

# 400 Watt C and Ku-Band Rack Mount High Power Amplifier



## FEATURES

- Power Factor Correction
- Digital Display & Control Interface
- High Efficiency

The **XTRD-400DB** is a highly efficient rack-mountable traveling wave tube (TWT) amplifier designed for fixed and mobile uplink applications. The unit includes RF gain control, a solid state pre-amplifier, RF filters, cooling, and monitoring & control (M&C) systems. Rack space is conserved because the amplifier occupies only 3 rack units (5 ¼ inches) of a standard 19 inch rack cabinet. Nominal weight is 50 pounds.

The unit features a menu driven front panel display, RS-232/422/485 serial port interfaces for complete computer control. RF, traveling wave tube, and default parameters are easily monitored on the four line front panel display. Gain control is provided via the front panel or through the serial interface.

The **XTRD-400DB** amplifier incorporates high efficiency dual-stage collector TWTs. Reliability is enhanced because both prime power consumption and internal operating temperatures are reduced for both the linear and saturated modes of operation. Power factor correction circuitry is also included which minimizes line current distortion and reduces the required Volt-Amps input. The automatic features of the high frequency resonant conversion power supply include quick recovery from prime power supply outages and multiple helix fault resets (three fault cycles). Depending upon user requirements, this high power amplifier can be configured for either single thread or redundant system operation.

