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*
- *Optional X-band linearizer*

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

The **XTD-450TLW** series incorporates high efficiency, dual-stage collector TWTs. Some of the benefits of this type of 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-450TLW** 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 TWTs 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 monitoring & control system is built into the unit. Ten status and fault monitors are provided for external monitoring. The **XTD-450TLW** series can be configured for single thread, redundant, phase combined, or linearized 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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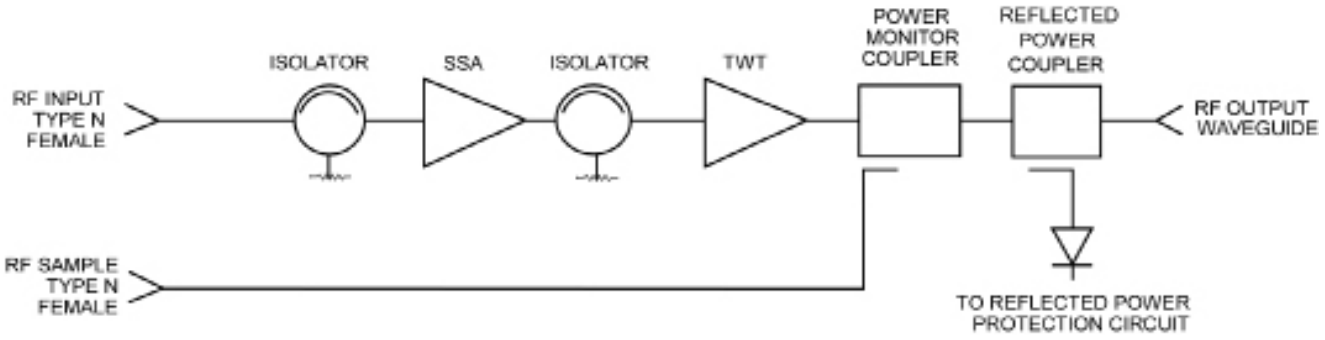
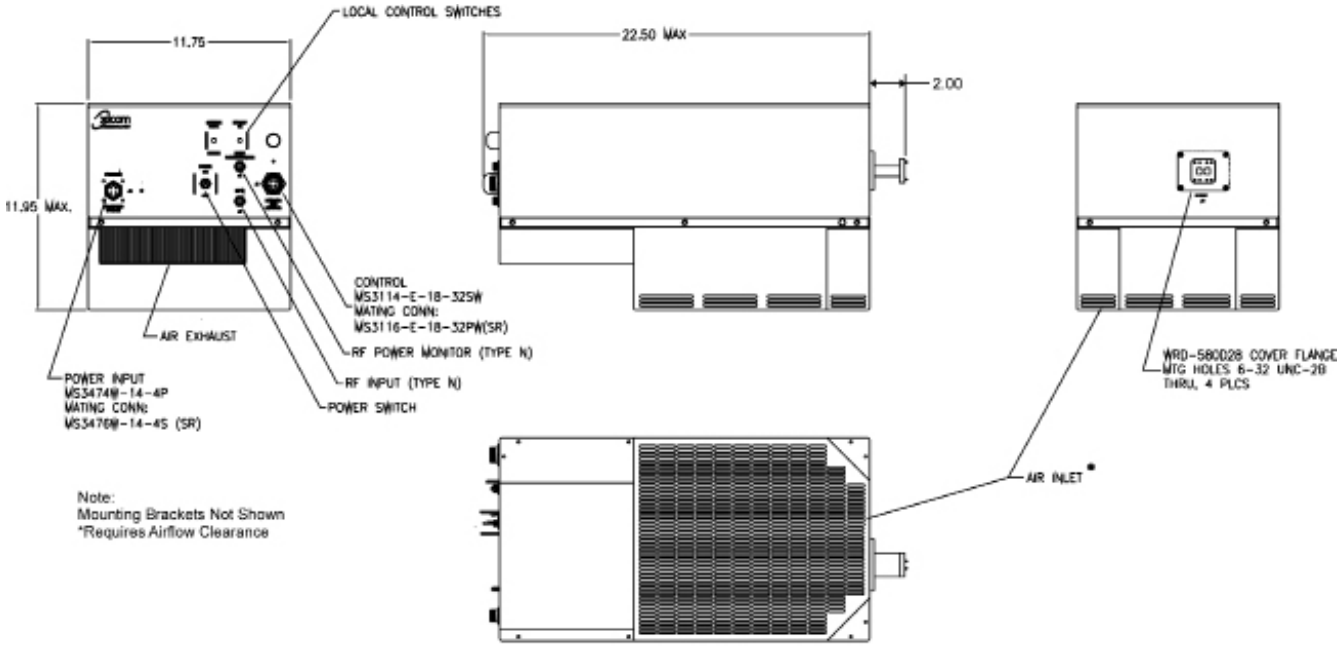
PERFORMANCE SPECIFICATION

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)
Rated Power @ Amplifier Flange	290 W (54.6 dBm)	400 W (56.0 dBm)	290 W (54.6 dBm)
GAIN			
Large Signal (minimum)		65 dB	
Small Signal (minimum)		70 dB	
Maximum SSG Variation Over			
Any Narrow Band		1.0 dB per 40 MHz	
Full Band		± 2.5 dB	
Slope (maximum)		± 0.04 dB/MHz	
Stability, 24 hr. (maximum)		± 0.25 dB	
Stability, Temperature (maximum)		± 1.0 dB over temperature range at any frequency	
INTERMODULATION (maximum) with two equal carriers		-18 dBc @ 4 dB total output power backoff from rated power	
HARMONIC OUTPUT (maximum)	0 dBc @ 49 dBm	-10 dBc	-12 dBc
AM/PM CONVERSION (maximum)		2.5 deg/dB at 6 dB below rated 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)		-50 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)		2.2:1	

BLOCK DIAGRAM



OUTLINE DRAWING



Typical Weight: 58 lbs (26.3 kg)

PRIME POWER

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

CE

ENVIRONMENT

NONOPERATING TEMPERATURE RANGE	-50°C to +70°C
OPERATING TEMPERATURE RANGE	-40°C to +50°C (2°C/1000 Feet Derating)
HUMIDITY	Up to 100% Condensing
ALTITUDE	10,000 Feet MSL (maximum)
SHOCK AND VIBRATION	Normal Transportation
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
- Remote External Controller
- Discrete Interface
- 1:1, 1:2, 1:N Redundancy
- Integrated X-Band Linearizer
- Detected RF Power Metering
- Digital Attenuator

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