CPI 2.5 kW SuperLinear® TWT Amplifier

X-Band

Built for Satellite Communications Uplink Applications

Provides 2500 watts of equivalent linear power (1110 watts operating) in a compact, nine rack-unit package, digital ready, for wideband, single- and multi-carrier satellite service in the X-band. Designed to operate at up to 1250 watts CW power for multi-carrier uplinks.

Cost Effective and Efficient

The CPI 2500 W X-band SuperLinear TWTA is one of the industry's most power-efficient amplifiers, optimized for maximum performance at linear output operating levels. Ideal for transportable and fixed earth stations where space and prime power are limited.

Simple to Operate

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

Easy to Maintain

Its modular design includes built-in fault diagnostic capabilities, with convenient and clearly visible indicators for easy maintainability in the field.

CPI 2500 W X-band SuperLinear TWTA, Model TL25XI

OPTIONS

- Remote control panel
- Serial interface
- Integral 1:1 switch control and drive
- Redundant and hybrid power combined systems
- Integral block upconverter (BUC): Contact CPI for specifications.
- External receive band reject filter
- LifeExtender/LifePredictor technology to significantly extend TWT lifespan

FEATURES

- Integral linearizer
- Ethernet interface

Quality Management System - ISO 9001:2015

CE

Meets Global Requirements

The amplifier 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

CPI satcom amplifiers are backed by over 40 years of satellite communications experience, and CPI's global customer support network, including regional service centers located worldwide.

Specification	CPI Model TL25XI, 2.5 kW SuperLinear X-Band TWTA
Output Frequency	7.9 to 8.4 GHz
Output Power (min.) TWT Peak Power Flange Peak Power CW Power at Flange Max. 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	0.035 dB/MHz max.
Small Signal Gain Variation	0.5 dB pk-pk max. across any 40 MHz; 4.0 dB pk-pk max. across the 500 MHz band
Input/Output VSWR	1.25:1 max.
Load VSWR	1.5:1 for full spec. compliance; 2.0:1 max. continuous; 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	2.0º/dB max
Harmonic Outputs	-65 dBc max. (RF); -60 dBc max. (IF)
Noise Density	<-130 dBW/4 kHz from 3.4 to 4.2 GHz; <-60 dBW/4 kHz from 4.2 to 12 GHz; -110 dBW/4 kHz from 12.0 to 40.0 GHz
Intermodulation - with respect to the sum of two 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	0.01 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, 208 VAC ±10% with or without neutral OR 380 to 415 VAC; Frequency: 47-63 Hz ±10% 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	0.95 min; 0.99 typ.
Ambient Temperature	0ºC to +50ºC operating; -54ºC to +71ºC non-operating
Relative Humidity	95% non-condensing
Altitude	10,000 ft. with standard adiabatic derating of 2ºC/1000 ft. operating; 50,000 ft. non-operating
Shock and Vibration	Designed for normal transportation environment per Section 514.4 MIL-STD-810E. 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	RJ45 Ethernet, includes embedded GUI control; RS422/485 serial interface
Weight and Dimensions	155 lbs (70.5 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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