

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 89/336/EEC 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 fourteen regional factory service centers.

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SPECIFICATIONS TL06TO 600 W Series

Electrical

	C-Band	X-Band	Ku-Band
Frequency	5.850 - 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)
TWT, Linear CW, No Linearizer	263 W (54.20 dBm)	140 W (51.50 dBm)	125 W (51.00 dBm)
TWT, Linear CW, X-band Linearizer	263 W (54.20 dBm)	380 W (55.80 dBm)	125 W (51.00 dBm)
TWT, Linear CW, X/Ku-band Lin.	263 W (54.20 dBm)	380 W (55.80 dBm)	275 W (54.40 dBm)
Flange, Lin. CW, No Linearizer	240 W (53.80 dBm)	125 W (50.97 dBm)	115 W (50.60 dBm)
Flange, Lin. CW, X-band Lin.	240 W (53.80 dBm)	300 W (54.80 dBm)	115 W (50.60 dBm)
Flange, Lin. CW, X/Ku-band Lin.	240 W (53.80 dBm)	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.	75 dB min.
Small Signal Gain Slope	± 0.04 dB/MHz max.		
Small Signal Gain Variation	1.0 dB pk-pk (across any 40 MHz band) 2.5 dB pk-pk (across individual frequency band)		
Gain Stability (at constant drive and temperature)	± 0.25 dB/24 hours max.		
VSWR (Input/Output/Load)	1.3:1 max./1.3:1 max./2.0:1 max. - no degradation, infinite VSWR without damage		
Phase Noise	10 dB below MIL-STD-188-164 A mask		
AM/PM Conversion	2.0°/dB max. for a single carrier up to rated linear power		
Noise Power Density (at max. gain)			
Transmit Band	<-65 dBW/4 kHz	<-65 dBW/4 kHz	<-63 dBW/4 kHz
Receive Band	<-70 dBW/4 kHz, 3.4 - 4.2 GHz	<-60 dBW/4 kHz, 7.25 - 7.75 GHz	<-55 dBW/4 kHz, 10.95 - 12.75 GHz
Intermodulation (with two equal carriers)	-19 dBc at 4.5 dB OBO, -25 dBc at 7.5 dB OBO		
Spectral Regrowth	-26 dBc max. at 53.9 dBm	-30 dBc max. (at 3.5 dB OBO w/ linearizer) at 54.8 dBm	-26 dBc max. (at 3.5 dB OBO w/ linearizer) at 54.0 dBm
Group Delay			
Linear	0.01 nsec/MHz max.		
Parabolic	0.005 nsec/MHz sq. max.		
Ripple	0.5 nsec pk-pk max.		
Primary Power	108 - 264 VAC, single phase; 47-63 Hz		
Power Consumption	1900 VA typ./ 2000 VA max.		
Power Factor	0.95 min., meets requirements of Harmonics EMC Directive EN61000-3-2		

Environmental

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, per MIL-STD 810-E/F

Mechanical

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 and Acoustic

Heat Dissipation	1250 W max.
Acoustic	69 dBA typ. (as measured from 3 feet)

Mounting hardware is provided with each amplifier.

OPTIONS:

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



KEEPING YOU ON THE AIR
not up in the air



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.