XTD-450T1 Tri-Band Low Profile Antenna-Mount HPA for Satellite Communications

- **325 Watts C-Band**
  450 Watts X-Band
  325 Watts Ku-Band
- **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 the XTD-450T1 series 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.

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PERFORMANCE SPECIFICATIONS

Parameter	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	325W (55.1 dBm)	450W (56.5 dBm)	325W (55.1 dBm)
Amplifier Flange	290W (54.6 dBm)	400W (56.0 dBm)	290W (54.6 dBm)
Rated, Linear	235W (53.7 dBm)	125W (51.0 dBm)	125W (51.0 dBm)
		300W (54.8 dBm)*1	250W (54.0 dBm)*1
GAIN			
Large Signal, minimum	75-80 dB	75-80 dB	75-80 dB
Small Signal, minimum	79 dB	79 dB (75 dB)*1	79 dB (75 dB)*1
Maximum SSG Variation Over:			
Any Narrow Band	1.0 dB per 40 MHz	1.0 dB per 40 MHz	1.0 dB per 40 MHz
Full Band	± 1.5 dB	± 1.5 dB	± 1.5 dB
Slope, maximum	± 0.04 db/MHz	± 0.04 db/MHz	± 0.04 db/MHz
Stability, 24 Hr maximum	± 0.25 dB	± 0.25 dB	± 0.25 dB
Stability, Temperature	2.5 dB pk-pk maximum over temperature range at any frequency		
ATTENUATOR RANGE (Optional)	0-20 dB		
SPECTRAL OCCUPANCY	-26 dBc @ 1 symbol rate offset from carrier @ rated linear power, QPSK	-30 dBc @ 1 symbol rate offset from carrier @ rated linear power, OQPSK	-26 dBc @ 1 symbol rate offset from carrier @ rated linear power, QPSK
HARMONIC OUTPUT, maximum	0 dBc	-10 dBc	-12 dBc
RESIDUAL AM/FM	-70 dBc measured in a 1 kHz BW excluding a 2 MHz band centered on the carrier @ rated Power		
	AC fundamental -50 dBc		Sum of all spurs -47 dBc
AM/PM CONVERSION, maximum	2.5°/ dB below rated power 2.0° dB below rated linear power		
NOISE POWER, maximum			
Transmit Band	-64 dBw/4 kHz	-64 dBw/4 kHz	-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	Any 40 MHz	Any 40 MHz
Linear	0.01 nS/MHz	0.01 nS/MHz	0.01 nS/MHz
Parabolic	0.005 nS/MHz^2	0.005 nS/MHz^2	0.005 nS/MHz^2
Ripple	0.5 nS/Pk-Pk	0.5 nS/Pk-Pk	0.5 nS/Pk-Pk
PHASE NOISE, maximum	10 dB below IESS phase noise profile		
VSWR			
Input, maximum	1.3:1	1.3:1	1.3:1
Output, maximum	2.2:1	2.2:1	2.2:1

