400 Watt C, X and Ku-Band Antenna Mount Amplifiers With Block Upconverter

FEATURES

- *L-band input*
- *Rugged 55 lb. antenna mount package*
- *Extended frequency band available*
- *RS-232/422/485 M&C interface*
- *1:1, 1:2, 1:N redundancy*

The **XTD-400-B1** is a series of compact self contained antenna mountable power amplifiers with a built-in block upconverter designed for low cost installation and long life.

The **XTD-400-B1** 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 mount 400 Watt Ku-Band amplifier with its shorter waveguide run will often deliver EIRP comparable to a 600 Watt rack mount 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-400-B1** uses high efficiency dual-stage collector Traveling Wave Tubes (TWT). Some 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.

The unit incorporates an L-Band block Upconverter, thereby eliminating the need for a separate outdoor unit (ODU). The L-Band transmit signal and a 10 MHz reference signal are brought out to the unit on a single coax line.

The **XTD-400-B1** may be configured for single thread, redundant, phase-combined, to linearized operation. A remote external controller is available to operate the HPA from a user selected locations. Mounting brackets can be supplied to mount the HPA to most popular antennas.

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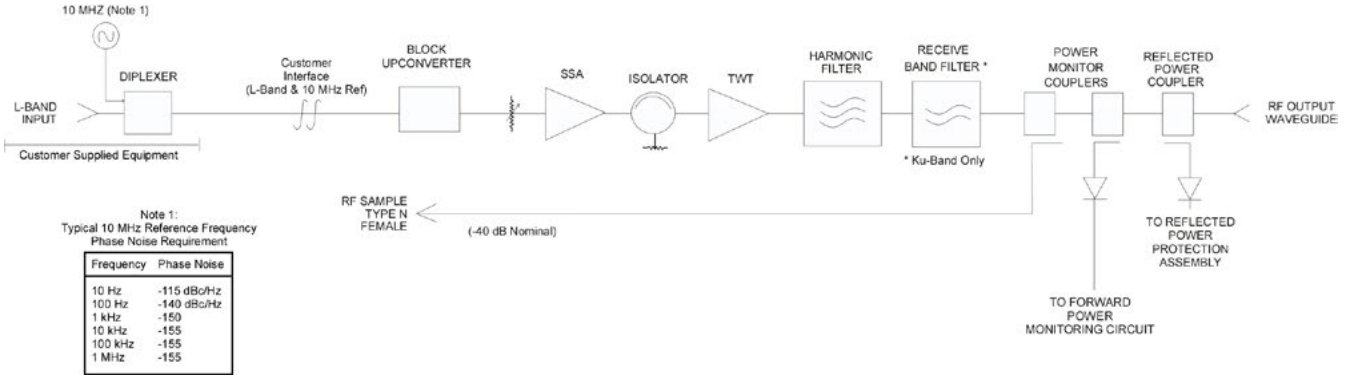
PERFORMANCE SPECIFICATION

Parameters	XTD-400C-B1 C-Band	XTD-400X-B1 X-Band	XTD-400K1-B1 Ku-Band
FREQUENCY RANGE (extended frequency coverage available)			
Output	5.850 to 6.425 GHz	7.9 to 8.4 GHz	13.75 to 14.5 GHz
Input	950 to 1525 MHz	950 to 1450 MHz	950 to 1700 MHz
LO Frequency	4900 MHz	6950 MHz	12800 MHz
Input Level, w/o damage (maximum)		10 dBm	
Reference Signal Frequency		external 10 MHz	
10 MHz Power Level		2 dBm ± 5 dB	
OUTPUT POWER			
Traveling Wave Tube		400 Watts	
Rated Power @ Amplifier Flange (minimum)		350 Watts	
GAIN			
Large Signal (minimum)		67 dB	
Small Signal (minimum)		72 dB	
Attenuator Range (continuous)		25 dB	
Maximum SSG Variation Over			
Any Narrow Band	1.0 dB per 40 MHz	1.0 dB per 80 MHz	1.0 dB per 80 MHz
Full Band		± 2 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)		-60 dBc	
AM/PM CONVERSION (maximum)		2.5 deg/dB at 6 dB below rated power	
NOISE POWER (maximum)			
Transmit Band		-70 dBW/4 kHz	
Receive Band	-150 dBW/4 kHz 3.7 to 4.2 GHz	-150 dBW/4 kHz 10.95 to 12.75 GHz	-150 dBW/4 kHz 10.95 to 12.75 GHz
GROUP DELAY (maximum)			
Bandwidth	Any 40 MHz	Any 80 MHz	Any 80 MHz
Linear		0.01 nS/MHz	
Parabolic		0.005 nS/MHz^2	
Ripple		0.5 nS/Pk-Pk	
RESIDUAL AM NOISE (maximum)		-60 dBc > 100 kHz from carrier AC fundamental -50 dBc Sum of all spurs -47 dBc	
PHASE NOISE (maximum		Per IESS phase noise profile	
VSWR			
Input (maximum)		1.8:1	
Output (maximum)		1.3:1	

