

# 150, 175, and 250 Watt Ka-Band Rack Mount High Power Amplifiers



## FEATURES

- *Extended Ka-Band frequencies between 26.5 and 31.0 GHz*
- *Power factor correction*
- *Digital display and control interface*
- *High efficiency*

The **XTRD-150Ka**, **XTRD-175Ka**, **XTRD-250Ka** and **XTRD-250KaHE** series are highly efficient rack mountable traveling wave tube amplifiers (TWTAs) designed for fixed and mobile uplink applications. The unit includes RF gain control, a solid-state pre-amplifier, RF filters, cooling, and monitoring and control (M&C) systems. Rack space is conserved because the amplifier occupies only 3 rack units (5¼ inches) or a standard 19-inch rack cabinet. Nominal weight is 58 pounds.

The unit features a menu-driven front panel display and 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. Power factor correction circuitry is also included, which minimizes line-current distortion and reduces the required Volt-Amps input.

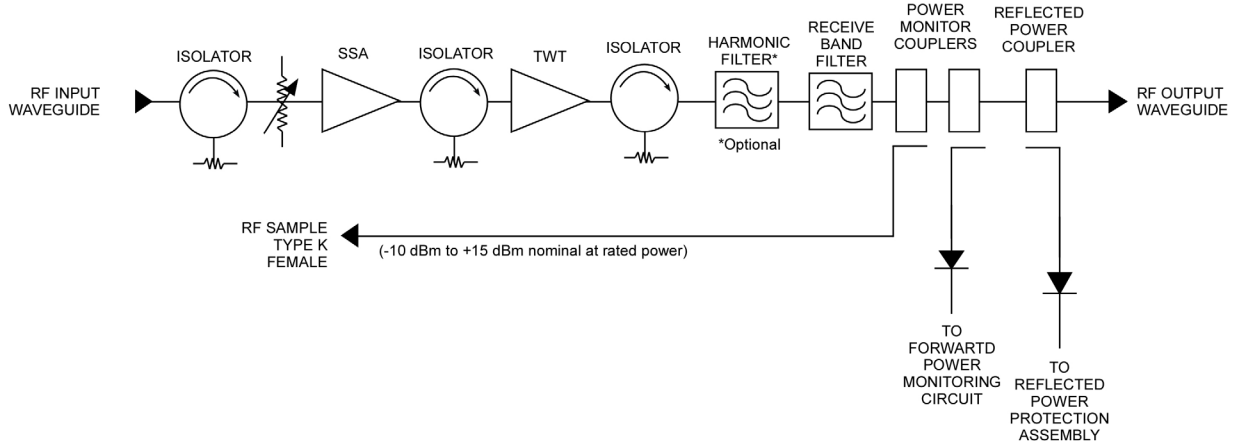
The automatic features of the high-frequency resonant-conversion power supply include quick recovery from prime power outages and multiple helix-fault resets (three fault cycles). Depending on user requirements, these amplifiers can be configured for either single-thread or redundant system operation.



