

325 Watt C and Ku-Band, 450 Watt X-Band Tri-Band Low Profile Antenna Mount HPA for Satellite Communications



FEATURES

- Power Factor Corrected
- High Efficiency Dual-Stage TWT
- Microprocessor M&C Interface
- Forward Power Metering
- Optional Linearizer

The **XTD-450T1** series are compact, self-contained, antenna mountable power amplifiers designed for low cost installation and long life. The antenna mount design eliminates the need for an amplifier shelter as well as a long waveguide run between the amplifier and the antenna feed; for example, an antenna mounted 350 Watt amplifier with its shorter waveguide run will deliver EIRP compatible to a 600 Watt rack mounted HPA. RF filters, cooling, & monitoring and control systems are all self-contained within the HPA. These features provide high reliability, low maintenance costs, and low replacement costs.

The **XTD-450T1** series incorporate high efficiency, dual-stage depressed collector TWTs. Some benefits of the dual-stage collector TWT are: reduced prime power consumption, lower internal operating temperatures, and reliability enhancement. These benefits are obtained for both the linear and saturated modes of operation. One of the features of this unit is incorporation of power factor correction circuitry that minimizes line current distortion and reduces the required volt-amps. The combination of power factor correction and high efficiency TWT reduces input Volt-Amps by 45% when compared to equivalent amplifiers. A high frequency resonant conversion power supply is used that accepts a wide range of prime power (100 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 microprocessor monitoring and control system is built into the unit, including a RS-232/485 remote interface.

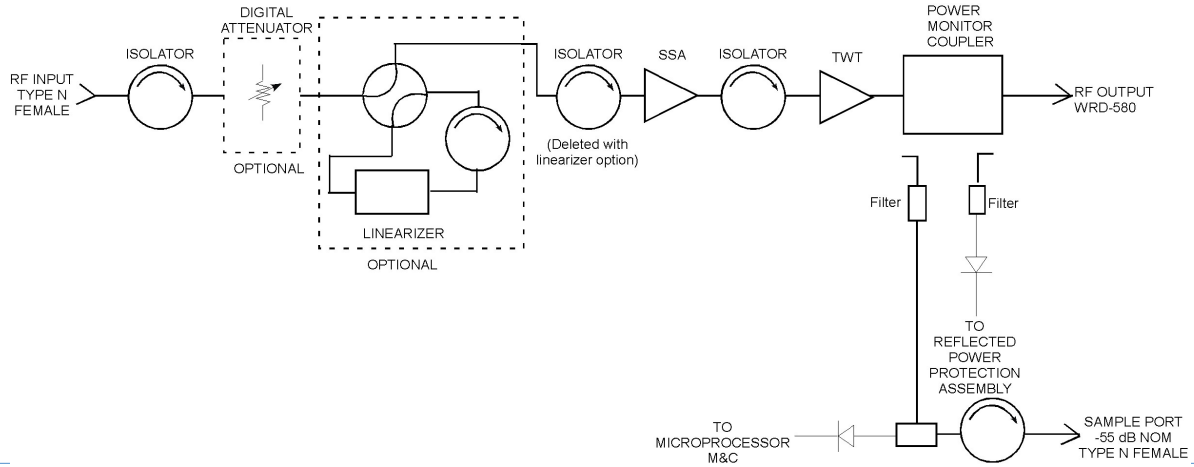
The **XTD-450T1** series can be configured to single thread or redundant operation. A remote external controller is available to operate the HPA from a user selected location. Mounting brackets can be supplied to mount the HPA to most popular antennas.



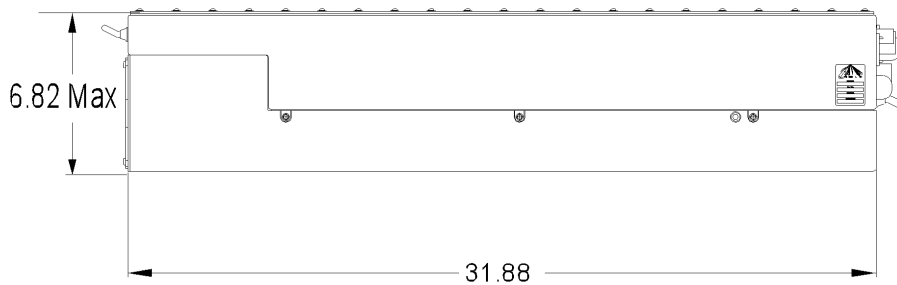
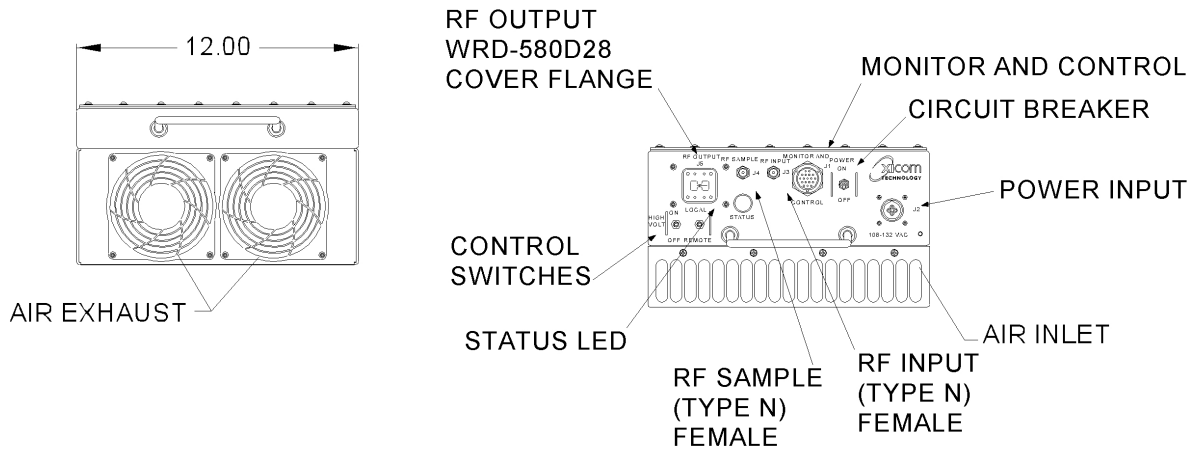
PERFORMANCE SPECIFICATION

