250 Watt Ka-Band Antenna Mount High Power Amplifiers



FEATURES

- Compact 48 lb. antenna mount package
- Variable gain control
- Complete RS-232/422/ 485 interface
- Ethernet interface
- Linearizer

The **XTD-250Ka** series are compact, self contained antenna mount power amplifiers designed for low cost installation and long life. Cooling and monitor & control systems are all self contained within the amplifier. By combining the power supply and the RF components within the same amplifier case the need for external high voltage cables (required for split box designs) is eliminated. This highly compact unit typically weighs only 48 lbs.

The amplifiers are available with multiple options including redundant and phase combined system configurations, integral linearizers and harmonic filters. Remote external controllers are available to operate the HPA from a user selected location.





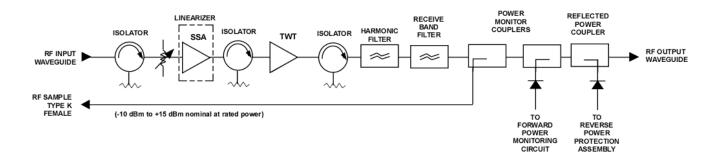
PERFORMANCE SPECIFICATION

| (alternate sub-bands in the 27.0 to 31.0 GHz band available) OUTPUT POWER Traveling Wave Tube (Saturated Power (typicall)) 250W Peak (S4 dBm) 250 W (S4 dBm) Rated Power @ Amplifier Flange (minimum) (P _{extern}) 100 W (S0 dBm) 215 W (S3.3 dBm) GAIN 70 dB Small Signal (minimum) 70 dB Small Signal (minimum) 70 dB Small Signal (wilnimum) 70 dB Attenuator Range (continuous) 30 dB Maximum SSG Variation Over 30 dB Stability, 24 hr. (maximum) ± 0.25 dB Stape (maximum) ± 0.25 dB Stape (maximum) ± 0.25 dB Stability, 24 hr. (maximum) ± 0.25 dB Stability, 24 hr. (maximum) -26 dBc @ P _{our} = 85W Stability, 24 hr. (maximum) -26 dBc @ P _{our} = 85W Stability, 24 hr. (maximum) -26 dBc @ P _{our} = 85W Stability, 24 hr. (maximum) -26 dBc @ P _{our} = 85W Stability, 24 hr. (maximum) -26 dBc @ P _{our} = 85W Stability, 24 hr. (maximum) -26 dBc @ P _{our} = 85W Stability, 24 hr. (maximum) -26 dBc @ P _{our} = 85W Stability, 24 hr. (maximum) -26 dBc @ Q out = 85 W Stability, 24 hr. (maximum) -26 dBc @ Q out = 85 W Stability, 24 hr. (maximum) -26 dBc @ Q out = 85 W Stability, 24 hr. (maximum) -26 dBc @ Q out = 85 W Stability, 24 hr. (maximum)< | Parameters | XTD-250KaL | XTD-250Ka | |
|--|--|---------------------------------------|------------------|--|
| OUTPUT POWER 250W Peak (54 dBm) 250 W (54 dBm) Taveling Wave Tube (Saturated Power (typical)) 250W (50 dBm) 215 W (53.3 dBm) GAIN 300 W (50 dBm) 215 W (53.3 dBm) Large Signal (minimum) 70 dB 57 mall Signal (minimum) 75 dB Small Signal w/Linearizer Option (minimum) 70 dB 30 dB 30 dB Maximum SGG Variation Over 30 dB 41 tenuator Range (continuous) 30 dB 41 tenuator Range (continuous) 30 dB 55 dB < | FREQUENCY RANGE | | | |
| Rated Power @ Amplifier Flange (minimum) (P gett) 100 W (50 dBm) 215 W (53.3 dBm) GAIN 70 dB Small Signal (minimum) 70 dB Small Signal (minimum) 70 dB Small Signal (wilnimum) 70 dB Matimum SSG Variation Over 30 dB Artenuator Range (continuous) 30 dB Maximum SSG Variation Over 40.04 dB/MHz Any Narrow Band 0.80 dB per 60 MHz Any Narrow Band 2.5 dB Slope (maximum) ± 0.25 dB Stability, 24 hr. (maximum) ± 0.25 dB Stability, 24 hr. (maximum) ± 0.26 dBc @ P _{out} = 85W With 2 equal carriers ± 1.10 dB at any frequency INTERMODULATION (maximum) -26 dBc @ P _{out} = 85W NOISE POWER (maximum) -60 dBc ARM/ONIC OUTPUT (maximum) -70 dBW/4 kHz Receive Band (<21.2 GHz) -70 dBW/4 kHz Receive Band (<21.2 GHz) -50 dBc to 10 kHz Bandwidth Any 60 MHz Linear 0.01 n5/MHz Parabolic 0.0305 n5/MHz² Ripple 0.50 dBc to 10 kHz | OUTPUT POWER | | | |
| GAIN 70 dB Large Signal (minimum) 70 dB Small Signal (minimum) 75 dB Small Signal (winimum) 70 dB Attenuator Range (continuous) 30 dB Maximum SSG Variation Over 30 dB 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, 24 hr. (maximum) ± 0.26 dBc @ P _{our} = 85W With 2 equal carriers ± 1.0 dB at any frequency INTERMODULATION (maximum) -26 dBc @ P _{our} = 85W NOISE POWER (maximum) -60 dBc AMV/PM CONVERSION (maximum) -70 dBW/4 kHz Receive Band (<21.2 GHz) | Traveling Wave Tube (Saturated Power (typical)) | 250W Peak (54 dBm) | 250 W (54 dBm) | |
