

650W Ka-Band Liquid-Cooled Antenna Mount High Power Amplifiers



FEATURES

- *650 watts Ka-band, peak power*
- *Commercial frequencies between 27.5 and 31.0 GHz*
- *Liquid-cooled for simpler hub installation*
- *Includes linearizer*
- *Complete RS-232/422/485 ethernet interface*
- *-40°C to +60°C ambient*

The **XTDL-650KaL** series are compact, self contained antenna mount power amplifiers designed for low cost installation and long life. The unit is liquid cooled instead of air-cooled, offering users ambient noise reduction, reduced heat load in hubs, and superior gain stability over temperature. Air conditioning in the hub is also simplified or eliminated.

The **XTDL-650KaL** family features high RF efficiency which enables a smaller, lighter amplifier with the ability to operate at up to 60 deg C ambient temperatures.

Comtech Xicom has developed proprietary features to improve performance and life including an automatic bias control system which extends TWT life by maintaining constant beam current over time and a precise system for matching linearizer performance to a specific tube over a wide range of operating conditions maximizing useable linear power.

Optional integrated block upconverters (BUC) are available. They can be ordered with an integral 10 MHz reference module for independent operation or with external 10 MHz input for phase lock to GPS or other system clocks.

The amplifier is equipped with an internal 1:1 switch control capable of driving an input and output switch for redundancy. Rack mountable controllers are also available.