*1 with optional linearizer

XICOM TECHNOLOGY

PRIME POWER

100-260 VAC

47 to 63 Hz, single phase

2200 VA Maximum

0.95 Minimum Power Factor

OPTIONS

Remote External Controller

Extended Frequency Coverage
- 13.75 - 14.5 GHz, 5.85 - 6.65 GHz

1:1, 1:2, 1:N redundancy

Integrated X-Band or Ku-Band Linearizer

Digital Attenuator

Reversed Air Flow

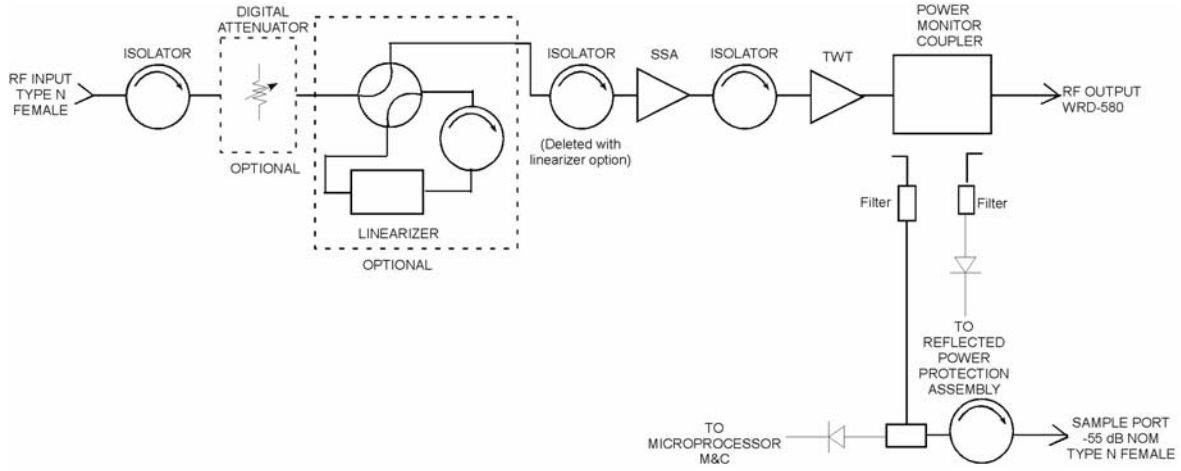
ENVIRONMENT

NONOPERATING TEMPERATURE RANGE	-50° C to + 70° C
OPERATING TEMPERATURE RANGE	-30° C to +50° C
HUMIDITY	Up to 100% Condensing
ALTITUDE	10,000 feet MSL maximum with 2°C/1k ft derating
SHOCK	15g, 11 ms per Mil STD 810F
VIBRATION	6 grms 20-2000 Hz
COOLING	Forced Air

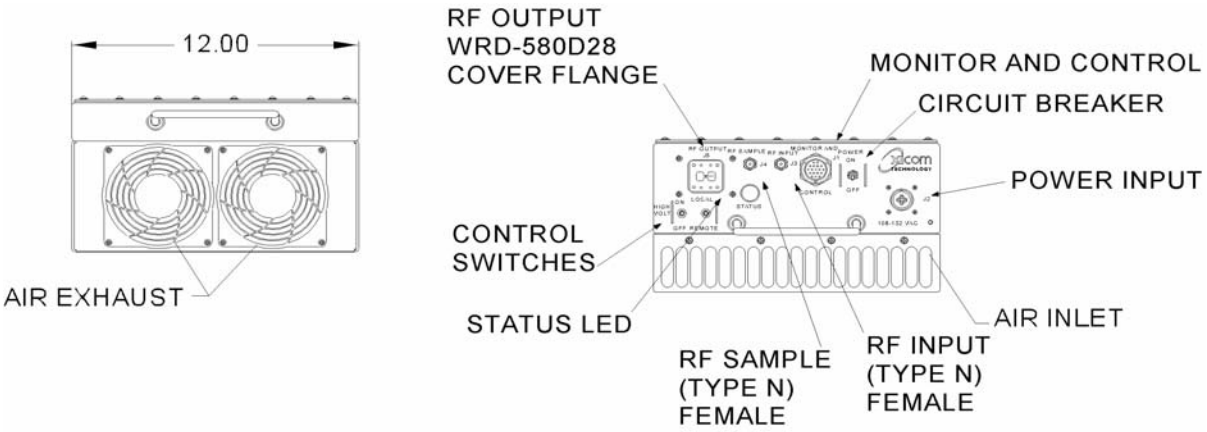
INTERFACE

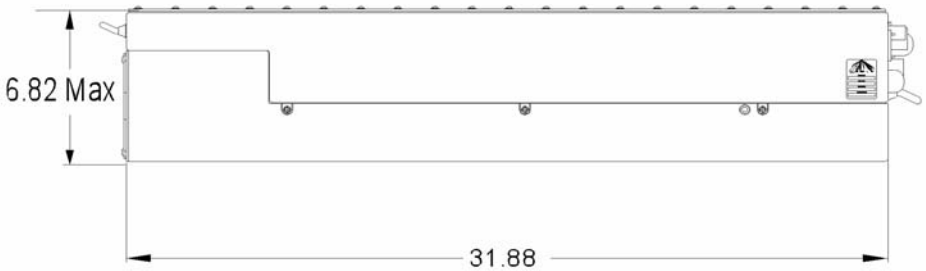
TYPE		FUNCTION	
CONTROL			
	LOCAL	Power ON/OFF	HV ON/OFF/Fault Reset
			Local/Remote
	RS-232-/485	HV ON/OFF	Frequency Band Select
		Fault Reset	RF Attenuation (optional)
			Linearizer In/Out (optional)
MONITOR			
	LOCAL	Three-color LED indicating FTD, Standby, HV ON, and Fault Conditions	
	RS-232-/485	High Voltage ON/OFF	Helix Current Fault
		Helix Voltage	Summary Fault
		Helix Current	High Voltage Fault
		TWT Temperature	High Temperature fault
		RF Output Power	Linearizer In/Out (optional)
		Heater Warm-up Time Delay (FTD)	

Block Diagram



Outline Drawing





SIDE VIEW

WEIGHT (TYPICAL)
68 LBS

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