

2.25 kW SuperLinear® TWT Amplifier

Compact

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 the 5.85 - 6.65 GHz frequency range (extended bands available). Designed for linear output up to 890 watts at the flange, with respect to each of two equal carriers, 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 and 50% more efficient than GaN SSPAs.

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

Modular design and built-in fault diagnostic capability via remote monitor and control.

Meets Global Requirements

Meets International Safety Standard EN-60215 and Electromagnetic Compatibility 2004/108/EC to satisfy worldwide requirements. CE certified.

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 TL22CI

2250 watt C-band 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) or dual-band BUC - contact CPI for specifications
- Integral linearizer
- External receive band reject filter
- Ethernet interface
- Extended frequency ranges
- TWT LifeExtender™/LifePredictor™



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2.25 kW C-Band SuperLinear® TWT Amplifier

Specification	Model TL22CI	
Output Frequency	5.85 to 6.65 GHz or 5.85 to 6.725 GHz	5.85 to 7.075 GHz
Output Power (min.) TWT Peak Power Flange Peak Power Guaranteed CW Power at Flange Maximum 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	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.	
Gain	75 dB at rated power, 78 dB 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 (1.0 dB pk-pk max. with linearizer); 3.0 dB pk-pk max. across 800 MHz (4.0 dB pk-pk max. with linearizer)	0.5 dB pk-pk max. over any 40 MHz (1.0 dB pk-pk max. with linearizer); 4.0 dB pk-pk max. across 1225 MHz (5.0 dB pk-pk max. with linearizer)
Input/Output VSWR	1.25:1 max.	
Load VSWR	1.7:1 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. With optional linearizer, can be tuned to 2°/dB max. (2.5°/dB max. for 5.850 to 6.725 GHz HPA with lin)	
Harmonic Output	-60 dBc max.	
Noise Density	-150 dBW/4 kHz from 3.7 to 4.2 GHz; -65 dBW/4 kHz from 4.2 to 12.0 GHz (-60 dBW/4 kHz from 4.2 to 12.0 GHz with linearizer option) -110 dBW/MHz from 12.0 to 40.0 GHz	
Intermodulation - with respect to each of 2 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 w/linearizer); -22 dBc max., 6.425 – 6.650 GHz (or 6.725 GHz) at 400 W output power without linearizer (-24 dBc max. at 890 W w/linearizer)	-23.5 dBc max, 5.850 – 6.425 GHz at 400 W output power without linearizer (-25 dBc max. @ 890 W w/linearizer); -20 dBc max., 6.425 – 7.075 GHz at 400 W output power without linearizer (-23 dBc max. 890 W w/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); 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; 2.5 kVA typ. at 100 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: CPR-137 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)	