Parameters	C-Band	X-Band	Ku-Band
FREQUENCY RANGE	5.850 to 6.425 GHz	7.90 to 8.40 GHz	14.0 to 14.5 GHz
OUTPUT POWER			
Traveling Wave Tube	325 W (55.1 dBm)	450 W (56.5 dBm)	325 W (55.1 dBm)
Amplifier Flange	290 W (54.6 dBm)	400 W (56.0 dBm)	290 W (54.6 dBm)
Rated Power, Linear	235 W (53.7 dBm)	125 W (51.0 dBm) 300 W (54.8 dBm) *	125 W (51.0 dBm) 250 W (54.0 dBm) *
GAIN			
Large Signal (minimum)		75 to 80 dB	
Small Signal (minimum)	79 dB	79 dB 75 dB *	79 dB 75 dB *
Attenuator Range (continuous)		0 to 20 dB	
Maximum SSG Variation Over			
Any Narrow Band		1.0 dB per 40 MHz	
Full Band		± 1.5 dB	
Slope (maximum)		± 0.04 dB/MHz	
Stability, 24 hr. (maximum)		± 0.25 dB	
Stability, Temperature (maximum)	2.5 dB Pk-Pk over temperature range at any frequency		
INTERMODULATION (maximum) with two equal carriers	-16 dBc @ 4 dB total output power backoff from rated power	-26 dBc @ 4 dB total output power backoff from rated power	-16 dBc @ 4 dB total output power backoff from rated power
HARMONIC OUTPUT (maximum)	0 dBc	-10 dBc	-12 dBc
AM/PM CONVERSION (maximum)	2.5 deg/dB below rated power 2.0 deg/dB below rated linear power		
NOISE POWER (maximum)			
Transmit Band		-64 dBW/4 kHz	
Receive Band	-64 dBW/4 kHz 3.7 to 4.2 GHz	-64 dBW/4 kHz 7.25 to 7.75 GHz	-64 dBW/4 kHz 10.95 to 12.75 GHz
GROUP DELAY (maximum)			
Bandwidth		Any 40 MHz	
Linear		± 0.01 nS/MHz	
Parabolic		± 0.005 nS/MHz ²	
Ripple		0.5 nS/Pk-Pk	
RESIDUAL AM NOISE (maximum)	-70 dBc measured in a 1 kHz BW excluding a 2 MHz band centered on the carrier @ rated power		
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)		2.2:1	
* With optional linearizer			

BLOCK DIAGRAM



OUTLINE DRAWING



SIDE VIEW

WEIGHT (TYPICAL)
68 LBS

PRIME POWER

100 to 260 VAC
47 to 63 Hz, Single Phase
2200 VA (maximum)
0.95 Minimum Prime Power Factor



ENVIRONMENT

NONOPERATING TEMPERATURE RANGE	-50°C to +70°C
OPERATING TEMPERATURE RANGE	-30°C to +60°C (2°C/1000 Feet Derating)
HUMIDITY	Up to 100% Condensing
ALTITUDE	10,000 Feet MSL (maximum)
SHOCK AND VIBRATION	15g, 11 ms per Mil STD 810F 6 grms 20 to 2000 Hz
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 Attenuation (optional)
	Fault Reset	Linearizer In/Out (optional)
	Frequency Band Select	
REMOTE STATUS	HV ON	Heater/Beam Hours
	RF Output Power	Fault Identification
	Reflected Power	TWT Temperature
	Filament Time Delay	Helix Current
	Helix Voltage	
HARDWARE INTERFACE	RS-232, RS422/485	
RF MONITOR PORT	-50 dB Coupling Value (nominal)	

OPTIONS

- Extended Frequency Coverage
13.75 to 14.5 GHz, 5.85 to 6.65 GHz
- Remote External Controller
- 1:1, 1:2, 1:N Redundancy
- Integrated X-Band or Ku-Band Linearizer
- Digital Attenuator
- Reversed Air Flow

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