

# 2.25 kW TWT Amplifier

## Compact

Provides 2250 watts of CW power in a compact nine rack-unit package, digital ready, for wideband, single- and multi-carrier satellite service in the 5.85 - 6.65 GHz or 5.85 to 7.075 GHz frequency bands. 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

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 full CW power.

## 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.

## Meets Global Requirements

Meets International Safety Standard EN-60215, Electromagnetic Compatibility 2004/108/EC 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 T22CI

2250 watt C-band 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
- TWT LifeExtender™ improves life of TWT



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## 2.25 kW C-Band TWT Amplifier

Specification	Model T22CI
Output Frequency	5.85 to 6.65 GHz or 5.85 - 7.075 GHz
Output Power (min.) TWT CW Power Flange CW Power	2250 W (63.54 dBm) min. 2000 W (63.00 dBm) min.
Instantaneous Bandwidth	800 MHz (1225 MHz optional)
Gain	70 dB min.
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); 4.0 dB pk-pk max. across 1225 MHz band; 5.0 dB pk-pk max. with linearizer option; 6.0 dB pk-pk max. across 1225 MHz band with BUC option; 7.0 dB pk-pk max. across 1225 MHz band with BUC and lin options
Input/Output VSWR	1.3:1 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	6.0°/dB max; with optional linearizer, can be tuned to 2.5°/dB max.
Harmonic Outputs	-60 dBc max.
Noise Density	<-150 dBW/4 kHz from 3.4 to 4.2 GHz; <-65 dBW/4 kHz from 4.2 to 12 GHz (<-60 dBW/4 kHz passband with linearizer option); -110 dBW/4 kHz from 12.0 to 40.0 GHz
Intermodulation - with respect to each of two equal carriers 5 MHz apart	-23.5 dBc max. from 5.850 to 6.425 GHz at 400 W output power (-25 dBc max. at 890 W with optional linearizer); -20 dBc max. from 6.425 to 7.075 GHz at output level of 400 W output power (-23 dBc max. at 890 W with optional linearizer)
Group Delay	0.02 ns/MHz linear max; 0.002 ns/MHz <sup>2</sup> 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	7.0 kVA max 6.7 kVA typ. at 2000 W output power 3.9 kVA typ. at 400 W output power 2.9 kVA typ. at 0 W at DC
Power Factor	0.90 min; 0.99 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-137G 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)