2500 Watt X-Band Rack Mount High Power Amplifier

FEATURES

- *Compact 11RU size*
- *High efficiency*
- *Menu driven front panel display and control*
- *Power factor correction*
- *Optional integrated linearizer*
- *Redudnant system mounts in single rack*

XTRD-2500X digital rack mount amplifier is designed for uplink applications. This high efficiency traveling wave tube amplifier includes RF gain control, a solid state pre-amplifier, RF filters, cooling, and monitor & control (M&C) systems. An integrated X-Band linearizer option is available. The dual drawer amplifier conserves rack space and occupies only 19.25 inches (11 rack units) of a standard 19 inch rack cabinet. A complete 1:1 or 1:2 redundant TWTA system, including a redundant controller, can be mounted in a single rack.

The unit features a menu driven front panel display and RS-232 & RS-422/RS-485 serial port interfaces for complete remote control

Gain Control is set by the front panel manual control or by computer commands sent via the remote interfaces. The unit incorporates high efficiency multi-stage depressed collector TWTs. Reliability is enhanced because both prime power consumption and internal operating temperatures are reduced for the linear and saturated modes of operation.

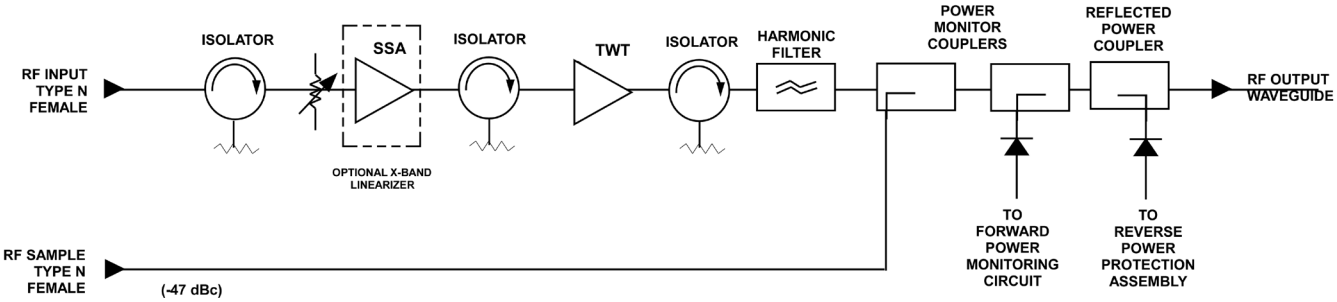
The high frequency resonant conversion power supply is highly efficient and allows for quick recovery from prime power outages. Depending upon user requirements the high power amplifier can be configured for single thread, redundant, or phase-combined operation.

COMTECH
XICOM TECHNOLOGY
3550 Bassett Street • Santa Clara • CA 95054 • Tel: (408) 213-3000 • Fax: (408) 213-3001
www.xicomtech.com • email sales@xicomtech.com

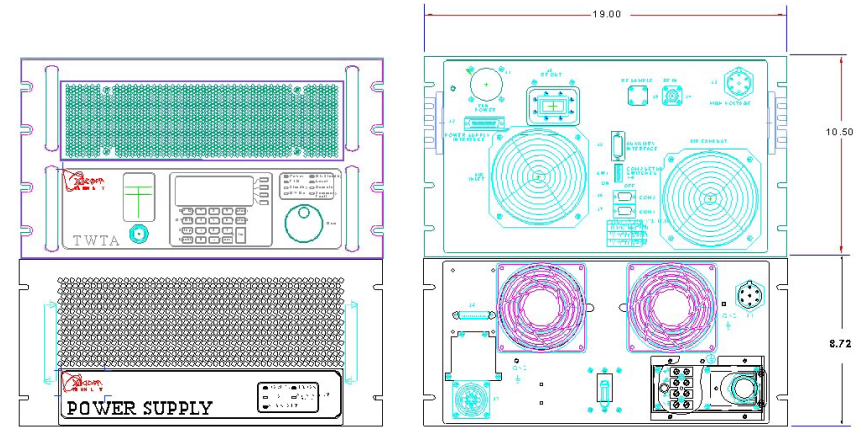
PERFORMANCE SPECIFICATION

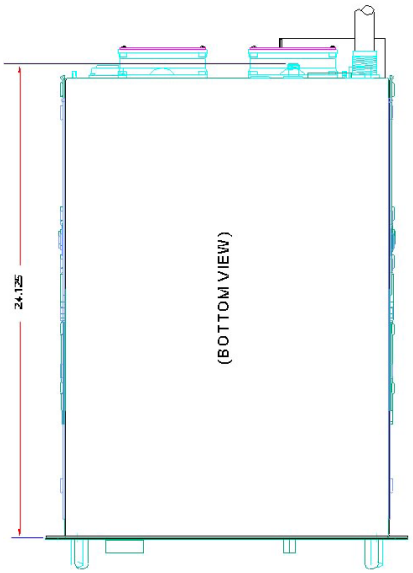
Parameters	XTRD-2500X
FREQUENCY RANGE	7.90 to 8.40 GHz
OUTPUT POWER	
Traveling Wave Tube	2500 W
Rated Power @ Amplifier Flange (minimum)	2200 W
GAIN	
Large Signal (minimum)	75 dB
Small Signal (minimum)	78 dB
Attenuator Range (continuous)	25 dB
Maximum SSG Variation Over:	
Any Narrow Band	1.0 dB per 40 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	-23 dBc @ 7 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	-70 dBW/4 kHz 7.25 to 7.75 GHz
GROUP DELAY (maximum)	
Bandwidth	Any 40 MHz
Linear	0.01 nS/MHz
Parabolic	0.005 nS/MH^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 -47 dBc
VSWR	
Input (maximum)	1.3:1
Output (maximum)	1.3:1

BLOCK DIAGRAM



OUTLINE DRAWING





Typical Weight

RF Drawer
37 kg (81.4 lbs)
Power Supply Drawer
43 kg (94.6 lbs)
Waveguide
X-band: CPR-112

PRIME POWER

208 VAC ± 10% Three Phase, 4 Wire, 47 to 63 Hz
8000 VA (maximum)
0.95 Minimum Prime Power Factor

CE

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 270 CFM (typical)

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
		Units Selection	Attenuator Setting
		Heater Hours	Faults: High VSWR High Voltage Helix Current TWT Temperature Arc Detection
	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	-47 dB Nominal	

OPTIONS

- 220/380 VAC ± 10% Three Phase, 5 Wire, 47 to 63 Hz
- 240/415 VAC ± 10% Three Phase, 5 Wire, 47 to 63 Hz
- 1:1, 1:2, 1:N Redundancy
- Variable Phase Combined
- Integrated Linearizer
- Block Upconverter

Headquarters

Comtech Xicom Technology, Inc.
3550 Bassett Street
Santa Clara, CA 95054
USA

Phone: +1-408-213-3000
Fax: +1-408-213-3001

email: sales@xicomtech.com
Web: www.xicomtech.com

Europe Sales Office

Comtech Xicom Technology Europe, LTD
4 Portland Business Center
Manor House Lane
Datchet
Berkshire SL3 9EG
United Kingdom

Phone: +011 44 (0) 1753 549 999
Fax: +011 44 (0) 1753 549 997

email: sales@xicomeurope.com
Web: www.xicomtech.com

Asia Sales Office

Comtech Xicom Technology
150 Cecil Street
#08-02
Singapore 069543

Phone: +011 65 6325 1953
Fax: +011 65 6325 1950

email: asiasales@xicomtech.com
Web: www.xicomtech.com

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