CPI 2.25 and 2.50 kW SuperLineartm TWT Amplifiers

for Satellite Communications

The TL22XI and TL25XI TWTAs

Up to 2.5 kW (1110 W operating) TWT Compact High Power Amplifiers, featuring high efficiency, small size and integral computer interface.



Compact

Provides 2250 or 2500 watts of equivalent linear power (1000 or 1110 watts operating) in a compact nine rack-unit package, digital ready, for wideband, single- and multi-carrier satellite service in the 7.9 – 8.4 GHz frequency band. Designed to operate at up to 1260 watts flange linear power 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.

Efficient and Reliable

Employs an ultra-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 super-cool operation.

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.

Global Applications

Meets International Safety Standard EN-60215 and EMC Standard EEC 89/336 to satisfy worldwide requirements.

Easy to Maintain

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

Worldwide Support

Backed by over two decades of satellite communications experience, and CPI's worldwide 24-hour customer support network that includes sixteen regional factory service centers.



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OPTIONS & COMPANION PRODUCTS:

- Integral Linearizer
- · Remote Control Panel
- · Redundant and Power Combined Subsystems
- External Receive Band Reject Filter
- Integral L-Band Block *Upconverter (BUC)*

SPECIFICATIONS, TL22XI and TL25XI

Electrical

Frequency 7.9 - 8.4 GHz **Output Power** TWT - TL22XI 2250 W min. (63.54 dBm) TWT - TL25XI 2500 W min. (63.98 dBm) Flange - TL22XI 1000 W max. operating (60.00 dBm) Flange - TL25XI 1110 W max. operating (60.45 dBm)

Linear Power

TL22XI 1000 W with linearizer option TL25XI 1110 W with linearizer option3

Bandwidth 500 MHz

Gain 75 dB min. at rated power output

78 dB min. at small signal

RF Level Adjust 0 to 30 dB continuous

Output Power Adjustability ±0.1 dB

Gain Stability ± 0.25 dB/24 hr max. (at constant drive and temp.)

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 the 500 MHz band; 4.0 dB pk-pk w/linearizer;

5.0 dB pk-pk w/ BUC; 6.0 dB pk-pk w/linearizer and BUC

Input/Output VSWR 1.25:1 max.

Load VSWR 2.0:1 max. for full spec compliance;

any value without damage

Residual AM, max.1 -50 dBc below 10 kHz,

-20 (1.5 +log F kHz) dBc, 10 kHz to 500 kHz (F in kHz) -85 dBc above 500 kHz

Phase Noise1

IESS-308/309

phase noise continuous 10 dB below mask at -10 dB backof AC fundamentals related -50 dBc

-47 dBc Sum of spurs

AM/PM Conversion 6°/dB max. With optional linearizer,

can be tuned to 2°/dB max.

Harmonic Output -80 dBc

-130 dBW/4 kHz from 3.4 to 4.2 GHz Noise and Spurious

-110 dBW/4 kHz from 12.0 to 40.0 GHz

Intermodulation

with two equal carriers, level at 56 dBm

total output power

-65 dBW/4 kHz from 4.2 to 12.0 GHz -23.5 dBc max, 7.9 - 8.4 GHz

(-25 dBc max. at 4 dB backoff

with linearizer);

Electrical (continued)

Primary Power²

Group Delay 0.02 ns/MHz linear (in any 40 MHz band) 0.002 ns/MHz² parabolic

0.5 ns pk-pk ripple max.

All ratings are ±10%, 47-63 Hz, 5-wire, 3-phase with neutral and ground 208 VAC (with or w/o neutral)

380 to 415 VAC

Power Factor

Power Consumption 5.5 kW max.:

4.9 kW typ. @ 1000 W linear RF output

power:

0.95 min.

4.2 kW typ. @ 800 W; 3.9 kW typ. @ 600 W; 3.6 kW typ. @ 400 W; 3.3 kW typ. @ 200 W; 2.8 kW typ. @ 100 W

(Power consumption 10% less for

2.25 kW HPA, typ.)

Environmental

Ambient Temperature -10° to +50°C operating

-40° to +71°C non-operating

Relative Humidity 95% non-condensing

Up to 10,000 ft (3000 m) with standard Altitude

adiabatic derating of 2°/1000 ft.; 50,000 feet 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

Mechanical

Cooling(TWT) Forced air with integral blower

> and power supply fan. Maximum external pressure loss allowable: 0.25 inch water gauge.

RF Input Connection Type N female

RF Output Connection CPR 112 F waveguide flange, grooved, threaded UNF 2B 10-32

RF Power Monitors Type N female Dimensions (W x H x D) 19 x 15.75 x 24 in.

(483 x 400 x 610 mm)

Weight 155 lbs. (70.5 kg) max.

¹Prime 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.

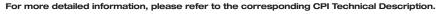
²AC current harmonic content: less than 20%, primarily fifth and seventh harmonics. Harmonics must be considered when choosing UPS sources

 $^3\mathrm{Up}$ to 1250 watts linear power available through optimization of linearizer settings.









Note: Specifications may change without notice as a result of additional data or product refinement. Please contact CPI before using this information for system design.

MKT 189, ISSUE 5



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