

For Satellite Communications Uplink Applications

Provides 2250 watts of peak power (1000 watts operating) in a compact nine rack-unit package, digital ready, for wideband, single- and multi-carrier satellite service in C-band to 6.725 GHz.

Cost Effective and Efficient

30% smaller than traditional HPAs and 50% more efficient than GaN SSPAs. Employs a high efficiency dual-depressed collector helix traveling wave tube backed by many years of field-proven experience in airborne and military applications. The collector design is optimized for cool operation and the HPA provides 890 of linear output power at the flange.

Reliable

SuperLinear HPAs are more reliable because they operate at lower temperatures. CAN-Bus architecture improves reliability and noise immunity. Optional LifeExtender™ significantly increases TWT lifetime.

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 C-band modems.

Easy to Maintain

Modular design and built-in fault diagnostic capability with convenient and clearly visible indicators for easy maintainability in the field.



CPI 2250 W C-band SuperLinear TWT Amplifier, Model TL22CI

OPTIONS:

- Remote control panel
- Redundant and hybrid power combined systems
- Integrated 1:1 switch control and drive
- Integral linearizer
- Integral block upconverter (BUC) - see CPI document TD-140 for specifications.
- TWT LifeExtender/LifePredictor significantly extends TWT life
- Ethernet interface
- External Receive band reject filter

Quality Management System - ISO 9001:2015



Meets Global Requirements

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

Worldwide Support

Backed by over 40 years of satellite communications experience, and CPI's worldwide 24-hour customer support network that includes more than 20 regional factory service centers.

Specification	CPI Model TL22CI, 2.25 kW peak C-Band Rack-Mount TWTA	
Output Frequency	5.850 to 6.65 GHz, 5.725 to 6.525 GHz, or 5.725 to 6.725 GHz	5.850 - 6.725 GHz
Output Power (min.) TWT Peak Power Flange Peak Power CW Power at Flange (min.) Max. CW Power at Flange	2250 W (63.54 dBm) min. 2000 W (63.00 dBm) min. 1000 W (60.00 dBm) min. 1120 W (60.50 dBm) max.	
Note on Output Power	<i>This amplifier guarantees 1000 W of CW power at the flange. The peak power specifications are provided so that desired backoff may be more easily calculated</i>	
Gain	75 dB min. at rated 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. over any 40 MHz; 3.0 dB pk-pk max. across passband (4.0 dB pk-pk max. across passband with optional linearizer)	
Input/Output VSWR	1.25:1 max. / 1.25:1 max.	
Load VSWR	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°/dB max; 2°/dB max. with linearizer (2.5°/dB max. with linearizer for 5.85 to 6.725 GHz unit)	
Harmonic Outputs	-60 dBc max.	
Noise Density	<-65 dBW/4 kHz in passband (<-60 dBW/4 kHz in passband with linearizer option)	
Intermodulation - with respect to each of two equal carriers 5 MHz apart	-23.5 dBc max, 5.850 – 6.425 GHz at 400 W output power without linearizer (-25 dBc max. @890 W with linearizer); -22 dBc max., 6.425 – 6.650 GHz (or to 6.725 GHz) at 400 W output power without linearizer (-24 dBc max. 890 W with linearizer)	-23.5 dBc max, 5.725 – 6.725 GHz at 400 W output power without linearizer (-25 dBc max. @ 890 W with linearizer); -20 dBc max., 6.425 – 6.725 GHz at 400 W output power without linearizer (-23 dBc max. at 890 W with linearizer)
Group Delay	0.01 ns/MHz linear max; 0.001 ns/MHz ² parabolic max; 0.5 ns pk-pk ripple max.	
Primary Power	All ratings are ±10%, 47-63 Hz, 5-wire, 3-phase with neutral and ground: 200 to 240 VAC (with or w/o neutral), or 380 to 415 VAC. AC current harmonic content: less than 20%, primarily fifth and seventh harmonics. Harmonics must be considered when choosing UPS sources.	
Power Consumption	5.5 kVA max; 4.5 KVA typ. at 1000 W output power, 3.5 kVA max. at 200 W output power	
Power Factor	0.90 min; 0.95 typ.	
Ambient Temperature	-10°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 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: CPR137G waveguide flange, grooved, threaded, UNF 2B 10-32; RF output monitor: Type N Female	
M&C Interface	RS-232 and RS-422/485 (4-wire) (Ethernet optional)	
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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For more detailed information, please refer to the corresponding CPI technical description if one has been published, or contact CPI. Specifications may change without notice as a result of additional data or product refinement. Please contact CPI before using this information for system design.

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