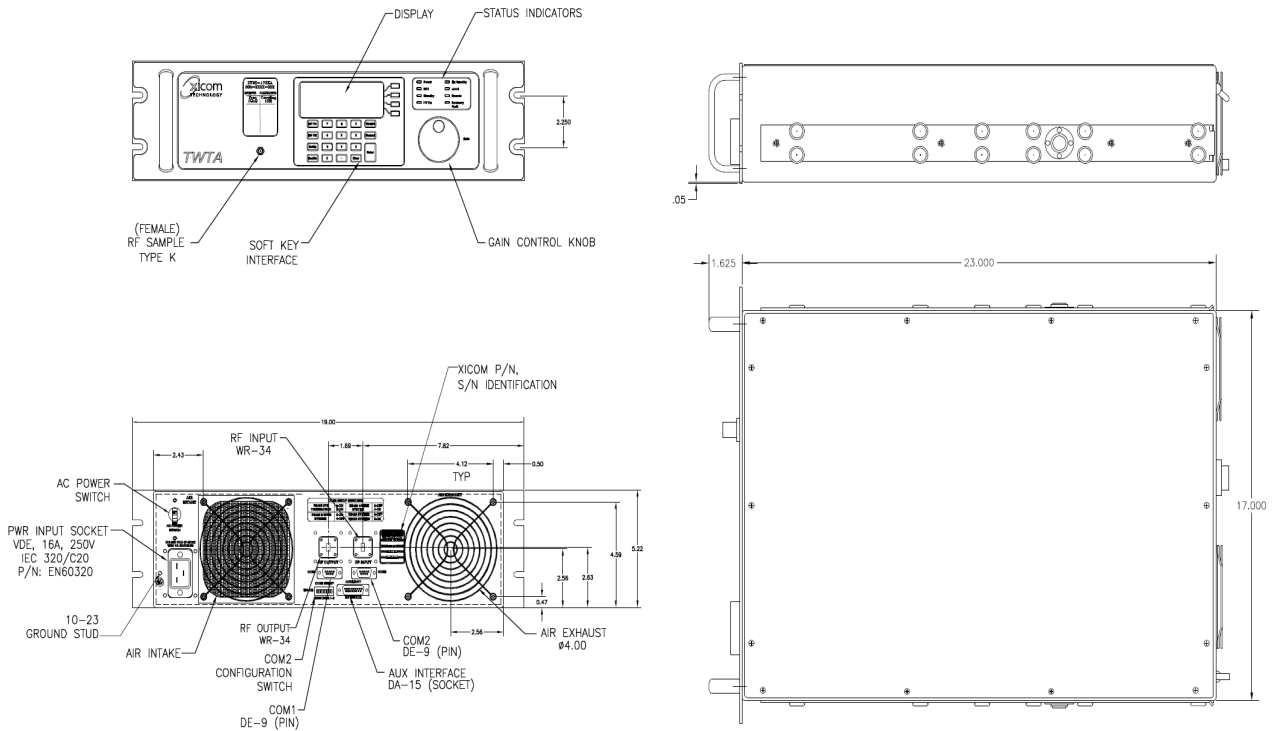
# PERFORMANCE SPECIFICATION

Parameters	XTRD-150Ka	XTRD-175Ka	XTRD-250Ka	XTRD-250KaHE
FREQUENCY RANGE (extended frequency coverage available)			28.0 to 30.0 GHz (26.5 to 31.0 GHz)	
OUTPUT POWER				
Traveling Wave Tube	150 W	175 W	250 W CW	250 W Peak
Rated Power @ Amplifier Flange (minimum)	125 W	150 W	220 W	100 W
GAIN				
Large Signal (minimum)			70 dB	
Small Signal (minimum)			75 dB	
Attenuator Range (continuous)			25 dB	
Maximum SSG Variation Over:				
Any Narrow Band			0.80 dB per 60 MHz	
Any 1 GHz 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 @ 50 W total output power at amplifier flange	-18 dBc	-19 dBc	-23 dBc	-23 dBc
HARMONIC OUTPUT (maximum)			-15 dBc (-60 dBc with optional filter)	
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 10.95 to 12.75 GHz	
GROUP DELAY (maximum)				
Bandwidth			Any 60 MHz	
Linear			0.01 nS/MHz	
Parabolic			0.005 nS/MH <sup>2</sup>	
Ripple			0.5 nS/Pk-Pk	
RESIDUAL AM NOISE (maximum)			-50 dBc to 10 kHz -20 (1.5 + logf) dBc 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



### DIMENSIONS

	Inches	Centimeters
W1	17.00	43.18
W2	19.00	48.26
L	23.00	58.42
H	5.219	13.26
Nominal Weight = 58 lbs. (26.31 kg)		

### RF OUTPUT

Ka-Band	WR-28
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## PRIME POWER

90 to 260 VAC  
47 to 63 Hz, Single Phase  
0.95 Minimum Prime Power Factor

XTRD-150Ka: 750 VA (maximum)  
XTRD-175Ka: 800 VA (maximum)  
XTRD-250KaHE: 800 VA (maximum)  
XTRD-250Ka: 850 VA (maximum)



## 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 250 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	
	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	-40 dB Nominal	

## OPTIONS

- Alternate Frequency Coverage
- 1:1, 1:2, 1:N Redundancy
- Phase Combined
- Linearizer
- WR-34 Waveguide Output or Input
- Harmonic Filter (0.3 dB output power reduction)

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