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| Any 1 GHz Band2.5 dBSlope (maximum)± 0.04 dB/MHzStability, 24 hr. (maximum)± 0.25 dBStability, Temperature± 1.0 dB at any frequencyINTERMODULATION (maximum)-26 dBc @ P _{our} = 85WWith 2 equal carriers-26 dBc @ P _{our} = 85WHARMONIC OUTPUT (maximum)-60 dBcAM/PM CONVERSION (maximum) @ P _{our} = 55W< 1.0 deg/dB at P _o = 55 WNOISE POWER (maximum)-60 dBcTransmit Band (27.5 to 30.0 GHz)-70 dBW/4 kHzReceive Band (<21.2 GHz) | Maximum SSG Variation Over | | | |
| Jore± 0.04 dB/MHzStability, 24 hr. (maximum)± 0.25 dBStability, 7emperature± 1.0 dB at any frequencyINTERMODULATION (maximum)-26 dBc @ Pour = 85WWith 2 equal carriers-26 dBc @ Pour = 85WHARMONIC OUTPUT (maximum)-60 dBcAM/PM CONVERSION (maximum) @ Pour = 55W< 1.0 deg/dB at Po = 55 W | Any Narrow Band | 0.80 dB per 60 MHz | | |
| Stability, 24 hr. (maximum)± 0.25 dBStability, Temperature± 1.0 dB at any frequencyINTERNODULATION (maximum)-26 dBc @ P _{out} = 85Wwith 2 equal carriers-26 dBc @ P _{out} = 85WHARMONIC OUTPUT (maximum)-60 dBcAM/PM CONVERSION (maximum) @ P _{out} = 55W<1.0 deg/dB at P _o = 55 WNOISE POWER (maximum)-70 dBW/4 kHzReceive Band (27.5 to 30.0 GHz)-70 dBW/4 kHzReceive Band (<21.2 GHz) | Any 1 GHz Band | 2.5 dB | | |
| Stability, Temperature± 1.0 dB at any frequencyINTERMODULATION (maximum) with 2 equal carriers-26 dBc @ P _{our} = 85WHARMONIC OUTPUT (maximum)-60 dBcAM/PM CONVERSION (maximum) @ P _{our} = 55W< 1.0 deg/dB at P _o = 55 WNOISE POWER (maximum)-70 dBW/4 kHzReceive Band (<21.2 GHz) | Slope (maximum) | ± 0.04 dB/MHz | | |
| INTERMODULATION (maximum) with 2 equal carriers-26 dBc @ P_out = 85WHARMONIC OUTPUT (maximum)-60 dBcAM/PM CONVERSION (maximum) @ P_out = 55W<1.0 deg/dB at P_o = 55 W | Stability, 24 hr. (maximum) | ± 0.25 dB | | |
| with 2 equal carriers-60 dBcHARMONIC OUTPUT (maximum) @ P_OUT = 55W<1.0 deg/dB at P_0 = 55 W | Stability, Temperature | \pm 1.0 dB at any frequency | | |
| AM/PM CONVERSION (maximum) @ P _{our} = 55W <1.0 deg/dB at P _o = 55 W NOISE POWER (maximum) Transmit Band (27.5 to 30.0 GHz) -70 dBW/4 kHz Receive Band (<21.2 GHz) -150 dBW/4 kHz GROUP DELAY (maximum) Bandwidth Any 60 MHz Linear 0.01 n5/MHz Parabolic 0.005 nS/MHz 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 | INTERMODULATION (maximum) with 2 equal carriers | -26 dBc @ P _{out} = 85W | | |
| NOISE POWER (maximum) Transmit Band (27.5 to 30.0 GHz) Arceive Band (<21.2 GHz) GROUP DELAY (maximum) Bandwidth Linear Parabolic Noise (maximum) Any 60 MHz 0.01 nS/MHz 0.01 nS/MHz 0.005 nS/MHz ² 0.005 nS/MHz ² 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 -85 dBc above 500 kHz 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 | HARMONIC OUTPUT (maximum) | -60 dBc | | |
| Transmit Band (27.5 to 30.0 GHz)-70 dBW/4 kHzReceive Band (<21.2 GHz) | AM/PM CONVERSION (maximum) @ P _{out} = 55W | < 1.0 deg/dB at P _o = 55 W | | |
| Receive Band (<21.2 GHz)-150 dBW/4 kHzGROUP DELAY (maximum)Any 60 MHzBandwidthAny 60 MHzLinear0.01 nS/MHzParabolic0.005 nS/MHz²Ripple0.5 nS/Pk-PkRESIDUAL AM NOISE (maximum)-50 dBc to 10 kHz -20 (1.5 + logf) dBc 10 to 500 kHz -85 dBc above 500 kHzPHASE NOISE (maximum)12 dB below IESS phase noise profile AC fundamental -50 dBc Sum of all spurs -47 dBcVSWRInput (maximum)1.3:1 | NOISE POWER (maximum) | | | |
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| Ripple 0.5 nS/Pk-Pk RESIDUAL AM NOISE (maximum) -50 dBc to 10 kHz -20 (1.5 + logf) dBc 10 to 500 kHz -20 (1.5 + logf) dBc 10 to 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 | Linear | 0.01 nS | /MHz | |
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| -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 | Ripple | 0.5 nS/Pk-Pk | | |
| AC fundamental -50 dBc Sum of all spurs -47 dBc VSWR Input (maximum) 1.3:1 | RESIDUAL AM NOISE (maximum) | -20 (1.5 + logf) dl | 3c 10 to 500 kHz | |
| Input (maximum) 1.3:1 | PHASE NOISE (maximum) | AC fundame | ntal -50 dBc | |
| | VSWR | · · · · · · · · · · · · · · · · · · · | | |
| Output (maximum) 1.3:1 | Input (maximum) | 1.3 | :1 | |
| | Output (maximum) | 1.3:1 | | |