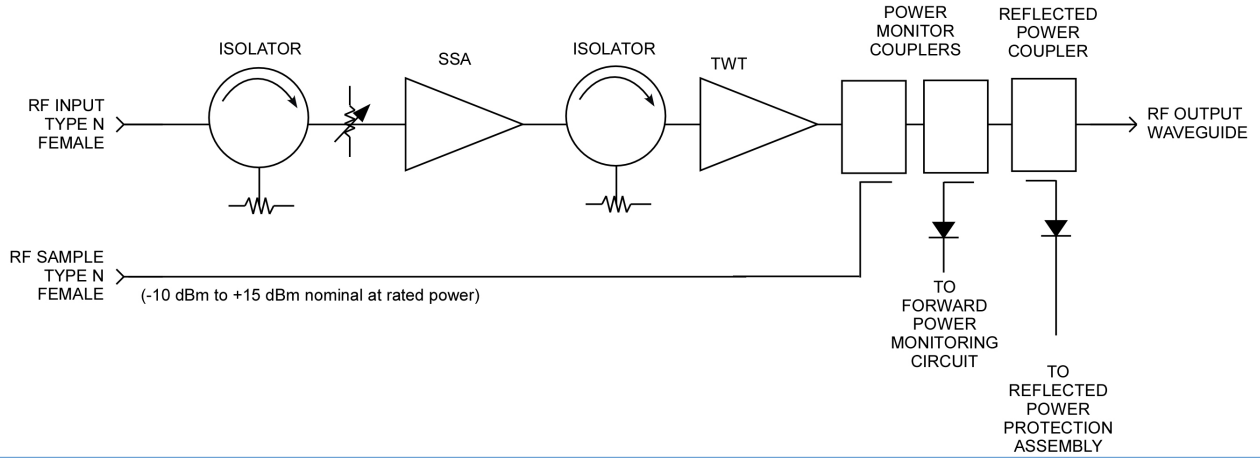


# PERFORMANCE SPECIFICATION

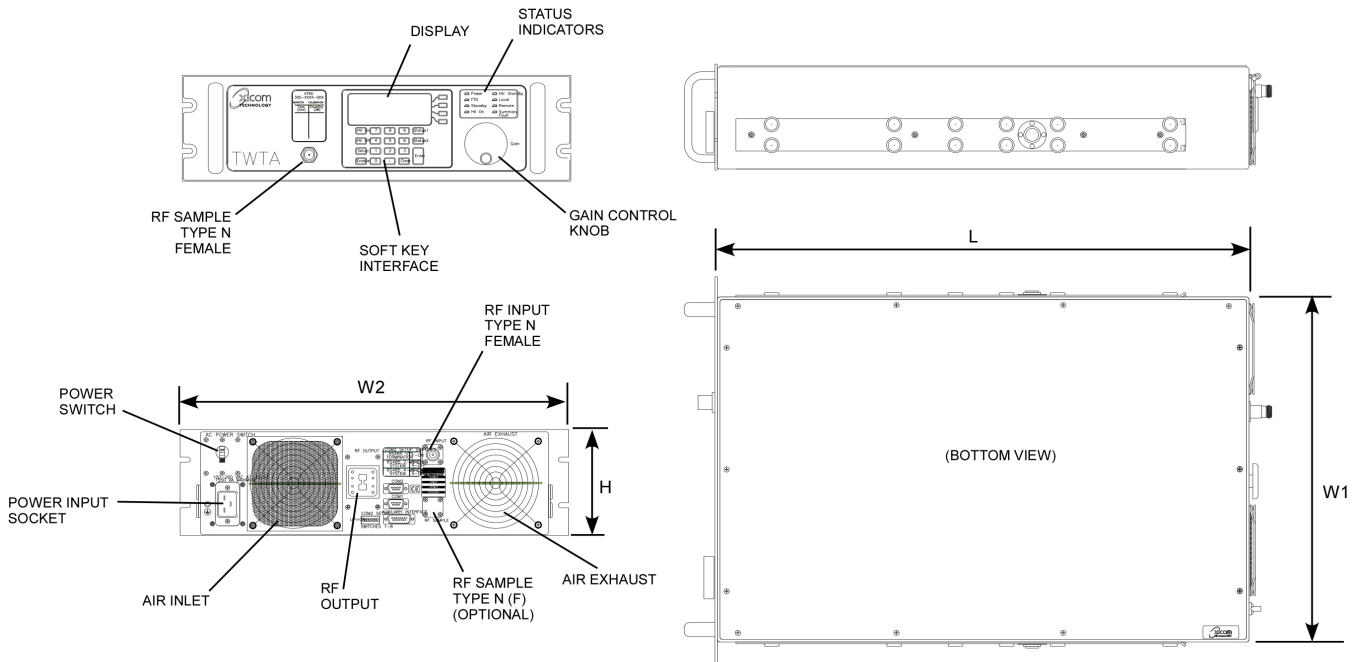
Parameters	C-Band	Ku-Band
FREQUENCY RANGE (extended frequency coverage available)	5.85 to 6.425 GHz *	14.0 to 14.5 GHz (13.75 to 14.5 GHz)
OUTPUT POWER		
Traveling Wave Tube		400 W
Rated Power @ Amplifier Flange (minimum)		350 W
GAIN		
Large Signal (minimum)	60 dB	62 dB
Small Signal (minimum)	63 dB	65 dB
Attenuator Range (continuous)		20 dB
Maximum SSG Variation Over:		
Any Narrow Band	1.5 dB per 40 MHz	1.3 dB per 80 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	-17 dBc @ 4 dB total output power backoff from rated power	
HARMONIC OUTPUT (maximum) *	0 dBc @ 49 dBm	-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 10.95 to 12.75 GHz
GROUP DELAY (maximum)		
Bandwidth	Any 40 MHz	Any 80 MHz
Linear		± 0.01 nS/MHz
Parabolic		± 0.005 nS/MHz <sup>2</sup>
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)	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

\* Harmonic/receive band filtering not included

# BLOCK DIAGRAM



# OUTLINE DRAWING



DIMENSIONS		
	INCHES	CENTIMETERS
L	26.00	66.04
W1	17.00	43.18
W2	19.00	48.26
H	5.219	13.26
Nominal Weight: 50 lbs (22.68 kg)		

# PRIME POWER

180 to 264 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	-10°C to +50°C (2°C/1000 Feet Derating)
HUMIDITY	Up to 95% Noncondensing
ALTITUDE	10,000 Feet MSL (maximum)
SHOCK AND VIBRATION	Normal Transportation
COOLING	Forced Air

## INTERFACE

	Type	Function	
CONTROLS	LOCAL	Local/Remote	AC Power On/OFF
	LOCAL AND REMOTE	Gain	High Voltage ON/OFF
		Min/Max Power Alarm/Fault	Audio Alarm ON/OFF
		Reflected Power Alarm/Fault	Units (Watts, dBm, dBW)
		Fault Reset	Lamp Test
	Heater Standby ON/OFF		
STATUS	FRONT PANEL LEDs	Standby	Power
		Local	Remote
		Summary Fault	High Voltage ON/OFF
		Heater Time Out (FTD)	Heater Standby
	FRONT PANEL DIGITAL DISPLAY	Power Out	Beam Hours
		Reflected Power	Helix Current
TWT Temperature		Helix Voltage	
	Heater Hours	Faults: High VSWR High Voltage Helix Current TWT Temperature	
	DRY FORM-C RELAY CONTACTS (2)	Summary Fault	
COMPUTER SERIAL PORT	HARDWARE INTERFACE	Two Ports: RS-232 & RS-422/RS-485	
	XICOM COMMAND SET	ASCII Commands	
	RF SAMPLE PORT COUPLING	-37 dB Nominal	

## OPTIONS

- Extended Frequency Coverage
- 1:1, 1:2, 1:N Redundancy
- Variable Phase Power Combining
- Integrated Linearizers

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