

CPI 1.25 kW SuperLinear® TWT Amplifier for Satellite Communications

The TL12UI

*1250 W peak TWT
Compact High Power
Amplifier features high
efficiency, small size and
integral computer interface.*

Ku-Band



Compact

Provides 1250 watts of peak power (540 watts average power) in a compact nine rack-unit package, digital ready, for wideband, single- and multi-carrier satellite service in the 13.75 to 14.50 GHz frequency band (12.75 to 14.50 GHz and 13.75 to 14.80 GHz optional). Designed for linear output up to 500 watts at the flange 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

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's high efficiency results in 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 2004/108/EC 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 twenty regional factory service centers.



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Ku-Band

1250 W SuperLinear® Compact TWT A

OPTIONS & COMPANION PRODUCTS:

- *Integral Linearizer*
- *Remote Control Panel*
- *Redundant and Power Combined Subsystems*
- *External Receive Band Reject Filter*
- *Extended Frequency (12.75 to 14.50 GHz and 13.75 to 14.80 GHz)*
- *Integral L-Band Block Upconverter (BUC) - specifications for the BUC option are not included on this data sheet. Please consult TD-169 for details.*
- *Ethernet Interface*

SPECIFICATIONS, TL12UI

Electrical

Output Frequency	13.75 to 14.50 GHz (12.75 to 14.50 GHz optional)
Output Power	
TWT Peak Power	1250 W (60.97 dBm)
Flange Peak Power*	1000 W (60.00 dBm)
CW Flange Power (min.)	540 W (57.33 dBm)
CW Flange Power (max.)	600 W (57.78 dBm)
<i>*Note: This amplifier does not provide 1000 W of power at the flange. The Flange Peak Power specification is provided so that the user can more easily calculate the desired backoff level from peak. See "CW Flange Power" above for CW output power specifications.</i>	
Bandwidth	750 MHz (1750 MHz optional)
Gain	70 dB min.
Output Power Adjustability	0 to -30 dB of output with 0.1 dB typical resolution
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	1.0 dB pk-pk max. over any 80 MHz; 1.5 dB pk-pk max. over any 80MHz with linearizer option; 3.0 dB pk-pk max. across 750 MHz (4.0 dB pk-pk across 1750 MHz); 4.0 dB pk-pk max. across 750 MHz with linearizer option (6.0 dB pk-pk across 1750 MHz)
Input/Output VSWR	1.3:1 max.
Load VSWR	1.5:1 max. for full spec compliance; any value without damage; 2.0:1 continuous operation
Phase Noise ¹	
IESS-308/309	
phase noise continuous	12 dB below mask
AC fundamentals related	-50 dBc
Sum of spurs	-47 dBc
Noise Density	<-150 dBW/4 kHz, 10.0 to 12.7 GHz (10.0 - 11.7 GHz w/ 12.75 GHz config.) <-65 dBW/4 kHz, transmit band (<-60 dBW/4 kHz with linearizer); <-105 dBW/4 KHz, 18.0 to 26.0 GHz <-125 dBW/4 kHz, 26.0 to 40.0 GHz
AM/PM Conversion	2.0°/dB max. for single carrier at 8 dB OBO (at 3 dB OBO with optional linearizer)
Intermodulation (with two equal carriers)	-25 dBc max. with linearizer at 500 W output power (-25 dBc without linearizer at 200 W output power)
Group Delay (in any 80 MHz band)	0.01 ns/MHz linear 0.001 ns/MHz ² parabolic 0.5 ns pk-pk ripple max.

Electrical (continued)

Primary Power ²	All ratings are ±10%, 47-63 Hz, 5-wire, 3-phase with neutral and ground 200 to 208 VAC (without neutral) 380 to 415 VAC
Power Factor	0.95 min.
Power Consumption	2.1 kVA typ. at 540 W output power

Environmental

Ambient Temperature	-10° to +50°C operating -20° to +70°C non-operating
Relative Humidity	95% non-condensing
Altitude	Up to 10,000 ft (3000 m) with standard 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
Heat Dissipation	2000 W max.

Mechanical

Cooling(TWT)	Forced air with integral blower. Maximum external pressure loss allowable: 0.25 inch water gauge.
RF Input Connection	Type N female
RF Output Connection	WR-75G waveguide flange, grooved, threaded UNF 2B 6-32
RF Power Monitors	Type N female
Computer Interface	RS-422/485 or RS232 serial (Ethernet optional)
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.



For more detailed information, please refer to the corresponding CPI Technical Description.

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.



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