

# 500W Ka-Band Antenna Mount High Power Amplifiers



## FEATURES

- 500 watts Ka-band peak or CW
- Optional frequencies within 27.0 and 31.0 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.

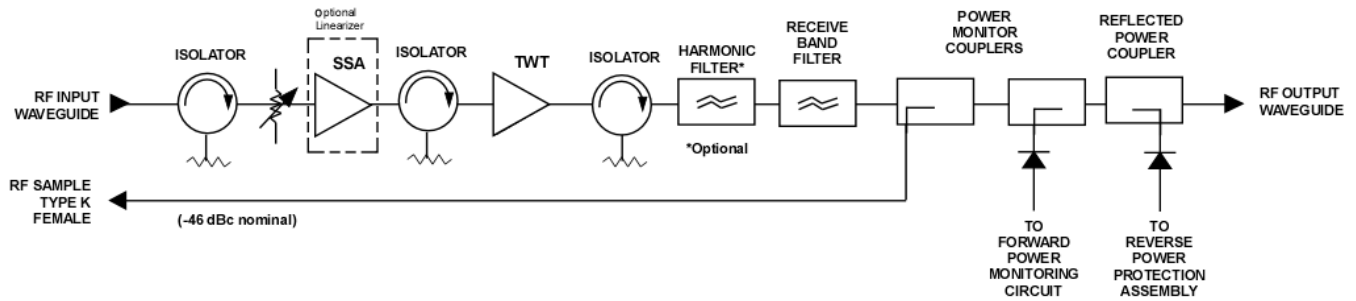
The amplifier is equipped with an internal 1:1 switch control capable of driving an input and output switch for redundancy. Rack mountable controllers are also available.



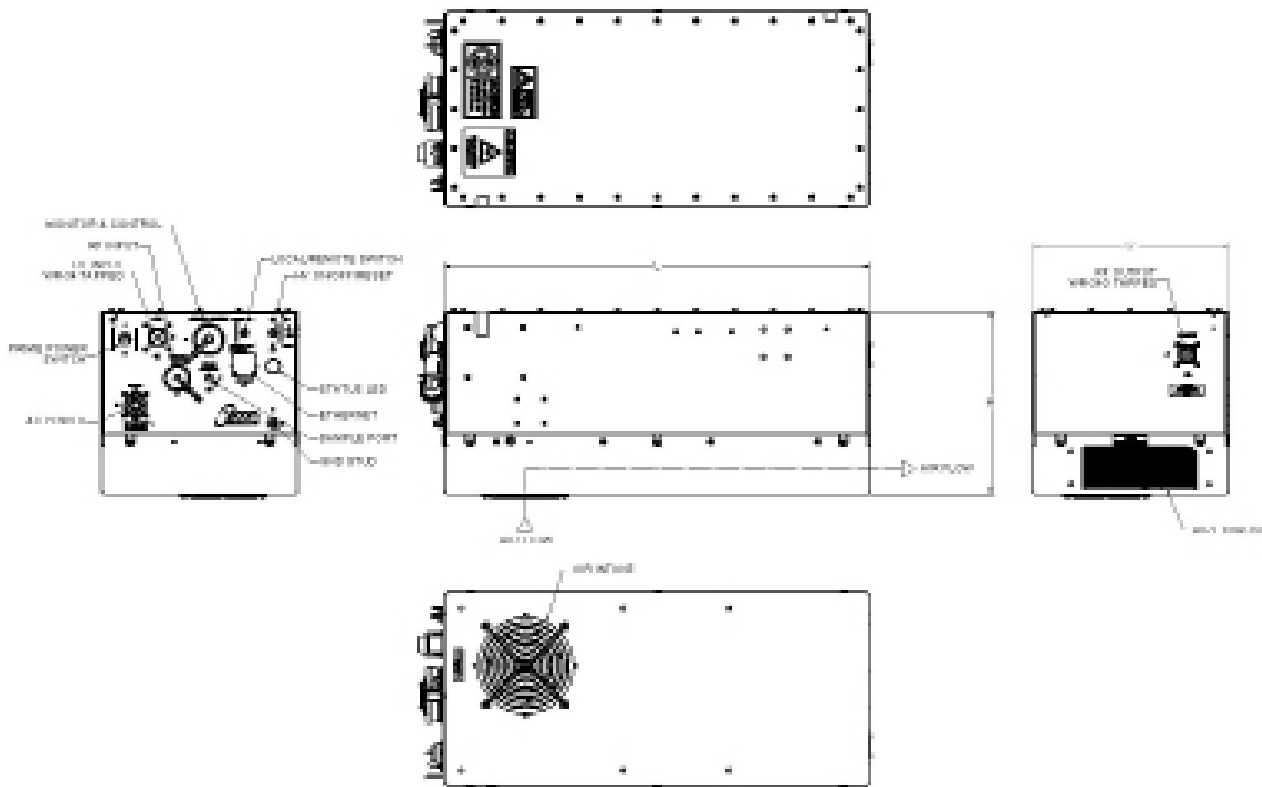
# PERFORMANCE SPECIFICATION

| Parameters   | XTD-500Ka  | XTD-500KaL         |
|--|--|--------------------|
| FREQUENCY RANGE                                      | 27.5 to 30 GHz<br>(Optional frequency coverage in the 27 to 31 GHz band)                   |                    |
| OUTPUT POWER   |  |                    |
| Traveling Wave Tube                                  | 500W (57 dBm) CW   | 500W (57 dBm) Peak |
| Rated Power @ Amplifier Flange                       | 415W (56.2 dBm)  | 225W (53.3 dBm)    |
| Linear Power @ Amplifier Flange: -19 dB NPR          | 160W (52.2 dBm)  | 160W (52.2 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)<br>with two equal carriers | -26 dBc @ 200W (53.2 dBm)  |                    |
| HARMONIC OUTPUT (maximum)                            | -60 dBc  |                    |
| AM/PM Conversion (maximum)                           | 1 deg/dB at 4 dB below rated output power  |                    |
| 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<br>-20 (1.5 + logf) dBc 10 to 500 kHz<br>-85 dBc above 500 kHz           |                    |
| PHASE NOISE (maximum)                                | 20 dB below IESS phase noise profile<br>AC fundamental -50 dBc<br>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



# 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 in the 27 to 31 GHz Band
- Remote External Controller
- 1:1, 1:2, 1:N Redundancy
- Phase Combined
- L-Band Block Upconverter
- Nonlinearized

 **CDIP**  
www.cdip.ru  
info@cdip.ru  
+7 (495) 956-20-22