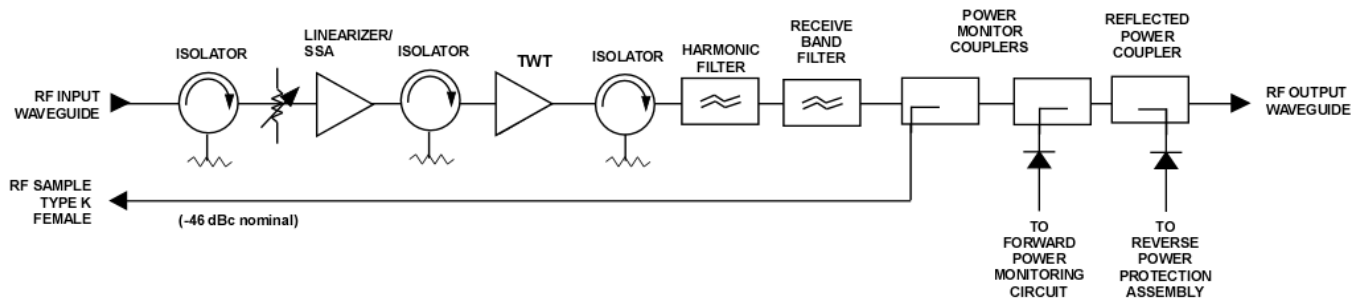
PERFORMANCE SPECIFICATION

Parameters

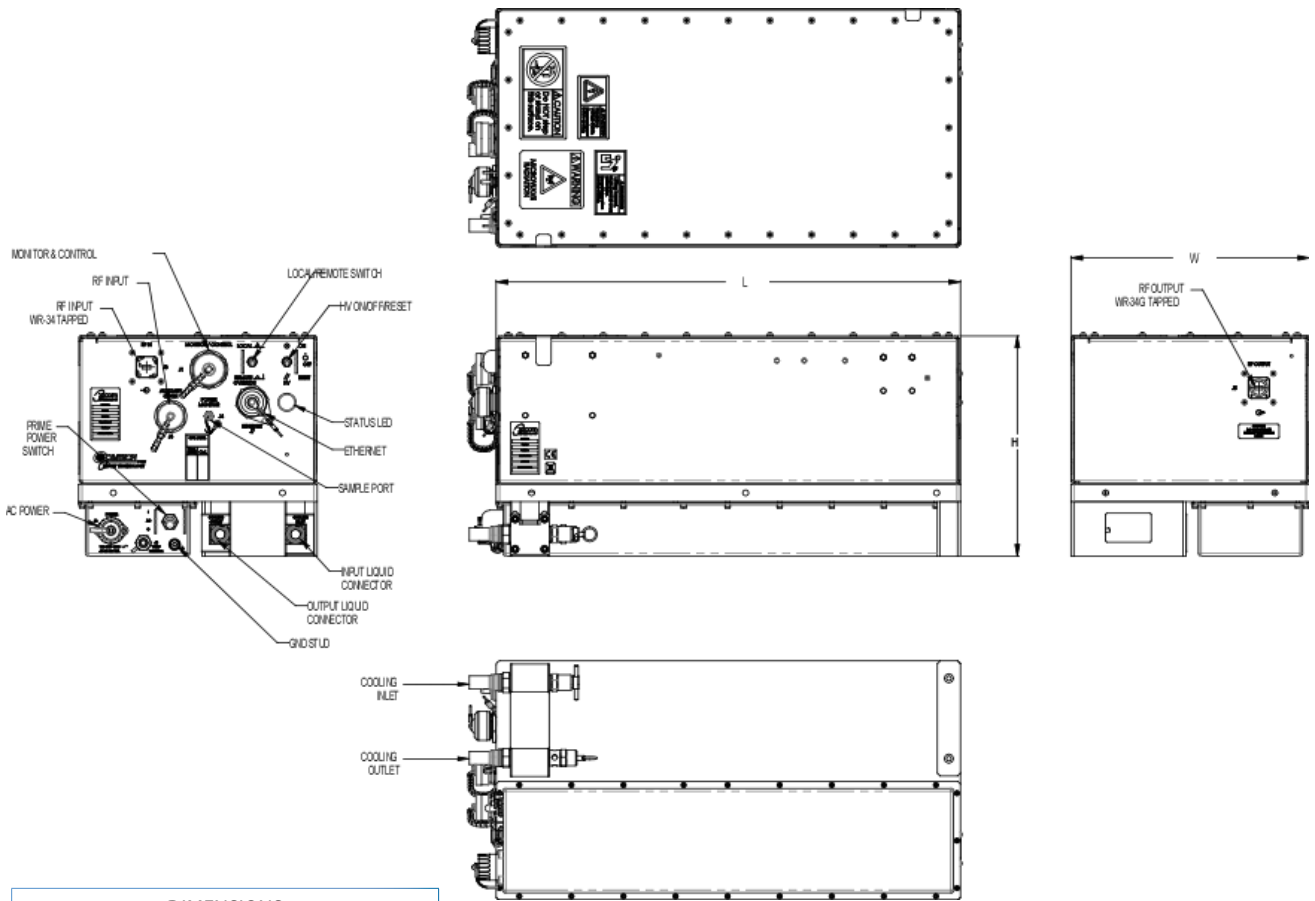
XTDL-650KaL

FREQUENCY RANGE	27.5 to 31.0 GHz	
OUTPUT POWER		
Traveling Wave Tube	650W (58.1 dBm)	
RF Output Limit (P_{LIMIT}) @ Flange	283W (54.52 dBm) to 333W (54.52 dBm) Optional: 346W (55.4 dBm) to 415W (56.2 dBm)	
Linear Power @ Amplifier Flange (P_{LIN})	215W (53.33 dBm)	
GAIN		
Large Signal (minimum)	70 dB	
Small Signal (minimum)	70 dB	
Attenuator range (0.1 dB steps)	30 dB	
Maximum SSG Variation Over		
Any Narrow Band	1.0 dB per 250 MHz	
Any 1 GHz Band (maximum)	2.5 dB	
Slope (maximum)	± 0.04 dB/MHz	
Stability, 24 hr. (maximum)	± 0.25 dB	
Stability, Temperature (maximum)	± 1.0 dB at any frequency	
INTERMODULATION (maximum) with two equal carriers	-25 dBc @ P_{LIN}	
NOISE POWER RATIO	-19 dBc @ P_{LIN}	
HARMONIC OUTPUT (maximum) with optional harmonic filter	-60 dBc	
AM/PM Conversion (maximum)	2 deg/dB @ P_{LIN}	
NOISE POWER DENSITY (maximum)		
Transmit Band	-70 dBW/4 kHz	
Receive Band (<21.2 GHz)	-150 dBW/4 kHz	
GROUP DELAY (maximum)		
Bandwidth	Any 250 MHz	
Linear	0.01 nS/MHz	
Parabolic	0.001 nS/MHz ²	
Ripple	0.25 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	
SPURIOUS (in band) Linear	-60 dBc	
PHASE NOISE (maximum)	10 Hz	-80 dBc
	100 Hz	-85 dBc
	1 kHz	-92 dBc
	10 kHz	-102 dBc
	100 kHz	-115 dBc
	1 MHz	-125 dBc
VSWR		
Input (maximum)	1.3:1	
Output (maximum)	1.3:1	

BLOCK DIAGRAM



OUTLINE DRAWING



DIMENSIONS		
	INCHES	CENTIMETERS
L	20.06	50.80
H	9.50	24.13
W	10.25	26.04
Typical Weight = 58 lb (26.31 kg)		

PRIME POWER

100 to 264 VAC
47 to 66 Hz, Single Phase
1800 VA Typical
0.95 Min. Prime Power Factor



ENVIRONMENT

NONOPERATING TEMPERATURE RANGE	-50°C to +70°C
OPERATING TEMPERATURE RANGE	-40°C to +60°C
HUMIDITY	Up to 100% Condensing
ALTITUDE	10,000 feet MSL maximum with standard adiabatic derating
SHOCK AND VIBRATION	Normal Transportation
COOLING	Liquid Cooled

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	
REMOTE CONTROL	HV ON/OFF	RF Inhibit (HV OFF)
	RF Attenuation	Fault Reset
	Heater Standby	Constant Power
REMOTE STATUS	HV ON	Heater/Beam Hours
	RF Output Power	Fault Identification
	Reflected Power	TWT Temperature
	Filament Time Delay	Helix Current
	Helix Voltage	
DISCRETE STATUS	Summary Fault (2X Form C Dry Contact Closure)	
RF MONITOR PORT	-50 dB Coupling Value (nominal)	
INTERFACE	Serial 232/422/485 Ethernet	

OPTIONS

- WR-28 Waveguide
- Alternate Frequency Coverage (27.5 to 30 GHz, 30 to 31 GHz)
- Remote External Controller
- 1:1, 1:2, 1:N Redundancy
- Phase Combined
- L-Band Block Upconverter
- Nonlinearized

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