400W Outdoor TWT Amplifier
for Satellite Communications

X-Band

The T04XO Series

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

Plays in the Rain
Provides 400 watts of power in a rugged and compact weatherproof package, digital ready, for wideband, single- and multi-carrier satellite service in the 7.9 - 8.4 GHz frequency band. Ideal for transportable 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, dual-depressed collector helix traveling wave tube 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, pin diode attenuation and optional integrated linearizer for improved intermodulation performance.

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

Global Applications
Meets International Safety Standard EN-60215, Electromagnetic Compatibility 2004/108/EC and Harmonic Standard EN-61000-3-2 to satisfy worldwide requirements.

Worldwide Support
Backed by over three 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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X-Band
400W Outdoor TWT Amplifier

OPTIONS:

- *Remote Control Panel*
- *Integrated 1:1 Switch Control and Drive*
- *Redundant and Power Combined Subsystems*
- *SSIPA with Variable Attenuator (provides typical RF Level Adjust Range of 0 to 30 dB)*
- *Integral Linearizer (Requires SSIPA option)*
- *L-Band Block Upconverter (BUC --- requires SSIPA --- SEE NOTE below)*
- *Forward Power Detection Over CIF*
- *Ethernet Interface*

***Note:** This data sheet does not provide specifications for when the BUC option is included. Please refer to TD-137 or contact CPI for details.*

SPECIFICATIONS, T04XO Series

Electrical

Frequency	7.9 - 8.4 GHz
Output Power	
TWT	400 W min. (56.02 dBm)
Flange	350 W min. (55.44 dBm)
Bandwidth	500 MHz
Gain	46 dB min. at rated power output (70 dB with SSIPA) 52 dB min. at small signal (75 dB with SSIPA)
Gain Stability	
At constant drive and temp.	±0.25 dB/24hr max. (after 30 min. warmup)
Over temp. constant drive	±1.0 dB over operating temp. range (any freq.); ±0.75 dB over ±10°C
Small Signal Gain Slope	±0.02 dB/MHz max.
Small Signal Gain Variation	1.0 dB pk-pk across any 40 MHz band; 2.5 dB pk-pk across the 500 MHz band 4.0 dB pk-pk across 500 MHz with linearizer
RF Level Adjust Range	0 to 30 dB typ. (SSIPA option required)
Attenuator Step-Size	0.1 dB (SSIPA option required)
Input VSWR	1.3:1 max.
Output VSWR	1.3:1 max.
Load VSWR	2.0:1 max. continuous operation; any value for operation without damage
Residual AM	-50 dBc below 10 kHz -20[1.5 +log F (kHz)] dBc, 10 kHz to 500 kHz -85 dBc above 500 kHz
Phase Noise	
IESS-308/309 phase noise continuous	10 dB below mask
AC fundamentals related	-42 dBc
Sum of spurs (370 Hz to 1 MHz)	-47 dBc
AM/PM Conversion	2.5°/dB max. for a single carrier at 7 dB below rated power (2.5°/dB max. at 3 dB below rated with linearizer)
Harmonic Output	-60 dBc at rated power
Noise and Spurious (at rated gain)	-60 dBc per MIL-STD-188-164A, transmit and receive band
Intermodulation	-24 dBc max. at 7.5 dB OBO per MIL-STD-188-164A

Electrical (continued)

Group Delay (in any 40 MHz band)	0.01 ns/MHz linear max. 0.002 ns/MHz^2 parabolic max. 0.5 ns pk-pk ripple max.
Primary Power	90-264 volts AC, single phase 47-63 Hz
Power Consumption	1350 W typ. 1500 W max.
Power Factor	0.95 min.

Environmental (Operating)

Ambient Temperature	-40°C to +50°C, operating in direct sunlight; -40°C to +55°C, operating out of direct sunlight; -40°C to +75°C non-operating
Relative Humidity	100% 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 20G at 11 ms (1/2 sine pulse) in non-operating configuration.
Acoustic Noise	65 dBA @ 3 ft. from amplifier
Heat Dissipation	1100 W max.

Mechanical

Cooling (TWT)	Forced air with integral blower
RF Input Connection	Type N female
RF Output Connection	CPR-112 G waveguide flange, grooved with UNC 2B 10-32 threaded holes
RF Output Monitor	Type N female
Dimensions (W x H x D)	10.25 x 10.5 x 20.5 in. (260 x 267 x 521 mm)
Weight	55 lbs (25.0 kg) with no options, max.

ISO 9001 Certificate Number: 30515

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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Communications & Power Industries

satcom division