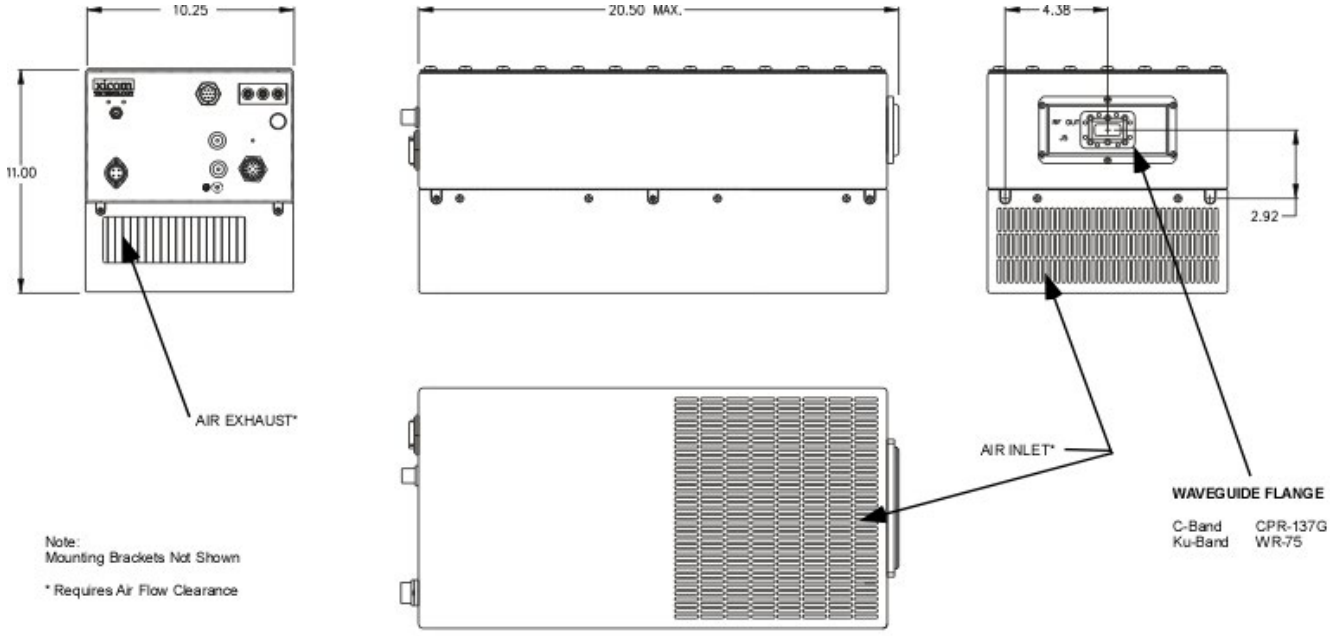
BLOCK DIAGRAM



Note 1:
Typical 10 MHz Reference Frequency Phase Noise Requirement

Frequency	Phase Noise
10 Hz	-115 dBc/Hz
100 Hz	-140 dBc/Hz
1 kHz	-150
10 kHz	-155
100 kHz	-155
1 MHz	-155

OUTLINE DRAWING



Typical Weight = 55 lbs (24.95 kg)

PRIME POWER

100 to 260 VAC
47 to 63 Hz, Single Phase
1550 VA (maximum)
0.95 Minimum Prime Power Factor

CE

ENVIRONMENT

NONOPERATING TEMPERATURE RANGE	-50°C to +70°C
OPERATING TEMPERATURE RANGE	-40°C to +60°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	Constant Power
	Min/Max Power Alarm/Fault	Gain
	Reflected Power Alarm/Fault	Fault Reset
	Heater Standby ON/OFF	Units (Watts, dBm, dBW)
REMOTE STATUS	Power Out	Reflected Power
	Helix Current	Helix Voltage
	Heater Hours	Beam Hours
	Attenuator Setting	Units Selection
	TWT Temperature	Faults: High VSWR High Voltage Helix Current TWT Temperature Arc Detection
FORM C DRY CONTACT CLOSURE	Summary Fault	
COMPUTER SERIAL PORT	Hardware Interface: RS-232 & RS-422/485	Xicom Command Set: ASCII Commands
RF MONITOR PORT	-40 dB Coupling Value (nominal)	

OPTIONS

- Remote External Controller
- 1:1, 1:2, 1:N Redundancy
- Integrated Linearizer
- Input Diplexer
  (combining IF & 10 MHz reference)
- Reverse RF Input
- Ethernet Connector

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