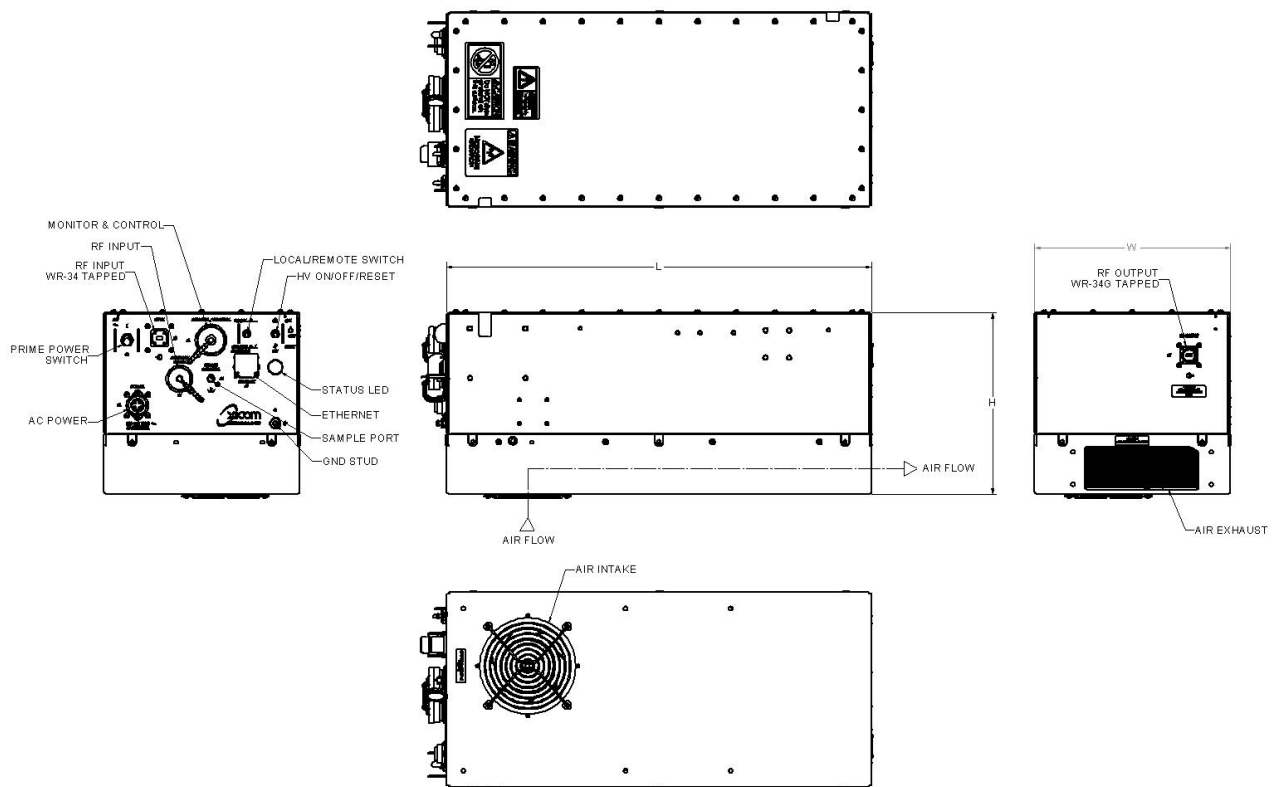
XTD-500KaL Option 1

Parameters	
FREQUENCY RANGE	28 to 30 GHz (Optional 27.5 to 30 GHz)
OUTPUT POWER	
Traveling Wave Tube	500W (57 dBm) Peak 350W (55.5 dBm) CW max.
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 500 MHz Segment	1.0 dB
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, ± 0.75 dB over ±10°C
INTERMODULATION (maximum) with two equal carriers	-26 dBc @ 186.2W (52.7 dBm) with Linearizer
NPR	-19 dB @ 4 dB OBO Typical -20 dB @ 4.3 dB OBO Typical
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)
SPURIOUS	-60 dBc max.
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 ²
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)	15 dB below IESS phase noise profile, 20 dB typical AC fundamental -47 dBc Sum of all spurs -50 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)		

Input Waveguide	WR-28F
Output Waveguide	WR-34G
RF Monitor	2.9 mm SMA Female

XTD-500KaL
Option 1



PRIME POWER

90 to 264 VAC
 47 to 66 Hz, Single Phase
 1300 VA Maximum, 1000 VA Typical
 0.95 Min. Prime Power Factor



ENVIRONMENT

NONOPERATING TEMPERATURE RANGE	-54°C to +75°C
OPERATING TEMPERATURE RANGE	-40°C to +60°C
HUMIDITY	Up to 100% Condensing
ALTITUDE	10,000 feet MSL maximum with standard adiabatic derating 2°C/1000 ft. operating; 50,000 ft. non-operating
SHOCK AND VIBRATION	20G @ 11ms (1/2 sine pulse in non-operating condition); 2.1G rms, 50 to 500 MHz
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

- 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

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