

# 600W Outdoor TWT High Power Amplifier

for Military Satellite Communications

**Tri-Band**

## The TL06TO Series

600 Watt TWT High Power Amplifier — high efficiency in an environmentally sealed compact package designed for outdoor operation



### Plays in the Rain

Provides up to 600 watts of peak power in a rugged and compact weatherproof package, with a digital serial interface, for wideband, single- and multi-carrier satellite service in C, X and Ku-bands. Ideal for mobile and fixed earth station applications.

### Cost Effective and Efficient

Mounting at the antenna improves performance through minimized cable losses and saves cost in system design. Employs a high efficiency, multi-stage depressed collector helix traveling wave tube, enabling higher operating temperatures reducing operating costs.

### Reliable

Designed and built to survive in extremely adverse environmental conditions and features increased cooling margin for longer life.

### Simple to Operate

User-friendly microprocessor-controlled logic with integrated RS422/485 computer interface. Digital metering, optional pin diode attenuator and solid state IPA for higher gain.

### Easy to Maintain

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

### Global Applications

Meets Electromagnetic Compatibility Directive 2004/108/EC and Harmonic Standard EN-61000-3-2 to satisfy worldwide requirements.

### 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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## SPECIFICATIONS TL06TO 600 W Series

### OPTIONS:

- *Integrated Switch Control*
- *Redundant Switch Subsystems*
- *Integrated Linearizer: X-band or X/Ku-band*
- *1 RU Remote Control Panel*
- *Extended Ku-Band (13.75 - 14.50 GHz)*
- *Extended C-Band (5.85 - 6.65 GHz)*

### Electrical

Frequency  
Output Power, min.  
TWT, Peak  
Flange, Plin  
Flange, Plin with linearizer  
Gain  
at rated linear power  
at small signal  
Small Signal Gain Slope  
Small Signal Gain Variation  
Gain Stability (at constant drive and temperature)  
VSWR  
Input  
Output  
Load  
Phase Noise  
AM/PM Conversion  
Noise Density (at max. gain)  
Transmit Band  
Receive Band  
Intermodulation (with two equal carriers)  
Spectral Regrowth  
Group Delay  
Linear  
Parabolic  
Ripple  
Primary Power  
Power Consumption  
Power Factor

### Environmental

Ambient Temperature (operating)  
Relative Humidity  
Altitude  
Shock and Vibration

### Mechanical

Cooling  
RF Input Connection  
RF Output Connection  
RF Output Monitor  
Dimensions (W x H x D)  
Weight

### Heat and Acoustic

Heat Dissipation  
Acoustic

|  | C-Band   | X-Band  | Ku-Band              |
|--|--|---|----------------------|
| Frequency  | 5.85 - 6.425 GHz   | 7.9 - 8.4 GHz   | 13.75 - 14.50 GHz    |
| Output Power, min.                                 |  |   |                      |
| TWT, Peak  | 350 W (55.44 dBm)  | 600 W (57.78 dBm)   | 350 W (55.44 dBm)    |
| Flange, Plin                                       | 240 W (53.80 dBm)  | 125 W (50.97 dBm)   | 115 W (50.60 dBm)    |
| Flange, Plin with linearizer                       | N.A.   | 300 W (54.80 dBm)   | 250 W (54.00 dBm)    |
| Gain   |  |   |                      |
| at rated linear power                              | 70 dB min.   | 72 dB min.  | 72 dB min.           |
| at small signal                                    | 73 dB min.   | 72 dB min.  | 72 dB min.           |
| Small Signal Gain Slope                            | ± 0.04 dB/MHz max.   |   |                      |
| Small Signal Gain Variation                        | 1.5 dB pk-pk max. (across any 120 MHz band)<br>2.5 dB pk-pk max. (across each full frequency band) |   |                      |
| Gain Stability (at constant drive and temperature) | ± 0.25 dB/24 hours max.  |   |                      |
| VSWR   |  |   |                      |
| Input  | 1.3:1 max.   |   |                      |
| Output   | 2.2:1 max.   |   |                      |
| Load   | 2.0:1 max.; no degradation, infinite VSWR without damage   |   |                      |
| Phase Noise  | 12 dB below IESS-308 mask  |   |                      |
| AM/PM Conversion                                   | 4.0°/dB max.   |   |                      |
| Noise Density (at max. gain)                       |  |   |                      |
| Transmit Band                                      | -65 dBW / 4 kHz max.   | -65 dBW / 4 kHz max.  | -63 dBW / 4 kHz max. |
| Receive Band                                       | -70 dBW / 4 kHz max.   | -60 dBW / 4 kHz max.  | -55 dBW / 4 kHz max. |
| Intermodulation (with two equal carriers)          | -25 dBc max. at 7.5 dB OBO   | -25 dBc max. at 7.5 dB OBO (at 4.5 dB OBO with optional linearizer) |                      |
| Spectral Regrowth                                  | -28 dBc max. at 6 dB OBO   | -30 dBc max. at 6 dB OBO (at 3 dB OBO with linearizer)              |                      |
| Group Delay  |  |   |                      |
| Linear   | 0.01 nsec/MHz max.   |   |                      |
| Parabolic  | 0.005 nsec/MHz sq. max.  |   |                      |
| Ripple   | 0.5 nsec pk-pk max.  |   |                      |
| Primary Power                                      | 110 - 240 VAC ±10% , single phase; 47-63 Hz  |   |                      |
| Power Consumption                                  | 1800 VA typ., 2000 VA max.   |   |                      |
| Power Factor                                       | 0.95 min., meets requirements of Harmonics EMC Directive EN61000-3-2                               |   |                      |
| Ambient Temperature (operating)                    | -40°C to +60°C, including solar loading  |   |                      |
| Relative Humidity                                  | 100% condensing  |   |                      |
| Altitude   | 10,000 ft with standard adiabatic derating of 2°C/1000 ft  |   |                      |
| Shock and Vibration                                | 20 g pk, 11 msec, 1/2 sine; 2.1 G rms, 5 to 500 Hz   |   |                      |
| Cooling  | Forced air with integral blower  |   |                      |
| RF Input Connection                                | Type N Female  |   |                      |
| RF Output Connection                               | WRD-580D28 waveguide flange, threaded 6-23 UNC-2B  |   |                      |
| RF Output Monitor                                  | Type N Female  |   |                      |
| Dimensions (W x H x D)                             | 12.5 x 6.75 x 30 inches (318 x 172 x 762 mm)   |   |                      |
| Weight   | 85 lbs (38.6 kg) typ.  |   |                      |
| Heat Dissipation                                   | 1580 W max.  |   |                      |
| Acoustic   | 69 dBA typ.  |   |                      |

Mounting hardware is provided with each amplifier.



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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