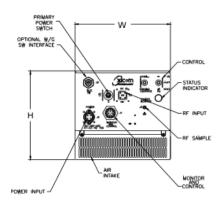


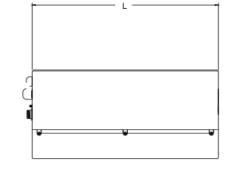
XTD-250Ka

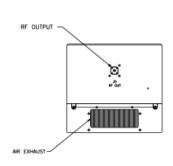
BLOCK DIAGRAM



OUTLINE DRAWING







RF OUTPUT = WR-28 TAPPED



| DIMENSIONS | | |
|-----------------------------------|-------|-------|
| INCHES CENTIMETERS | | |
| W | 10.25 | 26.04 |
| L | 20.00 | 50.80 |
| н | 9.50 | 24.13 |
| Nominal Weight = 48 lb (21.77 kg) | | |



XTD-250Ka

PRIME POWER

90 to 264 VAC 47 to 63 Hz, Single Phase 750 VA Max. — XTD-250KaL 800VA Max. — XTD-250Ka 0.95 Minimum Prime Power Factor

ENVIRONMENT

NONOPERATING TEMPERATURE RANGE OPERATING TEMPERATURE RANGE

HUMIDITY ALTITUDE SHOCK AND VIBRATION COOLING -50°C to +70°C -40°C to +60°C (2°C/1000 Feet Derating) Up to 100% Condensing 10,000 Feet MSL Max. Normal Transportation Forced Air

INTERFACE

| Туре | 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 | RF Inhibit (HV OFF) |
| | RF Attenuation (w/preamp) | Fault Reset |
| | Heater Standby | |
| REMOTE STATUS | HV ON | Heater/Beam Hours |
| | RF Output Power | Fault Identification |
| | Reflected Power | TWT Temperature |
| | Filament Time Delay | Helix Current |
| | Helix Voltage | |
| FORM C DRY CONTACT CLOSURE | Summary Fault | |
| RF MONITOR PORT | -40 dB Coupling Value (approx.) | |

OPTIONS

- Non-Linearized
- WR-34 Waveguide Output or Input
- Remote External Controller
- 1:1, 1:2, 1:N Redundancy
- Phase Combined
- Block Upconverter
- Liquid Cooling





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Note: Technical specifications are subject to change without notice. Please contact Xicom Technology before using this information for system design.