X-Band

2.5 kW Modular SuperLinear® TWTA

Compact

Provides 2500 watts of equivalent linear power (1110 watts operating) in a modular, nine rack-unit package, digital ready, for wideband, single- and multi-carrier satellite service in the 7.9 – 8.4 GHz frequency band. Designed to operate at up to 1260 watts CW power for multi-carrier uplinks. Ideal for transportable and fixed earth station applications where space and prime power are at a premium. 30% smaller than traditional HPAs.

Efficient and Reliable

CPI SuperLinear® TWTAs are among the most power efficient in the industry. This amplifier is optimized for maximum efficiency at linear output operating levels.

Simple to Operate

User-friendly microprocessor-controlled logic with integrated computer interface, digital metering, pin diode attenuation, optional integrated linearizer for improved intermodulation performance, and BUC option for use with L-band modems.

Easy to Maintain

User-friendly event monitor and help screens. Completely independent and pre-calibrated modules can be field-replaced with minimal training. Built-in fault diagnostic capability with convenient and clearly visible indicators.

Meets Global Requirements

Meets International Safety Standard EN-60215, Electromagnetic Compatibility 2014/30/EU and Harmonic Standard EN-61000-3-2 to satisfy worldwide requirements. CE Marked.

Worldwide Support

Backed by over three decades of satellite communications experience, and CPI's worldwide 24-hour customer support network that includes more than 20 regional factory service centers.

Model TL25XK

2500 watt X-band modular SuperLinear® TWTA for **satellite uplink** applications

OPTIONS

- Remote control panel
- Redundant and power combined sub-systems
- Integrated 1:1 switch control and drive
- L-band block upconverter (BUC) - contact CPI for specifications
- Integral linearizer
- External receive band reject filter
- Ethernet interface

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Specification	Model TL25XK
Output Frequency	7.9 to 8.4 GHz
Output Power (min.) TWT Peak Power Flange Peak Power Guaranteed CW Power at Flange Maximum CW Power at Flange	 2500 W (63.98 dBm) min. 2220 W (63.45 dBm) min. 1110 W (60.45 dBm) min. 1395 W (61.45 dBm) max.
Note on Output Power	This amplifier guarantees 1110 W of CW power at the flange. The peak power specifications are provided so that desired backoff may be more easily calculated.
Gain	75 dB min. at rated output power; 78 dB min. at small signal
RF Level Adjust Range	0 to 30 dB (via PIN diode attenuator) typ, 0.1 dB steps
Gain Stability Over temp, constant drive	±0.25 dB/24 hour max,max. at constant drive and temperature, after 30 minute warmup ±1.0 dB typ. over operating temperature range
Small Signal Gain Slope	±0.02 dB/MHz max.
Small Signal Gain Variation	0.5 dB pk-pk max. across any 40 MHz; 3.0 dB pk-pk max. across the 500 MHz band (4.0 dB pk-pk with optional linearizer);
Input/Output VSWR	1.3:1 max.
Load VSWR	2.0:1 continuous output; 1.5:1 for full spec. compliance; any value operation without damage
Phase Noise	10 dB below IESS-308/309 phase noise profile; -50 dBc AC fundamentals related; -47 dBc sum of spurs; Prime power AC line unbalance not to exceed 3%. Excess imbalance may cause an increase in residual RF noise (AM, FM and PM). Phase noise increase is typically 2.5 dB/% imbalance.
AM/PM Conversion	6.0°/dB max; with optional linearizer, can be tuned to 2.0°/dB max.
Harmonic Outputs	-60 dBc
Noise Density	<-130 dBW/4 kHz from 3.4 to 4.2 GHz; <-70 dBW/4 kHz from 4.2 to 12 GHz (<-65 dBW/4 kHz passband with linearizer option); -110 dBW/4 kHz from 12.0 to 40.0 GHz
Intermodulation - with respect to the sum of 2 equal carriers 5 MHz apart	-25 dBc max. at rated power (1110 W) with optional linearizer; -25 dBc max. at output level of 400 W output power without linearizer
Group Delay	0.02 ns/MHz linear max; 0.002 ns/MHz^2 parabolic max; 0.5 ns pk-pk ripple max.
Primary Power	Voltage: Three phase with neutral and ground, 200 to 240 VAC ±10% with or without neutral; OR 380/415 VAC ±10%; Frequency: 47-63 Hz five wire; AC current harmonic content: less than 20%, primarily fifth and seventh harmonics. Harmonics must be considered when choosing UPS sources.
Power Consumption	5.5 kW max; 4.9 kW typ. at 1000 W output power; 4.2 kW typ. at 800 W output power 3.3 kW typ. at 200 W output power 2.8 kW typ. at 100 W output power
Power Factor	0.90 min; 0.95 typ.
Ambient Temperature	0°C to +50°C operating; -54°C to +71°C non-operating
Relative Humidity	95% non-condensing
Altitude	10,000 ft. with standard adiabatic derating of 2°C/1000 ft. operating; 50,000 ft. non-operating
Shock and Vibration	Designed and tested for MIL-STD-167-1A. Designed to withstand 20g at 11 ms (1/2 sine pulse) in non-operating condition
Cooling	Forced air with integral blower. Maximum external pressure loss allowable: 0.25 inch water gauge.
Connections	RF Input: Type N Female; RF output: CPR-112 waveguide flange, grooved, threaded, UNC 2B 8-32; RF output monitor: Type N Female
M&C Interface	RS-232 and RS-422/485 (4-wire) (Ethernet optional)
Weight and Dimensions	165 lbs (74.8 kg) max. / 19 W x 15.75 H x 24 D inches (483 W x 400 H x 610 D mm)

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