C-Band

# 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.)<br>TWT CW Power<br>Flange CW Power | <br>2250 W (63.54 dBm) min.<br>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<br>Over temp, constant drive | ±0.25 dB/24 hour max,max. at constant drive and temperature, after 30 minute warmup<br>±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);<br>4.0 dB pk-pk max. across 1225 MHz band; 5.0 dB pk-pk max. with linearizer option;<br>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<br>Prime power AC line unbalance not to exceed 3%. Excess imbalance may cause an increase in residual RF noise<br>(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);<br>-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);<br>-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$^2$ 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;<br>Frequency: 47-63 Hz ±10% five wire;<br>AC current harmonic content: less than 20%, primarily fifth and seventh harmonics.<br>Harmonics must be considered when choosing UPS sources. |
| Power Consumption | 7.0 kVA max<br>6.7 kVA typ. at 2000 W output power<br>3.9 kVA typ. at 400 W output power<br>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<br>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;<br>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) |



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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